Catalog CAN/US • 2007

flender gear motors MOTOX-N

Gear Motors
up to 180.000 lb-in

SIEMENS

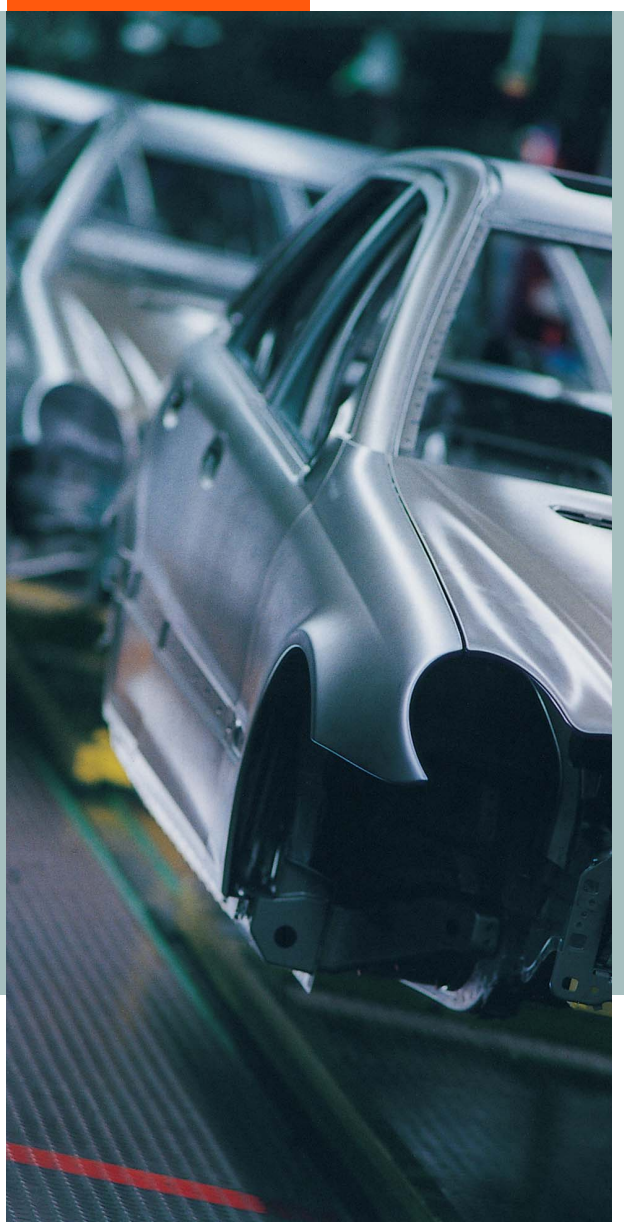
Flender MOTOX Geared Motors

Catalog CAN/US · 2007

Supersede:
Flender Catalog CAN/US05 · 12.05

SIEMENS

Siemens Automation and Drives. Welcome.



Welcome to the world of the totally integrated mechanical and electrical drive systems and components!

In all industry sectors, for all industrial applications Flender MOTOX geared motors
are leading in technology, quality and market orientation. Totally Integrated Automation – our integrated range of products, systems and solutions is now being expanded to include these drive systems.

Utilize the savings potential which a global partner can offer you. Enter the world of Totally Integrated Automation with Flender products.

Technical information

General

The MOTOX-N Gear Motor program is a modular system which is based on many years of experience. Through intelligent interfaces, different components can be assembled to create customized solutions. The patented MODULOG-Motor is integrated with all Gearboxes and offers diverse options through its design/flexibility. The electronic components MOTOX-Master and MOTOX-Drive complement the program for automatic control engineering applications.

High requirements are placed on modern drive system.

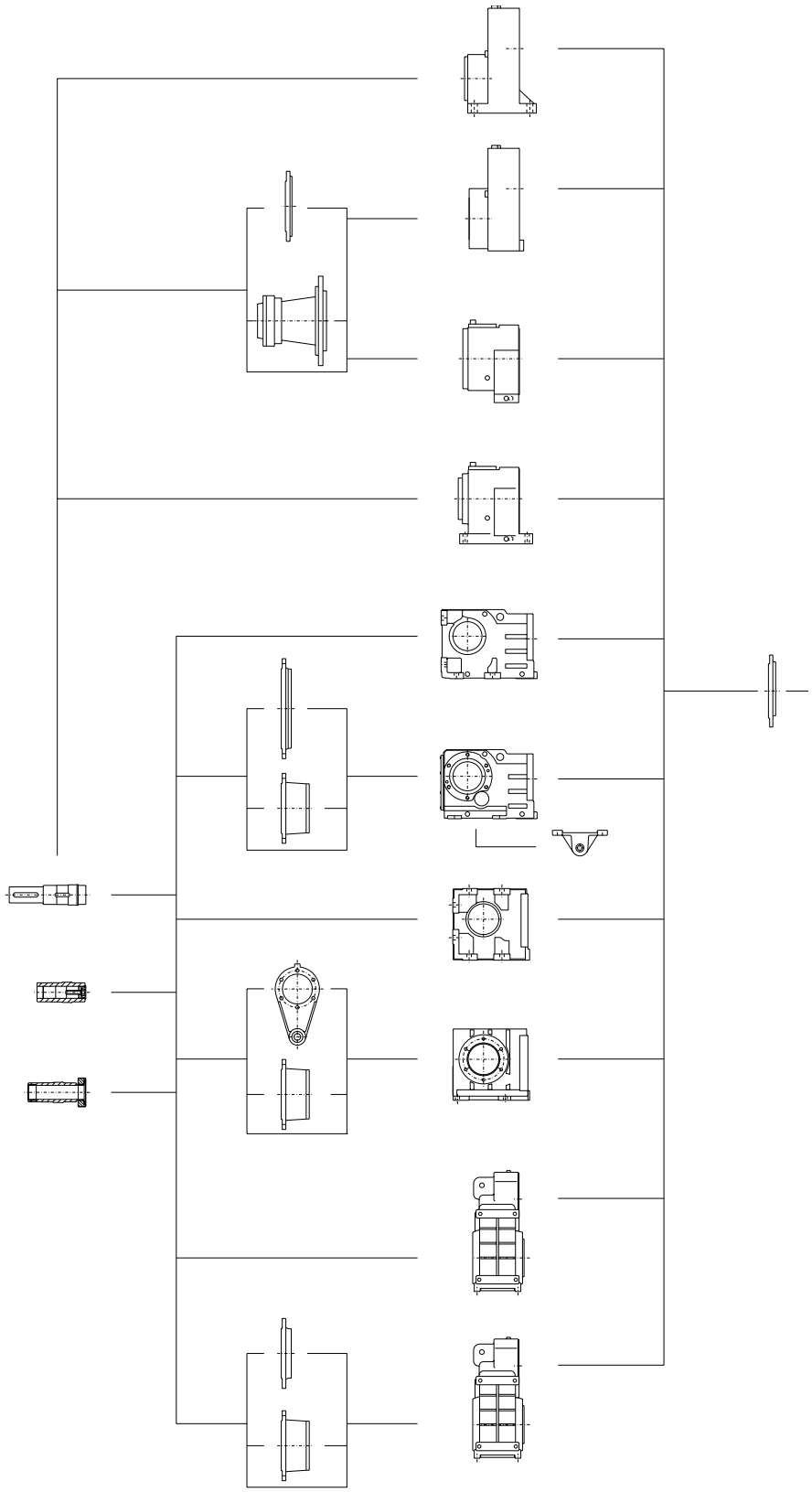
During the design of the **MOTOX-N** gearbox system we have taken into account the needs of our customers for a greater **reliability** and **economic efficiency.**

The gearing geometry has been totally redesigned with the help of the most modern calculation technics and via numerous actual research studies. This led not only to other constructive and productive technical measures, but also resulted in:

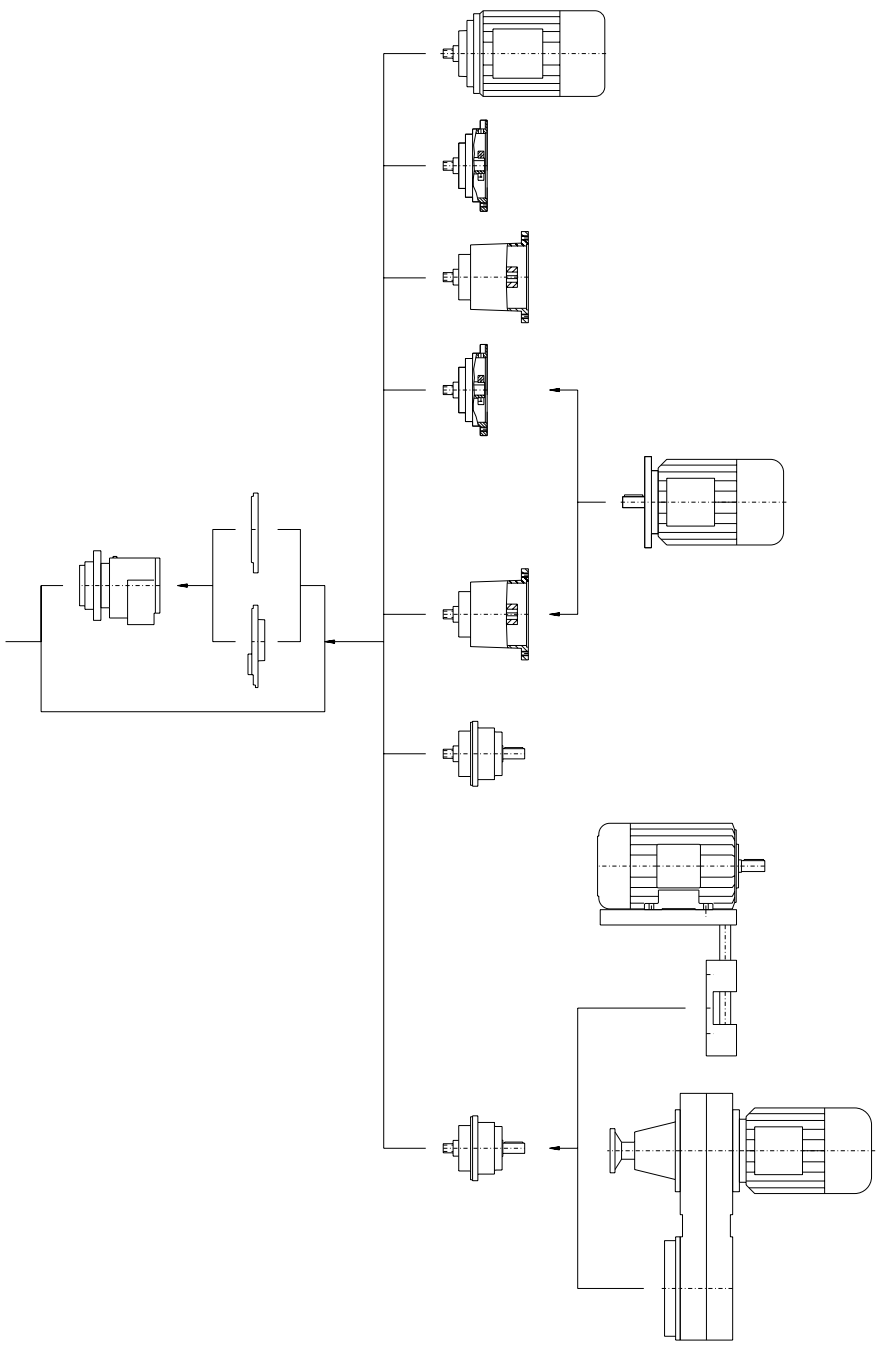
- Torque-increases, dependent on sizes and speed-variations
- Good environmental compatibility by reduction of noise levels
- High mounting and installation adaptability and modern housing Design, which is optimized using our 3D-CAD tool,
- Redesign cost saving thanks to the retention of the past connection dimensions for each size
- Cost advantages through the expansion of the ratio ranges
- An increase in reliability by the reduction of sealing surfaces, use of most modern seal materials and types on the output shafts.

We select and deliver complete variable speed drive solutions in connection with our frequency inverters.

Modular Gear Motor System



Modular Gear Motor System
Input Units



Tolerances for functional dimensions

Dimension D and SA (height from foot base to shaft center)

Imperial System [inch]		**Metric System** [mm]	
D	Tolerances	D	Tolerances
< = 9.84	+0 -0.02	< = 250	+0 -0.5
> 9.84	+0 -0.039	> 250	+0 -1

Shaft Diameters U and FU1 (ref. MG 1 - 4.05)

Imperial System [inch]			**Metric System** [mm]			
Diameter		Tolerances	Diameter		Tolerances	ISO Fit
over	to		over	to		
0.25	1.5	+0 -0.0005	10	18	+0.012 +0.001	k6
1.5	6.5	+0 -0.001	18	30	+0.015 +0.002	
			30	55	+0.018 +0.002	
			50	80	+0.03 +0.011	m6
			80	120	+0.035 +0.013	
			120	180	+0.040 +0.015	

Shaft Diameters UA and UH

Imperial System [inch]			**Metric System** [mm]			
Diameter		Tolerances	Diameter		Tolerances	ISO Fit
over	to		over	to		
-			18	30	+0.0 -0.013	h6
			30	50	+0.0 -0.016	
			50	80	+0.0 -0.019	
			80	120	+0.0 -0.022	

Key width KEY or KEY1 (1st value in w x h x l)

Imperial System [inch]			**Metric System** [mm]			
Square keys			Square and rectangular keys			
Width		Tolerances	Width		Tolerances	ISO Fit
over	to		from	to		
-	1 1/4	+0.003 +0	3	6	+0 -0.03	h9
			6	10	+0 -0.036	
			10	18	+0 -0.043	
			18	30	+0 -0.052	

Keyway width Y or FY1 (on hollow shafts and couplings)

Imperial System [inch]			**Metric System** [mm]			
Width		Tolerances	Width		Tolerances	ISO Fit
over	to		from	to		
-	1 1/4	+0.002 +0	6	10	+0.018 -0.018	JS9
1 1/4	3		10	18	+0.0215 -0.0215	
3	3 1/2		18	30	+0.026 -0.026	

Hollow shaft bore diameters U and FU1

Imperial System [inch]			**Metric System** [mm]			
Diameter		Tolerances	Diameter		Tolerances	ISO Fit
over	to		over	to		
-	2	+0.001 +0	18	30	+0.021 +0	H7*
2	6.5	+0.0015 +0	30	50	+0.025 +0	
Per AGMA 9002 - A86			50	80	+0.03 +0	
			80	120	+0.035 +0	

* Measured with plug gauge.

Mounting rabbet diameter AK / AK1

Imperial system [inch]			**Metric system** [mm]			
Diameter		Tolerances	Diameter		Tolerances	ISO Fit
over	to		over	to		
2	3.15	+0.0005 -0.0003	50	80	+0.012 -0.007	j6
3.15	4.75	+0.0005 -0.0004	80	120	+0.013 -0.009	
4.75	7	+0.0006 -0.0004	120	180	+0.014 -0.011	
7	9	+0.0006 -0.0005	180	230	+0.016 -0.013	
9	12.5	+0 -0.001	230	315	+0 -0.032	h6
12.5	15.75	+0 -0.001	315	400	+0 -0.036	
15.75	20	+0 -0.0015	400	550	+0 -0.04	

Tolerance for Customer Shaft Diameter (Load Classification)

The following table represents the appropriate tolerance that the customer should chose for their keyed shaft-end based on the nature of their load. Hollow shafts supplied by FLENDER are machined with bore tolerances as represented in page 1 - 4.

***Tolerance for Shaft Diameter U (in INCH)**

1

U		Load Class		
over	to	I	II	III
0.5	2.000	0.0 -0.0007	+0.0004 -0.0003	+0.0007 0.0
2.000	3.000	0.0 -0.0008	+0.0005 -0.0003	+0.0008 0.0
3.000	4.000	0.0 -0.0012	+0.0005 -0.0007	+0.0010 -0.0002

***Tolerance for Shaft Diameter U (in mm)**

U		Load Class		
over	to	I	II	III
-	30	0.0 -0.013	+0.009 -0.004	+0.015 +0.002
30	50	0.0 -0.016	+0.011 -0.005	+0.018 +0.002
50	80	0.0 -0.019	+0.012 -0.007	+0.021 +0.002
80	120	0.0 -0.022	+0.013 -0.009	+0.025 +0.003

Load Class. I = Uniform Load or light shocks and $J_L / J_M \leq 0.3$

Load Class. II = Moderate Shock Load and $J_L / J_M \leq 3.0$

Load Class. III = Heavy Shock Load and $J_L / J_M \leq 10$

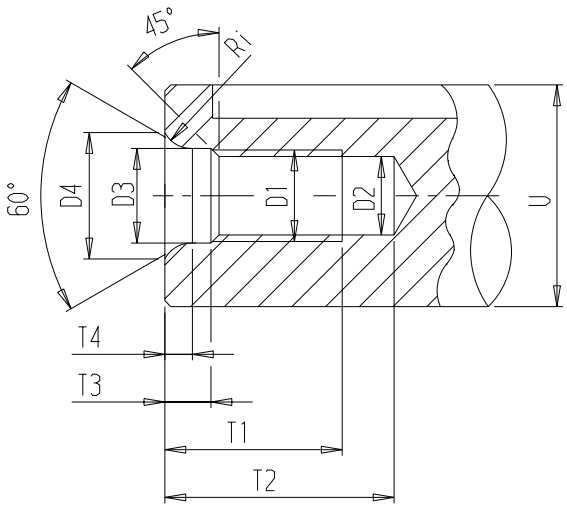
J_L = Load Inertia reflected to motor shaft

J_M = Motor Inertia

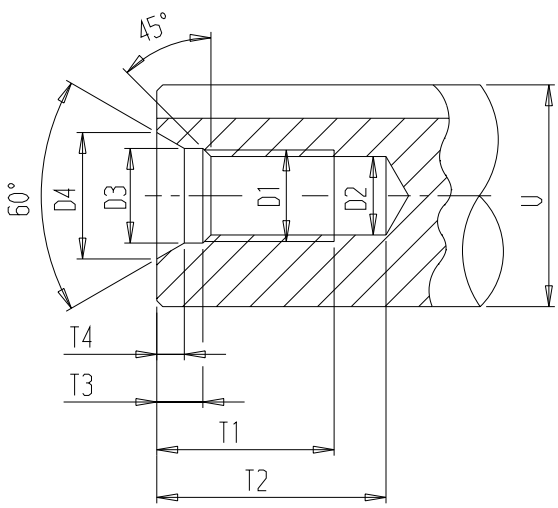
* Dimensions subject to change without notice.

Output Shaft Tap Specifications

Metric Shaft



Inch Shaft



Inch Shaft (Dimensions are in inch)

Shaft Diameter U over	Shaft Diameter U to	D1	D2	D3	D4	T1	T2	T3	T4
0	13/16	1/4 - 20	0.2086	0.256	0.374	0.630	0.787	0.197	0.102
7/8	15/16	5/16 - 18	0.2638	0.327	0.472	0.966	1.102	0.236	0.126
1	1 1/8	3/8 - 16	0.3189	0.386	0.571	0.966	1.102	0.285	0.169
11/4	1 3/8	1/2 - 13	0.4330	0.531	0.768	1.122	1.417	0.374	0.205
11/2	1 7/8	5/8 - 11	0.5433	0.654	0.984	1.378	1.772	0.472	0.283
2	3 1/4	3/4 - 10	0.6693	0.795	1.181	1.614	2.047	0.591	0.335
3 3/8	5	1 - 8	0.8858	1.016	1.457	2.126	2.756	0.709	0.394
5 1/6 and over		1 1/8 - 7	0.9844	1.181	1.638	2.441	3.307	0.787	0.394

Metric Shaft (Dimensions are in *mm*)

Shaft Diameter U over	Shaft Diameter U to	D1	D2	D3	D4	R_i	T1	T2	T3	T4
10	*13*	*M4*	*3.3*	*4.3*	*6.7*	*5.0*	*10.0*	*14.0*	*3.2*	*2.1*
13	*16*	*M5*	*4.2*	*5.3*	*8.1*	*6.3*	*12.5*	*17.0*	*4.0*	*2.4*
16	*21*	*M6*	*5.0*	*6.4*	*9.6*	*8.0*	*16.0*	*21.0*	*5.0*	*2.8*
21	*24*	*M8*	*6.8*	*8.4*	*12.2*	*10.0*	*19.0*	*25.0*	*6.0*	*3.3*
24	*30*	*M10*	*8.5*	*10.5*	*14.9*	*16.0*	*22.0*	*30.0*	*7.5*	*3.8*
30	*38*	*M12*	*10.2*	*13.0*	*18.1*	*20.0*	*28.0*	*37.0*	*9.5*	*4.4*
38	*50*	*M16*	*14.0*	*17.0*	*23.0*	*25.0*	*36.0*	*45.0*	*12.0*	*5.2*
50	*85*	*M20*	*17.5*	*21.0*	*28.4*	*31.5*	*42.0*	*53.0*	*15.0*	*6.4*
85	*130*	*M24*	*21.0*	*25.0*	*34.2*	*40.0*	*50.0*	*63.0*	*18.0*	*8.0*
130 and over		*M30*	*26.5*	*31.0*	*42.6*	*50.0*	*63.0*	*85.0*	*20.0*	*10.0*

Dimensions subject to change without notice.

Coats of paint

For protection of the drives against corrosive and aggressive environments FLENDER offers three high quality painting systems in several color tones.
All coats of paint are applied carefully by spray painting for optimal appearance using the most modern painting systems.
Other color tones and special paints are possible upon request.

Paint system	Color tone	Typical area of use	Overpaintability *	Chem. phys. resistance	Temperature resistance	Remarks
Plastic (Standard)	Standard: RAL 7011 on demand: RAL 1007, 1012, 1023, 2000, 2004, 3000, 5007, 5009, 5010, 5012, 6011, 7001, 5015, 7030, 7032, 7035, 9005, 9006, black-dull, others on request	Standard 1-layer coat of lacquer for the internal area, outdoors in shelter, i.e. suitable protection against sun and continuous atmospheric influence.	With plastic lacquer or synthetic resin lacquer.	Good resistance to cleaning agents, oil and benzine, resistant to short- time attack by diluted acid and alkaline solution (≤3%) not resistant to solvent	- 40°C to 100°C - 104°F to 212°F up to 140°C/284°F for a short time	Standard coat of lacquer with excellent adhesive characteristics.
2K-PUR (extra charge)	Standard: RAL 7031 on demand: RAL1003, 1018, 2004, 5002, 5015, 6011, 7000, 9010, 9011, 9016, others on request	Standard 2-layer coat of lacquer especially for installation in the open or in case of increased demands on corrosion protection	After preceding grinding with: 2K-PUR lacquer 2K-Epoxy lacquer	Excellent resistance to weak acid and alkaline solution (≤3%), oil, grease, benzine, cooling emulsion, salt, solvent; tough and scratch-resistant-coating film	-40°C to 150°C -104°F to 302°F	Standard coat of lacquer for cooling tower and agitator drive or if sea water resistance below deck or similar is required
2K-Epoxy (extra charge)	Standard: RAL 7035 on demand: RAL 5015, 6018, 7031, others on request	High-quality coat of lacquer for the external area or in case of attack by diluted acid and alkaline solution (≤5%)	After preceding grinding with: 2K-PUR lacquer 2K-Epoxy lacquer 2K-AC lacquer	Excellent resistance to weak acid and alkaline solution (≤5%), oil, grease, benzine, cooling emulsion, salt, solvent; tough and scratch-resistant-coating film	-40°C to 150°C -104°F to 302°F	2K-Epoxy lacquer “chalks” in case of installation in the open (does not effect the quality), high gloss with good mechanical resistance
Primed	(RAL 7032)	For overpainting: adhesive agent for all common paint systems, temporary corrosion protection	Excellent with: plastic lacquer, synthetic resin lacquer, 2K-PUR lacquer, 2K-Epoxy lacquer, SH lacquer, 2K-AC lacquer	Good resistance to cleaning agent, to salt spraying and resistant to oil and benzine	-40°C to 150°C -104°F to 302°F	Adhesive agent with excellent adhesive characteristics and good corrosion protection
Unpainted	-	For overpainting: (adhesive agent) temporary corrosion protection	Excellent with: plastic lacquer, synthetic resin lacquer, oil paint, bitumenous paint, 2K-PUR paint 2K-Epoxy paint	-	(-40°C to 150°C) (-104°F to 302°F)	Components from grey cast iron dip-primed, components from steel primed or galvanised, components from Al and plastic untreated

* Note:
The information for varnishing (over-coating) does not represent a release in the sense of a warranty for the quality of the coating material delivered by your supply.
FLENDER is not responsible for the quality of the paint itself. The paint manufacturer guarantees the quality.

Drive selection

Operating conditions decide the selection of drive. These conditions are taken into account by service factor **(SF)**.

For normal operating conditions with uniform loadings, low masses to be accelerated and few starts, this service factor **(SF) = 1**.

For different operating conditions see table “Service factor”. This factor decides the speed reducer size, not, however, the drive motor rating.

With known motor rating and output speed enter the selection tables list and choose a speed reducer type, whose permissible service factor $\mathbf{SF_o} \leq \mathbf{SF}$ (please see next page).

Flender personnel are available to advise on drive selection for special operating conditions, e.g. reversing, short time or intermittent operation, abnormal temperature, counter-current braking, high or rotating radial forces onto the output shaft etc. upon request.

For that purpose we require the following data:

1. Type of driven machine
2. Daily operating period
3. Required power [hp] or torque [lb.in.]
4. Nominal speed of gear unit [r.p.m.] or ratio i
5. Voltage [V] and frequency [Hz]
6. Starting (direct on line or star/delta)
7. Type of operation, starting cycles frequency, frequency inverter operation
8. Moments of inertia J_{ext} [lb.in.^{2}] of driven machine referred to nominal output speed of gear unit
9. Connection to input or output shaft (direct, coupling, belt drive, chain drive, gears)
10. Overhung loads F_R [lb] on shafts and their direction with distance of load application point from shaft shoulder, thrust forces F_A [N]
11. Ambient temperature [°F]
12. Mounting position
13. Desired braking torque [lb.in.]

If motors must conform to foreign standards, these standards should be specified exactly.

Service Factor

$$SF_0 = SF_1 \bullet SF_2 \bullet SF_3$$

$$SF_0 \leq SF$$

where,

SF_0 = Minimum service factor

SF = Service factor (see gear motors selection)

Factor SF_1

Daily operation		4 hours			8 hours			16 hours			24 hours		
Starts / hour		<10	10 - 200	>200	<10	10 - 200	>200	<10	10 - 200	>200	<10	10 - 200	>200
Load Classification	I	0.8	0.9	1	0.9	1	1.1	1	1.1	1.2	1.2	1.3	1.5
	II	1	1.1	1.3	1.1	1.2	1.3	1.2	1.4	1.5	1.4	1.5	1.6
	III	1.3	1.4	1.5	1.4	1.5	1.6	1.5	1.6	1.7	1.6	1.7	1.8

For daily operating periods up to 4 hours and if flexible coupling or belt drives are being used, lower service factors can be chosen.

Load Type	Driven Machine
I **Light Shocks**	Mass acceleration factor ≤ 0.3 : Generators, belt conveyors, platform conveyors, screw conveyors, light hoists, electric hoists, auxiliary machine tool drives, turbo blowers, turbo compressors, agitators and mixers for light uniform density materials.
II **Moderate Shocks**	Mass acceleration factor ≤ 3 : Main machine tool drives, hoists, slewing gears, cranes, induced draught fans, mixer and agitator for materials with variable density, muticylinder piston pumps, metering pumps.
III **Heavy Shocks**	Mass acceleration factor ≤ 10 : Punch presses, shears, banbury mixers, rolling mill and foundry drivers, bucket dredger, heavy centrifugal drives, heavy metering pumps, rotary drilling equipment, briquet presses, pug mills.

For very heavy shock load applications such as reversing operation, please contact your sales branch.

$$\textit{Mass Acceleration Factor} = \frac{\textit{all exterior moments of inertia}}{\textit{moment of inertia of drive motor}} \quad [\ lb\text{-}ft^2\ ]$$

Exterior moments of inertia are defined as the “load inertia” referring to the motor speed. The “load inertia” must be provided by the driven machine manufacturer. For assistance contact Flender or see the following formulae.

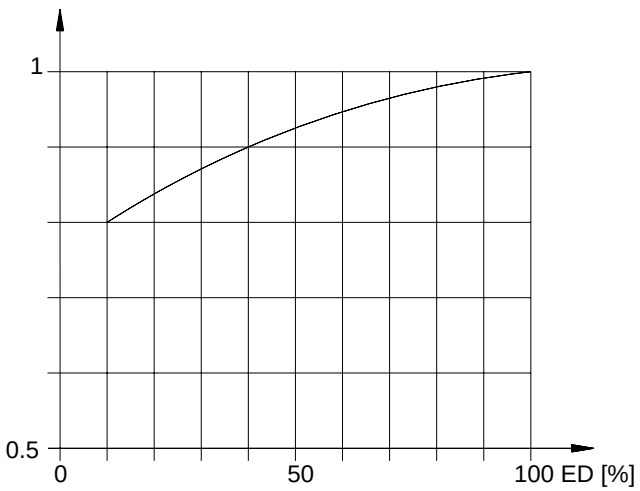
$$\textit{Exterior Moment of Inertia (Rotating)} = \textit{Load Inertia} \times \left[\frac{\textit{Load RPM}}{\textit{Motor RPM}}\right]^2$$

$$\textit{Exterior Moment of Inertia (Linear)} = W \times \left[\frac{V}{6.28\,N}\right]^2$$

where,

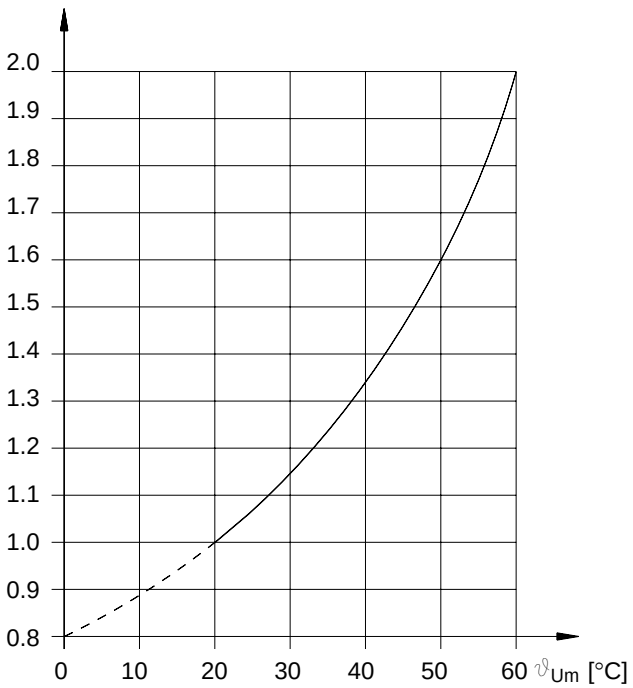
W = Weight (lb)
V = Linear Velocity (Ft./Min.)
N = Motor RPM

Factor SF_2 (for short term operation)



ED = Operating cycle / h

Factor SF_3 (for ambient temperature)



ϑ_{Um} = Ambient temperature

* For temperature below 20°C contact FLENDER

Losses by splashing

For certain mounting position the first stage gears dip completely into the oil. When using bigger gear boxes with high input speed there will be losses by splashing which have to be taken into consideration.

You should use the mounting positions B3.. / B5 / B5-01 / H01 for gear box types DZ., F., and K. to minimize losses.

AGMA Application Standard

Application	Hrs. per Day 8-10	24	Application	Hrs. per Day 8-10	24	Application	Hrs. per Day 8-10	24	Application	Hrs. per Day 8-10	24
AGITATORS			ELEVATORS			MACHINE TOOLS			Reciprocating		
Pure Liquids	I	II	Bucket-Uniform Load	I	II	Bending Roll	--	II	Single Acting		
Liquids and Solids	II	II	Bucket-Heavy Load	II	II	Notching Press-Belt Driven	I	II	3 or more Cylinders	II	II
Liquids-Variable Density	II	II	Bucket-Continuous	I	II	Plate Planer	III	III	Double Acting		
BLOWERS			Centrifugal-Discharge	I	II	Punch Press-Gear Driven	III	III	2 or more Cylinders	II	II
Centrifugal	I	II	Escalators	I	I	Tapping Machines	--	III	++Single Acting		
Lobe	II	II	Freight	II	II	Other Machine Tools			1 or 2 Cylinders	++	++
Vane	I	II	Gravity Discharge	I	I	Main Drives	II	II	++Double Acting		
BREWING & DESTILLING			Man Lifts	--	--	Auxiliary Drives	I	II	Single-Cylinder	++	++
Bottling Machinery	I	II	++Passenger	++	++	METAL MILLS			Rotary-Gear Type	I	II
Brew Kettles-Continuous Duty	--	II	Service Hand Lift	III	--	Draw-Bench-Carriage	III	III	Lobe,Vane	I	II
Cookers-Continuous Duty	--	II	FANS			Draw-Bench-Main Drive	II	III	RUBBER INDUSTRY		
Mash Tubs-Continuous Duty	--	II	Centrifugal	I	II	Forming Machines	III	III	Mixer	III	III
Scale Hopper											
Frequent Starts	II	II	Cooling Towers			++Pinch Dryer & Scubber			*Rubber Calender	II	II
CAN FILLING MACHINES	I	II	Induced Draft	II	II	Rolls Reversing	++	++	*Rubber Mill(2 or more)	II	II
CAN KNIVES	II	II	++Forced Draft	++	++	*Sitters	II	II	*Sheeter	II	II
CAR DUMPERS	III	--	Induced Draft	II	II	Table Conveyors	--	--	Tire Building Machines	II	II
CAR PULLERS	II	--	Large (Mine, etc..)	II	II	Non-Reversing	II	II	Tire & Tube Press Openers	I	I
CLARIFIERS	I	II	Large Industrial	I	II	*Reversing	--	--	Tubers and Strainers	II	II
						Wire Drawing & Flattening			SEWAGE DISPOSAL		
CLASSIFIERS	II	II	Light (Small Diameter)	I	II	Machine	II	II	EQUIPMENT		
CLAY WORKING											
MACHINERY			FEEDERS			Wire Winding Machine	--	II	Bare Screens	--	II
Brick Press	III	III	Apron	II	II	MILLS ROTARY TYPE			Chemical Feeders	I	II
Briquette Machine	III	III	Belt	II	II	*Ball	II	II	Collectors Circuline or Straightline	I	II
Clay Working Machinery	II	II	Disc	I	II	*Cement Kilns	--	II	Dewatering Screens	II	II
Pug Mill	II	II	Reciprocating	III	III	Dryers & Coolers	II	II	Grit Collectors	I	II
COMPRESSORS			Screw	II	II	Kilns	II	II	Scum Breakers	II	II
Centrifugal	I	II	FOOD INDUSTRY			*Pebble	II	II	Slow or Rapid Mixers	II	II
Lobe	II	II	Beet Slicer	II	II	Rod	III	III	Sludge Collectors	I	II
Reciprocating			Cereal Cooker	I	II	Tumbling Barrels	III	III	Thickeners	II	II
Multi-Cylinder	II	II	Dough Mixer	II	II	MIXERS			Vacuum Filters	II	II
Single-Cylinder	III	III	Meat Grinders	II	II	Concrete-Continuous	II	II	SCREENS		
CONVEYORS-UNIFORMLY			GENERATORS-								
LOADED OR FED			(Not Welding)	I	II	Concrete-Intermittent	I	--	Air Washing	I	II
Apron	I	II	HAMMER MILLS	III	III	Constant Density	I	II	Rotary-Stone or Gravel	II	II
Assembly	I	II	LAUNDRY WASHERS			Variable Density	II	II	Travelling Water Intake	I	II
Belt	I	II	Reversing	II	II	OIL INDUSTRY			SLAB PUSHERS	II	II
Bucket	I	II	LAUNDRY TUMBLERS	II	II	Chillers	II	II	STEERING GEAR	II	II
Chain	I	II	LINE SHAFTS			++Oil Well Pumping	++	++	STOKERS	I	II
Flight	I	II	Driving Processing Equipment	II	II	Paraffin Filter Press	II	II	TEXTILE INDUSTRY		
Oven	I	II	Other Line Shafts	I	II	Rotary Kilns	II	II	Batchers	II	II
Screw	I	II	LUMBER INDUSTRY			PAPER MILLS			Calenders	II	II
CONVEYORS-HEAVY DUTY			Barkers-Hydraulic-Mechanical	II	II	Agitators (Mixes)	II	II	*Card Machines	II	II
									Cloth Finishing Machines		
									(washers, pads ,		
									tenters, dryers ,		
Apron	II	II	Burner Conveyor	II	II	Barker Auxiliaries Hydraulic	--	III	calenders, etc.)	II	II
Assembly	II	II	Chain Saw and Drag Saw	III	III	Barker Mechanical	--	III	Dry Cans	II	II
Belt	II	II	Chain Transfer	III	III	Barking Drum	II	II	Dyeing Machinery	II	II
Bucket	II	II	Craneway Transfer	III	III	*Beater & Pulpers	--	II	++Knitting Machines (Looms, etc.)	++	++
Chain	II	II	De-Barking Drum	III	III	Bleacher	I	II	Looms	II	II
Flight	II	II	Edger Feed	II	II	*Calenders	--	II	Mangles	II	II
++Live Roll	++	++	Gang Feed	II	II	Calenders-Super	--	III	Nappers	II	II
						Converting Machines, Excep.					
Oven	II	II	Green Chain	II	II	Cutters, Platers	--	III	++Range Drivers	++	++
Reciprocating	III	III	Line Rolls	III	III	Conveyors	--	II	Soapers	II	II
Screw	II	II	Log Deck	III	III	*Coach	--	II	Spinners	II	II
Shaker	III	III	Log-Haul-Incline	III	III	Cutters, Platers	--	III	Tenter Frames	II	II
CRANES & HOISTS			Log-Haul-Well Type	III	III	Cylinders	--	II	Winders (other than Batchers)	II	II
									Yard Preparatory Machines (Cards		
Main Hoists			Log Turning Device	III	III	*Dryers	--	II	Spiners, Slashers, etc.)	II	II
Heavy Duty	III	III	Main Log Conveyor	III	III	Felt Stretcher	--	II	WINDLASS	II	II
Medium Duty	II	II	Off Bearing Rolls	II	II	Felt Whipper	--	III			
Reversing	II	II	Planer Feed Chains	II	II	Jordans	--	III			
Skip Hoists	II	II	Planer Floor Chains	II	II	Log Haul	--	III			
Travel Motion	II	II	Planer Tilting Hoist	II	II	*Presses	--	II			
			Re-Saw Merry-Go-Round								
Trolley Motion	II	II	Conveyor	II	II	Pulp Machines	--	II			
CRUSHERS			Roll Cases	III	III	Reel	--	II			

International SI-Units

Description	Symbol	Unit Symbol	SI-Units Denomination
Length (length of path)	l	m	Meter
Area	A	m^2	
Volume	V	m^3	
Angle in one plane	α, β, γ	rad	Radian
Angle of rotation	ϕ		
Time	t	s	Second
Cycle length	T	s	
Frequency	f	Hz	Hertz
Rotational speed	n	rpm	
Velocity	v	m/s	
Acceleration	a	m/s^2	$g=9.81\ m/s^2$
Gravitational Acceleration	g		
Angular velocity	ω	rad/s	
Angular acceleration	α	rad/s^2	
Mass	m	kg	Kilogram
Density	g	kg/dm^3	
Force	F	N	Newton
Weight	G		
Pressure	p	Pa N/m^2	Pascal
Mechanical stress	σ	N/mm^2	
Work	W	J	Joule
Energy	W	J	
Amount of Heat	Q	J	
Torque	T	Nm	Newton meter
Bending moment	M	Nm	
Output power	P	W	Watt
Moment of inertia	J	kgm^2	$m.r^2$
Dynamical viscosity	η	$Pa \cdot s$	
Kinematical viscosity	υ	m^2/s	
Electrical current	I	A	Ampere
Voltage	U	V	Volt
Electrical resistance	R	Ω	Ohm
Conductance	G	S	Siemens
Capacitance	C	F	Farad
Quantity of electricity Charge	Q	C	Coulomb
Self inductance	L	H	Henry
Magnetic flux density Magnetic induction	B	T	Tefla
Magnetic field strength	H	A/m	
Magnetical flux	ϕ	Wb	Weber
Temperature	T(ϑ)	K(°C)	Kelvin

Conversion table for frequently used Imperial-Metric units

DISTANCE		in	ft	yd	mm	m
1 in	=	1	0.0833	0.0278	25.4	0.0254
1 ft	=	12	1	0.3333	304.8	0.3048
1 yd	=	36	3	1	914	0.9144
1 mm	=	0.039	3.281E-03	1.094E-03	1	0.001
1 m	=	39.37	3.281	1.094	1000	1

AREA		sq in	sq ft	sq yd	cm^2	m^2
1 sq in	=	1	6.944E-03	7.716E-04	6.4516	6.452E-04
1 sq ft	=	144	1	0.1111	929	9.290E-02
1 sq yd	=	1296	9	1	8361	8.361E-01
1 cm^2	=	0.155	1.076E-03	1.196E-04	1	0.0001
1 m^2	=	1550	10.764	1.196	10000	1

VOLUME		cu in	pint	US-Gallon	dm^3	m^3
1 cu in	=	1	3.463E-02	4.330E-03	0.016	1.639E-05
1 pint	=	28.87	1	0.1250	4.732E-01	4.732E-04
1 US-Gallon	=	230.9	8	1	3.785	3.785E-03
1 l = 1 dm^3	=	61.01	2.113	2.642E-01	1	0.001
1 m^3	=	61013	2113	264,2	1000	1

MASS		1 oz	1 lb	1 g	1 kg
1 oz	=	1	6.250E-02	28.35	0.028
1 lb	=	16	1	453.6	0.454
1 g	=	0.035	0,0022	1	0.001
1 kg	=	35.27	2.205	1000	1

PRESSURE		bar	Pa	atm	psi
1 bar	=	1	1.0E+05	0.99	14.50
1 Pa = 1 N/m^2	=	1.0E-05	1	9.869E-06	1.45E-04
1 atm	=	1.013	1.013E+05	1	14.70
1 psi = 1 lb/sq in	=	0.069	6895	0.068	1

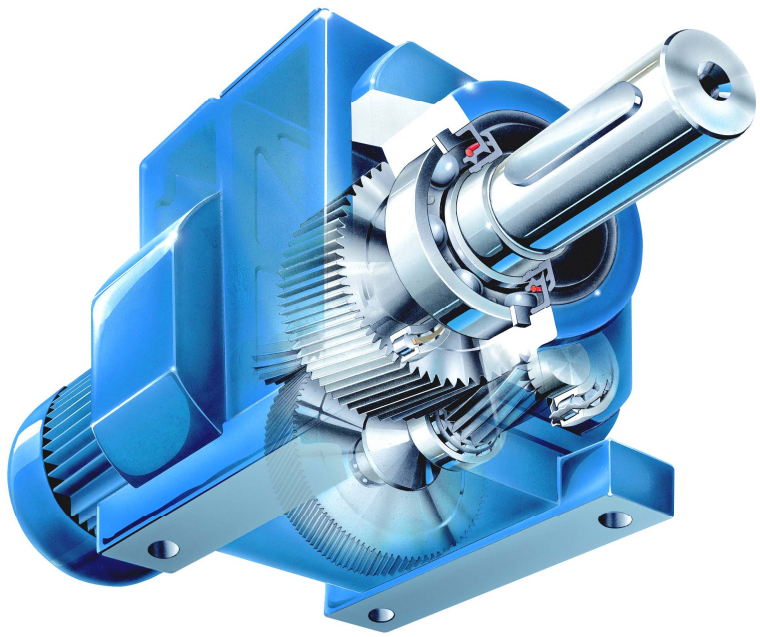
TORQUE		lb in	lb ft	kpm	Nm
1 lb in	=	1	8.333E-02	0.01	0.113
1 lb ft	=	12	1	0.1	1.356
1 kpm	=	86.77	7.231	1	9.807
1 Nm	=	8.848	0.737	0.102	1

FORCE		lbf	kp	N
1 lbf	=	1	0.454	4.448
1 kp	=	2.205	1	9.807
1 N	=	0.225	0.102	1

POWER		hp	PS	kW
1 hp	=	1	1.014	0.746
1 PS	=	0.986	1	0.735
1 kW	=	1.341	1.360	1

TEMPERATURE		°F	°C
1 °F	=	1	0.555 x (°F-32)
1 °C	=	1.8 x °C + 32	1

Notice: The information contained on this page were compiled with the utmost care. However, FLENDER does not assume liability for its accuracy or contents.



Helical Gear Motors and Gear Units

Table of Contents **Page**

Helical Gear Units

Technical description

MOTOX-N helical gear units are part of the MOTOX-N modular system which essentially comprises helical, helical bevel, parallel shaft, helical worm gear units or mechanical variable speed drives. With three or single phase AC motors with or without brake, all imaginable drive combinations up to electronic variable speed drives are possible.

MOTOX-N helical gear units are designed for continuous operation.

The housings made of grey cast iron or aluminium are developed in 3D-CAD and optimized for rigid and anti-vibration structure.

Lubricant loss and entry of dust and water are effectively prevented by high quality radial shaft seal.

All gears are hobbed, case hardened and profile ground or honed. Additionally, gear teeth are profile corrected and crowned for optimum performance.

Helical gearing provides for optimal quiet operation.

Helical gears are in compliance with ASME / AGMA Standard 2001-B88.

Helical gears have a hardness of 58-62 R_C.

The maximum permissible radial and axial forces at the input and output shafts are to be considered.

Design Variations

The standard unit is available in foot, face or flange mounted versions for use in all mounting positions.

Integrally mounted C-Face adapters, either in the clamp collar style (K5TC) or the elastic coupling style (KTC), are available for NEMA motors.

Electro-magnetic brakes, backstops, speed monitors and numerous integral options are available.

Output power, torque and speed

The horsepower, output torque and speeds shown in the selection tables are based on mounting position B3 (or a similar position), standard features, ambient temperature of 20°C (68°F) and standard lubricant.

The actual output speeds and torques may vary slightly from the figures in this catalogue due to motor variations, supply voltage or reflected load.

Efficiency

The efficiency of helical gearing is determined by gearing and bearing friction as well as splash losses. It ranges from approximately 94% for 3 stage units to 98% for single stage units.

Standards

The important dimensions correspond to the DIN standards, namely:

Shaft heights	DIN 747
Cylindrical shaft ends	DIN 748/1
Mounting flanges	DIN 42948
Coaxial concentricity and runout of shaft ends and of flange surface	DIN 42955
Parallel keys	DIN 6885/1
Second motor shaft extension	DIN 748/3
Centre holes in shaft ends	DIN 332/2

Direction of rotation of the gear motors

Three-phase a.c. motors are arranged so that the motor shaft turns to the right (IEC 60034-8).
The direction of rotation of the gear unit output shaft may be reversed by swapping over two external wires at the motor. For single-phase a.c. geared motors and for geared motors fitted with backstop, the required direction of rotation must be stated when the order is placed.

The Weights [lbs / kg] shown in the Dimension Sheets are average values and do not include Oil.

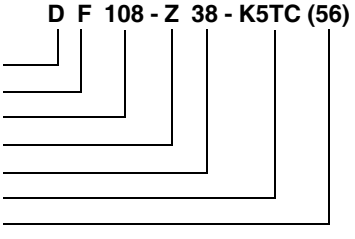
For Oil Quantities according to the operational mounting positions, see chapter “Lubrication, Oil Quantities”.

Specific Weights of Oils:
Mineral Oil (CLP) = 0.9 kg/l (2 lbs/l)
Synthetic Oil (PGLP) = 1.05 kg/l (2.3 lbs/l)

Type Designations

Gear Units

Example: **D F 108 - Z 38 - K5TC (56)**



Type of gear unit

(-) Helical Gear Unit

Stages

E 1-stage
Z 2-stages
D 3-stages

Design

Shaft

(-) Solid shaft

Fixing

(-) Foot-mounted
F Flange-mounted (A-type)
Z Housing flange (C-type)
R Agitator flange

Connection

(-) Parallel key

Type of ancillary gear unit

(-) Helical Gear Unit

Stages

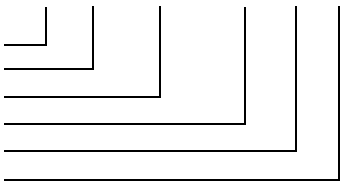
Z 2-stages
D 3-stages

Type of input unit

K4 Extended housing with shank assembly for IEC flange mounted motors
K2 Extended housing with elastic coupling for IEC flange mounted motor
A Input flange with free input shaft (metric)
P Design piggy back for IEC motors
K5TC Adapter with clamp collar for NEMA C-face motors
KTC Adapter 3 Piece Coupled for NEMA C-face mounted motors
A5 Input flange with free input shaft (imperial)
P5 Design piggy back for NEMA motors

Motors

Example: **M 100L 4/2 R - L16 NH - IN**



Types of motors

AM., M., MI.
Three phase motor

MB
Single phase motor with running capacitor

MK
Single phase motor with running and starting capacitor and starting relais

1MA, 1LA, 1LG
Three phase motors, explosion-proof EExe II

DNG., DVG., DBG.
Three phase motors, explosion-proof EExde II or EExd II

Additional characteristics

E Efficiency level class: eff1
R Resistance rotor
F Forced cooling
U Non ventilated
I High inertia fan
W Rain cover
H Reduced noise level
M MOTOX-Master (Integral Frequency Inverters)
X Backstop

Brake type / Brake design

L, KFB
Spring loaded-single disk brake, DC-excitation

16 Size = Nominal torque of brake
16/.. Adjusted braking torque

M Microswitch
N Normal design
G Encapsulated design

H Manual release
A Locking for manual release

Encoder system

IN Incremental encoder

Existing overhung loads

For the calculation of the existing radial load the type of drive element has to be taken into consideration.
For different drive elements the following factor C have to be considered.

Drive element	Factor C	Remarks
Gears	1.15	< 17 teeth
Chain sprockets	1.40	< 13 teeth
Chain sprockets	1.25	< 20 teeth
V-Belt	2.0	Pretension
Flat belt	2.50	Pretension
Toothed belt	1.50	Pretension
Agitator / Mixer	2.0	rotating radial force

$$F_{exist} = \frac{T_2 \cdot 2}{d_0}$$

F_{exist} = existing radial load [lbf]

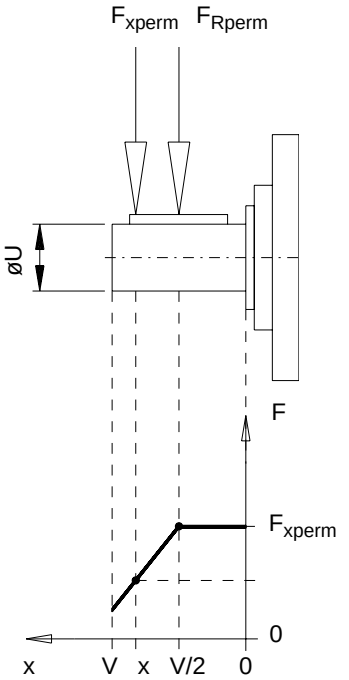
T_2 = existing torque [lb-in]

d_0 = average diameter of the drive element [in]

C = Factor for the drive element type [-]

$$F_{exist} \cdot C \leq F_{xperm}$$

Permissible overhung loads for helical gear units at Service Factor 1.0



Calculation based on bearing life

$$F_{xperm1} = F_{Rperm} \cdot \frac{y}{z + x} \qquad [lbf]$$

Calculation based on mechanical strength

$$F_{xperm2} = \frac{a \cdot 1000}{b + x} \qquad [lbf]$$

valid for x ≧ V/2
for x < V/2: $F_{xperm} = F_{Rperm}$

The dimension x is the distance from the shaft shoulder to the point where the load (F_{xperm}) is applied.
The lower value F_{xperm} of both calculation results is the permissible overhung load. Higher overhung loads are permitted under certain load conditions. If values on tables are not sufficient for the requirement, please consult FLENDER, stating the following criteria on overhung load:
- value
- direction / angle of force
- location (x) on shaft
- direction of rotation of shaft

Note:
Information on permissible overhung loads for agitator flange see supplementary catalogue.
For high or rotating radial load mixer- and agitator drives have to be used.

Standard Bearings

								F_{Rperm} in lbf for x = V/2 for output speeds n_2 in rpm							
Typ(e)	**y** [in.]	**z** [in.]	**a** [lb in]	**b** [in.]	**U** [in.]	**V** [in.]	*	≤ **160** [rpm]	≤ **250** [rpm]	≤ **400** [rpm]	≤ **500** [rpm]	≤ **625** [rpm]	≤ **780** [rpm]	≤ **980** [rpm]	≤ **1200** [rpm]
E.38	4.13	3.35	1.23	0.94	3/4	1.57	ccw	-	677	324	434	385	428	486	479
							cw		713	457	488	353	367	380	403
E.48	4.49	3.50	1.69	0.94	1	1.97	ccw	875	632	441	101	160	232	396	385
							cw		785	628	212	151	176	239	295
E.68	6.10	4.92	3.21	1.16	1 1/4	2.36	ccw	1372	1118	599	536	428	484	486	515
							cw		1372	619	326	63	176	221	293
E.88	6.73	5.16	5.64	1.28	1 5/8	3.15	ccw	1975	1640	1280	1172	1049	905	891	871
							cw		1739	1265	1069	857	518	585	666
E.108	7.64	5.67	8.62	1.44	2 1/8	3.94	ccw	2529	2189	1746	1373	1150	920	965	-
							cw		1636	1130	700	513	250	437	-
E.128	8.98	6.61	14.15	1.44	2 3/8	4.72	ccw	3728	3238	2511	2302	2106	2027	1917	-
							cw		3404	2320	1908	1438	1611	1690	-
E.148	10.24	7.48	20.25	1.83	2 3/4	5.51	ccw	4417	3839	3227	2912	2486	2480	2417	2288
							cw		3695	2644	2201	1539	1708	1829	1895

Heavy Duty Bearings

								F_{Rperm} in lbf for x = V/2 for output speeds n_2 in rpm							
Typ(e)	**y** [in.]	**z** [in.]	**a** [lb in]	**b** [in.]	**U** [in.]	**V** [in.]	*	≤ **160** [rpm]	≤ **250** [rpm]	≤ **400** [rpm]	≤ **500** [rpm]	≤ **625** [rpm]	≤ **780** [rpm]	≤ **980** [rpm]	≤ **1200** [rpm]
E.38	4.13	3.35	1.23	0.94	3/4	1.57	ccw	-	587	295	387	347	380	446	533
							cw	-	635	416	488	459	486	536	603
E.48	4.49	3.50	1.69	0.94	1	1.97	ccw	783	567	407	122	171	232	378	500
							cw	853	700	587	387	425	470	572	547
E.68	6.10	4.92	3.21	1.16	1 1/4	2.36	ccw	1231	956	540	491	412	605	736	880
							cw	1364	1166	875	846	797	934	1031	1127
E.88	6.73	5.16	5.64	1.28	1 5/8	3.15	ccw	1975	1975	1589	1433	1265	1033	1026	1019
							cw	1975	1975	1726	1573	1395	1188	1163	1136
E.108	7.64	5.67	8.62	1.44	2 1/8	3.94	ccw	2529	2081	1910	1730	1512	1321	1303	-
							cw	2529	2459	2212	1917	1703	1503	1451	-
E.128	8.98	6.61	14.15	1.44	2 3/8	4.72	ccw	3728	3728	3292	2972	2666	2592	2477	-
							cw	3728	3728	3508	3200	2914	2790	2633	-
E.148	10.24	7.48	20.25	1.83	2 3/4	5.51	ccw	4417	3989	3580	3398	2891	2846	2795	2660
							cw	4417	4417	4066	3661	3179	3105	3015	2840

* Direction of rotation with view on output shaft
cw = clockwise
ccw = counter clockwise

Standard Bearings

Typ(e)	y [in.]	z [in.]	a [lb in]	b [in.]	U [in.]	V [in.]	F_{Rperm} in lbf for x = V/2 for output speeds n_2 in rpm							
							*	≤ **16** [rpm]	≤ **25** [rpm]	≤ **40** [rpm]	≤ **63** [rpm]	≤ **100** [rpm]	≤ **160** [rpm]	≤ **250** [rpm]	≤ **400** [rpm]
D./Z.18	3.58	2.80	0.45	0.47	3/4	1.57	ccw	360	360	360	360	360	360	344	304
							cw	360	360	360	360	360	360	331	295
D./Z.F18	3.90	3.11	0.51	0.79	3/4	1.57	ccw	322	322	322	322	322	322	317	281
							cw	322	322	322	322	322	322	304	272
D./Z.28	4.09	3.11	1.15	0.47	1	1.97	ccw	648	648	648	612	394	223	122	205
							cw	770	770	770	734	515	344	241	304
D./Z.F28	4.33	3.35	1.15	0.71	1	1.97	ccw	626	632	677	583	473	196	218	189
							cw	677	677	677	677	567	302	317	277
D./Z.38	4.17	3.19	1.50	0	1	1.97	ccw	938	938	938	770	563	304	302	378
							cw	1051	1051	1051	889	722	464	452	497
D./Z.48	5.51	4.13	2.88	0.75	1 3/8	2.76	ccw	1348	1348	1348	1348	909	803	671	594
							cw	1353	1353	1353	1353	1091	968	839	740
D./Z.68	6.69	5.10	5.00	0	1 5/8	3.15	ccw	2477	2477	2477	1978	1310	806	761	871
							cw	2909	2909	2909	2410	1742	1229	1163	1098
D./Z.88	8.62	6.26	14.47	0.83	2 1/8	3.94	ccw	5175	5175	5175	4678	3929	3420	2909	2561
							cw	5175	5175	5175	4372	3623	3139	2682	2426
D./Z.108	9.80	7.44	18.71	0	2 3/8	4.72	ccw	7484	7481	6701	5679	4790	3980	3562	3155
							cw	7018	7016	6235	5211	4325	3515	3296	2984
D./Z.128	12.03	9.27	27.63	0	2 7/8	5.51	ccw	10032	10032	9464	7436	6014	5524	5112	4604
							cw	10032	10032	9043	6786	5362	5063	4811	4426
D./Z.148	13.43	10.08	56.32	0	3 5/8	6.69	ccw	15264	13509	10739	9142	7722	6656	6102	5351
							cw	14420	12665	9896	8296	6878	6062	5708	5119
D./Z.168	16.56	12.42	103.23	1.18	4 3/8	8.27	ccw	19420	19420	19420	19420	19420	19420	19420	19420
							cw	19420	19420	19420	19420	19420	19420	19420	19420
D./Z.188	17.54	13.41	149.86	1.42	4 3/4	8.27	ccw	26994	26994	26994	26994	22196	22109	25504	-
							cw	26994	26994	26994	26994	25976	25589	26994	-

Heavy Duty Bearings

Typ(e)	y [in.]	z [in.]	a [lb in]	b [in.]	U [in.]	V [in.]	F_{Rperm} in lbf for x = V/2 for output speeds n_2 in rpm							
							*	≤ **16** [rpm]	≤ **25** [rpm]	≤ **40** [rpm]	≤ **63** [rpm]	≤ **100** [rpm]	≤ **160** [rpm]	≤ **250** [rpm]	≤ **400** [rpm]
D./Z.68	6.69	5.10	5.00	0	1 5/8	3.15	ccw	3172	3172	3172	3172	3172	3172	3172	3172
							cw	3172	3172	3172	3172	3172	3172	3172	3172
D./Z.88	8.23	6.26	14.47	0.83	2 1/8	3.94	ccw	5175	5175	5175	5175	4428	3778	3490	3134
							cw	5175	5175	5175	5175	5175	4520	4100	3683
D./Z.108	9.80	7.44	18.71	0	2 3/8	4.72	ccw	7925	7925	7925	7925	6284	4590	5166	5654
							cw	7925	7925	7925	7925	7490	5794	6185	6080
D./Z.128	12.03	9.27	27.63	0	2 7/8	5.51	ccw	10032	10032	10032	10032	10032	10032	10032	10032
							cw	10032	10032	10032	10032	10032	10032	10032	10032
D./Z.148	13.43	10.08	56.32	0	3 5/8	6.69	ccw	16832	16832	16832	16832	16832	16832	16630	15217
							cw	16832	16832	16832	16832	16832	16832	16236	14983
D./Z.168	16.56	12.42	103.23	1.18	4 3/8	8.27	ccw	19420	19420	19420	19420	19420	19420	19420	19420
							cw	19420	19420	19420	19420	19420	19420	19420	19420
D./Z.188	17.54	13.41	149.86	1.42	4 3/4	8.27	ccw	26994	26994	26994	26994	22196	22109	25504	-
							cw	26994	26994	26994	26994	25976	25589	26994	-

* Direction of rotation with view on output shaft
cw = clockwise
ccw = counter clockwise

Legend / Explanations

Performance Data / Torque tables

P_{Motor} = Rated power of motor
(60Hz) = at mains frequency 60Hz

Ratio = Total ratio of the gear unit

★ = Ratio belonging to preferred list of MOTOX-N

n_2 = Output speed of gear unit
(60Hz) at mains frequency 60Hz (4pol.) and 4 pole motor

T_2 = Output torque of gear unit (SF=1) at Service Factor SF =1

T_1 = permisssible continuous input torque of input unit K., A., P.

SF = Service Factor of the drive

FU1 x V1 = Dimension of solid shaft of type if input unit A., P.

F_{RAperm} V1/2 = Permissible overhung load at type of input unit A., P. at 0.5 x V1

Prefered list

The preferred list offers short delivery through higher availability.

Performance Data

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
0.25 (60 Hz)	0.05	219803	0.81	32268 ★	**D.188-D48-M71C4**
	0.06	192504	0.92	28260	
	0.07	154321	1.1	22654	
	0.07	170273	1	24996 ★	
	0.09	122877	1.4	18039	
	0.09	136216	1.3	19997 ★	
	0.1	111451	1.6	16361 ★	
	0.11	101549	1.7	14907	
	0.14	87049	2	12504	**D.188-Z48-M71C4**
	0.08	142275	0.87	20886	**D.168-D48-M71C4**
	0.1	121956	1	17519	**D.168-Z48-M71C4**
	0.11	107935	1.1	15504 ★	
	0.12	98121	1.3	14094	
	0.13	88139	1.4	12661 ★	
	0.16	75552	1.6	10853	
	0.17	68351	1.8	9819 ★	
	0.19	63099	2	9064	
	0.15	79644	0.89	11440	**D.148-Z38-M71C4**
	0.16	74410	0.95	10689	
	0.18	65446	1.1	9401	
	0.21	57315	1.2	8233	
	0.23	50690	1.4	7282	
	0.26	45942	1.5	6600	
	0.29	40557	1.7	5826	
	0.32	36589	1.9	5256	
	0.23	52213	0.87	7500 ★	**D.128-Z38-M71C4**
	0.26	45730	0.99	6569	
	0.29	40451	1.1	5810 ★	
	0.32	36660	1.2	5266	
	0.36	32355	1.4	4648 ★	
	0.4	29193	1.5	4193	
	0.45	26474	1.7	3803 ★	
	0.49	24118	1.9	3465	
	0.54	22063	2	3169 ★	
	0.36	32320	0.85	4643	**D.108-Z38-M71C4**
	0.4	29556	0.93	4246	
	0.45	26430	1	3797	
	0.47	25225	1.1	3624	
	0.53	22435	1.2	3223	
	0.61	19468	1.4	2796	
	0.65	18184	1.5	2612	
	0.74	15987	1.7	2297	
	0.84	14003	2	2012	
	0.67	17581	0.85	2525 ★	**D.88-Z28-M71C4**
	0.74	15943	0.93	2290	
	0.81	14508	1	2084 ★	
	0.92	12825	1.2	1842	
	1	11842	1.3	1701 ★	
	1.2	10194	1.5	1465	
	1.3	9264	1.6	1331 ★	
	1.4	8423	1.8	1210 ★	
	1.5	7635	1.9	1097	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.25 (60 Hz)	1.4	8405	0.84	1208	★	**D.68-Z28-M71C4**
	1.5	7643	0.93	1098	★	
	1.7	6935	1	996		
	1.9	6306	1.1	906	★	
	2.1	5580	1.3	801		
	2.3	5154	1.4	740	★	
	2.7	4437	1.6	637		
	2.8	4224	1.7	607	★	
	3.1	3826	1.9	550		
	3.4	3489	2	501	★	
	2.6	4614	0.86	663		**D.48-Z28-M71C4**
	2.8	4198	0.95	603	★	
	3.2	3720	1.1	534		
	3.4	3427	1.2	493	★	
	4	2949	1.4	424		
	4	2940	1.4	423	★	
	4.4	2674	1.5	384		
	4.9	2426	1.6	349	★	
	5.5	2152	1.9	309		
	5.9	1984	2	285	★	
	8.1	1877	2.1	208.77	★	**D.48-M71C4**
	5.2	2276	0.86	323		**Z.38-Z28-M71C4**
	6	1975	0.99	281	★	
	6.7	1780	1.1	253		
	7.4	1603	1.2	228	★	
	8.2	1452	1.3	207		
	8.8	1718	1.1	191.75	★	**D.38-M71C4**
	10	1532	1.3	170.24		
	11.4	1337	1.5	149.26	★	
	12.7	1195	1.6	133.57		
	14.3	1062	1.8	118.55	★	
	16.3	930	2.1	103.89		
	10.3	1479	0.84	164.48	★	**D.28-M71C4**
	11.3	1346	0.92	149.53		
	12.8	1186	1	132.35	★	
	15.3	992	1.2	110.86		
	17.9	850	1.5	94.52	★	
	21	726	1.7	80.34	★	
	24	628	2	69.82		
	28	549	2.3	60.77	★	
	33	460	2.7	51.35		**Z.28-M71C4**
	39	389	3.2	43.3	★	
	44	345	3.6	38.45		
	50	301	4.1	33.71	★	
	56	274	4.6	30.16		
	63	239	5.2	26.77	★	
	72	212	5.9	23.46		
	82	186	6.7	20.63	★	
	91	168	7.4	18.63		
	104	141	8.5	16.24	★	
	116	132	9.5	14.58		
	129	115	10.5	13.17	★	
	142	106	11.6	11.94		
	156	97	12.7	10.87	★	
	176	85	14.4	9.61		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.25 (60 Hz)	269	56	14.8	6.31	★	**Z.28-M71C4**
	15.4	992	0.81	110.01	★	**D.18-M71C4**
	18.4	823	0.96	92.14		
	22	708	1.1	78.56	★	
	25	602	1.3	66.78	★	
	29	522	1.5	58.03		
	34	451	1.8	50.51	★	
	39	389	2.1	43.15		**Z.18-M71C4**
	46	336	2.4	37.23	★	
	53	283	2.8	31.98		
	58	265	3	29.45	★	
	63	239	3.3	26.77		
	72	212	3.7	23.69	★	
	85	177	4.5	19.85		
	100	150	5.2	16.92	★	
	118	132	6.2	14.38	★	
	136	115	7.1	12.5		
	156	97	7.9	10.88	★	
	173	87	8.3	9.81		
	196	77	9.1	8.66		
	228	66	7.3	7.42	★	
	263	57	8.1	6.45		
	302	50	9	5.61	★	
	335	45	9.5	5.06		
	379	39	10.8	4.47		
	473	31	12.7	3.58	★	
	182	84	3.4	9.33	★	**E.38-M71C4**
	204	74	3.8	8.3		
0.33 (60 Hz)	0.08	200972	0.88	19997	★	**D.188-D48-M71S4**
	0.09	181291	0.98	18039		
	0.1	164427	1.1	16361	★	
	0.11	149812	1.2	14907		
	0.14	128431	1.4	12504		**D.188-Z48-M71S4**
	0.15	113657	1.6	11066	★	
	0.19	92815	1.9	9037	★	
	0.12	144755	0.86	14094		**D.168-Z48-M71S4**
	0.13	130043	0.95	12661	★	
	0.15	111469	1.1	10853		
	0.17	100849	1.2	9819	★	
	0.19	93099	1.3	9064		
	0.21	80947	1.5	7881	★	
	0.23	73498	1.7	7156		
	0.26	67111	1.8	6534	★	
	0.28	61576	2	5995		
	0.2	84560	0.84	8233		**D.148-Z38-M71S4**
	0.23	74791	0.95	7282		
	0.26	67785	1	6600		
	0.29	59840	1.2	5826		
	0.32	53985	1.3	5256		
	0.35	48963	1.4	4767		
	0.39	44605	1.6	4343		
	0.42	40796	1.7	3972		
	0.47	36483	1.9	3552		
	0.32	54082	0.84	5266		**D.128-Z38-M71S4**
	0.36	47740	0.95	4648	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.33 (60 Hz)	0.4	43064	1	4193		**D.128-Z38-M71S4**
	0.44	39060	1.2	3803	★	
	0.49	35588	1.3	3465		
	0.53	32550	1.4	3169	★	
	0.59	29105	1.6	2834		
	0.65	26722	1.7	2602	★	
	0.72	24083	1.9	2345		
	0.52	33099	0.83	3223		**D.108-Z38-M71S4**
	0.6	28715	0.96	2796		
	0.65	26828	1	2612		
	0.73	23595	1.2	2297		
	0.84	20664	1.3	2012		
	0.95	18281	1.5	1780		
	1	16563	1.7	1613		
	1.2	14623	1.9	1424		
	0.99	17466	0.85	1701	★	**D.88-Z28-M71S4**
	1.2	15048	0.99	1465		
	1.3	13666	1.1	1331	★	
	1.4	12426	1.2	1210	★	
	1.5	11266	1.3	1097		
	1.7	10256	1.5	999	★	
	1.9	9069	1.6	883		
	2.1	8370	1.8	815	★	
	2.1	8228	0.86	801		**D.68-Z28-M71S4**
	2.3	7599	0.93	740	★	
	2.6	6545	1.1	637		
	2.8	6235	1.1	607	★	
	3.1	5650	1.3	550		
	3.4	5146	1.4	501	★	
	3.8	4552	1.6	443		
	4.1	4198	1.7	409	★	
	4.8	3613	2	352		
	6	3525	2	281.01		**D.68-M71S4**
	4	4348	0.92	423	★	**D.48-Z28-M71S4**
	4	4357	0.92	424		
	4.4	3941	1	384		
	4.8	3587	1.1	349	★	
	5.5	3170	1.3	309		
	5.9	2922	1.4	285	★	
	6.8	2524	1.6	246		
	7.6	2294	1.7	223	★	
	8.1	2621	1.5	208.77	★	**D.48-M71S4**
	9.1	2329	1.7	185.66		
	10.5	2019	2	161.05	★	
	11.2	1886	2.1	150.48		
	7.4	2364	0.82	228	★	**Z.38-Z28-M71S4**
	8.1	2152	0.91	207		
	8.8	2409	0.81	191.75	★	**D.38-M71S4**
	9.9	2134	0.91	170.24		
	11.3	1868	1	149.26	★	
	12.6	1674	1.2	133.57		
	14.2	1488	1.3	118.55	★	
	16.2	1302	1.5	103.89		
	18.4	1142	1.7	91.34	★	
	20	1036	1.9	82.52		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.33 (60 Hz)	23	903	2.2	71.91	★	**D.38-M71S4**
	26	814	2.4	64.58		
	15.2	1390	0.89	110.86		**D.28-M71S4**
	17.8	1186	1	94.52	★	
	21	1009	1.2	80.34	★	
	24	876	1.4	69.82		
	28	761	1.6	60.77	★	
	33	646	1.9	51.35		**Z.28-M71S4**
	39	540	2.3	43.3	★	
	44	478	2.6	38.45		
	50	425	2.9	33.71	★	
	56	380	3.3	30.16		
	63	336	3.7	26.77	★	
	72	292	4.2	23.46		
	82	256	4.8	20.63	★	
	90	230	5.3	18.63		
	104	203	6.1	16.24	★	
	116	186	6.8	14.58		
	128	168	7.5	13.17	★	
	141	150	8.3	11.94		
	155	132	9.1	10.87	★	
	175	124	10.3	9.61		
	190	115	11.1	8.87	★	
	221	97	12.6	7.64		
	243	86	13.4	6.94	★	
	267	78	10.6	6.31	★	
	295	71	11.5	5.72		
	323	65	12.5	5.21	★	
	366	57	13.5	4.6		
	396	53	14.9	4.25	★	
	21	983	0.81	78.56	★	**D.18-M71S4**
	25	841	0.95	66.78	★	
	29	726	1.1	58.03		
	33	637	1.3	50.51	★	
	39	540	1.5	43.15		**Z.18-M71S4**
	45	469	1.7	37.23	★	
	53	398	2	31.98		
	57	372	2.2	29.45	★	
	63	336	2.4	26.77		
	71	301	2.7	23.69	★	
	85	248	3.2	19.85		
	100	212	3.8	16.92	★	
	117	177	4.4	14.38	★	
	135	159	5.1	12.5		
	155	132	5.6	10.88	★	
	172	124	6	9.81		
	195	106	6.5	8.66		
	227	88	5.2	7.42	★	
	261	80	5.8	6.45		
	300	69	6.4	5.61	★	
	333	63	6.8	5.06		
	377	55	7.7	4.47		
	471	45	9.1	3.58	★	
	149	141	3.4	11.3		**E.48-M71S4**
	181	115	2.4	9.33	★	**E.38-M71S4**

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.33 (60 Hz)	203	106	2.7	8.3		**E.38-M71S4**
	234	88	3.7	7.2	★	
0.5 (60 Hz)	0.14	198483	0.89	12504		**D.188-Z48-M71M4**
	0.15	175658	1	11066	★	
	0.19	143444	1.2	9037	★	
	0.22	122957	1.4	7746		
	0.24	111239	1.6	7008	★	
	0.26	102682	1.7	6469		
	0.3	89290	2	5625	★	
	0.17	155862	0.8	9819	★	**D.168-Z48-M71M4**
	0.19	143878	0.86	9064		
	0.21	125100	0.99	7881	★	
	0.23	113586	1.1	7156		
	0.26	103719	1.2	6534	★	
	0.28	95163	1.3	5995		
	0.3	87669	1.4	5523	★	
	0.34	79618	1.6	5016		
	0.37	72523	1.7	4569	★	
	0.4	66447	1.9	4186		
	0.32	83427	0.85	5256		**D.148-Z38-M71M4**
	0.35	75668	0.94	4767		
	0.39	68936	1	4343		
	0.42	63046	1.1	3972		
	0.47	56385	1.3	3552		
	0.52	51762	1.4	3261		
	0.57	46651	1.5	2939		
	0.67	40017	1.8	2521		
	0.67	40123	1.8	2528		
	0.75	35774	2	2254		
	0.49	55003	0.82	3465		**D.128-Z38-M71M4**
	0.53	50300	0.9	3169	★	
	0.59	44986	1	2834		
	0.65	41301	1.1	2602	★	
	0.72	37227	1.2	2345		
	0.83	32019	1.4	2017	★	
	0.84	31921	1.4	2011	★	
	0.94	28538	1.6	1798		
	1	26208	1.7	1651	★	
	1.1	23622	1.9	1488		
	0.84	31939	0.86	2012		**D.108-Z38-M71M4**
	0.95	28254	0.97	1780		
	1	25606	1.1	1613		
	1.2	22603	1.2	1424		
	1.3	20380	1.3	1284		
	1.4	18494	1.5	1165		
	1.6	16837	1.6	1061		
	1.7	15411	1.8	971		
	1.9	13781	2	868		
	1.5	17413	0.85	1097		**D.88-Z28-M71M4**
	1.7	15854	0.94	999	★	
	1.9	14012	1.1	883		
	2.1	12940	1.2	815	★	
	2.4	11142	1.3	702		
	2.6	10265	1.4	647	★	
	2.9	9317	1.6	587		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.5 (60 Hz)	3.2	8476	1.8	534	★	**D.88-Z28-M71M4**
	3.6	7493	2	472		
	3.1	8733	0.81	550		**D.68-Z28-M71M4**
	3.4	7953	0.89	501	★	
	3.8	7032	1	443		
	4.1	6492	1.1	409	★	
	4.8	5588	1.3	352		
	5.3	5075	1.4	320	★	
	6	5216	1.4	281.01		**D.68-M71M4**
	6.8	4614	1.5	248.68	★	
	7.5	4198	1.7	226.07		
	8.3	3773	1.9	203.09	★	
	5.5	4906	0.81	309		**D.48-Z28-M71M4**
	5.9	4526	0.88	285	★	
	6.8	3906	1	246		
	7.6	3542	1.1	223	★	
	8.1	3879	1	208.77	★	**D.48-M71M4**
	9.1	3445	1.2	185.66		
	10.5	2993	1.3	161.05	★	
	11.2	2798	1.4	150.48		
	12.7	2462	1.6	132.34	★	
	14.5	2152	1.9	115.91		
	16.4	1904	2.1	102.52	★	
	18.1	1727	2.3	92.91		
	14.2	2205	0.88	118.55	★	**D.38-M71M4**
	16.2	1930	1	103.89		
	18.4	1700	1.1	91.34	★	
	20	1532	1.3	82.52		
	23	1337	1.5	71.91	★	
	26	1195	1.6	64.58		
	29	1080	1.8	58.3	★	
	32	983	2	52.86		
	38	814	2	44.12	★	**Z.38-M71M4**
	43	726	2.5	39.24		
	21	1488	0.83	80.34	★	**D.28-M71M4**
	24	1293	0.96	69.82		
	28	1124	1.1	60.77	★	
	33	956	1.3	51.35		**Z.28-M71M4**
	39	806	1.5	43.3	★	
	44	717	1.7	38.45		
	50	628	2	33.71	★	
	56	558	2.2	30.16		
	63	496	2.5	26.77	★	
	72	434	2.8	23.46		
	82	380	3.2	20.63	★	
	33	938	0.85	50.51	★	**D.18-M71M4**
	39	797	0.99	43.15		**Z.18-M71M4**
	45	690	1.2	37.23	★	
	53	593	1.3	31.98		
	57	549	1.5	29.45	★	
	63	496	1.6	26.77		
	71	442	1.8	23.69	★	
	85	372	2.2	19.85		
	100	318	2.5	16.92	★	
	117	265	3	14.38	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.5 (60 Hz)	135	230	3.4	12.5		**Z.18-M71M4**
	155	203	3.8	10.88	★	
	172	186	4	9.81		
	195	159	4.4	8.66		
	227	141	3.5	7.42	★	
	261	124	3.9	6.45		
	300	106	4.3	5.61	★	
	333	97	4.6	5.06		
	377	83	5.2	4.47		
	136	230	3.1	12.4	★	**E.68-M71M4**
	151	203	3.9	11.18		
	149	212	2.3	11.3		**E.48-M71M4**
	168	186	3.8	10	★	
	185	168	3.4	9.09		
	181	177	1.6	9.33	★	**E.38-M71M4**
	203	150	1.8	8.3		
	234	132	2.5	7.2	★	
	250	124	3.4	6.73		
	285	106	4.3	5.92	★	
0.75 (60 Hz)	0.19	219386	0.81	9037	★	**D.188-Z48-M71MB4**
	0.22	188049	0.94	7746		
	0.24	170131	1	7008	★	
	0.26	157049	1.1	6469		
	0.3	136553	1.3	5625	★	
	0.33	123984	1.4	5107		
	0.36	113205	1.6	4663	★	
	0.39	103878	1.7	4279		
	0.43	95703	1.9	3942	★	
	0.47	86907	2	3580		
	0.28	145543	0.85	5995		**D.168-Z48-M71MB4**
	0.3	134082	0.92	5523	★	
	0.34	121770	1	5016		
	0.37	110920	1.1	4569	★	
	0.4	101620	1.2	4186		
	0.45	90672	1.4	3735	★	
	0.47	86234	0.82	3552		**D.148-Z38-M71MB4**
	0.52	79166	0.9	3261		
	0.57	71345	0.99	2939		
	0.67	61204	1.2	2521		
	0.67	61372	1.2	2528		
	0.75	54720	1.3	2254		
	0.81	50256	1.4	2070		
	0.9	45278	1.6	1865		
	1.1	38936	1.8	1604		
	1	39592	1.8	1631		**D.148-Z48-M71MB4**
	1.1	36465	1.9	1502		
	0.83	48963	0.92	2017	★	**D.128-Z38-M71MB4**
	0.84	48821	0.93	2011	★	
	0.94	43648	1	1798		
	1	40079	1.1	1651	★	
	1.1	36120	1.3	1488		
	1.3	31071	1.5	1280	★	
	1.3	30858	1.5	1271		**D.128-Z48-M71MB4**
	1.4	28307	1.6	1166		
	1.6	26075	1.7	1074		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.75 (60 Hz)	1.7	23666	1.9	975		**D.128-Z48-M71MB4**
	1.3	31168	0.88	1284		**D.108-Z38-M71MB4**
	1.4	28281	0.97	1165		
	1.6	25757	1.1	1061		
	1.7	23569	1.2	971		
	1.9	21071	1.3	868		
	2.1	19344	1.4	797		
	2.3	17431	1.6	718		
	2.7	15004	1.8	618		
	2.7	14951	1.8	616		
	2.4	17041	0.87	702		**D.88-Z28-M71MB4**
	2.6	15704	0.95	647	★	
	2.9	14251	1	587		
	3.2	12967	1.1	534	★	
	3.6	11461	1.3	472		
	3.9	10584	1.4	436	★	
	4.5	9105	1.6	375		
	4.9	8281	1.8	341	★	
	5.6	8290	1.8	300.41	★	**D.88-M71MB4**
	6.2	7475	2	270.9		
	4.8	8547	0.83	352		**D.68-Z28-M71MB4**
	5.3	7767	0.91	320	★	
	6	7759	0.91	281.01		**D.68-M71MB4**
	6.8	6864	1	248.68	★	
	7.5	6244	1.1	226.07		
	8.3	5606	1.3	203.09	★	
	9.7	4809	1.5	174.08		
	10.7	4348	1.6	157.5	★	
	11.6	4012	1.8	145.38		
	13.3	3489	2	126.41	★	
	14.7	3170	2.2	114.78		
	10.5	4446	0.9	161.05	★	**D.48-M71MB4**
	11.2	4154	0.96	150.48		
	12.7	3658	1.1	132.34	★	
	14.5	3197	1.2	115.91		
	16.4	2834	1.4	102.52	★	
	18.1	2568	1.6	92.91		
	20	2267	1.8	82.02	★	
	23	2046	2	73.99		
	25	1851	2.2	67.1	★	
	28	1691	2.4	61.14		
	33	1417	1.8	51.28		**Z.48-M71MB4**
	20	2276	0.86	82.52		**D.38-M71MB4**
	23	1984	0.98	71.91	★	
	26	1780	1.1	64.58		
	29	1612	1.2	58.3	★	
	32	1461	1.3	52.86		
	35	1328	1.5	48.1	★	
	38	1222	1.3	44.12	★	**Z.38-M71MB4**
	43	1080	1.7	39.24		
	50	938	2.1	34.04	★	
	53	876	2.2	31.8		
	60	770	2.5	27.97	★	
	69	673	2.9	24.5		
	33	1417	0.87	51.35		**Z.28-M71MB4**

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.75 (60 Hz)	39	1195	1	43.3	★	**Z.28-M71MB4**
	44	1062	1.2	38.45		
	50	930	1.3	33.71	★	
	56	832	1.5	30.16		
	63	735	1.7	26.77	★	
	72	646	1.9	23.46		
	82	566	2.2	20.63	★	
	90	513	2.4	18.63		
	104	451	2.8	16.24	★	
	116	398	3.1	14.58		
	128	363	3.4	13.17	★	
	141	327	3.8	11.94		
	267	177	4.8	6.31	★	
	53	885	0.9	31.98		**Z.18-M71MB4**
	57	814	0.98	29.45	★	
	63	735	1.1	26.77		
	71	655	1.2	23.69	★	
	85	549	1.5	19.85		
	100	469	1.7	16.92	★	
	117	398	2	14.38	★	
	135	345	2.3	12.5		
	155	301	2.6	10.88	★	
	172	274	2.7	9.81		
	195	239	3	8.66		
	227	203	2.4	7.42	★	
	261	177	2.6	6.45		
	300	159	2.9	5.61	★	
	333	141	3.1	5.06		
	377	124	3.5	4.47		
	471	97	4.1	3.58	★	
	136	345	2.1	12.4	★	**E.68-M71MB4**
	151	310	2.6	11.18		
	167	274	3	10.08	★	
	149	310	1.6	11.3		**E.48-M71MB4**
	168	274	2.6	10	★	
	185	248	2.3	9.09		
	206	230	3.3	8.17	★	
	241	194	4.4	7		
	181	256	1.1	9.33	★	**E.38-M71MB4**
	203	230	1.2	8.3		
	234	194	1.7	7.2	★	
	250	186	2.3	6.73		
	285	159	2.9	5.92	★	
	325	141	4.3	5.18		
	406	115	4.8	4.15		
1 (60 Hz)	0.26	215533	0.82	6469		**D.188-Z48-M80M4**
	0.3	187411	0.95	5625	★	
	0.33	170149	1	5107		
	0.36	155357	1.1	4663	★	
	0.4	142567	1.2	4279		
	0.43	131336	1.3	3942	★	
	0.47	119272	1.5	3580		
	0.52	108652	1.6	3261	★	
	0.57	99556	1.8	2988		
	0.64	88821	2	2666	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
1 (60 Hz)	0.37	152230	0.81	4569 ★	**D.168-Z48-M80M4**
	0.41	139467	0.89	4186	
	0.46	124436	1	3735 ★	
	0.51	111044	1.1	3333	
	0.6	94321	1.3	2831	
	0.72	78528	1.6	2357 ★	
	0.73	77262	1.6	2319 ★	
	0.82	68963	1.8	2070	
	0.67	83993	0.84	2521	**D.148-Z38-M80M4**
	0.67	84224	0.84	2528	
	0.75	75101	0.94	2254	
	0.82	68963	1	2070	
	0.91	62134	1.1	1865	
	1.1	53445	1.3	1604	
	1	54339	1.3	1631	**D.148-Z48-M80M4**
	1.1	50043	1.4	1502	
	1.2	45446	1.6	1364	
	1.4	41416	1.7	1243	
	1.5	37944	1.9	1139	
	1	55003	0.82	1651 ★	**D.128-Z38-M80M4**
	1.1	49574	0.91	1488	
	1.3	42647	1.1	1280 ★	
	1.3	42346	1.1	1271	**D.128-Z48-M80M4**
	1.5	38848	1.2	1166	
	1.6	35783	1.3	1074	
	1.7	32488	1.4	975	
	1.9	29618	1.5	889	
	2.1	27121	1.7	814	
	2.3	24189	1.9	726	
	1.8	32346	0.85	971	**D.108-Z38-M80M4**
	2	28919	0.95	868	
	2.1	26554	1	797	
	2.4	23923	1.1	718	
	2.8	20593	1.3	618	
	2.8	20522	1.3	616	
	3.1	18361	1.5	551	
	3.4	16855	1.6	506	
	3.7	15190	1.8	456	
	4.7	13409	2	359.3	**D.108-M80M4**
	3.1	18006	0.83	534 ★	**D.88-Z28-M71MP4**
	3.6	15916	0.94	472	
	3.9	14703	1	436 ★	
	4.5	12639	1.2	375	
	4.9	11496	1.3	341 ★	
	5.7	11213	1.3	300.41 ★	**D.88-M80M4**
	6.3	10106	1.5	270.9	
	7	9114	1.6	244.29 ★	
	8	7971	1.9	213.64	
	8.9	7156	2.1	191.8 ★	
	7.5	8432	0.84	226.07	**D.68-M80M4**
	8.4	7581	0.93	203.09 ★	
	9.8	6492	1.1	174.08	
	10.8	5881	1.2	157.5 ★	
	11.7	5429	1.3	145.38	
	13.4	4720	1.5	126.41 ★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1 (60 Hz)	14.8	4286	1.7	114.78		**D.68-M80M4**
	16.2	3914	1.8	104.8	★	
	17.7	3587	2	96.16		
	19.2	3303	2.1	88.59	★	
	21	3002	2.4	80.46		
	35	1798	2.6	48.09	★	**Z.68-M80M4**
	12.8	4942	0.81	132.34	★	**D.48-M80M4**
	14.7	4322	0.92	115.91		
	16.6	3826	1	102.52	★	
	18.3	3463	1.1	92.91		
	21	3064	1.3	82.02	★	
	23	2763	1.4	73.99		
	25	2506	1.6	67.1	★	
	28	2285	1.7	61.14		
	30	2090	1.9	55.92	★	
	34	1868	2.1	50		
	33	1913	1.4	51.28		**Z.48-M80M4**
	38	1691	2.4	45.38	★	
	41	1541	2.6	41.26		
	26	2409	0.81	64.58		**D.38-M80M4**
	29	2178	0.9	58.3	★	
	32	1975	0.99	52.86		
	35	1798	1.1	48.1	★	
	38	1647	0.98	44.12	★	**Z.38-M80M4**
	43	1461	1.3	39.24		
	50	1266	1.5	34.04	★	
	54	1186	1.6	31.8		
	61	1045	1.9	27.97	★	
	69	912	2.1	24.5		
	78	806	2.4	21.67	★	
	87	735	2.7	19.64		
	98	646	3	17.33	★	
	109	584	3.3	15.64		
	120	531	3.7	14.18	★	
	44	1452	0.85	38.45		**Z.28-M71MP4**
	50	1275	0.97	33.71	★	
	56	1142	1.1	30.16		
	63	1009	1.2	26.77	★	
	72	885	1.4	23.46		
	81	779	1.6	20.63	★	
	90	699	1.8	18.63		
	103	611	2	16.24	★	
	115	549	2.3	14.58		
	128	496	2.5	13.17	★	
	141	451	2.8	11.94		
	155	407	3	10.87	★	
	175	363	3.4	9.61		
	189	336	3.7	8.87	★	
	220	292	4.2	7.64		
	242	265	4.5	6.94	★	
	266	239	3.5	6.31	★	
	294	212	3.8	5.72		
	322	194	4.1	5.21	★	
	365	177	4.5	4.6		
	395	159	5	4.25	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1 (60 Hz)	459	141	5.1	3.66		**Z.28-M71MP4**
	505	124	5.4	3.33	★	
	71	894	0.89	23.69	★	**Z.18-M71MP4**
	85	752	1.1	19.85		
	99	637	1.2	16.92	★	
	117	540	1.5	14.38	★	
	134	469	1.7	12.5		
	154	407	1.9	10.88	★	
	171	372	2	9.81		
	194	327	2.2	8.66		
	226	283	1.7	7.42	★	
	260	248	1.9	6.45		
	299	212	2.1	5.61	★	
	332	194	2.3	5.06		
	376	168	2.6	4.47		
	469	132	3	3.58	★	
	137	460	1.6	12.4	★	**E.68-M80M4**
	152	416	2	11.18		
	169	372	2.2	10.08	★	
	193	327	4	8.82		
	150	425	1.2	11.3		**E.48-M80M4**
	170	372	1.9	10	★	
	187	336	1.7	9.09		
	208	301	2.5	8.17	★	
	243	265	3.3	7		
	269	239	4.3	6.33	★	
	291	221	4.9	5.85		
	205	310	0.92	8.3		**E.38-M80M4**
	236	265	1.3	7.2	★	
	253	248	1.7	6.73		
	287	221	2.1	5.92	★	
	328	194	3.2	5.18		
	371	168	4	4.58	★	
	410	159	3.5	4.15		
	463	141	4.5	3.67	★	
	514	124	4.7	3.31		
1.5 (60 Hz)	0.4	210015	0.84	4279		**D.188-Z48-M90S4**
	0.43	193479	0.92	3942	★	
	0.48	175711	1	3580		
	0.53	160051	1.1	3261	★	
	0.57	146650	1.2	2988		
	0.64	130849	1.4	2666	★	
	0.72	116766	1.5	2379		
	0.85	99193	1.8	2021		
	0.61	138944	0.89	2831		**D.168-Z48-M90S4**
	0.73	115685	1.1	2357	★	
	0.74	113816	1.1	2319	★	
	0.83	101593	1.2	2070		
	0.98	86279	1.4	1758		
	1.2	71806	1.7	1463	★	
	1.2	71708	1.7	1461		**D.168-Z68-M90S4**
	1.1	78723	0.9	1604		**D.148-Z38-M90S4**
	1.1	73719	0.96	1502		**D.148-Z48-M90S4**
	1.1	80052	0.89	1631		
	1.3	66943	1.1	1364		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1.5 (60 Hz)	1.4	61009	1.2	1243		**D.148-Z48-M90S4**
	1.5	55898	1.3	1139		
	1.7	49866	1.4	1016		
	1.9	44516	1.6	907		
	2.2	37794	1.9	770		
	1.6	52709	0.86	1074		**D.128-Z48-M90S4**
	1.8	47856	0.94	975		
	1.9	43631	1	889		
	2.1	39955	1.1	814		
	2.4	35632	1.3	726		
	2.6	31806	1.4	648		
	3.1	27041	1.7	551		
	3.7	22479	2	458		
	3.8	22134	2	451		
	2.8	30327	0.91	618		**D.108-Z38-M90S4**
	2.8	30230	0.91	616		
	3.1	27041	1	551		
	3.4	24835	1.1	506		
	3.8	22382	1.2	456		
	4.4	19238	1.4	392		
	4.8	19494	1.4	359.3		**D.108-M90S4**
	5.3	17643	1.6	325.21	★	
	6	15447	1.8	284.73		
	6.7	13932	2	256.86	★	
	4.6	18405	0.81	375		**D.88-Z28-M90S4**
	5	16740	0.89	341	★	
	5.7	16297	0.91	300.41	★	**D.88-M90S4**
	6.3	14694	1	270.9		
	7	13250	1.1	244.29	★	
	8	11594	1.3	213.64		
	8.9	10407	1.4	191.8	★	
	9.8	9503	1.6	175.18		
	11	8432	1.8	155.46	★	
	12	7785	1.9	143.5		
	13.2	7041	2.1	129.79	★	
	10.9	8547	0.83	157.5	★	**D.68-M90S4**
	11.8	7891	0.9	145.38		
	13.6	6855	1	126.41	★	
	14.9	6226	1.1	114.78		
	16.4	5686	1.2	104.8	★	
	17.8	5216	1.4	96.16		
	19.4	4809	1.5	88.59	★	
	21	4366	1.6	80.46		
	23	3976	1.8	73.3	★	
	26	3640	1.9	67.14		
	29	3250	2.2	59.91	★	
	32	2905	2.4	53.47		
	36	2612	1.8	48.09	★	**Z.68-M90S4**
	21	4446	0.9	82.02	★	**D.48-M90S4**
	23	4012	0.99	73.99		
	26	3640	1.1	67.1	★	
	28	3321	1.2	61.14		
	31	3038	1.3	55.92	★	
	34	2710	1.5	50		
	38	2462	1.6	45.38	★	**Z.48-M90S4**

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1.5 (60 Hz)	42	2240	1.8	41.26		**Z.48-M90S4**
	46	2010	2	37.06	★	
	54	1727	2.3	31.77		
	60	1558	2.6	28.74	★	
	65	1443	2.8	26.53		
	74	1248	3.2	23.07	★	
	40	2311	0.84	42.53		**D.38-M90S4**
	44	2134	0.91	39.28	★	
	50	1851	1.1	34.04	★	**Z.38-M90S4**
	54	1727	1.1	31.8		
	61	1514	1.3	27.97	★	
	70	1328	1.5	24.5		
	79	1178	1.7	21.67	★	
	87	1062	1.8	19.64		
	99	938	2.1	17.33	★	
	110	850	2.3	15.64		
	121	770	2.5	14.18	★	
	133	699	2.8	12.92		
	145	637	3	11.82	★	
	162	575	3.2	10.57		
	177	522	3.4	9.7	★	
	196	478	3.6	8.75		
	228	407	4.1	7.52	★	
	229	407	4	7.5	★	
	256	363	4.4	6.71		
	278	336	4.5	6.16	★	
	309	301	4.9	5.55		
	64	1452	0.85	26.77	★	**Z.28-M90S4**
	73	1275	0.97	23.46		
	83	1116	1.1	20.63	★	
	92	1009	1.2	18.63		
	106	885	1.4	16.24	★	
	118	788	1.6	14.58		
	130	717	1.7	13.17	★	
	144	646	1.9	11.94		
	158	593	2.1	10.87	★	
	178	522	2.4	9.61		
	193	478	2.6	8.87	★	
	224	416	2.9	7.64		
	247	372	3.1	6.94	★	
	272	345	2.5	6.31	★	
	300	310	2.7	5.72		
	329	283	2.9	5.21	★	
	373	248	3.1	4.6		
	404	230	3.5	4.25	★	
	469	194	3.6	3.66		
	515	177	3.8	3.33	★	
	166	558	3.6	10.33	★	**E.88-M90S4**
	181	513	3.6	9.46		
	138	673	1.1	12.4	★	**E.68-M90S4**
	153	602	1.3	11.18		
	170	549	1.5	10.08	★	
	194	478	2.8	8.82		
	217	425	3.5	7.92	★	
	237	389	3.4	7.23		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1.5 (60 Hz)	267	345	4.3	6.42	★	**E.68-M90S4**
	172	540	1.3	10	★	**E.48-M90S4**
	189	496	1.1	9.09		
	210	442	1.7	8.17	★	
	245	380	2.3	7		
	271	345	3	6.33	★	
	293	318	3.3	5.85		
	338	274	3.9	5.08	★	
	371	248	4.6	4.62		
	238	389	0.86	7.2	★	**E.38-M90S4**
	255	363	1.2	6.73		
	290	318	1.5	5.92	★	
	331	283	2.2	5.18		
	374	248	2.8	4.58	★	
	413	221	2.4	4.15		
	467	194	3.1	3.67	★	
	518	177	3.2	3.31		
	572	159	4.4	3	★	
	628	150	4.8	2.73		
	686	132	4.8	2.5	★	
	766	124	5.2	2.24		
	837	115	6.4	2.05	★	
2 (60 Hz)	0.53	219882	0.81	3261	★	**D.188-Z48-M90L4**
	0.57	201477	0.88	2988		
	0.64	179759	0.99	2666	★	
	0.72	160414	1.1	2379		
	0.85	136269	1.3	2021		
	1	113417	1.6	1682	★	
	1	111593	1.6	1655	★	
	1.2	99591	1.8	1477		
	0.83	139573	0.89	2070		**D.168-Z48-M90L4**
	0.98	118537	1	1758		
	1.2	98643	1.3	1463	★	
	1.2	98511	1.3	1461		**D.168-Z68-M90L4**
	1.4	82665	1.5	1226		
	1.6	70530	1.8	1046		
	1.4	83816	0.85	1243		**D.148-Z48-M90L4**
	1.5	76801	0.92	1139		
	1.7	68511	1	1016		
	1.9	61159	1.2	907		
	2.2	51921	1.4	770		
	2.7	42550	1.7	631		
	2.7	43223	1.6	641		
	3	37962	1.9	563		
	2.1	54888	0.82	814		**D.128-Z48-M90L4**
	2.4	48954	0.92	726		
	2.6	43693	1	648		
	3.1	37156	1.2	551		
	3.7	30885	1.5	458		
	3.8	30407	1.5	451		
	4.3	27174	1.7	403		
	5	23064	2	342		
	3.4	34118	0.8	506		**D.108-Z38-M90L4**
	3.8	30743	0.89	456		
	4.4	26430	1	392		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
2 (60 Hz)	4.8	26580	1	359.3		**D.108-M90L4**
	5.3	24056	1.1	325.21	★	
	6	21062	1.3	284.73		
	6.7	18998	1.4	256.86	★	
	7.3	17395	1.6	235.19		
	8.2	15473	1.8	209.21	★	
	9	14145	1.9	191.21		
	9.8	13002	2.1	175.78	★	
	7	18068	0.82	244.29	★	**D.88-M90L4**
	8	15801	0.94	213.64		
	8.9	14189	1	191.8	★	
	9.8	12958	1.1	175.18		
	11	11505	1.3	155.46	★	
	12	10619	1.4	143.5		
	13.2	9601	1.5	129.79	★	
	14.3	8839	1.7	119.52		
	15.5	8175	1.8	110.54	★	
	16.7	7590	2	102.61		
	18.9	6696	2.2	90.53	★	
	14.9	8494	0.83	114.78		**D.68-M90L4**
	16.4	7750	0.91	104.8	★	
	17.8	7112	1	96.16		
	19.4	6554	1.1	88.59	★	
	21	5952	1.2	80.46		
	23	5420	1.3	73.3	★	
	26	4968	1.4	67.14		
	29	4428	1.6	59.91	★	
	32	3959	1.8	53.47		
	36	3560	1.3	48.09	★	**Z.68-M90L4**
	41	3108	2.3	42.06		
	45	2790	2.5	37.76	★	
	50	2550	2.8	34.49		
	26	4960	0.8	67.1	★	**D.48-M90L4**
	28	4526	0.88	61.14		
	31	4136	0.96	55.92	★	
	34	3702	1.1	50		
	38	3356	1.2	45.38	★	**Z.48-M90L4**
	42	3055	1.3	41.26		
	46	2745	1.5	37.06	★	
	54	2347	1.7	31.77		
	60	2125	1.9	28.74	★	
	65	1966	2	26.53		
	74	1709	2.3	23.07	★	
	82	1550	2.6	20.95		
	90	1417	2.8	19.13	★	
	98	1302	3.1	17.55		
	106	1195	3.2	16.17	★	
	117	1089	3.4	14.68		
	128	992	3.7	13.38	★	
	140	903	3.9	12.25		
	54	2356	0.83	31.8		**Z.38-M90L4**
	61	2072	0.94	27.97	★	
	70	1815	1.1	24.5		
	79	1603	1.2	21.67	★	
	87	1452	1.3	19.64		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
2 (60 Hz)	99	1284	1.5	17.33	★	**Z.38-M90L4**
	110	1160	1.7	15.64		
	121	1045	1.9	14.18	★	
	133	956	2	12.92		
	145	876	2.2	11.82	★	
	162	779	2.4	10.57		
	177	717	2.5	9.7	★	
	196	646	2.7	8.75		
	228	558	3	7.52	★	
	229	558	3	7.5	★	
	256	496	3.2	6.71		
	278	460	3.3	6.16	★	
	309	407	3.6	5.55		
	360	354	4	4.77	★	
	83	1523	0.81	20.63	★	**Z.28-M90L4**
	92	1381	0.9	18.63		
	106	1204	1	16.24	★	
	118	1080	1.1	14.58		
	130	974	1.3	13.17	★	
	144	885	1.4	11.94		
	158	806	1.5	10.87	★	
	178	708	1.7	9.61		
	193	655	1.9	8.87	★	
	224	566	2.1	7.64		
	247	513	2.3	6.94	★	
	272	469	1.8	6.31	★	
	300	425	1.9	5.72		
	329	389	2.1	5.21	★	
	373	336	2.3	4.6		
	404	318	2.5	4.25	★	
	469	274	2.6	3.66		
	515	248	2.8	3.33	★	
	166	761	2.7	10.33	★	**E.88-M90L4**
	181	699	2.7	9.46		
	204	620	3.5	8.42	★	
	223	566	3.8	7.69		
	153	823	0.99	11.18		**E.68-M90L4**
	170	744	1.1	10.08	★	
	194	655	2	8.82		
	217	584	2.6	7.92	★	
	237	531	2.5	7.23		
	267	478	3.2	6.42	★	
	290	434	3.8	5.92		
	320	398	4.9	5.36	★	
	172	744	0.96	10	★	**E.48-M90L4**
	189	673	0.84	9.09		
	210	602	1.2	8.17	★	
	245	513	1.7	7		
	271	469	2.2	6.33	★	
	293	434	2.5	5.85		
	338	372	2.8	5.08	★	
	371	345	3.4	4.62		
	407	310	4.3	4.21	★	
	443	283	4.9	3.87		
	482	265	4.7	3.56	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
2 (60 Hz)	529	239	5.5	3.24		**E.48-M90L4**
	255	496	0.85	6.73		**E.38-M90L4**
	290	434	1.1	5.92	★	
	331	380	1.6	5.18		
	374	336	2	4.58	★	
	413	310	1.8	4.15		
	467	274	2.3	3.67	★	
	518	248	2.4	3.31		
	572	221	3.2	3	★	
	628	203	3.5	2.73		
	686	186	3.5	2.5	★	
	766	168	3.8	2.24		
	837	150	4.7	2.05	★	
	927	141	5.3	1.85		
	1079	115	5.4	1.59	★	
3 (60 Hz)	0.85	200582	0.88	2021		**D.188-Z48-M100L4**
	1	166933	1.1	1682	★	
	1	164258	1.1	1655	★	
	1.2	146588	1.2	1477		
	1.4	124551	1.4	1255		
	1.6	103612	1.7	1044	★	
	1.4	124161	1.4	1251		**D.188-Z68-M100L4**
	1.6	104206	1.7	1050		
	1.9	88927	2	896	★	
	1.2	145003	0.86	1461		**D.168-Z68-M100L4**
	1.4	121681	1	1226		
	1.6	103816	1.2	1046		
	2	86447	1.4	871		
	2.4	71655	1.7	722		
	2.7	63223	2	637		
	1.2	145198	0.85	1463	★	**D.168-Z48-M100L4**
	2.2	76420	0.93	770		**D.148-Z48-M100L4**
	2.7	63622	1.1	641		
	2.7	62621	1.1	631		
	3.1	55871	1.3	563		
	3.6	47439	1.5	478		
	4.3	39503	1.8	398		
	5.1	36368	1.9	336.11		**D.148-M100L4**
	3.1	54685	0.83	551		**D.128-Z48-M100L4**
	3.8	44764	1	451		
	3.8	45455	0.99	458		
	4.3	39999	1.1	403		
	5	33941	1.3	342		
	6	28281	1.6	285		
	6.4	29016	1.6	268.16	★	**D.128-M100L4**
	7	26607	1.7	245.93		
	7.8	23773	1.9	219.72	★	
	8.5	21771	2.1	201.22		
	6	30805	0.89	284.73		**D.108-M100L4**
	6.7	27794	0.99	256.86	★	
	7.3	25447	1.1	235.19		
	8.2	22639	1.2	209.21	★	
	9	20690	1.3	191.21		
	9.8	19016	1.4	175.78	★	
	10.6	17572	1.6	162.4		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
3 (60 Hz)	11.4	16306	1.7	150.7	★	**D.108-M100L4**
	12.3	15190	1.8	140.37		
	13.6	13728	2	126.9	★	
	14.7	12639	2.2	116.83		
	11.1	16820	0.88	155.46	★	**D.88-M100L4**
	12	15526	0.96	143.5		
	13.3	14038	1.1	129.79	★	
	14.4	12931	1.2	119.52		
	15.6	11957	1.2	110.54	★	
	16.8	11098	1.3	102.61		
	19	9796	1.5	90.53	★	
	21	9043	1.6	83.58		
	23	8104	1.8	74.88	★	
	25	7466	2	69.05		
	30	6270	2.4	57.93		
	34	5491	2.4	50.73		**Z.88-M100L4**
	21	8706	0.81	80.46		**D.68-M100L4**
	24	7927	0.89	73.3	★	
	26	7263	0.98	67.14		
	29	6483	1.1	59.91	★	
	32	5783	1.2	53.47		
	41	4552	1.6	42.06		**Z.68-M100L4**
	46	4083	1.7	37.76	★	
	50	3728	1.9	34.49		
	56	3312	2.1	30.6	★	
	61	3055	2.3	28.25		
	67	2763	2.6	25.55	★	
	73	2542	2.8	23.53		
	79	2356	3	21.76	★	
	85	2187	3.2	20.2		
	38	4968	0.8	45.91	★	**D.48-M100L4**
	42	4472	0.89	41.38		
	48	3852	1	35.59		
	54	3436	1.2	31.77		**Z.48-M100L4**
	60	3108	1.3	28.74	★	
	65	2869	1.4	26.53		
	75	2497	1.6	23.07	★	
	82	2267	1.8	20.95		
	90	2072	1.9	19.13	★	
	98	1895	2.1	17.55		
	106	1753	2.2	16.17	★	
	117	1585	2.3	14.68		
	129	1443	2.5	13.38	★	
	140	1328	2.7	12.25		
	157	1186	2.9	10.93	★	
	176	1054	3.2	9.76		
	207	894	3.6	8.29		
	249	744	4	6.9	★	
	253	735	3.3	6.79	★	
	284	655	3.6	6.06		
	334	558	4.3	5.15		
	402	460	5	4.28	★	
	79	2347	0.83	21.67	★	**Z.38-M100L4**
	88	2125	0.92	19.64		
	99	1877	1	17.33	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
3 (60 Hz)	110	1691	1.2	15.64		**Z.38-M100L4**
	121	1532	1.3	14.18	★	
	133	1399	1.4	12.92		
	146	1275	1.5	11.82	★	
	163	1142	1.6	10.57		
	177	1045	1.7	9.7	★	
	197	947	1.8	8.75		
	229	814	2.1	7.52	★	
	229	814	2	7.5	★	
	256	726	2.2	6.71		
	279	664	2.3	6.16	★	
	310	602	2.4	5.55		
	361	513	2.7	4.77	★	
	130	1426	0.87	13.17	★	**Z.28-M90LB4**
	144	1293	0.96	11.94		
	158	1178	1.1	10.87	★	
	178	1045	1.2	9.61		
	193	965	1.3	8.87	★	
	224	832	1.5	7.64		
	247	752	1.6	6.94	★	
	272	682	1.2	6.31	★	
	300	620	1.3	5.72		
	329	566	1.4	5.21	★	
	373	496	1.6	4.6		
	404	460	1.7	4.25	★	
	469	398	1.8	3.66		
	515	363	1.9	3.33	★	
	167	1116	1.8	10.33	★	**E.88-M100L4**
	182	1027	1.8	9.46		
	204	912	2.4	8.42	★	
	224	832	2.6	7.69		
	243	761	3.4	7.07	★	
	263	708	3.8	6.53		
	284	655	3.8	6.06	★	
	304	611	4.6	5.65		
	195	956	1.4	8.82		**E.68-M100L4**
	217	859	1.8	7.92	★	
	238	779	1.7	7.23		
	268	690	2.2	6.42	★	
	291	637	2.6	5.92		
	321	584	3.4	5.36	★	
	349	531	3.7	4.93		
	377	496	3.9	4.56	★	
	406	460	4.4	4.24		
	460	407	5	3.74	★	
	499	372	5.7	3.45		
	246	761	1.1	7		**E.48-M100L4**
	272	682	1.5	6.33	★	
	294	637	1.7	5.85		
	339	549	1.9	5.08	★	
	372	496	2.3	4.62		
	409	451	2.9	4.21	★	
	444	416	3.4	3.87		
	483	389	3.2	3.56	★	
	531	354	3.8	3.24		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
3 (60 Hz)	583	318	4.7	2.95	★	**E.48-M100L4**
	637	292	4.9	2.7		
	714	256	5.1	2.41	★	
	800	230	5.1	2.15		
	940	194	5.1	1.83		
	1132	168	5.4	1.52	★	
	332	558	1.1	5.18		**E.38-M100L4**
	376	496	1.4	4.58	★	
	414	451	1.2	4.15		
	469	398	1.6	3.67	★	
	520	354	1.6	3.31		
	573	327	2.2	3	★	
	630	292	2.4	2.73		
	688	265	2.4	2.5	★	
	768	239	2.6	2.24		
	839	221	3.2	2.05	★	
	930	203	3.6	1.85		
	1082	168	3.7	1.59	★	
4 (60 Hz)	1.2	199466	0.89	1477		**D.188-Z48-M100LB4**
	1.4	169493	1	1255		
	1.7	140990	1.3	1044	★	
	1.4	168953	1	1251		**D.188-Z68-M100LB4**
	1.6	141805	1.2	1050		
	1.9	121008	1.5	896	★	
	2.3	100751	1.8	746		
	1.7	141265	0.88	1046		**D.168-Z68-M100LB4**
	2	117634	1.1	871		
	2.4	97510	1.3	722		
	2.7	86031	1.4	637		
	3.2	73471	1.7	544		
	3.8	61177	2	453		
	2.7	85216	0.83	631		**D.148-Z48-M100LB4**
	2.7	86571	0.82	641		
	3.1	76031	0.93	563		
	3.6	64552	1.1	478		
	4.3	53746	1.3	398		
	5.1	49299	1.4	336.11		**D.148-M100LB4**
	5.7	44198	1.6	301.34	★	
	6.3	40522	1.7	276.23		
	6.8	37360	1.9	254.7	★	
	7.3	34623	2	236.05		
	4.3	54428	0.83	403		**D.128-Z48-M100LB4**
	5.1	46190	0.98	342		
	6.1	38493	1.2	285		
	6.5	39335	1.1	268.16	★	**D.128-M100LB4**
	7	36075	1.3	245.93		
	7.9	32231	1.4	219.72	★	
	8.6	29512	1.5	201.22		
	9.3	27191	1.7	185.36	★	
	10.1	25172	1.8	171.62		
	10.8	23409	1.9	159.6	★	
	11.6	21851	2.1	148.99		
	7.4	34499	0.8	235.19		**D.108-M100LB4**
	8.3	30690	0.89	209.21	★	
	9	28051	0.98	191.21		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
4 (60 Hz)	9.8	25783	1.1	175.78	★	**D.108-M100LB4**
	10.7	23817	1.2	162.4		
	11.5	22107	1.2	150.7	★	
	12.3	20593	1.3	140.37		
	13.6	18618	1.5	126.9	★	
	14.8	17138	1.6	116.83		
	16.5	15411	1.8	105.08	★	
	17.8	14215	1.9	96.94		
	21	12045	2.3	82.14		
	29	8662	2.4	59.05	★	**Z.108-M100LB4**
	14.5	17528	0.85	119.52		**D.88-M100LB4**
	15.7	16217	0.92	110.54	★	
	16.9	15048	0.99	102.61		
	19.1	13277	1.1	90.53	★	
	21	12258	1.2	83.58		
	23	10983	1.4	74.88	★	
	25	10132	1.5	69.05		
	30	8494	1.8	57.93		
	34	7440	1.7	50.73		**Z.88-M100LB4**
	38	6713	2.2	45.76	★	
	41	6146	2.4	41.9		
	46	5464	2.7	37.27	★	
	29	8786	0.81	59.91	★	**D.68-M100LB4**
	32	7847	0.9	53.47		
	41	6173	1.1	42.06		**Z.68-M100LB4**
	46	5535	1.3	37.76	★	
	50	5057	1.4	34.49		
	56	4490	1.6	30.6	★	
	61	4145	1.7	28.25		
	68	3746	1.9	25.55	★	
	74	3454	2.1	23.53		
	80	3188	2.2	21.76	★	
	86	2967	2.4	20.2		
	97	2612	2.7	17.82	★	
	105	2409	2.9	16.45		
	117	2161	3.3	14.74	★	
	127	1992	3.6	13.59		
	292	868	5	5.93		
	54	4658	0.86	31.77		**Z.48-M100LB4**
	60	4216	0.95	28.74	★	
	65	3888	1	26.53		
	75	3383	1.2	23.07	★	
	83	3073	1.3	20.95		
	90	2807	1.4	19.13	★	
	99	2577	1.5	17.55		
	107	2373	1.6	16.17	★	
	118	2152	1.7	14.68		
	129	1966	1.9	13.38	★	
	141	1798	2	12.25		
	158	1603	2.2	10.93	★	
	177	1434	2.4	9.76		
	209	1213	2.6	8.29		
	251	1009	3	6.9	★	
	255	992	2.4	6.79	★	
	285	885	2.7	6.06		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
4 (60 Hz)	336	752	3.2	5.15		**Z.48-M100LB4**
	404	628	3.7	4.28	★	
	111	2294	0.85	15.64		**Z.38-M100LB4**
	122	2081	0.94	14.18	★	
	134	1895	1	12.92		
	146	1736	1.1	11.82	★	
	164	1550	1.2	10.57		
	178	1426	1.2	9.7	★	
	198	1284	1.3	8.75		
	230	1107	1.5	7.52	★	
	231	1098	1.5	7.5	★	
	258	983	1.6	6.71		
	281	903	1.7	6.16	★	
	312	814	1.8	5.55		
	363	699	2	4.77	★	
	180	1408	0.88	9.61		**Z.28-M100LB4**
	195	1302	0.95	8.87	★	
	226	1124	1.1	7.64		
	249	1018	1.1	6.94	★	
	274	921	0.91	6.31	★	
	302	841	0.98	5.72		
	332	761	1.1	5.21	★	
	376	673	1.2	4.6		
	407	620	1.3	4.25	★	
	473	540	1.3	3.66		
	520	487	1.4	3.33	★	
	171	1488	3.2	10.14	★	**E.128-M100LB4**
	184	1381	3.8	9.4		
	194	1310	4.3	8.94	★	
	167	1514	1.3	10.33	★	**E.88-M100LB4**
	183	1390	1.3	9.46		
	205	1231	1.8	8.42	★	
	225	1124	1.9	7.69		
	245	1036	2.5	7.07	★	
	265	956	2.8	6.53		
	285	885	2.8	6.06	★	
	306	832	3.4	5.65		
	339	752	4.4	5.11	★	
	368	690	4.9	4.7		
	196	1293	1	8.82		**E.68-M100LB4**
	218	1160	1.3	7.92	★	
	239	1062	1.3	7.23		
	269	938	1.6	6.42	★	
	292	868	1.9	5.92		
	323	788	2.5	5.36	★	
	351	726	2.8	4.93		
	379	673	2.9	4.56	★	
	408	620	3.3	4.24		
	463	549	3.7	3.74	★	
	501	504	4.2	3.45		
	560	451	4.9	3.09	★	
	607	416	5.3	2.85		
	724	354	5.8	2.39		
	848	301	6.2	2.04	★	
	1018	248	6.2	1.7		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
4 (60 Hz)	247	1027	0.84	7		**E.48-M100LB4**
	273	930	1.1	6.33	★	
	296	859	1.2	5.85		
	341	744	1.4	5.08	★	
	374	673	1.7	4.62		
	411	620	2.2	4.21	★	
	447	566	2.5	3.87		
	486	522	2.4	3.56	★	
	534	478	2.8	3.24		
	586	434	3.5	2.95	★	
	641	398	3.6	2.7		
	718	354	3.8	2.41	★	
	805	318	3.8	2.15		
	945	265	3.8	1.83		
	1138	221	4	1.52	★	
	334	761	0.82	5.18		**E.38-M100LB4**
	378	673	1	4.58	★	
	417	611	0.9	4.15		
	471	540	1.2	3.67	★	
	523	487	1.2	3.31		
	577	442	1.6	3	★	
	634	398	1.8	2.73		
	692	363	1.8	2.5	★	
	772	327	1.9	2.24		
	844	301	2.4	2.05	★	
	935	274	2.7	1.85		
	1088	230	2.7	1.59	★	
5.5 (60 Hz)	1.7	187916	0.94	1050		**D.188-Z68-M112MB4**
	1.9	160361	1.1	896	★	
	2.3	133515	1.3	746		
	2.8	110787	1.6	619	★	
	3.2	97722	1.8	546		
	1.7	186845	0.95	1044	★	**D.188-Z48-M112MB4**
	2	155879	0.8	871		**D.168-Z68-M112MB4**
	2.4	129219	0.96	722		
	2.7	114002	1.1	637		
	3.2	97359	1.3	544		
	3.9	81071	1.5	453		
	4.6	67289	1.8	376		
	3.7	85543	0.83	478		**D.148-Z48-M112MB4**
	4.4	71230	0.99	398		
	5.2	65172	1.1	336.11		**D.148-M112MB4**
	5.8	58431	1.2	301.34	★	
	6.3	53560	1.3	276.23		
	6.9	49388	1.4	254.7	★	
	7.4	45765	1.5	236.05		
	7.8	43516	1.6	224.43	★	
	8.3	40672	1.7	209.76		
	9.4	35880	2	185.03	★	
	10	33843	2.1	174.53		
	6.1	51009	0.89	285		**D.128-Z48-M112MB4**
	6.5	51992	0.87	268.16	★	**D.128-M112MB4**
	7.1	47687	0.95	245.93		
	7.9	42603	1.1	219.72	★	
	8.7	39016	1.2	201.22		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
5.5 (60 Hz)	9.4	35942	1.3	185.36 ★	**D.128-M112MB4**
	10.2	33276	1.4	171.62	
	10.9	30947	1.5	159.6 ★	
	11.7	28892	1.6	148.99	
	13.1	25845	1.7	133.3 ★	
	14.1	23950	1.9	123.53	
	15.4	21957	2.1	113.24 ★	
	16.8	20123	2.2	103.8	
	9.9	34082	0.81	175.78 ★	**D.108-M112MB4**
	10.7	31487	0.87	162.4	
	11.6	29220	0.94	150.7 ★	
	12.4	27218	1	140.37	
	13.8	24605	1.1	126.9 ★	
	14.9	22657	1.2	116.83	
	16.6	20371	1.3	105.08 ★	
	18	18795	1.5	96.94	
	21	15925	1.7	82.14	
	24	13879	2	71.59 ★	
	29	11806	2.3	60.9	
	30	11452	1.8	59.05 ★	**Z.108-M112MB4**
	32	10495	1.9	54.15	
	19.3	17555	0.85	90.53 ★	**D.88-M112MB4**
	21	16208	0.92	83.58	
	23	14517	1	74.88 ★	
	25	13392	1.1	69.05	
	30	11231	1.3	57.93	
	38	8875	1.7	45.76 ★	**Z.88-M112MB4**
	42	8122	1.8	41.9	
	47	7227	2.1	37.27 ★	
	51	6607	2.3	34.07	
	56	6076	2.5	31.32 ★	
	60	5606	2.7	28.93	
	65	5208	2.9	26.85 ★	
	70	4844	3.1	25.01	
	46	7325	0.97	37.76 ★	**Z.68-M112MB4**
	51	6687	1.1	34.49	
	57	5934	1.2	30.6 ★	
	62	5473	1.3	28.25	
	68	4951	1.4	25.55 ★	
	74	4561	1.6	23.53	
	80	4216	1.7	21.76 ★	
	86	3914	1.8	20.2	
	98	3454	2.1	17.82 ★	
	106	3188	2.2	16.45	
	118	2860	2.5	14.74 ★	
	128	2639	2.7	13.59	
	153	2214	3.1	11.4	
	179	1886	3.5	9.73 ★	
	215	1576	3.9	8.11	
	260	1302	4.4	6.72 ★	
	294	1151	3.8	5.93	
	345	983	4.3	5.06 ★	
	414	814	5.1	4.22	
	500	673	5.5	3.49 ★	
	76	4472	0.89	23.07 ★	**Z.48-M112MB4**

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
5.5 (60 Hz)	83	4065	0.98	20.95		**Z.48-M112MB4**
	91	3711	1.1	19.13	★	
	99	3401	1.2	17.55		
	108	3135	1.2	16.17	★	
	119	2843	1.3	14.68		
	130	2595	1.4	13.38	★	
	142	2373	1.5	12.25		
	160	2116	1.6	10.93	★	
	179	1895	1.8	9.76		
	210	1603	2	8.29		
	253	1337	2.3	6.9	★	
	257	1319	1.8	6.79	★	
	288	1178	2	6.06		
	339	1000	2.4	5.15		
	408	832	2.8	4.28	★	
	148	2294	0.85	11.82	★	**Z.38-M112MB4**
	165	2046	0.91	10.57		
	180	1877	0.94	9.7	★	
	199	1700	1	8.75		
	232	1461	1.2	7.52	★	
	233	1452	1.1	7.5	★	
	260	1302	1.2	6.71		
	283	1195	1.3	6.16	★	
	314	1071	1.4	5.55		
	366	921	1.5	4.77	★	
	172	1966	2.5	10.14	★	**E.128-M112MB4**
	186	1824	2.8	9.4		
	195	1736	3.3	8.94	★	
	209	1620	3.9	8.35		
	169	2001	1	10.33	★	**E.88-M112MB4**
	184	1833	1	9.46		
	207	1629	1.3	8.42	★	
	227	1488	1.5	7.69		
	247	1372	1.9	7.07	★	
	267	1266	2.1	6.53		
	288	1178	2.1	6.06	★	
	309	1098	2.6	5.65		
	341	992	3.3	5.11	★	
	371	912	3.7	4.7		
	413	823	4.3	4.23	★	
	447	752	4.5	3.9		
	220	1532	0.98	7.92	★	**E.68-M112MB4**
	241	1399	0.95	7.23		
	272	1248	1.2	6.42	★	
	295	1151	1.5	5.92		
	326	1036	1.9	5.36	★	
	354	956	2.1	4.93		
	383	885	2.2	4.56	★	
	412	823	2.5	4.24		
	467	726	2.8	3.74	★	
	506	673	3.2	3.45		
	565	602	3.7	3.09	★	
	612	549	4	2.85		
	730	460	4.4	2.39		
	855	398	4.7	2.04	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
5.5 (60 Hz)	1026	327	4.7	1.7		**E.68-M112MB4**
	276	1231	0.83	6.33	★	**E.48-M112MB4**
	298	1133	0.94	5.85		
	344	983	1.1	5.08	★	
	378	894	1.3	4.62		
	414	814	1.6	4.21	★	
	451	752	1.9	3.87		
	490	690	1.8	3.56	★	
	539	628	2.1	3.24		
	592	575	2.6	2.95	★	
	646	522	2.7	2.7		
	724	469	2.8	2.41	★	
	812	416	2.9	2.15		
	954	354	2.9	1.83		
	1148	292	3	1.52	★	
	475	708	0.87	3.67	★	**E.38-M112MB4**
	527	637	0.9	3.31		
	582	584	1.2	3	★	
	639	531	1.3	2.73		
	779	434	1.5	2.24		
	851	398	1.8	2.05	★	
	943	354	2	1.85		
	1097	310	2.1	1.59	★	
7.5 (60 Hz)	1.9	220945	0.8	896	★	**D.188-Z68-M132SB4**
	2.3	183957	0.96	746		
	2.8	152638	1.2	619	★	
	3.2	134640	1.3	546		
	3.7	114914	1.5	466	★	
	4.5	95676	1.9	388		
	3.2	134144	0.92	544		**D.168-Z68-M132SB4**
	3.9	111708	1.1	453		
	4.6	92718	1.3	376		
	5.1	91079	1.4	341.61	★	**D.168-M132SB4**
	5.6	83559	1.5	313.41		
	6	77111	1.6	289.23	★	
	6.5	71531	1.7	268.29		
	6.9	67475	1.8	253.08	★	
	7.4	63108	2	236.72		
	5.8	80335	0.88	301.34	★	**D.148-M132SB4**
	6.3	73648	0.96	276.23		
	6.9	67909	1	254.7	★	
	7.4	62931	1.1	236.05		
	7.8	59831	1.2	224.43	★	
	8.3	55925	1.3	209.76		
	9.4	49326	1.4	185.03	★	
	10	46527	1.5	174.53		
	11.2	41691	1.7	156.38	★	
	12.1	38493	1.8	144.39		
	14.1	32887	2.2	123.37		
	8.7	53648	0.84	201.22		**D.128-M132SB4**
	9.4	49414	0.91	185.36	★	
	10.2	45756	0.99	171.62		
	10.9	42550	1.1	159.6	★	
	11.7	39725	1.1	148.99		
	13.1	35535	1.3	133.3	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
7.5 (60 Hz)	14.1	32931	1.4	123.53		**D.128-M132SB4**
	15.4	30194	1.5	113.24	★	
	16.8	27670	1.6	103.8		
	19.7	23587	1.9	88.46		
	22	20814	2.2	78.06	★	
	40	11780	2.5	44.19	★	**Z.128-M132SB4**
	43	10921	2.6	40.96		
	13.8	33834	0.81	126.9	★	**D.108-M132SB4**
	14.9	31151	0.88	116.83		
	16.6	28015	0.98	105.08	★	
	18	25845	1.1	96.94		
	21	21895	1.3	82.14		
	24	19087	1.4	71.59	★	
	29	16235	1.7	60.9		
	36	12896	2.1	48.38	★	**Z.108-M132SB4**
	39	11815	2.3	44.31		
	43	10885	2.5	40.82	★	
	46	10070	2.7	37.79		
	25	18405	0.81	69.05		**D.88-M132SB4**
	30	15447	0.96	57.93		
	35	13179	1.1	49.42	★	
	42	10983	1.4	41.19		
	47	9937	1.5	37.27	★	**Z.88-M132SB4**
	51	9087	1.6	34.07		
	56	8352	1.8	31.32	★	
	60	7714	1.9	28.93		
	65	7156	2.1	26.85	★	
	70	6669	2.2	25.01		
	77	6031	2.5	22.61	★	
	84	5544	2.7	20.81		
	93	4986	3	18.72	★	
	101	4605	3.2	17.27		
	119	3897	3.7	14.63		
	57	8157	0.87	30.6	★	**Z.68-M132SB4**
	62	7528	0.94	28.25		
	68	6811	1	25.55	★	
	74	6270	1.1	23.53		
	80	5801	1.2	21.76	★	
	86	5385	1.3	20.2		
	98	4747	1.5	17.82	★	
	106	4384	1.6	16.45		
	118	3932	1.8	14.74	★	
	128	3622	2	13.59		
	153	3038	2.3	11.4		
	179	2595	2.5	9.73	★	
	215	2161	2.9	8.11		
	260	1789	3.2	6.72	★	
	294	1576	2.7	5.93		
	345	1346	3.2	5.06	★	
	414	1124	3.7	4.22		
	500	930	4	3.49	★	
	99	4676	0.85	17.55		**Z.48-M132SB4**
	108	4313	0.88	16.17	★	
	119	3914	0.95	14.68		
	130	3569	1	13.38	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
7.5 (60 Hz)	142	3268	1.1	12.25		**Z.48-M132SB4**
	160	2914	1.2	10.93	★	
	179	2604	1.3	9.76		
	210	2214	1.4	8.29		
	253	1842	1.6	6.9	★	
	257	1806	1.3	6.79	★	
	288	1612	1.5	6.06		
	339	1372	1.7	5.15		
	408	1142	2	4.28	★	
	128	3640	1.5	13.67	★	**E.148-M132SB4**
	139	3339	1.6	12.54		
	151	3082	2	11.57	★	
	163	2860	2.4	10.73		
	172	2701	2.6	10.13	★	
	184	2524	3.2	9.47		
	207	2240	3.9	8.42	★	
	219	2116	4.4	7.95		
	172	2701	1.8	10.14	★	**E.128-M132SB4**
	186	2506	2.1	9.4		
	195	2382	2.4	8.94	★	
	209	2223	2.8	8.35		
	237	1966	3.7	7.37	★	
	251	1851	4.2	6.95		
	280	1665	4.9	6.23	★	
	320	1452	4	5.46	★	**E.108-M132SB4**
	349	1337	4.5	5		
	464	1000	5.3	3.76	★	
	207	2240	0.97	8.42	★	**E.88-M132SB4**
	227	2046	1.1	7.69		
	247	1886	1.4	7.07	★	
	267	1744	1.5	6.53		
	288	1612	1.5	6.06	★	
	309	1505	1.9	5.65		
	341	1364	2.4	5.11	★	
	371	1248	2.7	4.7		
	413	1124	3.1	4.23	★	
	447	1036	3.3	3.9		
	529	876	4.5	3.3		
	606	770	5	2.88	★	
	712	655	5.7	2.45		
	272	1709	0.88	6.42	★	**E.68-M132SB4**
	295	1576	1.1	5.92		
	326	1426	1.4	5.36	★	
	354	1310	1.5	4.93		
	383	1213	1.6	4.56	★	
	412	1133	1.8	4.24		
	467	1000	2	3.74	★	
	506	921	2.3	3.45		
	565	823	2.7	3.09	★	
	612	761	2.9	2.85		
	730	637	3.2	2.39		
	855	540	3.4	2.04	★	
	1026	451	3.4	1.7		
	378	1231	0.93	4.62		**E.48-M132SB4**
	414	1124	1.2	4.21	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
7.5 (60 Hz)	451	1027	1.4	3.87		**E.48-M132SB4**
	490	947	1.3	3.56	★	
	539	868	1.5	3.24		
	592	788	1.9	2.95	★	
	646	717	2	2.7		
	724	637	2.1	2.41	★	
	812	575	2.1	2.15		
	954	487	2.1	1.83		
	1148	407	2.2	1.52	★	
10 (60 Hz)	2.8	208448	0.85	619	★	**D.188-Z68-M132M4**
	3.2	183869	0.96	546		
	3.7	156925	1.1	466	★	
	4.5	130663	1.4	388		
	5.4	108431	1.6	322	★	
	7.2	88644	2	243.82		**D.188-M132M4**
	3.9	152549	0.81	453		**D.168-Z68-M132M4**
	4.6	126615	0.98	376		
	5.1	124197	1	341.61	★	**D.168-M132M4**
	5.6	113940	1.1	313.41		
	6	105154	1.2	289.23	★	
	6.5	97536	1.3	268.29		
	6.9	92009	1.3	253.08	★	
	7.4	86057	1.4	236.72		
	8.3	76527	1.6	210.49	★	
	8.8	72240	1.7	198.71		
	9.8	64853	1.9	178.38	★	
	10.7	59521	2.1	163.72		
	7.4	85818	0.83	236.05		**D.148-M132M4**
	7.8	81593	0.87	224.43	★	
	8.3	76261	0.93	209.76		
	9.4	67271	1.1	185.03	★	
	10	63453	1.1	174.53		
	11.2	56855	1.2	156.38	★	
	12.1	52497	1.3	144.39		
	14.1	44853	1.6	123.37		
	15.7	40539	1.7	111.5	★	
	16.2	39051	1.8	107.42		
	18.8	33781	2.1	92.91		
	22	29459	2.4	81.04	★	
	30	20903	2	57.5		**Z.148-M132M4**
	11.7	54162	0.83	148.99		**D.128-M132M4**
	13.1	48458	0.93	133.3	★	
	14.1	44906	1	123.53		
	15.4	41168	1.1	113.24	★	
	16.8	37741	1.2	103.8		
	19.7	32160	1.4	88.46		
	22	28378	1.6	78.06	★	
	26	24153	1.9	66.43		
	30	20929	2.2	57.56	★	
	36	17608	2.6	48.44	★	
	40	16067	1.8	44.19	★	**Z.128-M132M4**
	43	14889	1.9	40.96		
	21	29866	0.92	82.14		**D.108-M132M4**
	24	26022	1.1	71.59	★	
	29	22143	1.2	60.9		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
10 (60 Hz)	36	17590	1.6	48.38	★	**Z.108-M132M4**
	39	16111	1.7	44.31		
	43	14836	1.9	40.82	★	
	46	13737	2	37.79		
	50	12772	2.1	35.14	★	
	53	11930	2.3	32.81		
	60	10673	2.6	29.35	★	
	64	9884	2.8	27.2		
	70	9069	3	24.94	★	
	35	17962	0.83	49.42	★	**D.88-M132M4**
	42	14977	0.99	41.19		
	47	13551	1.1	37.27	★	**Z.88-M132M4**
	51	12382	1.2	34.07		
	56	11390	1.3	31.32	★	
	60	10513	1.4	28.93		
	65	9760	1.5	26.85	★	
	70	9096	1.6	25.01		
	77	8219	1.8	22.61	★	
	84	7564	2	20.81		
	93	6802	2.2	18.72	★	
	101	6279	2.4	17.27		
	119	5323	2.7	14.63		
	137	4632	3	12.75	★	
	161	3941	3.3	10.85		
	188	3365	3.7	9.26	★	
	230	2763	4.2	7.59	★	
	251	2533	4.4	6.96		
	294	2161	4.9	5.94	★	
	392	1620	4.4	4.45	★	
	460	1381	4.8	3.79	★	
	561	1133	5.2	3.11	★	
	74	8556	0.83	23.53		**Z.68-M132M4**
	80	7909	0.9	21.76	★	
	86	7342	0.96	20.2		
	98	6474	1.1	17.82	★	
	106	5978	1.2	16.45		
	118	5358	1.3	14.74	★	
	128	4942	1.4	13.59		
	153	4145	1.7	11.4		
	179	3534	1.9	9.73	★	
	215	2949	2.1	8.11		
	260	2444	2.4	6.72	★	
	294	2152	2	5.93		
	345	1842	2.3	5.06	★	
	414	1532	2.7	4.22		
	500	1266	2.9	3.49	★	
	142	4455	0.8	12.25		**Z.48-M132M4**
	160	3976	0.87	10.93	★	
	179	3551	0.95	9.76		
	210	3011	1.1	8.29		
	253	2506	1.2	6.9	★	
	257	2471	0.97	6.79	★	
	288	2205	1.1	6.06		
	339	1868	1.3	5.15		
	408	1558	1.5	4.28	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
10 (60 Hz)	128	4968	1.1	13.67	★	**E.148-M132M4**
	139	4561	1.2	12.54		
	151	4207	1.4	11.57	★	
	163	3897	1.7	10.73		
	172	3684	1.9	10.13	★	
	184	3445	2.4	9.47		
	207	3064	2.9	8.42	★	
	219	2887	3.2	7.95		
	244	2595	3.8	7.14	★	
	266	2382	4.3	6.55		
	172	3684	1.3	10.14	★	**E.128-M132M4**
	186	3418	1.5	9.4		
	195	3250	1.7	8.94	★	
	209	3038	2.1	8.35		
	237	2683	2.7	7.37	★	
	251	2524	3.1	6.95		
	280	2267	3.6	6.23	★	
	303	2090	4.1	5.75		
	355	1789	4.8	4.91		
	320	1984	2.9	5.46	★	**E.108-M132M4**
	349	1815	3.3	5		
	410	1550	4.1	4.26		
	464	1364	3.9	3.76	★	
	545	1160	5.7	3.2		
	630	1009	5.9	2.77	★	
	247	2568	1	7.07	★	**E.88-M132M4**
	267	2373	1.1	6.53		
	288	2205	1.1	6.06	★	
	309	2054	1.4	5.65		
	341	1860	1.8	5.11	★	
	371	1709	2	4.7		
	413	1541	2.3	4.23	★	
	447	1417	2.4	3.9		
	529	1195	3.3	3.3		
	606	1045	3.7	2.88	★	
	712	894	4.2	2.45		
	835	761	4.9	2.09	★	
	1020	620	5.1	1.71	★	
	326	1948	1	5.36	★	**E.68-M132M4**
	354	1789	1.1	4.93		
	383	1656	1.2	4.56	★	
	412	1541	1.3	4.24		
	467	1364	1.5	3.74	★	
	506	1257	1.7	3.45		
	565	1124	2	3.09	★	
	612	1036	2.1	2.85		
	730	868	2.3	2.39		
	855	744	2.5	2.04	★	
	1026	620	2.5	1.7		
	414	1532	0.87	4.21	★	**E.48-M132M4**
	451	1408	1	3.87		
	490	1293	0.96	3.56	★	
	539	1178	1.1	3.24		
	592	1071	1.4	2.95	★	
	646	983	1.4	2.7		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
10 (60 Hz)	724	876	1.5	2.41 ★	**E.48-M132M4**
	812	779	1.5	2.15	
	954	664	1.5	1.83	
	1148	549	1.6	1.52 ★	
12.3 (60 Hz)	3.7	192637	0.92	466 ★	**D.188-Z68-M132MB4**
	4.5	160397	1.1	388	
	5.4	133116	1.3	322 ★	
	7.2	108732	1.6	243.82	**D.188-M132MB4**
	7.9	98183	1.8	220.17	
	8.5	92018	1.9	206.34	
	4.6	155437	0.8	376	**D.168-Z68-M132MB4**
	5.1	152345	0.81	341.61 ★	**D.168-M132MB4**
	5.6	139768	0.89	313.41	
	6	128989	0.96	289.23 ★	
	6.5	119644	1	268.29	
	6.9	112859	1.1	253.08 ★	
	7.4	105570	1.2	236.72	
	8.3	93869	1.3	210.49 ★	
	8.8	88617	1.4	198.71	
	9.8	79547	1.6	178.38 ★	
	10.7	73010	1.7	163.72	
	12.4	63002	2	141.28	
	14.1	55119	2.2	123.59	
	9.4	82514	0.86	185.03 ★	**D.148-M132MB4**
	10	77838	0.91	174.53	
	11.2	69742	1	156.38 ★	
	12.1	64392	1.1	144.39	
	14.1	55021	1.3	123.37	
	15.7	49724	1.4	111.5 ★	
	16.2	47909	1.5	107.42	
	18.8	41434	1.7	92.91	
	22	36137	2	81.04 ★	
	25	30929	2.3	69.36 ★	
	30	25641	1.6	57.5	**Z.148-M132MB4**
	14.1	55092	0.82	123.53	**D.128-M132MB4**
	15.4	50504	0.89	113.24 ★	
	16.8	46288	0.98	103.8	
	19.7	39450	1.1	88.46	
	22	34809	1.3	78.06 ★	
	26	29627	1.5	66.43	
	30	25668	1.8	57.56 ★	
	36	21602	2.1	48.44 ★	
	40	19494	2.3	43.71	
	40	19707	1.5	44.19 ★	**Z.128-M132MB4**
	43	18263	1.5	40.96	
	45	17369	2.6	38.94 ★	
	48	16226	2.8	36.39	
	24	31930	0.86	71.59 ★	**D.108-M132MB4**
	29	27156	1	60.9	
	36	21576	1.3	48.38 ★	**Z.108-M132MB4**
	39	19760	1.4	44.31	
	43	18201	1.5	40.82 ★	
	46	16855	1.6	37.79	
	50	15668	1.8	35.14 ★	
	53	14632	1.9	32.81	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
12.3 (60 Hz)	60	13091	2.1	29.35	★	**Z.108-M132MB4**
	64	12134	2.3	27.2		
	70	11124	2.5	24.94	★	
	76	10194	2.7	22.86		
	90	8689	3.2	19.48		
	333	2338	4.3	5.24	★	
	396	1966	5.1	4.41	★	
	438	1771	5.6	3.98		
	42	18370	0.81	41.19		**D.88-M132MB4**
	47	16625	0.9	37.27	★	**Z.88-M132MB4**
	51	15190	0.98	34.07		
	56	13967	1.1	31.32	★	
	60	12905	1.2	28.93		
	65	11975	1.2	26.85	★	
	70	11151	1.3	25.01		
	77	10079	1.5	22.61	★	
	84	9282	1.6	20.81		
	93	8352	1.8	18.72	★	
	101	7705	1.9	17.27		
	119	6527	2.2	14.63		
	137	5686	2.4	12.75	★	
	161	4836	2.7	10.85		
	188	4127	3	9.26	★	
	230	3383	3.4	7.59	★	
	251	3100	3.6	6.96		
	294	2648	4	5.94	★	
	358	2170	4.5	4.87	★	
	392	1984	3.6	4.45	★	
	460	1691	3.9	3.79	★	
	561	1390	4.2	3.11	★	
	98	7945	0.89	17.82	★	**Z.68-M132MB4**
	106	7333	0.97	16.45		
	118	6572	1.1	14.74	★	
	128	6058	1.2	13.59		
	153	5084	1.4	11.4		
	179	4340	1.5	9.73	★	
	215	3613	1.7	8.11		
	260	2993	1.9	6.72	★	
	294	2648	1.6	5.93		
	345	2258	1.9	5.06	★	
	414	1877	2.2	4.22		
	500	1558	2.4	3.49	★	
	210	3693	0.86	8.29		**Z.48-M132MB4**
	253	3073	0.98	6.9	★	
	288	2701	0.88	6.06		
	339	2294	1	5.15		
	408	1904	1.2	4.28	★	
	128	6093	0.87	13.67	★	**E.148-M132MB4**
	139	5588	0.95	12.54		
	151	5163	1.2	11.57	★	
	163	4782	1.4	10.73		
	172	4517	1.6	10.13	★	
	184	4224	1.9	9.47		
	207	3755	2.4	8.42	★	
	219	3542	2.6	7.95		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
12.3 (60 Hz)	244	3179	3.1	7.14	★	**E.148-M132MB4**
	266	2922	3.5	6.55		
	309	2515	4.8	5.65		
	172	4526	1.1	10.14	★	**E.128-M132MB4**
	186	4189	1.2	9.4		
	195	3985	1.4	8.94	★	
	209	3720	1.7	8.35		
	237	3286	2.2	7.37	★	
	251	3100	2.5	6.95		
	280	2781	3	6.23	★	
	303	2568	3.3	5.75		
	355	2187	3.9	4.91		
	393	1984	4.5	4.44	★	
	408	1904	4.6	4.28		
	472	1647	5.4	3.7		
	320	2435	2.4	5.46	★	**E.108-M132MB4**
	349	2232	2.7	5		
	410	1895	3.4	4.26		
	464	1674	3.2	3.76	★	
	545	1426	4.6	3.2		
	630	1231	4.8	2.77	★	
	749	1036	5.8	2.33	★	
	827	938	5.8	2.11		
	964	806	6	1.81	★	
	247	3153	0.81	7.07	★	**E.88-M132MB4**
	267	2914	0.91	6.53		
	288	2701	0.92	6.06	★	
	309	2515	1.1	5.65		
	341	2276	1.4	5.11	★	
	371	2099	1.6	4.7		
	413	1886	1.9	4.23	★	
	447	1736	2	3.9		
	529	1470	2.7	3.3		
	606	1284	3	2.88	★	
	712	1089	3.4	2.45		
	835	930	4	2.09	★	
	1020	761	4.1	1.71	★	
	326	2391	0.82	5.36	★	**E.68-M132MB4**
	354	2196	0.91	4.93		
	383	2037	0.96	4.56	★	
	412	1886	1.1	4.24		
	467	1665	1.2	3.74	★	
	506	1541	1.4	3.45		
	565	1381	1.6	3.09	★	
	612	1266	1.7	2.85		
	730	1062	1.9	2.39		
	855	912	2	2.04	★	
	1026	761	2	1.7		
	451	1727	0.82	3.87		**E.48-M132MB4**
	539	1443	0.92	3.24		
	592	1319	1.1	2.95	★	
	646	1204	1.2	2.7		
15 (60 Hz)	4.5	192983	0.92	388		**D.188-Z68-M160MB4**
	5.4	160158	1.1	322	★	
	7.1	130760	1.4	243.82		**D.188-M160MB4**

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
15 (60 Hz)	7.9	118076	1.5	220.17		**D.188-M160MB4**
	8.4	110654	1.6	206.34		
	9.8	95047	1.9	177.23	★	
	11.3	82116	2.2	153.12		
	6.9	135720	0.91	253.08	★	**D.168-M160MB4**
	7.3	126951	0.98	236.72		
	8.2	112886	1.1	210.49	★	
	8.7	106562	1.2	198.71		
	9.7	95659	1.3	178.38	★	
	10.6	87802	1.4	163.72		
	12.3	75765	1.6	141.28		
	14	66279	1.9	123.59		
	16.1	57643	2.2	107.48		
	11.1	83861	0.84	156.38	★	**D.148-M160MB4**
	12	77430	0.92	144.39		
	14.1	66164	1.1	123.37		
	15.6	59795	1.2	111.5	★	
	16.2	57607	1.2	107.42		
	18.7	49822	1.4	92.91		
	21	43462	1.6	81.04	★	
	25	37200	1.9	69.36	★	
	28	33312	2.1	62.12		
	32	29087	2.4	54.24	★	**Z.148-M160MB4**
	34	27209	2.6	50.74		
	16.7	55668	0.81	103.8		**D.128-M160MB4**
	19.6	47439	0.95	88.46		
	22	41859	1.1	78.06	★	
	26	35624	1.3	66.43		
	30	30867	1.5	57.56	★	
	36	25978	1.7	48.44	★	
	40	23445	1.9	43.71		
	45	20885	2.2	38.94	★	**Z.128-M160MB4**
	48	19512	2.3	36.39		
	54	17218	2.6	32.11	★	
	57	16235	2.8	30.28		
	28	32656	0.84	60.9		**D.108-M160MB4**
	33	27873	0.99	51.97	★	
	41	22851	1.2	42.61	★	
	49	18848	1.5	35.14	★	**Z.108-M160MB4**
	53	17599	1.6	32.81		
	59	15739	1.7	29.35	★	
	64	14588	1.9	27.2		
	70	13374	2.1	24.94	★	
	76	12258	2.2	22.86		
	89	10442	2.6	19.48		
	101	9220	3	17.19	★	
	119	7847	3.5	14.63		
	244	3808	4.2	7.1	★	
	271	3436	4.5	6.41		
	315	2958	5.1	5.51	★	
	331	2807	3.6	5.24	★	
	393	2364	4.3	4.41	★	
	436	2134	4.6	3.98		
	507	1833	5.2	3.42	★	
	65	14401	1	26.85	★	**Z.88-M160MB4**

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
15 (60 Hz)	69	13409	1.1	25.01		**Z.88-M160MB4**
	77	12125	1.2	22.61	★	
	83	11160	1.3	20.81		
	93	10035	1.5	18.72	★	
	100	9264	1.6	17.27		
	119	7847	1.8	14.63		
	136	6837	2	12.75	★	
	160	5819	2.2	10.85		
	187	4968	2.5	9.26	★	
	229	4074	2.8	7.59	★	
	249	3728	3	6.96		
	292	3188	3.3	5.94	★	
	356	2612	3.8	4.87	★	
	390	2382	3	4.45	★	
	458	2028	3.2	3.79	★	
	558	1665	3.5	3.11	★	
	105	8821	0.8	16.45		**Z.68-M160MB4**
	118	7900	0.9	14.74	★	
	128	7289	0.97	13.59		
	152	6111	1.1	11.4		
	178	5216	1.3	9.73	★	
	214	4348	1.4	8.11		
	258	3604	1.6	6.72	★	
	293	3179	1.4	5.93		
	343	2710	1.6	5.06	★	
	411	2267	1.8	4.22		
	497	1868	2	3.49	★	
	171	5429	1.3	10.13	★	**E.148-M160MB4**
	183	5075	1.6	9.47		
	206	4517	2	8.42	★	
	218	4260	2.2	7.95		
	243	3826	2.6	7.14	★	
	265	3516	2.9	6.55		
	307	3029	4	5.65		
	351	2648	4.7	4.94		
	403	2302	5.1	4.3		
	194	4791	1.2	8.94	★	**E.128-M160MB4**
	208	4481	1.4	8.35		
	235	3950	1.8	7.37	★	
	250	3728	2.1	6.95		
	278	3339	2.5	6.23	★	
	302	3082	2.8	5.75		
	353	2630	3.2	4.91		
	391	2382	3.7	4.44	★	
	405	2294	3.9	4.28		
	469	1984	4.5	3.7		
	537	1736	5.1	3.23	★	
	629	1479	6	2.76	★	
	318	2931	2	5.46	★	**E.108-M160MB4**
	347	2683	2.2	5		
	407	2285	2.8	4.26		
	461	2019	2.6	3.76	★	
	542	1718	3.8	3.2		
	626	1488	4	2.77	★	
	745	1248	4.8	2.33	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
15 (60 Hz)	822	1133	4.9	2.11		**E.108-M160MB4**
	959	974	5	1.81	★	
	307	3029	0.94	5.65		**E.88-M160MB4**
	340	2736	1.2	5.11	★	
	369	2524	1.4	4.7		
	410	2267	1.6	4.23	★	
	445	2090	1.6	3.9		
	526	1771	2.3	3.3		
	602	1541	2.5	2.88	★	
	708	1310	2.8	2.45		
	830	1124	3.3	2.09	★	
	1015	921	3.4	1.71	★	
	380	2444	0.8	4.56	★	**E.68-M160MB4**
	409	2276	0.9	4.24		
	464	2001	1	3.74	★	
	503	1851	1.1	3.45		
	561	1656	1.3	3.09	★	
	609	1532	1.4	2.85		
	726	1284	1.6	2.39		
	850	1098	1.7	2.04	★	
	1021	912	1.7	1.7		
20 (60 Hz)	5.4	218554	0.81	322	★	**D.188-Z68-M160L4**
	7.1	178306	0.99	243.82		**D.188-M160L4**
	7.9	161008	1.1	220.17		
	8.4	150893	1.2	206.34		
	9.8	129609	1.4	177.23	★	
	11.3	111974	1.6	153.12		
	12.8	98838	1.8	135.16		
	14.3	88980	2	121.67	★	
	8.2	153931	0.81	210.49	★	**D.168-M160L4**
	8.7	145313	0.85	198.71		
	9.7	130450	0.95	178.38	★	
	10.6	119733	1	163.72		
	12.3	103320	1.2	141.28		
	14	90380	1.4	123.59		
	16.1	78599	1.6	107.48		
	18.4	68963	1.8	94.3	★	
	22	58325	2.1	79.75	★	
	24	52913	2.3	72.36		
	37	34082	2.6	46.61		**Z.168-M160L4**
	15.6	81540	0.87	111.5	★	**D.148-M160L4**
	16.2	78555	0.9	107.42		
	18.7	67944	1	92.91		
	21	59264	1.2	81.04	★	
	25	50725	1.4	69.36	★	
	28	45429	1.6	62.12		
	32	39663	1.8	54.24	★	**Z.148-M160L4**
	34	37103	1.9	50.74		
	38	32984	2.1	45.11	★	
	41	31142	2.3	42.59		
	45	27953	2.5	38.23	★	
	49	25659	2.8	35.09		
	26	48582	0.93	66.43		**D.128-M160L4**
	30	42089	1.1	57.56	★	
	36	35420	1.3	48.44	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
20 (60 Hz)	40	31966	1.4	43.71		**D.128-M160L4**
	45	28476	1.6	38.94	★	**Z.128-M160L4**
	48	26616	1.7	36.39		
	54	23480	1.9	32.11	★	
	57	22143	2	30.28		
	64	19840	2.3	27.13	★	
	69	18316	2.5	25.05		
	81	15659	2.9	21.41		
	90	14153	3.2	19.35	★	
	93	13631	3.3	18.64		
	238	5332	4.2	7.29	★	
	278	4561	4.9	6.24	★	
	41	31160	0.88	42.61	★	**D.108-M160L4**
	49	25695	1.1	35.14	★	**Z.108-M160L4**
	53	23994	1.1	32.81		
	59	21461	1.3	29.35	★	
	64	19893	1.4	27.2		
	70	18237	1.5	24.94	★	
	76	16713	1.6	22.86		
	89	14242	1.9	19.48		
	101	12568	2.2	17.19	★	
	119	10699	2.6	14.63		
	137	9273	3	12.68	★	
	163	7803	3.5	10.67	★	
	180	7032	3.9	9.62		
	210	6049	4.5	8.27	★	
	244	5190	3.1	7.1	★	
	271	4685	3.3	6.41		
	315	4030	3.7	5.51	★	
	331	3835	2.6	5.24	★	
	393	3224	3.1	4.41	★	
	436	2914	3.4	3.98		
	507	2497	3.8	3.42	★	
	69	18290	0.81	25.01		**Z.88-M160L4**
	77	16536	0.9	22.61	★	
	83	15216	0.98	20.81		
	93	13693	1.1	18.72	★	
	100	12630	1.2	17.27		
	119	10699	1.3	14.63		
	136	9326	1.5	12.75	★	
	160	7936	1.6	10.85		
	187	6775	1.8	9.26	★	
	229	5553	2.1	7.59	★	
	249	5092	2.2	6.96		
	292	4340	2.4	5.94	★	
	356	3560	2.8	4.87	★	
	390	3250	2.2	4.45	★	
	458	2772	2.4	3.79	★	
	558	2276	2.6	3.11	★	
	152	8334	0.83	11.4		**Z.68-M160L4**
	178	7112	0.93	9.73	★	
	214	5934	1	8.11		
	258	4915	1.2	6.72	★	
	293	4340	1	5.93		
	343	3702	1.1	5.06	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
20 (60 Hz)	411	3082	1.3	4.22		**Z.68-M160L4**
	497	2550	1.5	3.49	★	
	171	7404	0.96	10.13	★	**E.148-M160L4**
	183	6926	1.2	9.47		
	206	6155	1.4	8.42	★	
	218	5810	1.6	7.95		
	243	5225	1.9	7.14	★	
	265	4791	2.1	6.55		
	307	4127	2.9	5.65		
	351	3613	3.4	4.94		
	403	3144	3.7	4.3		
	460	2754	4.3	3.77	★	
	544	2329	5.9	3.19	★	
	598	2116	5.8	2.9		
	688	1842	5.9	2.52	★	
	194	6536	0.87	8.94	★	**E.128-M160L4**
	208	6102	1	8.35		
	235	5394	1.3	7.37	★	
	250	5084	1.5	6.95		
	278	4552	1.8	6.23	★	
	302	4207	2	5.75		
	353	3587	2.4	4.91		
	391	3250	2.7	4.44	★	
	405	3126	2.8	4.28		
	469	2701	3.3	3.7		
	537	2364	3.7	3.23	★	
	629	2019	4.4	2.76	★	
	702	1806	4.7	2.47		
	826	1532	5	2.1	★	
	959	1319	5.4	1.81		
	318	3994	1.5	5.46	★	**E.108-M160L4**
	347	3658	1.6	5		
	407	3117	2	4.26		
	461	2745	1.9	3.76	★	
	542	2338	2.8	3.2		
	626	2028	2.9	2.77	★	
	745	1700	3.5	2.33	★	
	822	1541	3.6	2.11		
	959	1319	3.7	1.81	★	
	340	3737	0.88	5.11	★	**E.88-M160L4**
	369	3436	0.99	4.7		
	410	3091	1.1	4.23	★	
	445	2852	1.2	3.9		
	526	2409	1.7	3.3		
	602	2108	1.8	2.88	★	
	708	1789	2.1	2.45		
	830	1532	2.4	2.09	★	
	1015	1248	2.5	1.71	★	
	503	2524	0.84	3.45		**E.68-M160L4**
	561	2258	0.98	3.09	★	
	609	2081	1.1	2.85		
25 (60 Hz)	7.1	220547	0.8	243.82		**D.188-M180MB4**
	7.9	199156	0.89	220.17		
	8.4	186641	0.95	206.34		
	9.8	160308	1.1	177.23	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
25 (60 Hz)	11.3	138501	1.3	153.12		**D.188-M180MB4**
	12.8	122257	1.4	135.16		
	14.2	110052	1.6	121.67	★	
	17.1	91318	1.9	100.96	★	
	18.8	83276	2.1	92.06		
	21	73064	2.4	80.77	★	
	10.6	148094	0.84	163.72		**D.168-M180MB4**
	12.2	127793	0.97	141.28		
	14	111797	1.1	123.59		
	16.1	97217	1.3	107.48		
	18.3	85295	1.5	94.3	★	
	22	72133	1.7	79.75	★	
	24	65455	1.9	72.36		
	27	57058	2.2	63.08	★	
	37	42160	2.1	46.61		**Z.168-M180MB4**
	18.6	84038	0.84	92.91		**D.148-M180MB4**
	21	73303	0.97	81.04	★	
	25	62736	1.1	69.36	★	
	28	56190	1.3	62.12		
	33	47590	1.5	52.61	★	
	38	40805	1.7	45.11	★	**Z.148-M180MB4**
	41	38520	1.8	42.59		
	45	34578	2	38.23	★	
	49	31744	2.2	35.09		
	57	27386	2.6	30.28		
	65	23959	3	26.49		
	30	52063	0.87	57.56	★	**D.128-M180MB4**
	36	43817	1	48.44	★	
	40	39539	1.1	43.71		
	46	33985	1.3	37.57	★	
	54	29043	1.6	32.11	★	**Z.128-M180MB4**
	57	27386	1.6	30.28		
	64	24543	1.8	27.13	★	
	69	22657	2	25.05		
	81	19362	2.3	21.41		
	89	17502	2.6	19.35	★	
	93	16864	2.7	18.64		
	107	14579	3	16.12		
	123	12719	3.4	14.06	★	
	144	10885	3.8	12.03	★	
	237	6589	3.4	7.29	★	
	277	5642	4	6.24	★	
	309	5057	4.6	5.59	★	
	358	4366	5.1	4.83		
	366	4278	4.9	4.73	★	
	59	26545	1	29.35	★	**Z.108-M180MB4**
	64	24605	1.1	27.2		
	69	22559	1.2	24.94	★	
	76	20681	1.3	22.86		
	89	17617	1.6	19.48		
	101	15553	1.8	17.19	★	
	118	13232	2.1	14.63		
	136	11470	2.4	12.68	★	
	162	9654	2.8	10.67	★	
	180	8697	3.2	9.62		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
25 (60 Hz)	209	7484	3.7	8.27	★	**Z.108-M180MB4**
	244	6421	2.5	7.1	★	
	270	5801	2.7	6.41		
	314	4986	3	5.51	★	
	330	4738	2.1	5.24	★	
	392	3985	2.5	4.41	★	
	435	3596	2.8	3.98		
	506	3091	3.1	3.42	★	
	92	16935	0.88	18.72	★	**Z.88-M180MB4**
	100	15624	0.95	17.27		
	118	13232	1.1	14.63		
	136	11532	1.2	12.75	★	
	159	9813	1.3	10.85		
	187	8379	1.5	9.26	★	
	228	6864	1.7	7.59	★	
	249	6297	1.8	6.96		
	291	5376	2	5.94	★	
	355	4402	2.2	4.87	★	
	389	4021	1.8	4.45	★	
	456	3427	1.9	3.79	★	
	556	2816	2.1	3.11	★	
	205	7617	1.2	8.42	★	**E.148-M180MB4**
	218	7192	1.3	7.95		
	242	6456	1.5	7.14	★	
	264	5925	1.7	6.55		
	306	5110	2.4	5.65		
	350	4464	2.8	4.94		
	402	3888	3	4.3		
	459	3410	3.5	3.77	★	
	542	2887	4.8	3.19	★	
	597	2621	4.7	2.9		
	687	2276	4.7	2.52	★	
	808	1939	5.5	2.14		
	1055	1479	5.7	1.64	★	
	235	6669	1.1	7.37	★	**E.128-M180MB4**
	249	6288	1.2	6.95		
	278	5633	1.5	6.23	★	
	301	5199	1.6	5.75		
	352	4437	1.9	4.91		
	390	4012	2.2	4.44	★	
	404	3870	2.3	4.28		
	468	3348	2.6	3.7		
	536	2922	3	3.23	★	
	627	2497	3.5	2.76	★	
	700	2232	3.8	2.47		
	824	1895	4	2.1	★	
	956	1638	4.3	1.81		
	317	4942	1.2	5.46	★	**E.108-M180MB4**
	346	4526	1.3	5		
	406	3852	1.7	4.26		
	460	3401	1.6	3.76	★	
	541	2896	2.3	3.2		
	625	2506	2.4	2.77	★	
	742	2108	2.9	2.33	★	
	820	1904	2.9	2.11		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
25 (60 Hz)	956	1638	3	1.81 ★	**E.108-M180MB4**
	368	4251	0.8	4.7	**E.88-M180MB4**
	409	3826	0.93	4.23 ★	
	444	3525	0.97	3.9	
	524	2984	1.3	3.3	
	601	2604	1.5	2.88 ★	
	706	2214	1.7	2.45	
	828	1886	2	2.09 ★	
	1012	1550	2	1.71 ★	
30 (60 Hz)	8.5	220051	0.81	206.34	**D.188-M180LB4**
	9.8	189006	0.94	177.23 ★	
	11.4	163293	1.1	153.12	
	12.9	144135	1.2	135.16	
	14.3	129750	1.4	121.67 ★	
	17.3	107669	1.6	100.96 ★	
	19	98174	1.8	92.06	
	22	86137	2.1	80.77 ★	
	25	74020	2.4	69.41	
	33	55827	2.5	52.35	**Z.188-M180LB4**
	12.4	150662	0.82	141.28	**D.168-M180LB4**
	14.1	131796	0.94	123.59	
	16.2	114622	1.1	107.48	
	18.5	100565	1.2	94.3 ★	
	22	85047	1.5	79.75 ★	
	24	77164	1.6	72.36	
	28	67271	1.8	63.08 ★	
	33	57120	2.2	53.56	
	37	49707	1.8	46.61	**Z.168-M180LB4**
	22	86420	0.82	81.04 ★	**D.148-M180LB4**
	25	73967	0.96	69.36 ★	
	28	66243	1.1	62.12	
	33	56102	1.3	52.61 ★	
	39	48104	1.5	45.11 ★	**Z.148-M180LB4**
	41	45420	1.6	42.59	
	46	40770	1.7	38.23 ★	
	50	37422	1.9	35.09	
	58	32293	2.2	30.28	
	66	28245	2.5	26.49	
	76	24570	2.9	23.04	
	86	21549	3.3	20.21 ★	
	36	51655	0.87	48.44 ★	**D.128-M180LB4**
	40	46616	0.97	43.71	
	46	40061	1.1	37.57 ★	
	54	34242	1.3	32.11 ★	**Z.128-M180LB4**
	58	32293	1.4	30.28	
	64	28927	1.6	27.13 ★	
	70	26713	1.7	25.05	
	82	22834	2	21.41	
	90	20637	2.2	19.35 ★	
	94	19875	2.3	18.64	
	108	17192	2.6	16.12	
	124	14995	2.9	14.06 ★	
	145	12825	3.3	12.03 ★	
	162	11496	3.5	10.78	
	191	9734	4	9.13 ★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
30 (60 Hz)	221	8405	4.5	7.88		**Z.128-M180LB4**
	239	7776	2.9	7.29	★	
	280	6651	3.4	6.24	★	
	312	5960	3.9	5.59	★	
	361	5154	4.3	4.83		
	369	5039	4.2	4.73	★	
	427	4357	4.8	4.09	★	
	481	3870	5.3	3.63	★	
	60	31301	0.88	29.35	★	**Z.108-M180LB4**
	64	29007	0.95	27.2		
	70	26598	1	24.94	★	
	76	24375	1.1	22.86		
	90	20770	1.3	19.48		
	102	18334	1.5	17.19	★	
	119	15597	1.8	14.63		
	138	13525	2	12.68	★	
	164	11381	2.4	10.67	★	
	181	10256	2.7	9.62		
	211	8821	3.1	8.27	★	
	246	7573	2.1	7.1	★	
	272	6837	2.3	6.41		
	317	5872	2.6	5.51	★	
	333	5588	1.8	5.24	★	
	396	4703	2.1	4.41	★	
	438	4242	2.3	3.98		
	510	3649	2.6	3.42	★	
	101	18414	0.81	17.27		**Z.88-M180LB4**
	119	15597	0.92	14.63		
	137	13595	1	12.75	★	
	161	11567	1.1	10.85		
	188	9875	1.2	9.26	★	
	230	8095	1.4	7.59	★	
	251	7422	1.5	6.96		
	294	6332	1.7	5.94	★	
	358	5190	1.9	4.87	★	
	392	4747	1.5	4.45	★	
	460	4038	1.6	3.79	★	
	561	3312	1.8	3.11	★	
	207	8981	0.99	8.42	★	**E.148-M180LB4**
	219	8476	1.1	7.95		
	244	7617	1.3	7.14	★	
	266	6988	1.5	6.55		
	309	6022	2	5.65		
	353	5270	2.4	4.94		
	406	4588	2.6	4.3		
	463	4021	3	3.77	★	
	547	3401	4	3.19	★	
	602	3091	4	2.9		
	692	2683	4	2.52	★	
	815	2285	4.7	2.14		
	1064	1744	4.9	1.64	★	
	237	7856	0.92	7.37	★	**E.128-M180LB4**
	251	7413	1.1	6.95		
	280	6642	1.2	6.23	★	
	303	6129	1.4	5.75		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
30 (60 Hz)	355	5234	1.6	4.91		**E.128-M180LB4**
	393	4738	1.9	4.44	★	
	408	4561	1.9	4.28		
	472	3941	2.2	3.7		
	540	3445	2.6	3.23	★	
	632	2940	3	2.76	★	
	706	2630	3.2	2.47		
	831	2240	3.4	2.1	★	
	964	1930	3.7	1.81		
	320	5819	1	5.46	★	**E.108-M180LB4**
	349	5332	1.1	5		
	410	4543	1.4	4.26		
	464	4012	1.3	3.76	★	
	545	3410	1.9	3.2		
	630	2958	2	2.77	★	
	749	2488	2.4	2.33	★	
	827	2249	2.4	2.11		
	964	1930	2.5	1.81	★	
	447	4162	0.82	3.9		**E.88-M180LB4**
	529	3516	1.1	3.3		
	606	3073	1.3	2.88	★	
	835	2232	1.7	2.09	★	
	1020	1824	1.7	1.71	★	
40 (60 Hz)	11.6	219528	0.81	153.12		**D.188-M200LB4**
	13.1	193780	0.91	135.16		
	14.5	174436	1	121.67	★	
	17.5	144746	1.2	100.96	★	
	19.2	131982	1.3	92.06		
	22	115800	1.5	80.77	★	
	26	99511	1.8	69.41		
	33	77501	2.3	54.06	★	
	34	75056	1.9	52.35		**Z.188-M200LB4**
	37	69131	2	48.22		
	42	59999	2.4	41.85	★	
	48	52887	2.8	36.89		
	16.5	154090	0.8	107.48		**D.168-M200LB4**
	18.8	135198	0.92	94.3	★	
	22	114339	1.1	79.75	★	
	24	103745	1.2	72.36		
	28	90433	1.4	63.08	★	
	33	76784	1.6	53.56		
	38	66819	1.3	46.61		**Z.168-M200LB4**
	42	60344	2.1	42.09		
	45	56562	2.2	39.45		
	52	48573	2.6	33.88	★	
	60	41965	3	29.27		
	28	89060	0.8	62.12		**D.148-M200LB4**
	34	75428	0.94	52.61	★	
	39	64676	1.1	45.11	★	**Z.148-M200LB4**
	42	61062	1.2	42.59		
	46	54809	1.3	38.23	★	
	50	50309	1.4	35.09		
	58	43409	1.6	30.28		
	67	37980	1.9	26.49		
	77	33028	2.1	23.04		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
40 (60 Hz)	88	28972	2.4	20.21	★	**Z.148-M200LB4**
	104	24499	2.9	17.09	★	
	114	22240	3.2	15.51		
	131	19379	3.7	13.52	★	
	205	12391	3.4	8.64	★	
	226	11239	3.8	7.84		
	234	10850	4.6	7.57	★	
	259	9805	4.3	6.84	★	
	305	8317	4.5	5.8		
	399	6368	5.4	4.44	★	
	47	53861	0.84	37.57	★	**D.128-M200LB4**
	55	46031	0.98	32.11	★	**Z.128-M200LB4**
	58	43409	1	30.28		
	65	38892	1.2	27.13	★	
	71	35916	1.3	25.05		
	83	30699	1.5	21.41		
	92	27741	1.6	19.35	★	
	95	26722	1.7	18.64		
	110	23108	1.9	16.12		
	126	20159	2.1	14.06	★	
	147	17245	2.4	12.03	★	
	164	15456	2.6	10.78		
	194	13091	3	9.13	★	
	225	11293	3.3	7.88		
	243	10451	2.2	7.29	★	
	284	8945	2.5	6.24	★	
	298	8503	4.1	5.93	★	
	317	8015	2.9	5.59	★	
	366	6926	3.2	4.83		
	374	6784	3.1	4.73	★	
	433	5863	3.6	4.09	★	
	488	5208	3.9	3.63	★	
	577	4402	4.5	3.07	★	
	77	32772	0.84	22.86		**Z.108-M200LB4**
	91	27927	0.98	19.48		
	103	24641	1.1	17.19	★	
	121	20974	1.3	14.63		
	140	18175	1.5	12.68	★	
	166	15296	1.8	10.67	★	
	184	13790	2	9.62		
	214	11859	2.3	8.27	★	
	249	10177	1.6	7.1	★	
	276	9193	1.7	6.41		
	321	7900	1.9	5.51	★	
	338	7511	1.3	5.24	★	
	401	6324	1.6	4.41	★	
	445	5704	1.7	3.98		
	518	4906	2	3.42	★	
	223	11399	0.82	7.95		**E.148-M200LB4**
	248	10239	0.97	7.14	★	
	270	9388	1.1	6.55		
	313	8104	1.5	5.65		
	358	7085	1.8	4.94		
	412	6164	1.9	4.3		
	469	5402	2.2	3.77	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
40 (60 Hz)	555	4570	3	3.19	★	**E.148-M200LB4**
	610	4154	3	2.9		
	702	3613	3	2.52	★	
	827	3064	3.5	2.14		
	1079	2347	3.6	1.64	★	
	284	8928	0.92	6.23	★	**E.128-M200LB4**
	308	8246	1	5.75		
	360	7041	1.2	4.91		
	399	6368	1.4	4.44	★	
	414	6138	1.4	4.28		
	478	5305	1.7	3.7		
	548	4632	1.9	3.23	★	
	641	3959	2.2	2.76	★	
	717	3542	2.4	2.47		
	843	3011	2.5	2.1	★	
	978	2595	2.7	1.81		
	354	7165	0.84	5		**E.108-M200LB4**
	415	6111	1	4.26		
	471	5394	0.99	3.76	★	
	553	4588	1.4	3.2		
	639	3968	1.5	2.77	★	
	760	3339	1.8	2.33	★	
	839	3029	1.8	2.11		
	978	2595	1.9	1.81	★	
50 (60 Hz)	14.7	213328	0.83	121.67	★	**D.188-M225S4E**
	17.7	177022	1	100.96	★	
	19.4	161415	1.1	92.06		
	22	141619	1.3	80.77	★	
	26	121699	1.5	69.41		
	33	94782	1.9	54.06	★	
	42	75304	2.4	42.95	★	
	34	91788	1.5	52.35		**Z.188-M225S4E**
	37	84543	1.7	48.22		
	43	73374	1.9	41.85	★	
	48	64684	2.3	36.89		
	55	56757	2.9	32.37		
	22	139830	0.89	79.75	★	**D.168-M225S4E**
	25	126872	0.98	72.36		
	28	110601	1.1	63.08	★	
	33	93905	1.3	53.56		
	42	73799	1.7	42.09		**Z.168-M225S4E**
	45	69166	1.8	39.45		
	53	59406	2.1	33.88	★	
	61	51319	2.4	29.27		
	69	45305	2.7	25.84		
	77	40779	3	23.26	★	
	193	16235	4.3	9.26	★	
	39	79671	0.89	45.44		**D.148-M225S4E**
	47	67032	1.1	38.23	★	**Z.148-M225S4E**
	51	61522	1.2	35.09		
	59	53090	1.3	30.28		
	67	46447	1.5	26.49		
	78	40398	1.8	23.04		
	88	35438	2	20.21	★	
	104	29964	2.4	17.09	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
50 (60 Hz)	115	27191	2.6	15.51		**Z.148-M225S4E**
	132	23702	3	13.52	★	
	155	20132	3.5	11.48		
	207	15146	2.8	8.64	★	
	228	13746	3.1	7.84		
	236	13277	3.7	7.57	★	
	261	11992	3.5	6.84	★	
	278	11275	4.2	6.43		
	308	10168	3.7	5.8		
	363	8627	5.2	4.92	★	
	402	7785	4.4	4.44	★	
	66	47572	0.95	27.13	★	**Z.128-M225S4E**
	71	43923	1	25.05		
	83	37537	1.2	21.41		
	92	33923	1.3	19.35	★	
	96	32683	1.4	18.64		
	111	28263	1.6	16.12		
	127	24649	1.7	14.06	★	
	148	21089	2	12.03	★	
	166	18901	2.2	10.78		
	196	16005	2.4	9.13	★	
	227	13817	2.7	7.88		
	245	12781	1.8	7.29	★	
	286	10938	2	6.24	★	
	301	10398	3.3	5.93	★	
	319	9805	2.4	5.59	★	
	370	8467	2.6	4.83		
	377	8290	2.5	4.73	★	
	436	7174	2.9	4.09	★	
	492	6368	3.2	3.63	★	
	581	5385	3.7	3.07	★	
	92	34153	0.8	19.48		**Z.108-K4-MI225S4E**
	104	30141	0.91	17.19	★	
	122	25650	1.1	14.63		
	141	22231	1.2	12.68	★	
	167	18706	1.5	10.67	★	
	186	16864	1.6	9.62		
	216	14499	1.9	8.27	★	
	251	12444	1.3	7.1	★	
	278	11239	1.4	6.41		
	324	9663	1.6	5.51	★	
	341	9185	1.1	5.24	★	
	405	7732	1.3	4.41	★	
	448	6979	1.4	3.98		
	522	5996	1.6	3.42	★	
	273	11487	0.89	6.55		**E.148-M225S4E**
	316	9902	1.2	5.65		
	361	8662	1.4	4.94		
	415	7537	1.6	4.3		
	473	6607	1.8	3.77	★	
	560	5588	2.5	3.19	★	
	616	5084	2.4	2.9		
	708	4419	2.4	2.52	★	
	834	3755	2.8	2.14		
	1088	2878	3	1.64	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
50 (60 Hz)	310	10079	0.84	5.75		**E.128-M225S4E**
	364	8609	0.99	4.91		
	402	7785	1.1	4.44	★	
	417	7502	1.2	4.28		
	482	6483	1.4	3.7		
	553	5659	1.6	3.23	★	
	647	4836	1.8	2.76	★	
	723	4331	1.9	2.47		
	850	3684	2.1	2.1	★	
	986	3170	2.2	1.81		
	419	7466	0.85	4.26		**E.108-K4-MI225S4E**
	475	6589	0.81	3.76	★	
	558	5606	1.2	3.2		
	644	4853	1.2	2.77	★	
	766	4083	1.5	2.33	★	
	846	3702	1.5	2.11		
	986	3170	1.5	1.81	★	
60 (60 Hz)	17.7	215294	0.82	100.96	★	**D.188-M225M4E**
	19.4	196313	0.9	92.06		
	22	172239	1	80.77	★	
	26	148014	1.2	69.41		
	33	115277	1.5	54.06	★	
	42	91584	1.9	42.95	★	
	34	111637	1.2	52.35		**Z.188-M225M4E**
	37	102824	1.4	48.22		
	43	89246	1.6	41.85	★	
	48	78670	1.9	36.89		
	55	69025	2.4	32.37		
	61	62222	2.8	29.18	★	
	25	154303	0.8	72.36		**D.168-M225M4E**
	28	134516	0.92	63.08	★	
	33	114215	1.1	53.56		
	42	89751	1.4	42.09		**Z.168-M225M4E**
	45	84126	1.5	39.45		
	53	72249	1.7	33.88	★	
	61	62417	2	29.27		
	69	55101	2.3	25.84		
	77	49600	2.5	23.26	★	
	92	41159	3	19.3	★	
	101	37528	3.3	17.6		
	116	32922	3.6	15.44	★	
	193	19742	3.5	9.26	★	
	248	15349	4.1	7.2	★	
	318	11966	5	5.61	★	
	47	81522	0.87	38.23	★	**Z.148-M225M4E**
	51	74826	0.95	35.09		
	59	64569	1.1	30.28		
	67	56491	1.3	26.49		
	78	49131	1.4	23.04		
	88	43099	1.6	20.21	★	
	104	36447	1.9	17.09	★	
	115	33073	2.1	15.51		
	132	28830	2.5	13.52	★	
	155	24481	2.9	11.48		
	203	18742	3.8	8.79	★	

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
60 (60 Hz)	207	18423	2.3	8.64	★	**Z.148-M225M4E**
	228	16722	2.5	7.84		
	236	16146	3.1	7.57	★	
	261	14588	2.9	6.84	★	
	278	13711	3.5	6.43		
	308	12364	3	5.8		
	363	10495	4.3	4.92	★	
	402	9468	3.6	4.44	★	
	71	53418	0.85	25.05		**Z.128-M225M4E**
	83	45659	0.99	21.41		
	92	41266	1.1	19.35	★	
	96	39751	1.1	18.64		
	111	34375	1.3	16.12		
	127	29982	1.4	14.06	★	
	148	25650	1.6	12.03	★	
	166	22984	1.8	10.78		
	196	19468	2	9.13	★	
	227	16802	2.2	7.88		
	245	15544	1.4	7.29	★	
	286	13303	1.7	6.24	★	
	301	12648	2.7	5.93	★	
	319	11921	1.9	5.59	★	
	370	10301	2.2	4.83		
	377	10088	2.1	4.73	★	
	436	8724	2.4	4.09	★	
	492	7741	2.6	3.63	★	
	581	6545	3	3.07	★	
	122	31195	0.88	14.63		**Z.108-K4-MI225M4E**
	141	27041	1	12.68	★	
	167	22754	1.2	10.67	★	
	186	20513	1.3	9.62		
	216	17634	1.6	8.27	★	
	251	15137	1.1	7.1	★	
	278	13666	1.1	6.41		
	324	11753	1.3	5.51	★	
	341	11177	0.9	5.24	★	
	405	9406	1.1	4.41	★	
	448	8485	1.2	3.98		
	522	7289	1.3	3.42	★	
	316	12045	1	5.65		**E.148-M225M4E**
	361	10531	1.2	4.94		
	415	9167	1.3	4.3		
	473	8042	1.5	3.77	★	
	560	6802	2	3.19	★	
	616	6182	2	2.9		
	708	5376	2	2.52	★	
	834	4561	2.3	2.14		
	1088	3498	2.4	1.64	★	
	364	10469	0.81	4.91		**E.128-M225M4E**
	402	9468	0.94	4.44	★	
	417	9123	0.97	4.28		
	482	7891	1.1	3.7		
	553	6890	1.3	3.23	★	
	647	5881	1.5	2.76	★	
	723	5270	1.6	2.47		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
60 (60 Hz)	850	4481	1.7	2.1	★	**E.128-M225M4E**
	986	3861	1.8	1.81		
	558	6820	0.97	3.2		**E.108-K4-MI225M4E**
	644	5907	1	2.77	★	
75 (60 Hz)	22	209927	0.84	80.77	★	**D.188-M250M4E**
	26	180396	0.98	69.41		
	33	140503	1.3	54.06	★	
	42	111628	1.6	42.95	★	
	37	125322	1.1	48.22		**Z.188-M250M4E**
	43	108767	1.3	41.85	★	
	48	95880	1.5	36.89		
	55	84135	1.9	32.37		
	61	75836	2.3	29.18	★	
	72	64374	2.8	24.77	★	
	78	59804	3	23.01		
	91	51354	3.4	19.76	★	
	216	21576	4.4	8.3		
	45	102532	1.2	39.45		**Z.168-M250M4E**
	53	88059	1.4	33.88	★	
	61	76075	1.6	29.27		
	69	67156	1.8	25.84		
	77	60451	2.1	23.26	★	
	93	50158	2.5	19.3	★	
	102	45739	2.7	17.6		
	116	40132	3	15.44	★	
	135	34490	3.4	13.27		
	173	26873	4.1	10.34	★	
	193	24065	2.9	9.26	★	
	249	18715	3.4	7.2	★	
	289	16111	4.1	6.2	★	
	319	14579	4.1	5.61	★	
	363	12816	4.9	4.93	★	
	401	11594	4.9	4.46	★	
	59	78697	0.9	30.28		**Z.148-M250M4E**
	68	68847	1	26.49		
	78	59884	1.2	23.04		
	89	52523	1.3	20.21	★	
	105	44419	1.6	17.09	★	
	115	40309	1.8	15.51		
	132	35136	2	13.52	★	
	156	29840	2.4	11.48		
	204	22843	3.1	8.79	★	
	207	22453	1.9	8.64	★	
	228	20380	2.1	7.84		
	236	19672	2.5	7.57	★	
	262	17776	2.4	6.84	★	
	278	16713	2.9	6.43		
	309	15075	2.5	5.8		
	364	12789	3.5	4.92	★	
	403	11541	3	4.44	★	
	96	48449	0.93	18.64		**Z.128-K4-MI250M4E**
	111	41895	1.1	16.12		
	127	36545	1.2	14.06	★	
	149	31266	1.3	12.03	★	
	166	28015	1.5	10.78		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
75 (60 Hz)	196	23728	1.7	9.13	★	**Z.128-K4-MI250M4E**
	227	20478	1.8	7.88		
	246	18945	1.2	7.29	★	
	287	16217	1.4	6.24	★	
	302	15411	2.2	5.93	★	
	320	14526	1.6	5.59	★	
	371	12550	1.8	4.83		
	378	12293	1.7	4.73	★	
	438	10628	2	4.09	★	
	493	9433	2.2	3.63	★	
	583	7980	2.5	3.07	★	
	317	14685	0.82	5.65		**E.148-M250M4E**
	362	12843	0.97	4.94		
	416	11177	1.1	4.3		
	475	9796	1.2	3.77	★	
	561	8290	1.7	3.19	★	
	617	7537	1.6	2.9		
	710	6545	1.6	2.52	★	
	836	5562	1.9	2.14		
	1091	4260	2	1.64	★	
	418	11124	0.8	4.28		**E.128-K4-MI250M4E**
	484	9619	0.92	3.7		
	554	8396	1.1	3.23	★	
	649	7174	1.2	2.76	★	
	989	4703	1.5	1.81		
100 (60 Hz)	33	191814	0.92	54.06	★	**D.188-K4-MI280S4E**
	42	152390	1.2	42.95	★	
	48	130893	1.1	36.89		**Z.188-K4-MI280S4E**
	55	114852	1.4	32.37		
	61	103533	1.7	29.18	★	
	72	87891	2	24.77	★	
	78	81646	2.2	23.01		
	90	70114	2.5	19.76	★	
	106	59822	3	16.86		
	135	47120	3.5	13.28	★	
	167	37927	3.8	10.69	★	
	192	32958	3.8	9.29		
	215	29450	3.2	8.3		
	61	103852	1.2	29.27		**Z.168-K4-MI280S4E**
	69	91682	1.4	25.84		
	77	82532	1.5	23.26	★	
	93	68475	1.8	19.3	★	
	102	62444	2	17.6		
	116	54782	2.2	15.44	★	
	135	47085	2.5	13.27		
	173	36687	3	10.34	★	
	193	32851	2.1	9.26	★	
	218	29131	3.5	8.21	★	
	248	25544	2.5	7.2	★	
	288	22001	3	6.2	★	
	319	19902	3	5.61	★	
	363	17493	3.6	4.93	★	
	401	15828	3.6	4.46	★	
	78	81753	0.87	23.04		**Z.148-K4-MI280S4E**
	88	71708	0.99	20.21	★	

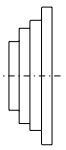
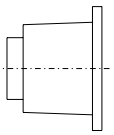
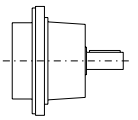
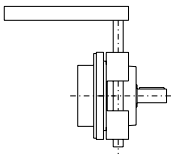
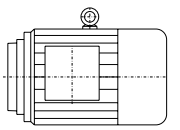
Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
100 (60 Hz)	105	60637	1.2	17.09	★	**Z.148-K4-MI280S4E**
	115	55030	1.3	15.51		
	132	47971	1.5	13.52	★	
	156	40734	1.7	11.48		
	203	31186	2.3	8.79	★	
	207	30655	1.4	8.64	★	
	228	27820	1.5	7.84		
	236	26855	1.8	7.57	★	
	261	24269	1.8	6.84	★	
	278	22816	2.1	6.43		
	308	20575	1.8	5.8		
	363	17457	2.6	4.92	★	
	403	15757	2.2	4.44	★	
	474	13374	0.89	3.77	★	**E.148-K4-MI280S4E**
	561	11319	1.2	3.19	★	
	617	10292	1.2	2.9		
	1090	5819	1.5	1.64	★	
125 (60 Hz)	42	182664	0.97	42.95	★	**D.188-K4-MI280M4E**
	48	156889	0.94	36.89		**Z.188-K4-MI280M4E**
	55	137669	1.2	32.37		
	61	124099	1.4	29.18	★	
	72	105348	1.7	24.77	★	
	78	97864	1.8	23.01		
	91	84038	2.1	19.76	★	
	106	71708	2.5	16.86		
	135	56483	3	13.28	★	
	167	45464	3.2	10.69	★	
	193	39512	3.2	9.29		
	216	35296	2.7	8.3		
	61	124489	1	29.27		**Z.168-K4-MI280M4E**
	69	109901	1.1	25.84		
	77	98927	1.3	23.26	★	
	93	82080	1.5	19.3	★	
	102	74853	1.6	17.6		
	116	65668	1.8	15.44	★	
	135	56438	2.1	13.27		
	173	43976	2.5	10.34	★	
	193	39379	1.8	9.26	★	
	218	34915	2.9	8.21	★	
	249	30619	2.1	7.2	★	
	289	26368	2.5	6.2	★	
	319	23861	2.5	5.61	★	
	363	20965	3	4.93	★	
	401	18972	3	4.46	★	
	89	85951	0.82	20.21	★	**Z.148-K4-MI280M4E**
	105	72683	0.97	17.09	★	
	115	65960	1.1	15.51		
	132	57501	1.2	13.52	★	
	156	48821	1.5	11.48		
	204	37386	1.9	8.79	★	
	207	36749	1.2	8.64	★	
	228	33347	1.3	7.84		
	236	32196	1.5	7.57	★	
	262	29087	1.5	6.84	★	
	278	27342	1.7	6.43		

Legend / explanations see page 3 - 11

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
125 (60 Hz)	309	24667	1.5	5.8		**Z.148-K4-MI280M4E**
	364	20920	2.1	4.92	★	
	403	18883	1.8	4.44	★	
	561	13569	1	3.19	★	**E.148-K4-MI280M4E**
	617	12329	1	2.9		

Possible types of input units

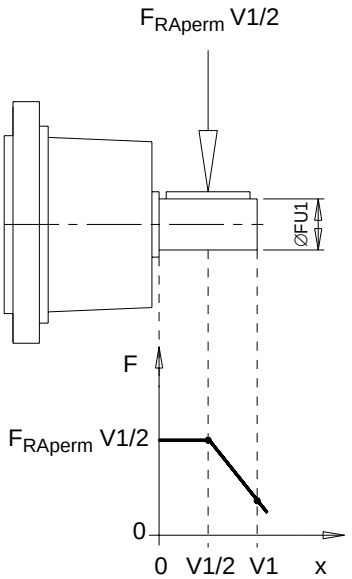
Frame-size		 NEMA-K5TC	IEC-K4 on request	 NEMA-KTC	IEC-K2 on request	 NEMA-A5	IEC-A on request	 NEMA-P5	IEC-P on request	 Motor
	63		•							•
56C	**71**	•	•	•		•	•	•		•
	80		•		•	•	•	•	•	•
140TC	**90**	•	•	•	•	•	•	•	•	•
180TC	**100**	•	•	•	•	•	•	•	•	•
	112		•		•	•	•	•	•	•
210TC	**132**	•	•	•	•	•	•	•	•	•
250TC	**160**	•	•	•	•	•	•	•	•	•
	180		•		•				•	•
280TC	**200**	•	•	•	•	•	•	•	•	•
320TC	**225**	•	•	•	•	•	•	•	•	•
360TC	**250**	•	•	•	•	•	•	•	•	•
	280		•				•		•	•
	315				•					

allowable combinations of input unit K., A., P. see chapter 7

Permissible overhung loads and torque

for type of input unit A., P.

Frame-size		T_1 1)		FU1		V1		F_{RAperm} V1/2	
		[lb in]	[Nm]	[in]	[*mm*]	[in]	[*mm*]	[lbf]	[N]
56C	**71**	26.5	3	5/8	*16*	1.575	*40*	54	240
	80	44.2	5	3/4	*19*	1.575	*40*	54	240
140TC	**90**	88.5	10	7/8	*24*	1.968	*50*	139	620
180TC	**100**	177	20	1 1/8	*28*	2.362	*60*	189	840
	112	230	26	1 1/4	*28*	2.362	*60*	225	1000
210TC	**132**	540	61	1 3/8	*38*	3.150	*80*	382	1700
250TC	**160**	867	98	1 5/8	*42*	4.331	*110*	405	1800
	180	1752	198	-	-	-	-	-	-
280TC	**200**	1752	198	2 1/8	*55*	4.331	*110*	674	3000
320TC	**225**	2575	291	2 1/8	*60*	5.512	*140*	776	3450
360TC	**250**	3150	356	2 3/8	*65*	5.512	*140*	877	3900
	280	5132	580	-	*70*	-	*140*	1158	5150
	315	11414	1290	-	-		-	-	-



1)permissible short time value is 2,5 times (for e.g. starting torque of motor)

Torque tables

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
					Size						
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132
E.38	**9.33** ★	188	283	32	•	•					
726 lb in	**8.30**	211	283	32	•	•	•				
	7.20 ★	243	336	38	•	•	•	•			
	6.73	260	425	48	•	•	•	•			
	5.92 ★	296	469	53	•	•	•	•			
	5.18	338	619	70	•	•	•	•	•		
	4.58 ★	382	690	78	•	•	•	•	•	•	
	4.15	422	549	62	•	•	•	•	•	•	
	3.67 ★	477	619	70	•	•	•	•	•	•	
	3.31	529	575	65	•	•	•	•	•	•	
	3.00 ★	583	708	80	•	•	•	•	•	•	
	2.73	641	708	80	•	•	•	•	•	•	
	2.50 ★	700	646	73	•	•	•	•	•	•	
	2.24	781	637	72	•	•	•	•	•	•	
	2.05 ★	854	708	80	•	•	•	•	•	•	
	1.85	946	726	82	•	•	•	•	•	•	
	1.59 ★	1101	637	72	•	•	•	•	•	•	
E.48	**11.30**	155	487	55	•	•	•				
1504 lb in	**10.00** ★	175	708	80	•	•	•	•			
	9.09	193	566	64	•	•	•	•			
	8.17 ★	214	752	85	•	•	•	•			
	7.00	250	858	97	•	•	•	•	•		
	6.33 ★	276	1017	115	•	•	•	•	•	•	
	5.85	299	1062	120	•	•	•	•	•	•	
	5.08 ★	344	1062	120	•	•	•	•	•	•	•
	4.62	379	1150	130	•	•	•	•	•	•	•
	4.21 ★	416	1327	150	•	•	•	•	•	•	•
	3.87	452	1416	160	•	•	•	•	•	•	•
	3.56 ★	492	1239	140	•	•	•	•	•	•	•
	3.24	540	1327	150	•	•	•	•	•	•	•
	2.95 ★	593	1504	170	•	•	•	•	•	•	•
	2.70	648	1416	160	•	•	•	•	•	•	•
	2.41 ★	726	1327	150	•	•	•	•	•	•	•
	2.15	814	1194	135			•	•	•	•	•
	1.83	956	1017	115			•	•	•	•	•
	1.52 ★	1151	885	100			•	•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]								
					3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752
					Size								
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160	180
	[-]	[rpm]	[lb in]	[Nm]									
E.68	**12.40** ★	141	717	81	•	•	•	•					
2212 lb in	**11.18**	157	814	92	•	•	•	•					
	10.08 ★	174	841	95	•	•	•	•					
	8.82	198	1327	150	•	•	•	•	•				
	7.92 ★	221	1504	170	•	•	•	•	•	•			
	7.23	242	1327	150	•	•	•	•	•	•			
	6.42 ★	273	1504	170	•	•	•	•	•	•	•		
	5.92	296	1681	190	•	•	•	•	•	•	•		
	5.36 ★	326	1946	220	•	•	•	•	•	•	•		
	4.93	355	1991	225	•	•	•	•	•	•	•		
	4.56 ★	384	1946	220	•	•	•	•	•	•	•	•	
	4.24	413	2035	230	•	•	•	•	•	•	•	•	
	3.74 ★	468	2035	230	•	•	•	•	•	•	•	•	
	3.45	507	2123	240	•	•	•	•	•	•	•	•	
	3.09 ★	566	2212	250	•	•	•	•	•	•	•	•	
	2.85	614	2212	250			•	•	•	•	•	•	
	2.39	732	2035	230			•	•	•	•	•	•	
	2.04 ★	858	1858	210			•	•	•	•	•	•	
	1.70	1029	1548	175					•	•	•	•	
	1.41 ★	1241	1327	150					•	•	•	•	
E.88	**10.33** ★	169	2035	230				•	•	•			
3981 lb in	**9.46**	185	1858	210				•	•	•			
	8.42 ★	208	2168	245				•	•	•	•		
	7.69	228	2168	245				•	•	•	•		
	7.07 ★	248	2566	290				•	•	•	•		
	6.53	268	2654	300				•	•	•	•		
	6.06 ★	289	2477	280				•	•	•	•	•	
	5.65	310	2831	320				•	•	•	•	•	
	5.11 ★	342	3274	370				•	•	•	•	•	•
	4.70	372	3406	385				•	•	•	•	•	•
	4.23 ★	414	3539	400				•	•	•	•	•	•
	3.90	449	3406	385				•	•	•	•	•	•
	3.30	530	3981	450				•	•	•	•	•	•
	2.88 ★	608	3849	435				•	•	•	•	•	•
	2.45	714	3716	420					•	•	•	•	•
	2.09 ★	837	3716	420					•	•	•	•	•
	1.71 ★	1023	3141	355					•	•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11

Input Units see chapter 7

					T_1 [1] [Nm / lb in]									
					10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752	291 / 2575	356 / 3150	580 / 5132
	Ratio	n_2 (60 Hz)	T_2	T_2	Size									
Gear Type		(4 pol.)	(SF=1)	(SF=1)	140TC	180TC		210TC	250TC		280TC	320TC	360TC	
	[-]	[rpm]	[lb in]	[Nm]	90	100	112	132	160	180	200	225	250	280
E.108	**5.46** ★	321	5839	660	•	•	•	•	•	•	•	•		
	5.00	350	6016	680	•	•	•	•	•	•	•	•		
6592 lb in	**4.26**	411	6370	720	•	•	•	•	•	•	•	•		
	3.76 ★	465	5309	600	•	•	•	•	•	•	•	•		
	3.20	547	6592	745		•	•	•	•	•	•	•		
	2.77 ★	632	5928	670		•	•	•	•	•	•	•		
	2.33 ★	751	6016	680		•	•	•	•	•	•	•		
	2.11	829	5486	620				•	•	•	•	•		
	1.81 ★	967	4866	550				•	•	•	•	•		
E.128	**10.14** ★	173	4813	544		•	•	•						
	9.40	186	5167	584		•	•	•						
8848 lb in	**8.94** ★	196	5663	640		•	•	•	•					
	8.35	210	6300	712		•	•	•	•					
	7.37 ★	237	7220	816		•	•	•	•	•	•			
	6.95	252	7786	880		•	•	•	•	•	•			
	6.23 ★	281	8211	928		•	•	•	•	•	•	•		
	5.75	304	8494	960		•	•	•	•	•	•	•		
	4.91	356	8494	960		•	•	•	•	•	•	•		
	4.44 ★	394	8848	1000		•	•	•	•	•	•	•		
	4.28	409	8848	1000			•	•	•	•	•	•	•	
	3.70	473	8848	1000		•	•	•	•	•	•	•	•	
	3.23 ★	542	8848	1000		•	•	•	•	•	•	•	•	
	2.76 ★	634	8848	1000		•	•	•	•	•	•	•	•	
	2.47	709	8405	950				•	•	•	•	•	•	
	2.10 ★	833	7609	860				•	•	•	•	•	•	
	1.81	967	7078	800					•	•	•	•	•	
	1.36 ★	1287	6016	680					•	•	•	•	•	
E.148	**13.67** ★	128	5309	600				•						
	12.54	140	5309	600				•						
13714 lb in	**11.57** ★	151	6016	680				•						
	10.73	163	6724	760				•						
	10.13 ★	173	7078	800				•	•					
	9.47	185	8140	920				•	•					
	8.42 ★	208	8848	1000				•	•	•	•			
	7.95	220	9379	1060				•	•	•	•			
	7.14 ★	245	9909	1120				•	•	•	•	•		
	6.55	267	10175	1150				•	•	•	•	•		
	5.65	310	12033	1360				•	•	•	•	•	•	
	4.94	354	12387	1400				•	•	•	•	•	•	
	4.30	407	11767	1330				•	•	•	•	•	•	•
	3.77 ★	464	11944	1350				•	•	•	•	•	•	•
	3.19 ★	549	13714	1550				•	•	•	•	•	•	•
	2.90	603	12387	1400				•	•	•	•	•	•	•
	2.52 ★	694	10794	1220				•	•	•	•	•	•	•
	2.14	818	10617	1200					•	•	•	•	•	•
	1.64 ★	1067	8494	960					•	•	•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	Size of motor						
						56C		140TC	180TC		210TC
	[-]	[rpm]	[lb in]	[Nm]	63	71	80	90	100	112	132
D.18	**200.36**	8.7	796	90		•					
796 lb in	**172.85** ★	10.1	796	90		•					
	148.50	11.8	796	90		•					
	136.71 ★	12.8	796	90		•					
	124.29	14.1	796	90		•					
	110.01 ★	15.9	796	90		•					
	92.14	19	796	90		•					
	78.56 ★	22.3	796	90		•					
	66.78 ★	26	796	90		•					
	58.03	30	796	90		•					
	50.51 ★	35	796	90		•					
	45.56	38	796	90		•					
	40.21	44	796	90		•					
	32.26 ★	54	796	90		•					
Z.18	**43.15**	41	796	90		•					
796 lb in	**37.23** ★	47	796	90		•					
	31.98	55	796	90		•					
	29.45 ★	59	796	90		•					
	26.77	65	796	90		•					
	23.69 ★	74	796	90		•					
	19.85	88	796	90		•					
	16.92 ★	103	796	90		•					
	14.38 ★	122	796	90		•					
	12.50	140	796	90		•					
	10.88 ★	161	770	87		•					
	9.81	178	734	83		•					
	8.66	202	708	80		•					
	7.42 ★	236	487	55		•					
	6.45	271	469	53		•					
	5.61 ★	312	451	51		•					
	5.06	346	434	49		•					
	4.47	392	434	49		•					
	3.58 ★	488	407	46		•					

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]								
					3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752
					Size								
						56C		140TC	180TC		210TC	250TC	
	[-]	[rpm]	[lb in]	[Nm]	63	71	80	90	100	112	132	160	180
D.28	**241.05**	7.3	1239	140		•							
1239 lb in	**207.96** ★	8.4	1239	140		•	•						
	178.66	9.8	1239	140		•	•						
	164.48 ★	10.6	1239	140		•	•	•					
	149.53	11.7	1239	140		•	•	•					
	132.35 ★	13.2	1239	140		•	•	•					
	110.86	15.8	1239	140		•	•	•					
	94.52 ★	18.5	1239	140		•	•	•					
	80.34 ★	22	1239	140		•	•	•					
	69.82	25	1239	140		•	•	•					
	60.77 ★	29	1239	140		•	•	•					
	54.82	32	1239	140		•	•	•					
	48.38	36	1239	140		•	•	•					
Z.28	**51.35**	34	1239	140		•							
1239 lb in	**43.30** ★	40	1239	140		•	•						
	38.45	46	1239	140		•	•						
	33.71 ★	52	1239	140		•	•	•					
	30.16	58	1239	140		•	•	•					
	26.77 ★	65	1239	140		•	•	•					
	23.46	75	1239	140		•	•	•					
	20.63 ★	85	1239	140		•	•	•					
	18.63	94	1239	140		•	•	•	•				
	16.24 ★	108	1239	140		•	•	•					
	14.58	120	1239	140		•	•	•					
	13.17 ★	133	1239	140		•	•	•	•				
	11.94	147	1239	140		•	•	•	•				
	10.87 ★	161	1239	140		•	•	•	•				
	9.61	182	1239	140		•	•	•	•				
	8.87 ★	197	1239	140		•	•	•	•				
	7.64	229	1203	136		•	•	•	•				
	6.94 ★	252	1168	132		•	•	•	•				
	6.31 ★	277	841	95		•	•	•	•				
	5.72	306	823	93		•	•	•	•				
	5.21 ★	336	814	92		•	•	•	•				
	4.60	380	779	88		•	•	•	•				
	4.25 ★	412	796	90		•	•	•	•				
	3.66	478	708	80		•	•	•	•				
	3.33 ★	526	681	77		•	•	•	•				

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]		n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
						Size						
						63	56C 71	80	140TC 90	180TC 100	112	210TC 132
Z.38-D.28	**5905**		0.29	1946	**220**		•					
1946 lb in	**5094**	★	0.33	1946	**220**		•	•				
	4376		0.39	1946	**220**		•	•				
	4029	★	0.42	1946	**220**		•	•	•			
	3663		0.46	1946	**220**		•	•	•			
	3242	★	0.52	1946	**220**		•	•	•			
	2715		0.62	1946	**220**		•	•	•			
	2315	★	0.73	1946	**220**		•	•	•			
	1968	★	0.85	1946	**220**		•	•	•			
	1710		0.98	1946	**220**		•	•	•			
	1489	★	1.13	1946	**220**		•	•	•			
	1343		1.2	1946	**220**		•	•	•			
Z.38-Z.28	**1258**		1.3	1946	**220**		•					
1946 lb in	**1061**	★	1.6	1946	**220**		•	•				
	942		1.8	1946	**220**		•	•				
	890		1.9	1946	**220**		•					
	751	★	2.2	1946	**220**		•	•				
	666		2.5	1946	**220**		•	•				
	584	★	2.9	1946	**220**		•	•	•			
	523		3.2	1946	**220**		•	•	•			
	464	★	3.6	1946	**220**		•	•	•			
	407		4.1	1946	**220**		•	•	•			
	358	★	4.7	1946	**220**		•	•	•			
	323		5.2	1946	**220**		•	•	•	•		
	281	★	6	1946	**220**		•	•	•			
	253		6.6	1946	**220**		•	•	•			
	228	★	7.3	1946	**220**		•	•	•	•		
	207		8.1	1946	**220**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11

Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
					Size						
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132
D.38	**191.75** ★	9.1	1946	**220**	•	•	•				
1946 lb in	**170.24**	10.3	1946	**220**	•	•	•				
	149.26 ★	11.7	1946	**220**	•	•	•	•			
	133.57	13.1	1946	**220**	•	•	•	•			
	118.55 ★	14.8	1946	**220**	•	•	•	•			
	103.89	16.8	1946	**220**	•	•	•	•			
	91.34 ★	19.2	1946	**220**	•	•	•	•			
	82.52	21	1946	**220**	•	•	•	•			
	71.91 ★	24	1946	**220**	•	•	•	•			
	64.58	27	1946	**220**	•	•	•	•			
	58.30 ★	30	1946	**220**	•	•	•	•			
	52.86	33	1946	**220**	•	•	•	•			
	48.10 ★	36	1946	**220**	•	•	•	•			
	42.53	41	1946	**220**	•	•	•	•			
	39.28 ★	45	1946	**220**	•	•	•	•			
	33.82	52	1946	**220**	•	•	•	•			
	30.74 ★	57	1946	**220**	•	•	•	•			
Z.38	**44.12** ★	40	1946	**220**	•	•	•				
1946 lb in	**39.24**	45	1840	**208**	•	•	•				
	34.04 ★	51	1946	**220**	•	•	•	•			
	31.80	55	1946	**220**	•	•	•	•			
	27.97 ★	63	1946	**220**	•	•	•	•			
	24.50	71	1946	**220**	•	•	•	•	•		
	21.67 ★	81	1946	**220**	•	•	•	•	•	•	
	19.64	89	1946	**220**	•	•	•	•	•	•	
	17.33 ★	101	1946	**220**	•	•	•	•	•	•	
	15.64	112	1946	**220**	•	•	•	•	•	•	
	14.18 ★	123	1946	**220**	•	•	•	•	•	•	
	12.92	135	1946	**220**	•	•	•	•	•	•	
	11.82 ★	148	1946	**220**	•	•	•	•	•	•	
	10.57	166	1858	**210**	•	•	•	•	•	•	
	9.70 ★	180	1770	**200**	•	•	•	•	•	•	
	8.75	200	1725	**195**	•	•	•	•	•	•	
	7.52 ★	233	1681	**190**	•	•	•	•	•	•	
	7.50 ★	233	1637	**185**	•	•	•	•	•	•	
	6.71	261	1593	**180**	•	•	•	•	•	•	
	6.16 ★	284	1504	**170**	•	•	•	•	•	•	
	5.55	315	1460	**165**	•	•	•	•	•	•	
	4.77 ★	367	1416	**160**	•	•	•	•	•	•	

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
					Size						
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132
D.48-D.28	**27940**	0.06	3981	**450**		•					
	24104 ★	0.07	3981	**450**		•	•				
3981 lb in	**20708**	0.08	3981	**450**		•	•				
	19065 ★	0.08	3981	**450**		•	•	•			
	17332	0.1	3981	**450**		•	•	•			
	15341 ★	0.11	3981	**450**		•	•	•			
	12849	0.13	3981	**450**		•	•	•			
	10956 ★	0.15	3981	**450**		•	•	•			
	9312 ★	0.18	3981	**450**		•	•	•			
	8093	0.21	3981	**450**		•	•	•			
	7044 ★	0.24	3981	**450**		•	•	•			
	6354	0.26	3981	**450**		•	•	•			
	5608	0.3	3981	**450**		•	•	•			
D.48-Z.28	**5019** ★	0.34	3981	**450**		•	•				
	4456	0.38	3981	**450**		•	•				
3981 lb in	**3907** ★	0.43	3981	**450**		•	•	•			
	3496	0.48	3981	**450**		•	•	•			
	3103 ★	0.54	3981	**450**		•	•	•			
	2720	0.62	3981	**450**		•	•	•			
	2391 ★	0.7	3981	**450**		•	•	•			
	2160	0.78	3981	**450**		•	•	•	•		
	1882 ★	0.89	3981	**450**		•	•	•			
	1690	0.99	3981	**450**		•	•	•			
	1526 ★	1.1	3981	**450**		•	•	•	•		
	1384	1.2	3981	**450**		•	•	•	•		
	1259 ★	1.3	3981	**450**		•	•	•	•		
	1113	1.5	3981	**450**		•	•	•	•		
	1028 ★	1.6	3981	**450**		•	•	•	•		
	885	1.9	3981	**450**		•	•	•	•		
	805 ★	2.1	3981	**450**		•	•	•	•		
	731 ★	2.3	3981	**450**		•	•	•	•		
	663	2.5	3981	**450**		•	•	•	•		
	603 ★	2.8	3981	**450**		•	•	•	•		
	534	3.1	3981	**450**		•	•	•	•		
	493 ★	3.4	3981	**450**		•	•	•	•		
	424	3.9	3981	**450**		•	•	•	•		
	423 ★	4	3981	**450**		•	•	•	•		
	384	4.4	3981	**450**		•	•	•	•		
	349 ★	4.8	3981	**450**		•	•	•	•		
	309	5.4	3981	**450**		•	•	•	•		
	285 ★	5.9	3981	**450**		•	•	•	•		
	246	6.8	3981	**450**		•	•	•	•		
	223 ★	7.5	3981	**450**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
					Size						
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132
D.48	**208.77** ★	8.4	3981	**450**	•	•	•				
3981 lb in	**185.66**	9.4	3981	**450**	•	•	•				
	161.05 ★	10.9	3981	**450**	•	•	•	•			
	150.48	11.6	3981	**450**	•	•	•	•			
	132.34 ★	13.2	3981	**450**	•	•	•	•			
	115.91	15.1	3981	**450**	•	•	•	•	•		
	102.52 ★	17.1	3981	**450**	•	•	•	•	•		
	92.91	18.8	3981	**450**	•	•	•	•	•		
	82.02 ★	21	3981	**450**	•	•	•	•	•		
	73.99	24	3981	**450**	•	•	•	•	•		
	67.10 ★	26	3981	**450**	•	•	•	•	•		
	61.14	29	3981	**450**	•	•	•	•	•		
	55.92 ★	31	3981	**450**	•	•	•	•	•		
	50.00	35	3981	**450**	•	•	•	•	•		
	45.91 ★	38	3981	**450**	•	•	•	•	•		
	41.38	42	3981	**450**	•	•	•	•	•		
	35.59	49	3981	**450**	•	•	•	•	•		
Z.48	**51.28**	34	2584	**292**	•	•	•				
3981 lb in	**45.38** ★	39	3981	**450**	•	•	•	•			
	41.26	42	3981	**450**	•	•	•	•			
	37.06 ★	47	3981	**450**	•	•	•	•			
	31.77	55	3981	**450**	•	•	•	•	•		
	28.74 ★	61	3981	**450**	•	•	•	•	•	•	
	26.53	66	3981	**450**	•	•	•	•	•	•	
	23.07 ★	76	3981	**450**	•	•	•	•	•	•	•
	20.95	84	3981	**450**	•	•	•	•	•	•	•
	19.13 ★	91	3981	**450**	•	•	•	•	•	•	•
	17.55	100	3981	**450**	•	•	•	•	•	•	•
	16.17 ★	108	3805	**430**	•	•	•	•	•	•	•
	14.68	119	3716	**420**	•	•	•	•	•	•	•
	13.38 ★	131	3628	**410**	•	•	•	•	•	•	•
	12.25	143	3539	**400**	•	•	•	•	•	•	•
	10.93 ★	160	3451	**390**	•	•	•	•	•	•	•
	9.76	179	3362	**380**			•	•	•	•	•
	8.29	211	3185	**360**			•	•	•	•	•
	6.90 ★	254	3008	**340**			•	•	•	•	•
	6.79 ★	258	2389	**270**	•	•	•	•	•	•	•
	6.06	289	2389	**270**			•	•	•	•	•
	5.15	340	2389	**270**			•	•	•	•	•
	4.28 ★	409	2300	**260**			•	•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
					Size						
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132
D.68-D.28	**41961**	0.04	7078	**800**		•					
7078 lb in	**36200** ★	0.05	7078	**800**		•	•				
	31101	0.05	7078	**800**		•	•				
	28633 ★	0.06	7078	**800**		•	•	•			
	26030	0.07	7078	**800**		•	•	•			
	23039 ★	0.07	7078	**800**		•	•	•			
	19297	0.09	7078	**800**		•	•	•			
	16454 ★	0.1	7078	**800**		•	•	•			
	13986 ★	0.12	7078	**800**		•	•	•			
	12154	0.14	7078	**800**		•	•	•			
	10579 ★	0.16	7078	**800**		•	•	•			
	9543	0.18	7078	**800**		•	•	•			
	8422	0.2	7078	**800**		•	•	•			
D.68-Z.28	**7538** ★	0.22	7078	**800**		•	•				
7078 lb in	**6693**	0.25	7078	**800**		•	•				
	5868 ★	0.29	7078	**800**		•	•	•			
	5251	0.32	7078	**800**		•	•	•			
	4660 ★	0.36	7078	**800**		•	•	•			
	4084	0.41	7078	**800**		•	•	•			
	3591 ★	0.47	7078	**800**		•	•	•			
	3244	0.52	7078	**800**		•	•	•	•		
	2827 ★	0.59	7078	**800**		•	•	•			
	2539	0.66	7078	**800**		•	•	•			
	2292 ★	0.73	7078	**800**		•	•	•	•		
	2078	0.81	7078	**800**		•	•	•	•		
	1891 ★	0.89	7078	**800**		•	•	•	•		
	1672	1	7078	**800**		•	•	•	•		
	1544 ★	1.1	7078	**800**		•	•	•	•		
	1329	1.3	7078	**800**		•	•	•	•		
	1208 ★	1.4	7078	**800**		•	•	•	•		
	1098 ★	1.5	7078	**800**		•	•	•	•		
	996	1.7	7078	**800**		•	•	•	•		
	906 ★	1.9	7078	**800**		•	•	•	•		
	801	2.1	7078	**800**		•	•	•	•		
	740 ★	2.3	7078	**800**		•	•	•	•		
	637	2.6	7078	**800**		•	•	•	•		
	607 ★	2.8	7078	**800**		•	•	•	•		
	550	3.1	7078	**800**		•	•	•	•		
	501 ★	3.4	7078	**800**		•	•	•	•		
	443	3.8	7078	**800**		•	•	•	•		
	409 ★	4.1	7078	**800**		•	•	•	•		
	352	4.8	7078	**800**		•	•	•	•		
	320 ★	5.3	7078	**800**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] Size 63	3 / 27 56C 71	3 / 27 80	5 / 44 140TC 90	10 / 88 180TC 100	20 / 177 112	26 / 230 210TC 132	61 / 540 250TC 160	98 / 867 180	198 / 1752 280TV 200	198 / 1752
D.68	**281.01**	6.2	7078	**800**	•	•	•								
7078 lb in	**248.68** ★	7	7078	**800**	•	•	•	•							
	226.07	7.7	7078	**800**	•	•	•	•							
	203.09 ★	8.6	7078	**800**	•	•	•	•							
	174.08	10.1	7078	**800**	•	•	•	•	•						
	157.50 ★	11.1	7078	**800**	•	•	•	•	•						
	145.38	12	7078	**800**	•	•	•	•	•						
	126.41 ★	13.8	7078	**800**	•	•	•	•	•						
	114.78	15.2	7078	**800**	•	•	•	•	•						
	104.80 ★	16.7	7078	**800**	•	•	•	•	•						
	96.16	18.2	7078	**800**	•	•	•	•	•						
	88.59 ★	19.8	7078	**800**	•	•	•	•	•						
	80.46	22	7078	**800**	•	•	•	•	•						
	73.30 ★	24	7078	**800**	•	•	•	•	•						
	67.14	26	7078	**800**	•	•	•	•	•						
	59.91 ★	29	7078	**800**	•	•	•	•	•						
	53.47	33	7078	**800**			•	•	•						
	45.41	39	7078	**800**			•	•	•						
	37.80	46	7078	**800**			•	•	•						
Z.68	**48.09** ★	36	4734	**535**	•	•	•	•							
7078 lb in	**42.06**	42	7078	**800**	•	•	•	•	•						
	37.76 ★	46	7078	**800**	•	•	•	•	•	•					
	34.49	51	7078	**800**	•	•	•	•	•	•					
	30.60 ★	57	7078	**800**	•	•	•	•	•	•	•				
	28.25	62	7078	**800**	•	•	•	•	•	•	•				
	25.55 ★	68	7078	**800**	•	•	•	•	•	•	•				
	23.53	74	7078	**800**	•	•	•	•	•	•	•				
	21.76 ★	80	7078	**800**	•	•	•	•	•	•	•	•			
	20.20	87	7078	**800**	•	•	•	•	•	•	•	•			
	17.82 ★	98	7078	**800**	•	•	•	•	•	•	•	•			
	16.45	106	7078	**800**	•	•	•	•	•	•	•	•			
	14.74 ★	119	7078	**800**	•	•	•	•	•	•	•	•			
	13.59	129	7078	**800**			•	•	•	•	•	•			
	11.40	154	6945	**785**			•	•	•	•	•	•			
	9.73 ★	180	6592	**745**			•	•	•	•	•	•			
	8.11	216	6193	**700**					•	•	•	•			
	6.72 ★	260	5751	**650**					•	•	•	•			
	5.93	295	4335	**490**			•	•	•	•	•	•			
	5.06 ★	346	4247	**480**			•	•	•	•	•	•			
	4.22	415	4158	**470**					•	•	•	•			
	3.49 ★	501	3716	**420**					•	•	•	•			

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]		n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 1)1) [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
						Size						
						63	56C 71	80	140TC 90	180TC 100	112	210TC 132
D.88-D.28	**46233**		0.04	14864	**1680**		•					
14864 lb in	**39885**	★	0.04	14864	**1680**		•	•				
	34267		0.05	14864	**1680**		•	•				
	31547	★	0.05	14864	**1680**		•	•	•			
	28679		0.06	14864	**1680**		•	•	•			
	25384	★	0.07	14864	**1680**		•	•	•			
	21262		0.08	14864	**1680**		•	•	•			
	18129	★	0.09	14864	**1680**		•	•	•			
	15409	★	0.11	14864	**1680**		•	•	•			
	13391		0.13	14864	**1680**		•	•	•			
	11656	★	0.14	14864	**1680**		•	•	•			
	10514		0.16	14864	**1680**		•	•	•			
	9279		0.18	14864	**1680**		•	•	•			
D.88-Z.28	**8305**	★	0.2	14864	**1680**		•	•				
14864 lb in	**7374**		0.23	14864	**1680**		•	•				
	6465	★	0.26	14864	**1680**		•	•	•			
	5785		0.29	14864	**1680**		•	•	•			
	5134	★	0.33	14864	**1680**		•	•	•			
	4500		0.37	14864	**1680**		•	•	•			
	3957	★	0.43	14864	**1680**		•	•	•			
	3574		0.47	14864	**1680**		•	•	•	•		
	3114	★	0.54	14864	**1680**		•	•	•			
	2797		0.6	14864	**1680**		•	•	•			
	2525	★	0.67	14864	**1680**		•	•	•	•		
	2290		0.73	14864	**1680**		•	•	•	•		
	2084	★	0.81	14864	**1680**		•	•	•	•		
	1842		0.91	14864	**1680**		•	•	•	•		
	1701	★	0.99	14864	**1680**		•	•	•	•		
	1465		1.1	14864	**1680**		•	•	•	•		
	1331	★	1.3	14864	**1680**		•	•	•	•		
	1210	★	1.4	14864	**1680**		•	•	•	•		
	1097		1.5	14864	**1680**		•	•	•	•		
	999	★	1.7	14864	**1680**		•	•	•	•		
	883		1.9	14864	**1680**		•	•	•	•		
	815	★	2.1	14864	**1680**		•	•	•	•		
	702		2.4	14864	**1680**		•	•	•	•		
	647	★	2.6	14864	**1680**		•	•	•	•		
	587		2.9	14864	**1680**		•	•	•	•		
	534	★	3.1	14864	**1680**		•	•	•	•		
	472		3.6	14864	**1680**		•	•	•	•		
	436	★	3.9	14864	**1680**		•	•	•	•		
	375		4.5	14864	**1680**		•	•	•	•		
	341	★	4.9	14864	**1680**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11

Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160	180	280TC 200
D.88	**300.41** ★	5.8	14864	**1680**	•	•	•	•						
14864 lb in	**270.90**	6.5	14864	**1680**	•	•	•	•						
	244.29 ★	7.2	14864	**1680**	•	•	•	•						
	213.64	8.2	14864	**1680**	•	•	•	•	•					
	191.80 ★	9.1	14864	**1680**	•	•	•	•	•	•				
	175.18	10	14864	**1680**	•	•	•	•	•	•				
	155.46 ★	11.3	14864	**1680**	•	•	•	•	•	•	•			
	143.50	12.2	14864	**1680**	•	•	•	•	•	•	•			
	129.79 ★	13.5	14864	**1680**	•	•	•	•	•	•	•			
	119.52	14.6	14864	**1680**	•	•	•	•	•	•	•			
	110.54 ★	15.8	14864	**1680**	•	•	•	•	•	•	•			
	102.61	17.1	14864	**1680**	•	•	•	•	•	•	•			
	90.53 ★	19.3	14864	**1680**	•	•	•	•	•	•	•			
	83.58	21	14864	**1680**	•	•	•	•	•	•	•			
	74.88 ★	23	14864	**1680**	•	•	•	•	•	•	•			
	69.05	25	14864	**1680**			•	•	•	•	•			
	57.93	30	14864	**1680**			•	•	•	•	•			
	49.42 ★	35	14864	**1680**			•	•	•	•	•			
	41.19	42	14864	**1680**					•	•	•			
	34.14 ★	51	14864	**1680**					•	•	•			
Z.88	**50.73**	34	12988	**1468**				•	•					
14864 lb in	**45.76** ★	38	14864	**1680**				•	•	•				
	41.90	42	14864	**1680**				•	•	•				
	37.27 ★	47	14864	**1680**				•	•	•	•			
	34.07	51	14864	**1680**				•	•	•	•			
	31.32 ★	56	14864	**1680**				•	•	•	•			
	28.93	60	14864	**1680**				•	•	•	•			
	26.85 ★	65	14864	**1680**				•	•	•	•	•		
	25.01	70	14864	**1680**				•	•	•	•	•		
	22.61 ★	77	14864	**1680**				•	•	•	•	•	•	
	20.81	84	14864	**1680**				•	•	•	•	•	•	
	18.72 ★	93	14864	**1680**				•	•	•	•	•	•	
	17.27	101	14864	**1680**				•	•	•	•	•	•	
	14.63	120	14333	**1620**				•	•	•	•	•	•	
	12.75 ★	137	13714	**1550**				•	•	•	•	•	•	
	10.85	161	13006	**1470**					•	•	•	•	•	
	9.26 ★	189	12298	**1390**					•	•	•	•	•	
	7.59 ★	231	11502	**1300**					•	•	•	•	•	
	6.96	251	11148	**1260**					•	•	•	•	•	
	5.94 ★	295	10529	**1190**					•	•	•	•	•	
	4.87 ★	359	9821	**1110**					•	•	•	•	•	
	4.45 ★	393	7078	**800**					•	•	•	•	•	
	3.79 ★	462	6547	**740**					•	•	•	•	•	
	3.11 ★	563	5839	**660**					•	•	•	•	•	

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11

Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]									
					3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
	[-]	[rpm]	[lb in]	[Nm]	63	71	80	90	100	112	132	160	180	200
D.108-D38	**68896**	0.03	27428	**3100**	•	•	•							
	61169	0.03	27428	**3100**	•	•	•							
27428 lb in	**53627**	0.03	27428	**3100**	•	•	•	•						
	47990	0.04	27428	**3100**	•	•	•	•						
	42595	0.04	27428	**3100**	•	•	•	•						
	37326	0.05	27428	**3100**	•	•	•	•						
	32819	0.05	27428	**3100**	•	•	•	•						
	29650	0.06	27428	**3100**	•	•	•	•						
	25836	0.07	27428	**3100**	•	•	•	•						
	23204	0.08	27428	**3100**	•	•	•	•						
	20948	0.08	27428	**3100**	•	•	•	•						
	18993	0.09	27428	**3100**	•	•	•	•						
	17282	0.1	27428	**3100**	•	•	•	•						
	15280	0.11	27428	**3100**	•	•	•	•						
D.108-Z38	**15853**	0.11	27428	**3100**	•	•	•							
	14098	0.12	27428	**3100**	•	•	•							
27428 lb in	**12229**	0.14	27428	**3100**	•	•	•	•						
	11426	0.15	27428	**3100**	•	•	•	•						
	10049	0.17	27428	**3100**	•	•	•	•						
	8801	0.2	27428	**3100**	•	•	•	•	•					
	7785	0.22	27428	**3100**	•	•	•	•	•					
	7055	0.25	27428	**3100**	•	•	•	•	•					
	6228	0.28	27428	**3100**	•	•	•	•	•					
	5618	0.31	27428	**3100**	•	•	•	•	•					
	5096	0.34	27428	**3100**	•	•	•	•	•					
	4643	0.38	27428	**3100**	•	•	•	•	•					
	4246	0.41	27428	**3100**	•	•	•	•	•					
	3797	0.46	27428	**3100**	•	•	•	•	•					
	3624	0.48	27428	**3100**	•	•	•							
	3223	0.54	27428	**3100**	•	•	•							
	2796	0.63	27428	**3100**	•	•	•	•						
	2612	0.67	27428	**3100**	•	•	•	•						
	2297	0.76	27428	**3100**	•	•	•	•						
	2012	0.87	27428	**3100**	•	•	•	•	•					
	1780	0.98	27428	**3100**	•	•	•	•	•					
	1613	1.1	27428	**3100**	•	•	•	•	•					
	1424	1.2	27428	**3100**	•	•	•	•	•					
	1284	1.4	27428	**3100**	•	•	•	•	•					
	1165	1.5	27428	**3100**	•	•	•	•	•					
	1061	1.6	27428	**3100**	•	•	•	•	•					
	971	1.8	27428	**3100**	•	•	•	•	•					
	868	2	27428	**3100**	•	•	•	•	•					
	797	2.2	27428	**3100**	•	•	•	•	•					
	718	2.4	27428	**3100**	•	•	•	•	•					
	618	2.8	27428	**3100**	•	•	•	•	•					
	616	2.8	27428	**3100**	•	•	•	•	•					
	551	3.2	27428	**3100**	•	•	•	•	•					
	506	3.5	27428	**3100**	•	•	•	•	•					
	456	3.8	27428	**3100**	•	•	•	•	•					
	392	4.5	27428	**3100**	•	•	•	•	•					

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11

Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752	291 / 2575	356 / 3150
					Size									
					80	140TC 90	180TC 100	112	210TC 132	250TC 160	180	280TC 200	320TC 225	360TC 250
D.108	**359.30**	4.9	27428	**3100**	•	•								
	325.21 ★	5.4	27428	**3100**	•	•								
27428 lb in	**284.73**	6.1	27428	**3100**	•	•	•							
	256.86 ★	6.8	27428	**3100**	•	•	•	•						
	235.19	7.4	27428	**3100**	•	•	•	•						
	209.21 ★	8.4	27428	**3100**	•	•	•	•	•					
	191.21	9.2	27428	**3100**	•	•	•	•	•					
	175.78 ★	10	27428	**3100**	•	•	•	•	•					
	162.40	10.8	27428	**3100**	•	•	•	•	•					
	150.70 ★	11.6	27428	**3100**	•	•	•	•	•	•				
	140.37	12.5	27428	**3100**	•	•	•	•	•	•				
	126.90 ★	13.8	27428	**3100**	•	•	•	•	•	•				
	116.83	15	27428	**3100**	•	•	•	•	•	•				
	105.08 ★	16.7	27428	**3100**	•	•	•	•	•	•				
	96.94	18.1	27428	**3100**	•	•	•	•	•	•				
	82.14	21	27428	**3100**	•	•	•	•	•	•				
	71.59 ★	24	27428	**3100**	•	•	•	•	•	•				
	60.90	29	27428	**3100**			•	•	•	•				
	51.97 ★	34	27428	**3100**			•	•	•	•				
	42.61 ★	41	27428	**3100**			•	•	•	•				
Z.108	**59.05** ★	30	20951	**2368**		•	•	•						
	54.15	32	20403	**2306**		•	•	•						
27428 lb in	**48.38** ★	36	27428	**3100**		•	•	•	•					
	44.31	39	27428	**3100**		•	•	•	•					
	40.82 ★	43	27428	**3100**		•	•	•	•					
	37.79	46	27428	**3100**		•	•	•	•					
	35.14 ★	50	27428	**3100**		•	•	•	•	•				
	32.81	53	27428	**3100**		•	•	•	•	•				
	29.35 ★	60	27428	**3100**		•	•	•	•	•	•	•		
	27.20	64	27428	**3100**		•	•	•	•	•	•	•		
	24.94 ★	70	27428	**3100**		•	•	•	•	•	•	•	•	
	22.86	77	27428	**3100**		•	•	•	•	•	•	•	•	
	19.48	90	27428	**3100**		•	•	•	•	•	•	•	•	
	17.19 ★	102	27428	**3100**		•	•	•	•	•	•	•	•	
	14.63	120	27428	**3100**			•	•	•	•	•	•	•	
	12.68 ★	138	27428	**3100**			•	•	•	•	•	•	•	
	10.67 ★	164	27428	**3100**			•	•	•	•	•	•	•	
	9.62	182	27428	**3100**					•	•	•	•	•	
	8.27 ★	212	27428	**3100**					•	•	•	•	•	
	7.10 ★	246	15926	**1800**			•	•	•	•	•	•	•	
	6.41	273	15572	**1760**					•	•	•	•	•	
	5.51 ★	318	15041	**1700**					•	•	•	•	•	
	5.24 ★	334	10086	**1140**					•	•	•	•	•	
	4.41 ★	397	10086	**1140**					•	•	•	•	•	
	3.98	440	9909	**1120**					•	•	•	•	•	
	3.42 ★	512	9556	**1080**					•	•	•	•	•	

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

3

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
					63	71	80	90	100	112	132	160	180	200
D.128-D38	**51420** ★	0.03	45123	**5100**	•	•	•							
	45652	0.04	45123	**5100**	•	•	•							
45123 lb in	**40024** ★	0.04	45123	**5100**	•	•	•	•						
	35817	0.05	45123	**5100**	•	•	•	•						
	31790 ★	0.06	45123	**5100**	•	•	•	•						
	27858	0.06	45123	**5100**	•	•	•	•						
	24494 ★	0.07	45123	**5100**	•	•	•	•						
	22129	0.08	45123	**5100**	•	•	•	•						
	19282 ★	0.09	45123	**5100**	•	•	•	•						
	17318	0.1	45123	**5100**	•	•	•	•						
	15634 ★	0.11	45123	**5100**	•	•	•	•						
	14175	0.12	45123	**5100**	•	•	•	•						
	12898 ★	0.14	45123	**5100**	•	•	•	•						
	11404	0.15	45123	**5100**	•	•	•	•						
D.128-Z38	**11831** ★	0.15	45123	**5100**	•	•	•							
	10521	0.17	45123	**5100**	•	•	•							
45123 lb in	**9127** ★	0.19	45123	**5100**	•	•	•	•						
	8528	0.21	45123	**5100**	•	•	•	•						
	7500 ★	0.23	45123	**5100**	•	•	•	•						
	6569	0.27	45123	**5100**	•	•	•	•	•					
	5810 ★	0.3	45123	**5100**	•	•	•	•	•					
	5266	0.33	45123	**5100**	•	•	•	•	•					
	4648 ★	0.38	45123	**5100**	•	•	•	•	•					
	4193	0.42	45123	**5100**	•	•	•	•	•					
	3803 ★	0.46	45123	**5100**	•	•	•	•	•					
	3465	0.51	45123	**5100**	•	•	•	•	•					
	3169 ★	0.55	45123	**5100**	•	•	•	•	•					
	2834	0.62	45123	**5100**	•	•	•	•	•					
	2602 ★	0.67	45123	**5100**	•	•	•	•	•					
	2345	0.75	45123	**5100**	•	•	•	•	•					
	2017 ★	0.87	45123	**5100**	•	•	•	•	•					
	2011 ★	0.87	45123	**5100**	•	•	•	•	•					
	1798	0.97	45123	**5100**	•	•	•	•	•					
	1651 ★	1.1	45123	**5100**	•	•	•	•	•					
	1488	1.2	45123	**5100**	•	•	•	•	•					
	1280 ★	1.4	45123	**5100**	•	•	•	•	•					
D.128-Z48	**1271**	1.4	45123	**5100**	•	•	•	•	•	•				
	1166	1.5	45123	**5100**	•	•	•	•	•	•				
45123 lb in	**1074**	1.6	45123	**5100**	•	•	•	•	•	•				
	975	1.8	45123	**5100**	•	•	•	•	•	•				
	889	2	45123	**5100**	•	•	•	•	•	•				
	814	2.1	45123	**5100**	•	•	•	•	•	•				
	726	2.4	45123	**5100**	•	•	•	•	•	•				
	648	2.7	45123	**5100**			•	•	•	•				
	551	3.2	45123	**5100**			•	•	•	•				
	458	3.8	45123	**5100**			•	•	•	•				
	451	3.9	45123	**5100**	•	•	•	•	•	•				
	403	4.3	45123	**5100**			•	•	•	•				
	342	5.1	45123	**5100**			•	•	•	•				
	285	6.1	45123	**5100**			•	•	•	•				

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11

Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752	291 / 2575	356 / 3150
					Size									
					80	140TC 90	180TC 100	112	210TC 132	250TC 160	180	280TC 200	320TC 225	360TC 250
D.128	**268.16** ★	6.5	45123	**5100**		•	•	•						
	245.93	7.1	45123	**5100**		•	•	•						
45123 lb in	**219.72** ★	8	45123	**5100**		•	•	•	•					
	201.22	8.7	45123	**5100**		•	•	•	•					
	185.36 ★	9.4	45123	**5100**		•	•	•	•					
	171.62	10.2	45123	**5100**		•	•	•	•					
	159.60 ★	11	45123	**5100**		•	•	•	•	•				
	148.99	11.7	45123	**5100**		•	•	•	•	•				
	133.30 ★	13.1	45123	**5100**		•	•	•	•	•	•	•		
	123.53	14.2	45123	**5100**		•	•	•	•	•	•	•		
	113.24 ★	15.5	45123	**5100**		•	•	•	•	•	•	•		
	103.80	16.9	45123	**5100**		•	•	•	•	•	•	•		
	88.46	19.8	45123	**5100**		•	•	•	•	•	•	•		
	78.06 ★	22	45123	**5100**		•	•	•	•	•	•	•		
	66.43	26	45123	**5100**			•	•	•	•	•	•		
	57.56 ★	30	45123	**5100**			•	•	•	•	•	•		
	48.44 ★	36	45123	**5100**			•	•	•	•	•	•		
	43.71	40	45123	**5100**					•	•	•	•		
	37.57 ★	47	45123	**5100**					•	•	•	•		
Z.128	**44.19** ★	40	28976	**3275**			•	•	•					
	40.96	43	28277	**3196**			•	•	•					
45123 lb in	**38.94** ★	45	45123	**5100**			•	•	•	•				
	36.39	48	45123	**5100**			•	•	•	•				
	32.11 ★	55	45123	**5100**			•	•	•	•	•	•		
	30.28	58	45123	**5100**			•	•	•	•	•	•		
	27.13 ★	65	45123	**5100**			•	•	•	•	•	•	•	
	25.05	70	45123	**5100**			•	•	•	•	•	•	•	
	21.41	82	45123	**5100**			•	•	•	•	•	•	•	•
	19.35 ★	90	45123	**5100**			•	•	•	•	•	•	•	•
	18.64	94	45123	**5100**				•	•	•	•	•	•	•
	16.12	109	44177	**4993**			•	•	•	•	•	•	•	•
	14.06 ★	124	43071	**4868**			•	•	•	•	•	•	•	•
	12.03 ★	145	41726	**4716**			•	•	•	•	•	•	•	•
	10.78	162	40726	**4603**					•	•	•	•	•	•
	9.13 ★	192	39151	**4425**					•	•	•	•	•	•
	7.88	222	37674	**4258**						•	•	•	•	•
	7.29 ★	240	22473	**2540**						•	•	•	•	•
	6.24 ★	280	22385	**2530**						•	•	•	•	•
	5.93 ★	295	34577	**3908**						•	•	•	•	•
	5.59 ★	313	23066	**2607**						•	•	•	•	•
	4.83	362	22225	**2512**						•	•	•	•	•
	4.73 ★	370	21013	**2375**						•	•	•	•	•
	4.09 ★	428	20881	**2360**						•	•	•	•	•
	3.63 ★	482	20438	**2310**						•	•	•	•	•
	3.07 ★	570	19642	**2220**						•	•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11

Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in]									
					3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
					63	71	80	90	100	112	132	160	180	200
D.148-D38	**64450**	0.03	70782	**8000**	•	•	•							
	57221	0.03	70782	**8000**	•	•	•							
70782 lb in	**50166**	0.03	70782	**8000**	•	•	•	•						
	44893	0.04	70782	**8000**	•	•	•	•						
	39846	0.04	70782	**8000**	•	•	•	•						
	34917	0.05	70782	**8000**	•	•	•	•						
	30701	0.06	70782	**8000**	•	•	•	•						
	27736	0.06	70782	**8000**	•	•	•	•						
	24169	0.07	70782	**8000**	•	•	•	•						
	21707	0.08	70782	**8000**	•	•	•	•						
	19596	0.09	70782	**8000**	•	•	•	•						
	17767	0.1	70782	**8000**	•	•	•	•						
	16167	0.11	70782	**8000**	•	•	•	•						
	14294	0.12	70782	**8000**	•	•	•	•						
D.148-Z38	**14830**	0.12	70782	**8000**	•	•	•							
	13188	0.13	70782	**8000**	•	•	•							
70782 lb in	**11440**	0.15	70782	**8000**	•	•	•	•						
	10689	0.16	70782	**8000**	•	•	•	•						
	9401	0.19	70782	**8000**	•	•	•	•						
	8233	0.21	70782	**8000**	•	•	•	•	•					
	7282	0.24	70782	**8000**	•	•	•	•	•					
	6600	0.27	70782	**8000**	•	•	•	•	•					
	5826	0.3	70782	**8000**	•	•	•	•	•					
	5256	0.33	70782	**8000**	•	•	•	•	•					
	4767	0.37	70782	**8000**	•	•	•	•	•					
	4343	0.4	70782	**8000**	•	•	•	•	•					
	3972	0.44	70782	**8000**	•	•	•	•	•					
	3552	0.49	70782	**8000**	•	•	•	•	•					
	3261	0.54	70782	**8000**	•	•	•	•	•					
	2939	0.6	70782	**8000**	•	•	•	•	•					
	2528	0.69	70782	**8000**	•	•	•	•	•					
	2521	0.69	70782	**8000**	•	•	•	•	•					
	2254	0.78	70782	**8000**	•	•	•	•	•					
	2070	0.85	70782	**8000**	•	•	•	•	•					
	1865	0.94	70782	**8000**	•	•	•	•	•					
	1604	1.1	70782	**8000**	•	•	•	•	•					
D.148-Z48	**1631**	1.1	70782	**8000**	•	•	•	•	•	•				
	1502	1.2	70782	**8000**	•	•	•	•	•	•				
70782 lb in	**1364**	1.3	70782	**8000**	•	•	•	•	•	•				
	1243	1.4	70782	**8000**	•	•	•	•	•	•				
	1139	1.5	70782	**8000**	•	•	•	•	•	•				
	1016	1.7	70782	**8000**	•	•	•	•	•	•				
	907	1.9	70782	**8000**			•	•	•	•				
	770	2.3	70782	**8000**			•	•	•	•				
	641	2.7	70782	**8000**			•	•	•	•				
	631	2.8	70782	**8000**	•	•	•	•	•	•				
	563	3.1	70782	**8000**			•	•	•	•				
	478	3.7	70782	**8000**			•	•	•	•				
	398	4.4	70782	**8000**			•	•	•	•				

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11

Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752	291 / 2575	356 / 3150	580 / 5132
					Size 140TC 90	180TC 100	112	210TC 132	250TC 160	180	280TC 200	320TC 225	360TC 250	280
D.148	**336.11**	5.2	70782	**8000**		•	•							
	301.34 ★	5.8	70782	**8000**		•	•	•						
70782 lb in	**276.23**	6.3	70782	**8000**		•	•	•						
	254.70 ★	6.9	70782	**8000**		•	•	•						
	236.05	7.4	70782	**8000**		•	•	•						
	224.43 ★	7.8	70782	**8000**		•	•	•	•					
	209.76	8.3	70782	**8000**		•	•	•	•					
	185.03 ★	9.5	70782	**8000**		•	•	•	•	•	•			
	174.53	10	70782	**8000**		•	•	•	•	•	•			
	156.38 ★	11.2	70782	**8000**		•	•	•	•	•	•	•		
	144.39	12.1	70782	**8000**		•	•	•	•	•	•	•		
	123.37	14.2	70782	**8000**		•	•	•	•	•	•	•		
	111.50 ★	15.7	70782	**8000**		•	•	•	•	•	•	•		
	107.42	16.3	70782	**8000**			•	•	•	•	•	•		
	92.91	18.8	70782	**8000**		•	•	•	•	•	•	•		
	81.04 ★	22	70782	**8000**		•	•	•	•	•	•	•		
	69.36 ★	25	70782	**8000**		•	•	•	•	•	•	•		
	62.12	28	70782	**8000**				•	•	•	•	•		
	52.61 ★	33	70782	**8000**				•	•	•	•	•		
	45.44	39	70782	**8000**					•	•	•	•		
	34.15 ★	51	70782	**8000**					•	•	•	•		
Z.148	**57.50**	30	41266	**4664**				•						
	54.24 ★	32	70782	**8000**				•	•					
70782 lb in	**50.74**	34	70782	**8000**				•	•					
	45.11 ★	39	70782	**8000**				•	•	•	•			
	42.59	41	70782	**8000**				•	•	•	•			
	38.23 ★	46	70782	**8000**				•	•	•	•	•		
	35.09	50	70782	**8000**				•	•	•	•	•		
	30.28	58	70782	**8000**				•	•	•	•	•	•	
	26.49	66	70782	**8000**				•	•	•	•	•	•	
	23.04	76	70782	**8000**				•	•	•	•	•	•	•
	20.21 ★	87	70782	**8000**				•	•	•	•	•	•	•
	17.09 ★	102	70782	**8000**				•	•	•	•	•	•	•
	15.51	113	70782	**8000**				•	•	•	•	•	•	•
	13.52 ★	129	70782	**8000**				•	•	•	•	•	•	•
	11.48	152	70782	**8000**					•	•	•	•	•	•
	8.79 ★	199	70782	**8000**					•	•	•	•	•	•
	8.64 ★	203	42469	**4800**				•	•	•	•	•	•	•
	7.84	223	42469	**4800**				•	•	•	•	•	•	•
	7.57 ★	231	49547	**5600**					•	•	•	•	•	•
	6.84 ★	256	42469	**4800**				•	•	•	•	•	•	•
	6.43	272	47778	**5400**					•	•	•	•	•	•
	5.80	302	37160	**4200**					•	•	•	•	•	•
	4.92 ★	356	44681	**5050**					•	•	•	•	•	•
	4.44 ★	394	34064	**3850**					•	•	•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in]									
					3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160	180	280TC 200
D.168-D48	**71317** ★	0.02	123868	**14000**	•	•	•							
	63421	0.03	123868	**14000**	•	•	•							
123868 lb in	**55016** ★	0.03	123868	**14000**	•	•	•	•						
	51404	0.03	123868	**14000**	•	•	•	•						
	45210 ★	0.04	123868	**14000**	•	•	•	•						
	39595	0.04	123868	**14000**	•	•	•	•	•					
	35022 ★	0.05	123868	**14000**	•	•	•	•	•					
	31740	0.06	123868	**14000**	•	•	•	•	•					
	28017 ★	0.06	123868	**14000**	•	•	•	•	•					
	25274	0.07	123868	**14000**	•	•	•	•	•					
	22923 ★	0.08	123868	**14000**	•	•	•	•	•					
	20886	0.08	123868	**14000**	•	•	•	•	•					
	19103 ★	0.09	123868	**14000**	•	•	•	•	•					
	17080	0.1	123868	**14000**	•	•	•	•	•					
D.168-Z48	**17519**	0.1	123868	**14000**	•	•	•							
	15504 ★	0.11	123868	**14000**	•	•	•	•						
123868 lb in	**14094**	0.12	123868	**14000**	•	•	•	•						
	12661 ★	0.14	123868	**14000**	•	•	•	•						
	10853	0.16	123868	**14000**	•	•	•	•	•					
	9819 ★	0.18	123868	**14000**	•	•	•	•	•	•				
	9064	0.19	123868	**14000**	•	•	•	•	•	•				
	7881 ★	0.22	123868	**14000**	•	•	•	•	•	•				
	7156	0.24	123868	**14000**	•	•	•	•	•	•				
	6534 ★	0.27	123868	**14000**	•	•	•	•	•	•				
	5995	0.29	123868	**14000**	•	•	•	•	•	•				
	5523 ★	0.32	123868	**14000**	•	•	•	•	•	•				
	5016	0.35	123868	**14000**	•	•	•	•	•	•				
	4569 ★	0.38	123868	**14000**	•	•	•	•	•	•				
	4186	0.42	123868	**14000**	•	•	•	•	•	•				
	3735 ★	0.47	123868	**14000**	•	•	•	•	•	•				
	3333	0.53	123868	**14000**			•	•	•	•				
	2831	0.62	123868	**14000**			•	•	•	•				
	2357 ★	0.74	123868	**14000**			•	•	•	•				
	2319 ★	0.75	123868	**14000**	•	•	•	•	•	•				
	2070	0.85	123868	**14000**			•	•	•	•				
	1758	1	123868	**14000**			•	•	•	•				
	1463 ★	1.2	123868	**14000**			•	•	•	•				
D.168-Z68	**1226**	1.4	123868	**14000**			•	•	•	•	•			
	1046	1.7	123868	**14000**			•	•	•	•	•			
123868 lb in	**871**	2	123868	**14000**					•	•	•			
	722	2.4	123868	**14000**					•	•	•			
	637	2.7	123868	**14000**			•	•	•	•	•			
	544	3.2	123868	**14000**			•	•	•	•	•			
	453	3.9	123868	**14000**					•	•	•			
	376	4.7	123868	**14000**					•	•	•			

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11

Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752	291 / 2575	356 / 3150	580 / 5132
					Size									
					140TC	180TC		210TC	250TC		280TC	320TC	360TC	
					90	100	112	132	160	180	200	225	250	280
D.168	**341.61** ★	5.1	123868	**14000**				•						
	313.41	5.6	123868	**14000**				•						
123868 lb in	**289.23** ★	6.1	123868	**14000**				•						
	268.29	6.5	123868	**14000**				•						
	253.08 ★	6.9	123868	**14000**				•	•					
	236.72	7.4	123868	**14000**				•	•					
	210.49 ★	8.3	123868	**14000**				•	•	•	•			
	198.71	8.8	123868	**14000**				•	•	•	•			
	178.38 ★	9.8	123868	**14000**				•	•	•	•	•		
	163.72	10.7	123868	**14000**				•	•	•	•	•		
	141.28	12.4	123868	**14000**				•	•	•	•	•		
	123.59	14.2	123868	**14000**				•	•	•	•	•		
	107.48	16.3	123868	**14000**				•	•	•	•	•		
	94.30 ★	18.6	123868	**14000**				•	•	•	•	•		
	79.75 ★	22	123868	**14000**				•	•	•	•	•		
	72.36	24	123868	**14000**				•	•	•	•	•		
	63.08 ★	28	123868	**14000**				•	•	•	•	•		
	53.56	33	123868	**14000**					•	•	•	•		
	40.99 ★	43	123868	**14000**					•	•	•	•		
Z.168	**46.61**	38	89362	**10100**				•	•	•	•			
	42.09	42	123868	**14000**				•	•	•	•	•		
123868 lb in	**39.45**	44	123868	**14000**				•	•	•	•	•	•	
	33.88 ★	52	123868	**14000**				•	•	•	•	•	•	
	29.27	60	123868	**14000**				•	•	•	•	•	•	•
	25.84	68	123868	**14000**				•	•	•	•	•	•	•
	23.26 ★	75	123868	**14000**				•	•	•	•	•	•	•
	19.30 ★	91	123868	**14000**				•	•	•	•	•	•	•
	17.60	99	122328	**13826**				•	•	•	•	•	•	•
	15.44 ★	113	119320	**13486**				•	•	•	•	•	•	•
	13.27	132	115737	**13081**				•	•	•	•	•	•	•
	10.34 ★	169	109225	**12345**					•	•	•	•	•	•
	9.26 ★	189	69454	**7850**				•	•	•	•	•	•	•
	8.21 ★	213	102828	**11622**						•	•	•	•	•
	7.20 ★	243	62819	**7100**					•	•	•	•	•	•
	6.20 ★	282	66420	**7507**					•	•	•	•	•	•
	5.61 ★	312	59987	**6780**					•	•	•	•	•	•
	4.93 ★	355	62500	**7064**						•	•	•	•	•
	4.46 ★	392	57245	**6470**						•	•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]		n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 1) [Nm / lb in]									
						3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
						Size									
						63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160	180	280TC 200
D.188-D48	**50901**	★	0.03	176954	**20000**	•	•	•							
	45266		0.04	176954	**20000**	•	•	•							
176954 lb in	**39267**	★	0.04	176954	**20000**	•	•	•	•						
	36689		0.05	176954	**20000**	•	•	•	•						
	32268	★	0.05	176954	**20000**	•	•	•	•						
	28260		0.06	176954	**20000**	•	•	•	•						
	24996	★	0.07	176954	**20000**	•	•	•	•	•					
	22654		0.08	176954	**20000**	•	•	•	•	•					
	19997	★	0.09	176954	**20000**	•	•	•	•	•					
	18039		0.1	176954	**20000**	•	•	•	•	•					
	16361	★	0.11	176954	**20000**	•	•	•	•	•					
	14907		0.12	176954	**20000**	•	•	•	•	•					
	13634	★	0.13	176954	**20000**	•	•	•	•	•					
	12191		0.14	176954	**20000**	•	•	•	•	•					
D.188-Z48	**12504**		0.14	176954	**20000**	•	•	•							
	11066	★	0.16	176954	**20000**	•	•	•	•						
176954 lb in	**9037**	★	0.19	176954	**20000**	•	•	•	•						
	7746		0.23	176954	**20000**	•	•	•	•	•					
	7008	★	0.25	176954	**20000**	•	•	•	•	•	•				
	6469		0.27	176954	**20000**	•	•	•	•	•	•				
	5625	★	0.31	176954	**20000**	•	•	•	•	•	•				
	5107		0.34	176954	**20000**	•	•	•	•	•	•				
	4663	★	0.38	176954	**20000**	•	•	•	•	•	•				
	4279		0.41	176954	**20000**	•	•	•	•	•	•				
	3942	★	0.44	176954	**20000**	•	•	•	•	•	•				
	3580		0.49	176954	**20000**	•	•	•	•	•	•				
	3261	★	0.54	176954	**20000**	•	•	•	•	•	•				
	2988		0.59	176954	**20000**	•	•	•	•	•	•				
	2666	★	0.66	176954	**20000**	•	•	•	•	•	•				
	2379		0.74	176954	**20000**			•	•	•	•				
	2021		0.87	176954	**20000**			•	•	•	•				
	1682	★	1	176954	**20000**			•	•	•	•				
	1655	★	1.1	176954	**20000**	•	•	•	•	•	•				
	1477		1.2	176954	**20000**			•	•	•	•				
	1255		1.4	176954	**20000**			•	•	•	•				
	1044	★	1.7	176954	**20000**			•	•	•	•				
D.188-Z68	**896**	★	2	176954	**20000**			•	•	•	•	•			
	746		2.3	176954	**20000**					•	•	•			
176954 lb in	**619**	★	2.8	176954	**20000**					•	•	•			
	546		3.2	176954	**20000**			•	•	•	•	•			
	466	★	3.8	176954	**20000**			•	•	•	•	•			
	388		4.5	176954	**20000**					•	•	•			
	322	★	5.4	176954	**20000**					•	•	•			

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

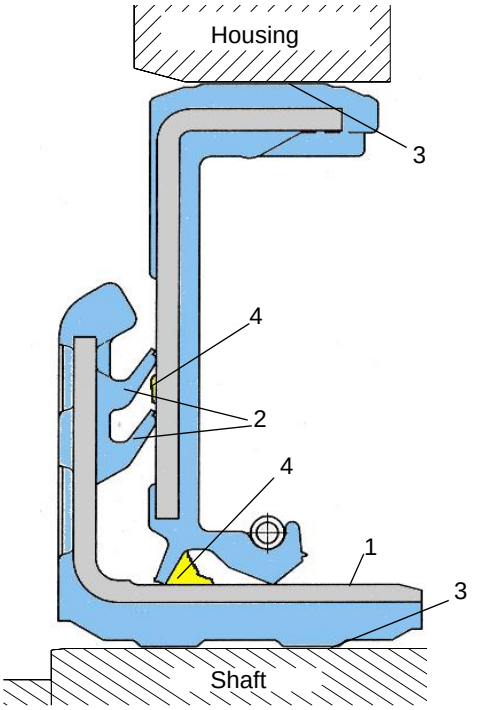
Legend / explanations see page 3 - 11
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 20/177	26/230	61/540	98/867	198/1752	198/1752	291/2575	356/3150	580/5132	1290/11414
					Size									
					180TC 100	112	210TC 132	250TC 160	180	280TC 200	320TC 225	360TC 250	280	315
D.188	**243.82**	7.2	176954	**20000**	•	•	•	•						
176954 lb in	**220.17**	7.9	176954	**20000**	•	•	•	•	•					
	206.34	8.5	176954	**20000**	•	•	•	•	•	•				
	177.23 ★	9.9	176954	**20000**	•	•	•	•	•	•				
	153.12	11.4	176954	**20000**	•	•	•	•	•	•	•			
	135.16	13	176954	**20000**	•	•	•	•	•	•	•			
	121.67 ★	14.4	176954	**20000**	•	•	•	•	•	•	•			
	100.96 ★	17.3	176954	**20000**	•	•	•	•	•	•	•			
	92.06	19	176954	**20000**	•	•	•	•	•	•	•			
	80.77 ★	22	176954	**20000**	•	•	•	•	•	•	•			
	69.41	25	176954	**20000**	•	•	•	•	•	•	•			
	54.06 ★	32	176954	**20000**	•	•	•	•	•	•	•			
	42.95 ★	41	176954	**20000**	•	•	•	•	•	•	•			
Z.188	**52.35**	33	138997	**15710**				•	•	•	•			
	48.22	36	140855	**15920**				•	•	•	•	•		
176954 lb in	**41.85** ★	42	142536	**16110**				•	•	•	•	•		
	36.89	47	146872	**16600**				•	•	•	•	•	•	
	32.37	54	163240	**18450**				•	•	•	•	•	•	
	29.18 ★	60	176954	**20000**				•	•	•	•	•	•	
	24.77 ★	71	176954	**20000**				•	•	•	•	•	•	
	23.01	76	176954	**20000**				•	•	•	•	•	•	
	19.76 ★	89	176954	**20000**				•	•	•	•	•	•	
	16.86	104	176954	**20000**				•	•	•	•	•	•	•
	13.28 ★	132	166514	**18820**				•	•	•	•	•	•	•
	10.69 ★	164	143067	**16170**					•	•	•	•	•	•
	9.29	188	126611	**14310**							•	•	•	•
	8.30	211	115374	**13040**								•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Quadrilip seals (optional)

Improvement of Sealing Quality D./Z.38-168



- Protected running surface for shaft seal **1**
- No risk of damage during assembly
- Additional seal-lips against dust **2**
- Separate sealing system prevents damage to the shaft through corrosion and dust
- Rubber coated inner ring and outer ring **3**
- Grease prevents dry run of lips of seals **4**

D./Z.18, 28 and 188 double sealing optional.

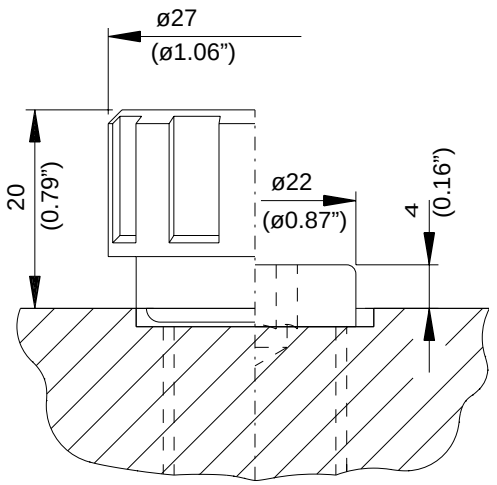
Breather Element

The position of the plug screw is shown in the dimension sheets for the horizontal mounting position (B3,B5).

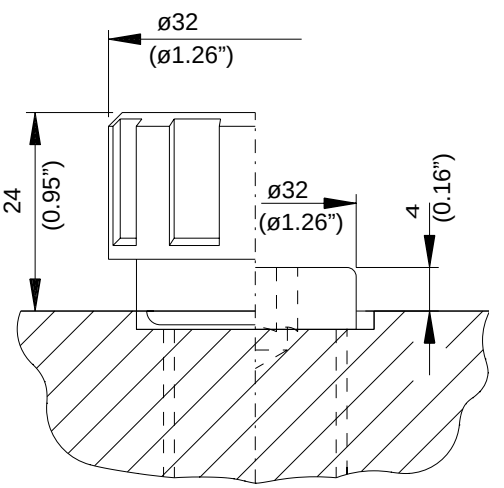
When running the gear box, in sizes E.48...E.148 and D./ Z.48 ... D./ Z.188 a breather must replace the plug screw. The breather dimensions are as follows.

Please note that the breather plug must be inserted at other locations for other mounting positions.

E./D./Z. 48 ... 128



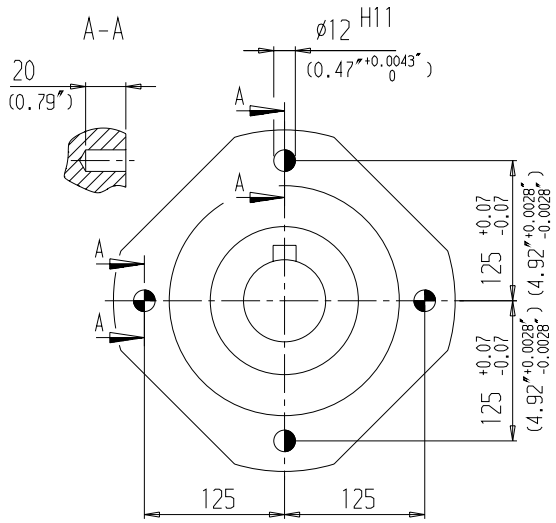
E. 148; D./Z. 148 ... 188



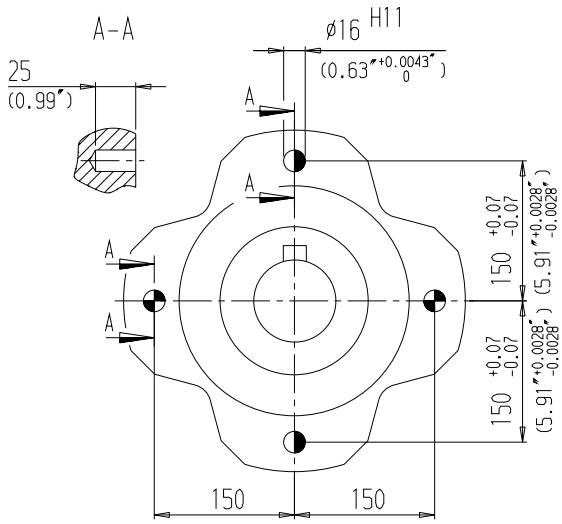
Pin holes

With housing flange (C-Type) for sizes EZ128...EZ148 and DZ/ZZ 108...DZ/ZZ 188, the output side can be pinned.
The output flanges are designed in a manner, that the permissible torques and radial loads can be transmitted safely by screw connection.
When there is need for additional safety, e.g. operation with heavy shock load, the existing pin holes can be used.
The gear box can also be bored and pinned together with the machine. In this case the given dimensions should be observed.

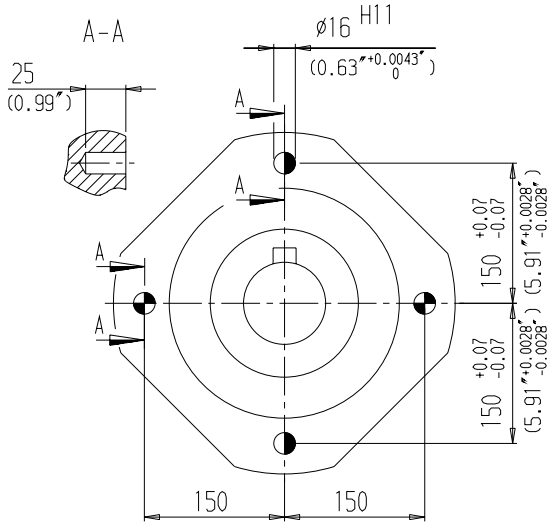
EZ128, DZ/ZZ108



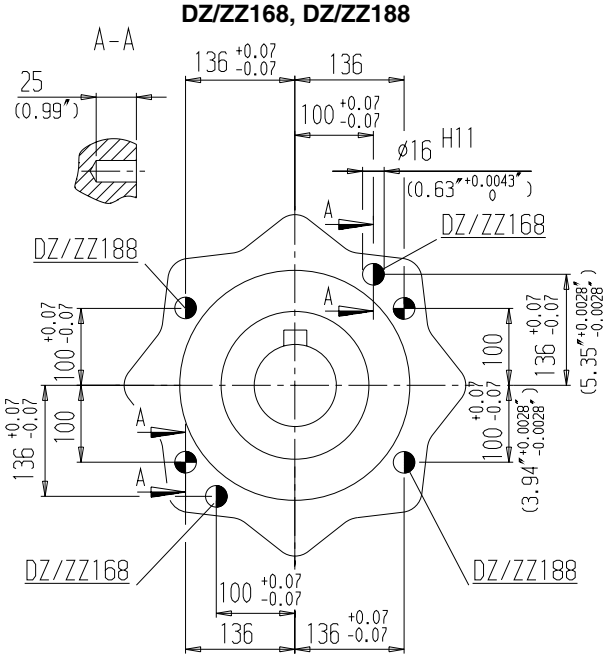
EZ148, DZ/ZZ128



DZ/ZZ148



DZ/ZZ168, DZ/ZZ188

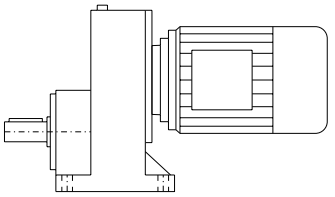
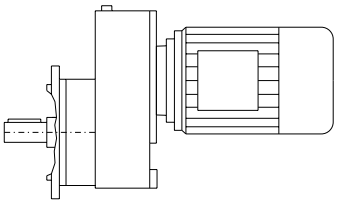
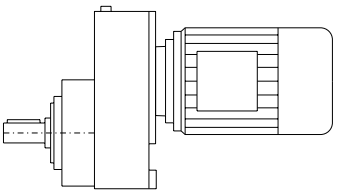
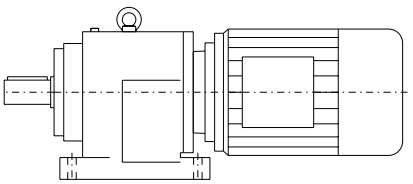
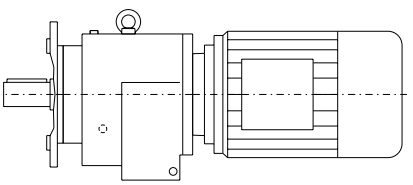


◑ With heavy straight pins to DIN 1481: Use existing pinholes in the housing flange.

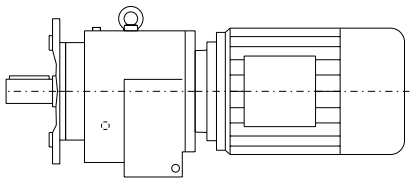
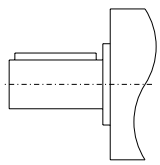
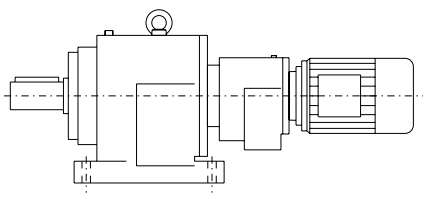
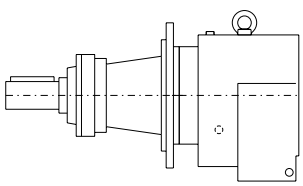
◒ With dowel pins to DIN EN 28740 / ISO 8740:

Note: Bore the mating part together with the housing.

Dimension Sheets-Overview

	Type	Dimension sheet see page
	E38	3 - 96
	E48	3 - 102
	E68	3 - 108
	E88	3 - 114
	E108	3 - 120
	E128	3 - 126
	E148	3 - 132
	EF38	3 - 98
	EF48	3 - 104
	EF68	3 - 110
	EF88	3 - 116
	EF108	3 - 122
	EF128	3 - 128
	EF148	3 - 134
	EZ38	3 - 100
	EZ48	3 - 106
	EZ68	3 - 112
	EZ88	3 - 118
	EZ108	3 - 124
	EZ128	3 - 130
	EZ148	3 - 136
	D/Z18	3 - 138
	D/Z28	3 - 142
	D/Z38	3 - 146
	D/Z48	3 - 152
	D/Z68	3 - 158
	D/Z88	3 - 164
	D/Z108	3 - 170
	D/Z128	3 - 176
	D/Z148	3 - 182
	D/Z168	3 - 188
	D/Z188	3 - 194
	DF/ZF18	3 - 140
	DF/ZF28	3 - 144
	DF/ZF38	3 - 148
	DF/ZF48	3 - 154
	DF/ZF68	3 - 160
	DF/ZF88	3 - 166
	DF/ZF108	3 - 172
	DF/ZF128	3 - 178
	DF/ZF148	3 - 184
	DF/ZF168	3 - 190
	DF/ZF188	3 - 196

Dimension Sheets-Overview

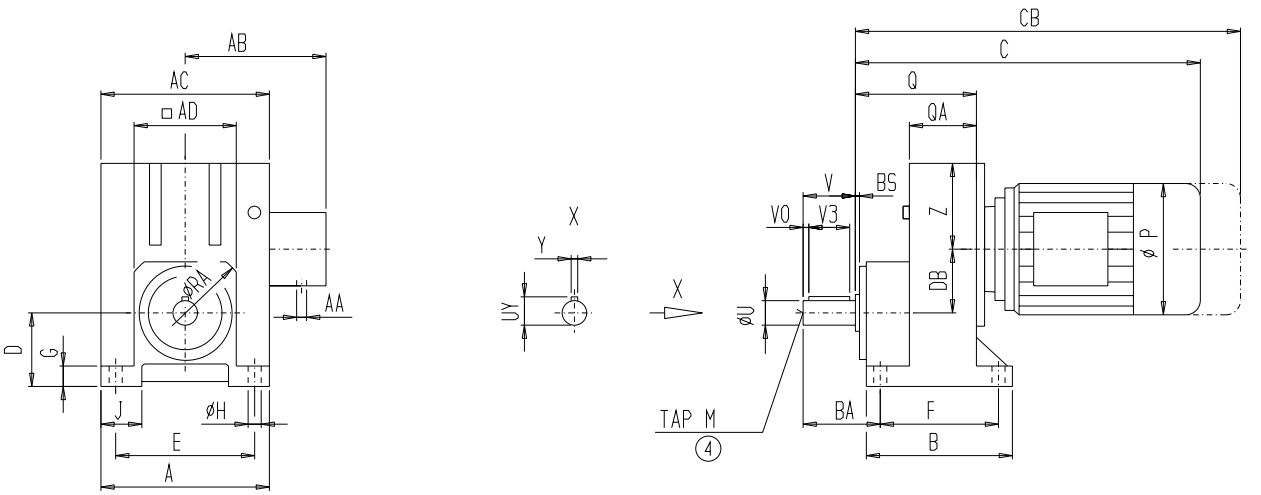
	Type	Dimension sheet see page
	DZ/ZZ38	3 - 150
	DZ/ZZ48	3 - 156
	DZ/ZZ68	3 - 162
	DZ/ZZ88	3 - 168
	DZ/ZZ108	3 - 174
	DZ/ZZ128	3 - 180
	DZ/ZZ148	3 - 186
	DZ/ZZ168	3 - 192
	DZ/ZZ188	3 - 198
	Available Output Solid Shaft	3 - 200
	D./Z.38-Z28 ... Z.188-Z68	3 - 202
	DR/ZR88 ... DR/ZR168	3 - 206

Helical Gear Motors
Foot mounted

E 38

E 510

[inch]



Mounting

E	F	G	H	J
4.92	4.33	0.71	0.43	1.38

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
0.75	1.57	1.25	0.01	0.83	0.1875	2.2	1/4-20UNC

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	Q	QA
4.49	3.54	5.31	6.1	5.04	2.2	0.12	1.93	2.52	4.33	2.34

Motor

	E38					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**E38**
M71	14.32	16.05	5.43	4.67	2x1/2"	35
M80	15.16	17.33	6.22	4.98	2x1/2"	40
M90S	16.78	19.37	6.93	5.91	2x3/4"	44
M90L	16.78	19.37	6.93	5.91	2x3/4"	49
M100L	18.55	21.38	7.64	6.3	2x3/4"	68
M112M	20.61	23.8	8.58	6.59	2x3/4"	86

Tolerances see page 1 - 4

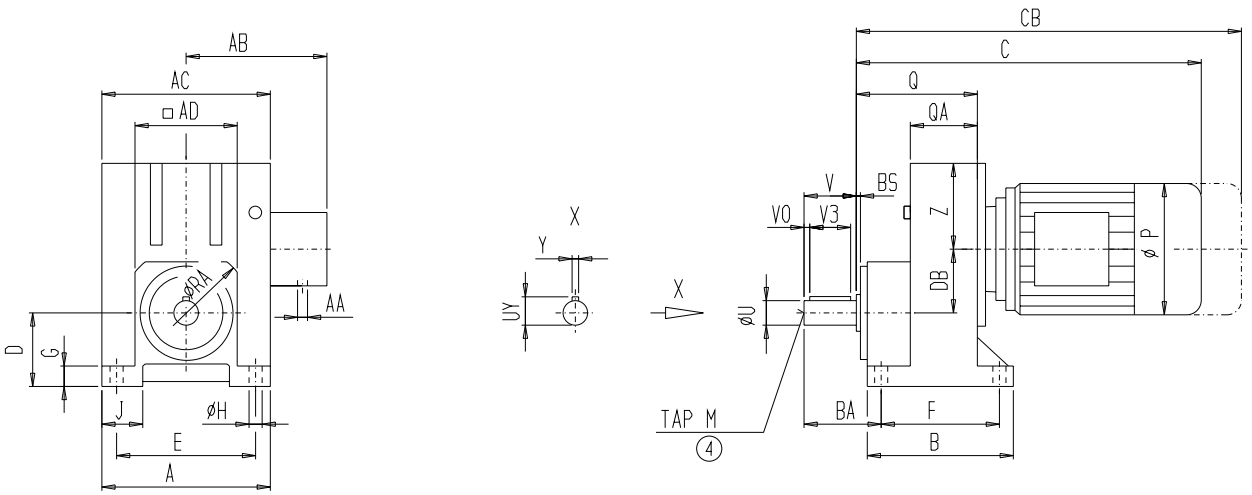
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

E 38

E 510

[mm]



Mounting

E	F	G	H	J
125	*110*	*18*	*11*	*35*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
19,05	*40*	*31,75*	*0,254*	*21,08*	*4,763*	*56*	*1/4"-20UNC*

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	Q	QA
114	*90*	*135*	*155*	*128*	*56*	*3*	*49*	*64*	*110*	*59,5*

Motor

	E38					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**E38**
M71	*364,5*	*408,5*	*138*	*118,5*	*2x1/2"*	*16*
M80	*386*	*441*	*158*	*126,5*	*2x1/2"*	*18*
M90S	*427*	*493*	*176*	*150*	*2x3/4"*	*20*
M90L	*427*	*493*	*176*	*150*	*2x3/4"*	*22*
M100L	*472*	*544*	*194*	*160*	*2x3/4"*	*31*
M112M	*524,5*	*605,5*	*218*	*167,5*	*2x3/4"*	*39*

Tolerances see page 1 - 4

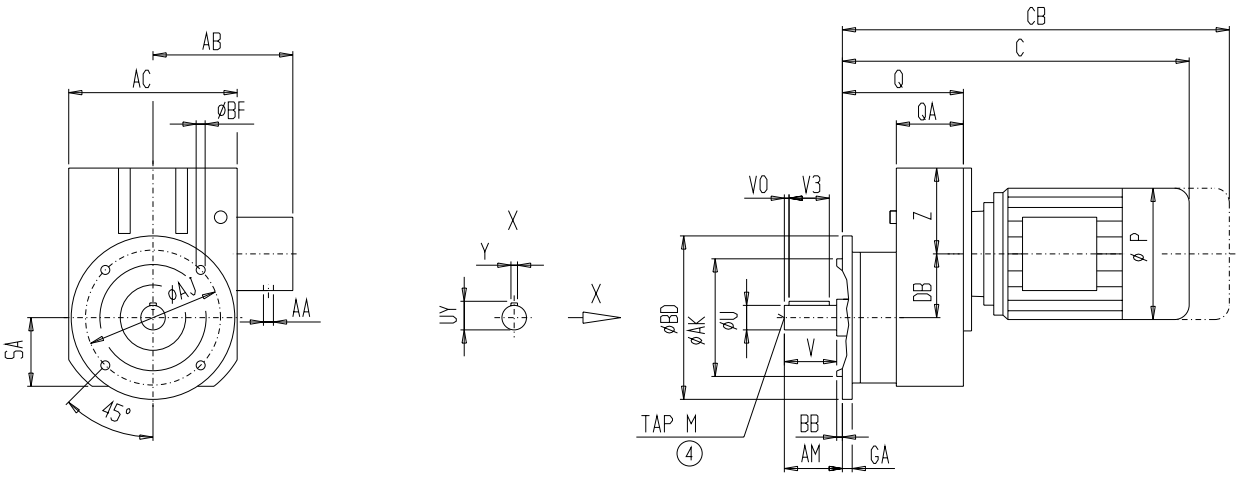
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EF 38

EF 510

[inch]



Flange

BD	AK	GA	AJ	BB	BF
4.72	3.15	0.31	3.94	0.12	0.27
5.51	3.74	0.39	4.53	0.12	0.35
6.3	4.33	0.39	5.12	0.14	0.35
7.87	5.12	0.47	6.5	0.14	0.43
9.84	7.09	0.59	8.46	0.16	0.53

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
0.75	1.57	1.25	0.01	0.83	0.1875	1.57	1/4-20UNC

Gearcase

AC	SA	DB	Z	Q	QA
5.04	2.36	1.93	2.52	4.33	2.34

Motor

	EF38					Weight [lb]
Motor	C	CB	P	AB	AA	EF38
M71	14.32	16.05	5.43	4.67	2x1/2"	40
M80	15.16	17.33	6.22	4.98	2x1/2"	44
M90S	16.78	19.37	6.93	5.91	2x3/4"	49
M90L	16.78	19.37	6.93	5.91	2x3/4"	53
M100L	18.55	21.38	7.64	6.3	2x3/4"	73
M112M	20.61	23.8	8.58	6.59	2x3/4"	90

Tolerances see page 1 - 4

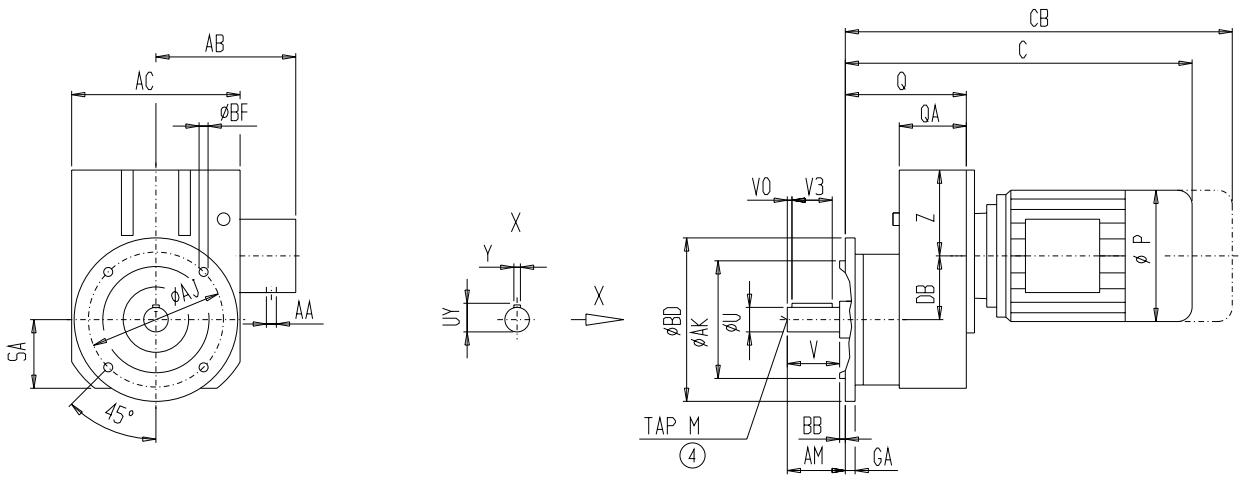
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EF 38

EF 510

[mm]



Flange

BD	AK	GA	AJ	BB	BF
120	*80*	*8*	*100*	*3*	*6,8*
140	*95*	*10*	*115*	*3*	*9*
160	*110*	*10*	*130*	*3,5*	*9*
200	*130*	*12*	*165*	*3,5*	*11*
250	*180*	*15*	*215*	*4*	*13,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
19,05	*40*	*31,75*	*0,254*	*21,08*	*4,763*	*40*	*1/4"-20UNC*

Gearcase

B	AC	SA	DB	Z	Q	QA
60,5	*128*	*60*	*49*	*64*	*110*	*59,5*

Motor

	EF38					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EF38**
M71	*364,5*	*408,5*	*138*	*118,5*	*2x1/2"*	*18*
M80	*386*	*441*	*158*	*126,5*	*2x1/2"*	*20*
M90S	*427*	*493*	*176*	*150*	*2x3/4"*	*22*
M90L	*427*	*493*	*176*	*150*	*2x3/4"*	*24*
M100L	*472*	*544*	*194*	*160*	*2x3/4"*	*33*
M112M	*524,5*	*605,5*	*218*	*167,5*	*2x3/4"*	*41*

Tolerances see page 1 - 4

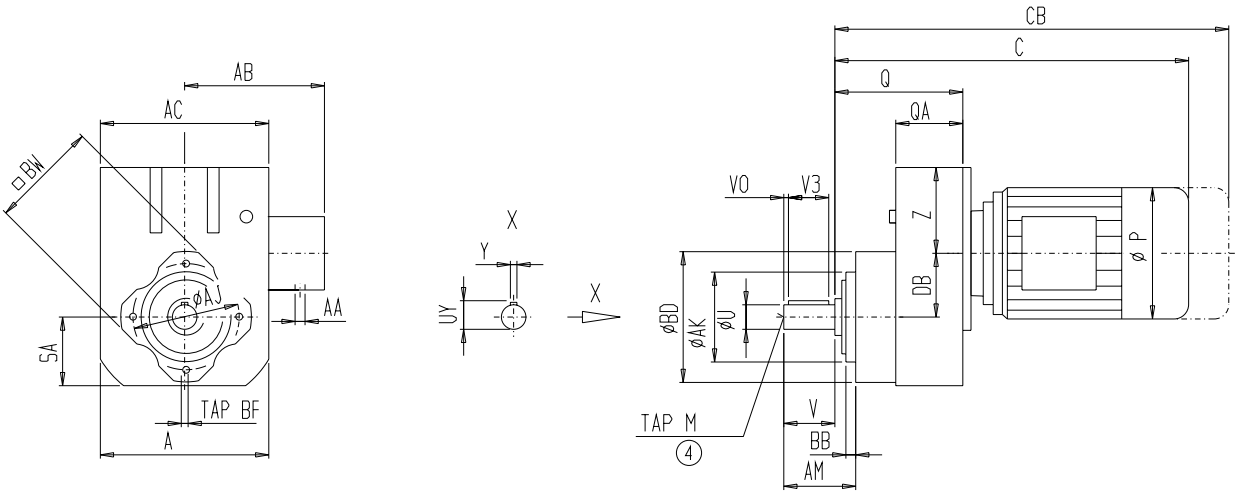
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EZ 38

EZ 510

[inch]



Flange

BD	AK	BB	AJ	TAP BF	BW
4.72	3.15	0.35	3.94	M8x11	3.94

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
0.75	1.57	1.25	0.01	0.83	0.1875	2.09	1/4-20UNC

Gearcase

A	AC	SA	DB	Z	Q	QA
5.04	5.04	2.36	1.93	2.52	4.33	2.34

Motor

	EZ38					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EZ38**
M71B	14.32	16.05	5.43	4.67	2x1/2"	33
M80M	15.16	17.33	6.22	4.98	2x1/2"	37
M90S	16.78	19.37	6.93	5.91	2x3/4"	42
M90L	16.78	19.37	6.93	5.91	2x3/4"	46
M100L	18.55	21.38	7.64	6.3	2x3/4"	66
M112M	20.61	23.8	8.58	6.59	2x3/4"	84

Tolerances see page 1 - 4

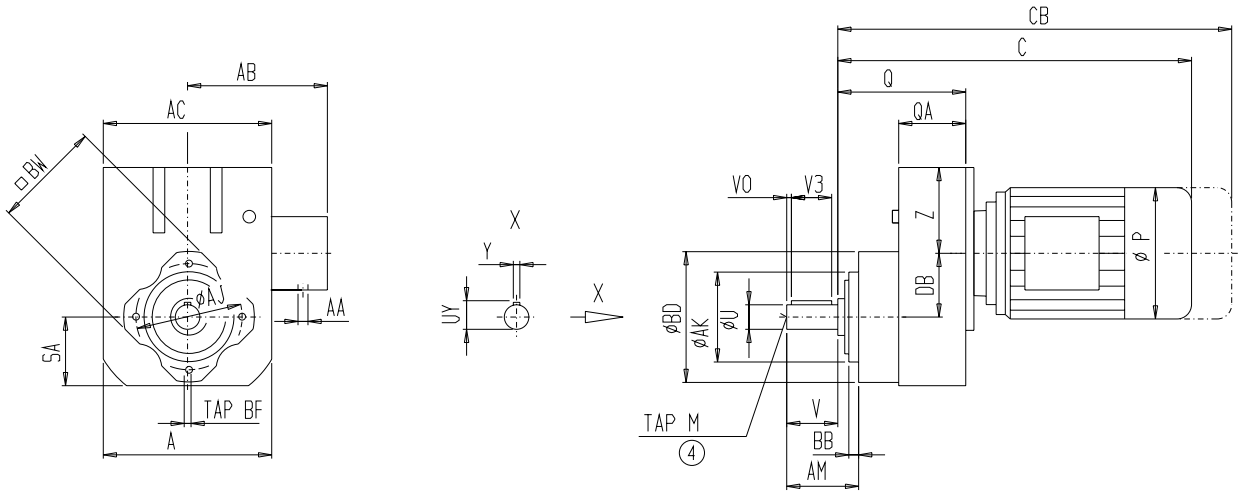
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EZ 38

EZ 510

[mm]



Flange

BD	AK	BB	AJ	TAP BF	BW
120	*80*	*9*	*100*	*M8x11*	*100*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
19,05	*40*	*31,75*	*0,254*	*21,08*	*4,763*	*53*	*1/4"-20UNC*

Gearcase

A	AC	SA	DB	Z	Q	QA
128	*128*	*60*	*49*	*64*	*110*	*59,5*

Motor

	EZ38					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EZ38**
M71	*364,5*	*408,5*	*138*	*118,5*	*2x1/2"*	*15*
M80	*386*	*441*	*158*	*126,5*	*2x1/2"*	*17*
M90S	*427*	*493*	*176*	*150*	*2x3/4"*	*19*
M90L	*427*	*493*	*176*	*150*	*2x3/4"*	*21*
M100L	*472*	*544*	*194*	*160*	*2x3/4"*	*30*
M112M	*524,5*	*605,5*	*218*	*167,5*	*2x3/4"*	*38*

Tolerances see page 1 - 4

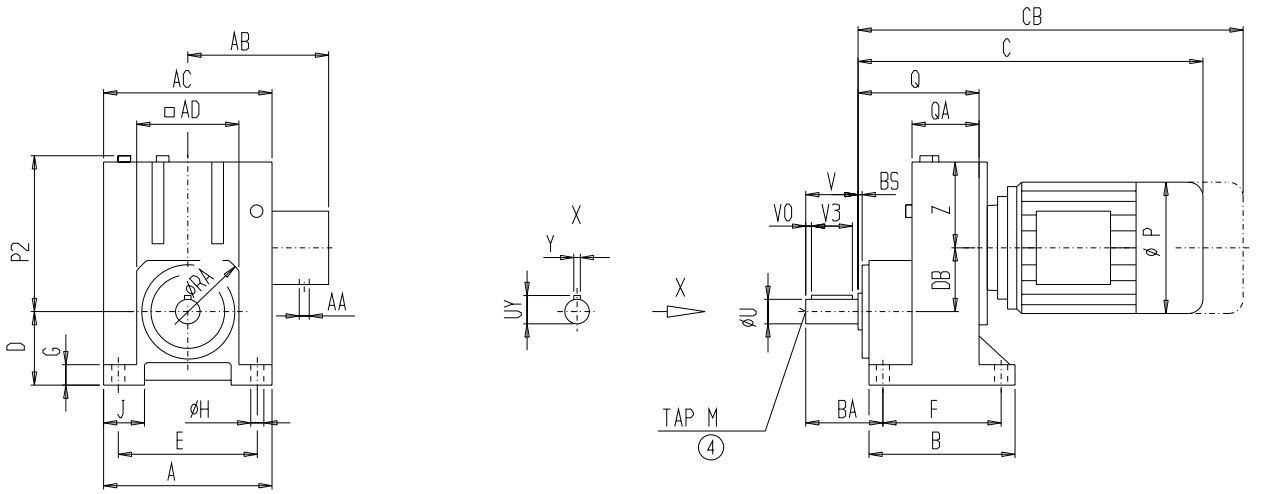
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

E 48

E 510

[inch]



Mounting

E	F	G	H	J
5.31	4.72	0.79	0.53	1.42

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1	1.97	1.5	0.252	1.11	0.25	2.95	3/8-16UNC

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	Q	QA
4.72	3.74	5.91	6.61	6.61	3.15	0.12	2.54	3.31	6.04	4.33	2.6

Motor

	E48					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**E48**
M71	14.1	15.83	5.43	4.67	2x1/2"	42
M80	14.94	17.11	6.22	4.98	2x1/2"	46
M90S	16.56	19.15	6.93	5.91	2x3/4"	51
M90L	16.56	19.15	6.93	5.91	2x3/4"	55
M100L	18.33	21.16	7.64	6.3	2x3/4"	75
M112M	20.35	23.54	8.58	6.59	2x3/4"	93
M132S	24.02	27.95	10.16	7.13	1"+3/4"	117
M132M	24.02	27.95	10.16	7.13	1"+3/4"	163

Tolerances see page 1 - 4

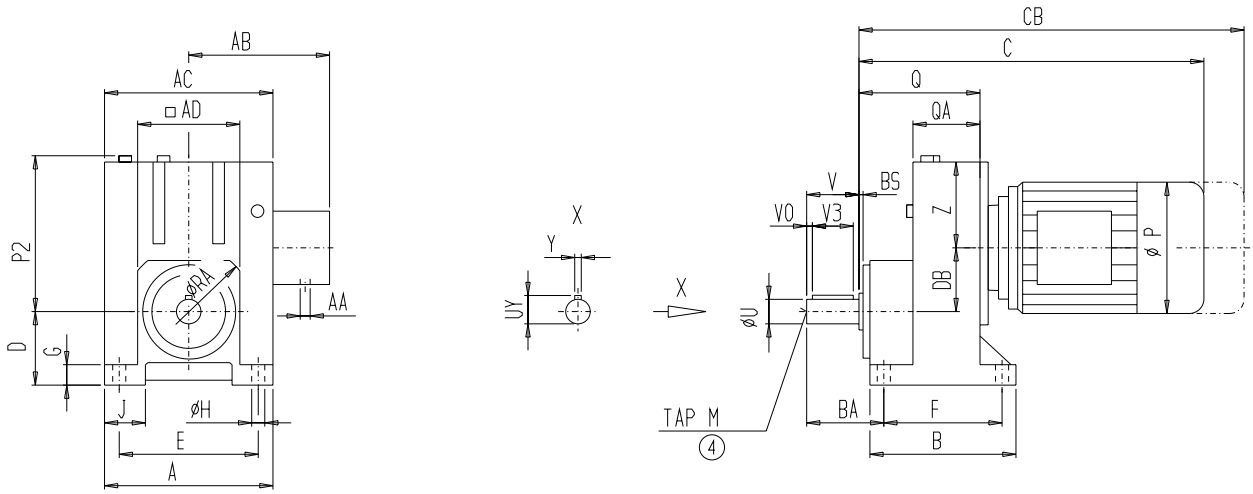
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

E 48

E 510

[mm]



Mounting

E	F	G	H	J
135	*120*	*20*	*13,5*	*36*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
25,4	*50*	*38,1*	*6,401*	*28,19*	*6,35*	*75*	*3/8"-16UNC*

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	Q	QA
120	*95*	*150*	*168*	*168*	*80*	*3*	*64,5*	*84*	*153,5*	*110*	*66*

Motor

	E48					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**E48**
M71	*359*	*403*	*138*	*118,5*	*2x1/2"*	*19*
M80	*380,5*	*435,5*	*158*	*126,5*	*2x1/2"*	*21*
M90S	*421,5*	*487,5*	*176*	*150*	*2x3/4"*	*23*
M90L	*421,5*	*487,5*	*176*	*150*	*2x3/4"*	*25*
M100L	*466,5*	*538,5*	*194*	*160*	*2x3/4"*	*34*
M112M	*518*	*599*	*218*	*167,5*	*2x3/4"*	*42*
M132S	*611*	*711*	*258*	*181*	*1"+3/4"*	*53*
M132M	*611*	*711*	*258*	*181*	*1"+3/4"*	*74*

Tolerances see page 1 - 4

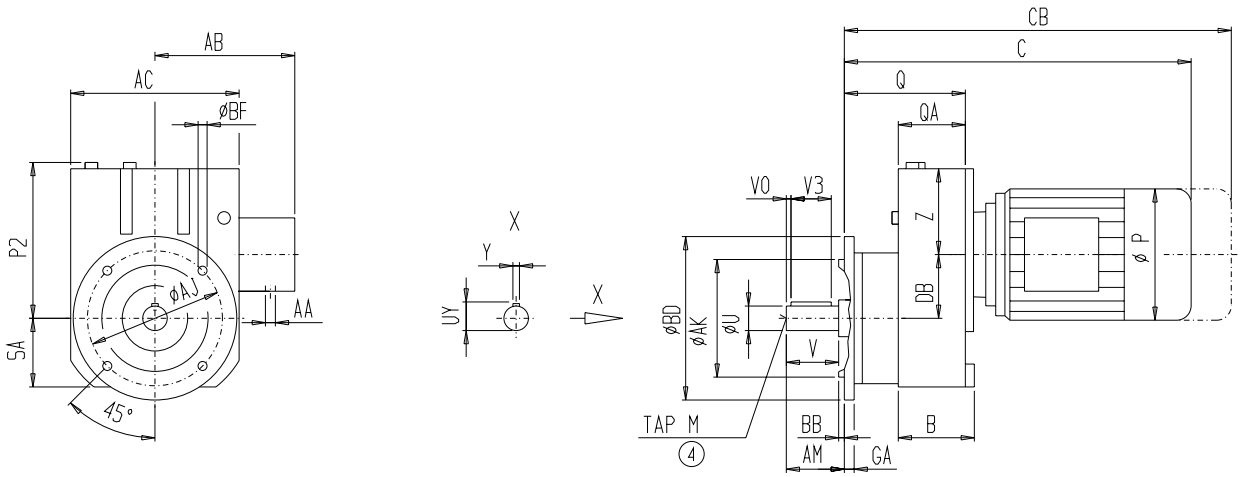
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EF 48

EF 510

[inch]



Flange

BD	AK	GA	AJ	BB	BF
4.72	3.15	0.31	3.94	0.12	0.27
5.51	3.74	0.39	4.53	0.12	0.35
6.3	4.33	0.39	5.12	0.14	0.35
7.87	5.12	0.47	6.5	0.14	0.43
9.84	7.09	0.59	8.46	0.16	0.53

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1	1.97	1.5	0.252	1.11	0.25	1.97	3/8-16UNC

Gearcase

B	AC	SA	DB	Z	P2	Q	QA
3.19	6.61	2.99	2.54	3.31	6.04	4.33	2.6

Motor

	EF48					Weight [lb]
Motor	C	CB	P	AB	AA	EF48
M71	14.1	15.83	5.43	4.67	2x1/2"	46
M80	14.94	17.11	6.22	4.98	2x1/2"	51
M90S	16.56	19.15	6.93	5.91	2x3/4"	55
M90L	16.56	19.15	6.93	5.91	2x3/4"	60
M100L	18.33	21.16	7.64	6.3	2x3/4"	79
M112M	20.35	23.54	8.58	6.59	2x3/4"	97
M132S	24.02	27.95	10.16	7.13	1"+3/4"	121
M132M	24.02	27.95	10.16	7.13	1"+3/4"	168

Tolerances see page 1 - 4

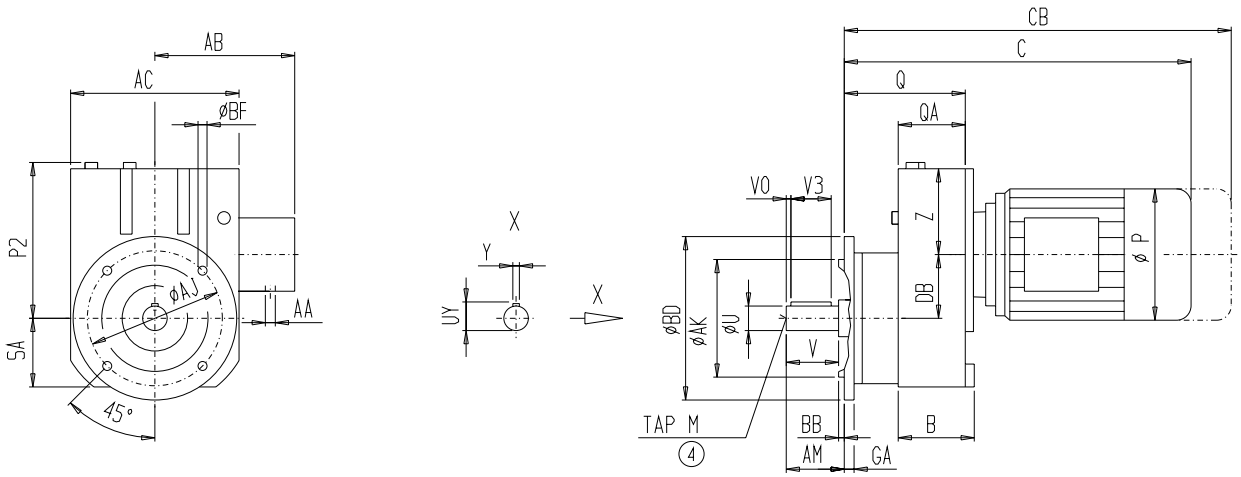
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EF 48

EF 510

[mm]



Flange

BD	AK	GA	AJ	BB	BF
120	*80*	*8*	*100*	*3*	*6,8*
140	*95*	*10*	*115*	*3*	*9*
160	*110*	*10*	*130*	*3,5*	*9*
200	*130*	*12*	*165*	*3,5*	*11*
250	*180*	*15*	*215*	*4*	*13,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
25,4	*50*	*38,1*	*6,401*	*28,19*	*6,35*	*50*	*3/8"-16UNC*

Gearcase

B	AC	SA	DB	Z	P2	Q	QA
81	*168*	*76*	*64,5*	*84*	*153,5*	*110*	*66*

Motor

	EF48					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EF48**
M71	*359*	*403*	*138*	*118,5*	*2x1/2"*	*21*
M80	*380,5*	*435,5*	*158*	*126,5*	*2x1/2"*	*23*
M90S	*421,5*	*487,5*	*176*	*150*	*2x3/4"*	*25*
M90L	*421,5*	*487,5*	*176*	*150*	*2x3/4"*	*27*
M100L	*466,5*	*538,5*	*194*	*160*	*2x3/4"*	*36*
M112M	*518*	*599*	*218*	*167,5*	*2x3/4"*	*44*
M132S	*611*	*711*	*258*	*181*	*1"+3/4"*	*55*
M132M	*611*	*711*	*258*	*181*	*1"+3/4"*	*76*

Tolerances see page 1 - 4

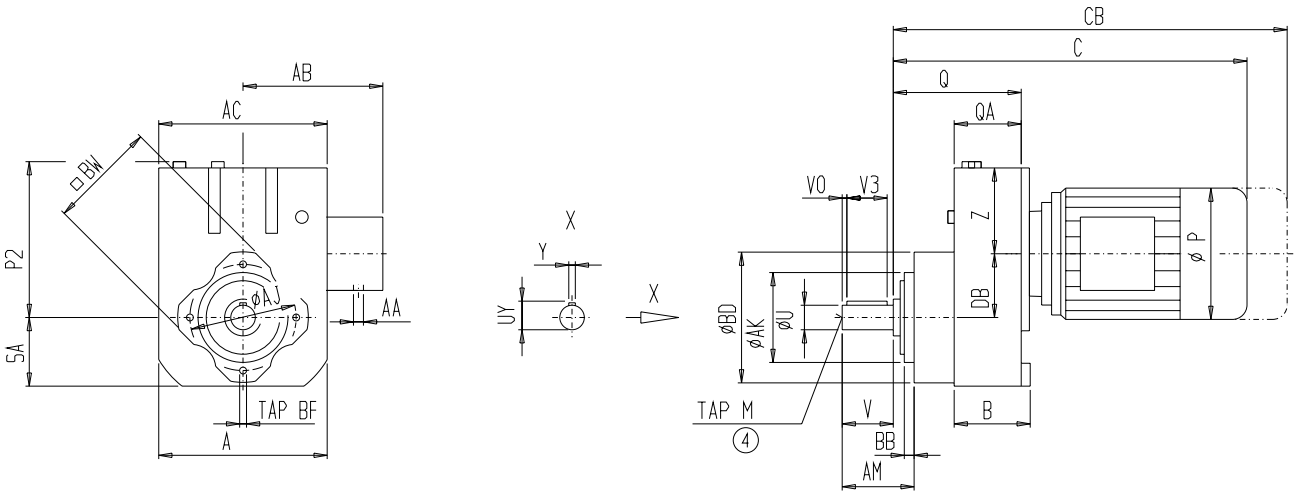
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EZ 48

EZ 510

[inch]



Flange

BD	AK	BB	AJ	TAP BF	BW
4.72	3.15	0.35	3.94	M8x11	3.94

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1	1.97	1.5	0.252	1.11	0.25	2.48	3/8-16UNC

Gearcase

B	A	AC	SA	DB	Z	P2	Q	QA
3.19	6.61	6.61	2.99	2.54	3.31	6.04	4.33	2.6

Motor

	EZ48					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EZ48**
M71	14.1	15.83	5.43	4.67	2x1/2"	40
M80	14.94	17.11	6.22	4.98	2x1/2"	44
M90S	16.56	19.15	6.93	5.91	2x3/4"	49
M90L	16.56	19.15	6.93	5.91	2x3/4"	53
M100L	18.33	21.16	7.64	6.3	2x3/4"	73
M112M	20.35	23.54	8.58	6.59	2x3/4"	90
M132S	24.02	27.95	10.16	7.13	1"+3/4"	112
M132M	24.02	27.95	10.16	7.13	1"+3/4"	159

Tolerances see page 1 - 4

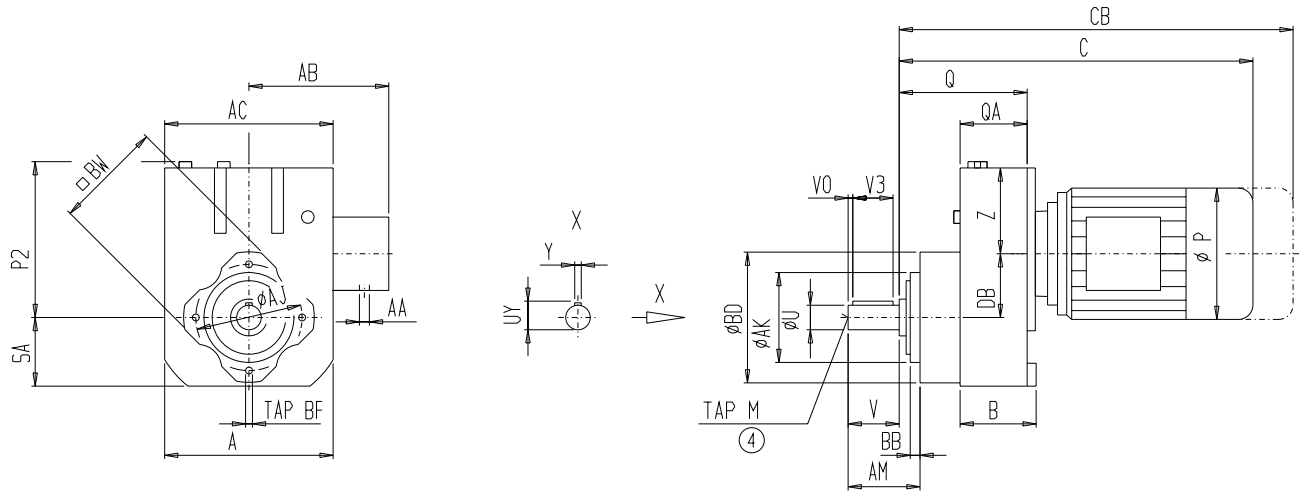
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EZ 48

EZ 510

[mm]



Flange

BD	AK	BB	AJ	TAP BF	BW
120	*80*	*9*	*100*	*M8x11*	*100*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
25,4	*50*	*38,1*	*6,401*	*28,19*	*6,35*	*63*	*3/8"-16UNC*

Gearcase

B	A	AC	SA	DB	Z	P2	Q	QA
81	*168*	*168*	*76*	*64,5*	*84*	*153,5*	*110*	*66*

Motor

	EZ48					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EZ48**
M71	*359*	*403*	*138*	*118,5*	*2x1/2"*	*18*
M80	*380,5*	*435,5*	*158*	*126,5*	*2x1/2"*	*20*
M90S	*421,5*	*487,5*	*176*	*150*	*2x3/4"*	*22*
M90L	*421,5*	*487,5*	*176*	*150*	*2x3/4"*	*24*
M100L	*466,5*	*538,5*	*194*	*160*	*2x3/4"*	*33*
M112M	*518*	*599*	*218*	*167,5*	*2x3/4"*	*41*
M132S	*611*	*711*	*258*	*181*	*1"+3/4"*	*51*
M132M	*611*	*711*	*258*	*181*	*1"+3/4"*	*72*

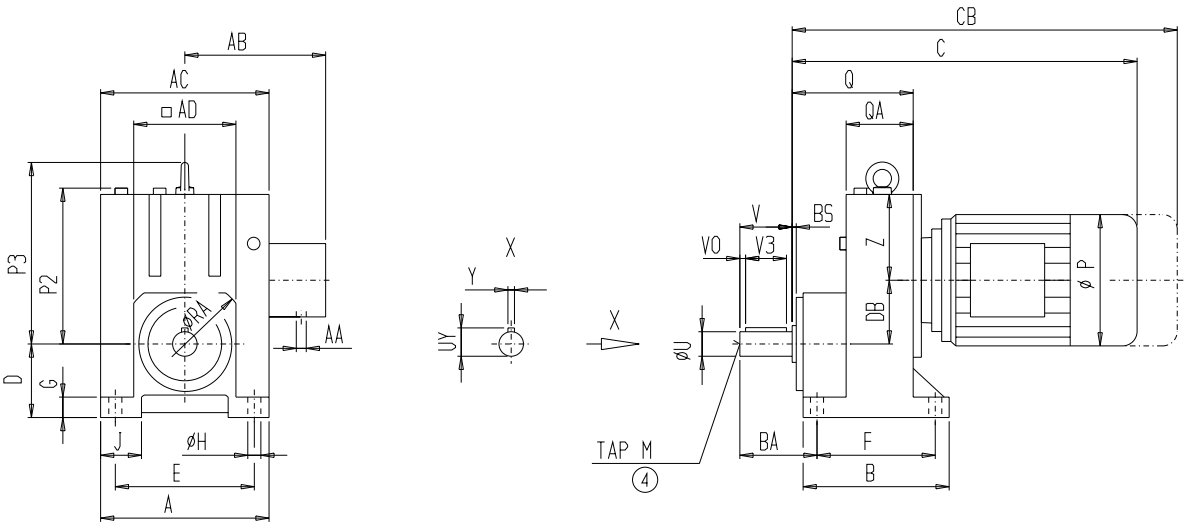
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

E 68

E 510

[inch]



Mounting

E	F	G	H	J
6.69	5.91	0.98	0.69	1.57

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1.25	2.36	1.875	0.133	1.36	0.25	3.35	1/2-13UNC

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	P3	Q	QA
6.3	4.92	7.24	8.27	8.27	3.54	0.12	3.07	4.13	7.4	8.94	5.83	3.35

Motor

	E68					Weight [lb]
Motor	C	CB	P	AB	AA	E68
M71	15.36	17.09	5.43	4.67	2x1/2"	64
M80	16.2	18.37	6.22	4.98	2x1/2"	68
M90S	17.82	20.41	6.93	5.91	2x3/4"	73
M90L	17.82	20.41	6.93	5.91	2x3/4"	77
M100L	19.59	22.42	7.64	6.3	2x3/4"	97
M112M	21.54	24.73	8.58	6.59	2x3/4"	115
M132S	25.1	29.07	10.16	7.13	1"+3/4"	141
M132M	25.1	29.07	10.16	7.13	1"+3/4"	187
M160M	28.41	33.02	12.2	7.83	1"+3/4"	223
M160L	28.41	33.02	12.2	7.83	1"+3/4"	223

Tolerances see page 1 - 4

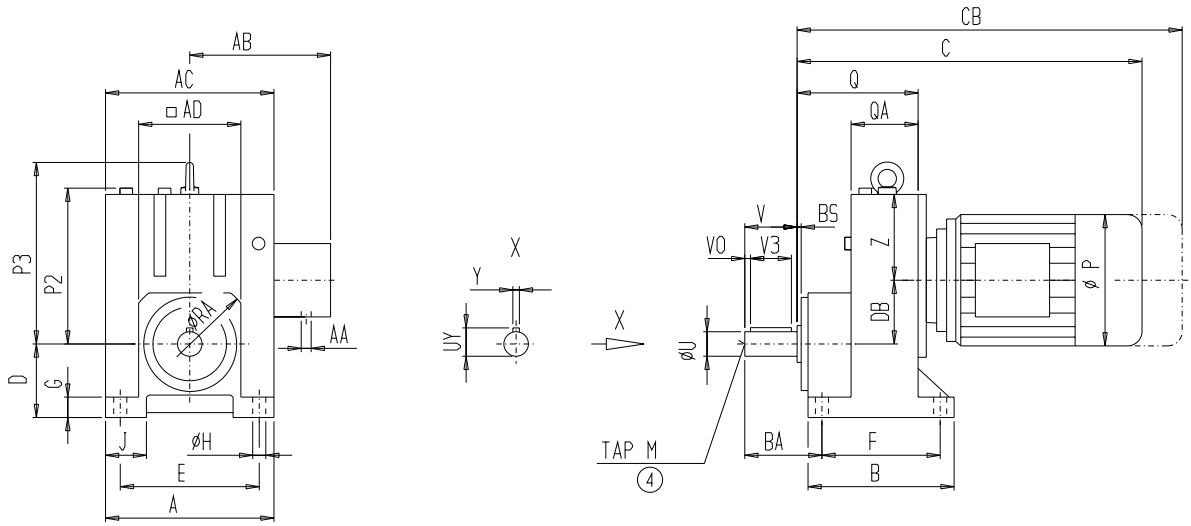
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

E 68

E 510

[mm]



Mounting

E	F	G	H	J
170	*150*	*25*	*17,5*	*40*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
31,75	*60*	*47,625*	*3,378*	*34,54*	*6,35*	*85*	*1/2"-13UNC*

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	P3	Q	QA
160	*125*	*184*	*210*	*210*	*90*	*3*	*78*	*105*	*188*	*227*	*148*	*85*

Motor

	E68					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**E68**
M71	*391*	*435*	*138*	*118,5*	*2x1/2"*	*29*
M80	*412,5*	*467,5*	*158*	*126,5*	*2x1/2"*	*31*
M90S	*453,5*	*519,5*	*176*	*150*	*2x3/4"*	*33*
M90L	*453,5*	*519,5*	*176*	*150*	*2x3/4"*	*35*
M100L	*498,5*	*570,5*	*194*	*160*	*2x3/4"*	*44*
M112M	*548*	*629*	*218*	*167,5*	*2x3/4"*	*52*
M132S	*638,5*	*739,5*	*258*	*181*	*1"+3/4"*	*64*
M132M	*638,5*	*739,5*	*258*	*181*	*1"+3/4"*	*85*
M160L	*722,5*	*839,5*	*310*	*199*	*1"+3/4"*	*101*
M160M	*722,5*	*839,5*	*310*	*199*	*1"+3/4"*	*101*

Tolerances see page 1 - 4

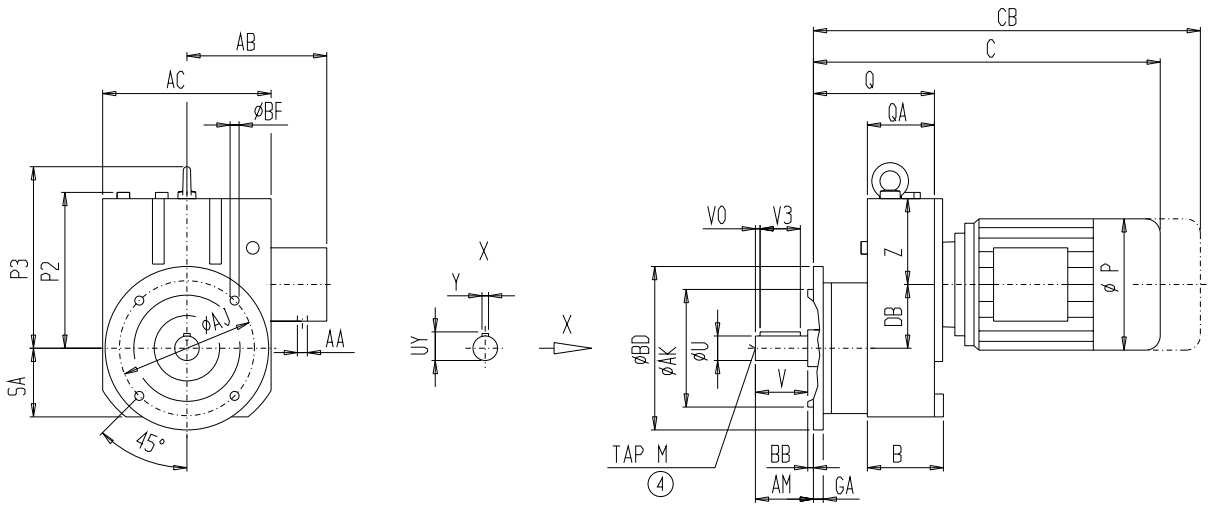
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EF 68

EF 510

[inch]



Flange

BD	AK	GA	AJ	BB	BF
7.87	5.12	0.47	6.5	0.14	0.43
9.84	7.09	0.59	8.46	0.16	0.53
11.81	9.06	0.63	10.43	0.16	0.53

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.25	2.36	1.875	0.133	1.36	0.25	2.36	1/2-13UNC

Gearcase

B	AC	SA	DB	Z	P2	P3	Q	QA
3.98	8.27	3.31	3.07	4.13	7.4	8.94	5.83	3.35

Motor

	EF68					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EF68**
M71	15.36	17.09	5.43	4.67	2x1/2"	68
M80	16.2	18.37	6.22	4.98	2x1/2"	73
M90S	17.82	20.41	6.93	5.91	2x3/4"	77
M90L	17.82	20.41	6.93	5.91	2x3/4"	82
M100L	19.59	22.42	7.64	6.3	2x3/4"	101
M112M	21.54	24.73	8.58	6.59	2x3/4"	119
M132S	25.1	29.07	10.16	7.13	1"+3/4"	146
M132M	25.1	29.07	10.16	7.13	1"+3/4"	192
M160M	28.41	33.02	12.2	7.83	1"+3/4"	227
M160L	28.41	33.02	12.2	7.83	1"+3/4"	227

Tolerances see page 1 - 4

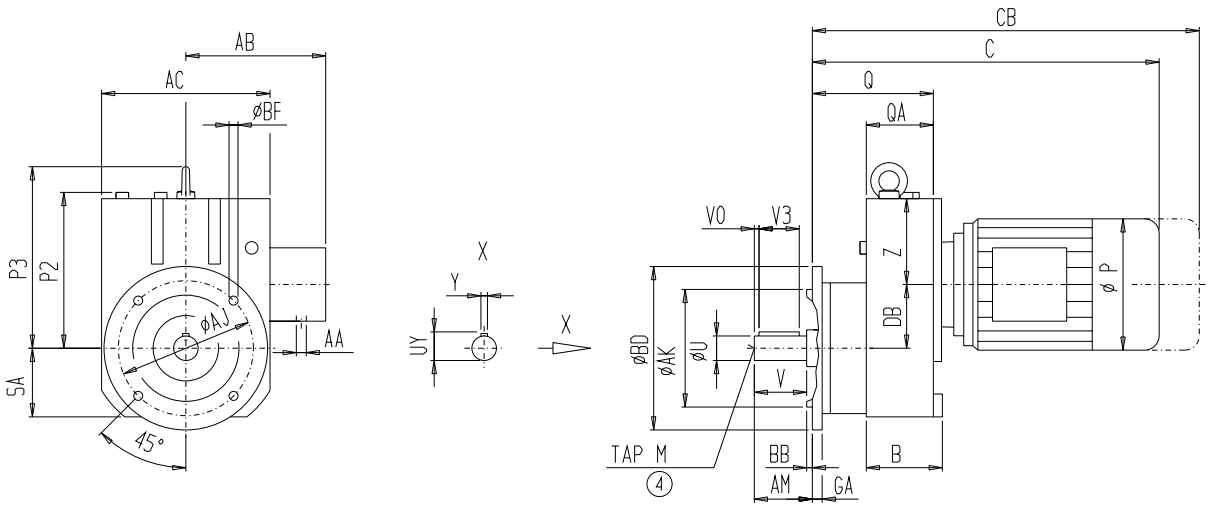
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EF 68

EF 510

[mm]



Flange

BD	AK	GA	AJ	BB	BF
200	*130*	*12*	*165*	*3,5*	*11*
250	*180*	*15*	*215*	*4*	*13,5*
300	*230*	*16*	*265*	*4*	*13,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
31,75	*60*	*47,625*	*3,378*	*34,54*	*6,35*	*60*	*1/2"-13UNC*

Gearcase

B	AC	SA	DB	Z	P2	P3	Q	QA
101	*210*	*84*	*78*	*105*	*188*	*227*	*148*	*85*

Motor

	EF68					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EF68**
M71	*391*	*435*	*138*	*118,5*	*2x1/2"*	*31*
M80	*412,5*	*467,5*	*158*	*126,5*	*2x1/2"*	*33*
M90S	*453,5*	*519,5*	*176*	*150*	*2x3/4"*	*35*
M90L	*453,5*	*519,5*	*176*	*150*	*2x3/4"*	*37*
M100L	*498,5*	*570,5*	*194*	*160*	*2x3/4"*	*46*
M112M	*548*	*629*	*218*	*167,5*	*2x3/4"*	*54*
M132S	*638,5*	*739,5*	*258*	*181*	*1"+3/4"*	*66*
M132M	*638,5*	*739,5*	*258*	*181*	*1"+3/4"*	*87*
M160L	*722,5*	*839,5*	*310*	*199*	*1"+3/4"*	*103*
M160M	*722,5*	*839,5*	*310*	*199*	*1"+3/4"*	*103*

Tolerances see page 1 - 4

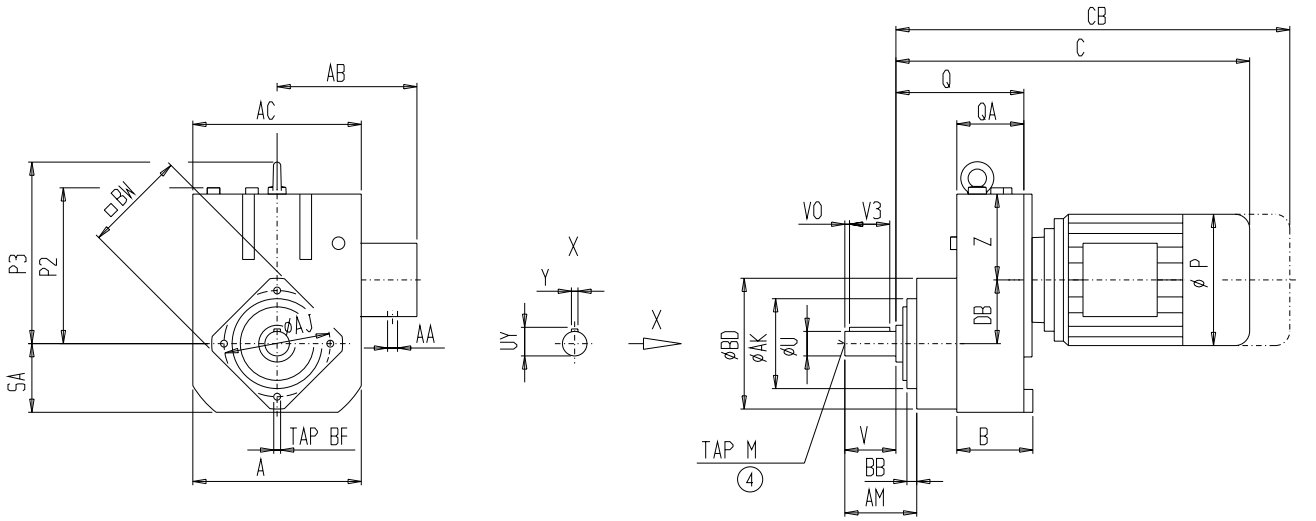
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EZ 68

EZ 510

[inch]



Flange

BD	AK	BB	AJ	TAP BF	BW
6.3	4.33	0.47	5.12	M10x16	4.92

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.25	2.36	1.875	0.133	1.36	0.25	3.03	1/2-13UNC

Gearcase

B	A	AC	SA	DB	Z	P2	P3	Q	QA
3.98	8.27	8.27	3.31	3.07	4.13	7.4	8.94	5.83	3.35

Motor

	EZ68					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EZ68**
M71	15.36	17.09	5.43	4.67	2x1/2"	57
M80	16.2	18.37	6.22	4.98	2x1/2"	62
M90S	17.82	20.41	6.93	5.91	2x3/4"	66
M90L	17.82	20.41	6.93	5.91	2x3/4"	71
M100L	19.59	22.42	7.64	6.3	2x3/4"	90
M112M	21.54	24.73	8.58	6.59	2x3/4"	110
M132S	25.1	29.07	10.16	7.13	1"+3/4"	135
M132M	25.1	29.07	10.16	7.13	1"+3/4"	181
M160M	28.41	33.02	12.2	7.83	1"+3/4"	216
M160L	28.41	33.02	12.2	7.83	1"+3/4"	216

Tolerances see page 1 - 4

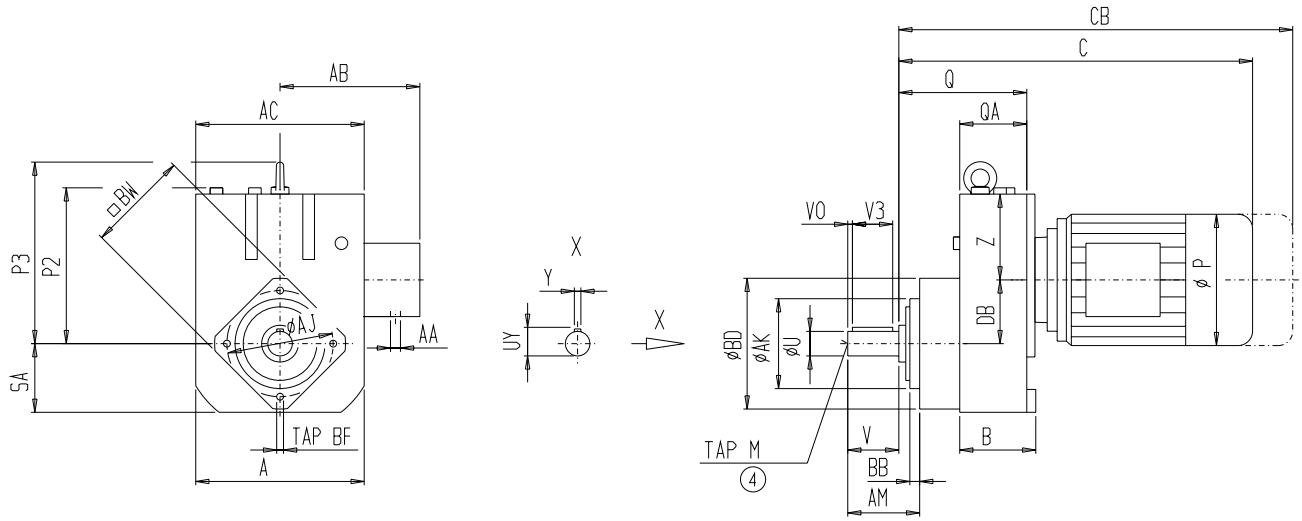
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EZ 68

EZ 510

[mm]



Flange

BD	AK	BB	AJ	TAP BF	BW
160	*110*	*12*	*130*	*M10x16*	*125*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
31,75	*60*	*47,625*	*3,378*	*34,54*	*6,35*	*77*	*1/2"-13UNC*

Gearcase

B	A	AC	SA	DB	Z	P2	P3	Q	QA
101	*210*	*210*	*84*	*78*	*105*	*188*	*227*	*148*	*85*

Motor

	EZ68					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EZ68**
M71	*391*	*435*	*138*	*118,5*	*2x1/2"*	*26*
M80	*412,5*	*467,5*	*158*	*126,5*	*2x1/2"*	*28*
M90S	*453,5*	*519,5*	*176*	*150*	*2x3/4"*	*30*
M90L	*453,5*	*519,5*	*176*	*150*	*2x3/4"*	*32*
M100L	*498,5*	*570,5*	*194*	*160*	*2x3/4"*	*41*
M112M	*548*	*629*	*218*	*167,5*	*2x3/4"*	*50*
M132S	*638,5*	*739,5*	*258*	*181*	*1"+3/4"*	*61*
M132M	*638,5*	*739,5*	*258*	*181*	*1"+3/4"*	*82*
M160L	*722,5*	*839,5*	*310*	*199*	*1"+3/4"*	*98*
M160M	*722,5*	*839,5*	*310*	*199*	*1"+3/4"*	*98*

Tolerances see page 1 - 4

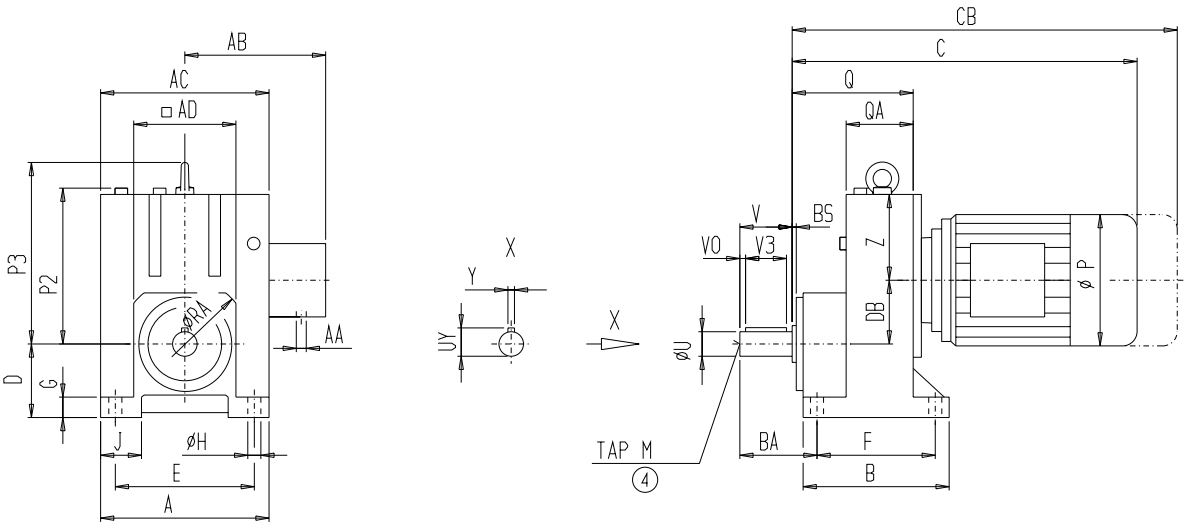
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

E 88

E 510

[inch]



Mounting

E	F	G	H	J
8.46	6.3	1.18	0.69	2.36

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1.625	3.15	2.75	0.065	1.79	0.375	4.33	5/8-11UNC

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	P3	Q	QA
7.48	6.3	8.07	10.24	10.24	3.94	0.16	3.9	5.12	9.23	11.1	6.38	3.84

Motor

	E88					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**E88**
M90S	17.78	20.37	6.93	5.91	2x3/4"	112
M90L	17.78	20.37	6.93	5.91	2x3/4"	117
M100L	19.45	22.28	7.64	6.3	2x3/4"	132
M112M	21.36	24.55	8.58	6.59	2x3/4"	152
M132S	24.93	28.9	10.16	7.13	1"+3/4"	174
M132M	24.93	28.9	10.16	7.13	1"+3/4"	221
M160M	28.28	32.89	12.2	7.83	1"+3/4"	251
M160L	28.28	32.89	12.2	7.83	1"+3/4"	282
M180M	30.32	34.96	13.7	9.69	1 1/4"+3/4"	344
M180L	30.32	34.96	13.7	9.69	1 1/4"+3/4"	359

Tolerances see page 1 - 4

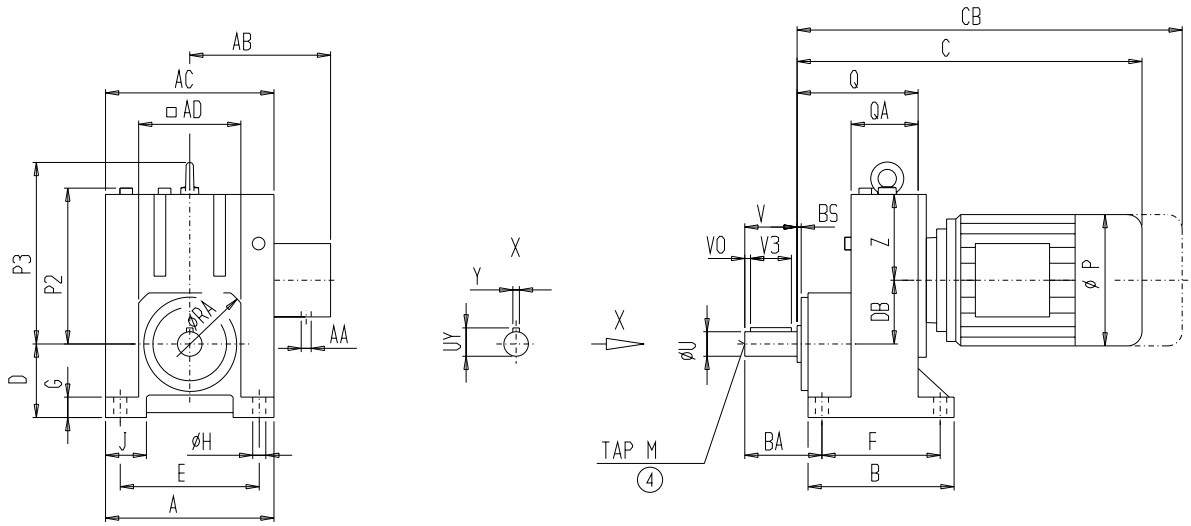
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

E 88

E 510

[mm]



Mounting

E	F	G	H	J
215	*160*	*30*	*17,5*	*60*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
41,275	*80*	*69,85*	*1,651*	*45,47*	*9,525*	*110*	*5/8"-11UNC*

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	P3	Q	QA
190	*160*	*205*	*260*	*260*	*100*	*4*	*99*	*130*	*234,5*	*282*	*162*	*97,5*

Motor

	E88					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**E88**
M90S	*452,5*	*518,5*	*176*	*150*	*2x3/4"*	*51*
M90L	*452,5*	*518,5*	*176*	*150*	*2x3/4"*	*53*
M100L	*495*	*567*	*194*	*160*	*2x3/4"*	*60*
M112M	*543,5*	*624,5*	*218*	*167,5*	*2x3/4"*	*69*
M132S	*634*	*735*	*258*	*181*	*1"+3/4"*	*79*
M132M	*634*	*735*	*258*	*181*	*1"+3/4"*	*100*
M160M	*719,5*	*836,5*	*310*	*199*	*1"+3/4"*	*114*
M160L	*719,5*	*836,5*	*310*	*199*	*1"+3/4"*	*128*
M180M	*727,5*	*845,5*	*348*	*246*	*1 1/4"+3/4"*	*156*
M180L	*727,5*	*845,5*	*348*	*246*	*1 1/4"+3/4"*	*163*
M200L	*752,5*	*882,5*	*385*	*260*	*2x3/4"*	*212*

Tolerances see page 1 - 4

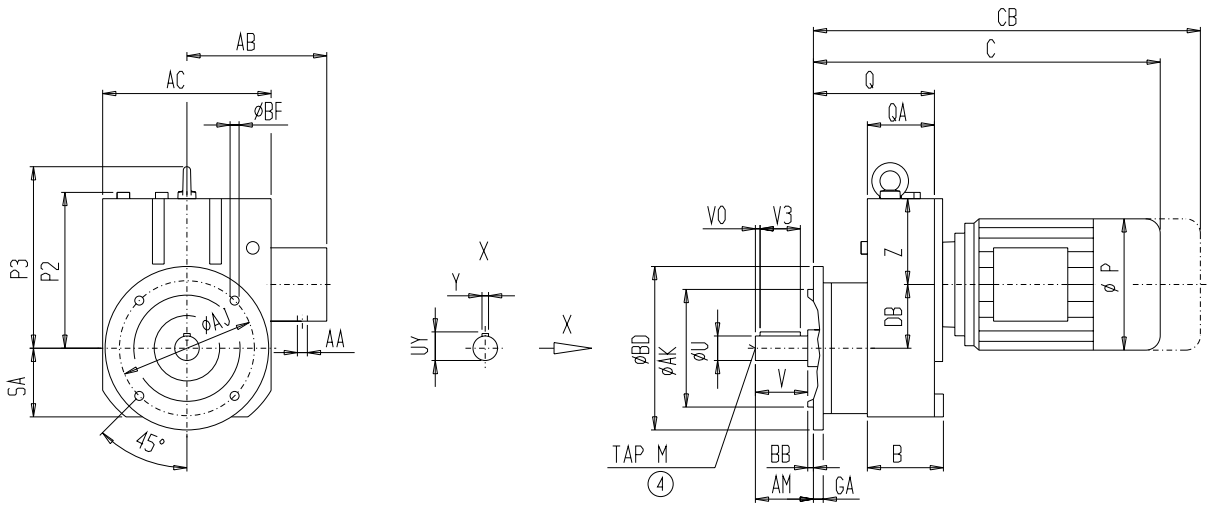
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EF 88

EF 510

[inch]



Flange

BD	AK	GA	AJ	BB	BF
9.84	7.09	0.59	8.46	0.16	0.53
11.81	9.06	0.63	10.43	0.16	0.53
13.78	9.84	0.71	11.81	0.2	0.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.625	3.15	2.75	0.065	1.79	0.375	3.15	5/8-11UNC

Gearcase

B	AC	SA	DB	Z	P2	P3	Q	QA
4.35	10.24	4.13	3.9	5.12	9.23	11.1	6.38	3.84

Motor.

	EF88					Weight [lb]
Motor	C	CB	P	AB	AA	EF88
M90S	17.78	20.37	6.93	5.91	2x3/4"	115
M90L	17.78	20.37	6.93	5.91	2x3/4"	119
M100L	19.45	22.28	7.64	6.3	2x3/4"	137
M112M	21.36	24.55	8.58	6.59	2x3/4"	157
M132S	24.93	28.9	10.16	7.13	1"+3/4"	179
M132M	24.93	28.9	10.16	7.13	1"+3/4"	225
M160M	28.28	32.89	12.2	7.83	1"+3/4"	256
M160L	28.28	32.89	12.2	7.83	1"+3/4"	287
M180M	30.32	34.96	13.7	9.69	1 1/4"+3/4"	348
M180L	30.32	34.96	13.7	9.69	1 1/4"+3/4"	364

Tolerances see page 1 - 4

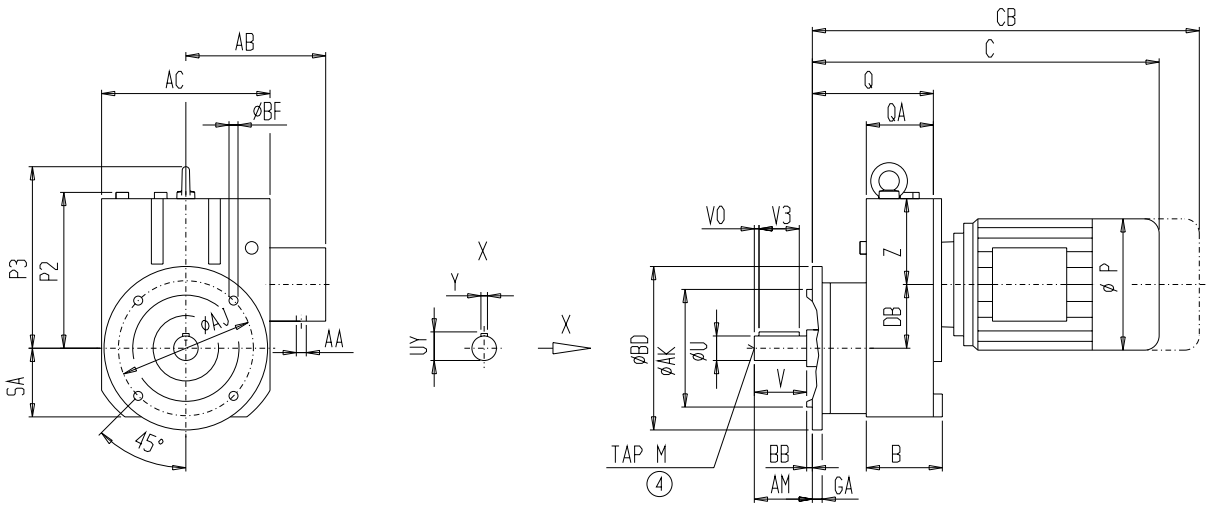
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EF 88

EF 510

[mm]



Flange

BD	AK	GA	AJ	BB	BF
250	*180*	*15*	*215*	*4*	*13,5*
300	*230*	*16*	*265*	*4*	*13,5*
350	*250*	*18*	*300*	*5*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
41,275	*80*	*69,85*	*1,651*	*45,47*	*9,525*	*80*	*5/8"-11UNC*

Gearcase

B	AC	SA	DB	Z	P2	P3	Q	QA
110,5	*260*	*105*	*99*	*130*	*234,5*	*282*	*162*	*97,5*

Motor

	EF88					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EF88**
M90S	*452,5*	*518,5*	*176*	*150*	*2x3/4"*	*52*
M90L	*452,5*	*518,5*	*176*	*150*	*2x3/4"*	*54*
M100L	*495*	*567*	*194*	*160*	*2x3/4"*	*62*
M112M	*543,5*	*624,5*	*218*	*167,5*	*2x3/4"*	*71*
M132S	*634*	*735*	*258*	*181*	*1"+3/4"*	*81*
M132M	*634*	*735*	*258*	*181*	*1"+3/4"*	*102*
M160M	*719,5*	*836,5*	*310*	*199*	*1"+3/4"*	*116*
M160L	*719,5*	*836,5*	*310*	*199*	*1"+3/4"*	*130*
M180M	*727,5*	*845,5*	*348*	*246*	*1 1/4"+3/4"*	*158*
M180L	*727,5*	*845,5*	*348*	*246*	*1 1/4"+3/4"*	*165*
M200L	*752,5*	*882,5*	*385*	*260*	*2x3/4"*	*214*

Tolerances see page 1 - 4

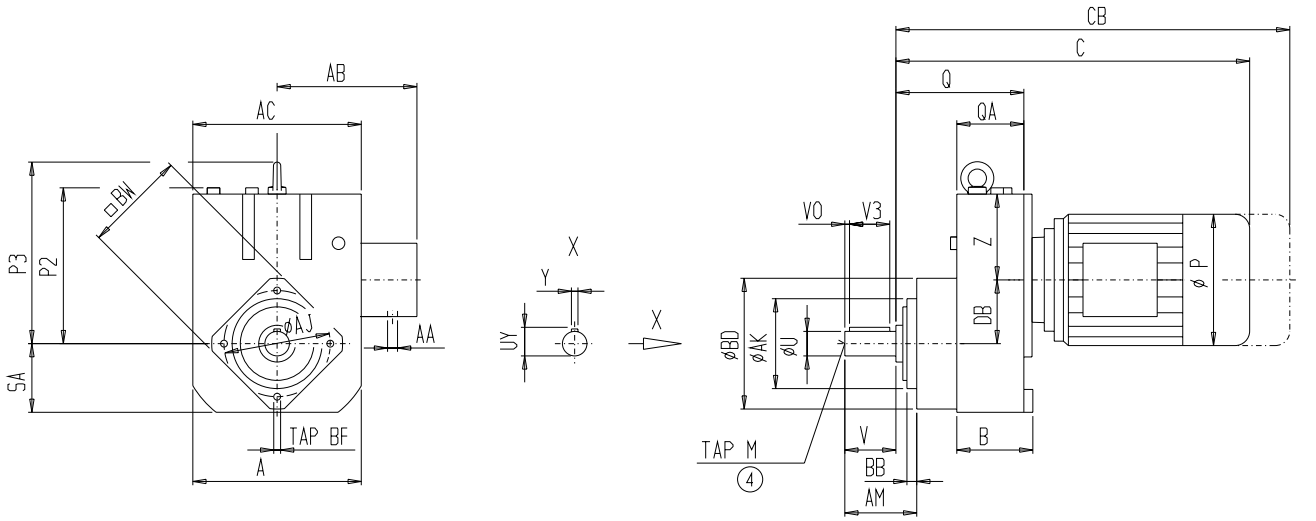
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EZ 88

EZ 510

[inch]



3

Flange

BD	AK	BB	AJ	TAP BF	BW
7.48	5.12	0.43	6.5	M12x17	6.3

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.625	3.15	2.75	0.065	1.79	0.375	3.86	5/8-11UNC

Gearcase

B	A	AC	SA	DB	Z	P2	P3	Q	QA
4.35	10.24	10.24	4.13	3.9	5.12	9.23	11.1	6.38	3.84

Motor

	EZ88					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EZ88**
M90S	17.78	20.37	6.93	5.91	2x3/4"	101
M90L	17.78	20.37	6.93	5.91	2x3/4"	106
M100L	19.45	22.28	7.64	6.3	2x3/4"	121
M112M	21.36	24.55	8.58	6.59	2x3/4"	141
M132S	24.93	28.9	10.16	7.13	1"+3/4"	163
M132M	24.93	28.9	10.16	7.13	1"+3/4"	209
M160M	28.28	32.89	12.2	7.83	1"+3/4"	240
M160L	28.28	32.89	12.2	7.83	1"+3/4"	271
M180M	30.32	34.96	13.7	9.69	1 1/4"+3/4"	333
M180L	30.32	34.96	13.7	9.69	1 1/4"+3/4"	348

Tolerances see page 1 - 4

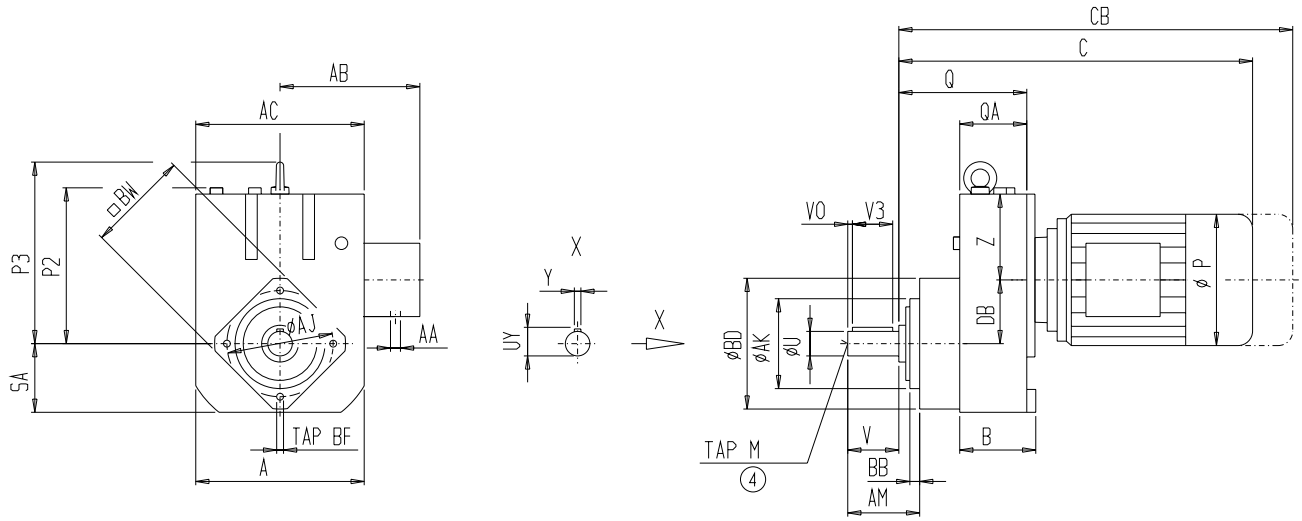
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

EZ 88

EZ 510

[mm]



Flange

BD	AK	BB	AJ	TAP BF	BW
190	*130*	*11*	*165*	*M12x17*	*160*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
41,275	*80*	*69,85*	*1,651*	*45,47*	*9,525*	*98*	*5/8"-11UNC*

Gearcase

B	A	AC	SA	DB	Z	P2	P3	Q	QA
110,5	*260*	*260*	*105*	*99*	*130*	*234,5*	*282*	*162*	*97,5*

Motor

	EZ88					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**EZ88**
M90S	*452,5*	*518,5*	*176*	*150*	*2x3/4"*	*46*
M90L	*452,5*	*518,5*	*176*	*150*	*2x3/4"*	*48*
M100L	*495*	*567*	*194*	*160*	*2x3/4"*	*55*
M112M	*543,5*	*624,5*	*218*	*167,5*	*2x3/4"*	*64*
M132S	*634*	*735*	*258*	*181*	*1"+3/4"*	*74*
M132M	*634*	*735*	*258*	*181*	*1"+3/4"*	*95*
M160M	*719,5*	*836,5*	*310*	*199*	*1"+3/4"*	*109*
M160L	*719,5*	*836,5*	*310*	*199*	*1"+3/4"*	*123*
M180M	*727,5*	*845,5*	*348*	*246*	*1 1/4"+3/4"*	*151*
M180L	*727,5*	*845,5*	*348*	*246*	*1 1/4"+3/4"*	*158*
M200L	*752,5*	*882,5*	*385*	*260*	*2x3/4"*	*207*

Tolerances see page 1 - 4

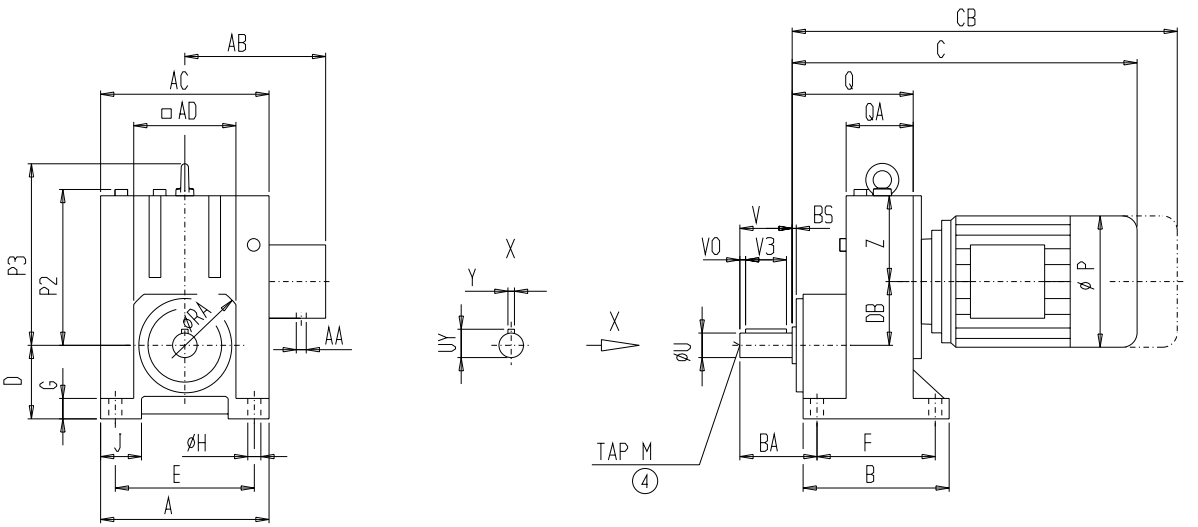
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

E 108

E 510

[inch]



Mounting

E	F	G	H	J
9.84	7.28	1.38	0.87	2.56

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
2.125	3.94	3.5	0.043	2.35	0.5	5.51	3/4-10UNC

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	P3	Q	QA
9.45	7.48	9.45	12.05	12.05	4.41	0.16	4.76	6.18	10.98	13.23	7.32	4.53

Motor

	E108						Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**E108**
M90S	18.27	20.86	6.93	5.91	5.91	2x3/4"	161
M90L	18.27	20.86	6.93	5.91	5.91	2x3/4"	165
M100L	19.92	22.75	7.64	6.3	6.3	2x3/4"	183
M112M	21.85	25.04	8.58	6.59	6.59	2x3/4"	201
M132S	25.38	29.35	10.16	7.13	7.13	1"+3/4"	221
M132M	25.38	29.35	10.16	7.13	7.13	1"+3/4"	267
M160M	28.77	33.38	12.2	7.83	7.83	1"+3/4"	298
M160L	28.77	33.38	12.2	7.83	7.83	1"+3/4"	329
M180M	30.74	35.39	13.7	9.69	9.69	1 1/4"+3/4"	381
M180L	30.74	35.39	13.7	9.69	9.69	1 1/4"+3/4"	397
M200L	31.73	36.85	15.16	10.24	10.24	1 1/4"+3/4"	505
LG225S incl.adapter	42.56	on request	17.4	12.8	on request	2x1 1/2“	943
LG225ZM incl.adapter	43.74	on request	17.4	12.8	on request	2x1 1/2“	1032

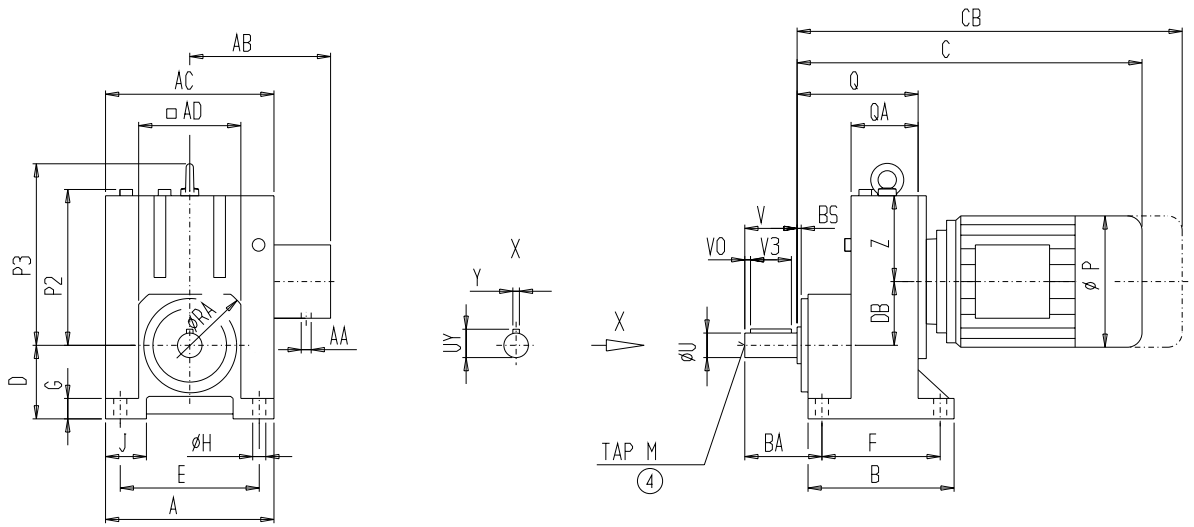
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

E 108

E 510

[mm]



Mounting

E	F	G	H	J
250	*185*	*35*	*22*	*65*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
53,975	*100*	*88,9*	*1,092*	*59,69*	*12,7*	*140*	*3/4"-10UNC*

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	P3	Q	QA
240	190	240	306	306	112	4	121	157	279	336	186	115

Motor

	E108						Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**E108**
M90S	*465*	*531*	*176*	*150*	*150*	*2x3/4"*	*73*
M90L	*465*	*531*	*176*	*150*	*150*	*2x3/4"*	*75*
M100L	*507*	*579*	*194*	*160*	*160*	*2x3/4"*	*83*
M112M	*556*	*637*	*218*	*167,5*	*167,5*	*2x3/4"*	*91*
M132S	*645,5*	*746,5*	*258*	*181*	*181*	*1"+3/4"*	*100*
M132M	*645,5*	*746,5*	*258*	*181*	*181*	*1"+3/4"*	*121*
M160M	*732*	*849*	*310*	*199*	*199*	*1"+3/4"*	*135*
M160L	*732*	*849*	*310*	*199*	*199*	*1"+3/4"*	*149*
M180M	*782*	*900*	*348*	*246*	*246*	*1 1/4"+3/4"*	*173*
M180L	*782*	*900*	*348*	*246*	*246*	*1 1/4"+3/4"*	*180*
M200L	*807*	*937*	*385*	*260*	*260*	*1 1/4"+3/4"*	*229*
LG225S incl.adapter	*1081*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*428*
LG225ZM incl.adapter	*1111*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*468*

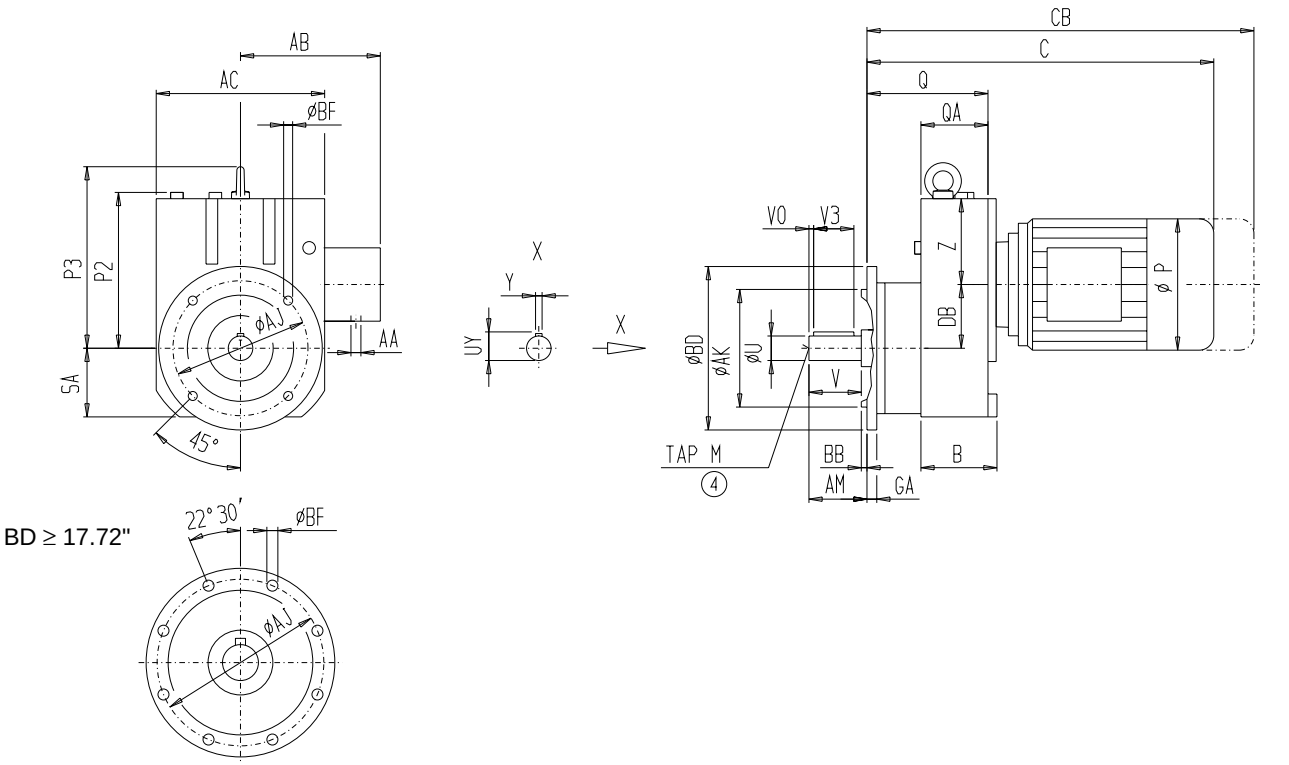
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EF 108

EF 510

[inch]



Flange

BD	AK	GA	AJ	BB	BF
11.81	9.06	0.63	10.43	0.16	0.53
13.78	9.84	0.71	11.81	0.2	0.69
17.72	13.78	0.87	15.75	0.2	0.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.125	3.94	3.5	0.043	2.35	0.5	3.94	3/4-10UNC

Gearcase

B	AC	SA	DB	Z	P2	P3	Q	QA
5.16	12.05	4.92	4.76	6.18	10.98	13.35	7.32	4.53

Motor

	EF108						Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EF108**
M90S	18.27	20.86	6.93	5.91	5.91	2x3/4"	181
M90L	18.27	20.86	6.93	5.91	5.91	2x3/4"	185
M100L	19.92	22.75	7.64	6.3	6.3	2x3/4"	203
M112M	21.85	25.04	8.58	6.59	6.59	2x3/4"	221
M132S	25.38	29.35	10.16	7.13	7.13	1"+3/4"	243
M132M	25.38	29.35	10.16	7.13	7.13	1"+3/4"	289
M160M	28.77	33.38	12.2	7.83	7.83	1"+3/4"	318
M160L	28.77	33.38	12.2	7.83	7.83	1"+3/4"	348
M180M	30.74	35.39	13.7	9.69	9.69	1 1/4"+3/4"	401
M180L	30.74	35.39	13.7	9.69	9.69	1 1/4"+3/4"	417
M200L	31.73	36.85	15.16	10.24	10.24	1 1/4"+3/4"	525
LG225S incl.adapter	42.56	on request	17.4	12.8	on request	2x1 1/2“	964
LG225ZM incl.adapter	43.74	on request	17.4	12.8	on request	2x1 1/2“	1052

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

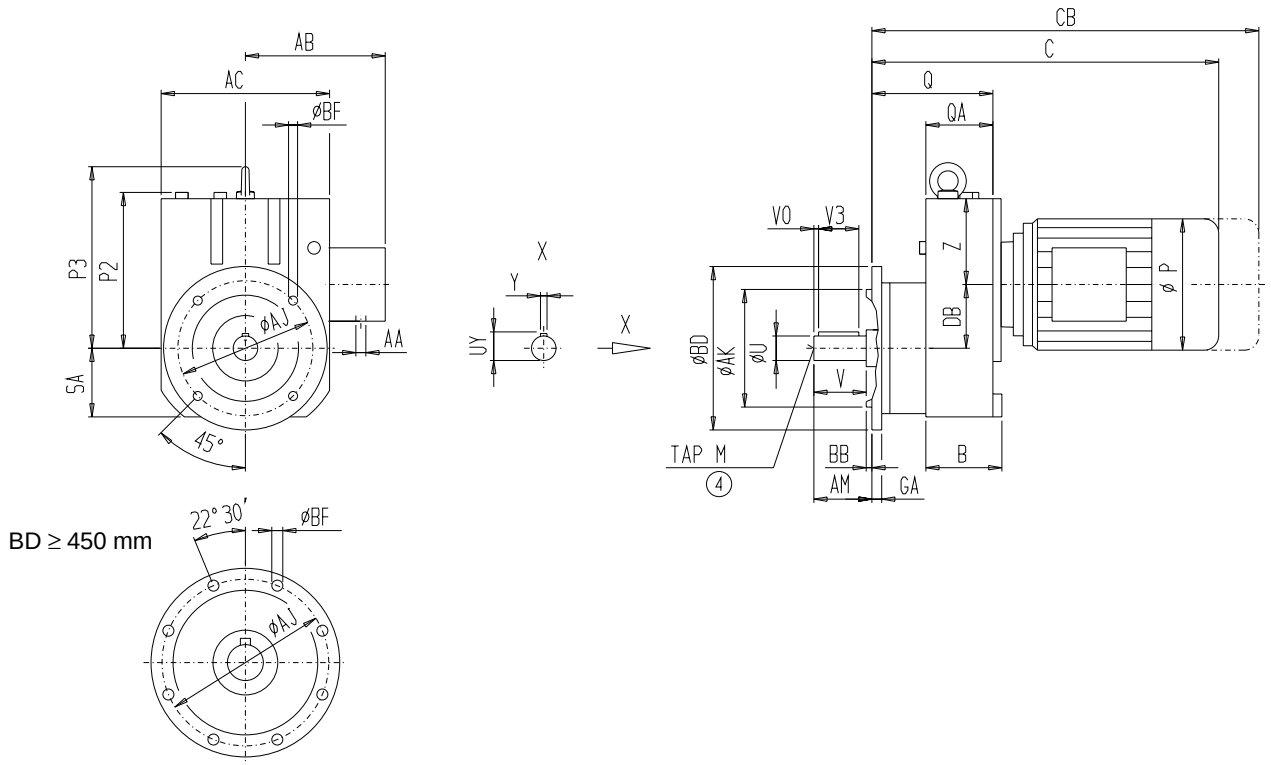
** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EF 108

EF 510

[mm]



3

Flange

BD	AK	GA	AJ	BB	BF
300	*230*	*16*	*265*	*4*	*13,5*
350	*250*	*18*	*300*	*5*	*17,5*
450	*350*	*22*	*400*	*5*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
53,975	*100*	*88,9*	*1,092*	*59,69*	*12,7*	*100*	*3/4"-10UNC*

Gearcase

B	AC	SA	DB	Z	P2	P3	Q	QA
131	*306*	*125*	*121*	*157*	*279*	*339*	*186*	*115*

Motor

	EF108						Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EF108**
M90S	*465*	*531*	*176*	*150*	*150*	*2x3/4"*	*82*
M90L	*465*	*531*	*176*	*150*	*150*	*2x3/4"*	*84*
M100L	*507*	*579*	*194*	*160*	*160*	*2x3/4"*	*92*
M112M	*556*	*637*	*218*	*167,5*	*167,5*	*2x3/4"*	*100*
M132S	*645,5*	*746,5*	*258*	*181*	*181*	*1"+3/4"*	*110*
M132M	*645,5*	*746,5*	*258*	*181*	*181*	*1"+3/4"*	*131*
M160M	*732*	*849*	*310*	*199*	*199*	*1"+3/4"*	*144*
M160L	*732*	*849*	*310*	*199*	*199*	*1"+3/4"*	*158*
M180M	*782*	*900*	*348*	*246*	*246*	*1 1/4"+3/4"*	*182*
M180L	*782*	*900*	*348*	*246*	*246*	*1 1/4"+3/4"*	*189*
M200L	*807*	*937*	*385*	*260*	*260*	*1 1/4"+3/4"*	*238*
LG225S incl.adapter	*1081*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*437*
LG225ZM incl.adapter	*1111*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*477*

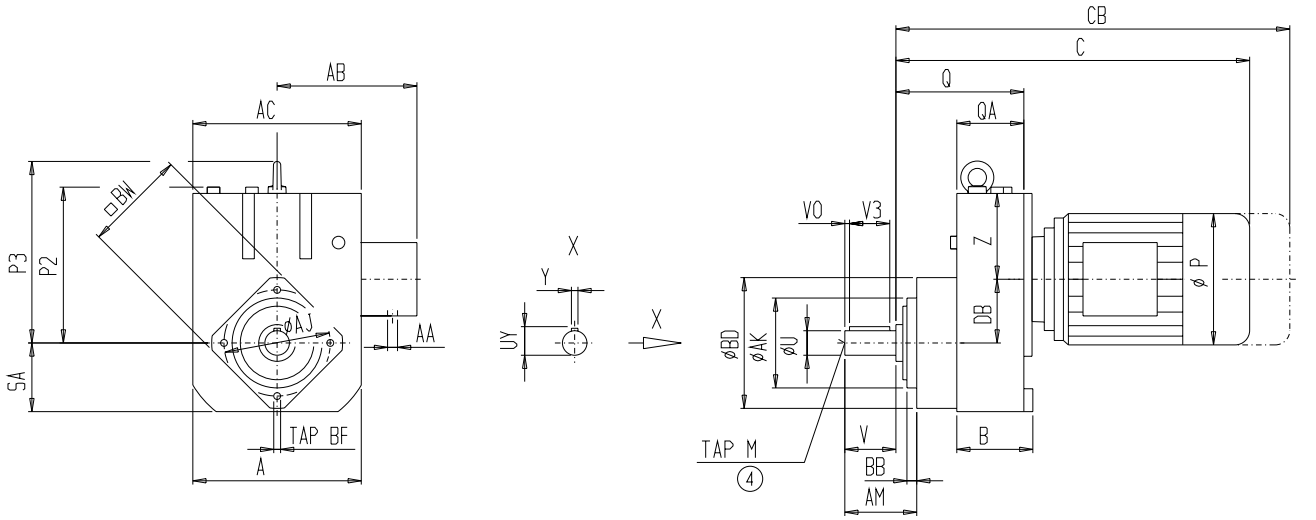
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EZ 108

EZ 510

[inch]



3

Flange

BD	AK	BB	AJ	TAP BF	BW
9.84	7.09	0.59	8.46	M16x25	7.87

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.125	3.94	3.5	0.043	2.35	0.5	4.8	3/4-10UNC

Gearcase

B	A	AC	SA	DB	Z	P2	P3	Q	QA
5.16	12.05	12.05	4.92	4.76	6.18	10.98	13.35	7.32	4.53

Motor

	EZ108						Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EZ108**
M90S	18.27	20.86	6.93	5.91	5.91	2x3/4"	146
M90L	18.27	20.86	6.93	5.91	5.91	2x3/4"	150
M100L	19.92	22.75	7.64	6.3	6.3	2x3/4"	168
M112M	21.85	25.04	8.58	6.59	6.59	2x3/4"	185
M132S	25.38	29.35	10.16	7.13	7.13	1"+3/4"	205
M132M	25.38	29.35	10.16	7.13	7.13	1"+3/4"	251
M160M	28.77	33.38	12.2	7.83	7.83	1"+3/4"	282
M160L	28.77	33.38	12.2	7.83	7.83	1"+3/4"	313
M180M	30.74	35.39	13.7	9.69	9.69	1 1/4"+3/4"	366
M180L	30.74	35.39	13.7	9.69	9.69	1 1/4"+3/4"	381
M200L	31.73	36.85	15.16	10.24	10.24	1 1/4"+3/4"	490
LG225S incl.adapter	42.56	on request	17.4	12.8	on request	2x1 1/2“	928
LG225ZM incl.adapter	43.74	on request	17.4	12.8	on request	2x1 1/2“	1017

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

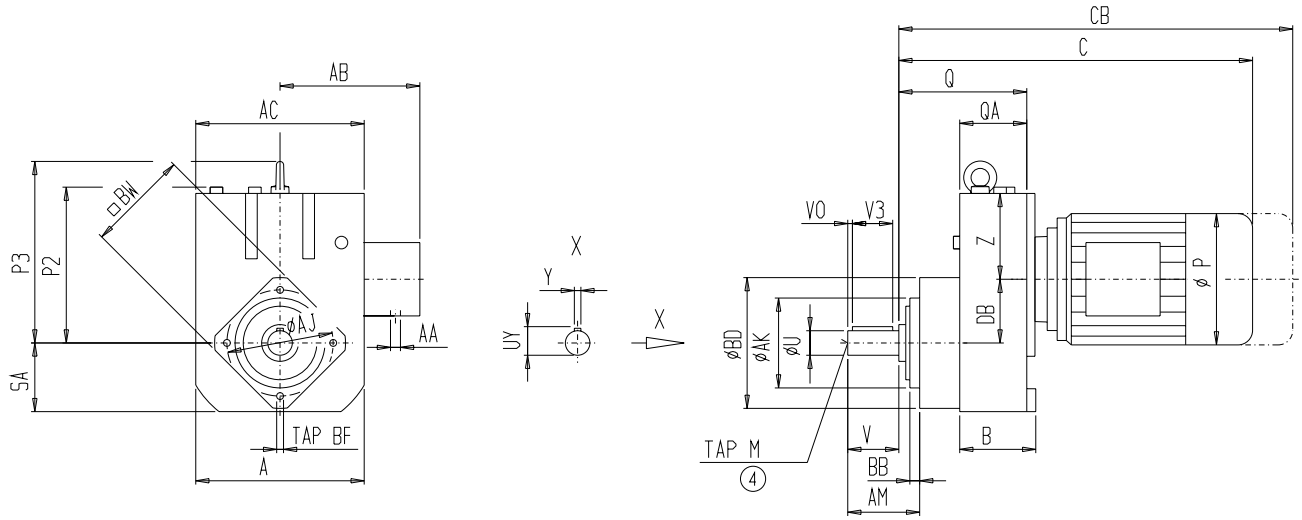
** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EZ 108

EZ 510

[mm]



Flange

BD	AK	BB	AJ	TAP BF	BW
250	*180*	*15*	*215*	*M16x25*	*200*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
53,975	*100*	*88,9*	*1,092*	*59,69*	*12,7*	*122*	*3/4"-10UNC*

Gearcase

B	A	AC	SA	DB	Z	P2	P3	Q	QA
131	*306*	*306*	*125*	*121*	*157*	*279*	*339*	*186*	*115*

Motor

	EZ108						Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EZ108**
M90S	*465*	*531*	*176*	*150*	*150*	*2x3/4"*	*66*
M90L	*465*	*531*	*176*	*150*	*150*	*2x3/4"*	*68*
M100L	*507*	*579*	*194*	*160*	*160*	*2x3/4"*	*76*
M112M	*556*	*637*	*218*	*167,5*	*167,5*	*2x3/4"*	*84*
M132S	*645,5*	*746,5*	*258*	*181*	*181*	*1"+3/4"*	*93*
M132M	*645,5*	*746,5*	*258*	*181*	*181*	*1"+3/4"*	*114*
M160M	*732*	*849*	*310*	*199*	*199*	*1"+3/4"*	*128*
M160L	*732*	*849*	*310*	*199*	*199*	*1"+3/4"*	*142*
M180M	*782*	*900*	*348*	*246*	*246*	*1 1/4"+3/4"*	*166*
M180L	*782*	*900*	*348*	*246*	*246*	*1 1/4"+3/4"*	*173*
M200L	*807*	*937*	*385*	*260*	*260*	*1 1/4"+3/4"*	*222*
LG225S incl.adapter	*1081*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*421*
LG225ZM incl.adapter	*1111*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*461*

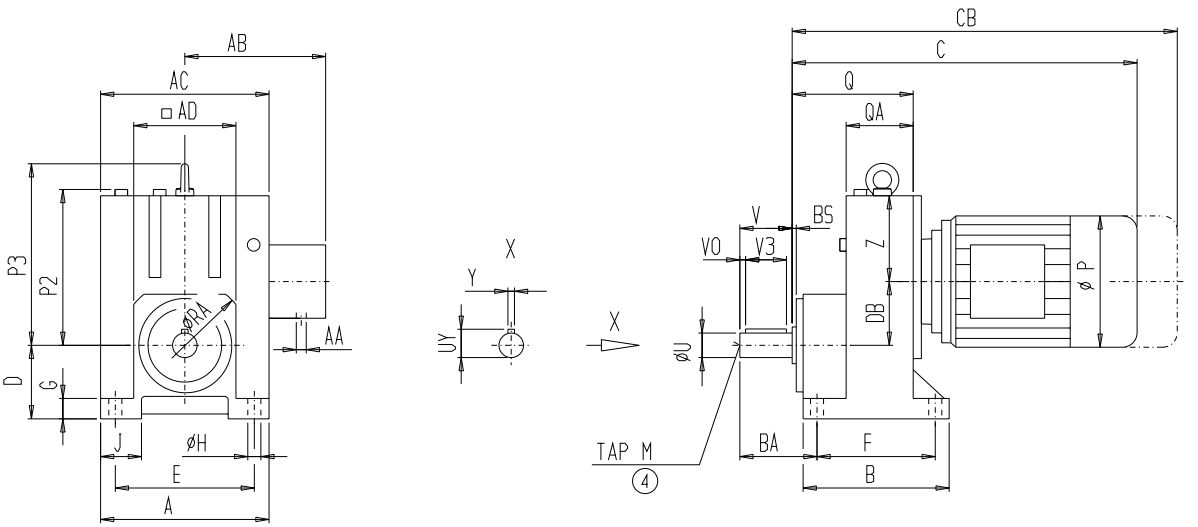
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 * incl.adapter ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

E 128

E 510

[inch]



Mounting

E	F	G	H	J
12.2	8.27	1.77	0.87	2.76

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
2.375	4.72	4.25	0.081	2.65	0.625	5.98	3/4-10UNC

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	P3	Q	QA
11.81	9.84	10.24	14.57	14.57	5.51	0.16	5.35	7.28	12.83	15.28	8.54	5.12

Motor

	E128						Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**E128**
M100L	20.77	23.6	7.64	6.3	6.3	2x3/4"	267
M112M	22.66	25.85	8.58	6.59	6.59	2x3/4"	284
M132S	26.19	30.16	10.16	7.13	7.13	1"+3/4"	302
M132M	26.19	30.16	10.16	7.13	7.13	1"+3/4"	348
M160M	29.35	33.96	12.2	7.83	7.83	1"+3/4"	388
M160L	29.35	33.96	12.2	7.83	7.83	1"+3/4"	419
M180M	31.43	36.08	13.7	9.69	9.69	1 1/4"+3/4"	452
M180L	31.43	36.08	13.7	9.69	9.69	1 1/4"+3/4"	467
M200L	32.42	37.54	15.16	10.24	10.24	1 1/4"+3/4"	576
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl.adapter	55.62	on request	19.49	15.43	on request	2x2“	1702

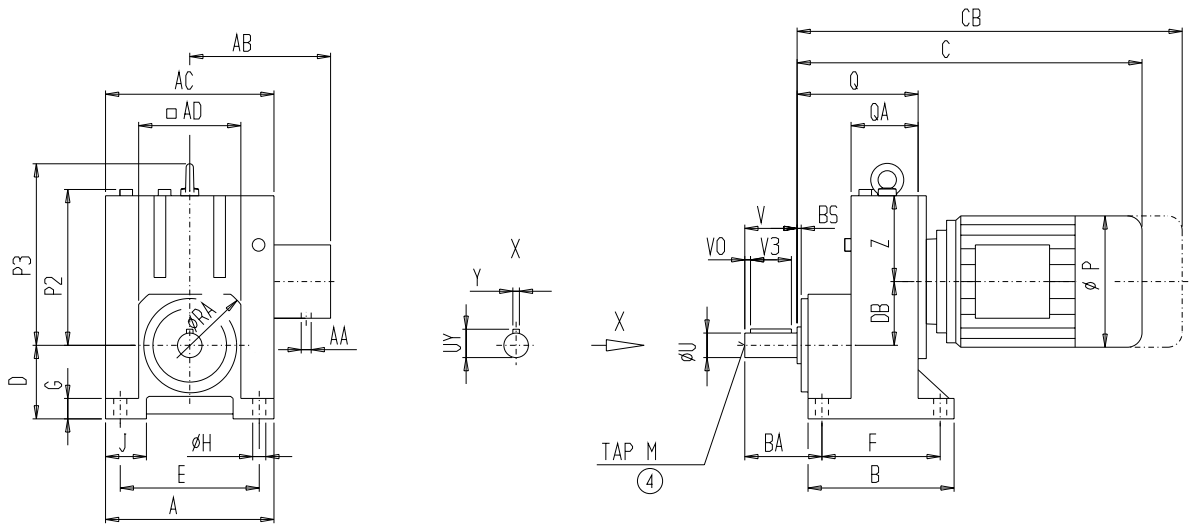
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

E 128

E 510

[mm]



Mounting

E	F	G	H	J
310	*210*	*45*	*22*	*70*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
60,325	*120*	*107,95*	*2,057*	*67,31*	*15,875*	*152*	*3/4"-10UNC*

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	P3	Q	QA
300	*250*	*260*	*370*	*370*	*140*	*4*	*136*	*185*	*326*	*388*	*217*	*130*

Motor

	E128						Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**E128**
M100L	*528,5*	*600,5*	*194*	*160*	*160*	*2x3/4"*	*121*
M112M	*576,5*	*657,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*129*
M132S	*666*	*767*	*258*	*181*	*181*	*1"+3/4"*	*137*
M132M	*666*	*767*	*258*	*181*	*181*	*1"+3/4"*	*158*
M160M	*746,5*	*863,5*	*310*	*199*	*199*	*1"+3/4"*	*176*
M160L	*746,5*	*863,5*	*310*	*199*	*199*	*1"+3/4"*	*190*
M180M	*799,5*	*917,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*205*
M180L	*799,5*	*917,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*212*
M200L	*824,5*	*954,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*261*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl.adapter	*1196*	*on request*	*495*	*392*	*on request*	*2x2"*	*772*

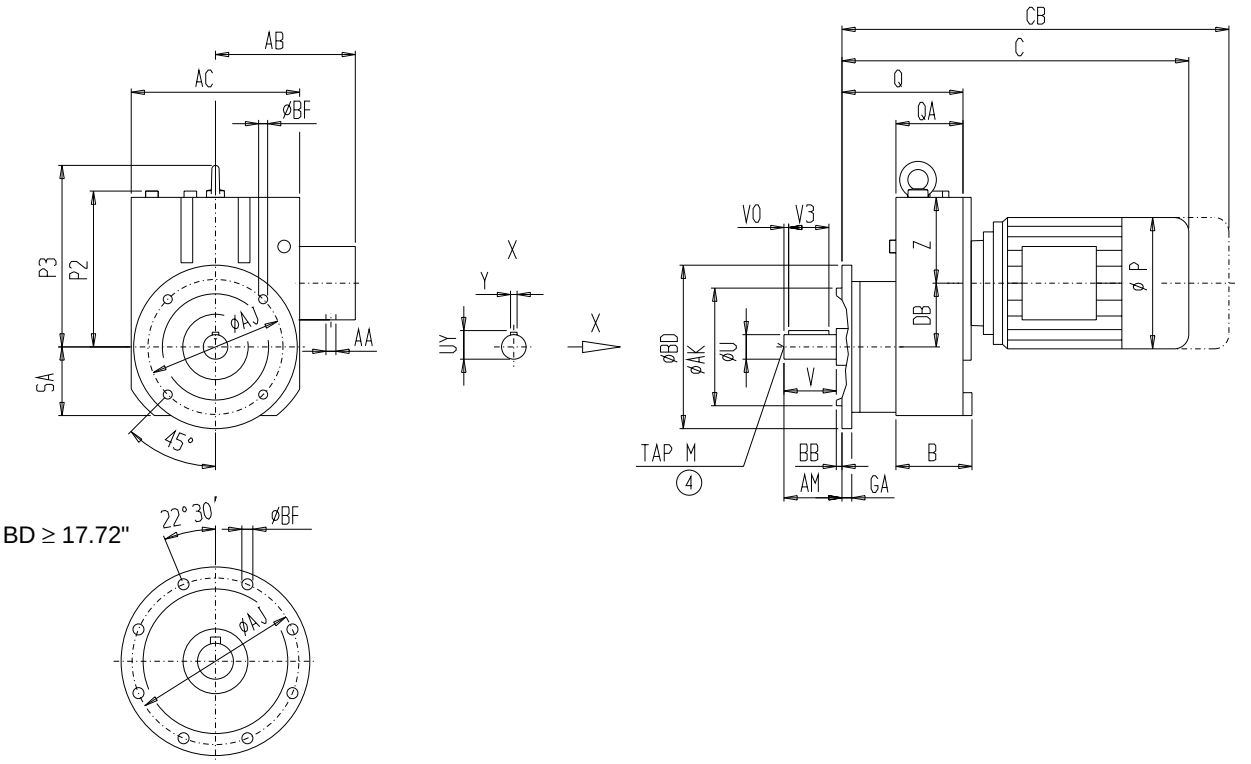
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EF 128

EF 510

[inch]



Flange

BD	AK	GA	AJ
13.78	9.84	0.71	11.81
17.72	13.78	0.87	15.75

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.375	4.72	4.25	0.081	2.65	0.625	4.72	3/4-10UNC

Gearcase

B	BB	AC	SA	DB	Z	P2	P3	Q	QA	BF
5.35	0.2	14.57	5.91	5.35	7.28	12.83	15.28	8.54	5.12	0.69

Motor

	EF128						Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EF128**
M100L	20.77	23.6	7.64	6.3	6.3	*2x3/4"*	278
M112M	22.66	25.85	8.58	6.59	6.59	*2x3/4"*	295
M132S	26.19	30.16	10.16	7.13	7.13	*1"+3/4"*	311
M132M	26.19	30.16	10.16	7.13	7.13	*1"+3/4"*	357
M160M	29.35	33.96	12.2	7.83	7.83	*1"+3/4"*	399
M160L	29.35	33.96	12.2	7.83	7.83	*1"+3/4"*	430
M180M	31.43	36.08	13.7	9.69	9.69	*1 1/4"+3/4"*	463
M180L	31.43	36.08	13.7	9.69	9.69	*1 1/4"+3/4"*	478
M200L	32.42	37.54	15.16	10.24	10.24	*1 1/4"+3/4"*	587
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl.adapter	55.62	on request	19.49	15.43	on request	2x2“	1713

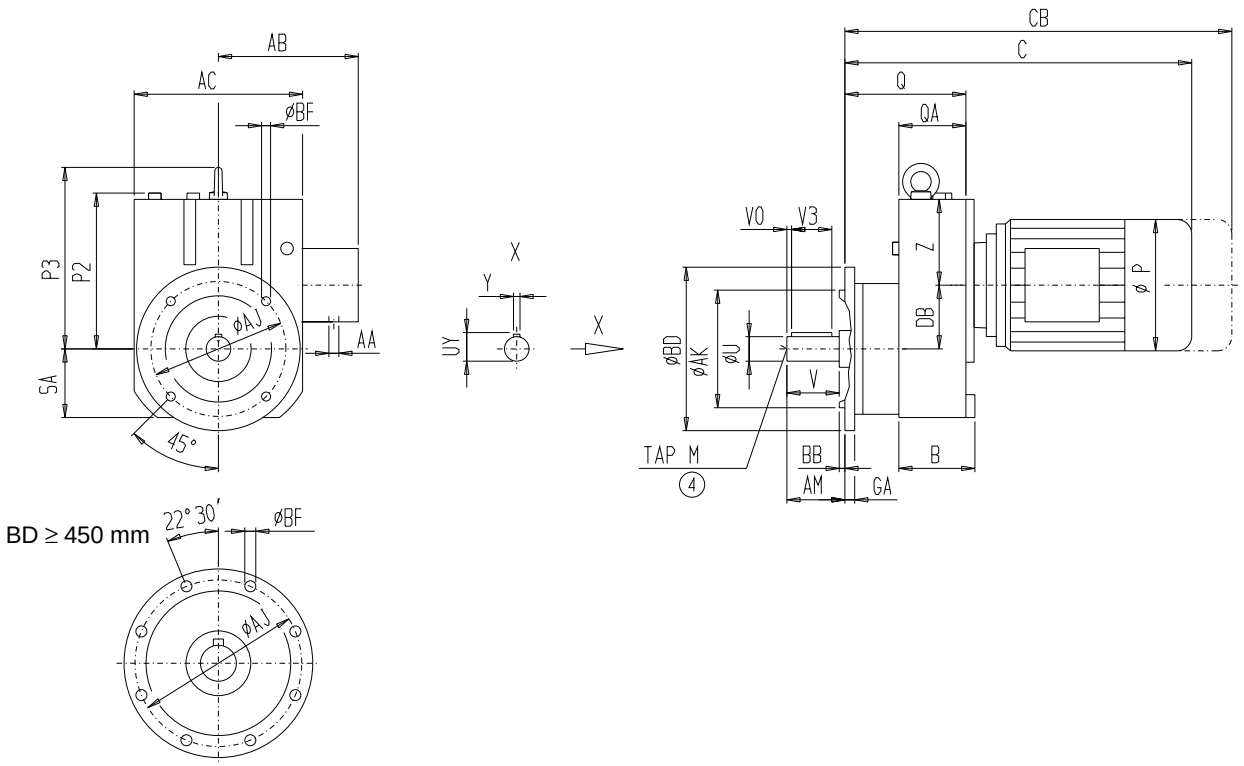
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EF 128

EF 510

[mm]



Flange

BD	AK	GA	AJ
350	*250*	*18*	*300*
450	*350*	*22*	*400*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
60,325	*120*	*107,95*	*2,057*	*67,31*	*15,875*	*120*	*3/4"-10UNC*

Gearcase

B	BB	AC	SA	DB	Z	P2	P3	Q	QA	BF
136	*5*	*370*	*150*	*136*	*185*	*326*	*388*	*217*	*130*	*17,5*

Motor

	EF128						Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EF128**
M100L	*528,5*	*600,5*	*194*	*160*	*160*	*2x3/4"*	*126*
M112M	*576,5*	*657,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*134*
M132S	*666*	*767*	*258*	*181*	*181*	*1"+3/4"*	*141*
M132M	*666*	*767*	*258*	*181*	*181*	*1"+3/4"*	*162*
M160M	*746,5*	*863,5*	*310*	*199*	*199*	*1"+3/4"*	*181*
M160L	*746,5*	*863,5*	*310*	*199*	*199*	*1"+3/4"*	*195*
M180M	*799,5*	*917,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*210*
M180L	*799,5*	*917,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*217*
M200L	*824,5*	*954,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*266*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl.adapter	*1196*	*on request*	*495*	*392*	*on request*	*2x2"*	*777*

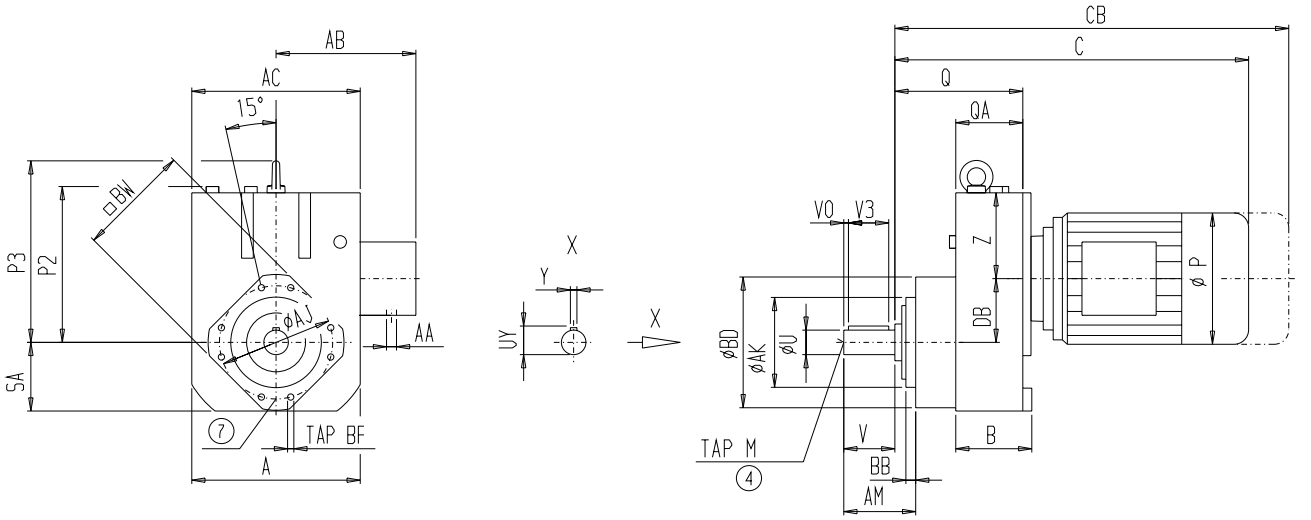
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EZ 128

EZ 510

[inch]



Flange

BD	AK	BB	AJ	TAP BF	BW
11.81	7.87	0.83	9.84	M16x28	9.84

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.375	4.72	4.25	0.081	2.65	0.625	5.83	3/4-10UNC

Gearcase

B	A	AC	SA	DB	Z	P2	P3	Q	QA
5.35	14.57	14.57	5.91	5.35	7.28	12.83	15.28	8.54	5.12

Motor

	EZ128						Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EZ128**
M100L	20.77	23.6	7.64	6.3	6.3	2x3/4"	238
M112M	22.66	25.85	8.58	6.59	6.59	2x3/4"	256
M132S	26.19	30.16	10.16	7.13	7.13	1"+3/4"	273
M132M	26.19	30.16	10.16	7.13	7.13	1"+3/4"	320
M160M	29.35	33.96	12.2	7.83	7.83	1"+3/4"	359
M160L	29.35	33.96	12.2	7.83	7.83	1"+3/4"	390
M180M	31.43	36.08	13.7	9.69	9.69	1 1/4"+3/4"	423
M180L	31.43	36.08	13.7	9.69	9.69	1 1/4"+3/4"	439
M200L	32.42	37.54	15.16	10.24	10.24	1 1/4"+3/4"	547
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl.adapter	55.62	on request	19.49	15.43	on request	2x2“	1673

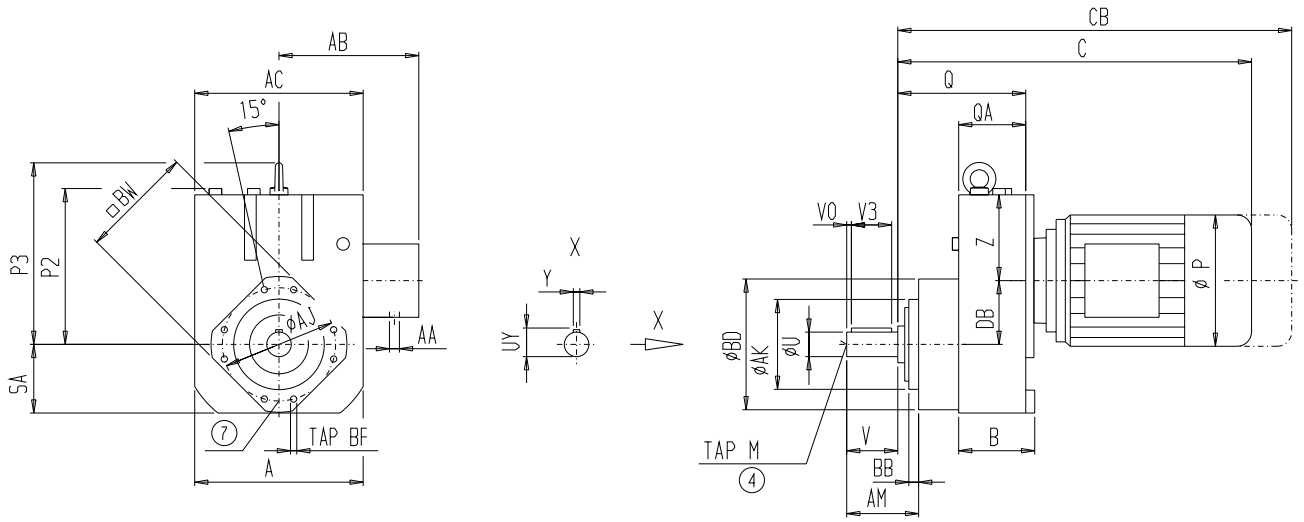
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EZ 128

EZ 510

[mm]



3

Flange

BD	AK	BB	AJ	TAP BF	BW
300	*200*	*21*	*250*	*M16x28*	*250*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
60,325	*120*	*107,95*	*2,057*	*67,31*	*15,875*	*148*	*3/4"-10UNC*

Gearcase

B	A	AC	SA	DB	Z	P2	P3	Q	QA
136	*370*	*370*	*150*	*136*	*185*	*326*	*388*	*217*	*130*

Motor

	EZ128						Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EZ128**
M100L	*528,5*	*600,5*	*194*	*160*	*160*	*2x3/4"*	*108*
M112M	*576,5*	*657,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*116*
M132S	*666*	*767*	*258*	*181*	*181*	*1"+3/4"*	*124*
M132M	*666*	*767*	*258*	*181*	*181*	*1"+3/4"*	*145*
M160M	*746,5*	*863,5*	*310*	*199*	*199*	*1"+3/4"*	*163*
M160L	*746,5*	*863,5*	*310*	*199*	*199*	*1"+3/4"*	*177*
M180M	*799,5*	*917,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*192*
M180L	*799,5*	*917,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*199*
M200L	*824,5*	*954,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*248*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl.adapter	*1196*	*on request*	*495*	*392*	*on request*	*2x2"*	*759*

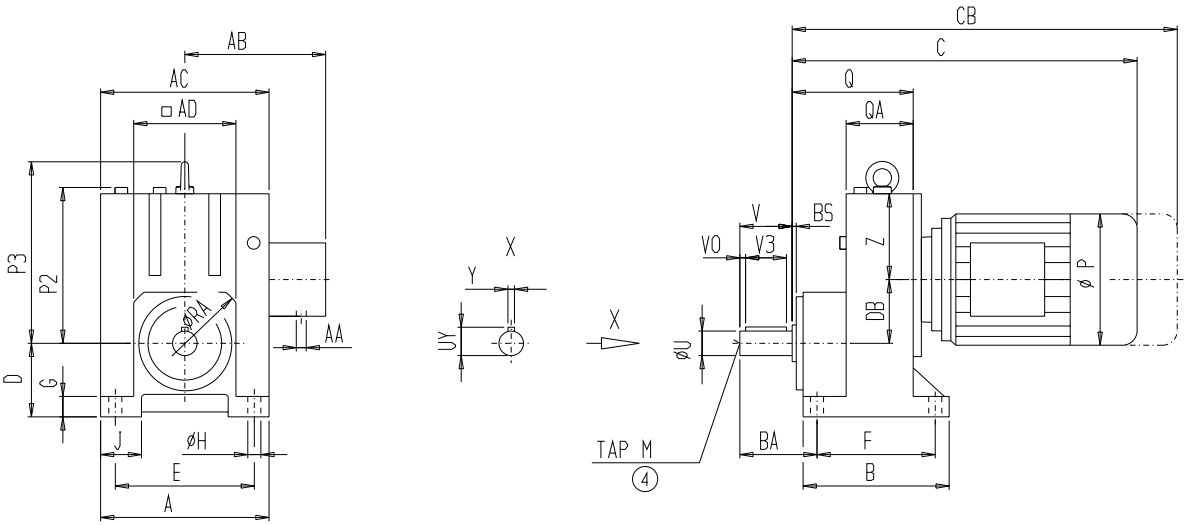
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

E 148

E 510

[inch]



Mounting

E	F	G	H	J
13.39	9.45	1.97	1.38	4.33

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
2.75	5.51	4.25	0.671	3.03	0.625	6.89	3/4-10UNC

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	P3	Q	QA
13.39	11.18	12.6	17.72	16.38	6.3	0.2	6.02	8.19	14.41	17.76	9.37	5.71

Motor

	E148						Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**E148**
M132S	26.7	30.67	10.16	7.13	7.13	1"+3/4"	362
M132M	26.7	30.67	10.16	7.13	7.13	1"+3/4"	408
M160M	29.88	34.49	12.2	7.83	7.83	1"+3/4"	437
M160L	29.88	34.49	12.2	7.83	7.83	1"+3/4"	467
M180M	31.96	36.61	13.7	9.69	9.69	1 1/4"+3/4"	496
M180L	31.96	36.61	13.7	9.69	9.69	1 1/4"+3/4"	512
M200L	32.95	38.07	15.16	10.24	10.24	1 1/4"+3/4"	620
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2"	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2"	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2"	on request
LG280S incl.adapter	41.65	on request	21.85	17.01	on request	2x2"	2010
LG280ZM incl.adapter	55.31	on request	21.85	17.01	on request	2x2"	2231

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

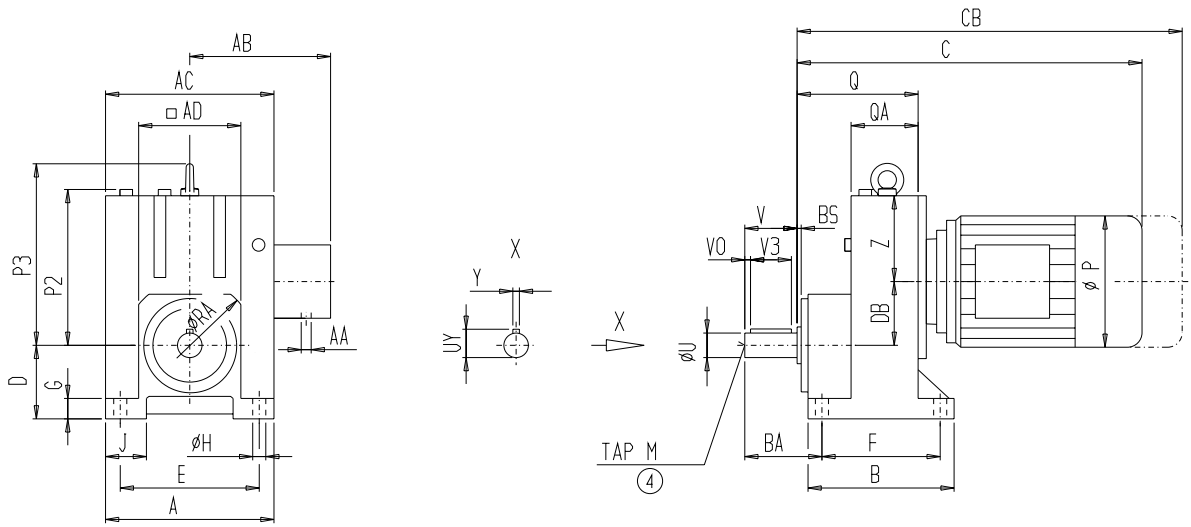
** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

E 148

E 510

[mm]



Mounting

E	F	G	H	J
340	*240*	*50*	*35*	*110*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
69,85	*140*	*107,95*	*17,043*	*76,96*	*15,875*	*175*	*3/4"-10UNC*

Gearcase

RA	AD	B	A	AC	D	BS	DB	Z	P2	P3	Q	QA
340	*284*	*320*	*450*	*416*	*160*	*5*	*153*	*208*	*366*	*451*	*238*	*145*

Motor

	E148						Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**E148**
M132S	*679*	*780*	*258*	*181*	*181*	1"+3/4"	*164*
M132M	*679*	*780*	*258*	*181*	*181*	1"+3/4"	*185*
M160M	*760*	*877*	*310*	*199*	*199*	1"+3/4"	*198*
M160L	*760*	*877*	*310*	*199*	*199*	1"+3/4"	*212*
M180M	*813*	*931*	*348*	*246*	*246*	1 1/4"+3/4"	*225*
M180L	*813*	*931*	*348*	*246*	*246*	1 1/4"+3/4"	*232*
M200L	*838*	*958*	*385*	*260*	*260*	1 1/4"+3/4"	*281*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl.adapter	*1058*	*on request*	*555*	*432*	*on request*	*2x2"*	*912*
LG280ZM incl.adapter	*1405*	*on request*	*555*	*432*	*on request*	*2x2"*	*1012*

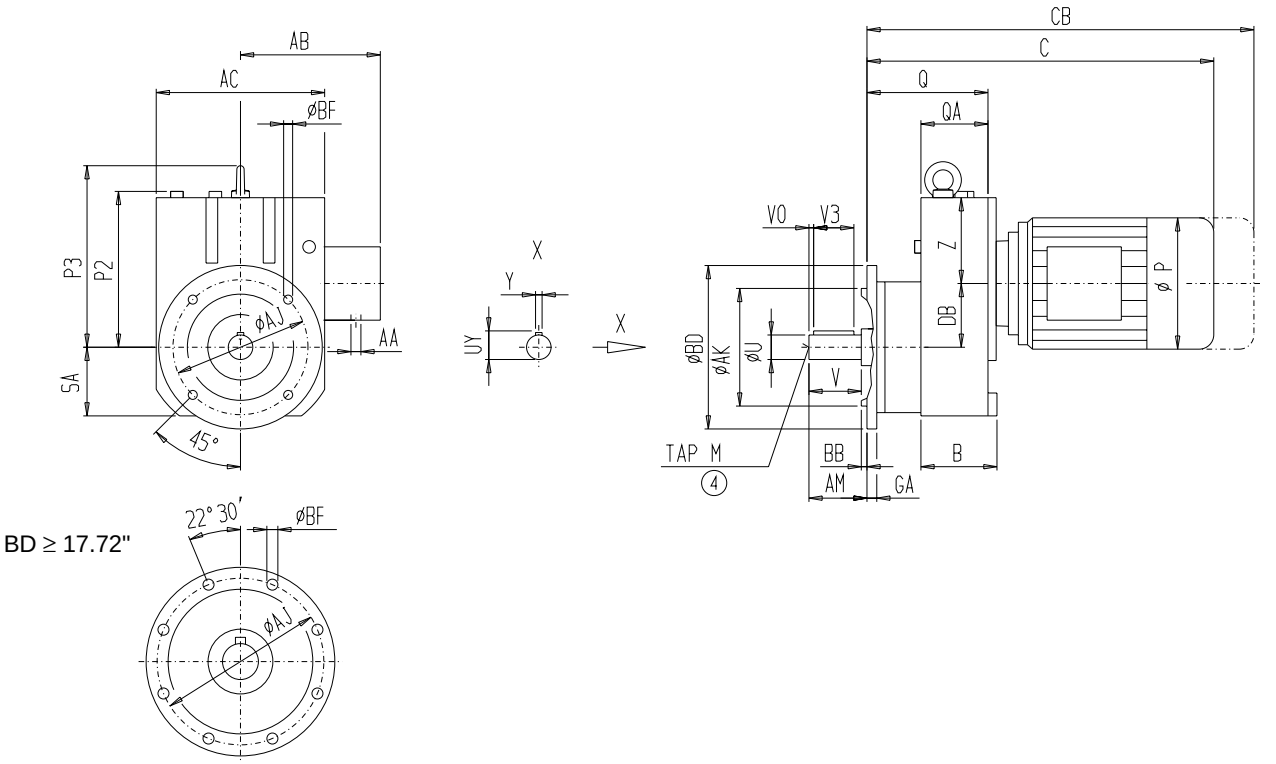
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EF 148

EF 510

[inch]



Flange

BD	AK	GA	AJ
13.78	9.84	0.71	11.81
17.72	13.78	0.87	15.75
21.65	17.72	0.98	19.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.75	5.51	4.25	0.671	3.03	0.625	5.51	3/4-10UNC

Gearcase

B	BB	AC	SA	DB	Z	P2	P3	Q	QA	BF
6.38	0.2	16.38	6.69	6.02	8.19	14.41	17.76	9.37	5.71	0.69

Motor

	EF148						Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EF148**
M132S	26.7	30.67	10.16	7.13	7.13	1"+3/4"	388
M132M	26.7	30.67	10.16	7.13	7.13	1"+3/4"	434
M160M	29.88	34.49	12.2	7.83	7.83	1"+3/4"	463
M160L	29.88	34.49	12.2	7.83	7.83	1"+3/4"	494
M180M	31.96	36.61	13.7	9.69	9.69	1 1/4"+3/4"	523
M180L	31.96	36.61	13.7	9.69	9.69	1 1/4"+3/4"	538
M200L	32.95	38.07	15.16	10.24	10.24	1 1/4"+3/4"	646
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl.adapter	41.65	on request	21.85	17.01	on request	2x2“	2036
LG280ZM incl.adapter	55.31	on request	21.85	17.01	on request	2x2“	2257

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

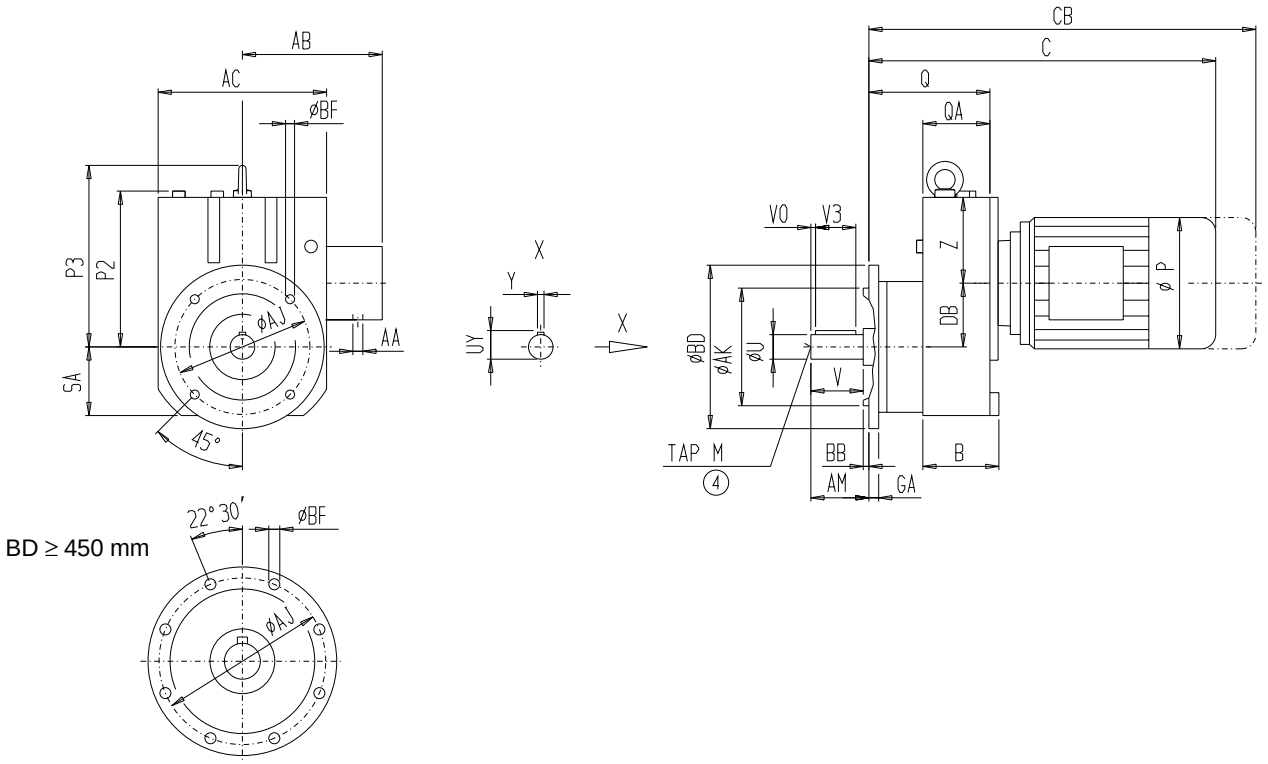
** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EF 148

EF 510

[mm]



Flange

BD	AK	GA	AJ
350	*250*	*18*	*300*
450	*350*	*22*	*400*
550	*450*	*25*	*500*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
69,85	*140*	*107,95*	*17,043*	*76,96*	*15,875*	*140*	*3/4"-10UNC*

Gearcase

B	BB	AC	SA	DB	Z	P2	P3	Q	QA	BF
162	*5*	*416*	*170*	*153*	*208*	*366*	*451*	*238*	*145*	*17,5*

Motor

	EF148						Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EF148**
M132S	*679*	*780*	*258*	*181*	*181*	1"+3/4"	*176*
M132M	*679*	*780*	*258*	*181*	*181*	1"+3/4"	*197*
M160M	*760*	*877*	*310*	*199*	*199*	1"+3/4"	*210*
M160L	*760*	*877*	*310*	*199*	*199*	1"+3/4"	*224*
M180M	*813*	*931*	*348*	*246*	*246*	1 1/4"+3/4"	*237*
M180L	*813*	*931*	*348*	*246*	*246*	1 1/4"+3/4"	*244*
M200L	*838*	*958*	*385*	*260*	*260*	1 1/4"+3/4"	*293*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl.adapter	*1058*	*on request*	*555*	*432*	*on request*	*2x2"*	*924*
LG280ZM incl.adapter	*1405*	*on request*	*555*	*432*	*on request*	*2x2"*	*1024*

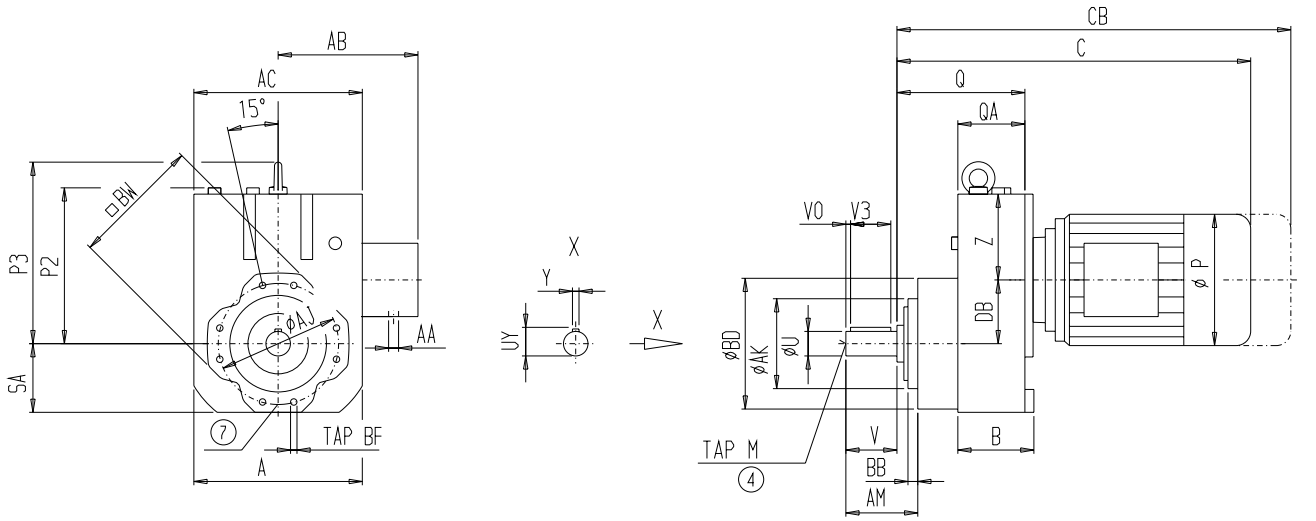
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EZ 148

EZ 510

[inch]



Flange

BD	AK	BB	AJ	TAP BF	BW
13.39	9.45	0.98	11.81	M16x28	12.68

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.75	5.51	4.25	0.671	3.03	0.625	6.81	3/4-10UNC

Gearcase

B	A	AC	SA	DB	Z	P2	P3	Q	QA
6.38	16.38	16.38	6.69	6.02	8.19	14.41	17.76	9.37	5.71

Motor

	EZ148						Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EZ148**
M132S	26.7	30.67	10.16	7.13	7.13	1"+3/4"	329
M132M	26.7	30.67	10.16	7.13	7.13	1"+3/4"	375
M160M	29.88	34.49	12.2	7.83	7.83	1"+3/4"	404
M160L	29.88	34.49	12.2	7.83	7.83	1"+3/4"	434
M180M	31.96	36.61	13.7	9.69	9.69	1 1/4"+3/4"	463
M180L	31.96	36.61	13.7	9.69	9.69	1 1/4"+3/4"	478
M200L	32.95	38.07	15.16	10.24	10.24	1 1/4"+3/4"	587
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl.adapter	41.65	on request	21.85	17.01	on request	2x2“	1977
LG280ZM incl.adapter	55.31	on request	21.85	17.01	on request	2x2“	2198

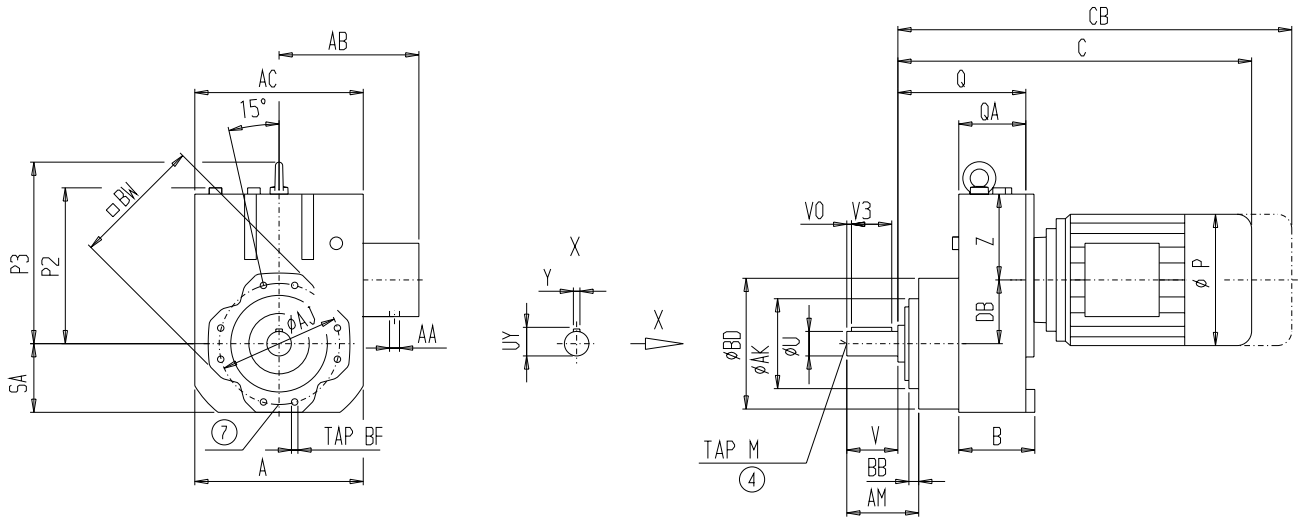
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

EZ 148

EZ 510

[mm]



Flange

BD	AK	BB	AJ	TAP BF	BW
340	*240*	*25*	*300*	*M16x28*	*322*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
69,85	*140*	*107,95*	*17,043*	*76,96*	*15,875*	*173*	*3/4"-10UNC*

Gearcase

B	A	AC	SA	DB	Z	P2	P3	Q	QA
162	*416*	*416*	*170*	*153*	*208*	*366*	*451*	*238*	*145*

Motor

	EZ148						Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**EZ148**
M132S	*679*	*780*	*258*	*181*	*181*	*1"+3/4"*	*149*
M132M	*679*	*780*	*258*	*181*	*181*	*1"+3/4"*	*170*
M160M	*760*	*877*	*310*	*199*	*199*	*1"+3/4"*	*183*
M160L	*760*	*877*	*310*	*199*	*199*	*1"+3/4"*	*197*
M180M	*813*	*931*	*348*	*246*	*246*	*1 1/4"+3/4"*	*210*
M180L	*813*	*931*	*348*	*246*	*246*	*1 1/4"+3/4"*	*217*
M200L	*838*	*958*	*385*	*260*	*260*	*1 1/4"+3/4"*	*266*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl.adapter	*1058*	*on request*	*555*	*432*	*on request*	*2x2"*	*897*
LG280ZM incl.adapter	*1405*	*on request*	*555*	*432*	*on request*	*2x2"*	*997*

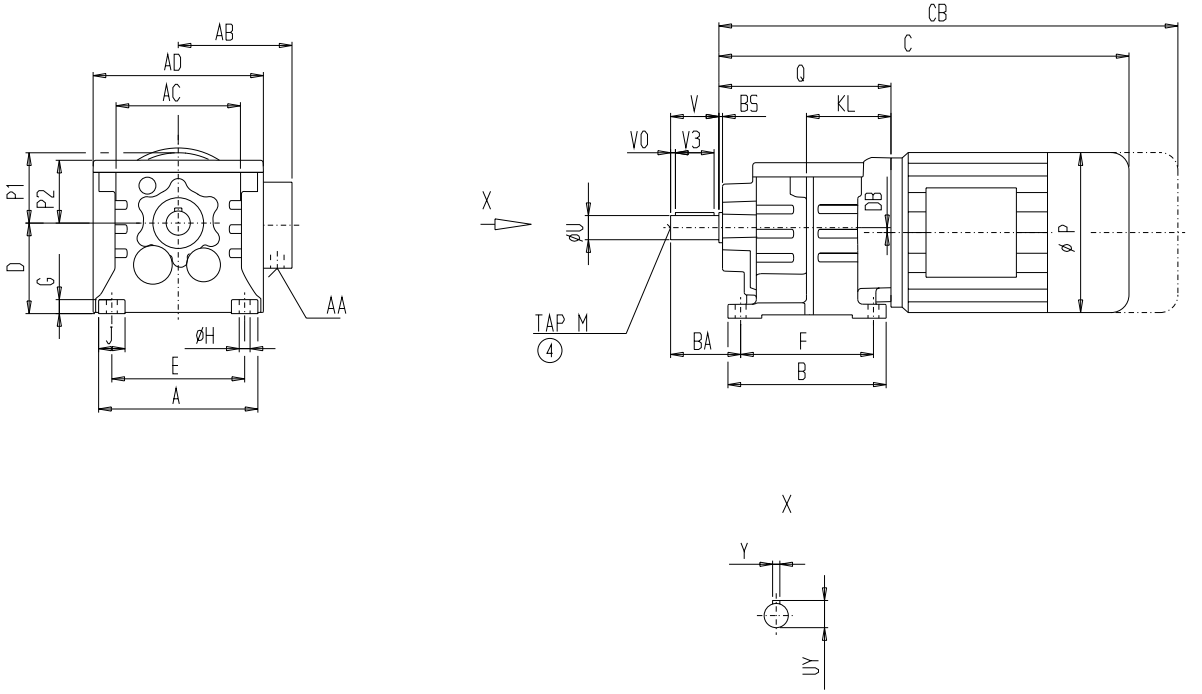
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

D/Z 18

DZ 510

[inch]



Mounting

E	F	G	H	J
4,33	4.33	0.47	0.35	0.98

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
0.75	1.57	1.25	0.01	0.83	0.1875	2.28	1/4-20UNC

Gearcase

KL	B	A	AC	AD	D	BS	DB	P1	P2	Q
2.76	5.16	5.31	4.13	5.39	2.95	0.12	0.07	2.28	2.13	5.61

Motor

	Z18 / D18					Weight [lb]	
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Z18**	**D18**
M71	12.95	14.68	5.43	4.67	2x1/2"	22	22
M71MP	13.54	15.71	5.43	4.67	2x1/2"	26	26

Tolerances see page 1 - 4

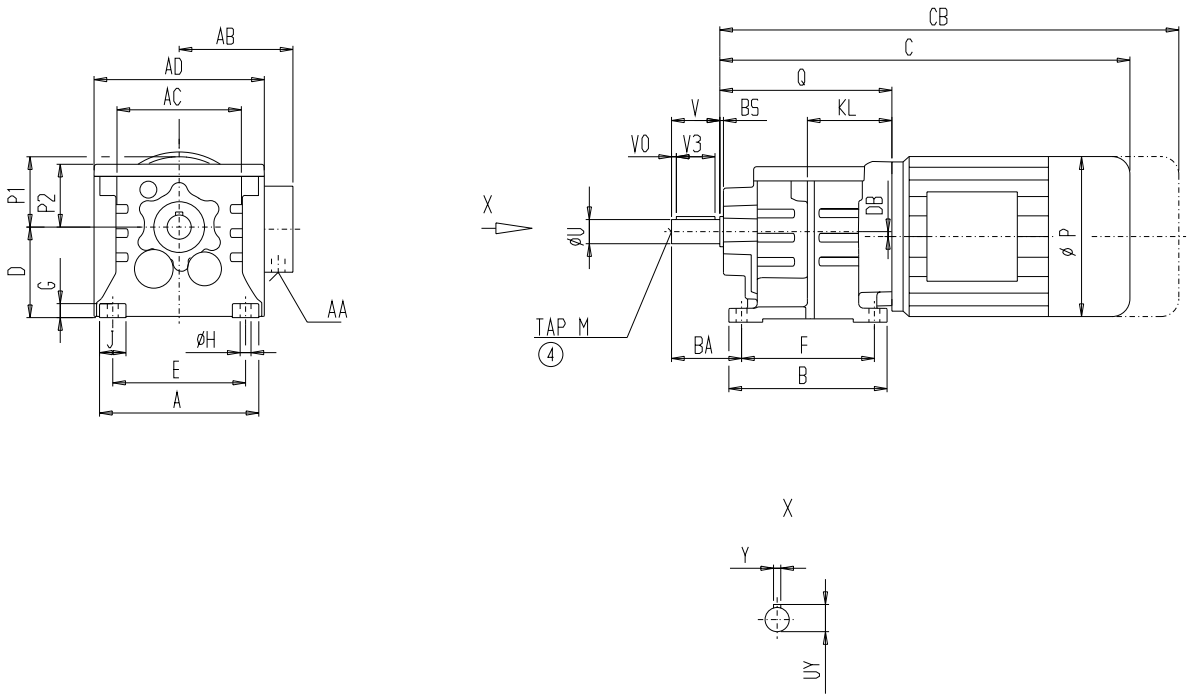
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 18

DZ 510

[mm]



Mounting

E	F	G	H	J
110	*110*	*12*	*9*	*25*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
19,05	*40*	*31,75*	*0,254*	*21,08*	*4,763*	*58*	1/4"-20UNC

Gearcase

KL	B	A	AC	AD	D	BS	DB	P1	P2	Q
70	*131*	*135*	*105*	*137*	*75*	*3*	*1,8*	*58*	*54*	*142,5*

Motor

	Z18 / D18					Weight *[kg]*	
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Z18**	**D18**
M71	*330*	*374*	*138*	*118,5*	*2x1/2"*	*10*	*10*
M71MP	*345*	*400*	*138*	*118,5*	*2x1/2"*	*12*	*12*

Tolerances see page 1 - 4

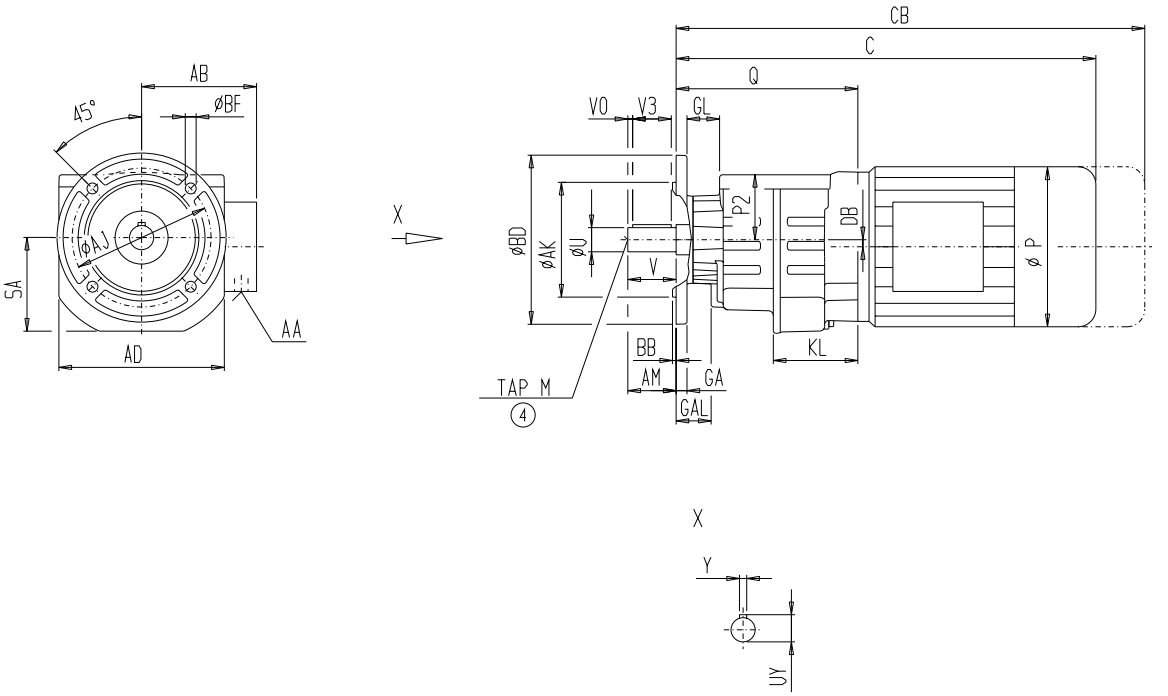
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DF/ZF 18

DZF 510

[inch]



3

Flange

BD	AK	GA	AJ	BB	GL	BF
4.72	3.15	0.31	3.94	0.12	1.1	0.26
5.51	3.74	0.35	4.53	0.12	1.06	0.35
6.3	4.33	0.35	5.12	0.14	1.06	0.35

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
0.75	1.57	1.25	0.01	0.83	0.1875	1.57	1/4-20UNC

Gearcase

KL	AD	SA	DB	P2	Q	GAL
2.76	5.39	3.05	0.07	2.13	5.93	1.14

Motor

	ZF / DF18					Weight [lb]	
Motor	C	CB	P	AB	AA	ZF18	DF18
M71	13.26	14.99	5.43	4.67	2x1/2"	22	22
M71MP	13.85	16.02	5.43	4.67	2x1/2"	24	26

Tolerances see page 1 - 4

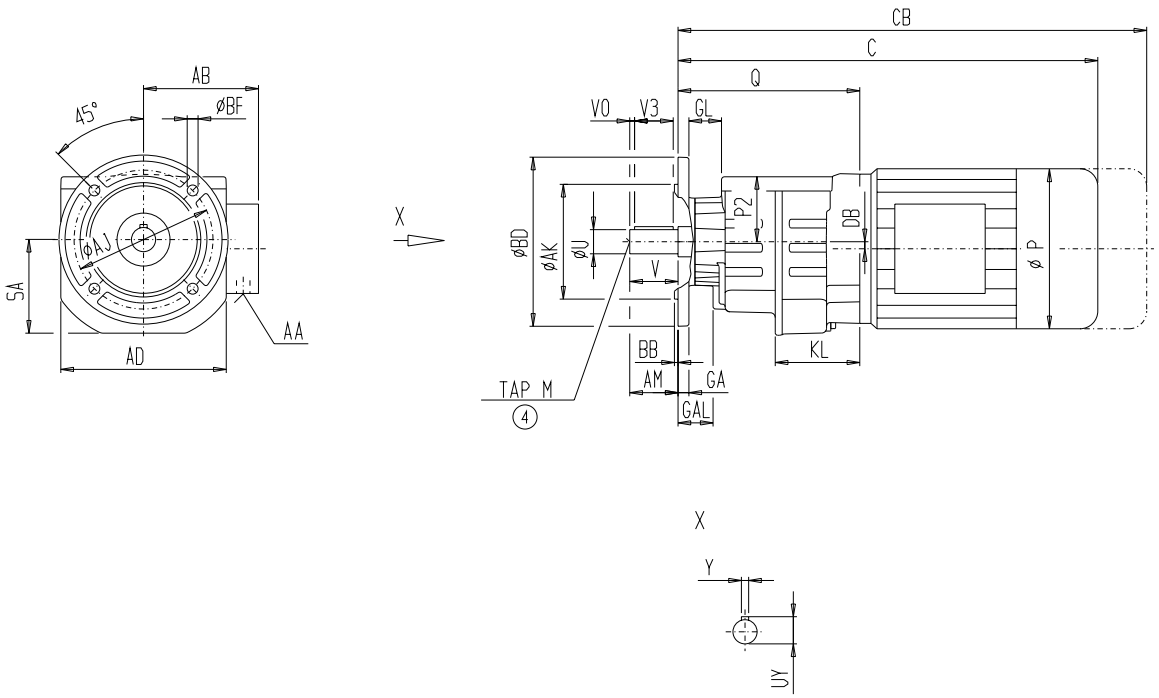
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DF/ZF 18

DZF 510

[mm]



Flange

BD	AK	GA	AJ	BB	GL	BF
120	*80*	*8*	*100*	*3*	*28*	*6,6*
140	*95*	*9*	*115*	*3*	*27*	*9*
160	*110*	*9*	*130*	*3,5*	*27*	*9*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
19,05	*40*	*31,75*	*0,254*	*21,08*	*4,763*	*40*	1/4"-20UNC

Gearcase

KL	AD	SA	DB	P2	Q	GAL
70	*137*	*77,5*	*1,8*	*54*	*150,5*	*29*

Motor

	ZF18 / DF18					Weight *[kg]*	
Motor	**C**	**CB**	**P**	**AB**	**AA**	**ZF18**	**DF18**
M71	*338*	*382*	*138*	*118,5*	*2x1/2"*	*10*	*10*
M71MP	*353*	*408*	*138*	*118,5*	*2x1/2"*	*11*	*12*

Tolerances see page 1 - 4

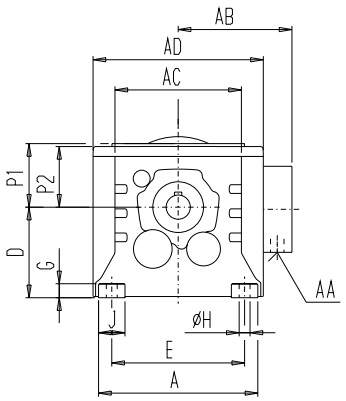
④ Tap specification see page 1 - 7

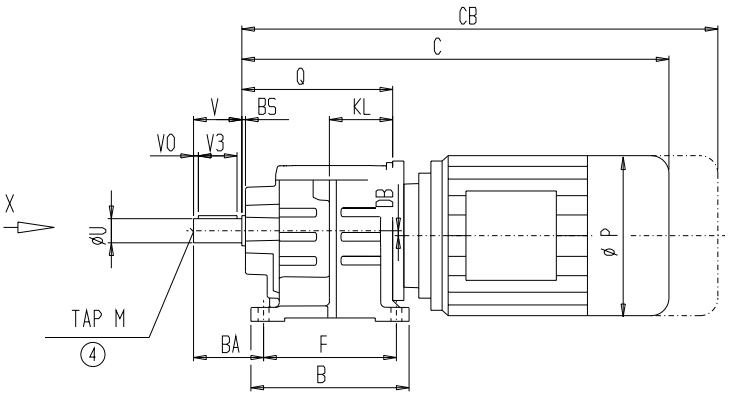
Helical Gear Motors
Foot mounted

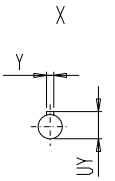
D/Z 28

DZ 510

[inch]







Mounting

E	F	G	H	J
4.33	5.12	0.69	0.35	1.06

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1	1.97	1.5	0.252	1.11	0.25	2.95	3/8-16UNC

Gearcase

KL	B	A	AC	AD	D	BS	DB	P1	P2	Q
2.2	5.98	5.51	4.13	5.63	3.54	0.12	0.24	2.05	2.01	5.31

Motor

	Z28 / D28					Weight [lb]	
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Z28**	**D28**
M71	13.37	15.1	5.43	4.67	2x1/2"	24	24
M71MP	13.96	16.13	5.43	4.67	2x1/2"	26	29
M90S	16.7	19.3	6.93	5.91	2x3/4"	37	40
M90L	16.7	19.3	6.93	5.91	2x3/4"	46	46
M100L	19.88	22.71	7.64	6.3	2x3/4"	62	62

Tolerances see page 1 - 4

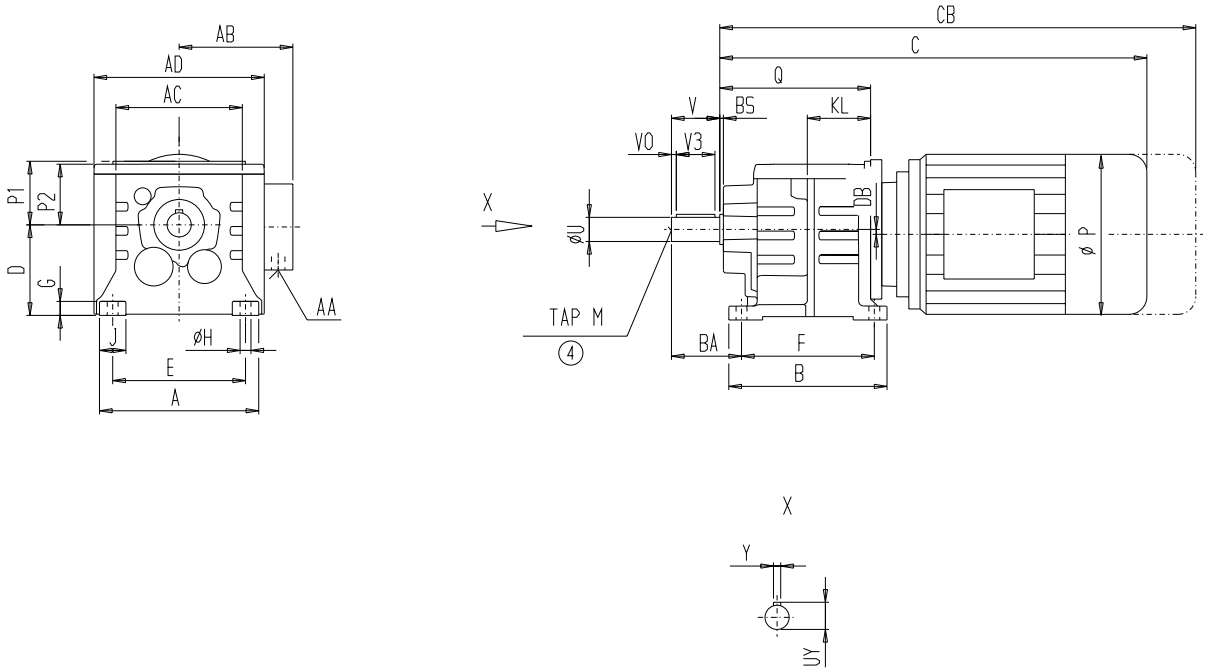
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 28

DZ 510

[mm]



Mounting

E	F	G	H	J
110	*130*	*17,5*	*9*	*27*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
25,4	*50*	*38,1*	*6,401*	*28,19*	*6,35*	*75*	*3/8"-16UNC*

Gearcase

KL	B	A	AC	AD	D	BS	DB	P1	P2	Q
56	*152*	*140*	*105*	*143*	*90*	*3*	*6,2*	*52*	*51*	*135*

Motor

	Z28 / D28					Weight *[kg]*	
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Z28**	**D28**
M71	*340,5*	*384,5*	*138*	*118,5*	*2x1/2"*	*11*	*11*
M71MP	*355,5*	*410,5*	*138*	*118,5*	*2x1/2"*	*12*	*13*
M90S	*425*	*491*	*176*	*150*	*2x3/4"*	*17*	*18*
M90L	*425*	*491*	*176*	*150*	*2x3/4"*	*21*	*21*
M100L	*506*	*578*	*194*	*160*	*2x3/4"*	*28*	*28*

Tolerances see page 1 - 4

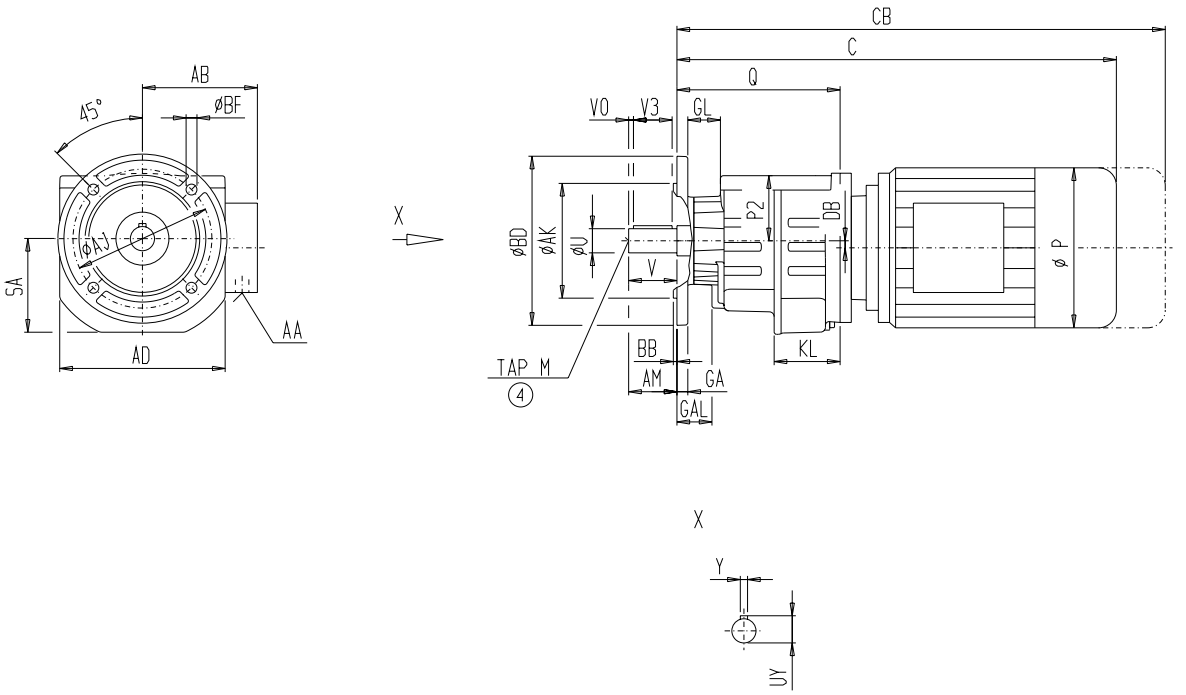
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DF/ZF 28

DZF 510

[inch]



Flange

BD	AK	GA	AJ	BB	GL	BF
4.72	3.15	0.31	3.94	0.12	1.1	0.26
5.51	3.74	0.35	4.53	0.12	1.06	0.35
6.3	4.33	0.35	5.12	0.14	1.06	0.35

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1	*1.97*	*1.5*	*0.252*	*1.11*	*0.25*	*1.97*	*3/8-16UNC*

Gearcase

KL	AD	SA	DB	P2	Q	GAL
2.2	*5.59*	*3.54*	*0.12*	*2.05*	*5.55*	*1.1*

Motor

	DF28					Weight [lb]	
Motor	**C**	**CB**	**P**	**AB**	**AA**	**ZF28**	**DF28**
M71	13.62	15.34	5.43	4.67	2x1/2"	24	24
M71MP	14.20	16.37	5.43	4.67	2x1/2"	26	26
M90S	16.94	19.54	6.93	5.91	2x3/4"	37	37
M90L	16.94	19.54	6.93	5.91	2x3/4"	46	49
M100L	20.12	22.95	7.64	6.3	2x3/4"	62	62

Tolerances see page 1 - 4

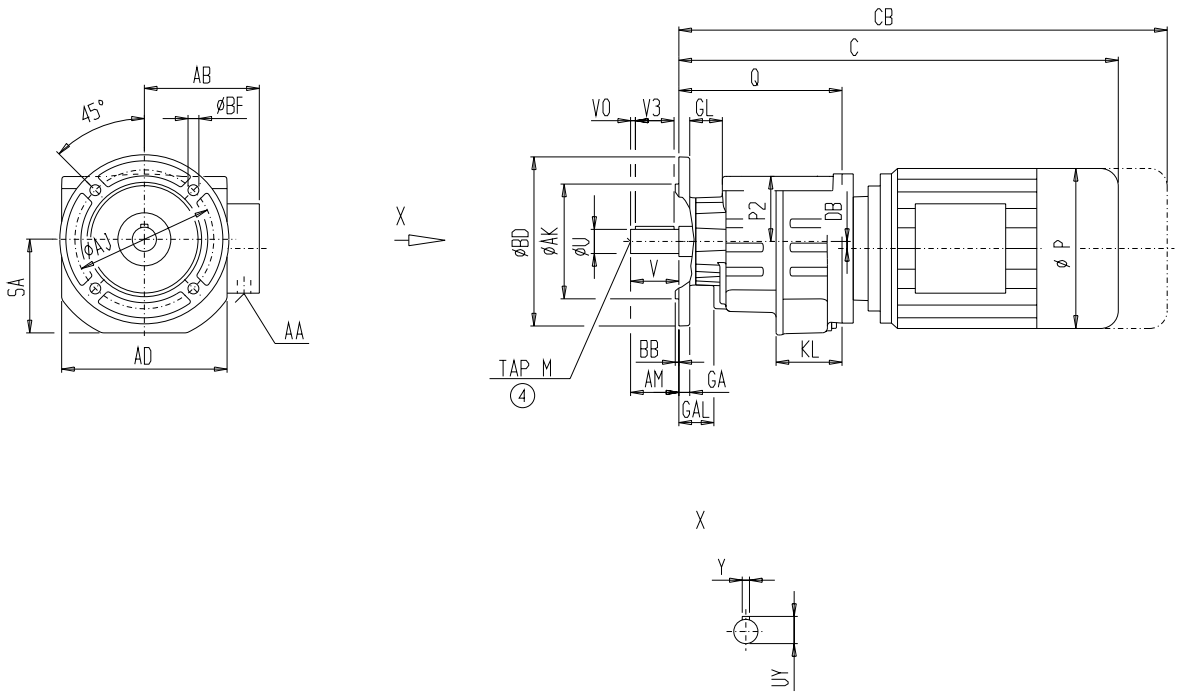
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DF/ZF 28

DZF 510

[mm]



Flange

BD	AK	GA	AJ	BB	GL	BF
120	*80*	*8*	*100*	*3*	*28*	*6,6*
140	*95*	*9*	*115*	*3*	*27*	*9*
160	*110*	*9*	*130*	*3,5*	*27*	*9*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
25,4	*50*	*38,1*	*6,401*	*27,94*	*6,35*	*50*	*3/8"-16UNC*

Gearcase

KL	AD	SA	DB	P2	Q	GAL
56	*142*	*90*	*6,2*	*52*	*141*	*28*

Motor

	ZF28 / DF28					Weight *[kg]*	
Motor	**C**	**CB**	**P**	**AB**	**AA**	**ZF28**	**DF28**
M71	*346,5*	*390,5*	*138*	*118,5*	*2x1/2"*	*11*	*11*
M71MP	*361,5*	*416,5*	*138*	*118,5*	*2x1/2"*	*12*	*12*
M90S	*431*	*497*	*176*	*150*	*2x3/4"*	*17*	*17*
M90L	*431*	*497*	*176*	*150*	*2x3/4"*	*21*	*22*
M100L	*512*	*584*	*194*	*160*	*2x3/4"*	*28*	*28*

Tolerances see page 1 - 4

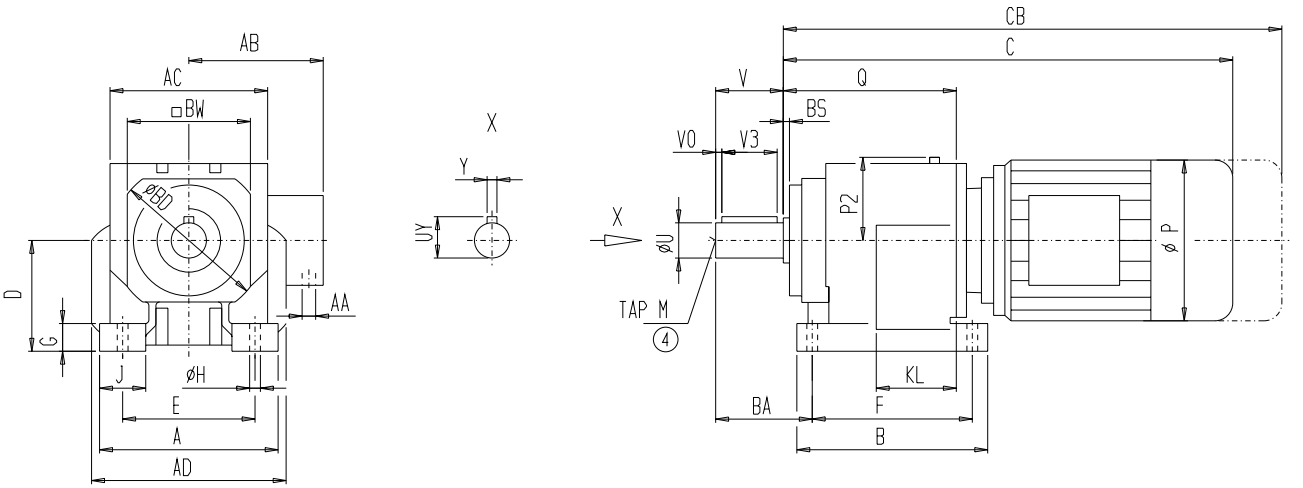
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 38

DZ 510

[inch]



Mounting

E	F	G	H	J
4.33	5.12	0.79	0.39	1.38

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1	1.97	1.5	0.252	1.1	0.25	2.95	3/8-16UNC

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P2	Q
4.72	3.11	3.94	6.3	5.71	5.04	6.42	3.54	0.12	2.72	5.51

Motor

	Z38		D38					Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**Z38**	**D38**
M71	15.5	17.23	16.09	17.82	5.43	4.67	2x1/2"	44	46
M80	16.34	18.51	16.93	19.1	6.22	4.98	2x1/2"	49	51
M90S	17.96	20.55	18.55	21.14	6.93	5.91	2x3/4"	53	55
M90L	17.96	20.55	18.55	21.14	6.93	5.91	2x3/4"	57	60
M100L	19.73	22.56	-	-	7.64	6.3	2x3/4"	77	-
M112M	21.77	24.96	-	-	8.58	6.59	2x3/4"	95	-

Tolerances see page 1 - 4

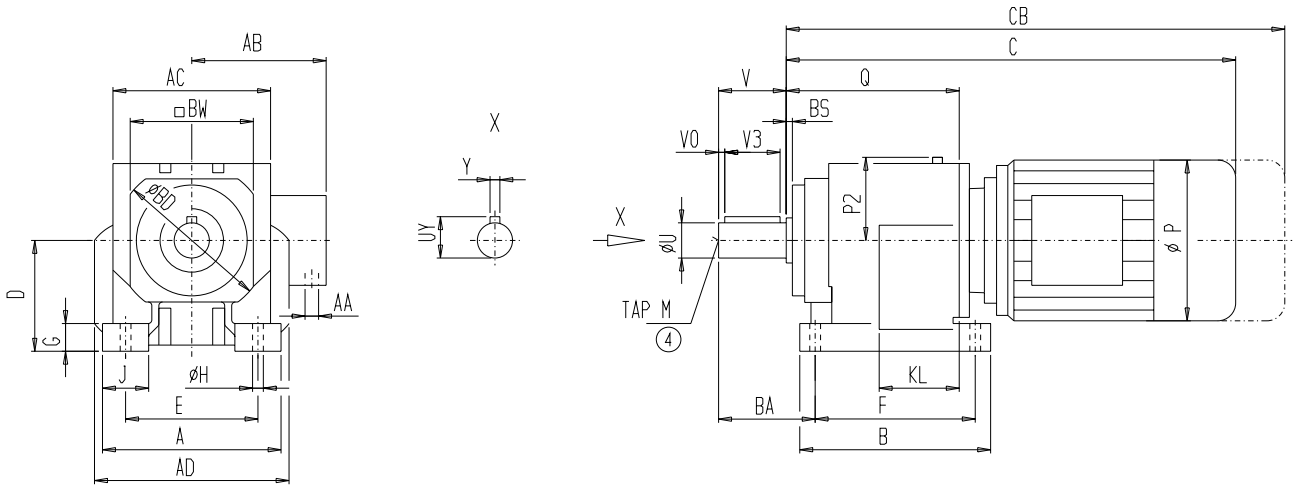
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 38

DZ 510

[mm]



Mounting

E	F	G	H	J
110	*130*	*20*	*9,8*	*35*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
25,4	*50*	*38,1*	*6,401*	*27,94*	*6,35*	*75*	*3/8"-16UNC*

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P2	Q
120	*79*	*100*	*160*	*145*	*128*	*163*	*90*	*3*	*69*	*140*

Motor

	Z38		D38					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**Z38**	**D38**
M71	*394,5*	*438,5*	*409,5*	*453,5*	*138*	*118,5*	*2x1/2"*	*20*	*21*
M80	*416*	*471*	*431*	*486*	*158*	*126,5*	*2x1/2"*	*22*	*23*
M90S	*457*	*523*	*472*	*538*	*176*	*150*	*2x3/4"*	*24*	*25*
M90L	*457*	*523*	*472*	*538*	*176*	*150*	*2x3/4"*	*26*	*27*
M100L	*502*	*574*	-	-	*194*	*160*	*2x3/4"*	*35*	-
M112M	*554*	*635*	-	-	*218*	*167,5*	*2x3/4"*	*43*	-

Tolerances see page 1 - 4

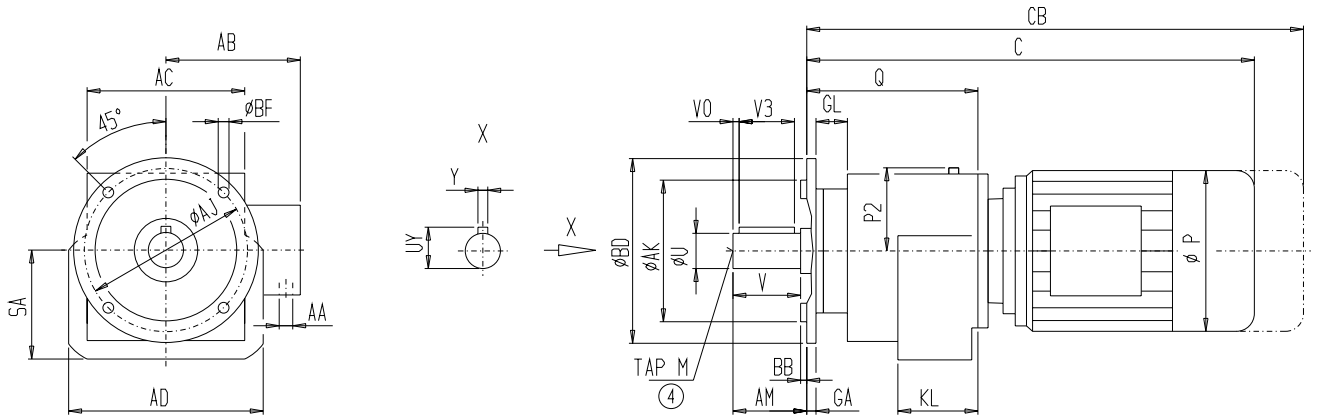
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DF/ZF 38

DZF 510

[inch]



Flange

BD	AK	GA	AJ	BB	GL	BF
4.72	3.15	0.31	3.94	0.12	0.91	0.27
5.51	3.74	0.39	4.53	0.12	1.02	0.35
6.3	4.33	0.39	5.12	0.14	1.02	0.35
7.87	5.12	0.47	6.5	0.14	0.94	0.43
9.84	7.09	0.59	8.46	0.16	0.83	0.53

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1	1.97	1.5	0.252	1.11	0.25	1.97	3/8-16UNC

Gearcase

KL	AC	AD	SA	P2	Q
2.72	5.04	6.42	3.62	2.72	5.51

Motor

	ZF38		DF38					Weight [lb]	
Motor	C	CB	C	CB	P	AB	AA	ZF38	DF38
M71	15.5	17.23	16.09	17.82	5.43	4.67	2x1/2"	46	49
M80	16.34	18.51	16.93	19.1	6.22	4.98	2x1/2"	51	53
M90S	17.96	20.55	18.55	21.14	6.93	5.91	2x3/4"	55	57
M90L	17.96	20.55	18.55	21.14	6.93	5.91	2x3/4"	60	62
M100L	19.73	22.56	-	-	7.64	6.3	2x3/4"	79	-
M112M	21.77	24.96	-	-	8.58	6.59	2x3/4"	97	-

Tolerances see page 1 - 4

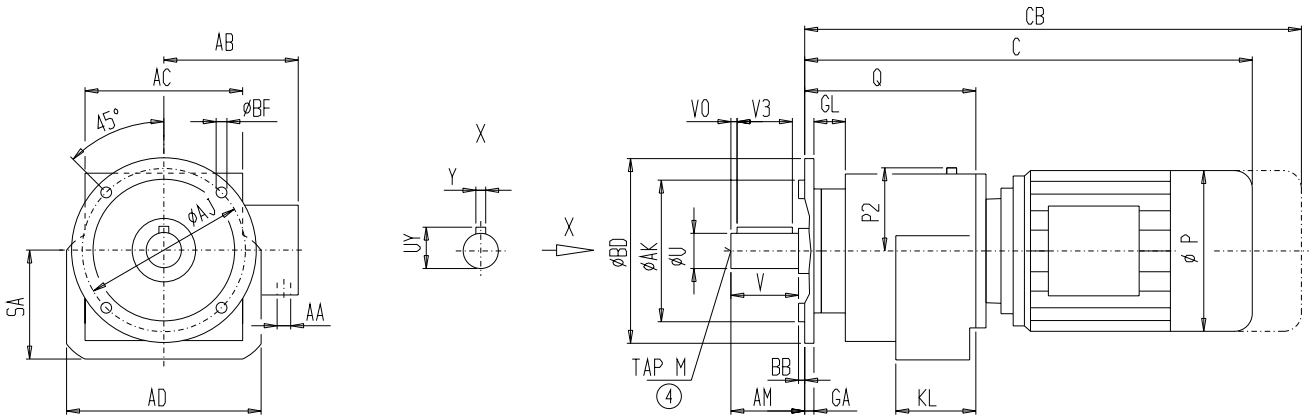
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DF/ZF 38

DZF 510

[mm]



Flange

BD	AK	GA	AJ	BB	GL	BF
120	*80*	*8*	*100*	*3*	*23*	*6,8*
140	*95*	*10*	*115*	*3*	*26*	*9*
160	*110*	*10*	*130*	*3,5*	*26*	*9*
200	*130*	*12*	*165*	*3,5*	*24*	*11*
250	*180*	*15*	*215*	*4*	*21*	*13,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
25,4	*50*	*38,1*	*6,401*	*28,19*	*6,35*	*50*	*3/8"-16UNC*

Gearcase

KL	AC	AD	SA	P2	Q
69	*128*	*163*	*92*	*69*	*140*

Motor

	ZF38		DF38					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZF38**	**DF38**
M71	*394,5*	*438,5*	*409,5*	*453,5*	*138*	*118,5*	*2xM20x1,5*	*21*	*22*
M80	*416*	*471*	*431*	*486*	*158*	*126,5*	*2xM20x1,5*	*23*	*24*
M90S	*457*	*523*	*472*	*538*	*176*	*150*	*2xM25x1,5*	*25*	*26*
M90L	*457*	*523*	*472*	*538*	*176*	*150*	*2xM25x1,5*	*27*	*28*
M100L	*502*	*574*	-	-	*194*	*160*	*2xM25x1,5*	*36*	-
M112M	*554*	*635*	-	-	*218*	*167,5*	*2xM25x1,5*	*44*	-

Tolerances see page 1 - 4

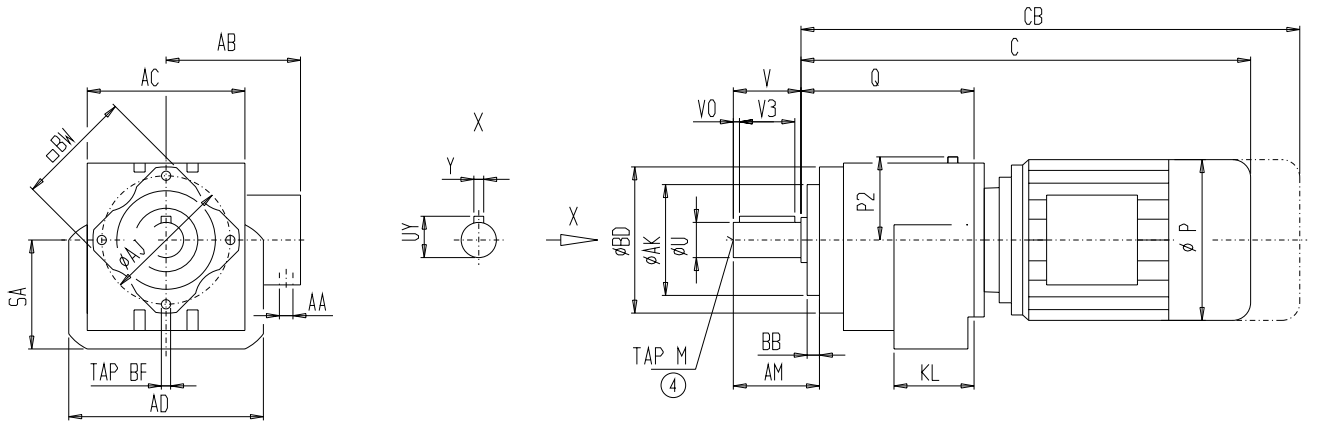
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DZ/ZZ 38

DZZ 510

[inch]



Flange

BD	AK	BW	AJ	BB	TAP BF
4.72	3.15	3.94	3.94	0.39	M8x11

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1	1.97	1.5	0.252	1.11	0.25	2.48	3/8-16UNC

Gearcase

KL	AC	AD	SA	P2	Q
2.72	5.04	6.42	3.62	2.72	5.51

Motor

	ZZ38		DZ38					Weight [lb]	
Motor	C	CB	C	CB	P	AB	AA	ZZ38	DZ38
M71	15.5	17.23	16.09	17.82	5.43	4.67	2x1/2"	42	44
M80	16.34	18.51	16.93	19.1	6.22	4.98	2x1/2"	46	49
M90S	17.96	20.55	18.55	21.14	6.93	5.91	2x3/4"	51	53
M90L	17.96	20.55	18.55	21.14	6.93	5.91	2x3/4"	55	57
M100L	19.73	22.56	-	-	7.64	6.3	2x3/4"	75	-
M112M	21.77	24.96	-	-	8.58	6.59	2x3/4"	93	-

Tolerances see page 1 - 4

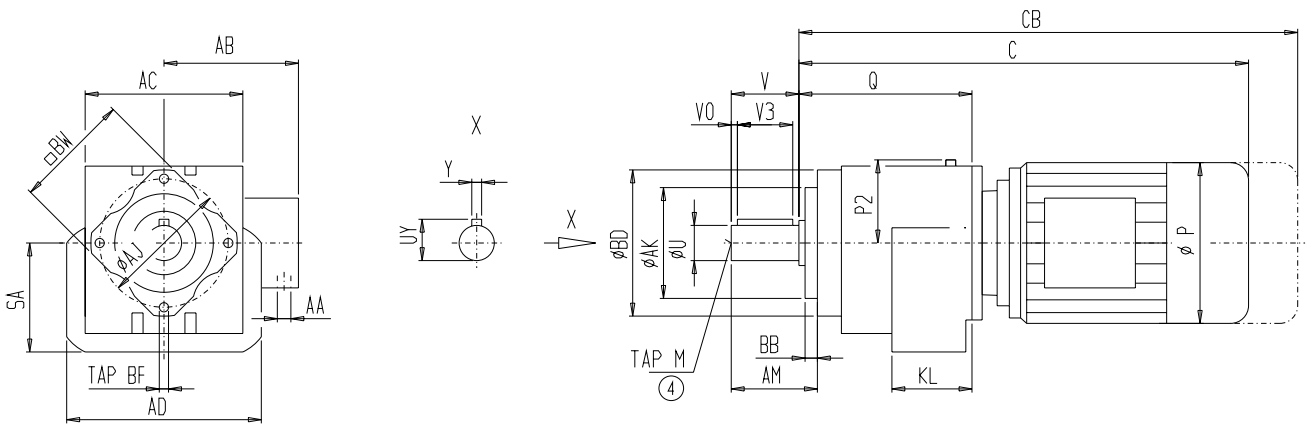
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DZ/ZZ 38

DZZ 510

[mm]



Flange

BD	AK	BW	AJ	BB	TAP BF
120	*80*	*100*	*100*	*10*	*M8x11*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
25,4	*50*	*38,1*	*6,4*	*28,19*	*6,35*	*63*	*3/8"-16UNC*

Gearcase

KL	AC	AD	SA	P2	Q
69	*128*	*163*	*92*	*69*	*140*

Motor

	ZZ38		DZ38					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZZ38**	**DZ38**
M71	*394,5*	*438,5*	*409,5*	*453,5*	*138*	*118,5*	2x1/2"	*19*	*20*
M80	*416*	*471*	*431*	*486*	*158*	*126,5*	2x1/2"	*21*	*22*
M90S	*457*	*523*	*472*	*538*	*176*	*150*	2x3/4"	*23*	*24*
M90L	*457*	*523*	*472*	*538*	*176*	*150*	2x3/4"	*25*	*26*
M100L	*502*	*574*	-	-	*194*	*160*	2x3/4"	*34*	-
M112M	*554*	*635*	-	-	*218*	*167,5*	2x3/4"	*42*	-

Tolerances see page 1 - 4

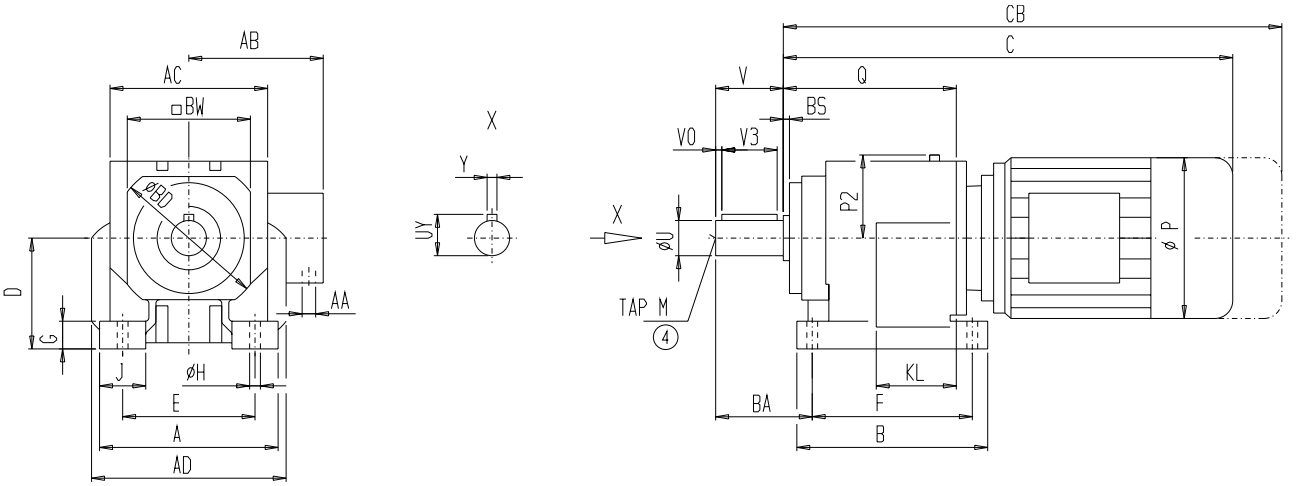
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 48

DZ 510

[inch]



Mounting

E	F	G	H	J
5.31	6.5	0.98	0.53	2.17

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1.375	2.76	2.375	0.027	1.51	0.3125	3.96	3/8-16UNC

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P2	Q
6.3	3.15	4.92	7.87	7.68	6.61	8.66	4.53	0.12	3.46	6.81

Motor

	Z48		D48					Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**Z48**	**D48**
M71	16.58	18.31	17.25	18.98	5.43	4.67	2x1/2“	66	68
M80	17.42	19.59	18.09	20.26	6.22	4.98	2x1/2"	71	73
M90S	19.04	21.63	19.71	22.3	6.93	5.91	2x3/4"	75	77
M90L	19.04	21.63	19.71	22.3	6.93	5.91	2x3/4"	79	82
M100L	20.81	23.64	21.48	24.31	7.64	6.3	2x3/4"	99	101
M112M	22.83	26.02	-	-	8.58	6.59	2x3/4"	117	-
M132S	26.48	30.41	-	-	10.16	7.13	1"+3/4"	139	-
M132M	26.48	30.41	-	-	10.16	7.13	1"+3/4"	185	-

Tolerances see page 1 - 4

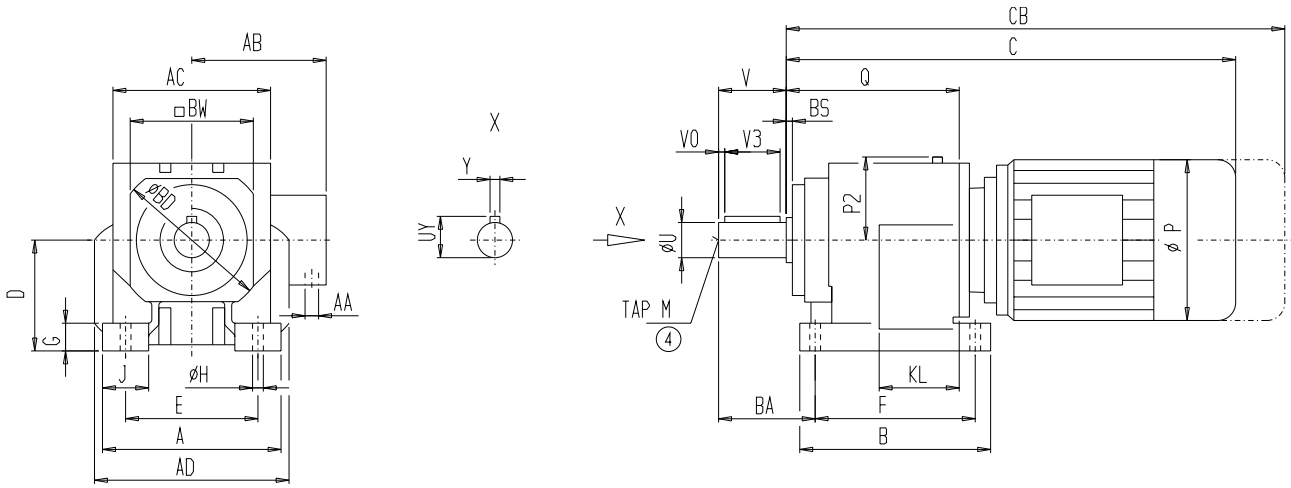
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 48

DZ 510

[mm]



Mounting

E	F	G	H	J
135	*165*	*25*	*13,5*	*55*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
34,925	*70*	*60,325*	*0,686*	*38,35*	*7,938*	*100,5*	*3/8"-16UNC*

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P2	Q
160	*80*	*125*	*200*	*195*	*168*	*220*	*115*	*3*	*88*	*173*

Motor

	Z48		D48					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**Z48**	**D48**
M71	*422*	*466*	*439*	*483*	*138*	*118,5*	*2x1/2"*	*30*	*31*
M80	*443,5*	*498,5*	*460,5*	*515,5*	*158*	*126,5*	*2x1/2"*	*32*	*33*
M90S	*484,5*	*550,5*	*501,5*	*567,5*	*176*	*150*	*2x3/4"*	*34*	*35*
M90L	*484,5*	*550,5*	*501,5*	*567,5*	*176*	*150*	*2x3/4"*	*36*	*37*
M100L	*529,5*	*601,5*	*546,5*	*618,5*	*194*	*160*	*2x3/4"*	*45*	*46*
M112M	*581*	*662*	-	-	*218*	*167,5*	*2x3/4"*	*53*	-
M132S	*673,5*	*773,5*	-	-	*258*	*181*	*1"+3/4"*	*63*	-
M132M	*673,5*	*773,5*	-	-	*258*	*181*	*1"+3/4"*	*84*	-

Tolerances see page 1 - 4

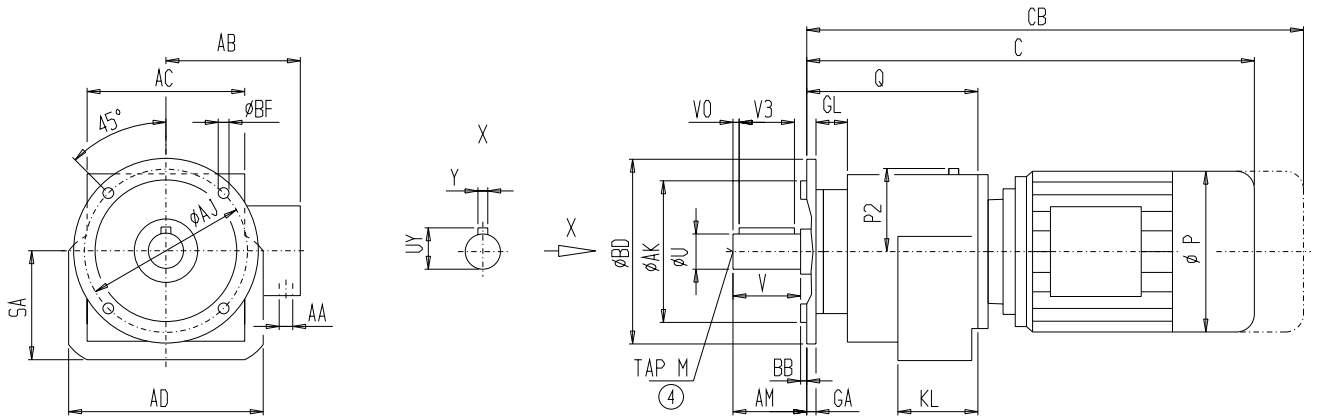
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DF/ZF 48

DZF 510

[inch]



Flange

BD	AK	GA	AJ	BB	GL	BF
7.87	5.12	0.47	6.5	0.14	1.14	0.43
9.84	7.09	0.59	8.46	0.16	1.02	0.53
11.81	9.06	0.59	10.43	0.16	1.02	0.53

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.375	2.76	2.375	0.027	1.51	0.3125	2.76	3/8-16UNC

Gearcase

KL	AC	AD	SA	P2	Q
3.15	6.61	8.66	4.61	3.46	6.81

Motor

	ZF48		DF48					Weight [lb]	
Motor	C	CB	C	CB	P	AB	AA	ZF48	DF48
M71	16.58	18.31	17.25	18.98	5.43	4.67	2x1/2“	68	71
M80	17.42	19.59	18.09	20.26	6.22	4.98	2x1/2"	73	75
M90S	19.04	21.63	19.71	22.3	6.93	5.91	2x3/4"	77	79
M90L	19.04	21.63	19.71	22.3	6.93	5.91	2x3/4"	82	84
M100L	20.81	23.64	21.48	24.31	7.64	6.3	2x3/4"	101	104
M112M	22.83	26.02	-	-	8.58	6.59	2x3/4"	119	-
M132S	26.48	30.41	-	-	10.16	7.13	1"+3/4"	141	-
M132M	26.48	30.41	-	-	10.16	7.13	1"+3/4"	187	-

Tolerances see page 1 - 4

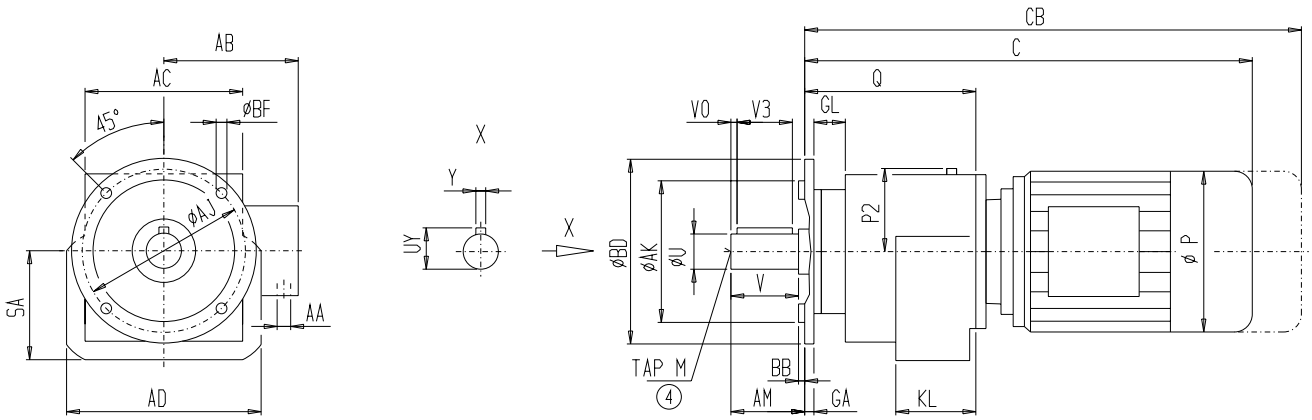
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DF/ZF 48

DZF 510

[mm]



Flange

BD	AK	GA	AJ	BB	GL	BF
200	*130*	*12*	*165*	*3,5*	*29*	*11*
250	*180*	*15*	*215*	*4*	*26*	*13,5*
300	*230*	*15*	*265*	*4*	*26*	*13,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
34,925	*70*	*60,325*	*0,686*	*38,35*	*7,938*	*70*	*3/8"-16UNC*

Gearcase

KL	AC	AD	SA	P2	Q
80	*168*	*220*	*117*	*88*	*173*

Motor

	ZF48		DF48					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZF48**	**DF48**
M71	*422*	*466*	*439*	*483*	*138*	*118,5*	*2x1/2"*	*31*	*32*
M80	*443,5*	*498,5*	*457,5*	*512,5*	*158*	*126,5*	*2x1/2"*	*33*	*34*
M90S	*484,5*	*550,5*	*501,5*	*567,5*	*176*	*150*	*2x3/4"*	*35*	*36*
M90L	*484,5*	*550,5*	*501,5*	*567,5*	*176*	*150*	*2x3/4"*	*37*	*38*
M100L	*529,5*	*601,5*	*546,5*	*618,5*	*194*	*160*	*2x3/4"*	*46*	*47*
M112M	*581*	*662*	-	-	*218*	*167,5*	*2x3/4"*	*54*	-
M132S	*673,5*	*773,5*	-	-	*258*	*181*	*1"+3/4"*	*64*	-
M132M	*673,5*	*773,5*	-	-	*258*	*181*	*1"+3/4"*	*85*	-

Tolerances see page 1 - 4

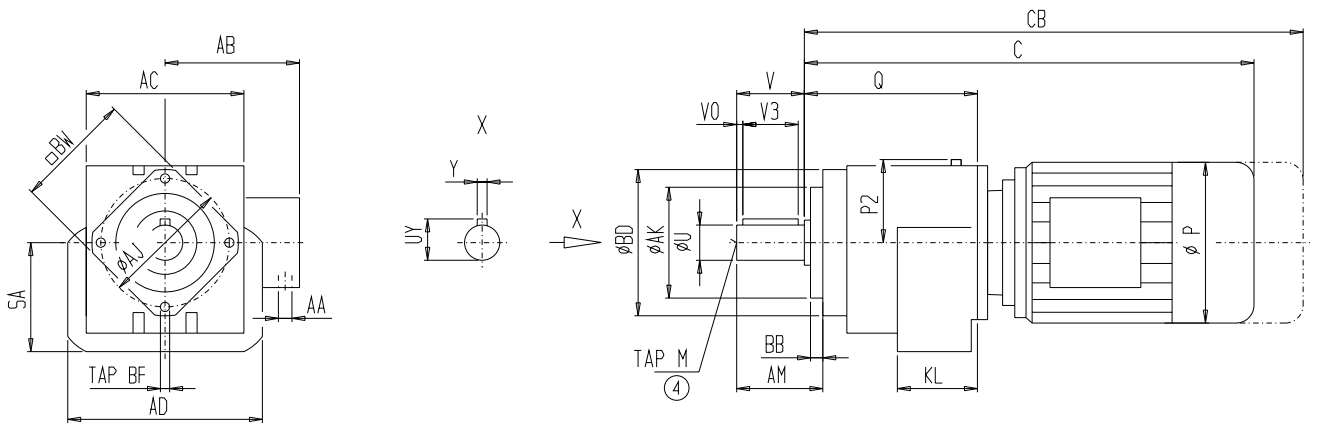
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DZ/ZZ 48

DZZ 510

[inch]



Flange

BD	AK	BW	AJ	BB	TAP BF
6.26	4.33	4.92	5.12	0.55	M10x16

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.375	2.76	2.375	0.027	1.51	0.3125	3.425	3/8-16UNC

Gearcase

KL	AC	AD	SA	P2	Q
3.15	6.61	8.66	4.61	3.46	6.81

Motor

	ZZ48		DZ48					Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZZ48**	**DZ48**
M71	16.58	18.31	17.25	18.98	5.43	4.67	2x1/2“	62	64
M80	17.42	19.59	18.09	20.26	6.22	4.98	2x1/2"	66	68
M90S	19.04	21.63	19.71	22.3	6.93	5.91	2x3/4"	71	73
M90L	19.04	21.63	19.71	22.3	6.93	5.91	2x3/4"	75	77
M100L	20.81	23.64	21.48	24.31	7.64	6.3	2x3/4"	95	97
M112M	22.83	26.02	-	-	8.58	6.59	2x3/4"	112	-
M132S	26.48	30.41	-	-	10.16	7.13	1"+3/4"	135	-
M132M	26.48	30.41	-	-	10.16	7.13	1"+3/4"	181	-

Tolerances see page 1 - 4

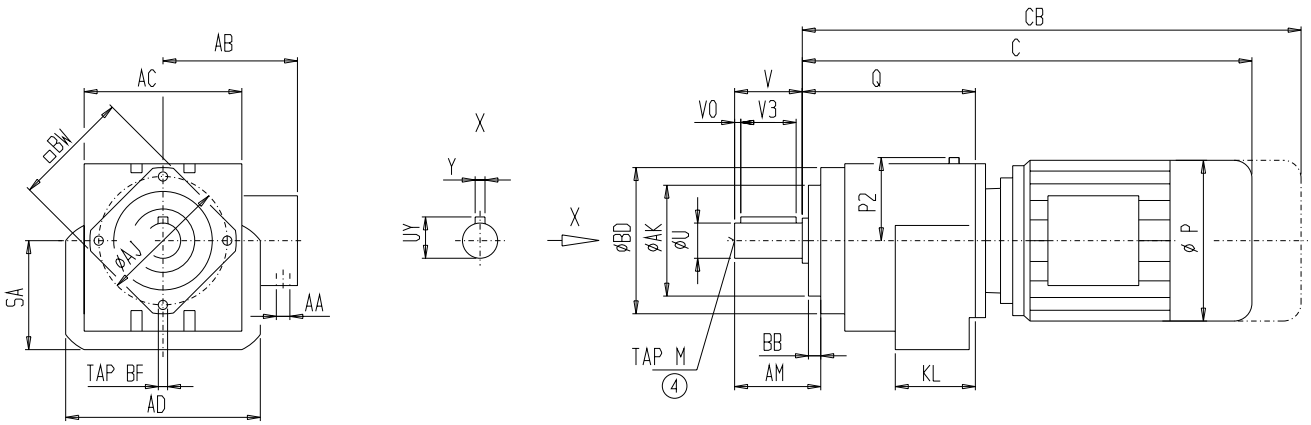
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DZ/ZZ 48

DZZ 510

[mm]



Flange

BD	AK	BW	AJ	BB	TAP BF
159	*110*	*125*	*130*	*14*	*M10x16*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
34,925	*70*	*60,325*	*0,686*	*38,35*	*7,938*	*87*	*3/8"-16UNC*

Gearcase

KL	AC	AD	SA	P2	Q
80	*168*	*220*	*117*	*88*	*173*

Motor

	ZZ48		DZ48					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZZ48**	**DZ48**
M71	*422*	*466*	*439*	*483*	*138*	*118,5*	*2x1/2"*	*28*	*29*
M80	*443,5*	*498,5*	*457,5*	*512,5*	*158*	*126,5*	*2x1/2"*	*30*	*31*
M90S	*484,5*	*550,5*	*501,5*	*567,5*	*176*	*150*	*2x3/4"*	*32*	*33*
M90L	*484,5*	*550,5*	*501,5*	*567,5*	*176*	*150*	*2x3/4"*	*34*	*35*
M100L	*529,5*	*601,5*	*546,5*	*618,5*	*194*	*160*	*2x3/4"*	*43*	*44*
M112M	*581*	*662*	-	-	*218*	*167,5*	*2x3/4"*	*51*	-
M132S	*673,5*	*773,5*	-	-	*258*	*181*	*1"+3/4"*	*61*	-
M132M	*673,5*	*773,5*	-	-	*258*	*181*	*1"+3/4"*	*82*	-

Tolerances see page 1 - 4

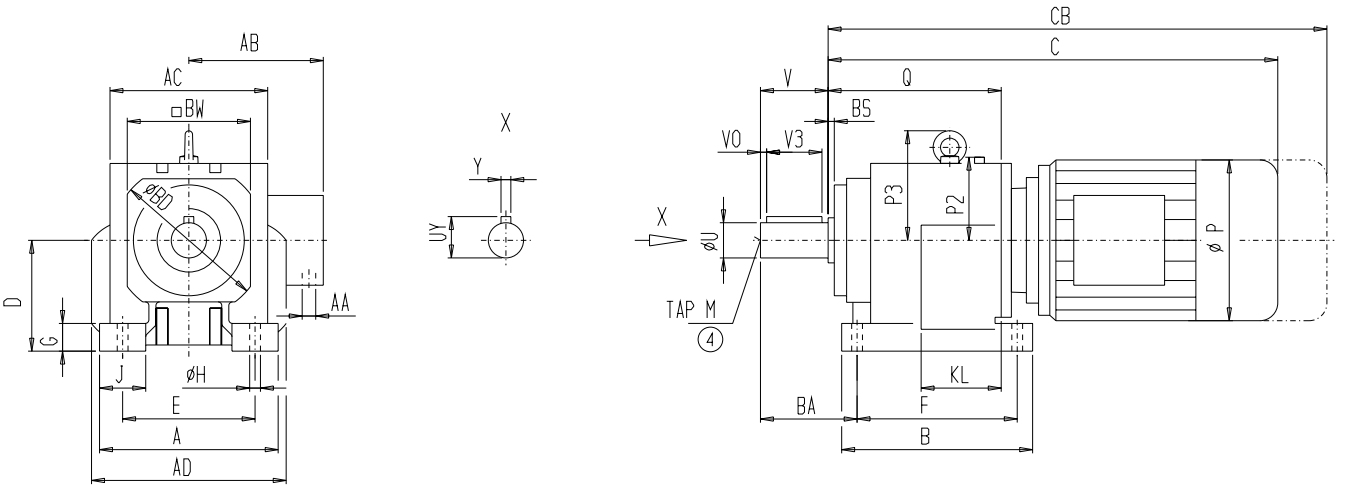
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 68

DZ 510

[inch]



Mounting

E	F	G	H	J
6.69	8.07	1.18	0.69	2.36

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1.625	3.15	2.75	0.065	1.79	0.375	4.53	5/8-11UNC

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P2	P3	Q
7.48	3.62	6.3	9.65	9.25	8.11	10.35	5.51	0.16	4.29	5.87	8.23

Motor

	Z68		D68					Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**Z68**	**D68**
M71	17.76	19.49	18.49	20.22	5.43	4.67	2x1/2"	104	108
M80	18.6	20.77	19.33	21.5	6.22	4.98	2x1/2"	108	112
M90S	20.22	22.81	20.95	23.54	6.93	5.91	2x3/4"	112	117
M90L	20.22	22.81	20.95	23.54	6.93	5.91	2x3/4"	117	121
M100L	21.99	24.82	22.72	25.55	7.64	6.3	2x3/4"	137	141
M112M	23.94	27.13	-	-	8.58	6.59	2x3/4"	154	-
M132S	27.5	31.47	-	-	10.16	7.13	1"+3/4"	179	-
M132M	27.5	31.47	-	-	10.16	7.13	1"+3/4"	225	-
M160M	30.79	35.4	-	-	12.2	7.83	1"+3/4"	260	-
M160L	30.79	35.4	-	-	12.2	7.83	1"+3/4"	293	-

Tolerances see page 1 - 4

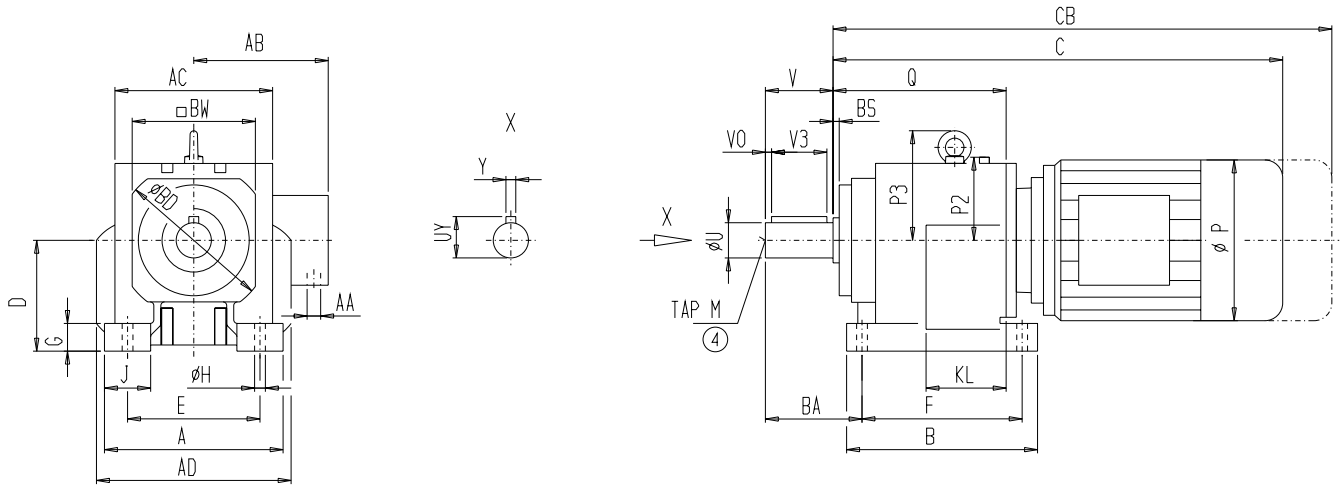
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 68

DZ 510

[mm]



Mounting

E	F	G	H	J
170	*205*	*30*	*17,5*	*60*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
41,275	*80*	*69,85*	*1,651*	*45,47*	*9,525*	*115*	*5/8"-11UNC*

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P2	P3	Q
190	*92*	*160*	*245*	*235*	*206*	*263*	*140*	*4*	*109*	*149*	*209*

Motor

	Z68		D68					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**Z68**	**D68**
M71	*452*	*496*	*471,5*	*515,5*	*138*	*118,5*	*2x1/2"*	*47*	*49*
M80	*473,5*	*528,5*	*490*	*545*	*158*	*126,5*	*2x1/2"*	*49*	*51*
M90S	*514,5*	*580,5*	*534*	*600*	*176*	*150*	*2x3/4"*	*51*	*53*
M90L	*514,5*	*580,5*	*534*	*600*	*176*	*150*	*2x3/4"*	*53*	*55*
M100L	*559,5*	*631,5*	*579*	*651*	*194*	*160*	*2x3/4"*	*62*	*64*
M112M	*609*	*690*	-	-	*218*	*167,5*	*2x3/4"*	*70*	-
M132S	*699,5*	*800,5*	-	-	*258*	*181*	*1"+3/4"*	*81*	-
M132M	*699,5*	*800,5*	-	-	*258*	*181*	*1"+3/4"*	*102*	-
M160M	*783*	*900*	-	-	*310*	*199*	*1"+3/4"*	*118*	-
M160L	*783*	*900*	-	-	*310*	*199*	*1"+3/4"*	*133*	-

Tolerances see page 1 - 4

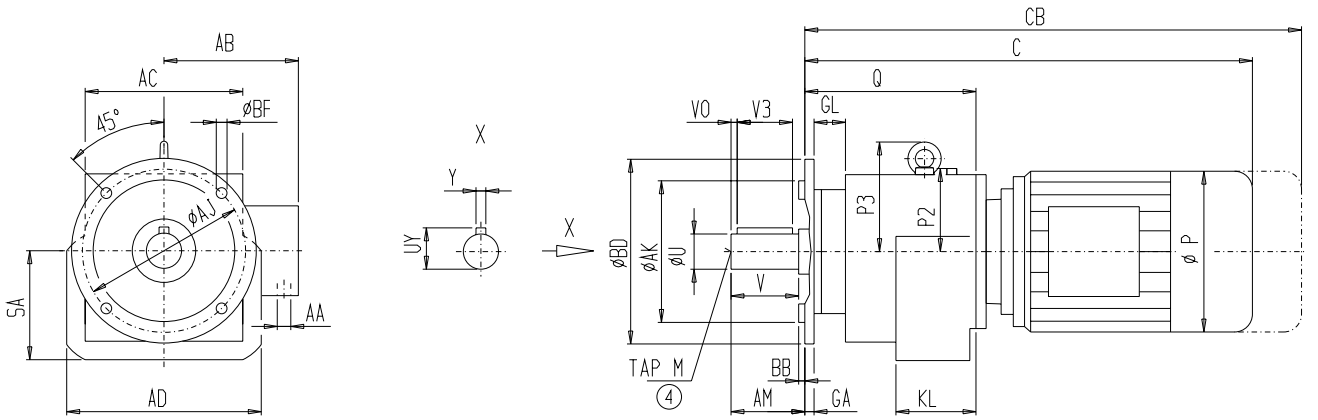
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DF/ZF 68

DZF 510

[inch]



Flange

BD	AK	GA	AJ	BB	GL	BF
9.84	7.09	0.59	8.46	0.16	1.69	0.53
11.81	9.06	0.63	10.43	0.16	1.65	0.53
13.78	9.84	0.71	11.81	0.16	1.57	0.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.625	3.15	2.75	0.065	1.79	0.375	3.15	5/8-11UNC

Gearcase

KL	AC	AD	SA	P2	P3	Q
3.6	8.11	10.35	5.67	4.29	5.87	8.23

Motor

	ZF68		DF68					Weight [lb]	
Motor	C	CB	C	CB	P	AB	AA	ZF68	DF68
M71	17.76	19.49	18.49	20.22	5.43	4.67	2x1/2"	106	110
M80	18.6	20.77	19.33	21.5	6.22	4.98	2x1/2"	110	115
M90S	20.22	22.81	20.95	23.54	6.93	5.91	2x3/4"	115	119
M90L	20.22	22.81	20.95	23.54	6.93	5.91	2x3/4"	119	123
M100L	21.99	24.82	22.72	25.55	7.64	6.3	2x3/4"	139	143
M112M	23.94	27.13	-	-	8.58	6.59	2x3/4"	157	-
M132S	27.5	31.47	-	-	10.16	7.13	1"+3/4"	181	-
M132M	27.5	31.47	-	-	10.16	7.13	1"+3/4"	227	-
M160M	30.79	35.4	-	-	12.2	7.83	1"+3/4"	258	-
M160L	30.79	35.4	-	-	12.2	7.83	1"+3/4"	291	-

Tolerances see page 1 - 4

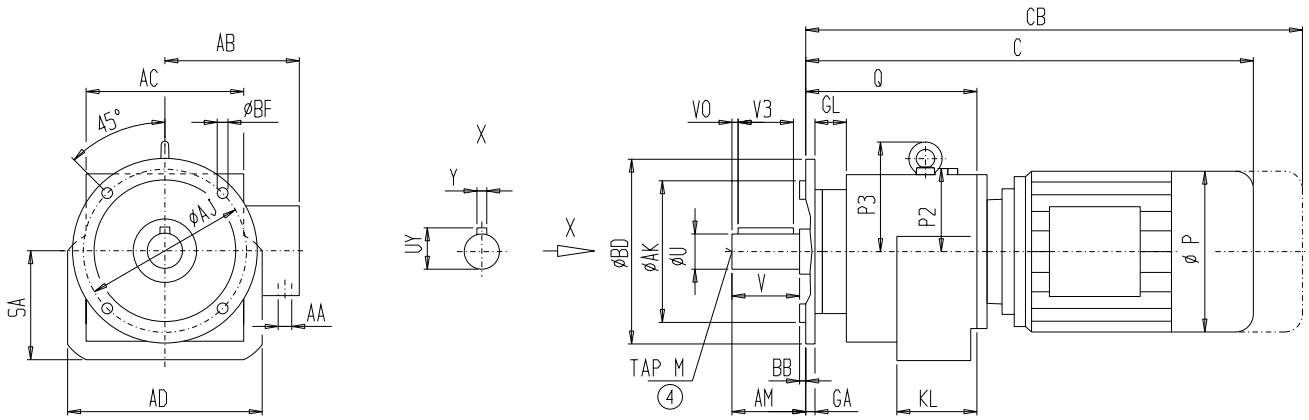
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DF/ZF 68

DZF 510

[mm]



Flange

BD	AK	GA	AJ	BB	GL	BF
250	*180*	*15*	*215*	*4*	*43*	*13,5*
300	*230*	*16*	*265*	*4*	*42*	*13,5*
350	*250*	*18*	*300*	*4*	*42*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
41,275	*80*	*69,85*	*1,651*	*45,47*	*9,525*	*80*	*5/8"-11UNC*

Gearcase

KL	AC	AD	SA	P2	P3	Q
91,5	*206*	*263*	*144*	*109*	*149*	*209*

Motor

	ZF68		DF68					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZF68**	**DF68**
M71	*452*	*496*	*470,5*	*514,5*	*138*	*118,5*	*2x1/2"*	*48*	*50*
M80	*473,5*	*528,5*	*492*	*547*	*158*	*126,5*	*2x1/2"*	*50*	*52*
M90S	*514,5*	*580,5*	*533*	*599*	*176*	*150*	*2x3/4"*	*52*	*54*
M90L	*514,5*	*580,5*	*533*	*599*	*176*	*150*	*2x3/4"*	*54*	*56*
M100L	*559,5*	*631,5*	*578*	*650*	*194*	*160*	*2x3/4"*	*63*	*65*
M112M	*609*	*690*	-	-	*218*	*167,5*	*2x3/4"*	*71*	-
M132S	*669,5*	*800,5*	-	-	*258*	*181*	*1"+3/4"*	*82*	-
M132M	*669,5*	*800,5*	-	-	*258*	*181*	*1"+3/4"*	*103*	-
M160M	*783*	*900*	-	-	*310*	*199*	*1"+3/4"*	*117*	-
M160L	*783*	*900*	-	-	*310*	*199*	*1"+3/4"*	*132*	-

Tolerances see page 1 - 4

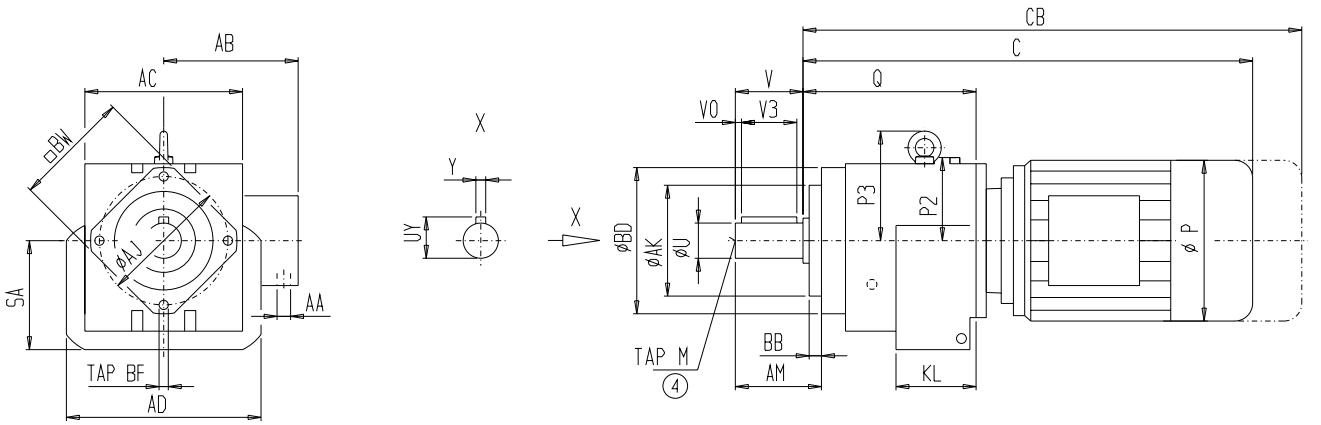
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DZ/ZZ 68

DZZ 510

[inch]



Flange

BD	AK	BW	AJ	BB	TAP BF
7.48	5.12	6.3	6.5	0.55	M12x17

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.625	3.15	2.75	0.065	1.79	0.375	3.86	5/8-11UNC

Gearcase

KL	AC	AD	SA	P2	P3	Q
3.6	8.11	10.35	5.67	4.29	5.87	8.23

Motor

	ZZ68		DZ68					Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZZ68**	**DZ68**
M71	17.76	19.49	18.49	20.22	5.43	4.67	2x1/2"	90	97
M80	18.6	20.77	19.33	21.5	6.22	4.98	2x1/2"	97	101
M90S	20.22	22.81	20.95	23.54	6.93	5.91	2x3/4"	101	106
M90L	20.22	22.81	20.95	23.54	6.93	5.91	2x3/4"	106	110
M100L	21.99	24.82	22.72	25.55	7.64	6.3	2x3/4"	126	130
M112M	23.94	27.13	-	-	8.58	6.59	2x3/4"	143	-
M132S	27.5	31.47	-	-	10.16	7.13	1"+3/4"	170	-
M132M	27.5	31.47	-	-	10.16	7.13	1"+3/4"	216	-
M160M	30.79	35.4	-	-	12.2	7.83	1"+3/4"	249	-
M160L	30.79	35.4	-	-	12.2	7.83	1"+3/4"	282	-

Tolerances see page 1 - 4

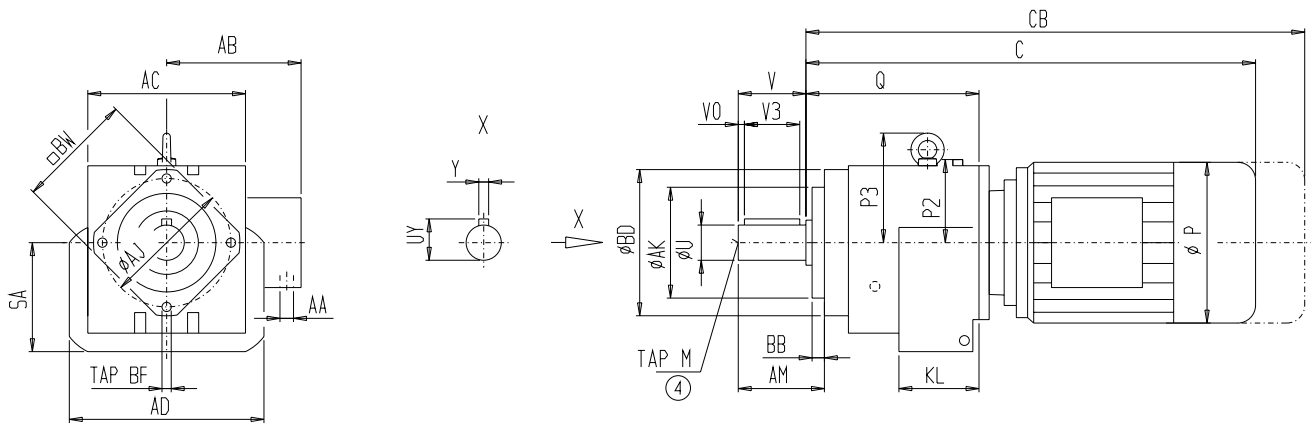
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DZ/ZZ 68

DZZ 510

[mm]



Flange

BD	AK	BW	AJ	BB	TAP BF
190	*130*	*160*	*165*	*14*	*M12x17*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
41,275	*80*	*69,85*	*1,651*	*45,47*	*9,525*	*98*	*5/8"-11UNC*

Gearcase

KL	AC	AD	SA	P2	P3	Q
91,5	*206*	*263*	*144*	*109*	*149*	*209*

Motor

	ZZ68		DZ68					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZZ68**	**DZ68**
M71	*452*	*496*	*470,5*	*514,5*	*138*	*118,5*	*2x1/2"*	*41*	*44*
M80	*473,5*	*528,5*	*492*	*547*	*158*	*126,5*	*2x1/2"*	*44*	*46*
M90S	*514,5*	*580,5*	*533*	*599*	*176*	*150*	*2x3/4"*	*46*	*48*
M90L	*514,5*	*580,5*	*533*	*599*	*176*	*150*	*2x3/4"*	*48*	*50*
M100L	*559,5*	*631,5*	*578*	*650*	*194*	*160*	*2x3/4"*	*57*	*59*
M112M	*609*	*690*	-	-	*218*	*167,5*	*2x3/4"*	*65*	-
M132S	*669,5*	*800,5*	-	-	*258*	*181*	*1"+3/4"*	*77*	-
M132M	*669,5*	*800,5*	-	-	*258*	*181*	*1"+3/4"*	*98*	-
M160M	*783*	*900*	-	-	*310*	*199*	*1"+3/4"*	*113*	-
M160L	*783*	*900*	-	-	*310*	*199*	*1"+3/4"*	*128*	-

Tolerances see page 1 - 4

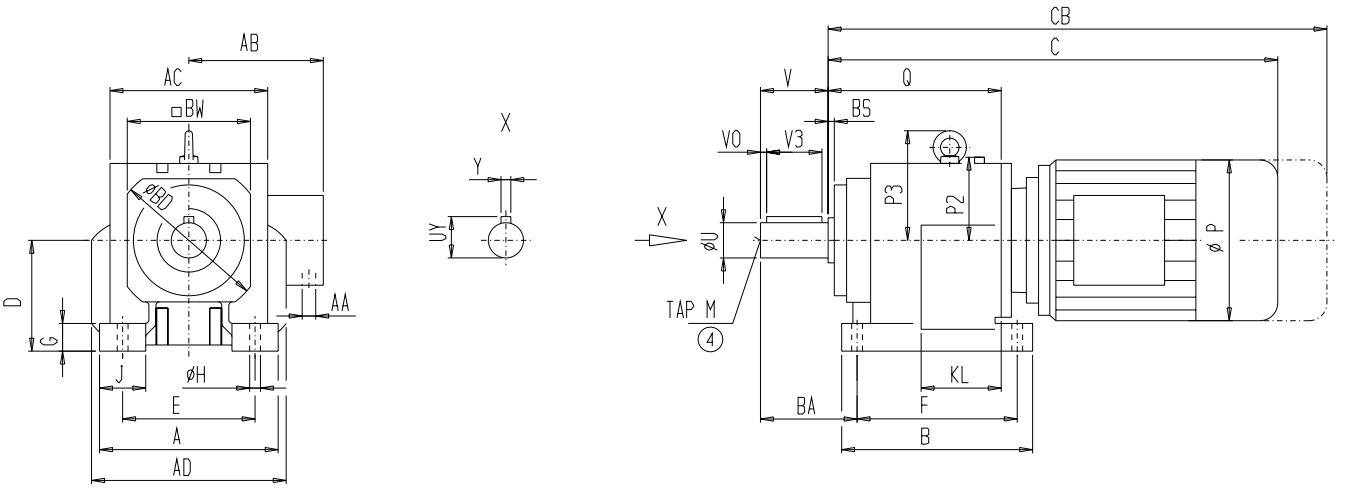
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 88

DZ 510

[inch]



Mounting

E	F	G	H	J
8.46	10.24	1.77	0.69	2.95

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
2.125	3.94	3.5	0.004	2.35	0.5	5.51	3/4-10UNC

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	DB	P	P2	P3	Q
9.65	5.08	7.87	12.2	11.42	10.24	13.07	7.09	0.16	0	5.12	5.28	7.13	10.47

Motor

	Z88		D88					Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**Z88**	**D88**
M71	-	-	20.4	22.13	5.43	4.67	2x1/2"	-	174
M80	-	-	21.24	23.41	6.22	4.98	2x1/2"	-	179
M90S	21.87	24.46	22.86	25.45	6.93	5.91	2x3/4"	187	183
M90L	21.87	24.46	22.86	25.45	6.93	5.91	2x3/4"	192	187
M100L	23.55	26.38	24.63	27.46	7.64	6.3	2x3/4"	205	207
M112M	25.45	28.64	26.59	29.78	8.58	6.59	2x3/4"	216	223
M132S	29.02	32.99	30.12	34.09	10.16	7.13	1"+3/4"	282	251
M132M	29.02	32.99	30.12	34.09	10.16	7.13	1"+3/4"	313	298
M160M	32.38	36.99	-	-	12.2	7.83	1"+3/4"	324	-
M160L	32.38	36.99	-	-	12.2	7.83	1"+3/4"	355	-
M180M	34.39	39.03	-	-	13.7	9.69	1 1/4"+3/4"	417	-
M180L	34.39	39.03	-	-	13.7	9.69	1 1/4"+3/4"	432	-

Tolerances see page 1 - 4

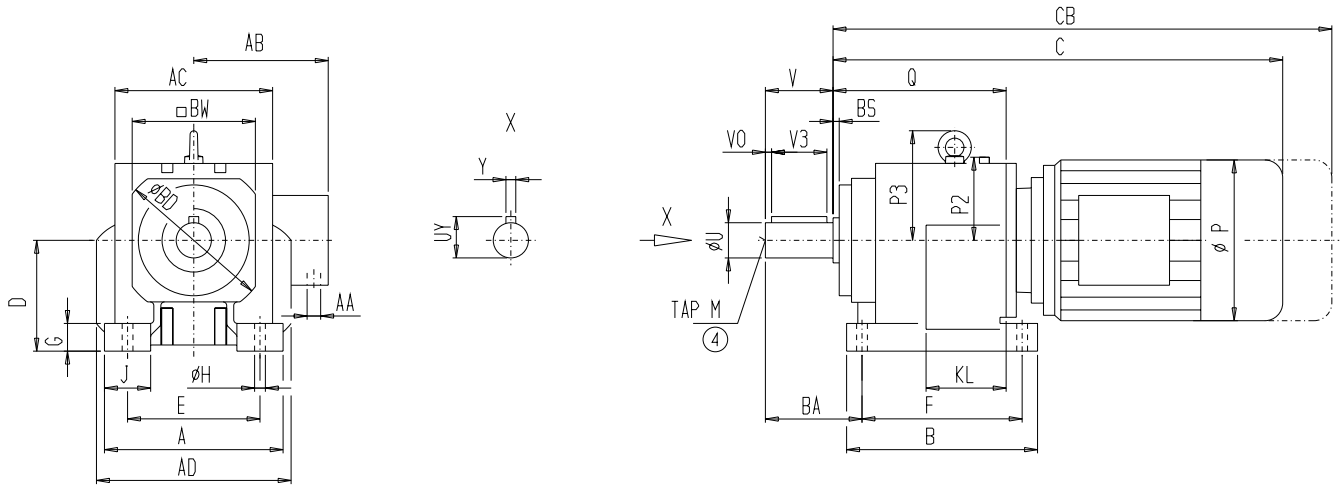
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 88

DZ 510

[mm]



Mounting

E	F	G	H	J
215	*260*	*45*	*17,5*	*75*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
83,975	*100*	*88,9*	*0,102*	*59,69*	*12,7*	*140*	*3/4"-10UNC*

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P2	P3	Q
245	*129*	*200*	*310*	*290*	*260*	*332*	*180*	*4*	*134*	*181*	*266*

Motor

	Z88		D88					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**Z88**	**D88**
M71	-	-	*519*	*563*	*138*	*118,5*	*2x1/2"*	-	*79*
M80	-	-	*540,5*	*595,5*	*158*	*126,5*	*2x1/2"*	-	*81*
M90S	*556,5*	*622,5*	*581,5*	*647,5*	*176*	*150*	*2x3/4"*	*85*	*83*
M90L	*556,5*	*622,5*	*581,5*	*647,5*	*176*	*150*	*2x3/4"*	*87*	*85*
M100L	*599*	*671*	*626,5*	*698,5*	*194*	*160*	*2x3/4"*	*93*	*94*
M112M	*647,5*	*728,5*	*676,5*	*757,5*	*218*	*167,5*	*2x3/4"*	*98*	*103*
M132S	*738*	*839*	*766*	*867*	*258*	*181*	*1"+3/4"*	*128*	*114*
M132M	*738*	*839*	*766*	*867*	*258*	*181*	*1"+3/4"*	*142*	*135*
M160M	*823,5*	*940,5*	-	-	*310*	*199*	*1"+3/4"*	*147*	-
M160L	*823,5*	*940,5*	-	-	*310*	*199*	*1"+3/4"*	*161*	-
M180M	*874,5*	*992,5*	-	-	*348*	*246*	*1 1/4"+3/4"*	*189*	-
M180L	*874,5*	*992,5*	-	-	*348*	*246*	*1 1/4"+3/4"*	*196*	-

Tolerances see page 1 - 4

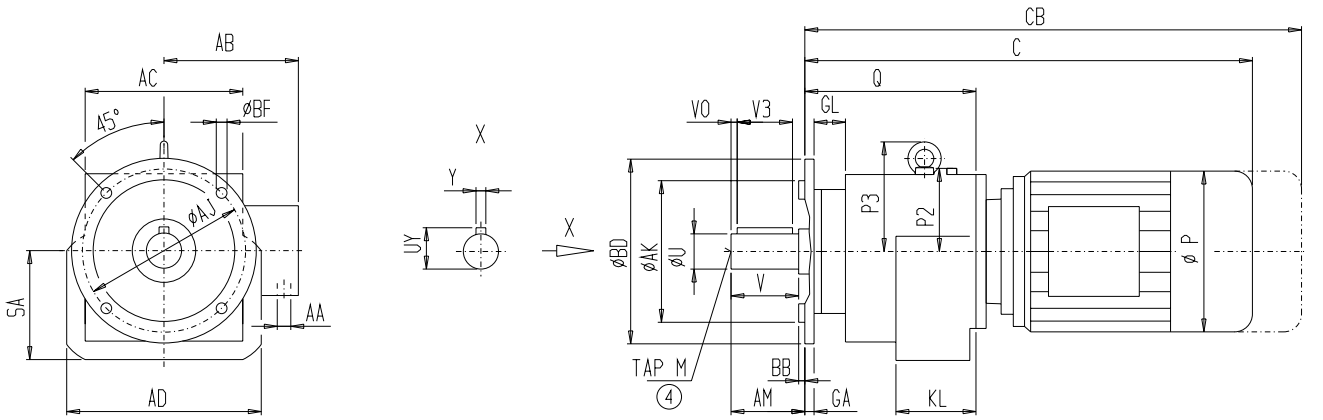
④ Tap specification see page 1 - 7

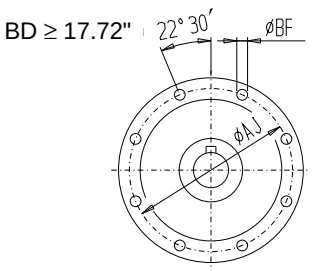
Helical Gear Motors
Flange mounted

DF/ZF 88

DZF 510

[inch]





Flange

BD	AK	GA	AJ	BB	GL	BF
11.81	9.06	0.63	10.43	0.16	2.13	0.53
13.78	9.84	0.71	11.81	0.2	2.05	0.69
17.72	13.78	0.71	15.75	0.2	2.05	0.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.125	3.94	3.5	0.004	2.35	0.5	3.94	3/4-10UNC

Gearcase

KL	AC	AD	SA	P2	P3	Q
5.08	10.24	13.07	7.17	5.28	7.13	10.47

Motor

	ZF88		DF88					Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZF88**	**DF88**
M71	-	-	20.4	22.13	5.43	4.67	2x1/2"	-	179
M80	-	-	21.24	23.41	6.22	4.98	2x1/2"	-	183
M90S	21.87	24.46	22.86	25.45	6.93	5.91	2x3/4"	192	187
M90L	21.87	24.46	22.86	25.45	6.93	5.91	2x3/4"	196	192
M100L	23.55	26.38	24.63	27.46	7.64	6.3	2x3/4"	209	212
M112M	25.45	28.64	26.59	29.78	8.58	6.59	2x3/4"	221	232
M132S	29.02	32.99	30.12	34.09	10.16	7.13	1"+3/4"	287	256
M132M	29.02	32.99	30.12	34.09	10.16	7.13	1"+3/4"	317	302
M160M	32.38	36.99	-	-	12.2	7.83	1"+3/4"	318	-
M160L	32.38	36.99	-	-	12.2	7.83	1"+3/4"	359	-
M180M	34.39	39.03	-	-	13.7	9.69	1 1/4"+3/4"	421	-
M180L	34.39	39.03	-	-	13.7	9.69	1 1/4"+3/4"	437	-

Tolerances see page 1 - 4

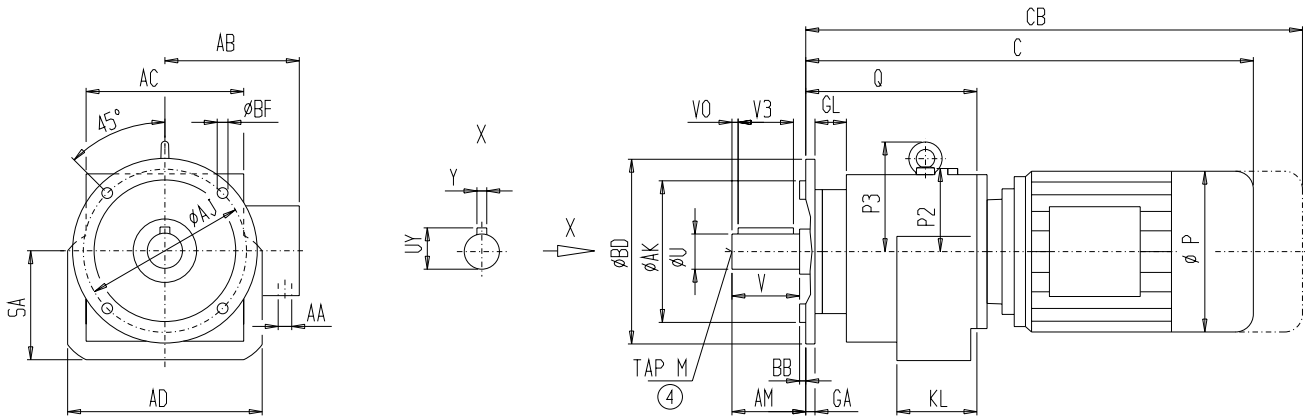
④ Tap specification see page 1 - 7

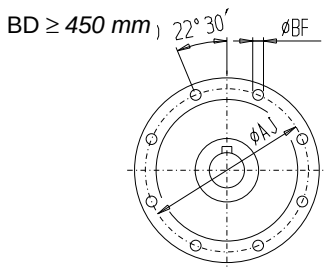
Helical Gear Motors
Flange mounted

DF/ZF 88

DZF 510

[mm]





Flange

BD	AK	GA	AJ	BB	GL	BF
300	*230*	*16*	*265*	*4*	*54*	*13,5*
350	*250*	*18*	*300*	*5*	*52*	*17,5*
450	*350*	*18*	*400*	*5*	*52*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
83,975	*100*	*88,9*	*0,102*	*59,69*	*12,7*	*100*	*3/4"-10UNC*

Gearcase

KL	AC	AD	SA	P2	P3	Q
129	*260*	*332*	*182*	*134*	*181*	*266*

Motor

	ZF88		DF88					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZF88**	**DF88**
M71	-	-	*519*	*563*	*138*	*118,5*	*2x1/2"*	-	*81*
M80	-	-	*540,5*	*595,5*	*158*	*126,5*	*2x1/2"*	-	*83*
M90S	*556,5*	*622,5*	*581,5*	*647,5*	*176*	*150*	*2x3/4"*	*87*	*85*
M90L	*556,5*	*622,5*	*581,5*	*647,5*	*176*	*150*	*2x3/4"*	*89*	*87*
M100L	*599*	*671*	*626,5*	*698,5*	*194*	*160*	*2x3/4"*	*95*	*96*
M112M	*647,5*	*728,5*	*676,5*	*757,5*	*218*	*167,5*	*2x3/4"*	*100*	*105*
M132S	*738*	*839*	*766*	*867*	*258*	*181*	*1"+3/4"*	*130*	*116*
M132M	*738*	*839*	*766*	*867*	*258*	*181*	*1"+3/4"*	*144*	*137*
M160M	*823,5*	*940,5*	-	-	*310*	*199*	*1"+3/4"*	*149*	-
M160L	*823,5*	*940,5*	-	-	*310*	*199*	*1"+3/4"*	*163*	-
M180M	*874,5*	*992,5*	-	-	*348*	*246*	*1 1/4"+3/4"*	*191*	-
M180L	*874,5*	*992,5*	-	-	*348*	*246*	*1 1/4"+3/4"*	*198*	-

Tolerances see page 1 - 4

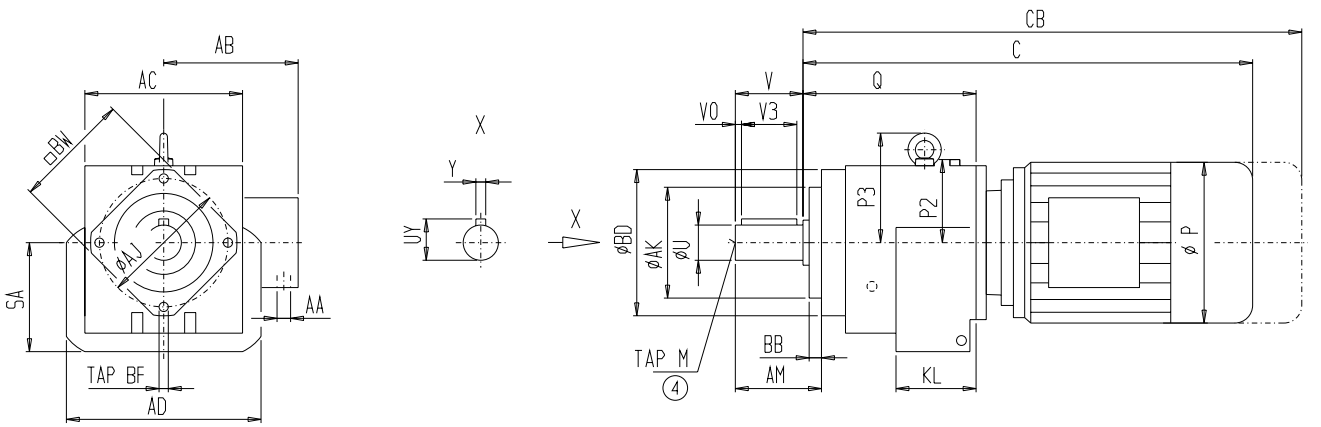
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DZ/ZZ 88

DZZ 510

[inch]



Flange

BD	AK	BW	AJ	BB	TAP BF
9.65	7.09	7.87	8.46	0.71	M16x22

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.125	3.94	3.5	0.004	2.35	0.5	4.8	3/4-10UNC

Gearcase

KL	AC	AD	SA	P2	P3	Q
5.08	10.24	13.07	7.17	5.28	7.13	10.47

Motor

	ZZ88		DZ88					Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZZ88**	**DZ88**
M71	-	-	20.4	22.13	5.43	4.67	2x1/2"	-	161
M80	-	-	21.24	23.41	6.22	4.98	2x1/2"	-	165
M90S	21.87	24.46	22.86	25.45	6.93	5.91	2x3/4"	174	170
M90L	21.87	24.46	22.86	25.45	6.93	5.91	2x3/4"	174	174
M100L	23.55	26.38	24.63	27.46	7.64	6.3	2x3/4"	192	194
M112M	25.45	28.64	26.59	29.78	8.58	6.59	2x3/4"	203	214
M132S	29.02	32.99	30.12	34.09	10.16	7.13	1"+3/4"	269	238
M132M	29.02	32.99	30.12	34.09	10.16	7.13	1"+3/4"	300	284
M160M	32.38	36.99	-	-	12.2	7.83	1"+3/4"	311	-
M160L	32.38	36.99	-	-	12.2	7.83	1"+3/4"	342	-
M180M	34.39	39.03	-	-	13.7	9.69	1 1/4"+3/4"	404	-
M180L	34.39	39.03	-	-	13.7	9.69	1 1/4"+3/4"	419	-

Tolerances see page 1 - 4

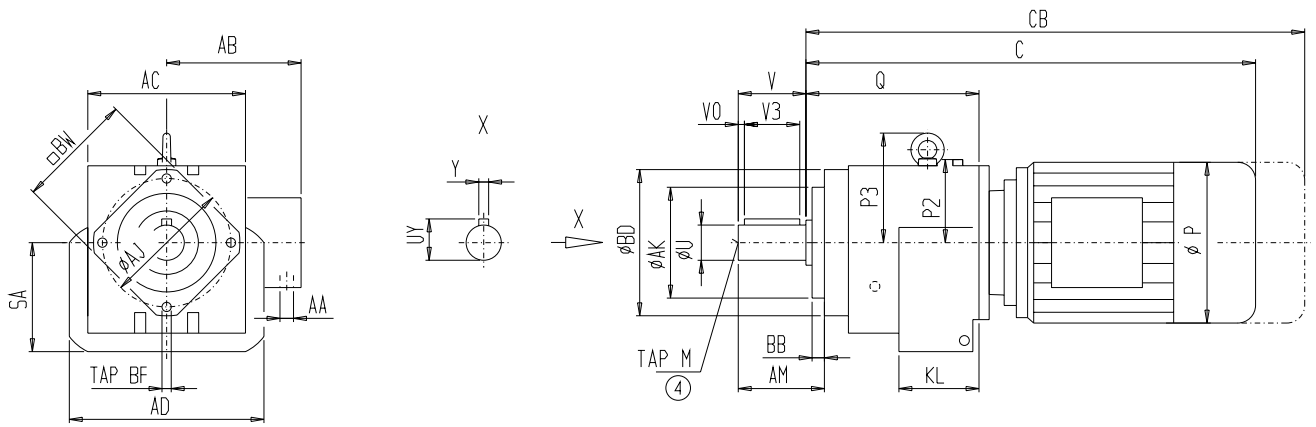
④ Tap specification see page 1 - 7

Helical Gear Motors
Flange mounted

DZ/ZZ 88

DZZ 510

[mm]



Flange

BD	AK	BW	AJ	BB	TAP BF
245	*180*	*200*	*215*	*18*	*M16x22*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
53,975	*100*	*88,9*	*0,102*	*59,69*	*12,7*	*122*	*3/4"-10UNC*

Gearcase

KL	AC	AD	SA	P2	P3	Q
129	*260*	*332*	*182*	*134*	*181*	*266*

Motor

	ZZ88		DZ88					Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AA**	**ZZ88**	**DZ88**
M71	-	-	*519*	*563*	*138*	*118,5*	*2x1/2"*	-	*73*
M80	-	-	*540,5*	*595,5*	*158*	*126,5*	*2x1/2"*	-	*75*
M90S	*556,5*	*622,5*	*581,5*	*647,5*	*176*	*150*	*2x3/4"*	*79*	*77*
M90L	*556,5*	*622,5*	*581,5*	*647,5*	*176*	*150*	*2x3/4"*	*79*	*79*
M100L	*599*	*671*	*626,5*	*698,5*	*194*	*160*	*2x3/4"*	*87*	*88*
M112M	*647,5*	*728,5*	*676,5*	*757,5*	*218*	*167,5*	*2x3/4"*	*92*	*97*
M132S	*738*	*839*	*766*	*867*	*258*	*181*	*1"+3/4"*	*122*	*108*
M132M	*738*	*839*	*766*	*867*	*258*	*181*	*1"+3/4"*	*136*	*129*
M160M	*823,5*	*940,5*	-	-	*310*	*199*	*1"+3/4"*	*141*	-
M160L	*823,5*	*940,5*	-	-	*310*	*199*	*1"+3/4"*	*155*	-
M180M	*874,5*	*992,5*	-	-	*348*	*246*	*1 1/4"+3/4"*	*183*	-
M180L	*874,5*	*992,5*	-	-	*348*	*246*	*1 1/4"+3/4"*	*190*	-

Tolerances see page 1 - 4

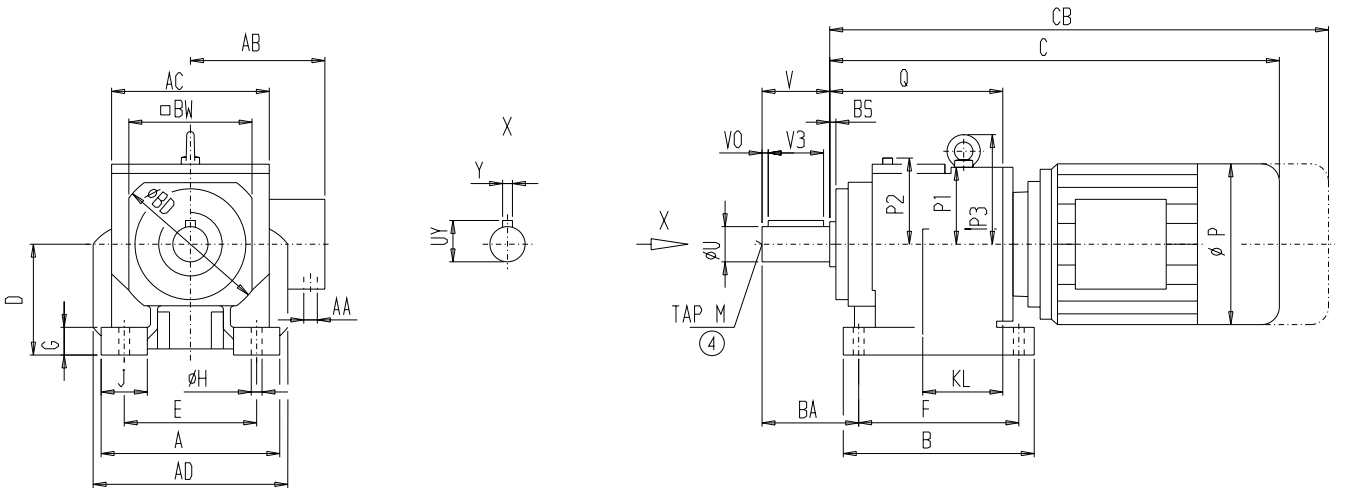
④ Tap specification see page 1 - 7

Helical Gear Motors
Foot mounted

D/Z 108

DZ 510

[inch]



Mounting

E	F	G	H	J
9.84	12.2	1.97	0.87	3.54

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
2.375	4.72	4.25	0.002	2.65	0.625	6.28	3/4-10UNC

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P1	P2	P3	Q
11.81	4.94	9.84	14.37	13.39	12.05	16.14	8.86	0.2	6.18	6.54	8.58	12.24

Motor

	Z108		D108						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**Z108**	**D108**
M80	-	-	22.77	24.94	6.22	4.98	4.98	2x1/2"	-	289
M90S	23.19	25.78	24.39	26.98	6.93	5.91	5.91	2x3/4"	289	293
M90L	23.19	25.78	24.39	26.98	6.93	5.91	5.91	2x3/4"	293	298
M100L	24.84	27.67	26.16	28.99	7.64	6.3	6.3	2x3/4"	311	318
M112M	26.77	29.96	28.01	31.2	8.58	6.59	6.59	2x3/4"	329	337
M132S	30.3	34.27	31.58	35.55	10.16	7.13	7.13	1"+3/4"	348	359
M132M	30.3	34.27	31.58	35.55	10.16	7.13	7.13	1"+3/4"	395	406
M160M	33.7	38.31	34.86	39.47	12.2	7.83	7.83	1"+3/4"	426	441
M160L	33.7	38.31	34.86	39.47	12.2	7.83	7.83	1"+3/4"	456	472
M180M	35.67	40.32	-	-	13.7	9.69	9.69	1 1/4"+3/4"	529	-
M180L	35.67	40.32	-	-	13.7	9.69	9.69	1 1/4"+3/4"	542	-
M200L	36.66	41.78	-	-	15.16	10.24	10.24	1 1/4"+3/4"	653	-
LG225S incl. adapter	47.46	on request	-	-	17.4	12.8	on request	2x1 1/2"	1072	-
LG225ZM incl. adapter	48.64	on request	-	-	17.4	12.8	on request	2x1 1/2"	1160	-

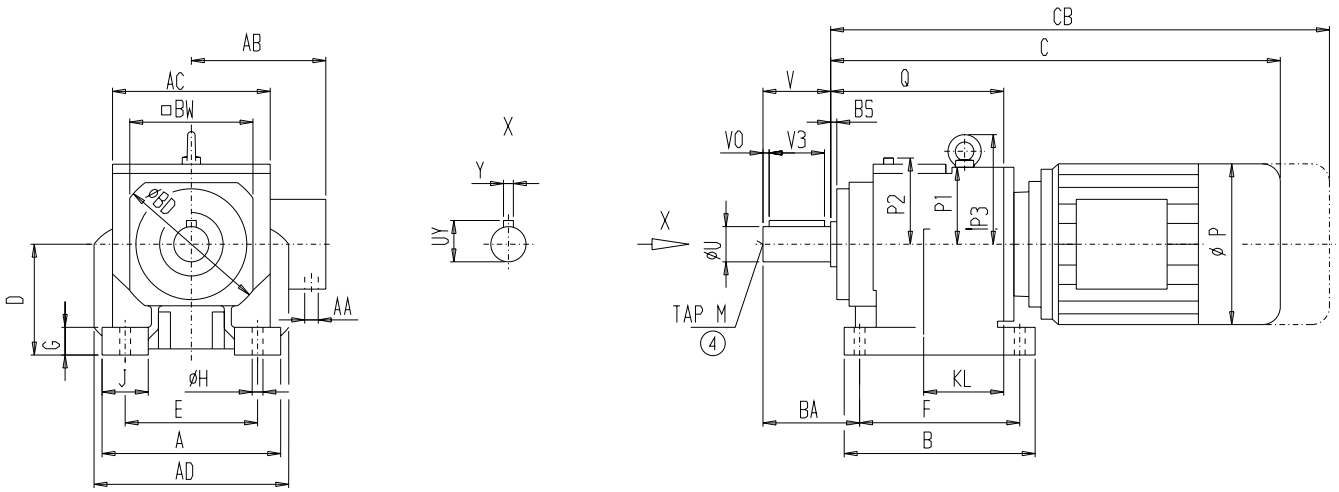
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

D/Z 108

DZ 510

[mm]



Mounting

E	F	G	H	J
250	*310*	*50*	*22*	*90*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
60,325	*120*	*107,95*	*0,051*	*67,31*	*15,875*	*159,5*	*3/4"-10UNC*

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P1	P2	P3	Q
300	*125,5*	*250*	*365*	*340*	*306*	*410*	*225*	*5*	*157*	*166*	*218*	*311*

Motor

	Z108		D108						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**Z108**	**D108**
M80	-	-	*579,5*	*634,5*	*158*	*126,5*	*126,5*	*2x1/2"*	-	*131*
M90S	*590*	*656*	*620,5*	*686,5*	*176*	*150*	*150*	*2x3/4"*	*131*	*133*
M90L	*590*	*656*	*620,5*	*686,5*	*176*	*150*	*150*	*2x3/4"*	*133*	*135*
M100L	*632*	*704*	*665,5*	*737,5*	*194*	*160*	*160*	*2x3/4"*	*141*	*144*
M112M	*681*	*762*	*712,5*	*793,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*149*	*153*
M132S	*770,5*	*871,5*	*803*	*904*	*258*	*181*	*181*	*1"+3/4"*	*158*	*163*
M132M	*770,5*	*871,5*	*803*	*904*	*258*	*181*	*181*	*1"+3/4"*	*179*	*184*
M160M	*857*	*974*	*886,5*	*1003,5*	*310*	*199*	*199*	*1"+3/4"*	*193*	*200*
M160L	*857*	*974*	*886,5*	*1003,5*	*310*	*199*	*199*	*1"+3/4"*	*207*	*214*
M180M	*907*	*1025*	-	-	*348*	*246*	*246*	*1 1/4"+3/4"*	*240*	-
M180L	*907*	*1025*	-	-	*348*	*246*	*246*	*1 1/4"+3/4"*	*246*	-
M200L	*932*	*1062*	-	-	*385*	*260*	*260*	*1 1/4"+3/4"*	*296*	-
LG225S incl. adapter	*1205,5*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*486*	-
LG225ZM incl. adapter	*1235,5*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*526*	-

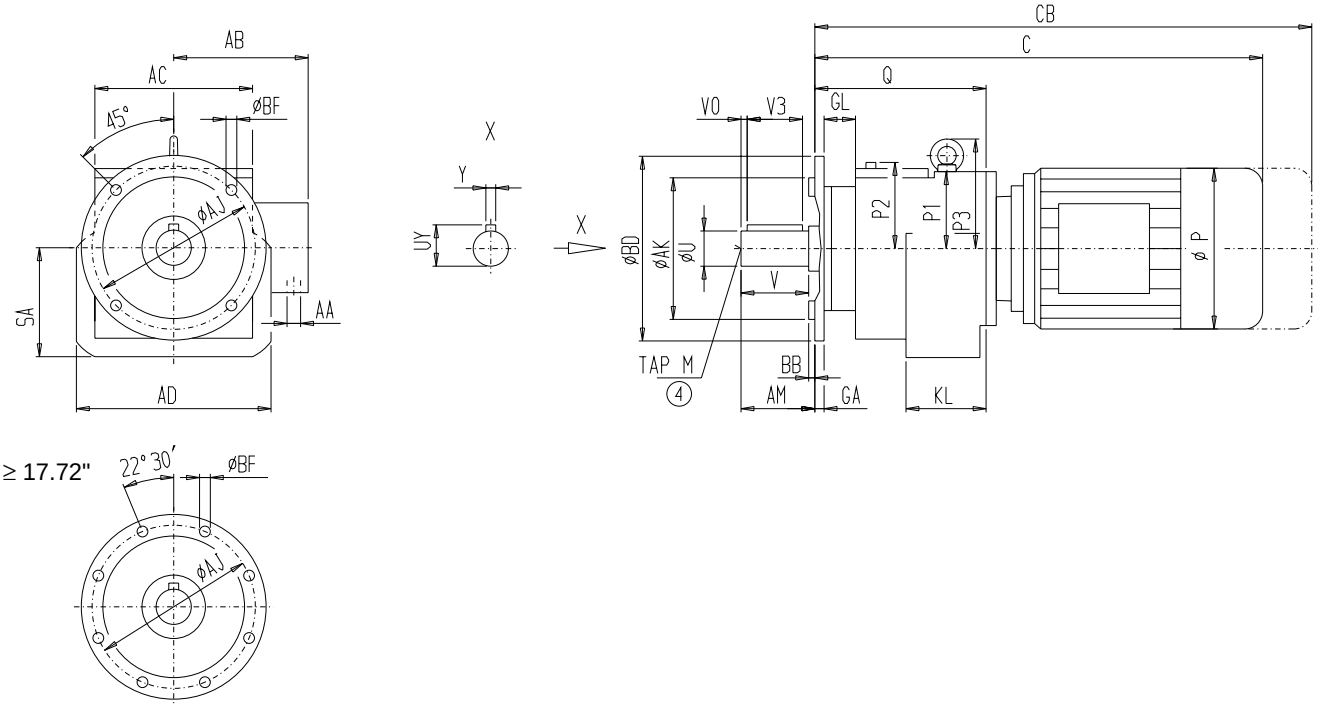
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

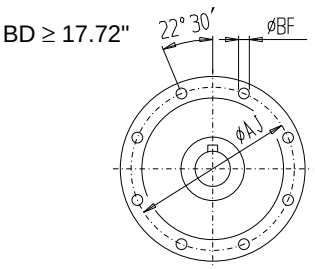
Helical Gear Motors
Flange mounted

DF/ZF 108

DZF 510

[inch]





Flange

BD	AK	GA	AJ	BB	GL	BF
13.78	9.84	0.71	11.81	0.2	1.61	0.69
17.72	13.78	0.79	15.75	0.2	1.54	0.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.375	*4.72*	*4.25*	*0.002*	*2.65*	*0.625*	*4.72*	*3/4-10UNC*

Gearcase

KL	AC	AD	SA	P1	P2	P3	Q
4.98	12.83	16.14	8.7	6.63	6.97	8.98	12.24

Motor

	ZF108		DF108						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZF108**	**DF108**
M80	-	-	22.77	24.94	6.22	4.98	4.98	2x1/2"	-	287
M90S	23.19	25.78	24.39	26.98	6.93	5.91	5.91	2x3/4"	287	291
M90L	23.19	25.78	24.39	26.98	6.93	5.91	5.91	2x3/4"	291	295
M100L	24.84	27.67	26.16	28.99	7.64	6.3	6.3	2x3/4"	309	315
M112M	26.77	29.96	28.01	31.2	8.58	6.59	6.59	2x3/4"	326	335
M132S	30.3	34.27	31.58	35.55	10.16	7.13	7.13	1"+3/4"	346	357
M132M	30.3	34.27	31.58	35.55	10.16	7.13	7.13	1"+3/4"	392	404
M160M	33.7	38.31	34.86	39.47	12.2	7.83	7.83	1"+3/4"	423	439
M160L	33.7	38.31	34.86	39.47	12.2	7.83	7.83	1"+3/4"	454	470
M180M	35.67	40.32	-	-	13.7	9.69	9.69	1 1/4"+3/4"	527	-
M180L	35.67	40.32	-	-	13.7	9.69	9.69	1 1/4"+3/4"	540	-
M200L	36.66	41.78	-	-	15.16	10.24	10.24	1 1/4"+3/4"	650	-
LG225S incl. adapter	47.46	on request	-	-	17.4	12.8	on request	2x1 1/2"	1069	-
LG225ZM incl. adapter	48.64	on request	-	-	17.4	12.8	on request	2x1 1/2"	1158	-

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

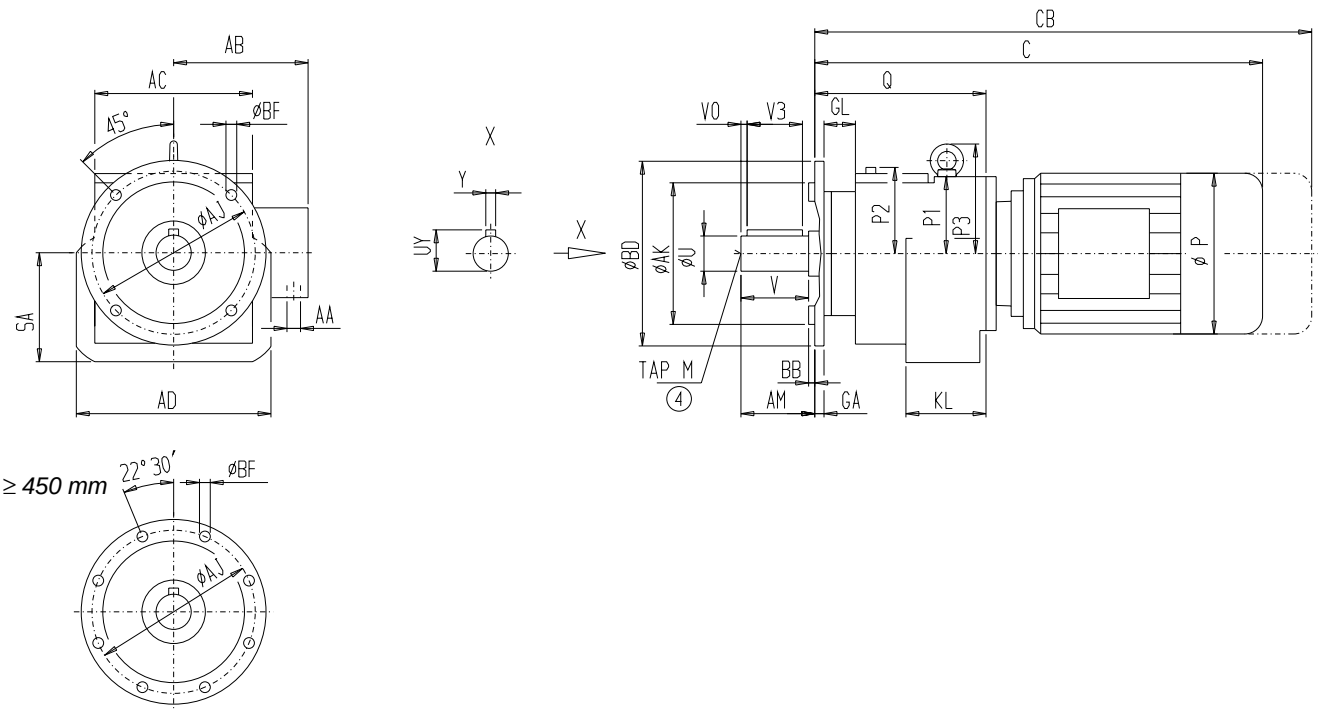
** for voltage ratio 1:2

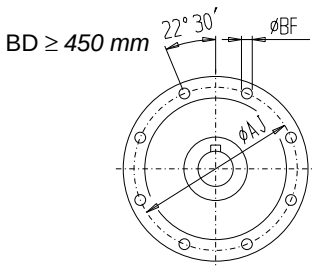
Helical Gear Motors
Flange mounted

DF/ZF 108

DZF 510

[mm]





Flange

BD	AK	GA	AJ	BB	GL	BF
350	*250*	*18*	*300*	*5*	*41*	*17,5*
450	*350*	*20*	*400*	*5*	*39*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
60,325	*120*	*107,95*	*0,051*	*67,31*	*15,875*	*120*	*3/4-10UNC*

Gearcase

KL	AC	AD	SA	P1	P2	P3	Q
126,5	*326*	*410*	*221*	*168,5*	*177*	*228*	*311*

Motor

	ZF108		DF108						Weight [kg]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZF108**	**DF108**
M80	-	-	*579,5*	*634,5*	*158*	*126,5*	*126,5*	*2x1/2"*	-	*130*
M90S	*590*	*656*	*620,5*	*686,5*	*176*	*150*	*150*	*2x3/4"*	*130*	*132*
M90L	*590*	*656*	*620,5*	*686,5*	*176*	*150*	*150*	*2x3/4"*	*132*	*134*
M100L	*632*	*704*	*665,5*	*737,5*	*194*	*160*	*160*	*2x3/4"*	*140*	*143*
M112M	*681*	*762*	*712,5*	*793,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*148*	*152*
M132S	*770,5*	*871,5*	*803*	*904*	*258*	*181*	*181*	*1"+3/4"*	*157*	*162*
M132M	*770,5*	*871,5*	*803*	*904*	*258*	*181*	*181*	*1"+3/4"*	*178*	*183*
M160M	*857*	*974*	*886,5*	*1003,5*	*310*	*199*	*199*	*1"+3/4"*	*192*	*199*
M160L	*857*	*974*	*886,5*	*1003,5*	*310*	*199*	*199*	*1"+3/4"*	*206*	*213*
M180M	*907*	*1025*	-	-	*348*	*246*	*246*	*1 1/4"+3/4"*	*239*	-
M180L	*907*	*1025*	-	-	*348*	*246*	*246*	*1 1/4"+3/4"*	*245*	-
M200L	*932*	*1062*	-	-	*385*	*260*	*260*	*1 1/4"+3/4"*	*295*	-
LG225S incl. adapter	*1205,5*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*485*	-
LG225ZM incl. adapter	*1235,5*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*525*	-

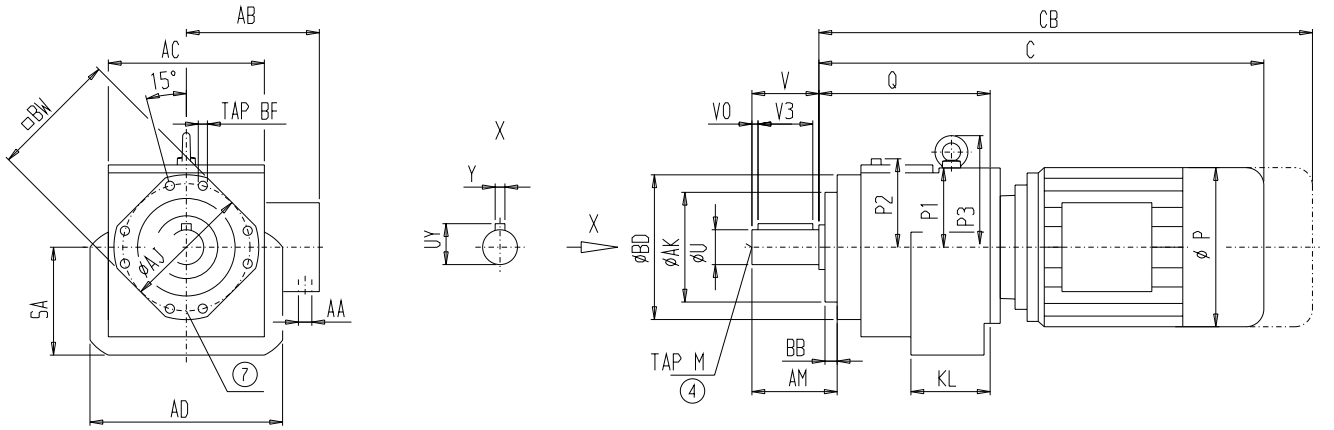
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DZ/ZZ 108

DZZ 510

[inch]



Flange

BD	AK	BW	AJ	BB	TAP BF
11.81	7.87	9.84	9.84	0.91	M16x28

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.375	4.72	4.25	0.002	2.65	0.625	5.827	3/4-10UNC

Gearcase

KL	AC	AD	SA	P1	P2	P3	Q
4.98	12.83	16.14	8.7	6.63	6.97	8.98	12.24

Motor

	ZZ108		DZ108						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZZ108**	**DZ108**
M80	-	-	22.77	24.94	6.22	4.98	4.98	2x1/2"	-	269
M90S	23.19	25.78	24.39	26.98	6.93	5.91	5.91	2x3/4"	267	273
M90L	23.19	25.78	24.39	26.98	6.93	5.91	5.91	2x3/4"	271	278
M100L	24.84	27.67	26.16	28.99	7.64	6.3	6.3	2x3/4"	289	298
M112M	26.77	29.96	28.01	31.2	8.58	6.59	6.59	2x3/4"	306	315
M132S	30.3	34.27	31.58	35.55	10.16	7.13	7.13	1"+3/4"	329	340
M132M	30.3	34.27	31.58	35.55	10.16	7.13	7.13	1"+3/4"	375	386
M160M	33.7	38.31	34.86	39.47	12.2	7.83	7.83	1"+3/4"	404	419
M160L	33.7	38.31	34.86	39.47	12.2	7.83	7.83	1"+3/4"	434	450
M180M	35.67	40.32	-	-	13.7	9.69	9.69	1 1/4"+3/4"	507	-
M180L	35.67	40.32	-	-	13.7	9.69	9.69	1 1/4"+3/4"	520	-
M200L	36.66	41.78	-	-	15.16	10.24	10.24	1 1/4"+3/4"	631	-
LG225S incl. adapter	47.46	on request	-	-	17.4	12.8	on request	2x1 1/2"	1050	-
LG225ZM incl. adapter	48.64	on request	-	-	17.4	12.8	on request	2x1 1/2"	1138	-

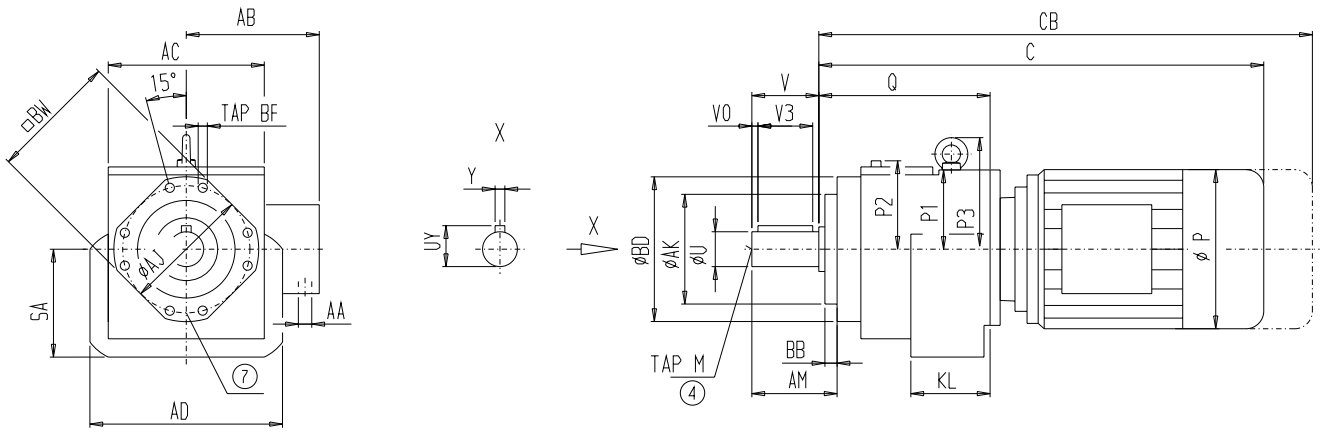
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DZ/ZZ 108

DZZ 510

[mm]



Flange

BD	AK	BW	AJ	BB	TAP BF
300	*200*	*250*	*250*	*23*	*M16x28*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
60,325	*120*	*107,95*	*0,051*	*67,31*	*15,875*	*148*	*3/4"-10UNC*

Gearcase

KL	AC	AD	SA	P1	P2	P3	Q
126,5	*326*	*410*	*221*	*168,5*	*177*	*228*	*311*

Motor

	ZZ108		DZ108						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZZ108**	**DZ108**
M80	-	-	*579,5*	*634,5*	*158*	*126,5*	*126,5*	*2x1/2"*	-	*122*
M90S	*590*	*656*	*620,5*	*686,5*	*176*	*150*	*150*	*2x3/4"*	*121*	*124*
M90L	*590*	*656*	*620,5*	*686,5*	*176*	*150*	*150*	*2x3/4"*	*123*	*126*
M100L	*632*	*704*	*665,5*	*737,5*	*194*	*160*	*160*	*2x3/4"*	*131*	*135*
M112M	*681*	*762*	*712,5*	*793,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*139*	*143*
M132S	*770,5*	*871,5*	*803*	*904*	*258*	*181*	*181*	*1"+3/4"*	*149*	*154*
M132M	*770,5*	*871,5*	*803*	*904*	*258*	*181*	*181*	*1"+3/4"*	*170*	*175*
M160M	*857*	*974*	*886,5*	*1003,5*	*310*	*199*	*199*	*1"+3/4"*	*183*	*190*
M160L	*857*	*974*	*886,5*	*1003,5*	*310*	*199*	*199*	*1"+3/4"*	*197*	*204*
M180M	*907*	*1025*	-	-	*348*	*246*	*246*	*1 1/4"+3/4"*	*230*	-
M180L	*907*	*1025*	-	-	*348*	*246*	*246*	*1 1/4"+3/4"*	*236*	-
M200L	*932*	*1062*	-	-	*385*	*260*	*260*	*1 1/4"+3/4"*	*286*	-
LG225S incl. adapter	*1205,5*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*476*	-
LG225ZM incl. adapter	*1235,5*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*516*	-

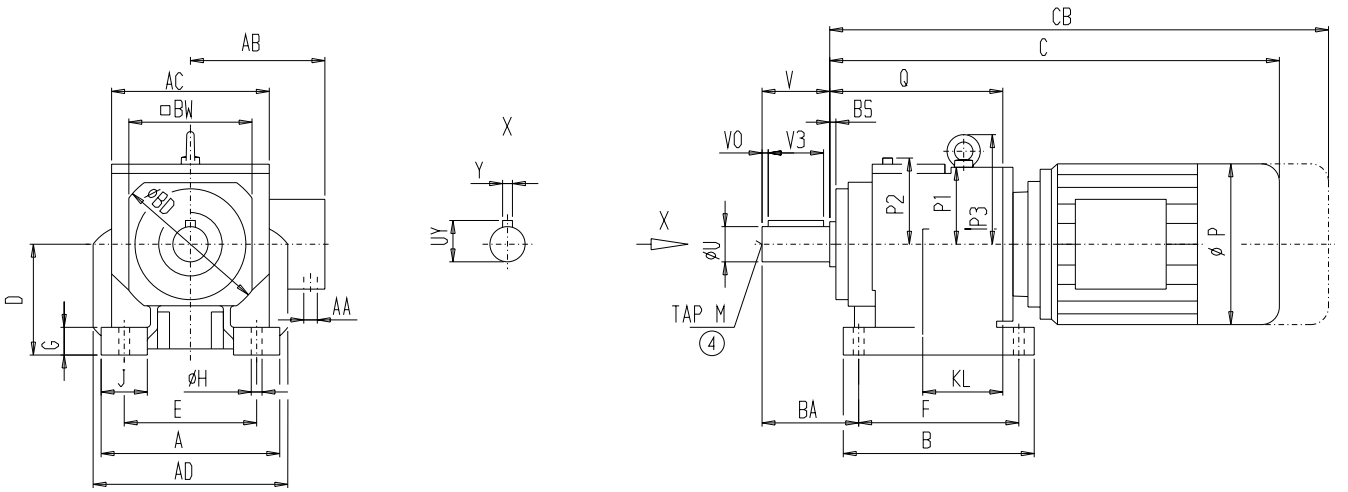
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

D/Z 128

DZ 510

[inch]



Mounting

E	F	G	H	J
11.42	14.57	2.17	1.02	4.33

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
2.875	5.51	4.875	0.046	3.2	0.75	7.28	3/4-10UNC

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P1	P2	P3	Q
13.39	5.63	11.81	17.32	15.75	14.17	18.19	9.84	0.2	7.2	7.24	10.06	14.72

Motor

	Z128		D128						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**Z128**	**D128**
M90S	-	-	26.6	29.19	6.93	5.91	5.91	2x3/4"	-	463
M90L	-	-	26.6	29.19	6.93	5.91	5.91	2x3/4"	-	467
M100L	26.95	29.78	28.37	31.2	7.64	6.3	6.3	2x3/4"	474	487
M112M	28.84	32.03	30.18	33.37	8.58	6.59	6.59	2x3/4"	492	507
M132S	32.37	36.34	33.71	37.68	10.16	7.13	7.13	1"+3/4"	507	531
M132M	32.37	36.34	33.71	37.68	10.16	7.13	7.13	1"+3/4"	553	578
M160M	35.53	40.14	36.98	41.59	12.2	7.83	7.83	1"+3/4"	595	611
M160L	35.53	40.14	36.98	41.59	12.2	7.83	7.83	1"+3/4"	626	642
M180M	37.61	42.26	39.07	43.72	13.7	9.69	9.69	1 1/4"+3/4"	686	712
M180L	37.61	42.26	39.07	43.72	13.7	9.69	9.69	1 1/4"+3/4"	699	725
M200L	38.6	43.72	40.06	45.18	15.16	10.24	10.24	1 1/4"+3/4"	809	836
LG225S	on request	on request	-	-	17.4	12.8	on request	2x1 1/2"	on request	-
LG225ZM	on request	on request	-	-	17.4	12.8	on request	2x1 1/2"	on request	-
LG250ZM incl. adapter	53.24	on request	-	-	19.49	15.43	on request	2x2"	1910	-

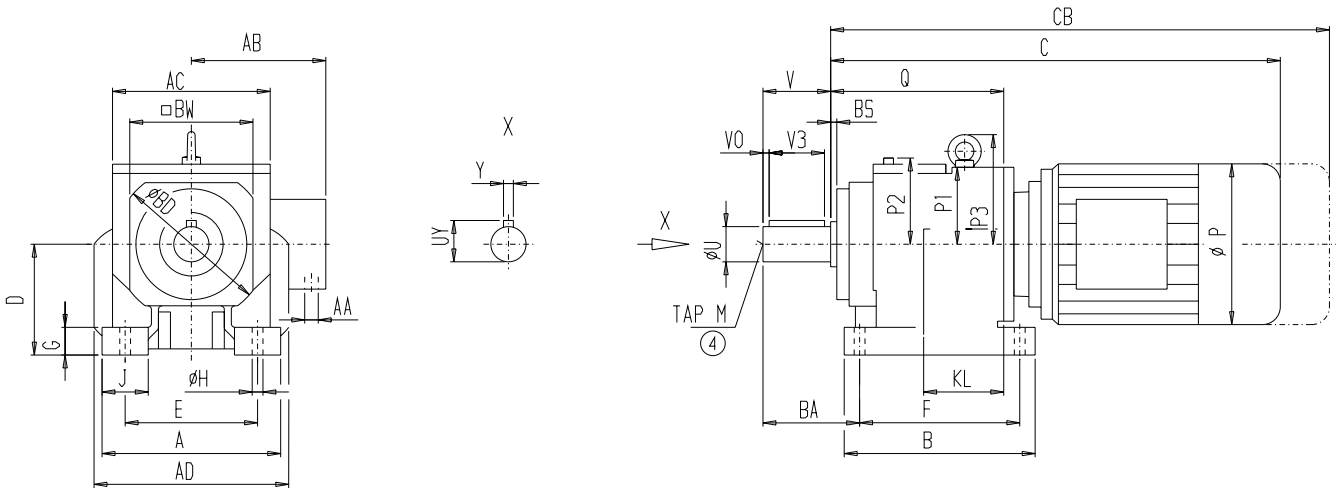
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

D/Z 128

DZ 510

[mm]



Mounting

E	F	G	H	J
290	*370*	*55*	*26*	*110*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
73,025	*140*	*123,825*	*1,168*	*81,28*	*19,05*	*185*	*3/4-10UNC*

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	P1	P2	P3	Q
340	*143*	*300*	*440*	*400*	*360*	*462*	*250*	*5*	*183*	*184*	*255,5*	*374*

Motor

	Z128		D128						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**Z128**	**D128**
M90S	-	-	*676,5*	*742,5*	*176*	*150*	*150*	*2x3/4"*	-	*210*
M90L	-	-	*676,5*	*742,5*	*176*	*150*	*150*	*2x3/4"*	-	*212*
M100L	*685,5*	*757,5*	*721,5*	*793,5*	*194*	*160*	*160*	*2x3/4"*	*215*	*221*
M112M	*733,5*	*814,5*	*767,5*	*848,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*223*	*230*
M132S	*823*	*924*	*857*	*958*	*258*	*181*	*181*	*1"+3/4"*	*230*	*241*
M132M	*823*	*924*	*857*	*958*	*258*	*181*	*181*	*1"+3/4"*	*251*	*262*
M160M	*903,5*	*1020,5*	*940,5*	*1057,5*	*310*	*199*	*199*	*1"+3/4"*	*270*	*277*
M160L	*903,5*	*1020,5*	*940,5*	*1057,5*	*310*	*199*	*199*	*1"+3/4"*	*284*	*291*
M180M	*956,5*	*1074,5*	*993,5*	*1111,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*311*	*323*
M180L	*956,5*	*1074,5*	*993,5*	*1111,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*317*	*329*
M200L	*981,5*	*1111,5*	*1018,5*	*1148,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*367*	*379*
LG225S	*on request*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	-
LG225ZM	*on request*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	-
LG250ZM incl. adapter	*1352,5*	*on request*	-	-	*495*	*392*	*on request*	*2x2"*	*866*	-

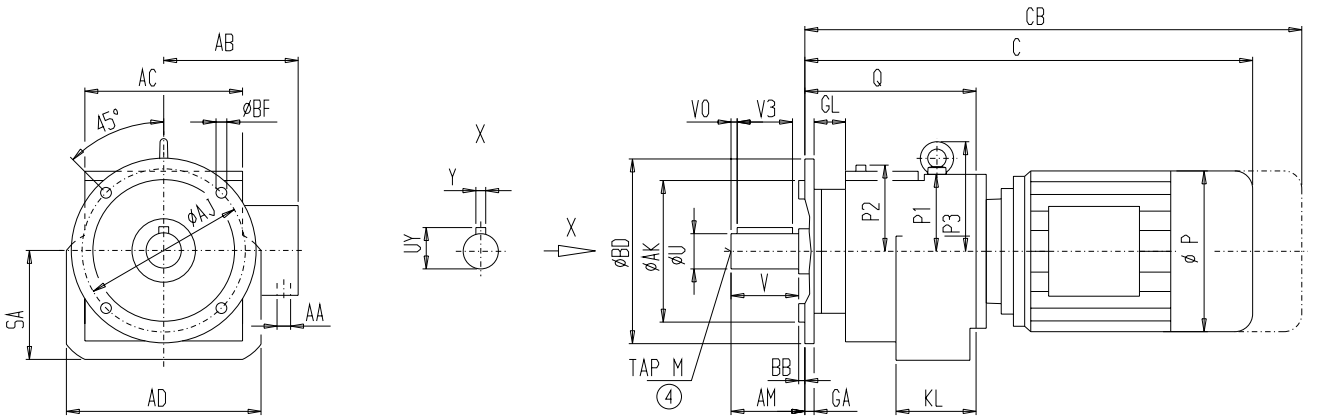
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

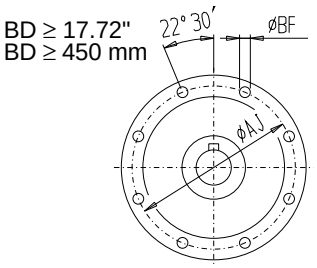
Helical Gear Motors
Flange mounted

DF/ZF 128

DZF 510

[inch]





Flange

BD	AK	GA	AJ	BB	GL	BF
13.78 1)	9.84	0.71	11.81	0.2	2.36	0.69
17.72	13.78	0.87	15.75	0.2	2.2	0.69
21.65	17.72	0.87	19.69	0.2	2.2	0.69

1)with torque > 3500Nm flange has to be aligned.
2 dowelpin of ∅12mm are recommended.

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.875	5.51	4.875	0.046	3.2	0.75	5.51	3/4-10UNC

Gearcase

KL	AC	AD	SA	P	P2	P3	Q
5.75	14.33	18.19	9.84	7.6	7.64	10.35	14.72

Motor

	ZF128		DF128						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZF128**	**DF128**
M90S	-	-	26.6	29.19	6.93	5.91	5.91	2x3/4"	-	452
M90L	-	-	26.6	29.19	6.93	5.91	5.91	2x3/4"	-	456
M100L	26.95	29.78	28.37	31.2	7.64	6.3	6.3	2x3/4"	461	476
M112M	28.84	32.03	30.18	33.37	8.58	6.59	6.59	2x3/4"	478	494
M132S	32.37	36.34	33.71	37.68	10.16	7.13	7.13	1"+3/4"	496	520
M132M	32.37	36.34	33.71	37.68	10.16	7.13	7.13	1"+3/4"	542	567
M160M	35.53	40.14	36.98	41.59	12.2	7.83	7.83	1"+3/4"	582	600
M160L	35.53	40.14	36.98	41.59	12.2	7.83	7.83	1"+3/4"	613	631
M180M	37.61	42.26	39.07	43.72	13.7	9.69	9.69	1 1/4"+3/4"	673	701
M180L	37.61	42.26	39.07	43.72	13.7	9.69	9.69	1 1/4"+3/4"	686	714
M200L	38.6	43.72	40.06	45.18	15.16	10.24	10.24	1 1/4"+3/4"	796	836
LG225S	on request	on request	-	-	17.4	12.8	on request	2x1 1/2"	on request	-
LG225ZM	on request	on request	-	-	17.4	12.8	on request	2x1 1/2"	on request	-
LG250ZM incl. adapter	53.24	on request	-	-	19.49	15.43	on request	2x2"	1899	-

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

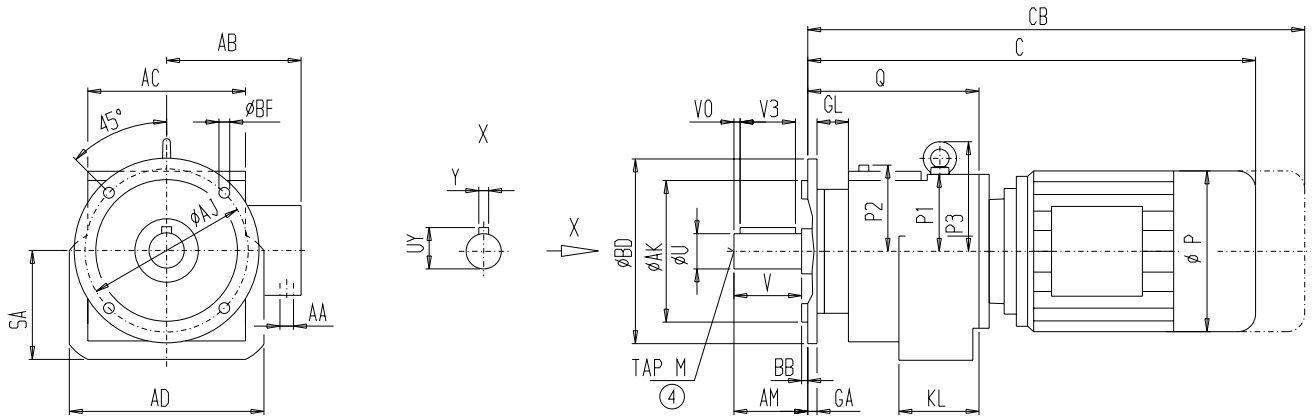
** for voltage ratio 1:2

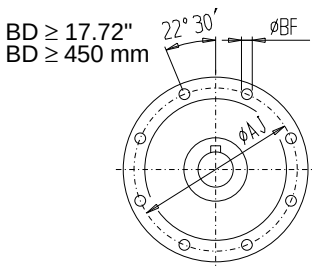
Helical Gear Motors
Flange mounted

DF/ZF 128

DZF 510

[mm]





Flange

BD	AK	GA	AJ	BB	GL	BF
350 1)	*250*	*18*	*300*	*5*	*60*	*17,5*
450	*350*	*22*	*400*	*5*	*56*	*17,5*
550	*450*	*22*	*500*	*5*	*56*	*17,5*

1)with torque > 3500Nm flange has to be aligned.
2 dowelpin of ∅12mm are recommended.

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
70,025	*140*	*123,825*	*1,168*	*81,28*	*19,05*	*140*	*3/4"-10UNC*

Gearcase

KL	AC	AD	SA	P1	P2	P3	Q
146	*364*	*462*	*250*	*193*	*194*	*263*	*374*

Motor

	ZF128		DF128						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZF128**	**DF128**
M90S	-	-	*676,5*	*742,5*	*176*	*150*	*150*	*2x3/4"*	-	*205*
M90L	-	-	*676,5*	*742,5*	*176*	*150*	*150*	*2x3/4"*	-	*207*
M100L	*685,5*	*757,5*	*721,5*	*793,5*	*194*	*160*	*160*	*2x3/4"*	*209*	*216*
M112M	*733,5*	*814,5*	*767,5*	*848,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*217*	*224*
M132S	*823*	*924*	*857*	*958*	*258*	*181*	*181*	*1"+3/4"*	*225*	*236*
M132M	*823*	*924*	*857*	*958*	*258*	*181*	*181*	*1"+3/4"*	*246*	*257*
M160M	*903,5*	*1020,5*	*940,5*	*1057,5*	*310*	*199*	*199*	*1"+3/4"*	*264*	*272*
M160L	*903,5*	*1020,5*	*940,5*	*1057,5*	*310*	*199*	*199*	*1"+3/4"*	*278*	*286*
M180M	*956,5*	*1074,5*	*993,5*	*1111,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*305*	*318*
M180L	*956,5*	*1074,5*	*993,5*	*1111,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*311*	*324*
M200L	*981,5*	*1111,5*	*1018,5*	*1148,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*361*	*379*
LG225S	*on request*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	-
LG225ZM	*on request*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	-
LG250ZM incl. adapter	*1352,5*	*on request*	-	-	*495*	*392*	*on request*	*2x2"*	*861*	-

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

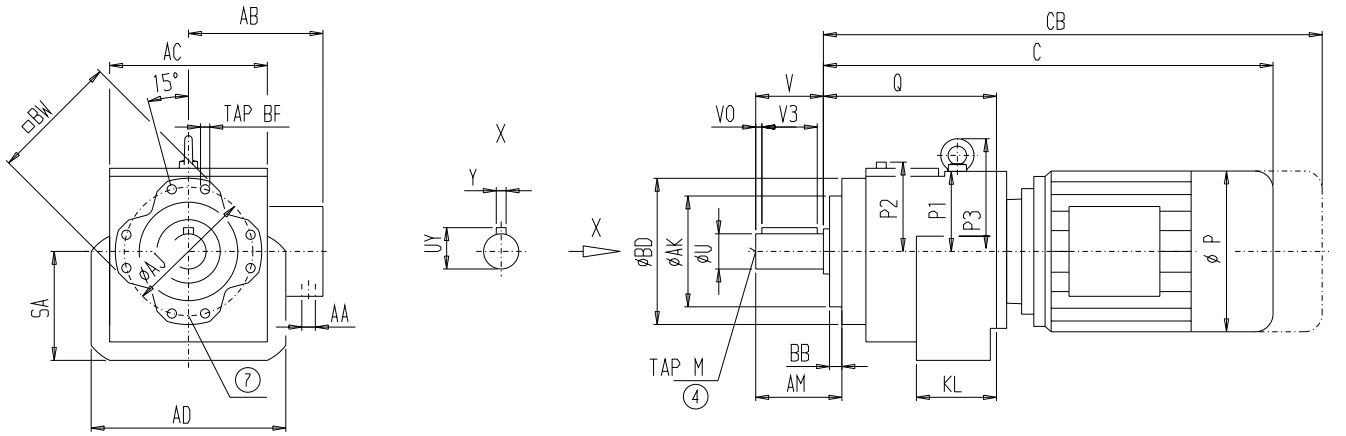
** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DZ/ZZ 128

DZZ 510

[inch]



3

Flange

BD	AK	BW	AJ	BB	TAP BF
13.39	9.45	11.81	11.81	1.06	M16x22

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.875	5.51	4.875	0.046	3.2	0.75	6.81	3/4-10UNC

Gearcase

KL	AC	AD	SA	P1	P2	P3	Q
5.75	14.33	18.19	9.84	7.6	7.64	10.35	14.72

Motor

	ZZ128		DZ128						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZZ128**	**DZ128**
M90S	-	-	26.6	29.19	6.93	5.91	5.91	2x3/4"	-	415
M90L	-	-	26.6	29.19	6.93	5.91	5.91	2x3/4"	-	419
M100L	26.95	29.78	28.37	31.2	7.64	6.3	6.3	2x3/4"	423	439
M112M	28.84	32.03	30.18	33.37	8.58	6.59	6.59	2x3/4"	441	456
M132S	32.37	36.34	33.71	37.68	10.16	7.13	7.13	1"+3/4"	459	483
M132M	32.37	36.34	33.71	37.68	10.16	7.13	7.13	1"+3/4"	505	529
M160M	35.53	40.14	36.98	41.59	12.2	7.83	7.83	1"+3/4"	545	562
M160L	35.53	40.14	36.98	41.59	12.2	7.83	7.83	1"+3/4"	576	593
M180M	37.61	42.26	39.07	43.72	13.7	9.69	9.69	1 1/4"+3/4"	635	664
M180L	37.61	42.26	39.07	43.72	13.7	9.69	9.69	1 1/4"+3/4"	648	677
M200L	38.6	43.72	40.06	45.18	15.16	10.24	10.24	1 1/4"+3/4"	759	787
LG225S	on request	on request	-	-	17.4	12.8	on request	2x1 1/2"	on request	-
LG225ZM	on request	on request	-	-	17.4	12.8	on request	2x1 1/2"	on request	-
LG250ZM incl. adapter	53.24	on request	-	-	19.49	15.43	on request	2x2"	1861	-

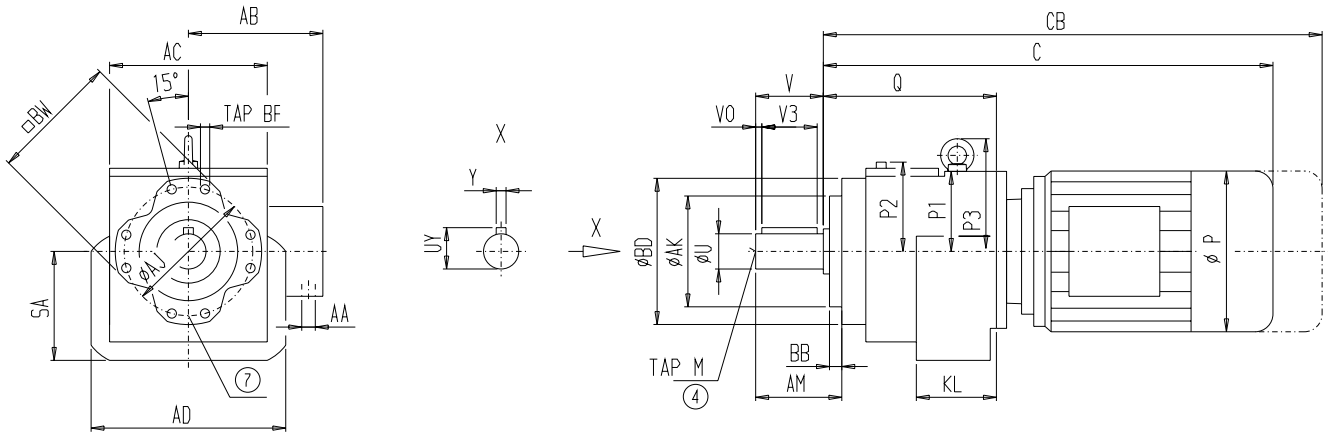
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DZ/ZZ 128

DZZ 510

[mm]



Flange

BD	AK	BW	AJ	BB	TAP BF
340	*240*	*300*	*300*	*27*	*M16x22*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
73,025	*140*	*123,825*	*1,168*	*81,28*	*19,05*	*173*	*3/4"-10UNC*

Gearcase

KL	AC	AD	SA	P1	P2	P3	Q
146	*364*	*462*	*250*	*193*	*194*	*263*	*374*

Motor

	ZZ128		DZ128						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZZ128**	**DZ128**
M90S	-	-	*676,5*	*742,5*	*176*	*150*	*150*	*2x3/4"*	-	*188*
M90L	-	-	*676,5*	*742,5*	*176*	*150*	*150*	*2x3/4"*	-	*190*
M100L	*685,5*	*757,5*	*721,5*	*793,5*	*194*	*160*	*160*	*2x3/4"*	*192*	*199*
M112M	*733,5*	*814,5*	*767,5*	*848,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*200*	*207*
M132S	*823*	*924*	*857*	*958*	*258*	*181*	*181*	*1"+3/4"*	*208*	*219*
M132M	*823*	*924*	*857*	*958*	*258*	*181*	*181*	*1"+3/4"*	*229*	*240*
M160M	*903,5*	*1020,5*	*940,5*	*1057,5*	*310*	*199*	*199*	*1"+3/4"*	*247*	*255*
M160L	*903,5*	*1020,5*	*940,5*	*1057,5*	*310*	*199*	*199*	*1"+3/4"*	*261*	*269*
M180M	*956,5*	*1074,5*	*993,5*	*1111,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*288*	*301*
M180L	*956,5*	*1074,5*	*993,5*	*1111,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*294*	*307*
M200L	*981,5*	*1111,5*	*1018,5*	*1148,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*344*	*357*
LG225S	*on request*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	-
LG225ZM	*on request*	*on request*	-	-	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	-
LG250ZM incl. adapter	*1352,5*	*on request*	-	-	*495*	*392*	*on request*	*2x2"*	*844*	-

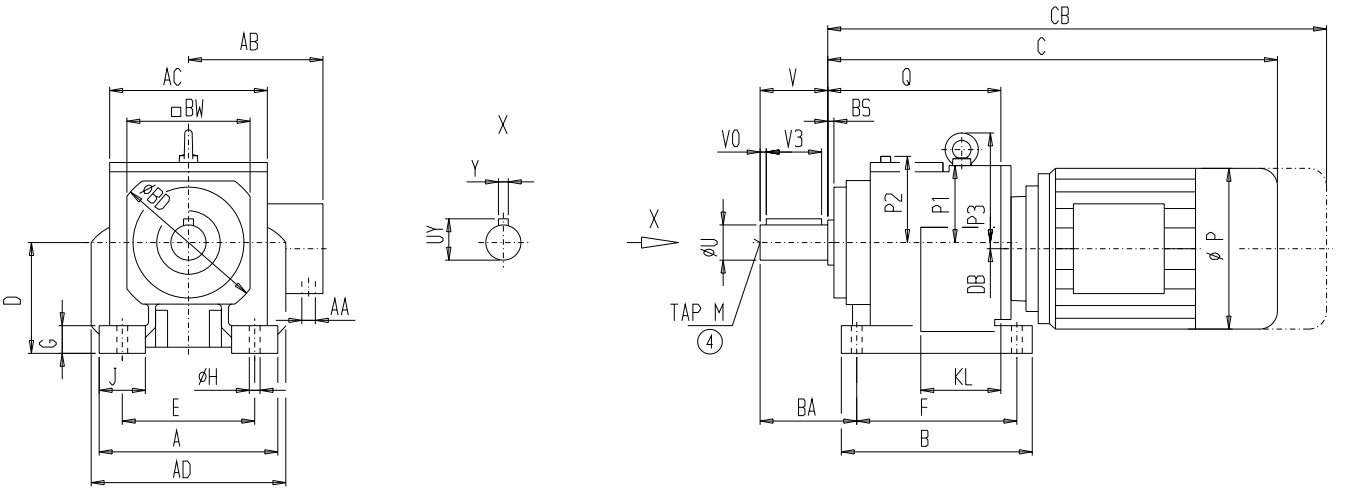
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

D/Z 148

DZ 510

[inch]



Mounting

E	F	G	H	J
13.39	16.14	2.36	1.3	4.33

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
3.625	6.69	5.5	0.602	4.01	0.875	8.66	1-8UNC

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	DB	J	P1	P2	P3	Q
13.39	6.3	11.81	19.29	17.72	16.38	20.08	12.4	0.24	1.46	4.33	6.77	7.2	10.35	16.18

Motor

	Z148		D148						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**Z148**	**D148**
M100L	-	-	29.63	32.46	7.64	6.3	6.3	2x3/4"	-	690
M112M	-	-	31.52	34.71	8.58	6.59	6.59	2x3/4"	-	708
M132S	33.51	37.48	35	38.97	10.16	7.13	7.13	1"+3/4"	706	730
M132M	33.51	37.48	35	38.97	10.16	7.13	7.13	1"+3/4"	752	776
M160M	36.69	41.3	38.18	42.79	12.2	7.83	7.83	1"+3/4"	783	809
M160L	36.69	41.3	38.18	42.79	12.2	7.83	7.83	1"+3/4"	814	840
M180M	38.78	43.43	40.27	44.92	13.7	9.69	9.69	1 1/4"+3/4"	882	911
M180L	38.78	43.43	40.27	44.92	13.7	9.69	9.69	1 1/4"+3/4"	897	926
M200L	39.77	44.89	41.26	46.38	15.16	10.24	10.24	1 1/4"+3/4"	1014	1034
LG225S	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG225ZM	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG250ZM	on request	on request	-	-	19.49	15.43	on request	2x2"	on request	-
LG280S incl. adapter	48.44	on request	-	-	21.85	17.01	on request	2x2"	2324	-
LG280ZM incl. adapter	62.1	on request	-	-	21.85	17.01	on request	2x2"	2575	-

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

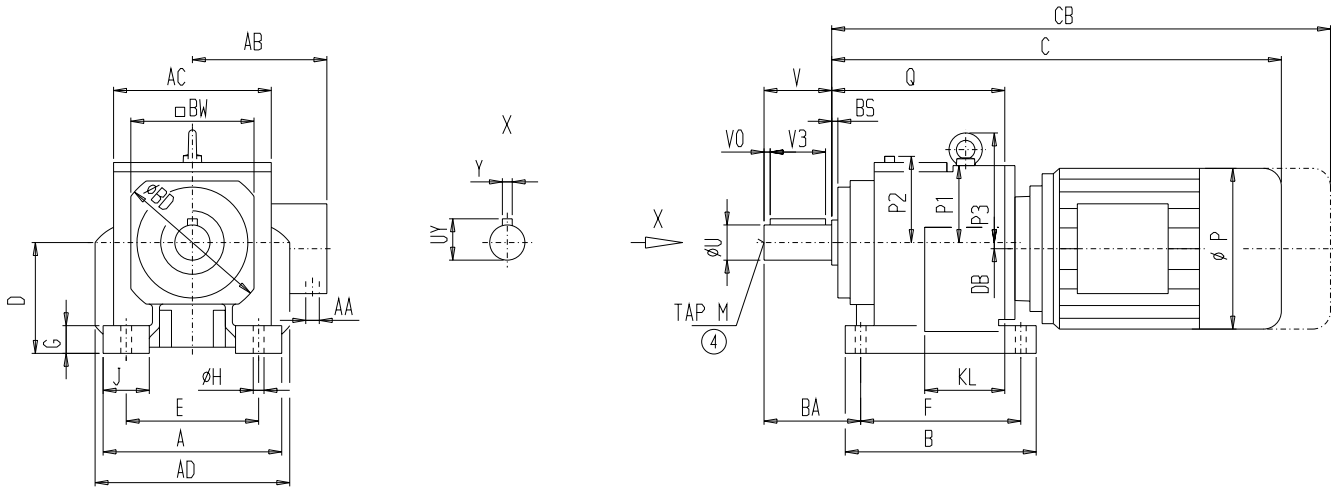
** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

D/Z 148

DZ 510

[mm]



Mounting

E	F	G	H	J
340	*410*	*60*	*33*	*110*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
92,075	*170*	*139,7*	*15,291*	*101,85*	*22,225*	*220*	*1"-8UNC*

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	DB	P1	P2	P3	Q
340	*160*	*300*	*490*	*450*	*416*	*510*	*315*	*6*	*37*	*172*	*183*	*263*	*411*

Motor

	Z148		D148						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**Z148**	**D148**
M100L	-	-	*753,5*	*825,5*	*194*	*160*	*160*	*2x3/4"*	-	*313*
M112M	-	-	*801,5*	*882,5*	*218*	*167,5*	*167,5*	*2x3/4"*	-	*321*
M132S	*852*	*953*	*890*	*991*	*258*	*181*	*181*	*1"+3/4"*	*320*	*331*
M132M	*852*	*953*	*890*	*991*	*258*	*181*	*181*	*1"+3/4"*	*341*	*352*
M160M	*933*	*1050*	*971*	*1088*	*310*	*199*	*199*	*1"+3/4"*	*355*	*367*
M160L	*933*	*1050*	*971*	*1088*	*310*	*199*	*199*	*1"+3/4"*	*369*	*381*
M180M	*986*	*1104*	*1024*	*1142*	*348*	*246*	*246*	*1 1/4"+3/4"*	*400*	*413*
M180L	*986*	*1104*	*1024*	*1142*	*348*	*246*	*246*	*1 1/4"+3/4"*	*407*	*420*
M200L	*1011*	*1141*	*1049*	*1179*	*385*	*260*	*260*	*1 1/4"+3/4"*	*460*	*469*
LG225S	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG225ZM	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG250ZM	*on request*	*on request*	-	-	*495*	*392*	*on request*	*2x2"*	*on request*	-
LG280S incl. adapter	*1230,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1054*	-
LG280ZM incl. adapter	*1577,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1168*	-

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

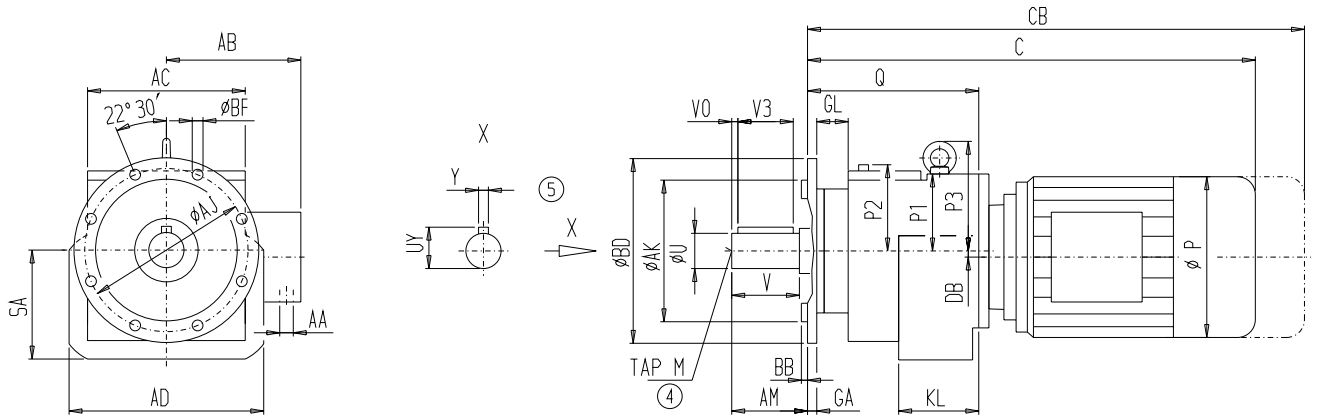
** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DF/ZF 148

DZF 510

[inch]



Flange

BD	AK	GA	AJ	BB	GL	BF
17.72	13.78	0.87	15.75	0.2	2.68	0.69
21.65	17.72	0.98	19.69	0.2	2.56	0.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
3.625	6.69	5.5	0.602	4.01	0.875	6.69	1-8UNC

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
6.3	16.38	20.08	12.48	1.46	7.17	8.27	10.63	16.18

Motor

	ZF148		DF148						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZF148**	**DF148**
M100L	-	-	29.63	32.46	7.64	6.3	6.3	2x3/4"	-	675
M112M	-	-	31.52	34.71	8.58	6.59	6.59	2x3/4"	-	692
M132S	33.51	37.48	35	38.97	10.16	7.13	7.13	1"+3/4"	692	714
M132M	33.51	37.48	35	38.97	10.16	7.13	7.13	1"+3/4"	739	761
M160M	36.69	41.3	38.18	42.79	12.2	7.83	7.83	1"+3/4"	767	794
M160L	36.69	41.3	38.18	42.79	12.2	7.83	7.83	1"+3/4"	798	825
M180M	38.78	43.43	40.27	44.92	13.7	9.69	9.69	1 1/4"+3/4"	867	895
M180L	38.78	43.43	40.27	44.92	13.7	9.69	9.69	1 1/4"+3/4"	882	911
M200L	39.77	44.89	41.26	46.38	15.16	10.24	10.24	1 1/4"+3/4"	999	1019
LG225S	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG225ZM	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG250ZM	on request	on request	-	-	19.49	15.43	on request	2x2"	on request	-
LG280S incl. adapter	48.44	on request	-	-	21.85	17.01	on request	2x2"	2309	-
LG280ZM incl. adapter	62.1	on request	-	-	21.85	17.01	on request	2x2"	2560	-

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

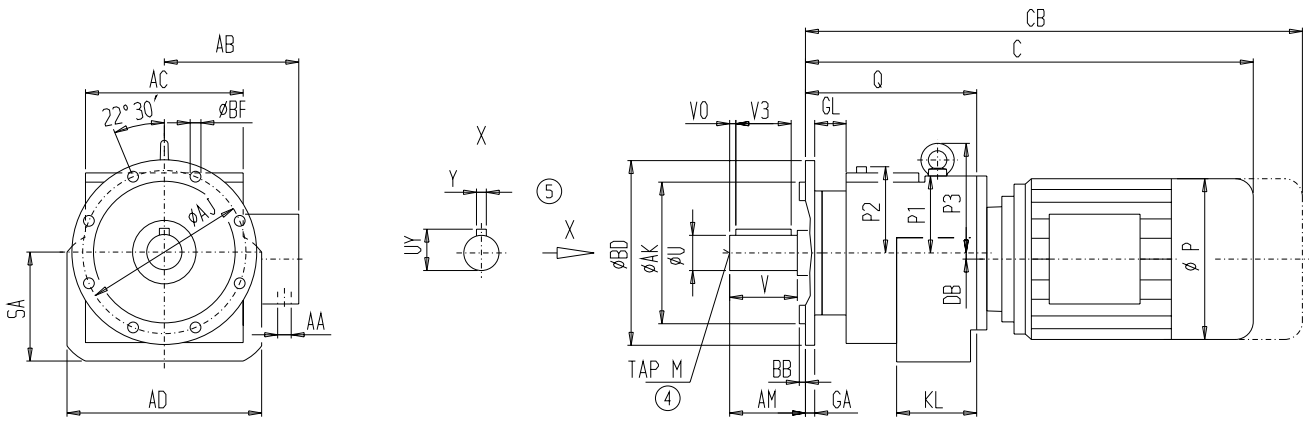
** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DF/ZF 148

DZF 510

[mm]



Flange

BD	AK	GA	AJ	BB	GL	BF
450	*350*	*22*	*400*	*5*	*68*	*17,5*
550	*450*	*25*	*500*	*5*	*65*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
92,075	*170*	*139,7*	*15,291*	*101,85*	*22,225*	*170*	*1"-8UNC*

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
160	*416*	*510*	*317*	*37*	*182*	*210*	*270*	*411*

Motor

	ZF148		DF148						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZF148**	**DF148**
M100L	-	-	*753,5*	*825,5*	*194*	*160*	*160*	*2x3/4"*	-	*306*
M112M	-	-	*801,5*	*882,5*	*218*	*167,5*	*167,5*	*2x3/4"*	-	*314*
M132S	*852*	*953*	*890*	*991*	*258*	*181*	*181*	*1"+3/4"*	*314*	*324*
M132M	*852*	*953*	*890*	*991*	*258*	*181*	*181*	*1"+3/4"*	*335*	*345*
M160M	*933*	*1050*	*971*	*1088*	*310*	*199*	*199*	*1"+3/4"*	*348*	*360*
M160L	*933*	*1050*	*971*	*1088*	*310*	*199*	*199*	*1"+3/4"*	*362*	*374*
M180M	*986*	*1104*	*1024*	*1142*	*348*	*246*	*246*	*1 1/4"+3/4"*	*393*	*406*
M180L	*986*	*1104*	*1024*	*1142*	*348*	*246*	*246*	*1 1/4"+3/4"*	*400*	*413*
M200L	*1011*	*1141*	*1049*	*1179*	*385*	*260*	*260*	*1 1/4"+3/4"*	*453*	*462*
LG225S	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG225ZM	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG250ZM	*on request*	*on request*	-	-	*495*	*392*	*on request*	*2x2"*	*on request*	-
LG280S incl. adapter	*1230,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1047*	-
LG280ZM incl. adapter	*1577,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1161*	-

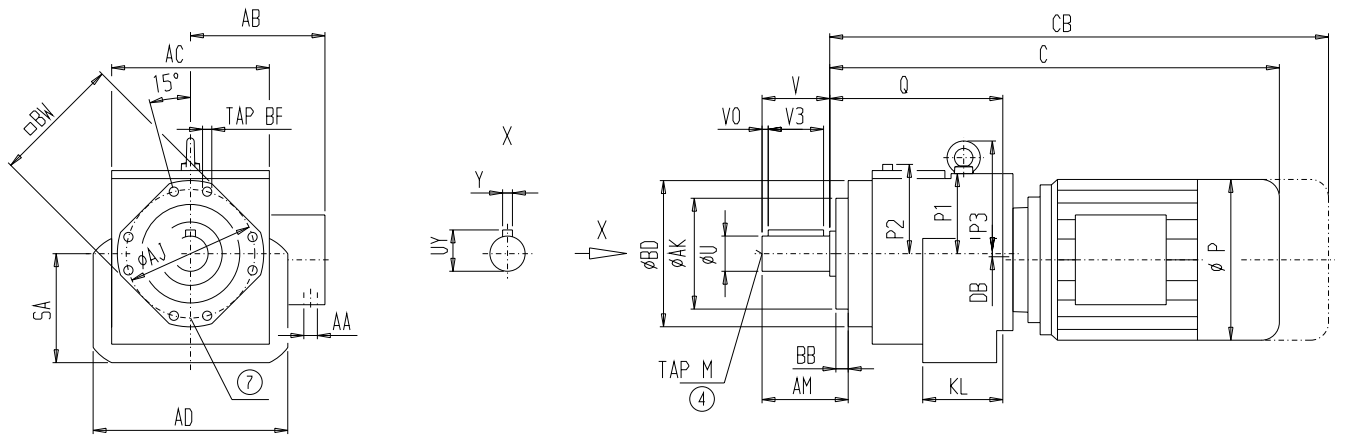
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DZ/ZZ 148

DZZ 510

[inch]



Flange

BD	AK	BW	AJ	BB	TAP BF
13.39	9.45	11.81	11.81	1.06	M16x22

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
3.625	6.69	5.5	0.602	4.01	0.875	7.99	1-8UNC

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
6.3	16.38	20.08	12.48	1.46	7.17	8.27	10.63	16.18

Motor

	ZZ148		DZ148						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZZ148**	**DZ148**
M100L	-	-	29.63	32.46	7.64	6.3	6.3	2x3/4"	-	639
M112M	-	-	31.52	34.71	8.58	6.59	6.59	2x3/4"	-	657
M132S	33.51	37.48	35	38.97	10.16	7.13	7.13	1"+3/4"	655	679
M132M	33.51	37.48	35	38.97	10.16	7.13	7.13	1"+3/4"	701	725
M160M	36.69	41.3	38.18	42.79	12.2	7.83	7.83	1"+3/4"	732	759
M160L	36.69	41.3	38.18	42.79	12.2	7.83	7.83	1"+3/4"	763	789
M180M	38.78	43.43	40.27	44.92	13.7	9.69	9.69	1 1/4"+3/4"	831	860
M180L	38.78	43.43	40.27	44.92	13.7	9.69	9.69	1 1/4"+3/4"	847	875
M200L	39.77	44.89	41.26	46.38	15.16	10.24	10.24	1 1/4"+3/4"	964	983
LG225S	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG225ZM	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG250ZM	on request	on request	-	-	19.49	15.43	on request	2x2"	on request	-
LG280S incl. adapter	48.44	on request	-	-	21.85	17.01	on request	2x2"	2273	-
LG280ZM incl. adapter	62.1	on request	-	-	21.85	17.01	on request	2x2"	2525	-

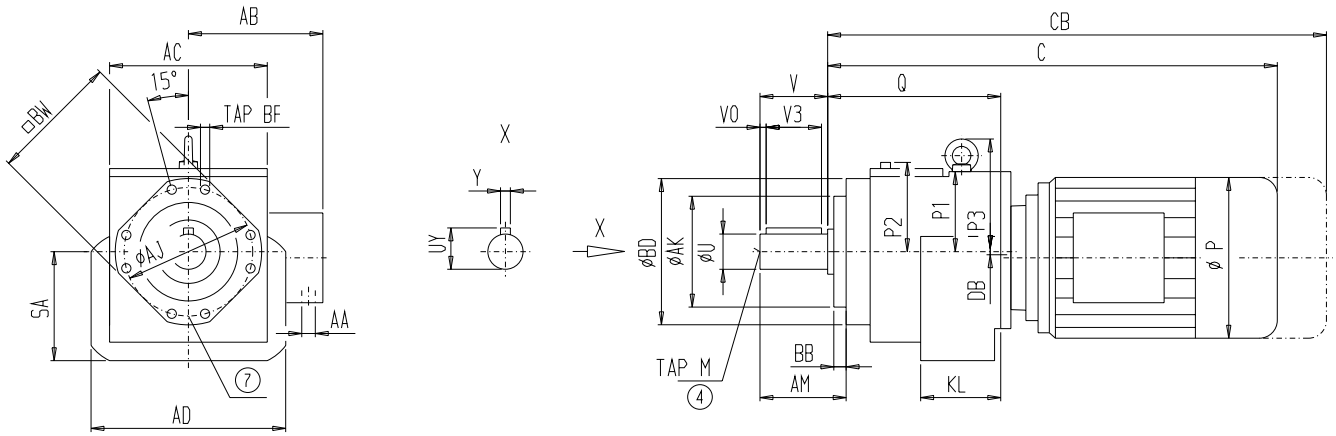
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DZ/ZZ 148

DZZ 510

[mm]



Flange

BD	AK	BW	AJ	BB	TAP BF
340	*240*	*300*	*300*	*27*	*M16x22*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
92,075	*170*	*139,7*	*15,291*	*101,85*	*22,225*	*203*	*1"-8UNC*

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
160	*416*	*510*	*317*	*37*	*182*	*210*	*270*	*411*

Motor

	ZZ148		DZ148						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZZ148**	**DZ148**
M100L	-	-	*753,5*	*825,5*	*194*	*160*	*160*	*2x3/4"*	-	*290*
M112M	-	-	*801,5*	*882,5*	*218*	*167,5*	*167,5*	*2x3/4"*	-	*298*
M132S	*852*	*953*	*890*	*991*	*258*	*181*	*181*	*1"+3/4"*	*197*	*308*
M132M	*852*	*953*	*890*	*991*	*258*	*181*	*181*	*1"+3/4"*	*318*	*329*
M160M	*933*	*1050*	*971*	*1088*	*310*	*199*	*199*	*1"+3/4"*	*332*	*344*
M160L	*933*	*1050*	*971*	*1088*	*310*	*199*	*199*	*1"+3/4"*	*346*	*358*
M180M	*986*	*1104*	*1024*	*1142*	*348*	*246*	*246*	*1 1/4"+3/4"*	*377*	*390*
M180L	*986*	*1104*	*1024*	*1142*	*348*	*246*	*246*	*1 1/4"+3/4"*	*384*	*397*
M200L	*1011*	*1141*	*1049*	*1179*	*385*	*260*	*260*	*1 1/4"+3/4"*	*437*	*446*
LG225S	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG225ZM	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG250ZM	*on request*	*on request*	-	-	*495*	*392*	*on request*	*2x2"*	*on request*	-
LG280S incl. adapter	*1230,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1031*	-
LG280ZM incl. adapter	*1577,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1145*	-

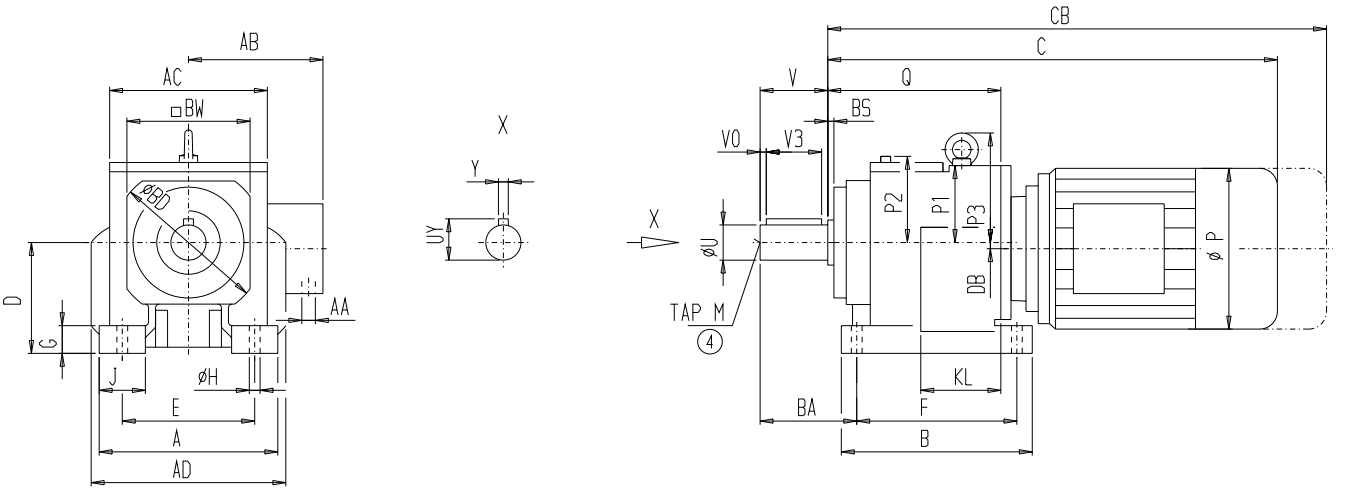
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

D/Z 168

DZ 510

[inch]



Mounting

E	F	G	H	J
14.96	19.69	2.56	1.54	5.71

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
4.375	8.27	7	0.677	4.82	1	10.24	1-8UNC

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	DB	P1	P2	P3	Q
16.54	7.26	15.75	23.23	20.87	18.11	22.83	13.98	0.24	1.65	8.54	8.98	12.01	19.45

Motor

	Z168		D168						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**Z168**	**D168**
M132S	36.21	40.18	37.82	41.79	10.16	7.13	7.13	1"+3/4"	1072	1109
M132M	36.21	40.18	37.82	41.79	10.16	7.13	7.13	1"+3/4"	1118	1155
M160M	39.38	43.99	41	45.61	12.2	7.83	7.83	1"+3/4"	1147	525
M160L	39.38	43.99	41	45.61	12.2	7.83	7.83	1"+3/4"	1177	1217
M180M	41.47	46.12	43.09	47.74	13.7	9.69	9.69	1 1/4"+3/4"	1246	1288
M180L	41.47	46.12	43.09	47.74	13.7	9.69	9.69	1 1/4"+3/4"	1261	1303
M200L	42.46	47.58	44.08	49.2	15.16	10.24	10.24	1 1/4"+3/4"	1369	1411
LG225S	on request	on request	51.73	61.14	17.4	12.8	on request	2x1 1/2"	on request	on request
LG225ZM	on request	on request	51.73	61.14	17.4	12.8	on request	2x1 1/2"	on request	on request
LG250ZM	on request	on request	-	-	19.49	15.43	on request	2x2"	on request	-
LG280S incl. adapter	51.71	on request	-	-	21.85	17.01	on request	2x2"	2677	-
LG280ZM incl. adapter	64.82	on request	-	-	21.85	17.01	on request	2x2"	2897	-

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

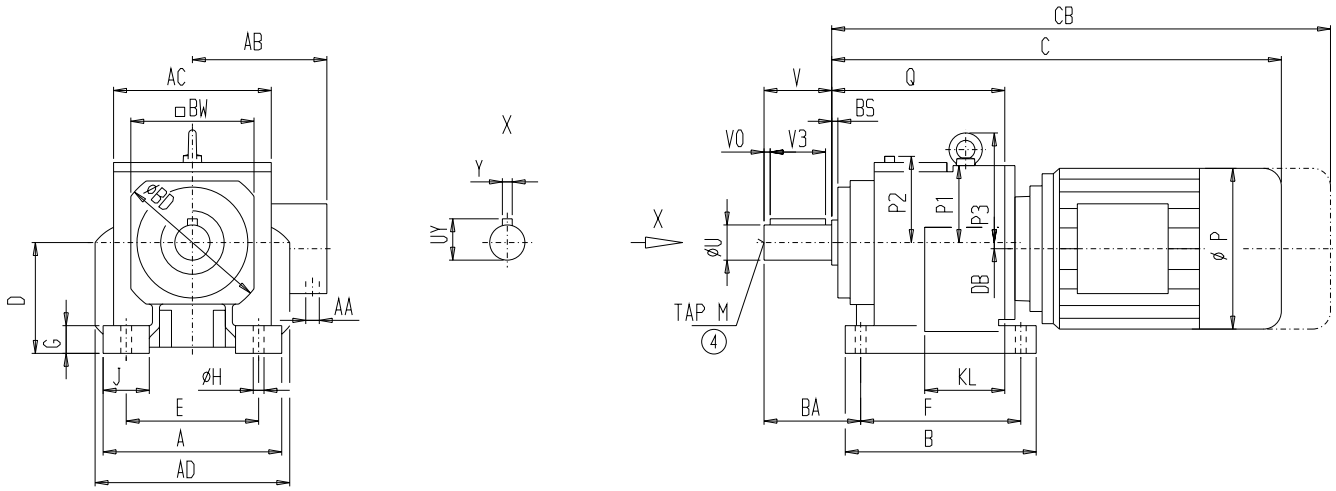
** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

D/Z 168

DZ 510

[mm]



Mounting

E	F	G	H	J
380	*500*	*65*	*39*	*145*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
111,13	*210*	*177,8*	*17,196*	*122,43*	*25,4*	*260*	*1"-8UNC*

Gearcase

BD	KL	BW	B	A	AC	AD	D	BS	DB	P1	P2	P3	Q
420	*184,5*	*400*	*590*	*530*	*460*	*580*	*355*	*6*	*42*	*217*	*228*	*305*	*494*

Motor

	Z168		D168						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**Z168**	**D168**
M132S	*920,5*	*1021,5*	*961,5*	*1062,5*	*258*	*181*	*181*	*1"+3/4"*	*486*	*503*
M132M	*920,5*	*1021,5*	*961,5*	*1062,5*	*258*	*181*	*181*	*1"+3/4"*	*507*	*524*
M160M	*1001,5*	*1118,5*	*1042,5*	*1159,5*	*310*	*199*	*199*	*1"+3/4"*	*520*	*538*
M160L	*1001,5*	*1118,5*	*1042,5*	*1159,5*	*310*	*199*	*199*	*1"+3/4"*	*534*	*552*
M180M	*1054,5*	*1172,5*	*1095,5*	*1213,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*565*	*584*
M180L	*1054,5*	*1172,5*	*1095,5*	*1213,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*572*	*591*
M200L	*1079,5*	*1209,5*	*1120,5*	*1250,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*621*	*640*
LG225S	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG225ZM	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG250ZM	*on request*	*on request*	-	-	*495*	*392*	*on request*	*2x2"*	*on request*	-
LG280S incl. adapter	*1313,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1214*	-
LG280ZM incl. adapter	*1646,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1314*	-

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

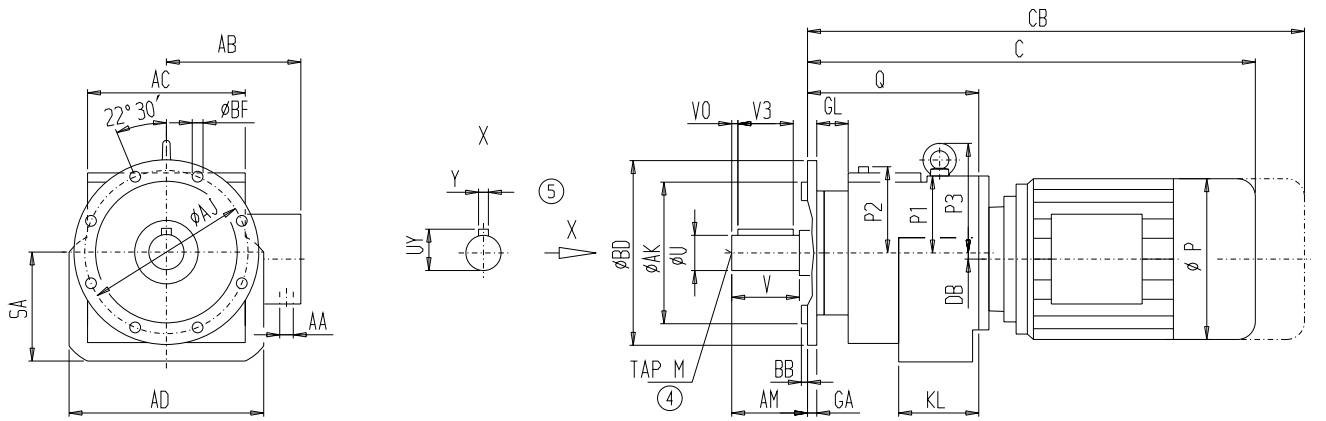
** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DF/ZF 168

DZF 510

[inch]



Flange

BD	AK	GA	AJ	BB	GL	BF
17.72	13.78	1.22	15.75	0.2	2.56	0.69
21.65	17.72	1.22	19.69	0.2	2.56	0.69
25.98	21.65	1.22	23.62	0.24	2.56	0.87

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
4.375	8.27	7	0.677	4.82	1	8.27	1-8UNC

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
7.42	18.5	22.83	14.09	1.65	9.33	9.76	12.8	19.45

Motor

	ZF168		DF168						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZF168**	**DF168**
M132S	36.21	40.18	37.82	41.79	10.16	7.13	7.13	1"+3/4"	1017	1056
M132M	36.21	40.18	37.82	41.79	10.16	7.13	7.13	1"+3/4"	1063	1103
M160M	39.38	43.99	41	45.61	12.2	7.83	7.83	1"+3/4"	1091	1133
M160L	39.38	43.99	41	45.61	12.2	7.83	7.83	1"+3/4"	1122	1164
M180M	41.47	46.12	43.09	47.74	13.7	9.69	9.69	1 1/4"+3/4"	1191	1235
M180L	41.47	46.12	43.09	47.74	13.7	9.69	9.69	1 1/4"+3/4"	1206	1250
M200L	42.46	47.58	44.08	49.2	15.16	10.24	10.24	1 1/4"+3/4"	1308	1358
LG225S	on request	on request	51.73	61.14	17.4	12.8	on request	2x1 1/2"	on request	on request
LG225ZM	on request	on request	51.73	61.14	17.4	12.8	on request	2x1 1/2"	on request	on request
LG250ZM	on request	on request	-	-	19.49	15.43	on request	2x2"	on request	-
LG280S incl. adapter	51.71	on request	-	-	21.85	17.01	on request	2x2"	2732	-
LG280ZM incl. adapter	64.82	on request	-	-	21.85	17.01	on request	2x2"	2952	-

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

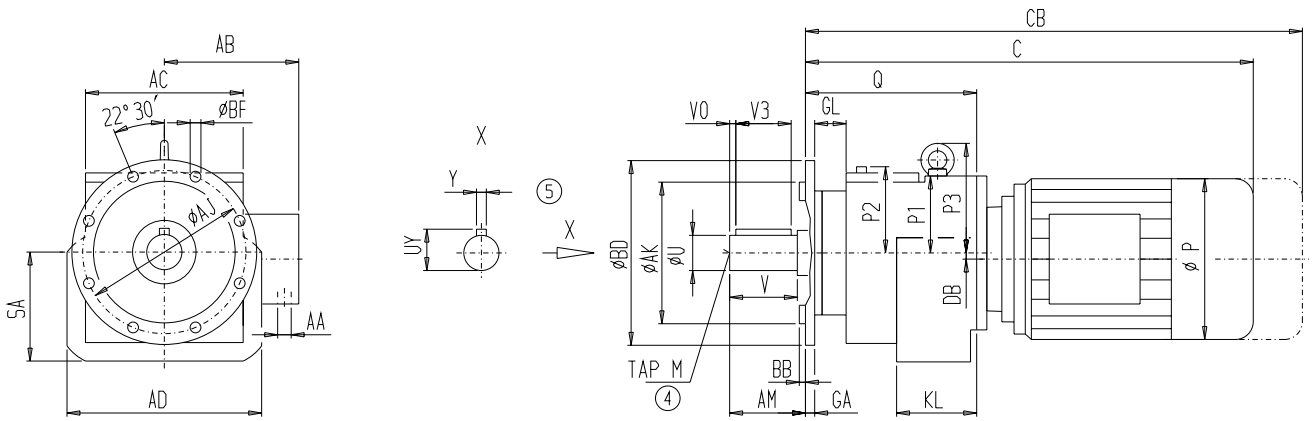
** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DF/ZF 168

DZF 510

[mm]



Flange

BD	AK	GA	AJ	BB	GL	BF
450	*350*	*31*	*400*	*5*	*65*	*17,5*
550	*450*	*31*	*500*	*5*	*65*	*17,5*
660	*550*	*31*	*600*	*6*	*65*	*22*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
111,13	*210*	*177,8*	*17,196*	*122,43*	*25,4*	*210*	*1"-8UNC*

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
188,5	*470*	*580*	*358*	*42*	*237*	*248*	*325*	*494*

Motor

	ZF168		DF168						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZF168**	**DF168**
M132S	*920,5*	*1021,5*	*961,5*	*1062,5*	*258*	*181*	*181*	*1"+3/4"*	*461*	*479*
M132M	*920,5*	*1021,5*	*961,5*	*1062,5*	*258*	*181*	*181*	*1"+3/4"*	*482*	*500*
M160M	*1001,5*	*1118,5*	*1042,5*	*1159,5*	*310*	*199*	*199*	*1"+3/4"*	*495*	*514*
M160L	*1001,5*	*1118,5*	*1042,5*	*1159,5*	*310*	*199*	*199*	*1"+3/4"*	*509*	*528*
M180M	*1054,5*	*1172,5*	*1095,5*	*1213,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*540*	*560*
M180L	*1054,5*	*1172,5*	*1095,5*	*1213,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*547*	*567*
M200L	*1079,5*	*1209,5*	*1120,5*	*1250,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*593*	*616*
LG225S	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG225ZM	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG250ZM	*on request*	*on request*	-	-	*495*	*392*	*on request*	*2x2"*	*on request*	-
LG280S incl. adapter	*1313,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1239*	-
LG280ZM incl. adapter	*1646,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1339*	-

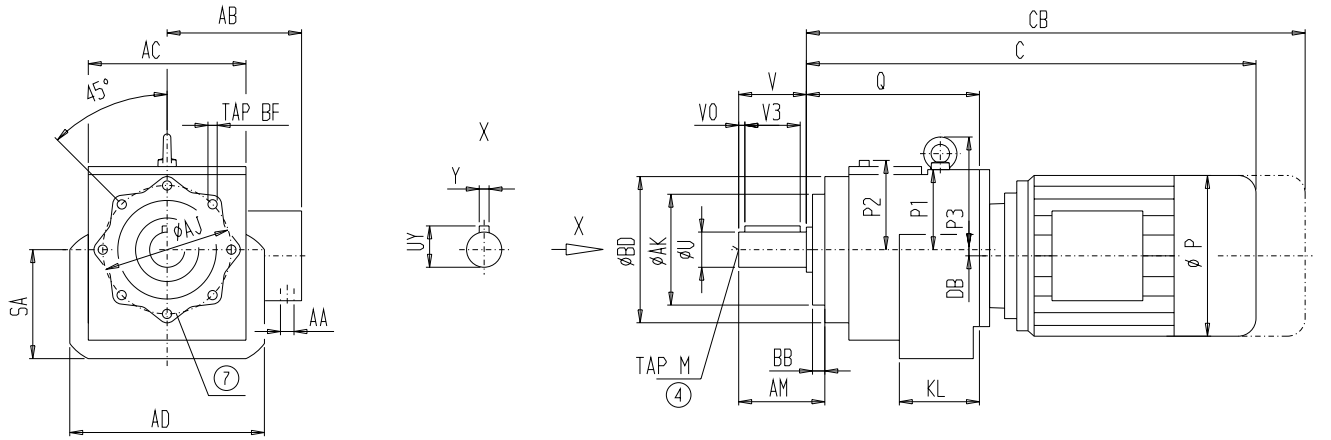
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DZ/ZZ 168

DZZ 510

[inch]



Flange

BD	AK	BW	AJ	BB	TAP BF
15.75	11.81	13.78	13.78	1.38	M20x34

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
4.375	8.27	7	0.677	4.82	1	9.88	1-8UNC

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
7.42	18.5	22.83	14.09	1.65	9.33	9.76	12.8	19.45

Motor

	ZZ168		DZ168						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZZ168**	**DZ168**
M132S	36.21	40.18	37.82	41.79	10.16	7.13	7.13	1"+3/4"	950	988
M132M	36.21	40.18	37.82	41.79	10.16	7.13	7.13	1"+3/4"	997	1034
M160M	39.38	43.99	41	45.61	12.2	7.83	7.83	1"+3/4"	1025	1065
M160L	39.38	43.99	41	45.61	12.2	7.83	7.83	1"+3/4"	1056	1096
M180M	41.47	46.12	43.09	47.74	13.7	9.69	9.69	1 1/4"+3/4"	112	1166
M180L	41.47	46.12	43.09	47.74	13.7	9.69	9.69	1 1/4"+3/4"	1140	1182
M200L	42.46	47.58	44.08	49.2	15.16	10.24	10.24	1 1/4"+3/4"	1248	1290
LG225S	on request	on request	51.73	61.14	17.4	12.8	on request	2x1 1/2"	on request	on request
LG225ZM	on request	on request	51.73	61.14	17.4	12.8	on request	2x1 1/2"	on request	on request
LG250ZM	on request	on request	-	-	19.49	15.43	on request	2x2"	on request	-
LG280S incl. adapter	51.71	on request	-	-	21.85	17.01	on request	2x2"	2556	-
LG280ZM incl. adapter	64.82	on request	-	-	21.85	17.01	on request	2x2"	2776	-

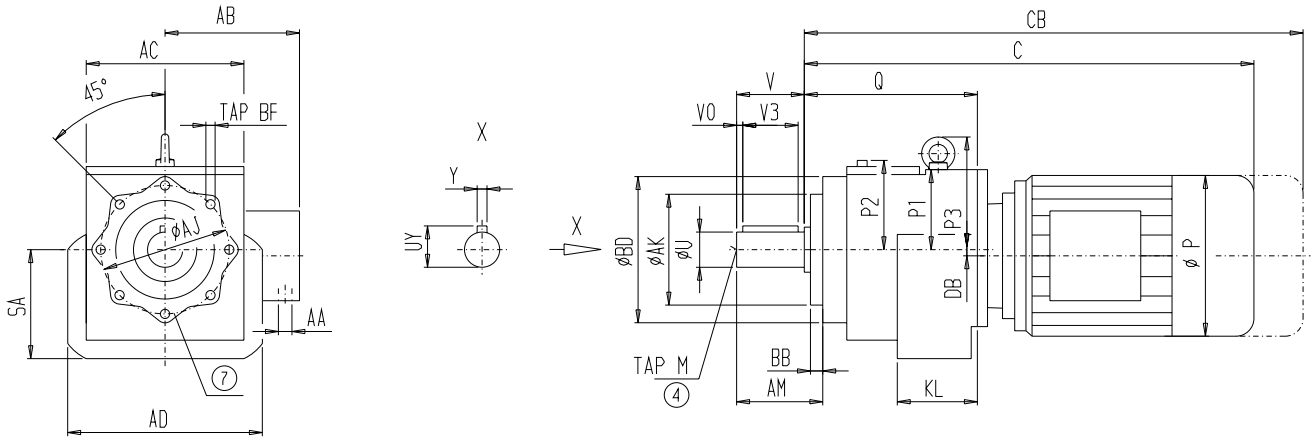
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DZ/ZZ 168

DZZ 510

[mm]



Flange

BD	AK	AJ	BB	TAP BF
400	*300*	*350*	*35*	*M20x34*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
111,13	*210*	*177,8*	*17,196*	*122,43*	*25,4*	*251*	*1"-8UNC*

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
188,5	*470*	*580*	*358*	*42*	*237*	*248*	*325*	*494*

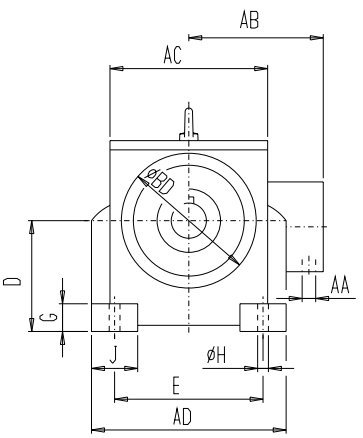
Motor

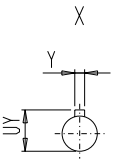
	ZZ168		DZ168						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZZ168**	**DZ168**
M132S	*920,5*	*1021,5*	*961,5*	*1062,5*	*258*	*181*	*181*	*1"+3/4"*	*431*	*448*
M132M	*920,5*	*1021,5*	*961,5*	*1062,5*	*258*	*181*	*181*	*1"+3/4"*	*452*	*469*
M160M	*1001,5*	*1118,5*	*1042,5*	*1159,5*	*310*	*199*	*199*	*1"+3/4"*	*465*	*483*
M160L	*1001,5*	*1118,5*	*1042,5*	*1159,5*	*310*	*199*	*199*	*1"+3/4"*	*479*	*497*
M180M	*1054,5*	*1172,5*	*1095,5*	*1213,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*510*	*529*
M180L	*1054,5*	*1172,5*	*1095,5*	*1213,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*517*	*536*
M200L	*1079,5*	*1209,5*	*1120,5*	*1250,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*566*	*585*
LG225S	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG225ZM	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG250ZM	*on request*	*on request*	-	-	*495*	*392*	*on request*	*2x2"*	*on request*	-
LG280S incl. adapter	*1313,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1159*	-
LG280ZM incl. adapter	*1646,5*	*on request*	-	-	*555*	*432*	*on request*	*2x2"*	*1259*	-

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

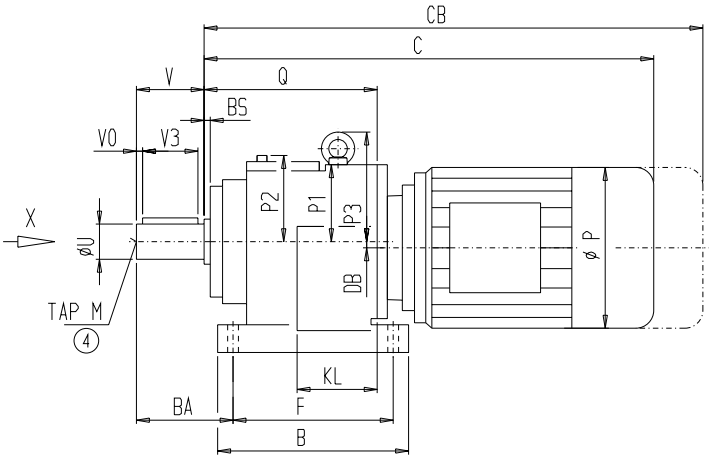
D/Z 188





DZ 510

[inch]



3

Mounting

E	F	G	H	J
19.69	22.83	3.94	1.54	5.51

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
4.75	8.27	7	0.677	5.29	1.25	10.63	1-8UNC

Gearcase

BD	KL	B	AC	AD	D	BS	DB	P1	P2	P3	Q
16.54	9.41	26.38	20.87	24.8	16.73	0.24	2.4	8.82	9.98	13.12	23.35

Motor

	Z188		D188						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**Z188**	**D188**
M132S	-	-	40.1	44.07	10.16	7.13	7.13	1"+3/4"	-	1427
M132M	-	-	40.1	44.07	10.16	7.13	7.13	1"+3/4"	-	1473
M160M	43.28	47.89	43.28	47.89	12.2	7.83	7.83	1"+3/4"	1433	1497
M160L	43.28	47.89	43.28	47.89	12.2	7.83	7.83	1"+3/4"	1464	1528
M180M	45.37	50.02	45.37	50.02	13.7	9.69	9.69	1 1/4"+3/4"	1532	1599
M180L	45.37	50.02	45.37	50.02	13.7	9.69	9.69	1 1/4"+3/4"	1548	1614
M200L	46.36	51.48	46.36	51.48	15.16	10.24	10.24	1 1/4"+3/4"	1656	1722
LG225S	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG225ZM	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG250ZM	on request	on request	on request	on request	19.49	15.43	on request	2x2"	on request	on request
LG280S incl. adapter	55.61	on request	55.61	on request	21.85	17.01	on request	2x2"	2964	3030
LG280ZM incl. adapter	68.72	on request	68.72	on request	21.85	17.01	on request	2x2"	3184	3250

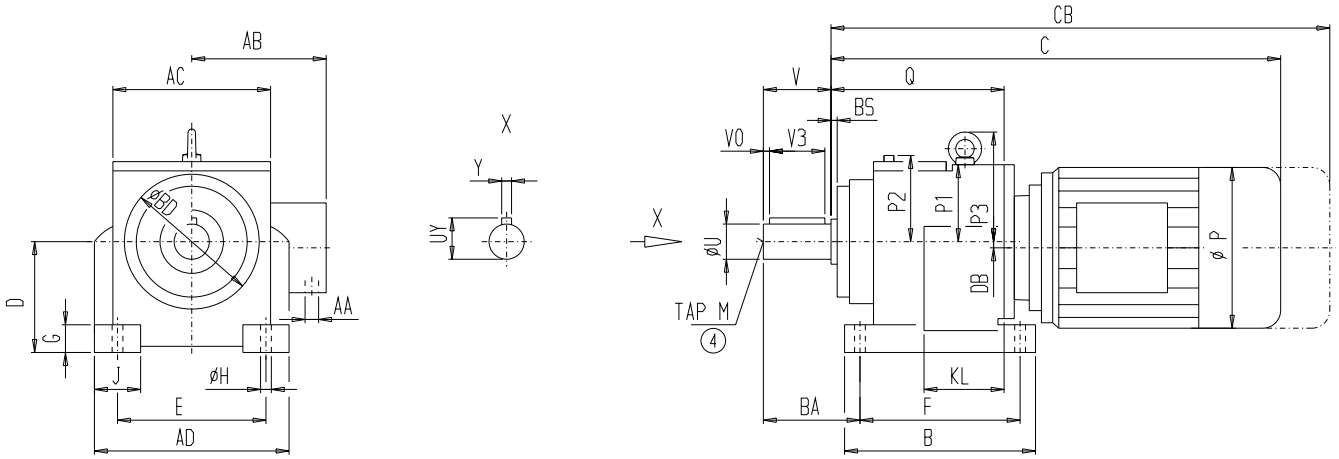
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Foot mounted

D/Z 188

DZ 510

[mm]



Mounting

E	F	G	H	J
500	*580*	*100*	*39*	*140*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
120,65	*210*	*177,8*	*17,196*	*134,37*	*31,75*	*270*	*1"-8UNC*

Gearcase

BD	KL	B	AC	AD	D	BS	DB	P1	P2	P3	Q
420	*239*	*670*	*530*	*630*	*425*	*6*	*61*	*224*	*253,5*	*333,5*	*593*

Motor

	Z188		D188						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**Z188**	**D188**
M132S	-	-	*1019,5*	*1120,5*	*258*	*181*	*181*	*1"+3/4"*	-	*647*
M132M	-	-	*1019,5*	*1120,5*	*258*	*181*	*181*	*1"+3/4"*	-	*668*
M160M	*1100,5*	*1217,5*	*1100,5*	*1217,5*	*310*	*199*	*199*	*1"+3/4"*	*650*	*679*
M160L	*1100,5*	*1217,5*	*1100,5*	*1217,5*	*310*	*199*	*199*	*1"+3/4"*	*664*	*693*
M180M	*1153,5*	*1271,5*	*1153,5*	*1271,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*695*	*725*
M180L	*1153,5*	*1271,5*	*1153,5*	*1271,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*702*	*732*
M200L	*1178,5*	*1308,5*	*1178,5*	*1308,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*751*	*781*
LG225S	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG225ZM	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG250ZM	*on request*	*on request*	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*	*on request*
LG280S incl. adapter	*1412,5*	*on request*	*1412,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1344*	*1374*
LG280ZM incl. adapter	*1745,5*	*on request*	*1745,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1444*	*1474*

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

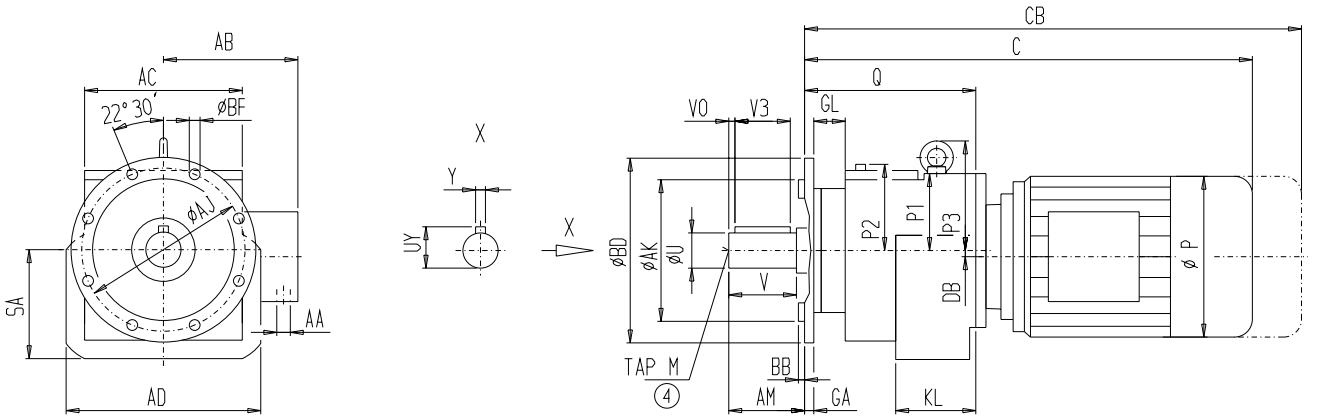
** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DF/ZF 188

DZF 510

[inch]



Flange

BD	AK	GA	AJ	BB	GL	BF
21.65	17.72	1.22	19.69	0.2	2.56	0.69
25.98	21.65	1.22	23.62	0.24	3.17	0.87

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
4.75	8.27	7	0.677	5.29	1.25	8.27	1-8UNC

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
9.41	20.87	24.8	16.73	2.4	8.82	9.98	13.12	23.35

Motor

	ZF188		DF188						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZF188**	**DF188**
M132S	-	-	40.1	44.07	10.16	7.13	7.13	1"+3/4"	-	1312
M132M	-	-	40.1	44.07	10.16	7.13	7.13	1"+3/4"	-	1358
M160M	43.28	47.89	43.28	47.89	12.2	7.83	7.83	1"+3/4"	1319	1383
M160L	43.28	47.89	43.28	47.89	12.2	7.83	7.83	1"+3/4"	1349	1413
M180M	45.37	50.02	45.37	50.02	13.7	9.69	9.69	1 1/4"+3/4"	1440	1484
M180L	45.37	50.02	45.37	50.02	13.7	9.69	9.69	1 1/4"+3/4"	1433	1499
M200L	46.36	51.48	46.36	51.48	15.16	10.24	10.24	1 1/4"+3/4"	1541	1607
LG225S	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG225ZM	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG250ZM	on request	on request	on request	on request	19.49	15.43	on request	2x2"	on request	on request
LG280S incl. adapter	55.61	on request	55.61	on request	21.85	17.01	on request	2x2"	2849	2915
LG280ZM incl. adapter	68.72	on request	68.72	on request	21.85	17.01	on request	2x2"	3069	3136

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

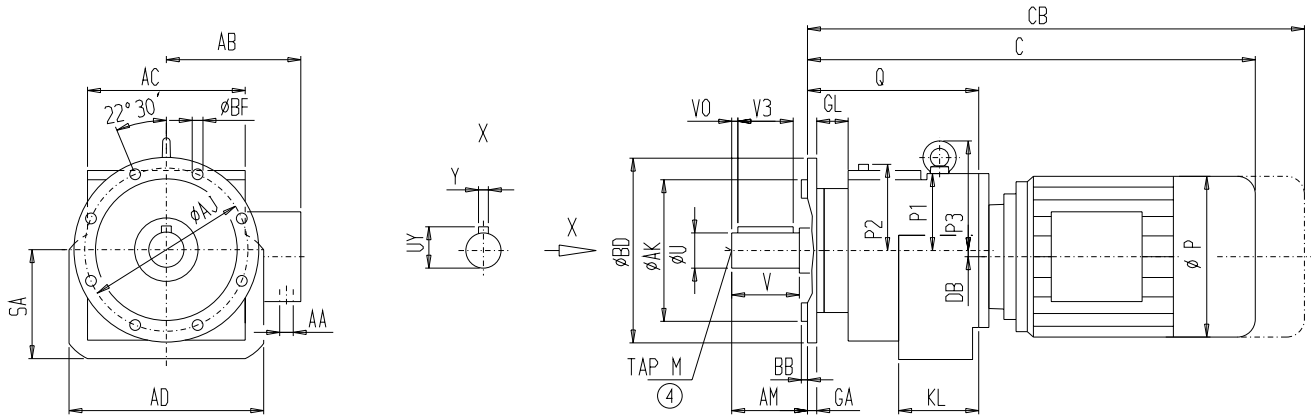
** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DF/ZF 188

DZF 510

[mm]



3

Flange

BD	AK	GA	AJ	BB	GL	BF
550	*450*	*31*	*500*	*5*	*65*	*17,5*
660	*550*	*31*	*600*	*6*	*80,5*	*22*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
120,65	*210*	*177,8*	*17,196*	*134,37*	*31,75*	*210*	*1"-8UNC*

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
239	*530*	*630*	*425*	*61*	*224*	*253,5*	*333,5*	*593*

Motor

	ZF188		DF188						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZF188**	**DF188**
M132S	-	-	*1019,5*	*1120,5*	*258*	*181*	*181*	*1"+3/4"*	-	*595*
M132M	-	-	*1019,5*	*1120,5*	*258*	*181*	*181*	*1"+3/4"*	-	*616*
M160M	*1100,5*	*1217,5*	*1100,5*	*1217,5*	*310*	*199*	*199*	*1"+3/4"*	*598*	*627*
M160L	*1100,5*	*1217,5*	*1100,5*	*1217,5*	*310*	*199*	*199*	*1"+3/4"*	*612*	*641*
M180M	*1153,5*	*1271,5*	*1153,5*	*1271,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*653*	*673*
M180L	*1153,5*	*1271,5*	*1153,5*	*1271,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*650*	*680*
M200L	*1178,5*	*1308,5*	*1178,5*	*1308,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*699*	*729*
LG225S	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG225ZM	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG250ZM	*on request*	*on request*	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*	*on request*
LG280S incl. adapter	*1412,5*	*on request*	*1412,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1292*	*1322*
LG280ZM incl. adapter	*1745,5*	*on request*	*1745,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1392*	*1422*

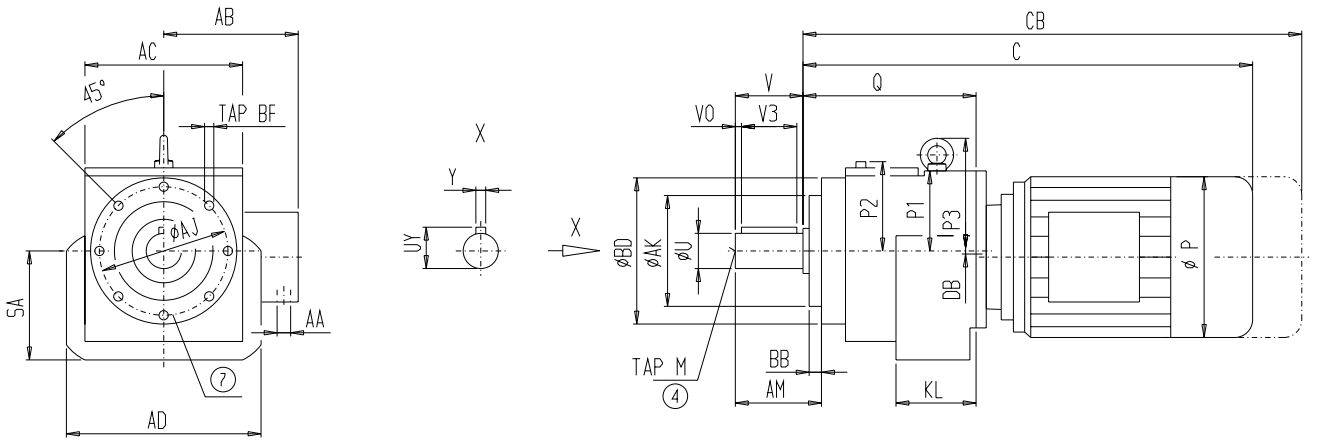
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DZ/ZZ 188

DZZ 510

[inch]



3

Flange

BD	AK	AJ	BB	TAP BF
16.54	11.81	13.78	1.38	M20x34

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
4.75	8.27	7	0.677	5.29	1.25	9.88	1-8UNC

Gearcase

KL	AC	AD	SA	DB	P1	P2	P3	Q
9.13	20.87	24.8	16.73	2.4	8.82	9.98	13.11	23.35

Motor

	ZZ188		DZ188						Weight [lb]	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZZ188**	**DZ188**
M132S	-	-	40.1	44.07	10.16	7.13	7.13	1"+3/4"	-	1268
M132M	-	-	40.1	44.07	10.16	7.13	7.13	1"+3/4"	-	1314
M160M	43.28	47.89	43.28	47.89	12.2	7.83	7.83	1"+3/4"	1274	1338
M160L	43.28	47.89	43.28	47.89	12.2	7.83	7.83	1"+3/4"	1305	1369
M180M	45.37	50.02	45.37	50.02	13.7	9.69	9.69	1 1/4"+3/4"	1374	1440
M180L	45.37	50.02	45.37	50.02	13.7	9.69	9.69	1 1/4"+3/4"	1389	1455
M200L	46.36	51.48	46.36	51.48	15.16	10.24	10.24	1 1/4"+3/4"	1497	1563
LG225S	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG225ZM	on request	on request	on request	on request	17.4	12.8	on request	2x1 1/2"	on request	on request
LG250ZM	on request	on request	on request	on request	19.49	15.43	on request	2x2"	on request	on request
LG280S incl. adapter	55.61	on request	55.61	on request	21.85	17.01	on request	2x2"	2805	2871
LG280ZM incl. adapter	68.72	on request	68.72	on request	21.85	17.01	on request	2x2"	3025	3091

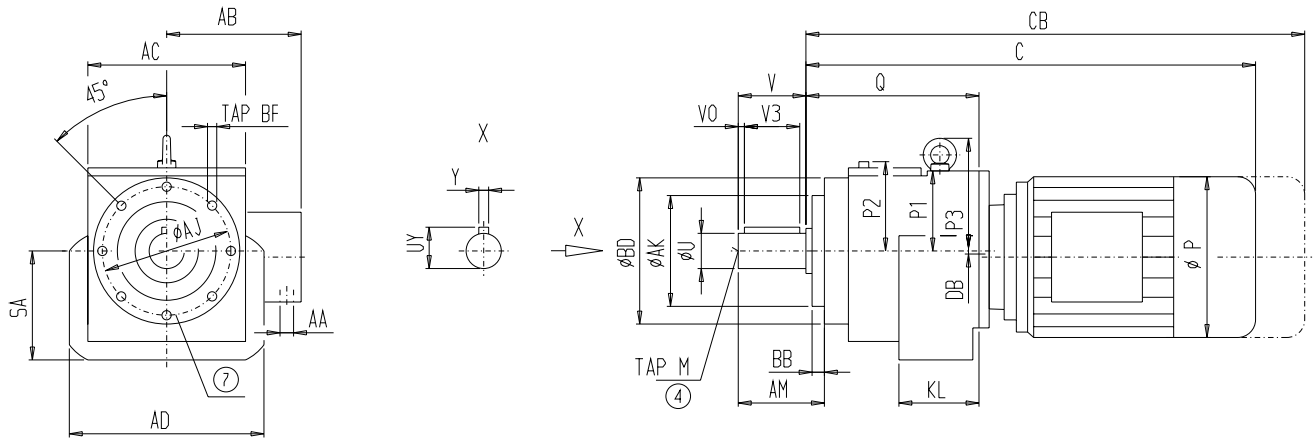
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Helical Gear Motors
Flange mounted

DZ/ZZ 188

DZZ 510

[mm]



Flange

BD	AK	AJ	BB	TAP BF
420	*300*	*350*	*35*	*M20x34*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
120,65	*210*	*177,8*	*17,196*	*134,37*	*31,75*	*251*	*1"-8UNC*

Gearcase

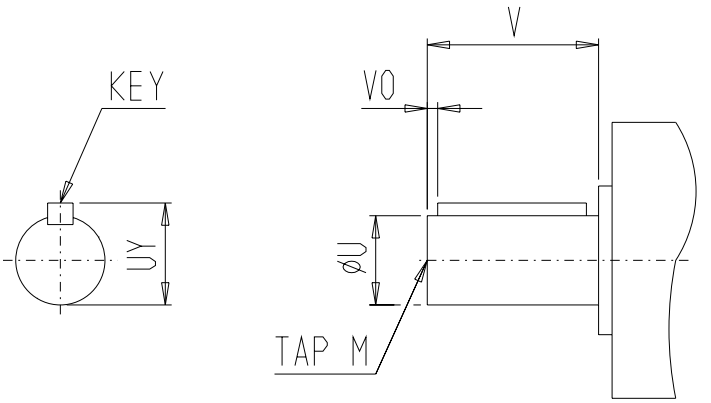
KL	AC	AD	SA	DB	P1	P2	P3	Q
232	*530*	*630*	*425*	*61*	*227*	*253,5*	*333*	*593*

Motor

	ZZ188		DZ188						Weight *[kg]*	
Motor	**C**	**CB**	**C**	**CB**	**P**	**AB**	**AB ****	**AA**	**ZZ188**	**DZ188**
M132S	-	-	*1019,5*	*1119,5*	*258*	*181*	*181*	*1"+3/4"*	-	*575*
M132M	-	-	*1019,5*	*1119,5*	*258*	*181*	*181*	*1"+3/4"*	-	*596*
M160M	*1100,5*	*1217,5*	*1100,5*	*1217,5*	*310*	*199*	*199*	*1"+3/4"*	*578*	*607*
M160L	*1100,5*	*1217,5*	*1100,5*	*1217,5*	*310*	*199*	*199*	*1"+3/4"*	*592*	*621*
M180M	*1123*	*1268*	*1123*	*1268*	*360*	*308*	*308*	*1 1/4"+3/4"*	*623*	*653*
M180L	*1161*	*1306*	*1161*	*1306*	*360*	*308*	*308*	*1 1/4"+3/4"*	*630*	*660*
M200L	*1211*	*1356*	*1211*	*1356*	*360*	*308*	*308*	*1 1/4"+3/4"*	*679*	*709*
LG225S	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG225ZM	*on request*	*on request*	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*	*on request*
LG250ZM	*on request*	*on request*	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*	*on request*
LG280S incl. adapter	*1412,5*	*on request*	*1412,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1272*	*1302*
LG280ZM incl. adapter	*1745,5*	*on request*	*1745,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1372*	*1402*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 3 - 93 ** for voltage ratio 1:2

Available Output Solid Shafts Inch

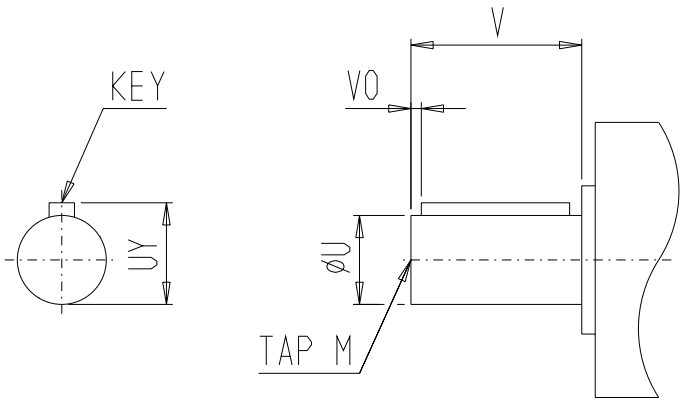


3

Size	U [inch]	UY [inch]	V [inch]	VO [inch]	KEY [inch]	TAP M [inch]
D/Z,DF/ZF18	3/4	0.83	1.57	0,01	3/16 x 3/16 x 1 1/4	1/4 - 20 x 0.63
E, EF38						
D/Z,DF/ZF28	1	1.11	1.97	0.252	1/4 x 1/4 x 1 1/2	3/8 - 16 x 0.87
D/Z,DF/ZF38						
E, EF48						
D/Z,DF/ZF38	1 1/4	1.36	2.36	0.133	1/4 x 1/4 x 1 7/8	3/8 - 16 x 0.87
D/Z,DF/ZF48						
E, EF68						
D/Z,DF/ZF48	1 3/8	1.51	2.76	0.027	5/16 x 5/16 x 2 3/8	3/8 - 16 x 0.87
D/Z,DF/ZF48	1 5/8	1.79	3.15	0.065	3/8 x 3/8 x 2 3/4	5/8 - 11 x 1.42
D/Z,DF/ZF68						
E, EF88						
E, EF108	2 1/8	2.35	3.94	0,043	1/2 x 1/2 x 3 1/2	3/4 - 10 x 1.65
D/Z,DF/ZF68				0,004		
D/Z,DF/ZF88						
D/Z,DF/ZF88	2 3/8	2.65	4.72	0,002	5/8 x 5/8 x 4 1/4	3/4 - 10 x 1.65
D/Z,DF/ZF108						
E, EF128				0,081		
E, EF148	2 3/4	3.03	5.51	0.671	5/8 x 5/8 x 4 1/4	3/4 - 10 x 1.65
D/Z,DF/ZF108	2 7/8	3.20	5.51	0.046	3/4 x 3/4 x 4 7/8	3/4 - 10 x 1.65
D/Z,DF/ZF128						
D/Z,DF/ZF128	3 5/8	4.01	6.69	0.602	7/8 x 7/8 x 5 1/2	1 - 8 x 1.97
D/Z,DF/ZF148						
D/Z,DF/ZF148	4	4.44	8.27	0.677	1 x 1 x 7	1 - 8 x 1.97
D/Z,DF/ZF168						
D/Z,DF/ZF168	4 3/8	4.82	8.27	0.677	1 x 1 x 7	1 - 8 x 1.97
D/Z,DF/ZF188	4 3/4	5.29	8.27	0.677	1 1/4 x 1 1/4 x 7	1 - 8 x 1.97

Tolerances see page 1 - 4. Tap specification see page 1 - 7.

Available Output Solid Shafts Metric

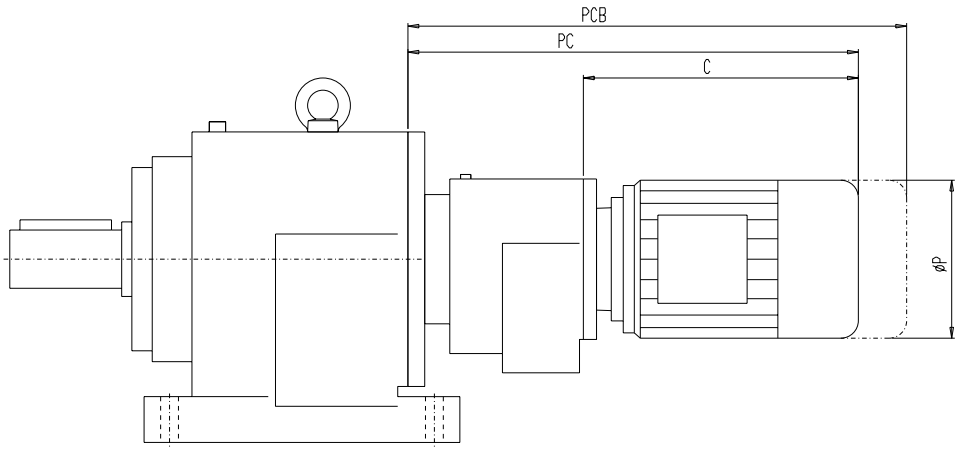


Size	U [mm]	UY [mm]	V [mm]	VO [mm]	KEY [mm]	TAP M [mm]
D/Z,DF/ZF18	*20*	*22.5*	*40*	*4*	*6 x 6 x 32*	*M6 x 16*
E, EF38				*5*	*6 x 6 x 30*	
D/Z,DF/ZF28	*25*	*28*	*50*	*7*	*8 x 7 x 40*	*M10 x 22*
D/Z,DF/ZF38						
E, EF48						
E, EF68	*30*	*33*	*60*	*7*	*8 x 7 x 50*	*M10 x 22*
D/Z,DF/ZF38					*8 x 7 x 50*	
D/Z,DF/ZF48						
D/Z,DF/ZF68	*40*	*43*	*80*	*5*	*12 x 8 x 70*	*M16 x 36*
E, EF88						
DR/ZR68	*50*	*53.5*	*100*	*10*	*14 x 9 x 80*	*M16 x 36*
D/Z,DF/ZF88						
E, EF108						
DR/ZR88	*60*	*64*	*120*	*10*	*18 x 11 x 100*	*M20 x 42*
D/Z,DF/ZF108						
E, EF128						
DR/ZR108	*70*	*74.5*	*140*	*15*	*20 x 12 x 125*	*M20 x 42*
D/Z,DF/ZF128					*20 x 12 x 110*	
E, EF148						
DR/ZR128	*80*	*85*	*170*	*20*	*22x14x125*	*M20 x 42*
D/Z,DF/ZF148	*90*	*95*	*170*	*15*	*25 x 14 x 140*	*M24 x 50*
DR/ZR148	*100*	*106*	*210*	*15*	*28 x 16 x 180*	*M24 x 50*
D/Z,DF/ZF168						
DR/ZR168	*110*	*116*	*210*	*15*	*28 x 16 x 180*	*M24 x 50*
D/Z,DF/ZF188	*120*	*127*	*210*	*15*	*32 x 18 x 180*	*M24 x 50*

Tolerances see page 1 - 4. Tap specification see page 1 - 7.

Tandem-Helical Gear Motors

DZ 710
[inch]



3

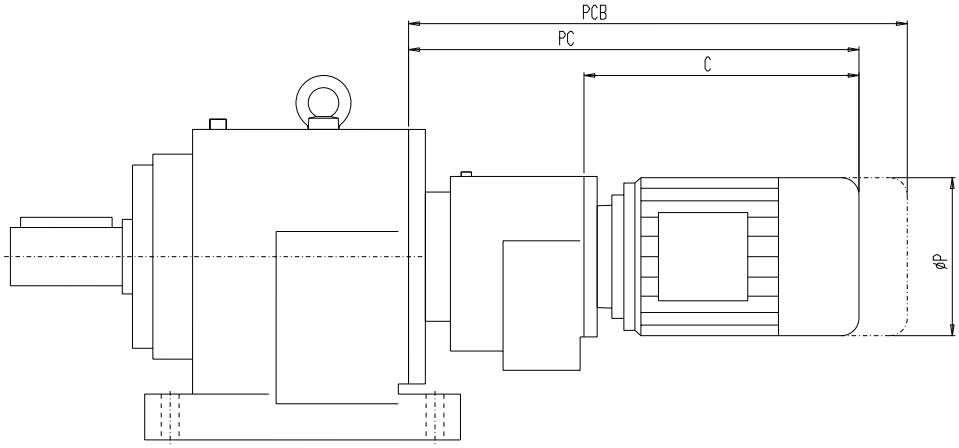
Gear Units		P	PC	PCB	C
Z.38-Z28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
	M100L	7.64	20.87	23.7	14.57
Z.38-D28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
D.48-Z28	M71	5.43	14.81	16.54	8.09
	M71MP	5.43	15.4	17.57	8.68
	M90S	6.93	18.14	20.74	11.42
	M90L	6.93	18.14	20.74	11.42
	M100L	7.64	21.33	24.16	14.57
D.48-D28	M71	5.43	14.81	16.54	8.09
	M71MP	5.43	15.4	17.57	8.68
	M90S	6.93	18.14	20.74	11.42
	M90L	6.93	18.14	20.74	11.42
D.68-Z28	M71	5.43	14.63	16.36	8.09
	M71MP	5.43	15.22	17.39	8.68
	M90S	6.93	17.96	20.56	11.42
	M90L	6.93	17.96	20.56	11.42
	M100L	7.64	21.15	23.98	14.57
D.68-D28	M71	5.43	14.63	16.36	8.09
	M71MP	5.43	15.22	17.39	8.68
	M90S	6.93	17.96	20.56	11.42
	M90L	6.93	17.96	20.56	11.42
D.88-Z28	M71	5.43	14.3	16.03	8.09
	M71MP	5.43	14.89	17.06	8.68
	M90S	6.93	17.63	20.23	11.42
	M90L	6.93	17.63	20.23	11.42
	M100L	7.64	20.82	23.65	14.57

Gear Units		P	PC	PCB	C
D.88-D28	M71	5.43	14.3	16.03	8.09
	M71MP	5.43	14.89	17.06	8.68
	M90S	6.93	17.63	20.23	11.42
	M90L	6.93	17.63	20.23	11.42
D.108-Z38	M71 1)	5.43	18.86	20.59	10.02
	M80 1)	6.22	19.7	21.87	10.87
	M90S 1)	6.93	21.32	23.91	12.48
	M90L 1)	6.93	21.32	23.91	12.48
	M100L 1)	7.64	23.09	25.92	14.25
	M112M 1)	8.58	25.14	28.33	16.3
	M71 2)	5.43	19.31	21.04	10.02
	M80 2)	6.22	20.15	22.32	10.87
	M90S 2)	6.93	21.77	24.36	12.48
	M90L 2)	6.93	21.77	24.36	12.48
	M100L 2)	7.64	23.54	26.37	14.25
	M112M 2)	8.58	25.59	28.78	16.3
D.108-D38	M71	5.43	19.46	21.19	10.61
	M80	6.22	20.3	22.47	11.46
	M90S	6.93	21.92	24.51	13.07
	M90L	6.93	21.92	24.51	13.07
D.128-Z38	M71	5.43	18.99	20.72	10.02
	M80	6.22	19.83	22	10.87
	M90S	6.93	21.45	24.04	12.48
	M90L	6.93	21.45	24.04	12.48
	M100L	7.64	23.22	26.05	14.25
	M112M	8.58	25.27	28.46	16.3
D.128-D38	M71	5.43	19.59	21.32	10.61
	M80	6.22	20.43	22.6	11.46
	M90S	6.93	22.05	24.64	13.07
	M90L	6.93	22.05	24.64	13.07

1) $i_{ges} \geq 3797$ 2) $i_{ges} < 3797$

Tandem-Helical Gear Motors

DZ 710
[inch]

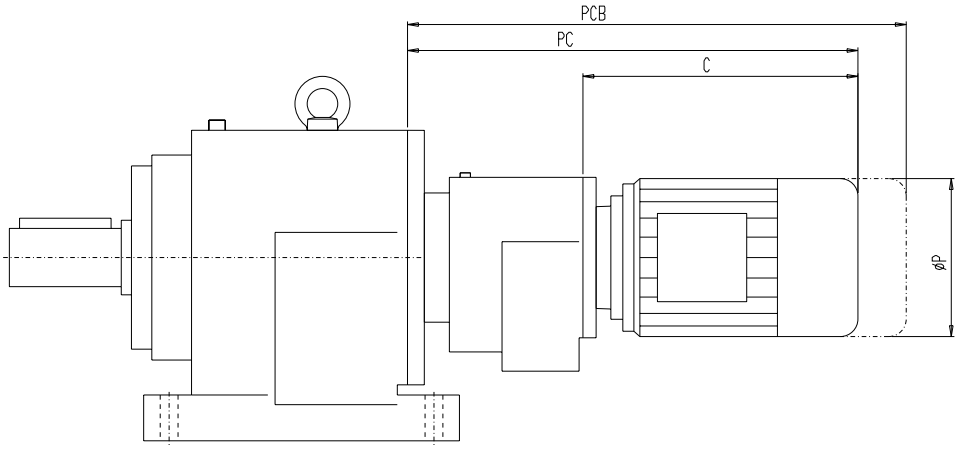


Gear Units		P	PC	PCB	C
D.128-Z48	M71	5.43	21.66	23.39	9.8
	M80	6.22	22.5	24.67	10.65
	M90S	6.93	24.12	26.71	12.26
	M90L	6.93	24.12	26.71	12.26
	M100L	7.64	25.89	28.72	14.04
	M112M	8.58	27.91	31.1	16.06
	M132S	10.16	31.56	35.49	19.7
	M132M	10.16	31.56	35.49	19.7
D.148-Z38	M71	5.43	18.87	20.6	10.02
	M80	6.22	19.71	21.88	10.87
	M90S	6.93	21.33	23.92	12.48
	M90L	6.93	21.33	23.92	12.48
	M100L	7.64	23.1	25.93	14.25
	M112M	8.58	25.15	28.34	16.3
D.148-D38	M71	5.43	19.47	21.2	10.61
	M80	6.22	20.31	22.48	11.46
	M90S	6.93	21.93	24.52	13.07
	M90L	6.93	21.93	24.52	13.07
D.148-Z48	M71	5.43	21.5	23.23	9.8
	M80	6.22	22.34	24.51	10.65
	M90S	6.93	23.96	26.55	12.26
	M90L	6.93	23.96	26.55	12.26
	M100L	7.64	25.73	28.56	14.04
	M112M	8.58	27.75	30.94	16.06
	M132S	10.16	31.4	35.33	19.7
	M132M	10.16	31.4	35.33	19.7
D.168-Z48	M71	5.43	21.05	22.78	9.8
	M80	6.22	21.89	24.06	10.65
	M90S	6.93	23.51	26.1	12.26
	M90L	6.93	23.51	26.1	12.26
	M100L	7.64	25.28	28.11	14.04
	M112M	8.58	27.3	30.49	16.06
	M132S	10.16	30.95	34.88	19.7
	M132M	10.16	30.95	34.88	19.7
D.168-D48	M71	5.43	21.72	23.45	10.47
	M80	6.22	22.56	24.73	11.32
	M90S	6.93	24.18	26.77	12.93
	M90L	6.93	24.18	26.77	12.93
	M100L	7.64	25.95	28.78	14.7

Gear Units		P	PC	PCB	C
D.168-Z68	M71	5.43	24.44	26.17	9.57
	M80	6.22	25.28	27.45	10.41
	M90S	6.93	26.9	29.49	12.03
	M90L	6.93	26.9	29.49	12.03
	M100L	7.64	28.67	31.5	13.8
	M112M	8.58	30.62	33.81	15.75
	M132S	10.16	34.19	38.12	19.31
	M132M	10.16	34.19	38.12	19.31
	M160M	12.2	37.47	42.08	22.6
	M160L	12.2	37.47	42.08	22.6
D.188-Z48	M71	5.43	19.44	21.17	9.8
	M80	6.22	20.28	22.45	10.65
	M90S	6.93	21.9	24.49	12.26
	M90L	6.93	21.9	24.49	12.26
	M100L	7.64	23.67	26.5	14.04
	M112M	8.58	25.69	28.88	16.06
	M132S	10.16	29.34	33.27	19.7
	M132M	10.16	29.34	33.27	19.7
D.188-D48	M71	5.43	20.11	21.84	10.47
	M80	6.22	20.95	23.12	11.32
	M90S	6.93	22.57	25.16	12.93
	M90L	6.93	22.57	25.16	12.93
	M100L	7.64	24.34	27.17	14.7
D.188-Z68	M71	5.43	22.82	24.55	9.57
	M80	6.22	23.66	25.83	10.41
	M90S	6.93	25.28	27.87	12.03
	M90L	6.93	25.28	27.87	12.03
	M100L	7.64	27.05	29.88	13.8
	M112M	8.58	29	32.19	15.75
	M132S	10.16	32.57	36.5	19.31
	M132M	10.16	32.57	36.5	19.31
	M160M	12.2	35.85	40.46	22.6
	M160L	12.2	35.85	40.46	22.6

DZ 710

[*mm*]



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Gear Units		P	PC	PCB	C
Z.38-Z28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
	M100L	194	531,5	603,5	370
Z.38-D28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
D.48-Z28	M71	138	377,5	421,5	205,5
	M71MP	138	392,5	447,5	220,5
	M90S	176	462	528	290
	M90L	176	462	528	290
	M100L	194	543	615	370
D.48-D28	M71	138	377,5	421,5	205,5
	M71MP	138	392,5	447,5	220,5
	M90S	176	462	528	290
	M90L	176	462	528	290
D.68-Z28	M71	138	373	417	205,5
	M71MP	138	388	443	220,5
	M90S	176	457,5	523,5	290
	M90L	176	457,5	523,5	290
	M100L	194	538,5	610,5	370
D.68-D28	M71	138	373	417	205,5
	M71MP	138	388	443	220,5
	M90S	176	457,5	523,5	290
	M90L	176	457,5	523,5	290
D.88-Z28	M71	138	364,5	408,5	205,5
	M71MP	138	379,5	434,5	220,5
	M90S	176	449	515	290
	M90L	176	449	515	290
	M100L	194	530	602	370

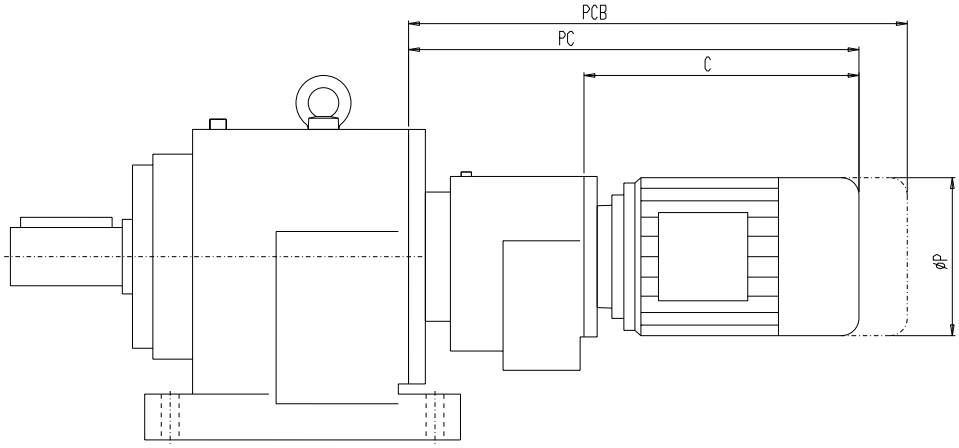
Gear Units		P	PC	PCB	C
D.88-D28	M71	138	364,5	408,5	205,5
	M71MP	138	379,5	434,5	220,5
	M90S	176	449	515	290
	M90L	176	449	515	290
D.108-Z38	M71 1)	138	480,5	524,5	254,5
	M80 1)	158	502	557	276
	M90S 1)	176	543	609	317
	M90L 1)	176	543	609	317
	M100L 1)	194	588	660	362
	M112M 1)	218	640	721	414
	M71 2)	138	492	536	254,5
	M80 2)	158	513,5	568,5	276
	M90S 2)	176	554,5	620,5	317
	M90L 2)	176	554,5	620,5	317
	M100L 2)	194	599,5	671,5	362
	M112M 2)	218	651,5	732,5	414
D.108-D38	M71	138	495,5	539,5	269,5
	M80	158	517	572	291
	M90S	176	558	624	332
	M90L	176	558	624	332
D.128-Z38	M71	138	484	528	254,5
	M80	158	505,5	560,5	276
	M90S	176	546,5	612,5	317
	M90L	176	546,5	612,5	317
	M100L	194	591,5	663,5	362
	M112M	218	643,5	724,5	414
D.128-D38	M71	138	499	543	269,5
	M80	158	520,5	575,5	291
	M90S	176	561,5	627,5	332
	M90L	176	561,5	627,5	332

1) $i_{ges} \geq 3797$ 2) $i_{ges} < 3797$

Tandem-Helical Gear Motors

DZ 710

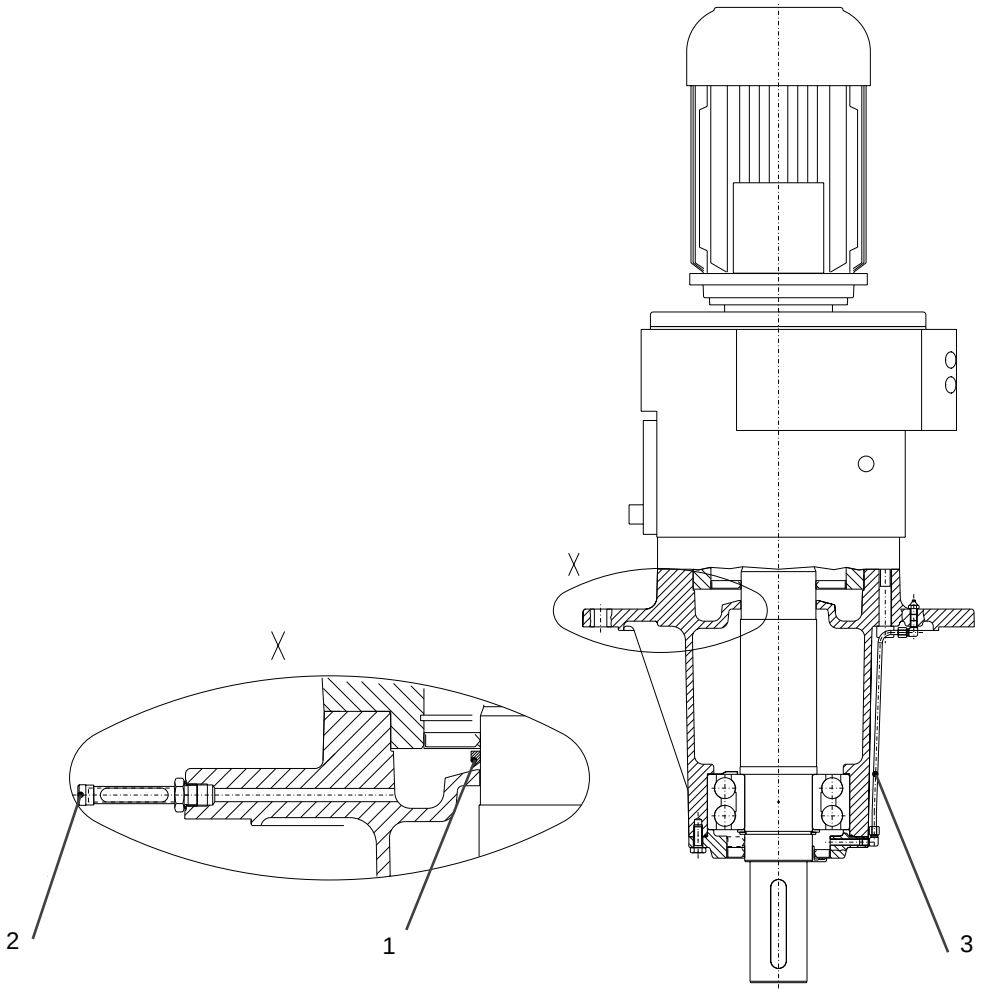
[*mm*]



Gear Units		P	PC	PCB	C
D.128-Z48	M71	138	551,5	595,5	249
	M80	158	573	628	270,5
	M90S	176	614	680	311,5
	M90L	176	614	680	311,5
	M100L	194	659	731	356,5
	M112M	218	710,5	791,5	408
	M132S	258	803	903	500,5
	M132M	258	803	903	500,5
D.148-Z38	M71	138	481	525	254,5
	M80	158	502,5	557,5	276
	M90S	176	543,5	609,5	317
	M90L	176	543,5	609,5	317
	M100L	194	588,5	660,5	362
	M112M	218	640,5	721,5	414
D.148-D38	M71	138	496	540	269,5
	M80	158	517,5	572,5	291
	M90S	176	558,5	624,5	332
	M90L	176	558,5	624,5	332
D.148-Z48	M71	138	547,5	591,5	249
	M80	158	569	624	270,5
	M90S	176	610	676	311,5
	M90L	176	610	676	311,5
	M100L	194	655	727	356,5
	M112M	218	706,5	787,5	408
	M132S	258	799	899	500,5
	M132M	258	799	899	500,5
D.168-Z48	M71	138	536	580	249
	M80	158	557,5	612,5	270,5
	M90S	176	598,5	664,5	311,5
	M90L	176	598,5	664,5	311,5
	M100L	194	643,5	715,5	356,5
	M112M	218	695	776	408
	M132S	258	787,5	887,5	500,5
	M132M	258	787,5	887,5	500,5
D.168-D48	M71	138	553	597	266
	M80	158	574,5	629,5	287,5
	M90S	176	615,5	681,5	328,5
	M90L	176	615,5	681,5	328,5
	M100L	194	660,5	732,5	373,5

Gear Units		P	PC	PCB	C
D.168-Z68	M71	138	622	666	243
	M80	158	643,5	698,5	264,5
	M90S	176	684,5	750,5	305,5
	M90L	176	684,5	750,5	305,5
	M100L	194	729,5	801,5	350,5
	M112M	218	779	860	400
	M132S	258	869,5	969,5	490,5
	M132M	258	869,5	969,5	490,5
	M160M	310	953	1070	574
	M160L	310	953	1070	574
D.188-Z48	M71	138	495	539	249
	M80	158	516,5	571,5	270,5
	M90S	176	557,5	623,5	311,5
	M90L	176	557,5	623,5	311,5
	M100L	194	602,5	674,5	356,5
	M112M	218	654	735	408
	M132S	258	746,5	846,5	500,5
	M132M	258	746,5	846,5	500,5
D.188-D48	M71	138	512	556	266
	M80	158	533,5	588,5	287,5
	M90S	176	574,5	640,5	328,5
	M90L	176	574,5	640,5	328,5
	M100L	194	619,5	691,5	373,5
D.188-Z68	M71	138	581	625	243
	M80	158	602,5	657,5	264,5
	M90S	176	643,5	709,5	305,5
	M90L	176	643,5	709,5	305,5
	M100L	194	688,5	760,5	350,5
	M112M	218	738	819	400
	M132S	258	828,5	928,5	490,5
	M132M	258	828,5	928,5	490,5
	M160M	310	912	1029	574
	M160L	310	912	1029	574

Helical Gear Units with Agitator Flange



Agitator-Design DZR

Heavy-Duty Design

Large fixed bearing with long distance between bearings on the output shaft to carry heavy radial and axial loads, especially for long shafts of mixer or agitator.

Optimized design resulting in no axial force transmission through the gear-housing.

Optional Dry-Well Design

For mounting position V1-00, safety against possible oil-leakage is made possible by diverting any leaked oil to a safety chamber with an additional 'V'-Ring (1) and detecting the leakage either through a sight glass or electronic sensor (2).

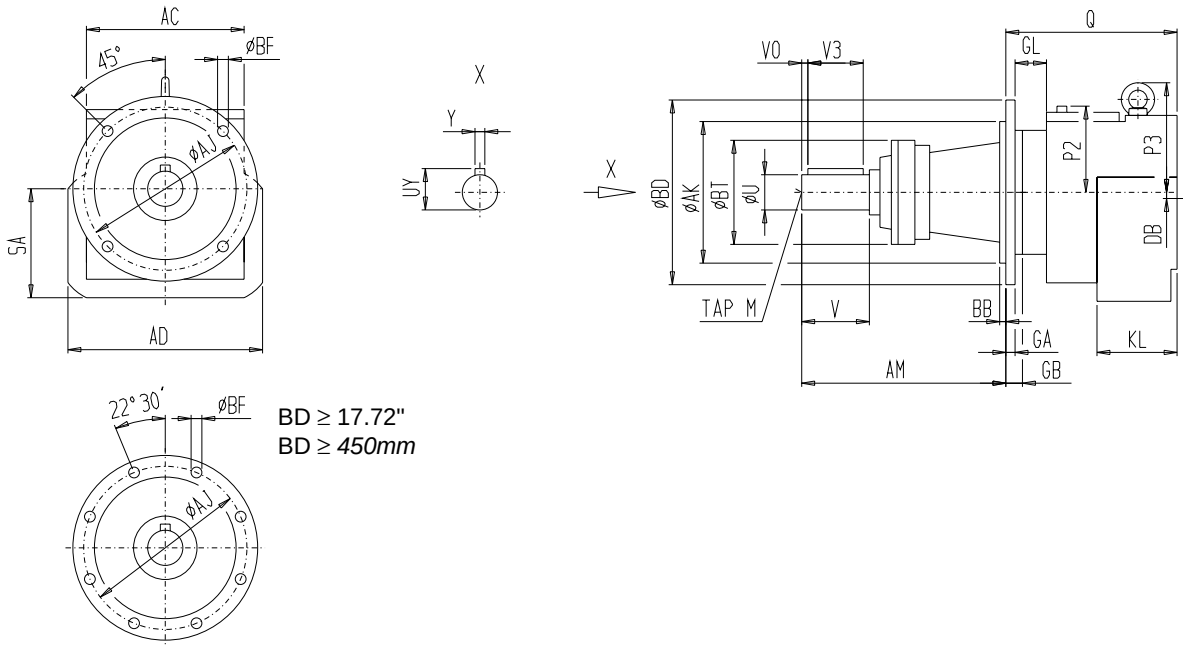
Optional Re-Greasing System (3)

Various Output Shaft Sealing System Possible.

Bearing Life Time Calculation

on request or in electronic catalogue.

Helical Gear Units with Agitator flange



BD ≥ 17.72"
BD ≥ *450mm*

3

Dimensions in **Inch** / ***mm***

Model	BD	AK	GA	BB	GL	BT	GB	VO / V3	U / V	Y / UY	AJ / BF	TAP M	AM / Q	P2	P3	SA	KL	AD	AC	DB	Add. Weight*
DR/ZR68	13.78	9.84	0.71	0.28	3.11	6.50	2.24	-	2	1/2	11.81	3/4-10x1.65 UNC	11.81	4.29	5.87	5.67	3.60	10.35	8.11	0	53
								-	*50.8*	*12.7*	*300*		*300*								
								3 1/2	3.94	2.22	0.69		9.76								
	350	*250*	*18*	*7*	*79*	*165*	*57*	*88.9*	*100*	*56.4*	*17.5*		*248*	*109*	*149*	*144*	*91.5*	*263*	*206*	*0*	*24*
DR/ZR88	13.78	9.84	0.71	0.28	3.62	7.28	2.44	-	2 3/8	5/8	11.81	3/4-10x1.65 UNC	14.17	5.28	7.13	7.17	5.08	13.07	10.24	0	101
								-	*60.33*	*15.9*	*300*		*360*								
								4 1/4	4.72	2.65	0.69		12.05								
	350	*250*	*18*	*7*	*92*	*185*	*62*	*108.0*	*120*	*67.3*	*17.5*		*306*	*134*	*181*	*182*	*129*	*332*	*260*	*0*	*46*
DR/ZR108	17.72	13.78	0.87	0.28	3.07	8.27	2.83	0.67	2 3/4	5/8	15.75	3/4-10x1.65 UNC	16.54	6.97	8.98	8.64	4.98	16.14	12.83	0	181
								17.0	*69.85*	*15.9*	*400*		*420*								
								4 1/4	5.51	3.03	0.69		13.98								
	450	*350*	*22*	*7*	*78*	*210*	*72*	*108.0*	*140*	*77.0*	*17.5*		*355*	*177*	*228*	*219.5*	*126.5*	*410*	*326*	*0*	*82*
DR/ZR128	21.65	17.72	0.98	0.31	3.98	9.92	3.19	0.83	3 1/8	3/4	19.69	3/4-10x1.65 UNC	19.69	7.64	10.35	9.84	5.75	18.19	14.33	0	187
								21.2	*79.38*	*19.1*	*500*		*500*								
								4 7/8	6.69	3.45	0.69		16.61								
	550	*450*	*25*	*8*	*101*	*252*	*81*	*123.8*	*170*	*87.7*	*17.5*		*422*	*194*	*263*	*250*	*146*	*462*	*364*	*0*	*85*
DR/ZR148	21.65	17.72	0.98	0.31	4.45	9.92	3.19	0.68	4	1	19.69	1-8x1.97 UNC	23.62	7.50	10.63	12.48	6.30	20.08	16.38	1.46	207
								17.2	*101.6*	*25.4*	*500*		*600*								
								7	8.27	4.44	0.69		18.07	*190.*							
	550	*450*	*25*	*8*	*113*	*252*	*81*	*177.8*	*210*	*112.8*	*17.5*		*459*	*5*	*270*	*317*	*160*	*510*	*416*	*37*	*94*
DR/ZR168	25.98	21.65	1.10	0.31	4.45	10.63	3.39	0.68	4 3/8	1	23.62	1-8x1.97 UNC	25.98	9.76	12.80	14.09	7.42	22.83	18.50	1.65	547
								17.2	*111.13*	*25.4*	*600*		*660*								
								7	8.27	4.82	0.87		21.22								
	660	*550*	*28*	*8*	*113*	*270*	*86*	*177.8*	*210*	*122.4*	*22*		*539*	*248*	*325*	*358*	*188.5*	*580*	*470*	*42*	*248*

Tolerances see page 1 - 4.

Tap specification see page 1 - 7.

***** To get the weight of the complete drive, the additional weight must be added to the weight of the gear unit in flange design DZ/ZZ.
Eg:- Weight DZ88-M112M (214 lb / 97 kg) + additional weight DR88 (101 lb / 46 kg) = total weight DR88-M112M (315 lb / 143 kg)

Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.

In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

Frame size 38:

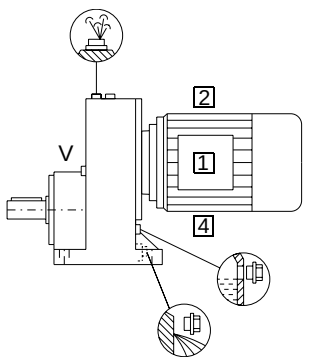
V Oil fitter inlet / Oil drain

From frame size 48:

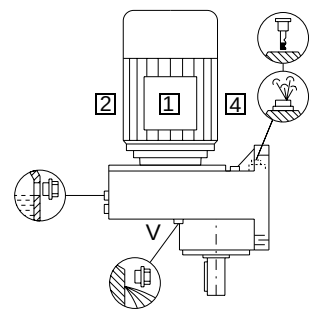
Oil level Ventilation Oil drain Dipstick

* on opposite side

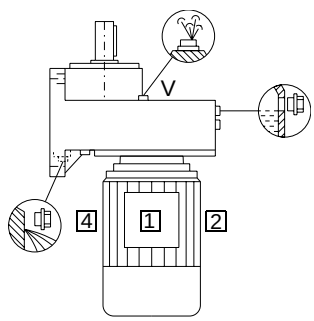
E B3 (IM B3)



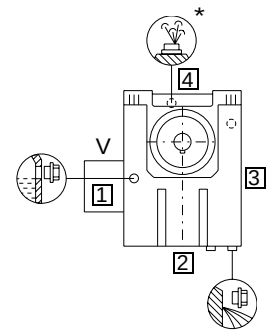
E V5 (IM V5)



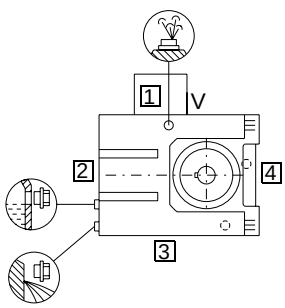
E V6 (IM V6)



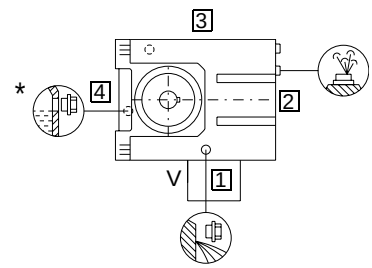
E B8 (IM B8)



E B7 (IM B7)



E B6 (IM B6)



Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

Frame size 38:

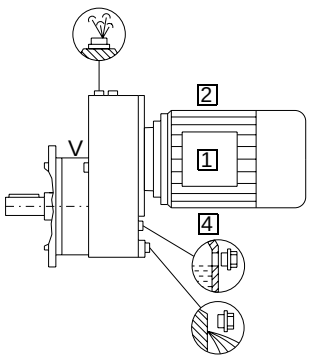
V Oil fitter inlet / Oil drain

From frame size 48:

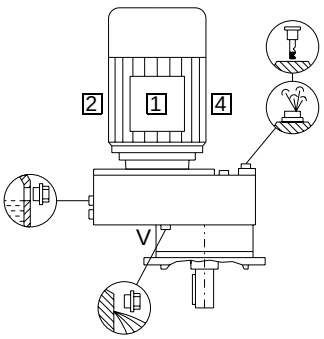
Oil level Ventilation Oil drain Dipstick

* on opposite side

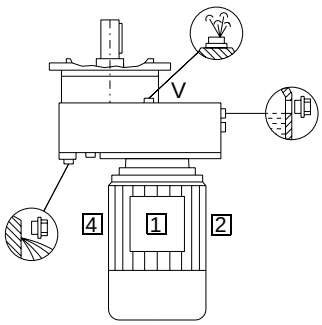
EF **B5 (IM B5)**
EZ **B14 (IM B14)**



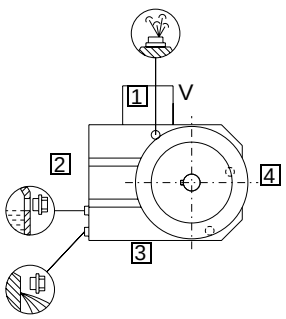
EF **V1 (IM V1)**
EZ **V18 (IM V18)**



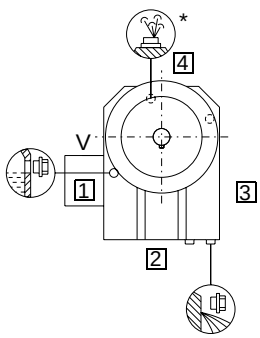
EF **V3 (IM V3)**
EZ **V19 (IM V19)**



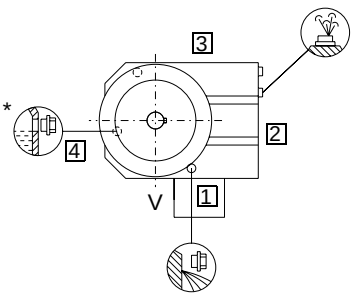
EF **B5-02 (IM B5**-02**)**
EZ **B14-02 (IM B14**-02**)**



EF **B5-03 (IM B5**-03**)**
EZ **B14-03 (IM B14**-03**)**



EF **B5-00 (IM B5**-00**)**
EZ **B14-00 (IM B14**-00**)**



Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

Frame size 18, 28:
These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.

Frame size 38:
V Oil fitter inlet / Oil drain

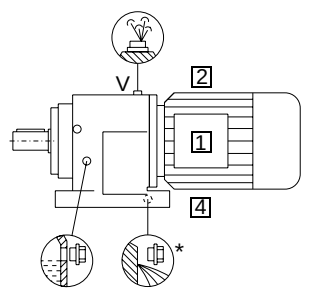
From frame size 48:

Oil level Ventilation Oil drain

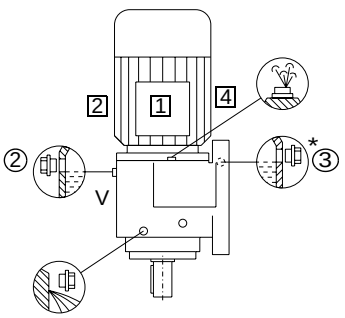
* on opposite side
② 2-stage Gear Units
③ 3-stage Gear Units

D/Z38-D/Z88

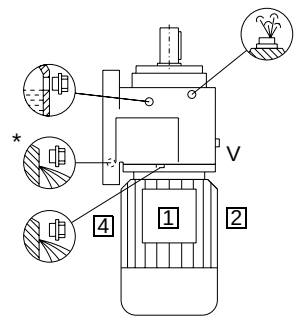
D/Z B3 (IM B3)



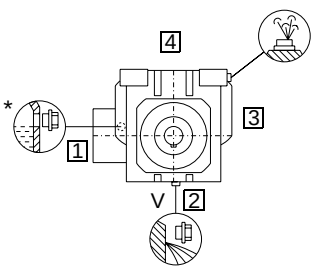
D/Z V5 (IM V5)



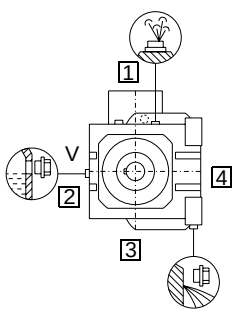
D/Z V6 (IM V6)



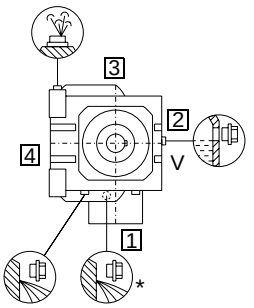
D/Z B8 (IM B8)



D/Z B7 (IM B7)



D/Z B6 (IM B6)



Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

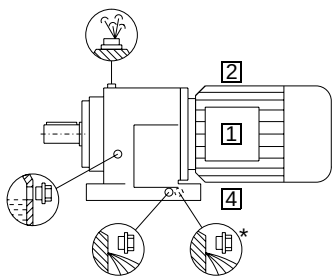
Oil fitting

Oil level Ventilation Oil drain

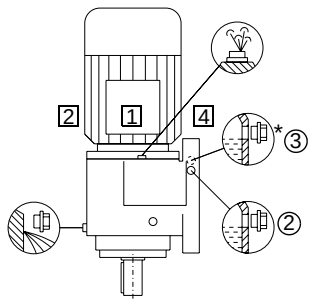
* on opposite side
② 2-stage Gear Units
③ 3-stage Gear Units

D/Z108-D/Z168

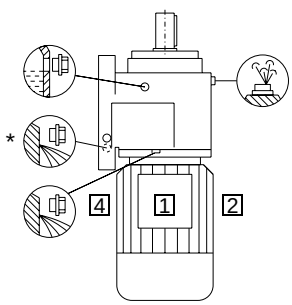
D/Z B3 (IM B3)



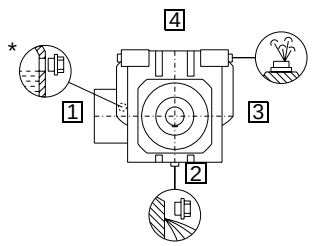
D/Z V5 (IM V5)



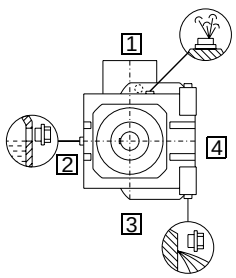
D/Z V6 (IM V6)



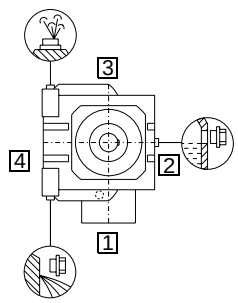
D/Z B8 (IM B8)



D/Z B7 (IM B7)



D/Z B6 (IM B6)



3

Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

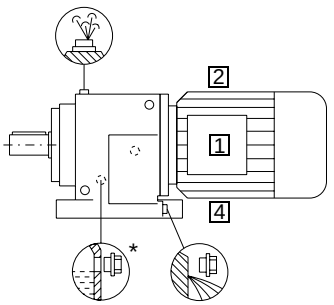
Oil fitting

Oil level Ventilation Oil drain

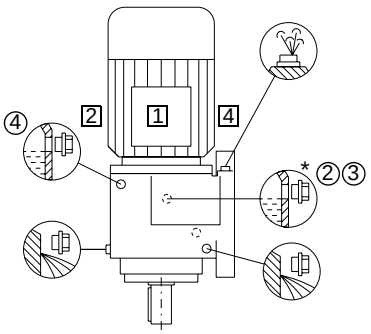
* on opposite side
② 2-stage Gear Units
③ 3-stage Gear Units
④ Tandem-Gear Units

D/Z188

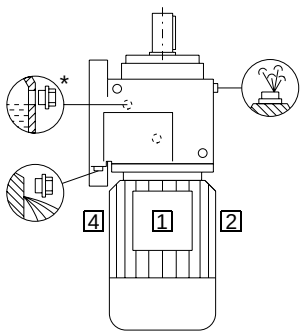
D/Z B3 (IM B3)



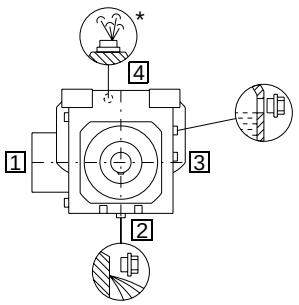
D/Z V5 (IM V5)



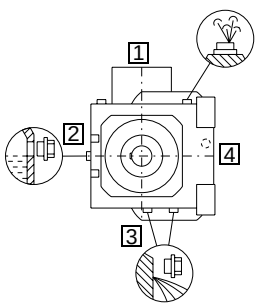
D/Z V6 (IM V6)



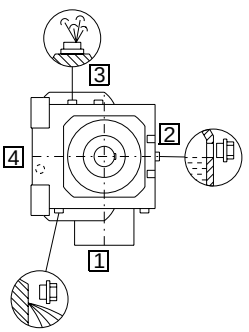
D/Z B8 (IM B8)



D/Z B7 (IM B7)



D/Z B6 (IM B6)



Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

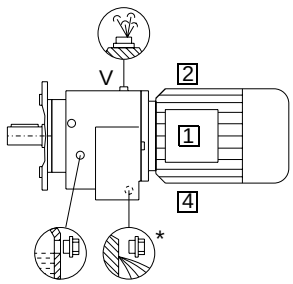
Frame size 18, 28: These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.
Frame size 38: V Oil fitter inlet / Oil drain

From frame size 48: Oil level Ventilation Oil drain

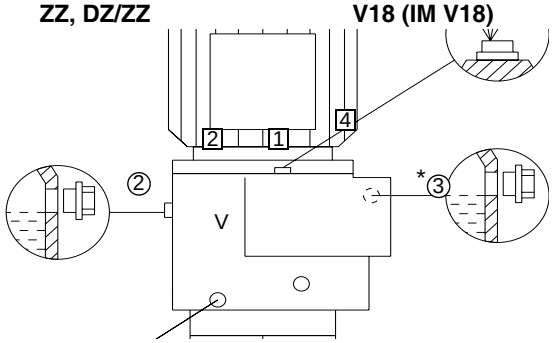
* on opposite side
② 2-stage Gear Units
③ 3-stage Gear Units

D./Z.38-D./Z.88, DR/ZR68-DR/ZR88

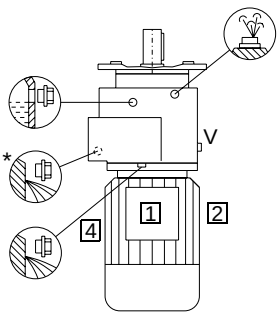
ZF, DF/ZF **B5 (IM B5)**
ZZ, DZ/ZZ **B14 (IM B14)**



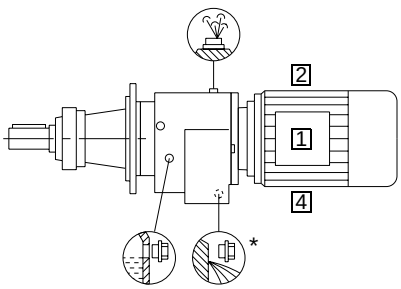
ZF, DF/ZF **V1 (IM V1)**
ZZ, DZ/ZZ **V18 (IM V18)**



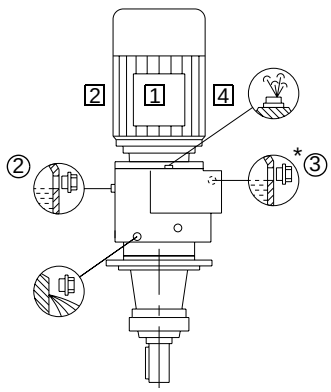
ZF, DF/ZF **V3 (IM V3)**
ZZ, DZ/ZZ **V19 (IM V19)**



DR/ZR68 -DR/ZR88 **B5 (IM B5)**



DR/ZR68 -DR/ZR88 **V1 (IM V1)**



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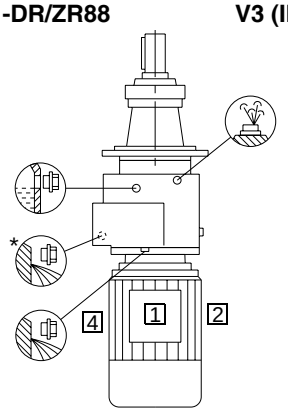


3

Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

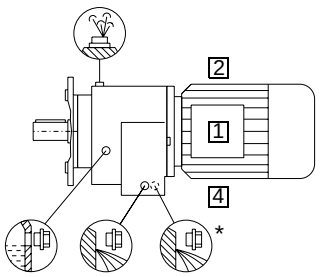
Oil fitting

Oil level Ventilation Oil drain

* on opposite side
② 2-stage Gear Units
③ 3-stage Gear Units

D./Z.108-D./Z.168

DF/ZF **B5 (IM B5)**
DZ/ZZ **B14 (IM B14)**



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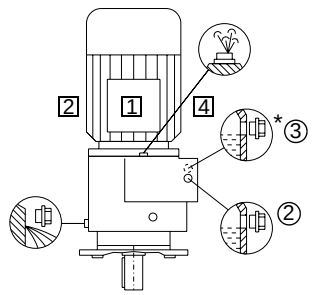
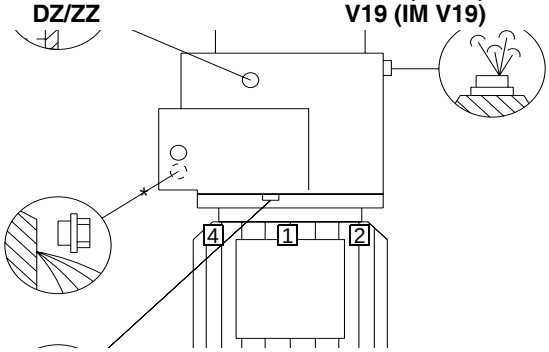
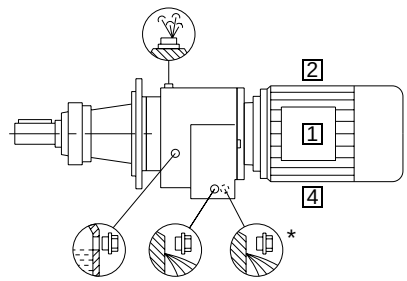
DZ/ZZ **V18 (IM V18)**



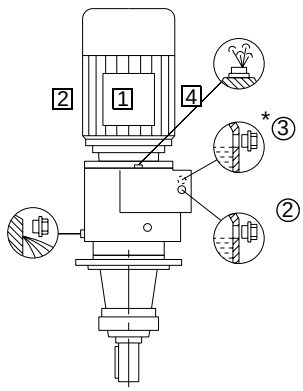
DF/ZF **V3 (IM V3)**
DZ/ZZ **V19 (IM V19)**



DR/ZR **B5 (IM B5)**



DR/ZR **V1 (IM V1)**



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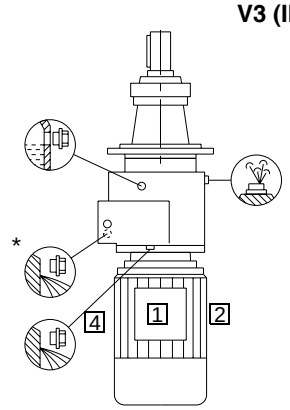


Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

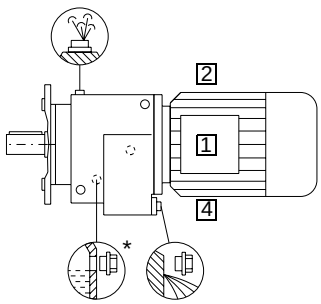
Oil fitting

Oil level Ventilation Oil drain

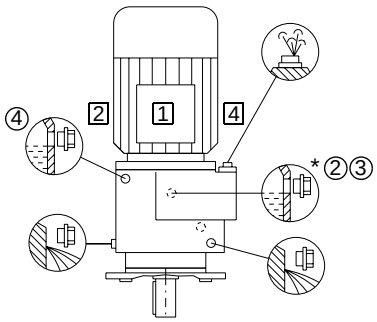
* on opposite side
② 2-stage Gear Units
③ 3-stage Gear Units
④ Tandem-Gear Units

D./Z.188

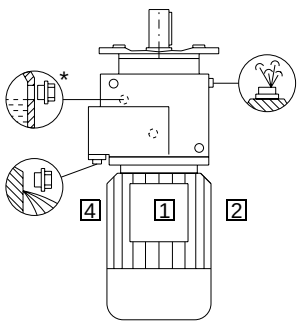
DF/ZF **B5 (IM B5)**
DZ/ZZ **B14 (IM B14)**



DF/ZF **V1 (IM V1)**
DZ/ZZ **V18 (IM V18)**



DF/ZF **V3 (IM V3)**
DZ/ZZ **V19 (IM V19)**



3

Tandem-Helical Gear Motors and Tandem-Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

Note:
In a horizontal mounting position the smaller gear unit generally is turned to the bottom.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

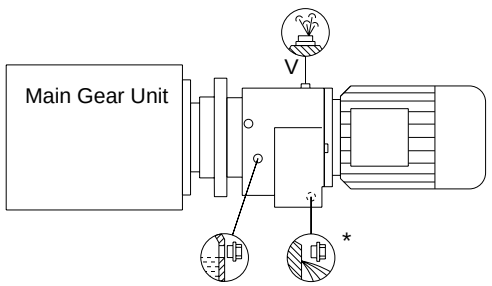
Frame size 28/38 (smaller gear unit):

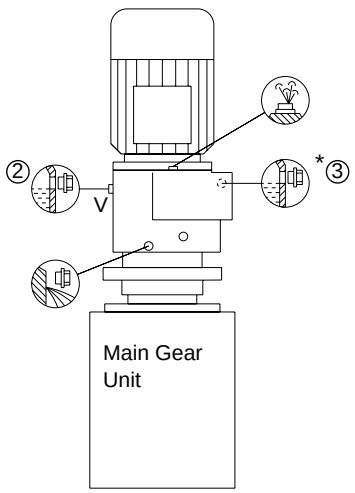
These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.

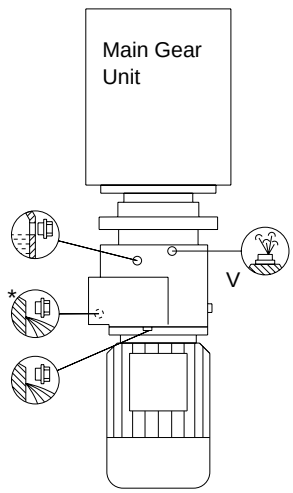
From frame size 48:

Oil level Ventilation Oil drain

* on opposite side
② 2-stage Gear Units
③ 3-stage Gear Units







Lubrication

MOTOX-N-Helical Gear Units of sizes 48...188 are furnished with filler, oil level and drain plug. Before starting operations the separately supplied breather plug has to replace the filler plug.
The sizes 18 ... 28 have no venting, oil level and oil drain plug. Because of the low thermal load, no lubricant-change is necessary.
E./D./Z. 38 gear units have one oil plug, ventilation of this gear units is not necessary. Speed reducers are shipped with their lubricant, ready for operation. In order to fill the housings with adequate **amount of lubricant, working conditions have to be specified in the order**. Only blended, age-resistant and non-foaming EP oils (FZG test DIN 51354 load stage > 12) are used.
Do not mix oils of different manufacturers. We recommend the oils listed. This is, of course, no exclusive recommendation and equivalent lubricants of other manufacturers can be used.
During an oil change, only oils of the same type (for example CLP) and with the same viscosity class (for example VG 220) may be mixed. **Do not mix differing types of oil (e.g. CLP and PGLP) under any circumstances.**
Biologically decomposable, environment- friendly oils based on synthetic or native ester with water hazard class 1or 2 respectively or oils with USDA -H1/-H2 acceptance can be supplied on request.

Maintenance

of the helical gear units has to be carried out in accordance with the Operating Instructions manual supplied with the units.

Lubricant selection table

Ambient temperature °C	Marking according to DIN 51502	Examples of Lubricants									
		ADDINOL	ARAL	bp	Castrol	DEA	Esso	FUCHS	KLÜBER LUBRICATION	Mobil	Shell
-10 ... + 40	CLP ISO VG 220	CLP 220S	Degol BG 220	Energol GR-XP 220	Alpha SP 220 Optigear BM220 Tribol 1100/220	Falcon CLP220	Spartan EP220	Renolin CLP 220	Klüberoil GEM 1-220	Mobilgear XMP 220	Omala 220
-20* ... + 50	CLP PG ISO VG 220	-	Degol GS 220	Enersyn SG-XP 220	Optiflex A220 Tribol 800/220	Polydea PGLP 220	Glycolube 220	Renolin PG 220	Syntheso D 220 EP	-	Tivela S 220
0* ... + 60*	CLP PG ISO VG 460	-	Degol GS 450	Enersyn SG-XP 460	Optiflex A460 Tribol 800/460	Polydea PGLP 460	Glycolube 460	Renolin PG 460	Syntheso D 460 EP	-	Tivela S 460

Other brands on request or see operating instruction BA7300.

* **Note:**
Ambient temperatures for motors according to EN 60034-1; see “Greasing of the bearings” in electrical section of this catalogue.

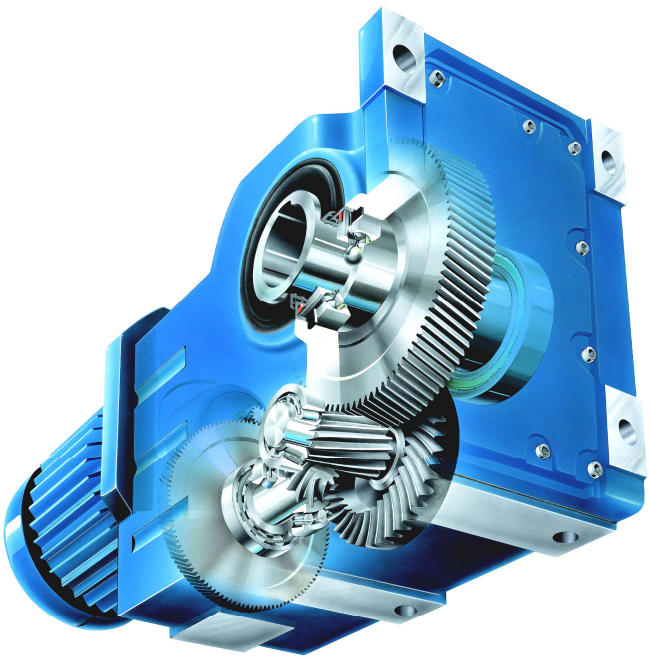
Oil quantities (*litre* / US gallon)

The quantities listed in the following tables are reference values.
The exact oil quantities are specified on the rating plates of the drives.

Important:
The value on the left (*italic*) is in litres; the value on the right is in U.S. gallons.

Type	Mounting position								
	B3	B5 B14	B6	B7	B8	V1 V18	V3 V19	V5	V6
E.38	*0.20* / 0.05	*0.20* / 0.05	*0.30* / 0.08	*0.30* / 0.08	*0.40* / 0.11	*0.50* / 0.13	*0.60* / 0.16	*0.50* / 0.13	*0.60* / 0.16
E.48	*0.30* / 0.08	*0.30* / 0.08	*0.60* / 0.16	*0.50* / 0.13	*0.70* / 0.18	*0.70* / 0.18	*1.1* / 0.29	*0.70* / 0.18	*1.1* / 0.29
E.68	*0.50* / 0.13	*0.50* / 0.13	*1.00* / 0.26	*1.1* / 0.29	*1.5* / 0.4	*1.7* / 0.45	*1.9* / 0.5	*1.8* / 0.48	*1.9* / 0.5
E.88	*0.80* / 0.21	*0.70* / 0.18	*1.6* / 0.42	*1.6* / 0.42	*2.5* / 0.66	*2.2* / 0.58	*3.8* / 1	*2.3* / 0.61	*3.8* / 1
E.108	*1.3* / 0.34	*1.00* / 0.26	*2.7* / 0.71	*2.8* / 0.74	*4.6* / 1.22	*3.7* / 0.98	*6.6* / 1.74	*3.8* / 1	*6.6* / 1.74
E.128	*2.3* / 0.61	*2.3* / 0.61	*5.3* / 1.4	*5.2* / 1.37	*7.2* / 1.9	*6.4* / 1.69	*10.9* / 2.88	*6.4* / 1.69	*10.9* / 2.88
E.148	*4.0* / 1.06	*2.8* / 0.74	*7.0* / 1.85	*7.0* / 1.85	*10.3* / 2.72	*9.3* / 2.46	*14.5* / 3.83	*9.5* / 2.51	*14.8* / 3.91
Z.18	*0.20* / 0.05	*0.20* / 0.05	*0.35* / 0.09	*0.30* / 0.08	*0.40* / 0.11	*0.50* / 0.13	*0.50* / 0.13	*0.50* / 0.13	*0.50* / 0.13
Z.28	*0.25* / 0.07	*0.25* / 0.07	*0.45* / 0.12	*0.40* / 0.11	*0.60* / 0.16	*0.60* / 0.16	*0.70* / 0.18	*0.60* / 0.16	*0.70* / 0.18
Z.38	*0.50* / 0.13	*0.50* / 0.13	0.60 / 0.16	*0.60* / 0.16	*0.60* / 0.16	*0.80* / 0.21	*1.00* / 0.26	*0.70* / 0.18	*1.1* / 0.29
Z.48	*1.1* / 0.29	*1.00* / 0.26	*1.6* / 0.42	*1.3* / 0.34	*1.5* / 0.4	*1.8* / 0.48	*2.4* / 0.63	*1.9* / 0.5	*2.4* / 0.63
Z.68	*1.8* / 0.48	*1.7* / 0.45	*2.7* / 0.71	*2.3* / 0.61	*2.5* / 0.66	*3.0* / 0.79	*4.1* / 1.08	*3.2* / 0.85	*4.1* / 1.08
Z.88	*4.1* / 1.08	*3.7* / 0.98	*6.1* / 1.61	*5.3* / 1.4	*5.7* / 1.51	*6.8* / 1.8	*8.3* / 2.19	*7.5* / 1.98	*8.8* / 2.32
Z.108	*7.3* / 1.93	*6.0* / 1.59	*10.5* / 2.77	*9.3* / 2.46	*8.6* / 2.27	*13.8* / 3.65	*14.0* / 3.7	*13.2* / 3.49	*13.6* / 3.59
Z.128	*9.5* / 2.51	*7.0* / 1.85	*16.0* / 4.23	*14.1* / 3.72	*13.2* / 3.49	*18.5* / 4.89	*22.1* / 5.84	*19.9* / 5.26	*22.3* / 5.89
Z.148	*13.0* / 3.43	*9.9* / 2.62	*20.8* / 5.49	*18.3* / 4.83	*26.9* / 7.11	*23.9* / 6.31	*27.7* / 7.32	*25.7* / 6.79	*27.4* / 7.24
Z.168	*21.0* / 5.55	*15.3* / 4.04	*34.8* / 9.19	*30.1* / 7.95	*32.1* / 8.48	*48.0* / 12.68	*31.1* / 8.22	*48.0* / 12.68	*41.7* / 11.02
Z.188	*18.5* / 4.89	*18.5* / 4.89	*50.0* / 13.21	*46.0* / 12.15	*75.0* / 19.81	*72.0* / 19.02	*70.0* / 18.49	*72.0* / 19.02	*70.0* / 18.49
D.18	*0.20* / 0.05	*0.20* / 0.05	*0.35* / 0.09	*0.30* / 0.08	*0.40* / 0.11	*0.50* / 0.13	*0.50* / 0.13	*0.50* / 0.13	*0.50* / 0.13
D.28	*0.25* / 0.07	*0.25* / 0.07	*0.45* / 0.12	*0.40* / 0.11	*0.60* / 0.16	*0.60* / 0.16	*0.70* / 0.18	*0.60* / 0.16	*0.70* / 0.18
D.38	*0.50* / 0.13	*0.50* / 0.13	*0.60* / 0.16	*0.60* / 0.16	*0.60* / 0.16	*0.90* / 0.24	*1.1* / 0.29	*0.90* / 0.24	*1.1* / 0.29
D.48	*1.1* / 0.29	*1.00* / 0.26	*1.5* / 0.4	*1.4* / 0.37	*1.5* / 0.4	*2.3* / 0.61	*2.4* / 0.63	*2.4* / 0.63	*2.4* / 0.63
D.68	*1.7* / 0.45	*1.6* / 0.42	*2.6* / 0.69	*2.4* / 0.63	*2.6* / 0.69	*3.9* / 1.03	*4.0* / 1.06	*4.0* / 1.06	*4.0* / 1.06
D.88	*4.0* / 1.06	*3.6* / 0.95	*5.9* / 1.56	*5.4* / 1.43	*5.9* / 1.56	*8.7* / 2.3	*8.9* / 2.35	*9.3* / 2.46	*8.9* / 2.35
D.108	*7.1* / 1.88	*5.7* / 1.51	*10.3* / 2.72	*9.5* / 2.51	*10.0* / 2.64	*16.3* / 4.31	*14.2* / 3.75	*15.6* / 4.12	*13.7* / 3.62
D.128	*9.4* / 2.48	*6.8* / 1.8	*15.8* / 4.17	*14.8* / 3.91	*14.1* / 3.72	*24.6* / 6.5	*21.8* / 5.76	*24.4* / 6.45	*21.5* / 5.68
D.148	*12.5* / 3.3	*9.4* / 2.48	*20.4* / 5.39	*19.1* / 5.05	*23.4* / 6.18	*30.6* / 8.08	*28.2* / 7.45	*32.2* / 8.51	*27.9* / 7.37
D.168	*19.0* / 5.02	*16.0* / 4.23	*34.1* / 9.01	*31.2* / 8.24	*33.8* / 8.93	*53.0* / 14	*43.7* / 11.54	*54.4* / 14.37	*42.2* / 11.15
D.188	*18.4* / 4.86	*18.4* / 4.86	*48.0* / 12.68	*46.0* / 12.15	*73.0* / 19.29	*69.0* / 18.23 *(83.0* / 21.93)	*68.0* / 17.96	*69.0* / 18.23 *(83.0* / 21.93)	*68.0* / 17.96

On tandem gear units the gear unit is provided with the oil quantity in paranthesis.



Bevel Helical Gear Motors and Gear Units

Table of Contents **Page**

Helical Bevel Gear Units

Technical description

MOTOX-N helical bevel gear units are part of the MOTOX-N modular system which essentially comprises helical, helical bevel, parallel shaft, helical worm gear units or mechanical variable speed drives. With three or single phase AC motors with or without brake, all imaginable drive combinations up to electronic variable speed drives are possible.

MOTOX-N helical bevel gear units are designed for continuous operation.

The housings made of grey cast iron or aluminium are developed in 3D-CAD and optimized for rigid and anti-vibration structure.

Lubricant loss and entry of dust and water are effectively prevented by high quality radial shaft seal.

The gears of the helical stages are hobbed, case hardened and profile ground or honed. Additionally, gear teeth are profile corrected and crowned for optimum performance.

The bevel stage for the standard program is hobbed, case hardened and lapped.

Helical gearing provides for optimum quiet operation. The positioning of the bevel gear stage as the second stage has positive effects on the noise behaviour.

Helical gears are in compliance with ASME / AGMA Standard 2001-B88.
Helical gears have a hardness of 58-62 R_C.

The output and input shafts are in right-angle position.

The maximum permissible radial and axial forces at the input and output shafts are to be considered.

Design Variations

The standard unit is available in foot, face, flange or shaft mounted versions for use in all mounting positions. The gear units are manufactured with a solid shaft or with a hollow shaft (fitted key or shrink disc).

Integrally mounted C-Face adapters, either in the clamp collar style (K5TC) or the elastic coupling style (KTC) , are available for NEMA motors.

Electro-magnetic brakes, backstops, speed monitors and numerous integral options are available.

Output power, torque and speed

The horsepower, output torque and speeds shown in the selection tables are based on mounting position B3 (or a similar position), standard features, ambient temperature of 20°C (68°F), and standard lubricant.

The actual output speeds and torques may vary slightly from the figures in this catalogue due to motor variations, supply voltage, or reflected load.

Efficiency

The efficiency of helical bevel gearing is determined by gearing and bearing friction and splash losses, and is approximately 94%.

Standards

The important dimensions correspond to the DIN standards, namely :

Shaft heights	DIN 747
Cylindrical shaft ends	DIN 748/1
Mounting flanges	DIN 42948
Coaxial concentricity and runout of shaft ends and of flange surface	DIN 42955
Parallel keys	DIN 6885/1
Second motor shaft extension	DIN 748/3
Centre holes in shaft ends	DIN 332/2

Direction of rotation of the gear motors

Three-phase a.c. motors are arranged so that the motor shaft turns to the right (IEC 60034-8).
The direction of rotation of the gear unit output shaft may be reversed by swapping over two external wires at the motor. For single-phase a.c. geared motors and for geared motors fitted with backstop, the required direction of rotation must be stated when the order is placed.

The Weights [lbs / kg] shown in the Dimension Sheets are average values and do not include Oil.

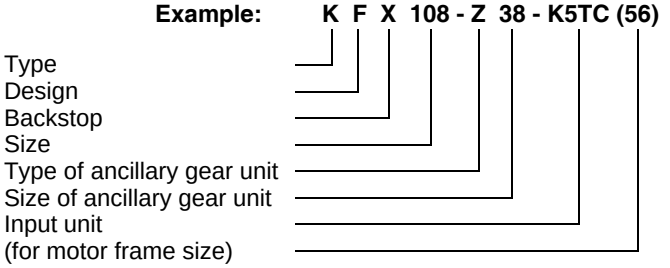
For Oil Quantities according to the operational mounting positions, see chapter “Lubrication, Oil Quantities”.

Specific Weights of Oils:
Mineral Oil (CLP) = 0.9 kg/l (2 lbs/l)
Synthetic Oil (PGLP) = 1.05 kg/l (2.3 lbs/l)

Type Designations

Gear Units

Example: **K F X 108 - Z 38 - K5TC (56)**



Type of gear unit

B Bevel Helical Gear Unit 2-stage
K Bevel Helical Gear Unit 3-stage

Stages

(-) without determination

Design

Shaft

(-) Solid shaft
A Hollow shaft

Fixing

(-) Foot-mounted
F Flange-mounted (A-type)
Z Housing flange (C-type)
D Torque arm
G Flange (A-type) on opposite side of output shaft
M Mixer/Agitator
E Extruder

Connection

(-) Parallel key
S Hollow shaft with shrink disc
T Splined hollow shaft

Backstop

X Backstop in intermediate shaft

Type of ancillary gear unit

(-) Helical Gear Unit

Stages

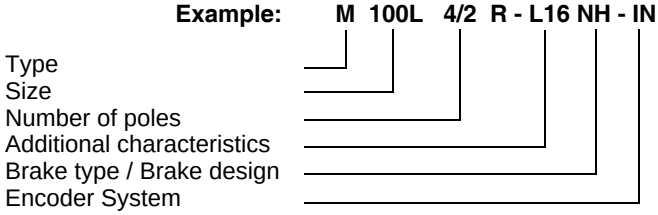
Z 2-stages
D 3-stages

Type of input unit

K4 Extended housing with shank assembly for IEC flange mounted motors
K2 Extended housing with elastic coupling for IEC flange mounted motor
A Input flange with free input shaft (metric)
P Design piggy back for IEC motors
K5TC Adapter with clamp collar for NEMA C-face motors
KTC Adapter 3 Piece Coupled for NEMA C-face mounted motors
A5 Input flange with free input shaft (imperial)
P5 Design piggy back for NEMA motors

Motors

Example: **M 100L 4/2 R - L16 NH - IN**



Types of motors

AM., M., MI.
Three phase motor

MB
Single phase motor with running capacitor

MK
Single phase motor with running and starting capacitor and starting relais

1MA, 1LA, 1LG
Three phase motors, explosion-proof EExe II

DNG., DVG., DBG.
Three phase motors, explosion-proof EExde II or EExd II

Additional characteristics

E Efficiency level class: eff1
R Resistance rotor
F Forced cooling
U Non ventilated
I High inertia fan
W Rain cover
H Reduced noise level
M MOTOX-Master (Integral Frequency Inverters)
X Backstop

Brake type / Brake design

L, KFB
Spring loaded-single disk brake, DC-excitation

16 Size = Nominal torque of brake
16/.. Adjusted braking torque

M Microswitch
N Normal design
G Encapsulated design

H Manual release
A Locking for manual release

Encoder system

IN Incremental encoder

Existing overhung loads

For the calculation of the existing radial load the type of drive element has to be taken into consideration.
For different drive elements the following factor C have to be considered.

Drive element	Factor C	Remarks
Gears	1.15	< 17 teeth
Chain sprockets	1.40	< 13 teeth
Chain sprockets	1.25	< 20 teeth
V-Belt	2.0	Pretension
Flat belt	2.50	Pretension
Toothed belt	1.50	Pretension
Agitator / Mixer	2.0	rotating radial force

$$F_{exist} = \frac{T_2 \cdot 2}{d_0}$$

F_{exist} = existing radial load [lbf]

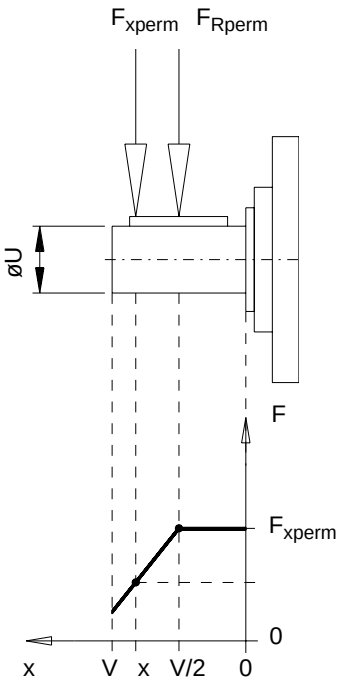
T_2 = existing torque [lb-in]

d_0 = average diameter of the drive element [in]

C = Factor for the drive element type [-]

$$F_{exist} \cdot C \leq F_{xperm}$$

Permissible overhung loads for bevel helical gear units at Service Factor 1.0



4

Calculation based on bearing life

$$F_{xperm1} = F_{RPerm} \cdot \frac{y}{z + x} \qquad [lbf]$$

Calculation based on mechanical strength

$$F_{xperm2} = \frac{a \cdot 1000}{x} \qquad [lbf]$$

valid for x ≧ V/2
for x < V/2: $F_{xperm} = F_{RPerm}$

The dimension x is the distance from the shaft shoulder to the point where the load (F_{xperm}) is applied.
The lower value F_{xperm} of both calculation results is the permissible overhung load. Higher overhung loads are permitted under certain load conditions. If values on tables are not sufficient for the requirement, please consult FLENDER, stating the following criteria on overhung load:
- value
- direction / angle of force
- location (x) on shaft
- direction of rotation of shaft

Note:
The listed radial forces refer to worst case setup (BF/KF). All setups can be calculated with Flender software (electronic cataloque). For high or rotating radial load mixer- and agitator drives have to be used.

Standard Bearings

							F_{Rperm} in lbf for x = V/2 for output speeds n_2 in rpm							
Typ(e)	**y** [in.]	**z** [in.]	**a** [lb in]	**U** [in.]	**V** [in.]	*	≤ **16** [rpm]	≤ **25** [rpm]	≤ **40** [rpm]	≤ **63** [rpm]	≤ **100** [rpm]	≤ **160** [rpm]	≤ **250** [rpm]	≤ **400** [rpm]
BF28	5.43	4.65	0.48	3/4	1.57	ccw	-	-	608	608	608	592	608	592
						cw	-	-	608	608	608	608	608	608
BF38	6.61	5.63	1.13	1	1.97	ccw	-	-	1098	887	736	664	736	664
						cw	-	-	1142	1051	891	806	891	806
KF38	5.75	4.76	1.22	1	1.97	ccw	1244	1244	979	790	711	608	711	608
						cw	1244	1244	1044	855	761	653	761	653
KF48	6.93	5.75	2.20	1 1/4	2.36	ccw	1864	1755	1384	1103	918	889	918	889
						cw	1864	1852	1481	1199	1015	934	1015	934
KF68	8.39	6.81	3.45	1 5/8	3.15	ccw	2135	1787	1359	997	756	691	756	691
						cw	2190	1913	1485	1123	882	817	882	817
KF88	10.31	8.35	6.48	2	3.94	ccw	3110	2545	2021	1422	1154	1197	1154	1197
						cw	3291	2788	2261	1663	1384	1400	1384	1400
KF108	11.73	9.37	12.17	2 3/8	4.72	ccw	4545	3535	2806	2313	1946	1688	1946	1688
						cw	4959	3949	3220	2727	2311	1881	2311	1881
KF128	14.63	11.87	19.90	2 7/8	5.51	ccw	6476	5272	4295	3382	2633	2522	2633	2522
						cw	6946	5742	4763	3850	3103	2792	3103	2792
KF148	17.09	13.74	25.41	3 5/8	6.69	ccw	6136	4923	3839	2876	2599	2972	2599	2972
						cw	6725	5510	4428	2585	1883	3276	1883	3276
KF168	20.37	16.24	52.18	4 3/8	8.27	ccw	9365	7632	5569	4160	4230	4057	4230	4057
						cw	10062	8330	6264	3951	4840	4356	4840	4356

Heavy Duty Bearings

							F_{Rperm} in lbf for x = V/2 for output speeds n_2 in rpm							
Typ(e)	**y** [in.]	**z** [in.]	**a** [lb in]	**U** [in.]	**V** [in.]	*	≤ **16** [rpm]	≤ **25** [rpm]	≤ **40** [rpm]	≤ **63** [rpm]	≤ **100** [rpm]	≤ **160** [rpm]	≤ **250** [rpm]	≤ **400** [rpm]
KF68	8.39	6.81	4.97	1 5/8	3.15	ccw	3156	3156	3156	3156	3112	2826	3112	2826
						cw	3156	3156	3156	3156	3156	2925	3156	2925
KF88	10.31	8.35	9.53	2	3.94	ccw	4838	4838	4838	4838	4838	4628	4838	4628
						cw	4838	4838	4838	4838	4838	4766	4838	4766
KF108	11.73	9.37	16.88	2 3/8	4.72	ccw	7155	7155	7155	7155	7027	6005	7027	6005
						cw	7155	7155	7155	7155	7155	6206	7155	6206
KF128	14.63	11.87	28.92	2 7/8	5.51	ccw	10500	10500	10500	10500	10500	9909	10500	9909
						cw	10500	10500	10500	10500	10500	10190	10500	10190
KF148	17.09	13.74	42.58	3 5/8	6.69	ccw	11741	11741	11741	11741	11741	11252	11741	11252
						cw	11741	11741	11741	11741	11741	11547	11741	11547
KF168	20.37	16.24	73.85	4 3/8	8.27	ccw	16709	16709	16709	16709	16709	16470	16709	16470
						cw	16709	16709	16709	16709	16709	16709	16709	16709
KF188	23.54	19.41	77.39	4 3/4	8.27	ccw	18719	18719	18719	18719	18719	18719	18719	18719
						cw	18719	18719	18719	18719	18719	18719	18719	18719

* Direction of rotation with view on output shaft
cw = clockwise
ccw = counter clockwise

Legend / Explanations

Performance Data / Torque tables

P_{Motor} = Rated power of motor
(60Hz) = at mains frequency 60Hz

Ratio = Total ratio of the gear unit

★ = Ratio belonging to preferred list of MOTOX-N

n_2 = Output speed of gear unit
(60Hz) at mains frequency 60Hz (4pol.) and 4 pole motor

T_2 = Output torque of gear unit (SF=1) at Service Factor SF =1

T_1 = permisssible continuous input torque of input unit K., A., P.

SF = Service Factor of the drive

FU1 x V1 = Dimension of solid shaft of type if input unit A., P.

F_{RAperm} V1/2 = Permissible overhung load at type of input unit A., P. at 0.5 x V1

Prefered list

The preferred list offers short delivery through higher availability.

Performance Data

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
0,25 (60 Hz)	0,06	189484	0,93	27817	**K.188-D68-M71C4**
	0,06	205277	0,86	30135 ★	
	0,07	164763	1,1	24187 ★	
	0,08	149600	1,2	21961	
	0,09	125322	1,4	18398	
	0,09	136588	1,3	20052 ★	
	0,1	115472	1,5	16951 ★	
	0,11	104861	1,7	15394	
	0,12	95526	1,9	14024 ★	
	0,13	87510	2	12847	
	0,08	145118	0,82	21304	**K.168-D48-M71C4**
	0,09	131628	0,91	19323 ★	
	0,1	109689	1,1	16102 ★	
	0,1	119919	1	17605	
	0,12	98068	1,2	14397	
	0,12	102798	1,2	14767	**K.168-Z48-M71C4**
	0,13	90973	1,3	13068 ★	
	0,14	82700	1,4	11880	
	0,16	74304	1,6	10673 ★	
	0,18	63684	1,9	9148	
	0,13	88670	0,8	13017	**K.148-D38-M71C4**
	0,14	83604	0,85	12009	**K.148-Z38-M71C4**
	0,16	72523	0,98	10418	
	0,17	67767	1	9734	
	0,2	59600	1,2	8561	
	0,23	52196	1,4	7498	
	0,26	46173	1,5	6632	
	0,28	41841	1,7	6010	
	0,32	36935	1,9	5305	
	0,23	50371	0,83	7236	**K.128-Z38-M71C4**
	0,27	44552	0,93	6400 ★	
	0,29	40380	1	5800	
	0,33	35641	1,2	5120 ★	
	0,37	32152	1,3	4619	
	0,41	29158	1,4	4189 ★	
	0,44	26571	1,6	3817	
	0,49	24304	1,7	3491 ★	
	0,54	21726	1,9	3121	
	0,39	30327	0,88	4357	**K.108-Z38-M71C4**
	0,43	27634	0,96	3970	
	0,47	25278	1,1	3631	
	0,52	22603	1,2	3247	
	0,57	20752	1,3	2981	
	0,63	18706	1,4	2687	
	0,73	16084	1,7	2311	
	0,82	14339	1,9	2060	
	0,9	13170	2	1892	
	0,7	16890	0,87	2426	**K.88-Z28-M71C4**
	0,8	14844	0,98	2133 ★	
	0,88	13409	1,1	1926	
	1	11691	1,3	1679 ★	
	1,1	10495	1,4	1508	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
0,25 (60 Hz)	1,2	9477	1,5	1361 ★	**K.88-Z28-M71C4**
	1,4	8591	1,7	1234	
	1,5	7821	1,9	1123 ★	
	1,4	8467	0,86	1216	**K.68-Z28-M71C4**
	1,5	7643	0,95	1098 ★	
	1,7	6935	1	996	
	1,9	6306	1,2	906 ★	
	2,1	5580	1,3	801	
	2,3	5154	1,4	740 ★	
	2,7	4437	1,6	637	
	2,9	4030	1,8	579 ★	
	3,2	3658	2	526 ★	
	2,4	4995	0,8	717 ★	**K.48-Z28-M71C4**
	2,6	4534	0,88	651	
	2,9	4118	0,97	592 ★	
	3,2	3640	1,1	523	
	3,5	3365	1,2	483 ★	
	4,1	2896	1,4	416	
	4,5	2630	1,5	378 ★	
	4,9	2391	1,7	344 ★	
	5,4	2170	1,8	312	
	6	1975	2	284 ★	
	4,5	2630	0,84	378 ★	**K.38-Z28-M71C4**
	4,9	2391	0,92	344 ★	
	5,4	2170	1	312	
	6	1975	1,1	284 ★	
	6,8	1744	1,3	251	
	7,3	1612	1,4	231 ★	
	8,5	1381	1,6	199	
	9,4	1257	1,8	181 ★	
	9,5	1612	1,4	179,13 ★	**K.38-M71C4**
	10,7	1426	1,5	159,04	
	12,2	1248	1,8	139,43 ★	
	13,6	1124	2	124,78	
	15,3	992	2,2	110,75 ★	
	30	513	2,2	57,53	**B.28-M71C4**
	35	434	2,6	48,51	
	39	389	3	43,07	
	45	336	3,4	37,76	
	50	301	3,8	33,79	
	56	265	4,3	29,99	
	64	239	4,9	26,28	
	73	203	5,5	23,11	
	81	186	6,1	20,87	
	93	159	7	18,19	
	104	150	7,8	16,34	
	115	132	8,7	14,75	
	127	124	9,6	13,38	
	139	106	10,5	12,17	
	158	97	11,9	10,76	
	171	88	12,7	9,94	
	198	77	13,9	8,56	
	218	69	14,8	7,78	
	226	67	11,8	7,49	
	251	61	13,1	6,76	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0,25 (60 Hz)	277	54	14,5	6,13		**B.28-M71C4**
0,33 (60 Hz)	0,08	201521	0,88	20052	★	**K.188-D68-M71S4**
	0,08	220706	0,8	21961		
	0,09	184905	0,96	18398		
	0,1	170361	1	16951	★	
	0,11	154710	1,1	15394		
	0,12	140946	1,3	14024	★	
	0,13	129113	1,4	12847		
	0,15	115207	1,5	11463	★	
	0,18	94507	1,9	9201	★	**K.188-Z68-M71S4**
	0,12	144693	0,83	14397		**K.168-D48-M71S4**
	0,13	134223	0,89	13068	★	**K.168-Z48-M71S4**
	0,14	122018	0,98	11880		
	0,16	109618	1,1	10673	★	
	0,18	93958	1,3	9148		
	0,2	85012	1,4	8277	★	
	0,22	78466	1,5	7640		
	0,25	68227	1,8	6643	★	
	0,28	61956	1,9	6032		
	0,2	87926	0,81	8561		**K.148-Z38-M71S4**
	0,23	77014	0,92	7498		
	0,25	68112	1	6632		
	0,28	61726	1,1	6010		
	0,32	54490	1,3	5305		
	0,35	49158	1,4	4786		
	0,39	44587	1,6	4341		
	0,43	40619	1,7	3955		
	0,47	37147	1,9	3617		
	0,36	47439	0,88	4619		**K.128-Z38-M71S4**
	0,4	43028	0,97	4189	★	
	0,44	39202	1,1	3817		
	0,48	35854	1,2	3491	★	
	0,54	32054	1,3	3121		
	0,59	29432	1,4	2866	★	
	0,65	26527	1,6	2583		
	0,76	22807	1,8	2221	★	
	0,85	20345	2	1981		
	0,52	33347	0,8	3247		**K.108-Z38-M71S4**
	0,56	30619	0,87	2981		
	0,63	27599	0,96	2687		
	0,73	23737	1,1	2311		
	0,82	21160	1,3	2060		
	0,89	19432	1,4	1892		
	0,99	17510	1,5	1705		
	1,1	15057	1,8	1466		
	1,3	13790	1,9	1343	★	**K.108-Z48-M71S4**
	1	17245	0,85	1679	★	**K.88-Z28-M71S4**
	1,1	15491	0,94	1508		
	1,2	13976	1	1361	★	
	1,4	12674	1,2	1234		
	1,5	11532	1,3	1123	★	
	1,7	10194	1,4	993		
	1,8	9415	1,6	917	★	
	2,1	8104	1,8	789		
	2,3	7378	2	718	★	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0,33 (60 Hz)	2,1	8228	0,88	801		**K.68-Z28-M71S4**
	2,3	7599	0,96	740	★	
	2,6	6545	1,1	637		
	2,9	5943	1,2	579	★	
	3,2	5402	1,3	526	★	
	3,5	4898	1,5	477		
	3,9	4455	1,6	434	★	
	4,4	3941	1,8	384		
	4,8	3631	2	354	★	
	3,5	4960	0,8	483	★	**K.48-Z28-M71S4**
	4,1	4269	0,93	416		
	4,5	3879	1	378	★	
	4,9	3534	1,1	344	★	
	5,4	3206	1,2	312		
	5,9	2914	1,4	284	★	
	6,7	2577	1,5	251		
	7,3	2382	1,7	232	★	
	8,5	2046	2	199		
	9,3	1860	2,1	181	★	
	9,9	2125	1,9	169,53	★	**K.48-M71S4**
	11,2	1895	2,1	150,76		
	6,7	2577	0,86	251		**K.38-Z28-M71S4**
	7,3	2373	0,93	231	★	
	8,5	2046	1,1	199		
	9,3	1860	1,2	181	★	
	9,4	2249	0,98	179,13	★	**K.38-M71S4**
	10,6	1992	1,1	159,04		
	12,1	1753	1,3	139,43	★	
	13,5	1567	1,4	124,78		
	15,2	1390	1,6	110,75	★	
	17,4	1222	1,8	97,05		
	19,7	1071	2,1	85,33	★	
	22	965	2,3	77,09		
	29	726	1,6	57,53		**B.28-M71S4**
	35	611	1,9	48,51		
	39	540	2,1	43,07		
	45	478	2,4	37,76		
	50	425	2,7	33,79		
	56	372	3,1	29,99		
	64	327	3,5	26,28		
	73	292	4	23,11		
	81	265	4,4	20,87		
	93	230	5	18,19		
	103	203	5,6	16,34		
	114	186	6,2	14,75		
	126	168	6,9	13,38		
	138	150	7,5	12,17		
	157	132	8,5	10,76		
	170	124	9,1	9,94		
	197	106	10	8,56		
	217	97	10,6	7,78		
	225	97	8,5	7,49		
	249	85	9,4	6,76		
	275	77	10,4	6,13		
	302	69	11,4	5,58		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0,33 (60 Hz)	341	62	12,9	4,94		**B.28-M71S4**
	370	57	13,5	4,56		
	430	49	14,8	3,92		
0,5 (60 Hz)	0,12	217819	0,81	14024	★	**K.188-D68-M71M4**
	0,13	199537	0,89	12847		
	0,15	178040	0,99	11463	★	
	0,18	146048	1,2	9201	★	**K.188-Z68-M71M4**
	0,21	127731	1,4	8047		
	0,23	114666	1,5	7224	★	
	0,26	104728	1,7	6598		
	0,29	92939	1,9	5855	★	
	0,18	145206	0,82	9148		**K.168-Z48-M71M4**
	0,2	131380	0,91	8277	★	
	0,22	121274	0,99	7640		
	0,25	105446	1,1	6643	★	
	0,28	95747	1,2	6032		
	0,31	87412	1,4	5507	★	
	0,33	80211	1,5	5053		
	0,36	73905	1,6	4656	★	
	0,4	67111	1,8	4228		
	0,44	61142	2	3852	★	
	0,32	84206	0,84	5305		**K.148-Z38-M71M4**
	0,35	75969	0,93	4786		
	0,39	68909	1	4341		
	0,43	62780	1,1	3955		
	0,47	57413	1,2	3617		
	0,52	51337	1,4	3234		
	0,57	47147	1,5	2970		
	0,63	42488	1,7	2677		
	0,73	36536	1,9	2302		
	0,54	49538	0,84	3121		**K.128-Z38-M71M4**
	0,59	45491	0,92	2866	★	
	0,65	41000	1	2583		
	0,76	35252	1,2	2221	★	
	0,85	31443	1,3	1981		
	0,93	28874	1,4	1819	★	
	1	26013	1,6	1639		
	1,2	22382	1,9	1410	★	
	1,2	22223	1,9	1400		**K.128-Z48-M71M4**
	1,3	20380	2	1284		
	0,82	32701	0,81	2060		**K.108-Z38-M71M4**
	0,89	30035	0,88	1892		
	0,99	27067	0,98	1705		
	1,1	23268	1,1	1466		
	1,3	21319	1,2	1343	★	**K.108-Z48-M71M4**
	1,4	19574	1,4	1233		
	1,5	18033	1,5	1136	★	
	1,6	16368	1,6	1031		
	1,8	14924	1,8	940	★	
	2	13666	1,9	861		
	1,5	17829	0,82	1123	★	**K.88-Z28-M71M4**
	1,7	15766	0,93	993		
	1,8	14552	1	917	★	
	2,1	12524	1,2	789		
	2,3	11399	1,3	718	★	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
0,5 (60 Hz)	2,6	10345	1,4	652 ★	**K.88-Z28-M71M4**
	2,9	9379	1,6	591	
	3,1	8538	1,7	538 ★	
	3,5	7555	1,9	476	
	3,2	8352	0,87	526 ★	**K.68-Z28-M71M4**
	3,5	7573	0,96	477	
	3,9	6890	1,1	434 ★	
	4,4	6093	1,2	384	
	4,8	5615	1,3	354 ★	
	5,5	4844	1,5	305	
	6,1	4393	1,7	277 ★	
	6,9	4526	1,6	243,72	**K.68-M71M4**
	7,8	4003	1,8	215,68 ★	
	8,6	3640	2	196,07	
	5,4	4951	0,8	312	**K.48-Z28-M71M4**
	5,9	4508	0,88	284 ★	
	6,7	3985	1	251	
	7,3	3684	1,1	232 ★	
	8,5	3162	1,3	199	
	9,3	2869	1,4	181 ★	
	9,9	3153	1,3	169,53 ★	**K.48-M71M4**
	11,2	2798	1,4	150,76	
	12,9	2426	1,6	130,78 ★	
	13,8	2267	1,8	122,19	
	15,7	1992	2	107,47 ★	
	17,9	1744	2,3	94,12	
	12,1	2586	0,86	139,43 ★	**K.38-M71M4**
	13,5	2320	0,96	124,78	
	15,2	2054	1,1	110,75 ★	
	17,4	1806	1,2	97,05	
	19,7	1585	1,4	85,33 ★	
	22	1434	1,5	77,09	
	25	1248	1,8	67,18 ★	
	28	1124	2	60,33	
	31	1009	2,2	54,47 ★	
	34	921	2,4	49,38	
	26	1222	1,8	65,69	**B.38-M71M4**
	30	1062	2,1	57,04	
	33	938	2,4	50,72	
	29	1071	1,1	57,53	**B.28-M71M4**
	35	903	1,3	48,51	
	39	797	1,4	43,07	
	45	699	1,6	37,76	
	50	628	1,8	33,79	
	56	558	2,1	29,99	
	64	487	2,4	26,28	
	73	425	2,7	23,11	
	81	389	3	20,87	
	93	336	3,4	18,19	
0,75 (60 Hz)	0,21	195356	0,91	8047	**K.188-Z68-M71MB4**
	0,23	175374	1	7224 ★	
	0,26	160175	1,1	6598	
	0,29	142142	1,2	5855 ★	
	0,31	131212	1,4	5405	
	0,34	118688	1,5	4889 ★	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0,75 (60 Hz)	0,37	109290	1,6	4502		**K.188-Z68-M71MB4**
	0,41	101061	1,8	4163	★	
	0,44	93825	1,9	3865		
	0,28	146438	0,82	6032		**K.168-Z48-M71MB4**
	0,31	133692	0,89	5507	★	
	0,33	122673	0,97	5053		
	0,36	113037	1,1	4656	★	
	0,4	102638	1,2	4228		
	0,44	93515	1,3	3852	★	
	0,48	85650	1,4	3528		
	0,54	76420	1,6	3148	★	
	0,47	87811	0,81	3617		**K.148-Z38-M71MB4**
	0,52	78511	0,9	3234		
	0,57	72098	0,98	2970		
	0,63	64986	1,1	2677		
	0,73	55889	1,3	2302		
	0,82	49840	1,4	2053		
	0,89	45765	1,5	1885		
	0,99	41248	1,7	1699		
	1,2	35464	2	1461		
	0,85	48095	0,87	1981		**K.128-Z38-M71MB4**
	0,93	44162	0,94	1819	★	
	1	39787	1	1639		
	1,2	34233	1,2	1410	★	
	1,2	33985	1,2	1400		**K.128-Z48-M71MB4**
	1,3	31168	1,3	1284		
	1,4	28715	1,4	1183		
	1,6	26075	1,6	1074		
	1,7	23764	1,8	979		
	1,9	21780	1,9	897		
	1,3	32603	0,81	1343	★	**K.108-Z48-M71MB4**
	1,4	29937	0,89	1233		
	1,5	27581	0,96	1136	★	
	1,6	25030	1,1	1031		
	1,8	22816	1,2	940	★	
	2	20903	1,3	861		
	2,2	18644	1,4	768	★	
	2,3	17431	0,84	718	★	**K.88-Z28-M71MB4**
	2,6	15828	0,92	652	★	
	2,9	14348	1	591		
	3,1	13064	1,1	538	★	
	3,5	11558	1,3	476		
	3,8	10655	1,4	439	★	
	4,5	9176	1,6	378		
	4,9	8352	1,7	344	★	
	5,6	8361	1,6	302,68	★	**K.88-M71MB4**
	6,2	7537	1,9	272,95		
	4,8	8591	0,85	354	★	**K.68-Z28-M71MB4**
	5,5	7404	0,98	305		
	6,1	6722	1,1	277	★	
	6,9	6731	1,1	243,72		**K.68-M71MB4**
	7,8	5952	1,2	215,68	★	
	8,6	5411	1,3	196,07		
	9,6	4862	1,5	176,14	★	
	11,2	4171	1,7	150,98		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
0,75 (60 Hz)	12,3	3773	1,9	136,6 ★	**K.68-M71MB4**
	13,4	3480	2,1	126,09	
	8,5	4827	0,83	199	**K.48-Z28-M71MB4**
	9,3	4393	0,91	181 ★	
	9,9	4676	0,85	169,53 ★	**K.48-M71MB4**
	11,2	4162	0,96	150,76	
	12,9	3613	1,1	130,78 ★	
	13,8	3374	1,2	122,19	
	15,7	2967	1,3	107,47 ★	
	17,9	2595	1,5	94,12	
	20	2302	1,7	83,25 ★	
	22	2081	1,9	75,45	
	25	1842	2,2	66,6 ★	
	28	1656	2,4	60,08	
	17,4	2683	0,83	97,05	**K.38-M71MB4**
	19,7	2356	0,94	85,33 ★	
	22	2125	1	77,09	
	25	1851	1,2	67,18 ★	
	28	1665	1,3	60,33	
	31	1505	1,5	54,47 ★	
	34	1364	1,6	49,38	
	38	1240	1,8	44,94 ★	
	42	1098	2	39,73	
	46	1009	2,2	36,69 ★	
	53	868	2,5	31,59	
	59	797	2,8	28,72 ★	
	63	744	2,6	26,9 ★	
	70	664	2,8	24,16	
	77,00	602	3	21,81 ★	
	85	549	3,2	19,78	
	94	496	3,4	17,99 ★	
	26	1815	1,2	65,69	**B.38-M71MB4**
	30	1576	1,4	57,04	
	33	1399	1,6	50,72	
	38	1213	1,8	44	
	41	1133	2	41,11	
	47	1000	2,2	36,16	
	53	876	2,5	31,67	
	60	770	2,9	28,01	
	35	1337	0,86	48,51	**B.28-M71MB4**
	39	1186	0,97	43,07	
	45	1045	1,1	37,76	
	50	930	1,2	33,79	
	56	832	1,4	29,99	
	64	726	1,6	26,28	
	73	637	1,8	23,11	
	81	575	2	20,87	
	93	504	2,3	18,19	
	103	451	2,6	16,34	
	114	407	2,8	14,75	
	126	372	3,1	13,38	
	138	336	3,4	12,17	
	157	301	3,9	10,76	
	170	274	4,1	9,94	
	225	203	3,9	7,49	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0,75 (60 Hz)	249	186	4,3	6,76		**B.28-M71MB4**
	275	168	4,7	6,13		
1 (60 Hz)	0,26	219829	0,81	6598		**K.188-Z68-M80M4**
	0,29	195073	0,91	5855	★	
	0,32	180078	0,98	5405		
	0,35	162886	1,1	4889	★	
	0,38	149998	1,2	4502		
	0,41	138696	1,3	4163	★	
	0,44	128767	1,4	3865		
	0,5	113612	1,6	3410	★	
	0,54	104879	1,7	3148		
	0,6	93984	1,9	2821	★	
	0,65	86659	2	2601		
	0,4	140866	0,85	4228		**K.168-Z48-M80M4**
	0,44	128342	0,93	3852	★	
	0,48	117545	1	3528		
	0,54	104879	1,1	3148	★	
	0,6	93621	1,3	2810		
	0,71	79494	1,5	2386		
	0,86	66164	1,8	1986	★	
	0,87	65136	1,8	1955	★	
	0,74	76695	0,92	2302		**K.148-Z38-M80M4**
	0,83	68405	1	2053		
	0,9	62807	1,1	1885		
	1	56607	1,3	1699		
	1,2	48679	1,5	1461		
	1,2	46376	1,5	1392		**K.148-Z68-M80M4**
	1,4	41549	1,7	1247	★	
	1,5	38316	1,8	1150		
	1,2	46979	0,89	1410	★	**K.128-Z38-M80M4**
	1,2	46642	0,89	1400		**K.128-Z48-M80M4**
	1,3	42780	0,97	1284		
	1,4	39415	1,1	1183		
	1,6	35783	1,2	1074		
	1,7	32621	1,3	979		
	1,9	29884	1,4	897		
	2,1	26651	1,6	800		
	2,4	23790	1,7	714		
	1,8	31319	0,85	940	★	**K.108-Z48-M80M4**
	2	28688	0,93	861		
	2,2	25588	1	768	★	
	2,5	22825	1,2	685		
	2,9	19388	1,4	582		
	3,5	16155	1,6	485	★	
	3,6	15890	1,7	477	★	
	4	14189	1,9	426		
	3,1	18139	0,81	538	★	**K.88-Z28-M71MP4**
	3,5	16049	0,91	476		
	3,8	14800	0,99	439	★	
	4,4	12745	1,1	378		
	4,9	11594	1,3	344	★	
	5,6	11293	1,2	302,68	★	**K.88-M80M4**
	6,2	10185	1,4	272,95		
	6,9	9185	1,6	246,13	★	
	7,9	8033	1,8	215,25		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
1 (60 Hz)	8,8	7209	2	193,24 ★	**K.88-M80M4**
	7	9096	0,8	243,72	**K.68-M80M4**
	7,9	8051	0,9	215,68 ★	
	8,7	7316	0,99	196,07	
	9,7	6572	1,1	176,14 ★	
	11,3	5633	1,3	150,98	
	12,4	5101	1,4	136,6 ★	
	13,5	4703	1,5	126,09	
	15,5	4092	1,8	109,64 ★	
	17,1	3711	2	99,55	
	18,7	3392	2,1	90,89 ★	
	20	3108	2,3	83,4	
	13	4880	0,82	130,78 ★	**K.48-M80M4**
	13,9	4561	0,87	122,19	
	15,8	4012	0,99	107,47 ★	
	18,1	3516	1,1	94,12	
	20	3108	1,3	83,25 ★	
	22	2816	1,4	75,45	
	26	2488	1,6	66,6 ★	
	28	2240	1,8	60,08	
	31	2037	2	54,49 ★	
	34	1851	2,2	49,65	
	37	1691	2,4	45,41 ★	
	42	1514	2,6	40,6	
	25	2506	0,88	67,18 ★	**K.38-M80M4**
	28	2249	0,98	60,33	
	31	2028	1,1	54,47 ★	
	34	1842	1,2	49,38	
	38	1674	1,3	44,94 ★	
	43	1479	1,5	39,73	
	46	1372	1,6	36,69 ★	
	54	1178	1,9	31,59	
	59	1071	2,1	28,72 ★	
	63	1000	1,9	26,9 ★	
	70	903	2,1	24,16	
	78	814	2,2	21,81 ★	
	86	735	2,4	19,78	
	94	673	2,5	17,99 ★	
	107	593	2,7	15,91	
	116	549	2,9	14,69 ★	
	134	469	3,2	12,65	
	148	425	3,4	11,5 ★	
	159	398	3,5	10,72 ★	
	175	363	3,9	9,72	
	192	327	4,3	8,85 ★	
	30	2125	1	57,04	**B.38-M80M4**
	34	1895	1,2	50,72	
	39	1638	1,3	44	
	41	1532	1,4	41,11	
	47	1346	1,6	36,16	
	54	1178	1,9	31,67	
	61	1045	2,1	28,01	
	67	947	2,3	25,38	
	76	832	2,5	22,41	
	84	752	2,7	20,22	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1 (60 Hz)	93	682	2,9	18,33		**B.38-M80M4**
	102	620	3,1	16,7		
	111	566	3,3	15,28		
	124	513	3,6	13,66		
	44	1426	0,81	37,76		**B.28-M71MP4**
	50	1275	0,9	33,79		
	56	1133	1	29,99		
	64	992	1,2	26,28		
	73	868	1,3	23,11		
	80	788	1,5	20,87		
	92	690	1,7	18,19		
	103	620	1,9	16,34		
	114	558	2,1	14,75		
	126	504	2,3	13,38		
	138	460	2,5	12,17		
	156	407	2,8	10,76		
	169	372	3	9,94		
	196	318	3,3	8,56		
	216	292	3,5	7,78		
	224	283	2,8	7,49		
	249	256	3,1	6,76		
	274	230	3,4	6,13		
	301	212	3,8	5,58		
	340	186	4,3	4,94		
	368	168	4,5	4,56		
	429	150	4,9	3,92		
	471	132	5,2	3,57		
1,5 (60 Hz)	0,38	220963	0,8	4502		**K.188-Z68-M90S4**
	0,41	204320	0,87	4163	★	
	0,44	189697	0,93	3865		
	0,5	167367	1,1	3410	★	
	0,55	154507	1,1	3148		
	0,61	138457	1,3	2821	★	
	0,66	127660	1,4	2601		
	0,79	107093	1,7	2182		
	0,92	91389	1,9	1862	★	
	0,61	137917	0,87	2810		**K.168-Z48-M90S4**
	0,72	117102	1	2386		
	0,86	97474	1,2	1986	★	
	0,88	95951	1,2	1955	★	
	0,98	85641	1,4	1745		
	1,2	72736	1,6	1482		
	1,4	60513	2	1233	★	
	1	83391	0,85	1699		**K.148-Z38-M90S4**
	1,2	71708	0,99	1461		
	1,2	68316	1	1392		**K.148-Z68-M90S4**
	1,4	61204	1,2	1247	★	
	1,5	56438	1,3	1150		
	1,8	47360	1,5	965		
	2,1	40389	1,8	823	★	
	1,8	48050	0,87	979		**K.128-Z48-M90S4**
	1,9	44020	0,95	897		
	2,1	39264	1,1	800		
	2,4	35039	1,2	714		
	2,8	29742	1,4	606		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1,5 (60 Hz)	3,4	24782	1,7	505		**K.128-Z48-M90S4**
	3,5	24393	1,7	497		
	3,9	21744	1,9	443		
	2,9	28564	0,93	582		**K.108-Z48-M90S4**
	3,5	23799	1,1	485	★	
	3,6	23409	1,1	477	★	
	4	20912	1,3	426		
	4,8	17714	1,5	361		
	5,7	14774	1,8	301	★	
	5,6	16669	1,5	307,24		**K.108-M90S4**
	6,2	15084	1,7	278,1	★	
	7	13206	2	243,47		
	5	16882	0,87	344	★	**K.88-Z28-M90S4**
	5,7	16421	0,83	302,68	★	**K.88-M90S4**
	6,3	14809	0,99	272,95		
	7	13356	1,1	246,13	★	
	8	11673	1,3	215,25		
	8,9	10487	1,4	193,24	★	
	9,7	9574	1,5	176,5		
	10,9	8494	1,7	156,63	★	
	11,9	7847	1,9	144,58		
	13,1	7094	2,1	130,77	★	
	14,2	6536	2,2	120,42		
	11,4	8193	0,89	150,98		**K.68-M90S4**
	12,6	7413	0,98	136,6	★	
	13,6	6837	1,1	126,09		
	15,6	5952	1,2	109,64	★	
	17,2	5402	1,3	99,55		
	18,9	4933	1,5	90,89	★	
	21	4526	1,6	83,4		
	22	4171	1,7	76,84	★	
	25	3782	1,9	69,78		
	27	3445	2,1	63,57	★	
	30	3162	2,3	58,23		
	33	2816	2,6	51,96	★	
	21	4517	0,88	83,25	★	**K.48-M90S4**
	23	4092	0,97	75,45		
	26	3613	1,1	66,6	★	
	28	3259	1,2	60,08		
	32	2958	1,3	54,49	★	
	34	2692	1,5	49,65		
	38	2462	1,6	45,41	★	
	42	2205	1,8	40,6		
	46	2019	2	37,28	★	
	51	1824	2,2	33,6		
	59	1567	2,5	28,9	★	
	62	1496	2,7	27,55	★	
	69	1346	3	24,85		
	35	2674	0,83	49,38		**K.38-M90S4**
	38	2435	0,91	44,94	★	
	43	2152	1	39,73		
	47	1992	1,1	36,69	★	
	54	1718	1,3	31,59		
	60	1558	1,4	28,72	★	
	64	1461	1,3	26,9	★	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
1,5 (60 Hz)	71	1310	1,4	24,16	**K.38-M90S4**
	79	1186	1,5	21,81 ★	
	87	1071	1,6	19,78	
	95	974	1,7	17,99 ★	
	108	868	1,9	15,91	
	117	797	2	14,69 ★	
	136	690	2,2	12,65	
	149	620	2,4	11,5 ★	
	160	584	2,4	10,72 ★	
	176	531	2,7	9,72	
	194	478	2,9	8,85 ★	
	219	425	3,3	7,82	
	238	389	3,6	7,22 ★	
	276	336	4	6,22	
	304	310	4,3	5,65 ★	
	39	2391	0,93	44	**B.38-M90S4**
	42	2232	0,99	41,11	
	47	1957	1,1	36,16	
	54	1718	1,3	31,67	
	61	1523	1,5	28,01	
	68	1372	1,6	25,38	
	76	1213	1,7	22,41	
	85	1098	1,9	20,22	
	94	992	2	18,33	
	103	903	2,2	16,7	
	112	832	2,3	15,28	
	126	744	2,5	13,66	
	137	682	2,9	12,5	
	155	602	3,3	11,05	
	171	540	3,6	10,02	
	194	478	4,4	8,84	
	65	1426	0,81	26,28	**B.28-M90S4**
	74	1257	0,92	23,11	
	82	1133	1	20,87	
	94	983	1,2	18,19	
	105	885	1,3	16,34	
	116	797	1,4	14,75	
	128	726	1,6	13,38	
	141	655	1,7	12,17	
	159	584	2	10,76	
	173	540	2,1	9,94	
	200	460	2,3	8,56	
	220	425	2,5	7,78	
	229	407	2	7,49	
	254	363	2,2	6,76	
	280	336	2,4	6,13	
	307	301	2,6	5,58	
	347	265	3	4,94	
	376	248	3,1	4,56	
	438	212	3,4	3,92	
	480	194	3,6	3,57	
2 (60 Hz)	0,55	212265	0,83	3148	**K.188-Z68-M90L4**
	0,61	190210	0,93	2821 ★	
	0,66	175383	1	2601	
	0,79	147128	1,2	2182	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
2 (60 Hz)	0,92	125552	1,4	1862 ★	**K.188-Z68-M90L4**
	1,7	69653	1,7	1033	**K.168-Z68-M90L4**
	1,9	59406	2	881	
	0,86	133913	0,89	1986 ★	**K.168-Z48-M90L4**
	0,88	131823	0,91	1955 ★	
	0,98	117660	1	1745	
	1,2	99928	1,2	1482	
	1,4	83134	1,4	1233 ★	
	1,4	84082	0,84	1247 ★	**K.148-Z68-M90L4**
	1,5	77545	0,91	1150	
	1,8	65065	1,1	965	
	2,1	55491	1,3	823 ★	
	2,4	48139	0,86	714	**K.128-Z48-M90L4**
	2,8	40858	1	606	
	3,4	34047	1,2	505	
	3,5	33516	1,2	497	
	3,9	29866	1,4	443	
	4,5	25420	1,6	377	
	5,5	21106	2	313	
	5,8	21851	1,9	295,38 ★	**K.128-M90L4**
	6,3	20044	2,1	270,9	
	3,5	32701	0,81	485 ★	**K.108-Z48-M90L4**
	3,6	32160	0,83	477 ★	
	4	28724	0,93	426	
	4,8	24339	1,1	361	
	5,7	20292	1,3	301 ★	
	5,6	22727	1,1	307,24	**K.108-M90L4**
	6,2	20575	1,2	278,1 ★	
	7	18015	1,5	243,47	
	7,8	16253	1,6	219,64 ★	
	8,5	14880	1,8	201,11	
	9,6	13232	2	178,9 ★	
	10,5	12099	2,2	163,51	
	7	18210	0,8	246,13 ★	**K.88-M90L4**
	8	15925	0,92	215,25	
	8,9	14295	1	193,24 ★	
	9,7	13055	1,1	176,5	
	10,9	11585	1,3	156,63 ★	
	11,9	10699	1,4	144,58	
	13,1	9672	1,5	130,77 ★	
	14,2	8910	1,6	120,42	
	15,4	8237	1,8	111,37 ★	
	16,6	7652	1,9	103,38	
	18,8	6749	2,2	91,22 ★	
	20	6226	2,3	84,21	
	15,6	8113	0,9	109,64 ★	**K.68-M90L4**
	17,2	7369	0,99	99,55	
	18,9	6722	1,1	90,89 ★	
	21	6173	1,2	83,4	
	22	5686	1,3	76,84 ★	
	25	5163	1,4	69,78	
	27	4703	1,5	63,57 ★	
	30	4304	1,7	58,23	
	33	3844	1,9	51,96 ★	
	37	3427	2,1	46,37	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
2 (60 Hz)	44	2914	2,5	39,39		**K.68-M90L4**
	26	4924	0,81	66,6	★	**K.48-M90L4**
	28	4446	0,9	60,08		
	32	4030	0,99	54,49	★	
	34	3675	1,1	49,65		
	38	3356	1,2	45,41	★	
	42	3002	1,3	40,6		
	46	2754	1,4	37,28	★	
	51	2488	1,6	33,6		
	59	2134	1,9	28,9	★	
	62	2037	2	27,55	★	
	69	1842	2,2	24,85		
	76	1665	2,4	22,54	★	
	84	1523	2,6	20,54		
	91	1390	2,9	18,78	★	
	102	1240	3,2	16,79		
	111	1142	3,5	15,42	★	
	151	841	3,1	11,35	★	
	169	752	3,3	10,15		
	184	690	3,6	9,32	★	
	204	620	3,8	8,4		
	238	531	4,2	7,22	★	
	47	2710	0,82	36,69	★	**K.38-M90L4**
	54	2338	0,95	31,59		
	60	2125	1	28,72	★	
	64	1992	0,96	26,9	★	
	71	1789	1	24,16		
	79	1612	1,1	21,81	★	
	87	1461	1,2	19,78		
	95	1328	1,3	17,99	★	
	108	1178	1,4	15,91		
	117	1089	1,5	14,69	★	
	136	938	1,6	12,65		
	149	850	1,7	11,5	★	
	160	797	1,8	10,72	★	
	176	717	2	9,72		
	194	655	2,2	8,85	★	
	219	575	2,4	7,82		
	238	531	2,6	7,22	★	
	276	460	2,9	6,22		
	304	416	3,1	5,65	★	
	47	2674	0,83	36,16		**B.38-M90L4**
	54	2347	0,95	31,67		
	61	2072	1,1	28,01		
	68	1877	1,2	25,38		
	76	1656	1,3	22,41		
	85	1496	1,4	20,22		
	94	1355	1,5	18,33		
	103	1231	1,6	16,7		
	112	1133	1,7	15,28		
	126	1009	1,8	13,66		
	137	921	2,1	12,5		
	155	814	2,4	11,05		
	171	744	2,6	10,02		
	194	655	3,2	8,84		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
2 (60 Hz)	215	593	3,5	7,98	**B.38-M90L4**
	237	531	3,9	7,24	
	260	487	4,3	6,59	
	284	442	4,7	6,03	
	318	398	4,7	5,39	
	94	1346	0,86	18,19	**B.28-M90L4**
	105	1204	0,95	16,34	
	116	1089	1,1	14,75	
	128	992	1,2	13,38	
	141	903	1,3	12,17	
	159	797	1,4	10,76	
	173	735	1,5	9,94	
	200	637	1,7	8,56	
	220	575	1,8	7,78	
	229	558	1,4	7,49	
	254	496	1,6	6,76	
	280	451	1,8	6,13	
	307	416	1,9	5,58	
	347	363	2,2	4,94	
	376	336	2,3	4,56	
	438	292	2,5	3,92	
	480	265	2,6	3,57	
3 (60 Hz)	0,79	216561	0,82	2182	**K.188-Z68-M100L4**
	0,92	184799	0,96	1862 ★	
	1,1	153931	1,2	1551	
	1,3	127633	1,4	1286 ★	
	1,5	112647	1,6	1135	
	1,8	96075	1,8	968 ★	
	1,7	102523	1,2	1033	**K.168-Z68-M100L4**
	2	87439	1,4	881	
	2,3	72948	1,6	735	
	2,8	60442	2	609	
	1,2	147084	0,81	1482	**K.168-Z48-M100L4**
	1,4	122372	0,98	1233 ★	
	2,1	81682	0,87	823 ★	**K.148-Z68-M100L4**
	2,5	68086	1	686	
	3	56474	1,3	569 ★	
	3,4	49822	1,4	502	
	4	42479	1,7	428 ★	
	4,8	35429	2	357	
	5,6	33117	2,1	306,08	**K.148-M100L4**
	3,4	50123	0,83	505	**K.128-Z48-M100L4**
	3,5	49326	0,84	497	
	3,9	43967	0,95	443	
	4,6	37413	1,1	377	
	5,5	31062	1,3	313	
	5,8	31957	1,3	295,38 ★	**K.128-M100L4**
	6,3	29308	1,4	270,9	
	7,1	26182	1,6	242,02 ★	
	7,8	23976	1,7	221,64	
	8,4	22090	1,9	204,18 ★	
	9,1	20451	2	189,04	
	5,7	29875	0,89	301 ★	**K.108-Z48-M100L4**
	7,1	26341	1	243,47	**K.108-M100L4**
	7,8	23764	1,1	219,64 ★	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
3 (60 Hz)	8,6	21762	1,2	201,11		**K.108-M100L4**
	9,6	19353	1,4	178,9	★	
	10,5	17688	1,5	163,51		
	11,4	16262	1,6	150,31	★	
	12,4	15022	1,8	138,87		
	13,3	13941	1,9	128,86	★	
	14,3	12984	2	120,03		
	15,8	11744	2,3	108,52	★	
	11	16944	0,86	156,63	★	**K.88-M100L4**
	11,9	15642	0,93	144,58		
	13,2	14145	1	130,77	★	
	14,3	13029	1,1	120,42		
	15,4	12045	1,2	111,37	★	
	16,6	11186	1,3	103,38		
	18,9	9867	1,5	91,22	★	
	20	9114	1,6	84,21		
	23	8166	1,8	75,45	★	
	25	7528	1,9	69,57		
	30	6315	2,3	58,37		
	21	9025	0,8	83,4		**K.68-M100L4**
	22	8317	0,87	76,84	★	
	25	7546	0,96	69,78		
	27	6882	1,1	63,57	★	
	30	6297	1,2	58,23		
	33	5624	1,3	51,96	★	
	37	5013	1,4	46,37		
	44	4260	1,7	39,39		
	52	3542	2	32,78	★	
	57	3286	2,2	30,38		
	62	3029	2,4	27,99	★	
	68	2754	2,6	25,42		
	74	2506	2,9	23,16	★	
	81	2294	3,2	21,22		
	151	1231	3,1	11,41		
	165	1124	3,3	10,4	★	
	181	1027	3,5	9,52		
	202	921	3,8	8,5	★	
	227	823	4,1	7,58		
	267	699	4,6	6,44		
	38	4915	0,81	45,41	★	**K.48-M100L4**
	42	4393	0,91	40,6		
	46	4030	0,99	37,28	★	
	51	3631	1,1	33,6		
	60	3126	1,3	28,9	★	
	62	2984	1,3	27,55	★	
	69	2692	1,5	24,85		
	76	2435	1,6	22,54	★	
	84	2223	1,8	20,54		
	92	2028	2	18,78	★	
	102	1815	2,2	16,79		
	112	1665	2,4	15,42	★	
	124	1505	2,6	13,9		
	144	1293	2,9	11,95	★	
	152	1231	2,1	11,35	★	
	169	1098	2,3	10,15		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
3 (60 Hz)	185	1009	2,4	9,32 ★	**K.48-M100L4**
	205	912	2,6	8,4	
	238	779	2,9	7,22 ★	
	117	1585	1	14,69 ★	**K.38-M100L4**
	136	1372	1,1	12,65	
	150	1240	1,2	11,5 ★	
	160	1160	1,2	10,72 ★	
	177	1054	1,3	9,72	
	194	956	1,5	8,85 ★	
	220	850	1,7	7,82	
	238	779	1,8	7,22 ★	
	277	673	2	6,22	
	304	611	2,1	5,65 ★	
	68	2745	0,81	25,38	**B.38-M100L4**
	77	2426	0,87	22,41	
	85	2187	0,94	20,22	
	94	1984	1	18,33	
	103	1806	1,1	16,7	
	113	1656	1,1	15,28	
	126	1479	1,2	13,66	
	138	1355	1,4	12,5	
	156	1195	1,7	11,05	
	172	1080	1,8	10,02	
	195	956	2,2	8,84	
	216	868	2,4	7,98	
	238	779	2,7	7,24	
	261	708	2,9	6,59	
	285	655	3,2	6,03	
	319	584	3,2	5,39	
	347	531	3,7	4,95	
	386	478	3,9	4,46	
	448	416	4,3	3,84	
	141	1319	0,87	12,17	**B.28-M90LB4**
	159	1169	0,99	10,76	
	173	1080	1,1	9,94	
	200	930	1,2	8,56	
	220	841	1,2	7,78	
	229	814	0,98	7,49	
	254	735	1,1	6,76	
	280	664	1,2	6,13	
	307	602	1,3	5,58	
	347	531	1,5	4,94	
	376	496	1,6	4,56	
	438	425	1,7	3,92	
	480	389	1,8	3,57	
4 (60 Hz)	2,6	90353	2	669 ★	**K.188-Z88-M100LB4**
	1,1	209466	0,85	1551	**K.188-Z68-M100LB4**
	1,3	173674	1	1286 ★	
	1,5	153284	1,2	1135	
	1,8	130734	1,4	968 ★	
	2,1	108989	1,6	807	
	2,6	90353	2	669 ★	
	1,7	139511	0,86	1033	**K.168-Z68-M100LB4**
	2	118980	1	881	
	2,4	99263	1,2	735	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
4 (60 Hz)	2,8	82249	1,5	609		**K.168-Z68-M100LB4**
	3,2	72523	1,6	537		
	3,8	61850	1,9	458		
	3	76846	0,92	569	★	**K.148-Z68-M100LB4**
	3,4	67793	1	502		
	4	57802	1,2	428	★	
	4,8	48210	1,5	357		
	5,8	39973	1,8	296	★	
	5,7	44897	1,6	306,08		**K.148-M100LB4**
	6,3	40256	1,8	274,42	★	
	6,9	36899	1,9	251,55		
	7,5	34020	2,1	231,95	★	
	4,6	50911	0,82	377		**K.128-Z48-M100LB4**
	5,5	42267	0,98	313		
	5,9	43329	0,96	295,38	★	**K.128-M100LB4**
	6,4	39733	1	270,9		
	7,1	35500	1,2	242,02	★	
	7,8	32515	1,3	221,64		
	8,5	29946	1,4	204,18	★	
	9,2	27732	1,5	189,04		
	9,8	25783	1,6	175,8	★	
	10,5	24074	1,7	164,11		
	11,8	21540	1,9	146,84	★	
	12,7	19955	2,1	136,06		
	7,9	32214	0,82	219,64	★	**K.108-M100LB4**
	8,6	29503	0,9	201,11		
	9,7	26244	1	178,9	★	
	10,6	23985	1,1	163,51		
	11,5	22045	1,2	150,31	★	
	12,5	20371	1,3	138,87		
	13,4	18901	1,4	128,86	★	
	14,4	17608	1,5	120,03		
	15,9	15916	1,7	108,52	★	
	17,3	14650	1,8	99,9		
	19,3	13179	2	89,85	★	
	21	12161	2,2	82,9		
	14,4	17661	0,83	120,42		**K.88-M100LB4**
	15,5	16332	0,89	111,37	★	
	16,7	15163	0,96	103,38		
	19	13383	1,1	91,22	★	
	20	12355	1,2	84,21		
	23	11071	1,3	75,45	★	
	25	10203	1,4	69,57		
	30	8565	1,7	58,37		
	35	7307	2	49,8	★	
	42	6084	2,4	41,5		
	30	8538	0,85	58,23		**K.68-M100LB4**
	33	7617	0,95	51,96	★	
	37	6802	1,1	46,37		
	44	5774	1,3	39,39		
	53	4809	1,5	32,78	★	
	57	4455	1,6	30,38		
	62	4109	1,8	27,99	★	
	68	3728	1,9	25,42		
	75	3401	2,1	23,16	★	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
4 (60 Hz)	82	3108	2,3	21,22	**K.68-M100LB4**
	91	2772	2,6	18,93 ★	
	102	2480	2,9	16,89	
	121	2108	3,4	14,35	
	145	1753	3,9	11,94 ★	
	152	1674	2,3	11,41	
	166	1523	2,5	10,4 ★	
	182	1399	2,6	9,52	
	204	1248	2,8	8,5 ★	
	228	1116	3,1	7,58	
	269	947	3,4	6,44	
	323	788	3,9	5,36 ★	
	52	4924	0,81	33,6	**K.48-M100LB4**
	60	4242	0,94	28,9 ★	
	63	4038	0,99	27,55 ★	
	70	3649	1,1	24,85	
	77	3303	1,2	22,54 ★	
	84	3011	1,3	20,54	
	92	2754	1,4	18,78 ★	
	103	2462	1,6	16,79	
	112	2258	1,8	15,42 ★	
	124	2037	1,9	13,9	
	145	1753	2,1	11,95 ★	
	152	1665	1,5	11,35 ★	
	170	1488	1,7	10,15	
	186	1364	1,8	9,32 ★	
	206	1231	1,9	8,4	
	240	1062	2,1	7,22 ★	
	137	1851	0,82	12,65	**K.38-M100LB4**
	150	1682	0,88	11,5 ★	
	161	1576	0,9	10,72 ★	
	178	1426	0,99	9,72	
	195	1302	1,1	8,85 ★	
	221	1151	1,2	7,82	
	240	1062	1,3	7,22 ★	
	278	912	1,5	6,22	
	306	832	1,6	5,65 ★	
	104	2453	0,8	16,7	**B.38-M100LB4**
	113	2240	0,85	15,28	
	127	2001	0,92	13,66	
	138	1833	1,1	12,5	
	157	1620	1,2	11,05	
	173	1470	1,3	10,02	
	196	1293	1,6	8,84	
	217	1169	1,8	7,98	
	239	1062	2	7,24	
	263	965	2,2	6,59	
	287	885	2,4	6,03	
	321	788	2,4	5,39	
	349	726	2,7	4,95	
	388	655	2,9	4,46	
	451	566	3,2	3,84	
	202	1257	0,85	8,56	**B.28-M100LB4**
	222	1142	0,91	7,78	
	256	992	0,8	6,76	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
4 (60 Hz)	282	903	0,89	6,13	**B.28-M100LB4**
	310	814	0,97	5,58	
	350	726	1,1	4,94	
	379	673	1,2	4,56	
	441	575	1,3	3,92	
	485	522	1,3	3,57	
5,5 (60 Hz)	2,6	119733	1,5	669 ★	**K.188-Z88-M112MB4**
	3,2	98077	1,8	548 ★	
	3,5	90025	2	503	
	1,5	203133	0,87	1135	**K.188-Z68-M112MB4**
	1,8	173240	1	968 ★	
	2,2	144427	1,2	807	
	2,6	119733	1,5	669 ★	
	2,4	131540	0,91	735	**K.168-Z68-M112MB4**
	2,9	108989	1,1	609	
	3,2	96110	1,2	537	
	3,8	81965	1,5	458	
	4,6	68369	1,7	382	
	5,5	56731	2,1	317	
	4,1	76598	0,93	428 ★	**K.148-Z68-M112MB4**
	4,9	63896	1,1	357	
	5,9	52975	1,3	296 ★	
	5,7	59344	1,2	306,08	**K.148-M112MB4**
	6,4	53205	1,3	274,42 ★	
	6,9	48777	1,5	251,55	
	7,5	44977	1,6	231,95 ★	
	8,1	41682	1,7	214,96	
	8,5	39627	1,8	204,38 ★	
	9,1	37041	1,9	191,02	
	10,4	32674	2,2	168,5 ★	
	7,2	46926	0,89	242,02 ★	**K.128-M112MB4**
	7,9	42975	0,97	221,64	
	8,5	39592	1,1	204,18 ★	
	9,2	36651	1,1	189,04	
	9,9	34082	1,2	175,8 ★	
	10,6	31824	1,3	164,11	
	11,9	28467	1,5	146,84 ★	
	12,8	26385	1,6	136,06	
	14	24180	1,7	124,73 ★	
	15,3	22169	1,9	114,34	
	17,9	18892	2,2	97,44	
	10,7	31700	0,84	163,51	**K.108-M112MB4**
	11,6	29140	0,91	150,31 ★	
	12,6	26926	0,99	138,87	
	13,5	24986	1,1	128,86 ★	
	14,5	23277	1,1	120,03	
	16,1	21044	1,3	108,52 ★	
	17,5	19370	1,4	99,9	
	19,4	17422	1,5	89,85 ★	
	21	16076	1,7	82,9	
	25	13622	2	70,24	
	28	11868	2,2	61,22 ★	
	34	10097	2,6	52,08	
	19,1	17688	0,83	91,22 ★	**K.88-M112MB4**
	21	16324	0,9	84,21	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
5,5 (60 Hz)	23	14632	1	75,45	★	**K.88-M112MB4**
	25	13489	1,1	69,57		
	30	11319	1,3	58,37		
	35	9654	1,5	49,8	★	
	42	8042	1,8	41,5		
	51	6669	2,2	34,4	★	
	56	5987	2,4	30,87	★	
	61	5526	2,6	28,5		
	68	4951	3	25,53	★	
	74	4561	3,2	23,54		
	156	2170	3,3	11,21		
	185	1824	3,7	9,41		
	217	1558	4,1	8,03	★	
	261	1293	4,7	6,69		
	38	8990	0,81	46,37		**K.68-M112MB4**
	44	7635	0,95	39,39		
	53	6359	1,1	32,78	★	
	57	5890	1,2	30,38		
	62	5429	1,3	27,99	★	
	69	4924	1,5	25,42		
	75	4490	1,6	23,16	★	
	82	4118	1,8	21,22		
	92	3666	2	18,93	★	
	103	3277	2,2	16,89		
	122	2781	2,6	14,35		
	146	2311	2,9	11,94	★	
	153	2214	1,7	11,41		
	168	2019	1,9	10,4	★	
	183	1842	2	9,52		
	205	1647	2,1	8,5	★	
	230	1470	2,3	7,58		
	271	1248	2,6	6,44		
	326	1036	2,9	5,36	★	
	70	4818	0,83	24,85		**K.48-M112MB4**
	77	4366	0,91	22,54	★	
	85	3985	1	20,54		
	93	3640	1,1	18,78	★	
	104	3259	1,2	16,79		
	113	2993	1,3	15,42	★	
	126	2692	1,4	13,9		
	146	2320	1,6	11,95	★	
	154	2196	1,2	11,35	★	
	172	1966	1,3	10,15		
	187	1806	1,4	9,32	★	
	208	1629	1,5	8,4		
	242	1399	1,6	7,22	★	
	197	1718	0,82	8,85	★	**K.38-M112MB4**
	223	1514	0,93	7,82		
	242	1399	1	7,22	★	
	281	1204	1,1	6,22		
	309	1098	1,2	5,65	★	
7,5 (60 Hz)	2,2	198997	0,89	807		**K.188-Z68-M132SB4**
	2,6	164967	1,1	669	★	
	2,6	164967	1,1	669	★	**K.188-Z88-M132SB4**
	3,2	135136	1,3	548	★	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
7,5 (60 Hz)	3,5	124037	1,4	503	**K.188-Z88-M132SB4**
	4,1	105791	1,7	429 ★	
	5	86801	2	352 ★	
	2,9	150175	0,8	609	**K.168-Z68-M132SB4**
	3,2	132416	0,9	537	
	3,8	112939	1,1	458	
	4,6	94197	1,3	382	
	5,5	78165	1,5	317	
	6,1	76766	1,6	287,95 ★	**K.168-M132SB4**
	6,6	70433	1,7	264,18	
	7,2	64994	1,8	243,8 ★	
	7,7	60291	2	226,15	
	8,2	56872	2,1	213,33 ★	
	4,9	88032	0,8	357	**K.148-Z68-M132SB4**
	5,9	72993	0,97	296 ★	
	6,4	73161	0,97	274,42 ★	**K.148-M132SB4**
	6,9	67067	1,1	251,55	
	7,5	61841	1,1	231,95 ★	
	8,1	57306	1,2	214,96	
	8,5	54490	1,3	204,38 ★	
	9,1	50929	1,4	191,02	
	10,4	44924	1,6	168,5 ★	
	11	42373	1,7	158,93	
	12,3	37971	1,9	142,41 ★	
	13,3	35057	2	131,49	
	9,2	50398	0,83	189,04	**K.128-M132SB4**
	9,9	46872	0,89	175,8 ★	
	10,6	43755	0,95	164,11	
	11,9	39149	1,1	146,84 ★	
	12,8	36270	1,1	136,06	
	14	33250	1,3	124,73 ★	
	15,3	30486	1,4	114,34	
	17,9	25978	1,6	97,44	
	20	22922	1,8	85,98 ★	
	24	19512	2,1	73,18	
	28	16908	2,5	63,41 ★	
	14,5	32001	0,83	120,03	**K.108-M132SB4**
	16,1	28927	0,92	108,52 ★	
	17,5	26633	1	99,9	
	19,4	23959	1,1	89,85 ★	
	21	22099	1,2	82,9	
	25	18724	1,4	70,24	
	28	16324	1,6	61,22 ★	
	34	13888	1,9	52,08	
	39	11851	2,2	44,44 ★	
	48	9716	2,6	36,44 ★	
	52	9025	2,9	33,87 ★	
	30	15562	0,94	58,37	**K.88-M132SB4**
	35	13277	1,1	49,8 ★	
	42	11062	1,3	41,5	
	51	9167	1,6	34,4 ★	
	56	8228	1,8	30,87 ★	
	61	7599	1,9	28,5	
	68	6802	2,1	25,53 ★	
	74	6279	2,3	23,54	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
7,5 (60 Hz)	88	5261	2,6	19,75		**K.88-M132SB4**
	104	4490	3	16,85	★	
	124	3746	3,4	14,04		
	150	3100	3,8	11,64	★	
	156	2984	2,4	11,21		
	185	2506	2,7	9,41		
	217	2143	3	8,03	★	
	261	1780	3,4	6,69		
	315	1479	3,9	5,54	★	
	53	8742	0,83	32,78	★	**K.68-M132SB4**
	57	8095	0,9	30,38		
	62	7466	0,97	27,99	★	
	69	6775	1,1	25,42		
	75	6173	1,2	23,16	★	
	82	5659	1,3	21,22		
	92	5048	1,4	18,93	★	
	103	4499	1,6	16,89		
	122	3826	1,9	14,35		
	146	3179	2,1	11,94	★	
	153	3038	1,3	11,41		
	168	2772	1,3	10,4	★	
	183	2542	1,4	9,52		
	205	2267	1,6	8,5	★	
	230	2019	1,7	7,58		
	271	1718	1,9	6,44		
	326	1426	2,1	5,36	★	
10 (60 Hz)	3,2	184542	0,96	548	★	**K.188-Z88-M132M4**
	3,5	169387	1	503		
	4,1	144471	1,2	429	★	
	5	118537	1,5	352	★	
	5,4	108094	1,6	321		
	6,4	92266	1,9	274	★	
	4,6	128643	0,93	382		**K.168-Z68-M132M4**
	5,5	106748	1,1	317		
	6,1	104684	1,1	287,95	★	**K.168-M132M4**
	6,6	96039	1,2	264,18		
	7,2	88635	1,3	243,8	★	
	7,7	82222	1,5	226,15		
	8,2	77554	1,5	213,33	★	
	8,7	72541	1,6	199,54		
	9,8	64507	1,9	177,43	★	
	10,4	60894	2	167,5		
	11,6	54667	2,2	150,36	★	
	7,5	84330	0,84	231,95	★	**K.148-M132M4**
	8,1	78148	0,91	214,96		
	8,5	74304	0,95	204,38	★	
	9,1	69450	1	191,02		
	10,4	61257	1,2	168,5	★	
	11	57776	1,2	158,93		
	12,3	51771	1,4	142,41	★	
	13,3	47802	1,5	131,49		
	15,5	40849	1,7	112,35		
	17,2	36908	1,9	101,53	★	
	17,8	35562	2	97,82		
	21	30761	2,3	84,61		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
10 (60 Hz)	12,8	49468	0,84	136,06		**K.128-M132M4**
	14	45349	0,92	124,73	★	
	15,3	41567	1	114,34		
	17,9	35429	1,2	97,44		
	20	31257	1,3	85,98	★	
	24	26607	1,6	73,18		
	28	23055	1,8	63,41	★	
	33	19397	2,1	53,36	★	
	36	17502	2,4	48,14		
	19,4	32665	0,81	89,85	★	**K.108-M132M4**
	21	30141	0,88	82,9		
	25	25535	1	70,24		
	28	22258	1,2	61,22	★	
	34	18936	1,4	52,08		
	39	16155	1,6	44,44	★	
	48	13250	1,9	36,44	★	
	52	12311	2,2	33,87	★	
	56	11363	2,3	31,25		
	66	9627	2,7	26,48		
	76	8387	2,9	23,08	★	
	89	7138	3,3	19,63		
	135	4685	3,7	12,9	★	
	159	3985	4,1	10,97		
	35	18104	0,81	49,8	★	**K.88-M132M4**
	42	15084	0,97	41,5		
	51	12506	1,2	34,4	★	
	56	11222	1,3	30,87	★	
	61	10363	1,4	28,5		
	68	9282	1,6	25,53	★	
	74	8556	1,7	23,54		
	88	7183	1,9	19,75		
	104	6129	2,2	16,85	★	
	124	5101	2,5	14,04		
	150	4233	2,8	11,64	★	
	156	4074	1,8	11,21		
	185	3418	2	9,41		
	217	2922	2,2	8,03	★	
	261	2435	2,5	6,69		
	315	2010	2,9	5,54	★	
	75	8423	0,86	23,16	★	**K.68-M132M4**
	82	7714	0,94	21,22		
	92	6882	1,1	18,93	★	
	103	6138	1,2	16,89		
	122	5216	1,4	14,35		
	146	4340	1,6	11,94	★	
	153	4145	0,93	11,41		
	168	3782	0,99	10,4	★	
	183	3463	1,1	9,52		
	205	3091	1,1	8,5	★	
	230	2754	1,2	7,58		
	271	2338	1,4	6,44		
	326	1948	1,6	5,36	★	
12,3 (60 Hz)	3,5	207934	0,85	503		**K.188-Z88-M132MB4**
	4,1	177341	1	429	★	
	5	145516	1,2	352	★	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
12,3 (60 Hz)	5,4	132700	1,3	321		**K.188-Z88-M132MB4**
	6,4	113267	1,6	274	★	
	7,8	93010	1,9	225	★	
	9,1	85331	2,1	191,34		**K.188-M132MB4**
	5,5	131044	0,91	317		**K.168-Z68-M132MB4**
	6,1	128413	0,93	287,95	★	**K.168-M132MB4**
	6,6	117811	1	264,18		
	7,2	108723	1,1	243,8	★	
	7,7	100858	1,2	226,15		
	8,2	95136	1,3	213,33	★	
	8,7	88989	1,3	199,54		
	9,8	79131	1,5	177,43	★	
	10,4	74702	1,6	167,5		
	11,6	67058	1,8	150,36	★	
	12,6	61540	1,9	138		
	9,1	85189	0,83	191,02		**K.148-M132MB4**
	10,4	75145	0,94	168,5	★	
	11	70876	1	158,93		
	12,3	63506	1,1	142,41	★	
	13,3	58635	1,2	131,49		
	15,5	50105	1,4	112,35		
	17,2	45278	1,6	101,53	★	
	17,8	43622	1,6	97,82		
	21	37732	1,9	84,61		
	24	32913	2,2	73,8	★	
	28	28166	2,5	63,16	★	
	15,3	50991	0,82	114,34		**K.128-M132MB4**
	17,9	43453	0,96	97,44		
	20	38343	1,1	85,98	★	
	24	32639	1,3	73,18		
	28	28281	1,5	63,41	★	
	33	23799	1,7	53,36	★	
	36	21470	1,9	48,14		
	42	18449	2,3	41,38	★	
	44	17475	2,4	39,19	★	
	49	16022	2,6	35,92		
	25	31328	0,85	70,24		**K.108-M132MB4**
	28	27298	0,97	61,22	★	
	34	23223	1,1	52,08		
	39	19822	1,3	44,44	★	
	48	16253	1,5	36,44	★	
	52	15101	1,8	33,87	★	
	56	13932	1,9	31,25		
	66	11806	2,2	26,48		
	76	10292	2,4	23,08	★	
	89	8751	2,7	19,63		
	104	7466	3	16,75	★	
	127	6129	3,4	13,74	★	
	135	5757	3	12,9	★	
	159	4889	3,3	10,97		
	186	4171	3,7	9,36	★	
	227	3427	4,3	7,68	★	
	51	15340	0,95	34,4	★	**K.88-M132MB4**
	56	13764	1,1	30,87	★	
	61	12710	1,1	28,5		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
12,3 (60 Hz)	68	11381	1,3	25,53	★	**K.88-M132MB4**
	74	10495	1,4	23,54		
	88	8804	1,6	19,75		
	104	7511	1,8	16,85	★	
	124	6262	2	14,04		
	150	5190	2,3	11,64	★	
	156	4995	1,4	11,21		
	185	4198	1,6	9,41		
	217	3578	1,8	8,03	★	
	261	2984	2	6,69		
	315	2471	2,3	5,54	★	
	92	8441	0,86	18,93	★	**K.68-M132MB4**
	103	7528	0,96	16,89		
	122	6403	1,1	14,35		
	146	5323	1,3	11,94	★	
	168	4641	0,81	10,4	★	
	183	4242	0,86	9,52		
	205	3790	0,93	8,5	★	
	230	3383	1	7,58		
	271	2869	1,1	6,44		
	326	2391	1,3	5,36	★	
15 (60 Hz)	4	213381	0,83	429	★	**K.188-Z88-M160MB4**
	4,9	175082	1	352	★	
	5,4	159662	1,1	321		
	6,3	136287	1,3	274	★	
	7,7	111912	1,6	225	★	
	9,1	102612	1,7	191,34		**K.188-M160MB4**
	10	92656	1,9	172,78		
	10,7	86837	2	161,92		
	8,1	114409	1	213,33	★	**K.168-M160MB4**
	8,7	107014	1,1	199,54		
	9,8	95154	1,3	177,43	★	
	10,4	89830	1,3	167,5		
	11,5	80637	1,5	150,36	★	
	12,6	74011	1,6	138		
	14,6	63870	1,9	119,09		
	16,7	55871	2,1	104,18		
	10,9	85233	0,83	158,93		**K.148-M160MB4**
	12,2	76376	0,93	142,41	★	
	13,2	70513	1	131,49		
	15,4	60256	1,2	112,35		
	17,1	54445	1,3	101,53	★	
	17,7	52461	1,4	97,82		
	20	45376	1,6	84,61		
	24	39574	1,8	73,8	★	
	28	33870	2,1	63,16	★	
	31	30336	2,3	56,57		
	17,8	52258	0,8	97,44		**K.128-M160MB4**
	20	46111	0,9	85,98	★	
	24	39246	1,1	73,18		
	27	34003	1,2	63,41	★	
	32	28617	1,5	53,36	★	
	36	25819	1,6	48,14		
	42	22187	1,9	41,38	★	
	44	21018	2	39,19	★	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
15 (60 Hz)	48	19264	2,2	35,92		**K.128-M160MB4**
	57	16412	2,5	30,61		
	64	14490	2,9	27,02	★	
	28	32834	0,81	61,22	★	**K.108-M160MB4**
	33	27927	0,95	52,08		
	39	23835	1,1	44,44	★	
	48	19539	1,3	36,44	★	
	51	18166	1,5	33,87	★	
	56	16758	1,6	31,25		
	66	14198	1,8	26,48		
	75	12373	2	23,08	★	
	88	10531	2,2	19,63		
	104	8981	2,5	16,75	★	
	126	7369	2,8	13,74	★	
	134	6917	2,5	12,9	★	
	158	5881	2,8	10,97		
	185	5022	3,1	9,36	★	
	226	4118	3,6	7,68	★	
	56	16554	0,88	30,87	★	**K.88-M160MB4**
	61	15287	0,96	28,5		
	68	13693	1,1	25,53	★	
	74	12621	1,2	23,54		
	88	10593	1,3	19,75		
	103	9034	1,5	16,85	★	
	124	7528	1,7	14,04		
	149	6244	1,9	11,64	★	
	155	6014	1,2	11,21		
	184	5048	1,3	9,41		
	216	4304	1,5	8,03	★	
	259	3587	1,7	6,69		
	313	2967	1,9	5,54	★	
20 (60 Hz)	5,4	217881	0,81	321		**K.188-Z88-M160L4**
	6,3	185977	0,95	274	★	
	7,7	152717	1,2	225	★	
	9,1	139927	1,3	191,34		**K.188-M160L4**
	10	126358	1,4	172,78		
	10,7	118413	1,5	161,92		
	12,5	101708	1,7	139,08	★	
	14,4	87873	2	120,16		
	16,4	77572	2,3	106,07		
	8,7	145924	0,82	199,54		**K.168-M160L4**
	9,8	129750	0,92	177,43	★	
	10,4	122496	0,98	167,5		
	11,5	109954	1,1	150,36	★	
	12,6	100920	1,2	138		
	14,6	87094	1,4	119,09		
	16,7	76190	1,6	104,18		
	19,2	66252	1,8	90,6		
	22	58130	2,1	79,49	★	
	26	49158	2,4	67,22	★	
	15,4	82160	0,86	112,35		**K.148-M160L4**
	17,1	74250	0,95	101,53	★	
	17,7	71531	0,99	97,82		
	20	61877	1,1	84,61		
	24	53967	1,3	73,8	★	

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
20 (60 Hz)	28	46190	1,5	63,16	★	**K.148-M160L4**
	31	41372	1,7	56,57		
	36	35039	2	47,91	★	
	42	30265	2,3	41,38		
	27	46368	0,9	63,41	★	**K.128-M160L4**
	32	39025	1,1	53,36	★	
	36	35207	1,2	48,14		
	42	30265	1,4	41,38	★	
	44	28662	1,5	39,19	★	
	48	26270	1,6	35,92		
	57	22382	1,9	30,61		
	64	19760	2,1	27,02	★	
	76	16811	2,5	22,99		
	87	14570	2,9	19,92	★	
	104	12258	3,4	16,76	★	
	115	11062	3,7	15,13		
	138	9185	3,1	12,56		
	159	7953	3,4	10,88	★	
	189	6696	3,9	9,16	★	
	210	6040	4,2	8,26		
	244	5190	4,6	7,1	★	
	39	32497	0,82	44,44	★	**K.108-M160L4**
	48	26651	0,94	36,44	★	
	51	24765	1,1	33,87	★	
	56	22851	1,2	31,25		
	66	19362	1,3	26,48		
	75	16882	1,5	23,08	★	
	88	14357	1,6	19,63		
	104	12249	1,8	16,75	★	
	126	10044	2,1	13,74	★	
	134	9433	1,8	12,9	★	
	158	8024	2	10,97		
	185	6846	2,3	9,36	★	
	226	5615	2,6	7,68	★	
	74	17218	0,85	23,54		**K.88-M160L4**
	88	14446	0,96	19,75		
	103	12320	1,1	16,85	★	
	124	10265	1,2	14,04		
	149	8511	1,4	11,64	★	
	155	8201	0,87	11,21		
	184	6882	0,98	9,41		
	216	5872	1,1	8,03	★	
	259	4889	1,2	6,69		
	313	4047	1,4	5,54	★	
25 (60 Hz)	7,7	188970	0,94	225	★	**K.188-Z88-M180MB4**
	9	173071	1	191,34		**K.188-M180MB4**
	10	156287	1,1	172,78		
	10,7	146464	1,2	161,92		
	12,4	125800	1,4	139,08	★	
	14,4	108688	1,6	120,16		
	16,3	95942	1,8	106,07		
	18,1	86367	2,1	95,48	★	
	11,5	136004	0,88	150,36	★	**K.168-M180MB4**
	12,5	124826	0,96	138		
	14,5	107722	1,1	119,09		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
25 (60 Hz)	16,6	94233	1,3	104,18		**K.168-M180MB4**
	19,1	81947	1,5	90,6		
	22	71903	1,7	79,49	★	
	26	60805	2	67,22	★	
	28	55172	2,2	60,99		
	32	48104	2,5	53,18	★	
	17,7	88484	0,8	97,82		**K.148-M180MB4**
	20	76536	0,93	84,61		
	23	66757	1,1	73,8	★	
	27	57129	1,2	63,16	★	
	31	51168	1,4	56,57		
	36	43338	1,6	47,91	★	
	42	37431	1,9	41,38		
	56	27803	2,5	30,74		
	56	28130	2,5	31,1	★	
	65	24038	2,9	26,58		
	197	7953	4,4	8,79		
	32	48263	0,86	53,36	★	**K.128-M180MB4**
	36	43542	0,96	48,14		
	42	37431	1,1	41,38	★	
	44	35446	1,2	39,19	★	
	48	32488	1,3	35,92		
	56	27687	1,5	30,61		
	64	24437	1,7	27,02	★	
	75	20796	2	22,99		
	87	18015	2,3	19,92	★	
	103	15163	2,7	16,76	★	
	114	13684	3	15,13		
	133	11762	3,3	13	★	
	138	11363	2,5	12,56		
	159	9840	2,8	10,88	★	
	189	8281	3,1	9,16	★	
	209	7475	3,4	8,26		
	244	6421	3,7	7,1	★	
	51	30637	0,87	33,87	★	**K.108-M180MB4**
	55	28263	0,94	31,25		
	65	23950	1,1	26,48		
	75	20876	1,2	23,08	★	
	88	17758	1,3	19,63		
	103	15154	1,5	16,75	★	
	126	12426	1,7	13,74	★	
	134	11665	1,5	12,9	★	
	158	9920	1,6	10,97		
	185	8467	1,8	9,36	★	
	225	6944	2,1	7,68	★	
30 (60 Hz)	9,1	204054	0,87	191,34		**K.188-M180LB4**
	10,1	184258	0,96	172,78		
	10,8	172673	1	161,92		
	12,5	148315	1,2	139,08	★	
	14,5	128138	1,4	120,16		
	16,5	113116	1,6	106,07		
	18,3	101823	1,7	95,48	★	
	22	84489	2,1	79,23	★	
	24	77040	2,3	72,24		
	12,6	147164	0,81	138		**K.168-M180LB4**

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
30 (60 Hz)	14,7	127005	0,94	119,09		**K.168-M180LB4**
	16,7	111097	1,1	104,18		
	19,3	96615	1,2	90,6		
	22	84773	1,4	79,49	★	
	26	71682	1,7	67,22	★	
	29	65039	1,8	60,99		
	33	56713	2,1	53,18	★	
	39	48148	2,5	45,15		
	24	78706	0,9	73,8	★	**K.148-M180LB4**
	28	67359	1,1	63,16	★	
	31	60327	1,2	56,57		
	36	51089	1,4	47,91	★	
	42	44127	1,6	41,38		
	56	33161	2,1	31,1	★	
	57	32780	2,2	30,74		
	66	28343	2,5	26,58		
	75	24729	2,9	23,19	★	
	88	21160	3,3	19,84	★	
	199	9371	3,8	8,79		
	235	7936	4,2	7,44	★	
	271	6855	4,7	6,43		
	36	51337	0,81	48,14		**K.128-M180LB4**
	42	44127	0,94	41,38	★	
	44	41797	1	39,19	★	
	49	38307	1,1	35,92		
	57	32639	1,3	30,61		
	65	28812	1,4	27,02	★	
	76	24517	1,7	22,99		
	88	21239	2	19,92	★	
	104	17874	2,3	16,76	★	
	115	16138	2,5	15,13		
	134	13861	2,8	13	★	
	139	13392	2,1	12,56		
	160	11603	2,4	10,88	★	
	191	9769	2,7	9,16	★	
	211	8813	2,8	8,26		
	246	7573	3,2	7,1	★	
	56	33330	0,8	31,25		**K.108-M180LB4**
	66	28237	0,9	26,48		
	76	24614	0,99	23,08	★	
	89	20929	1,1	19,63		
	104	17865	1,2	16,75	★	
	127	14650	1,4	13,74	★	
	135	13755	1,2	12,9	★	
	159	11700	1,4	10,97		
	186	9982	1,6	9,36	★	
	227	8193	1,8	7,68	★	
40 (60 Hz)	12,7	199395	0,89	139,08	★	**K.188-M200LB4**
	14,7	172274	1	120,16		
	16,7	152071	1,2	106,07		
	18,5	136889	1,3	95,48	★	
	22	113595	1,6	79,23	★	
	24	103568	1,7	72,24		
	28	90867	1,9	63,38	★	
	32	78094	2,3	54,47		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
40 (60 Hz)	17	149360	0,8	104,18		**K.168-M200LB4**
	19,5	129892	0,92	90,6		
	22	113967	1	79,49	★	
	26	96376	1,2	67,22	★	
	29	87439	1,4	60,99		
	33	76243	1,6	53,18	★	
	39	64729	1,8	45,15		
	51	49530	2,4	34,55	★	
	54	46633	2,6	32,53		
	62	40920	2,9	28,54	★	
	152	16731	3,7	11,67		
	174	14579	4,1	10,17	★	
	31	81106	0,87	56,57		**K.148-M200LB4**
	37	68688	1	47,91	★	
	43	59326	1,2	41,38		
	57	44587	1,6	31,1	★	
	58	44074	1,6	30,74		
	67	38104	1,9	26,58		
	76	33250	2,1	23,19	★	
	89	28440	2,5	19,84	★	
	100	25473	2,8	17,77		
	118	21576	3,1	15,05	★	
	136	18635	3,5	13		
	181	14003	4,2	9,77	★	
	201	12603	2,8	8,79		
	238	10664	3,1	7,44	★	
	275	9220	3,5	6,43		
	366	6926	4,2	4,83	★	
	49	51496	0,81	35,92		**K.128-M200LB4**
	58	43888	0,95	30,61		
	66	38741	1,1	27,02	★	
	77	32958	1,3	22,99		
	89	28555	1,5	19,92	★	
	106	24029	1,7	16,76	★	
	117	21691	1,9	15,13		
	136	18635	2,1	13	★	
	141	18006	1,6	12,56		
	163	15597	1,7	10,88	★	
	193	13135	2	9,16	★	
	214	11842	2,1	8,26		
	249	10177	2,4	7,1	★	
50 (60 Hz)	14,9	210680	0,84	120,16		**K.188-M225S4E**
	16,8	185977	0,95	106,07		
	18,7	167412	1,1	95,48	★	
	22	138918	1,3	79,23	★	
	25	126659	1,4	72,24		
	28	111123	1,6	63,38	★	
	33	95508	1,9	54,47		
	42	74392	2,4	42,43	★	
	52	60105	2,9	34,28	★	
	22	139369	0,86	79,49	★	**K.168-M225S4E**
	27	117864	1	67,22	★	
	29	106934	1,1	60,99		
	34	93240	1,3	53,18	★	
	40	79166	1,5	45,15		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
50 (60 Hz)	52	60575	2	34,55	★	**K.168-M225S4E**
	55	57032	2,1	32,53		
	62	50043	2,4	28,54	★	
	74	42329	2,8	24,14	★	
	82	38396	3	21,9		
	94	33471	3,3	19,09	★	
	153	20460	3	11,67		
	176	17829	3,3	10,17	★	
	207	15146	3,7	8,64		
	270	11585	4,5	6,61	★	
	37	84002	0,84	47,91	★	**K.148-M225S4E**
	43	72550	0,98	41,38		
	57	54525	1,3	31,1	★	
	58	53896	1,3	30,74		
	67	46607	1,5	26,58		
	77	40663	1,7	23,19	★	
	90	34782	2	19,84	★	
	100	31160	2,3	17,77		
	119	26385	2,6	15,05	★	
	137	22789	2,8	13		
	183	17130	3,4	9,77	★	
	203	15411	2,3	8,79		
	240	13046	2,6	7,44	★	
	278	11275	2,8	6,43		
	370	8467	3,5	4,83	★	
	66	47377	0,88	27,02	★	**K.128-K4-MI225S4E**
	78	40309	1	22,99		
	90	34924	1,2	19,92	★	
	107	29388	1,4	16,76	★	
	118	26527	1,5	15,13		
	137	22789	1,7	13	★	
	142	22019	1,3	12,56		
	164	19078	1,4	10,88	★	
	195	16058	1,6	9,16	★	
	216	14481	1,7	8,26		
	251	12444	1,9	7,1	★	
60 (60 Hz)	18,7	203603	0,87	95,48	★	**K.188-M225M4E**
	22	168953	1	79,23	★	
	25	154046	1,1	72,24		
	28	135153	1,3	63,38	★	
	33	116154	1,5	54,47		
	42	90477	2	42,43	★	
	52	73099	2,4	34,28	★	
	63	60672	2,9	28,45	★	
	27	143346	0,83	67,22	★	**K.168-M225M4E**
	29	130060	0,92	60,99		
	34	113400	1,1	53,18	★	
	40	96279	1,2	45,15		
	52	73675	1,6	34,55	★	
	55	69370	1,7	32,53		
	62	60858	2	28,54	★	
	74	51478	2,3	24,14	★	
	82	46704	2,5	21,9		
	94	40708	2,7	19,09	★	
	110	34570	3,1	16,21		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
60 (60 Hz)	144	26465	3,7	12,41	★	**K.168-M225M4E**
	153	24889	2,5	11,67		
	176	21682	2,7	10,17	★	
	207	18423	3,1	8,64		
	270	14091	3,7	6,61	★	
	43	88236	0,8	41,38		**K.148-M225M4E**
	57	66323	1,1	31,1	★	
	58	65553	1,1	30,74		
	67	56677	1,3	26,58		
	77	49450	1,4	23,19	★	
	90	42311	1,7	19,84	★	
	100	37891	1,9	17,77		
	119	32090	2,1	15,05	★	
	137	27723	2,3	13		
	183	20832	2,8	9,77	★	
	203	18742	1,9	8,79		
	240	15863	2,1	7,44	★	
	278	13711	2,3	6,43		
	370	10301	2,9	4,83	★	
	78	49025	0,85	22,99		**K.128-K4-MI225M4E**
	90	42479	0,98	19,92	★	
	107	35739	1,2	16,76	★	
	118	32267	1,3	15,13		
	137	27723	1,4	13	★	
	142	26784	1,1	12,56		
	164	23197	1,2	10,88	★	
	195	19530	1,3	9,16	★	
	216	17617	1,4	8,26		
	251	15137	1,6	7,1	★	
75 (60 Hz)	23	205923	0,86	79,23	★	**K.188-M250M4E**
	25	187757	0,94	72,24		
	28	164728	1,1	63,38	★	
	33	141566	1,3	54,47		
	42	110273	1,6	42,43	★	
	52	89095	2	34,28	★	
	63	73940	2,4	28,45	★	
	69	67421	2,6	25,94		
	79	59158	3	22,76	★	
	34	138218	0,87	53,18	★	**K.168-M250M4E**
	40	117350	1	45,15		
	52	89795	1,3	34,55	★	
	55	84543	1,4	32,53		
	63	74180	1,6	28,54	★	
	74	62745	1,9	24,14	★	
	82	56917	2	21,9		
	94	49618	2,2	19,09	★	
	110	42134	2,5	16,21		
	144	32258	3	12,41	★	
	153	30327	2	11,67		
	176	26430	2,2	10,17	★	
	207	22453	2,5	8,64		
	271	17183	3	6,61	★	
	58	79893	0,89	30,74		**K.148-K4-MI250M4E**
	58	80831	0,88	31,1	★	
	67	69087	1	26,58		

Legend / explanations see page 4 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
75 (60 Hz)	77	60274	1,2	23,19	★	**K.148-K4-MI250M4E**
	90	51567	1,4	19,84	★	
	101	46182	1,5	17,77		
	119	39113	1,7	15,05	★	
	138	33790	1,9	13		
	183	25393	2,3	9,77	★	
	204	22843	1,5	8,79		
	241	19335	1,7	7,44	★	
	278	16713	1,9	6,43		
	371	12550	2,3	4,83	★	
100 (60 Hz)	33	193266	0,92	54,47		**K.188-K4-MI280S4E**
	42	150547	1,2	42,43	★	
	52	121628	1,5	34,28	★	
	63	100946	1,8	28,45	★	
	69	92036	1,9	25,94		
	79	80752	2,2	22,76	★	
	91	69397	2,6	19,56		
	117	54038	3,1	15,23	★	
	148	42931	3,6	12,1	★	
	52	122585	0,98	34,55	★	**K.168-K4-MI280S4E**
	55	115419	1	32,53		
	63	101265	1,2	28,54	★	
	74	85650	1,4	24,14	★	
	82	77705	1,5	21,9		
	94	67731	1,6	19,09	★	
	110	57519	1,8	16,21		
	144	44029	2,2	12,41	★	
	153	41407	1,5	11,67		
	176	36084	1,6	10,17	★	
	207	30655	1,8	8,64		
	270	23454	2,2	6,61	★	
125 (60 Hz)	42	180458	0,98	42,43	★	**K.188-K4-MI280M4E**
	52	145791	1,2	34,28	★	
	63	120999	1,5	28,45	★	
	69	110326	1,6	25,94		
	79	96801	1,8	22,76	★	
	92	83187	2,1	19,56		
	118	64773	2,6	15,23	★	
	148	51461	3	12,1	★	
	52	146942	0,81	34,55	★	**K.168-K4-MI280M4E**
	55	138351	0,86	32,53		
	63	121380	0,99	28,54	★	
	74	102665	1,2	24,14	★	
	82	93143	1,2	21,9		
	94	81186	1,4	19,09	★	
	110	68945	1,5	16,21		
	144	52780	1,8	12,41	★	
	153	49636	1,2	11,67		
	176	43250	1,4	10,17	★	
	207	36749	1,5	8,64		
	271	28113	1,8	6,61	★	

Possible types of input units

Frame-size		NEMA-K5TC	IEC-K4 on request	NEMA-KTC	IEC-K2 on request	NEMA-A5	IEC-A on request	NEMA-P5	IEC-P on request	Motor
	63		•							•
56C	**71**	•	•	•		•	•	•		•
	80		•		•	•	•	•	•	•
140TC	**90**	•	•	•	•	•	•	•	•	•
180TC	**100**	•	•	•	•	•	•	•	•	•
	112		•		•	•	•	•	•	•
210TC	**132**	•	•	•	•	•	•	•	•	•
250TC	**160**	•	•	•	•	•	•	•	•	•
	180		•		•				•	•
280TC	**200**	•	•	•	•	•	•	•	•	•
320TC	**225**	•	•	•	•	•	•	•	•	•
360TC	**250**	•	•	•	•	•	•	•	•	•
	280		•				•		•	•
	315				•					

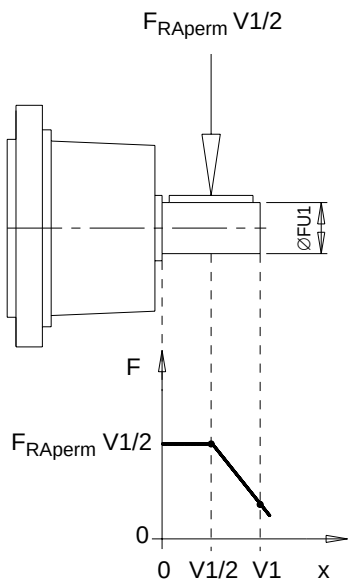
allowable combinations of input unit K., A., P. see chapter 7

4

Permissible overhung loads and torque

for type of input unit A., P.

Frame-size		T_1 1)		FU1		V1		F_{RAperm} V1/2	
		[lb in]	[Nm]	[in]	[*mm*]	[in]	[*mm*]	[lbf]	[N]
56C	**71**	26.5	3	5/8	*16*	1.575	*40*	54	240
	80	44.2	5	3/4	*19*	1.575	*40*	54	240
140TC	**90**	88.5	10	7/8	*24*	1.968	*50*	139	620
180TC	**100**	177	20	1 1/8	*28*	2.362	*60*	189	840
	112	230	26	1 1/4	*28*	2.362	*60*	225	1000
210TC	**132**	540	61	1 3/8	*38*	3.150	*80*	382	1700
250TC	**160**	867	98	1 5/8	*42*	4.331	*110*	405	1800
	180	1752	198	-	-	-	-	-	-
280TC	**200**	1752	198	2 1/8	*55*	4.331	*110*	674	3000
320TC	**225**	2575	291	2 1/8	*60*	5.512	*140*	776	3450
360TC	**250**	3150	356	2 3/8	*65*	5.512	*140*	877	3900
	280	5132	580	-	*70*	-	*140*	1158	5150
	315	11414	1290	-	-		-	-	-



1)permissible short time value is 2,5 times (for e.g. starting torque of motor)

Torque tables

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867
					Size							
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
B.28	**57.53**	29	1150	**130**		•						
	48.51 ★	35	1150	**130**		•	•					
1150 lb in	**43.07**	39	1150	**130**		•	•					
	37.76 ★	44	1150	**130**		•	•	•				
	33.79	48	1150	**130**		•	•	•				
	29.99 ★	56	1150	**130**		•	•	•				
	26.28	64	1150	**130**		•	•	•				
	23.11 ★	73	1150	**130**		•	•	•				
	20.87	80	1150	**130**		•	•	•	•			
	18.19 ★	92	1150	**130**		•	•	•				
	16.34	103	1150	**130**		•	•	•				
	14.75 ★	114	1150	**130**		•	•	•	•			
	13.38	126	1150	**130**		•	•	•	•			
	12.17 ★	138	1150	**130**		•	•	•	•			
	10.76	156	1150	**130**		•	•	•	•			
	9.94 ★	169	1133	**128**		•	•	•	•			
	8.56	196	1071	**121**		•	•	•	•			
	7.78 ★	216	1035	**117**		•	•	•	•			
	7.49	224	796	**90**		•	•	•				
	6.76 ★	248	796	**90**		•	•	•	•			
	6.13	274	796	**90**		•	•	•	•			
	5.58 ★	301	796	**90**		•	•	•	•			
	4.94	340	796	**90**		•	•	•	•			
	4.56 ★	369	770	**87**		•	•	•	•			
	3.92	428	726	**82**		•	•	•	•			
	3.57 ★	471	699	**79**		•	•	•	•			

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867
					Size							
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
B.38	**65.69**	26	1770	**200**		•						
	57.04 ★	31	2212	**250**		•	•					
2212 lb in	**50.72**	34	2212	**250**		•	•					
	44.00 ★	40	2212	**250**		•	•	•				
	41.11	42	2212	**250**		•	•	•				
	36.16 ★	48	2212	**250**		•	•	•				
	31.67	55	2212	**250**		•	•	•	•			
	28.01 ★	62	2212	**250**		•	•	•	•			
	25.38	69	2212	**250**		•	•	•	•			
	22.41 ★	78	2212	**250**		•	•	•	•			
	20.22	86	2168	**245**		•	•	•	•			
	18.33 ★	95	2097	**237**		•	•	•	•			
	16.70	104	2035	**230**		•	•	•	•			
	15.28 ★	114	1991	**225**		•	•	•	•			
	13.66	127	1920	**217**		•	•	•	•			
	12.50 ★	139	1946	**220**		•	•	•	•			
	11.05 ★	157	1973	**223**		•	•	•	•			
	10.02	174	1955	**221**		•	•	•	•			
	8.84 ★	197	2088	**236**		•	•	•	•			
	7.98	218	2088	**236**		•	•	•	•			
	7.24 ★	240	2088	**236**		•	•	•	•			
	6.59	264	2088	**236**		•	•	•	•			
	6.03 ★	289	2079	**235**		•	•	•	•			
	5.39	323	1867	**211**		•	•	•	•			
	4.95 ★	351	1955	**221**		•	•	•	•			
	4.46	390	1885	**213**		•	•	•	•			
	3.84 ★	453	1796	**203**		•	•	•	•			

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio		n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
	[-]					Size 63	56C 71	80	140TC 90	180TC 100	112	210TC 132
K.38-D.28	**13129**		0.13	2212	**250**		•					
2212 lb in	**11327**	★	0.15	2212	**250**		•	•				
	9731		0.17	2212	**250**		•	•				
	8959	★	0.19	2212	**250**		•	•	•			
	8144		0.21	2212	**250**		•	•	•			
	7209	★	0.23	2212	**250**		•	•	•			
	6038		0.28	2212	**250**		•	•	•			
	5148	★	0.33	2212	**250**		•	•	•			
	4376	★	0.38	2212	**250**		•	•	•			
	3803		0.44	2212	**250**		•	•	•			
	3310	★	0.51	2212	**250**		•	•	•			
	2986		0.56	2212	**250**		•	•	•			
K.38-Z.28	**2797**		0.6	2212	**250**		•					
2212 lb in	**2359**	★	0.71	2212	**250**		•	•				
	2094		0.8	2212	**250**		•	•				
	1836		0.92	2212	**250**		•	•	•			
	1643	★	1	2212	**250**		•	•	•			
	1458		1.2	2212	**250**		•	•	•			
	1278	★	1.3	2212	**250**		•	•	•			
	1124		1.5	2212	**250**		•	•	•			
	1015	★	1.7	2212	**250**		•	•	•	•		
	884		1.9	2212	**250**		•	•	•			
	794	★	2.1	2212	**250**		•	•	•			
	717		2.3	2212	**250**		•	•	•	•		
	650	★	2.6	2212	**250**		•	•	•	•		
	592		2.8	2212	**250**		•	•	•	•		
	523	★	3.2	2212	**250**		•	•	•	•		
	483		3.5	2212	**250**		•	•	•	•		
	416		4	2212	**250**		•	•	•	•		
	378		4.4	2212	**250**		•	•	•	•		
	344		4.9	2212	**250**		•	•	•	•		
	312		5.4	2212	**250**		•	•	•	•		
	284		5.9	2212	**250**		•	•	•	•		
	251		6.7	2212	**250**		•	•	•	•		
	231		7.3	2212	**250**		•	•	•	•		
	199		8.4	2212	**250**		•	•	•	•		
	181		9.3	2212	**250**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230
					Size					
						56C		140TC	180TC	
					63	71	80	90	100	112
K.38	**179.13** ★	9.8	2212	**250**	•	•	•			
	159.04	11	2212	**250**	•	•	•			
2212 lb in	**139.43** ★	12.6	2212	**250**	•	•	•	•		
	124.78	14	2212	**250**	•	•	•	•		
	110.75 ★	15.8	2212	**250**	•	•	•	•		
	97.05	18	2212	**250**	•	•	•	•		
	85.33 ★	21	2212	**250**	•	•	•	•		
	77.09	23	2212	**250**	•	•	•	•		
	67.18 ★	26	2212	**250**	•	•	•	•		
	60.33	29	2212	**250**	•	•	•	•		
	54.47 ★	32	2212	**250**	•	•	•	•		
	49.38	35	2212	**250**	•	•	•	•		
	44.94 ★	39	2212	**250**	•	•	•	•		
	39.73	44	2212	**250**	•	•	•	•		
	36.69 ★	48	2212	**250**	•	•	•	•		
	31.59	55	2212	**250**	•	•	•	•		
	28.72 ★	61	2212	**250**	•	•	•	•		
	26.9 ★	65	1911	**216**	•	•	•	•		
	24.16	72	1849	**209**	•	•	•	•		
	21.81 ★	80	1796	**203**	•	•	•	•		
	19.78	88	1743	**197**	•	•	•	•		
	17.99 ★	97	1690	**191**	•	•	•	•		
	15.91	110	1628	**184**	•	•	•	•		
	14.69 ★	119	1593	**180**	•	•	•	•	•	•
	12.65	138	1522	**172**	•	•	•	•	•	•
	11.5 ★	152	1478	**167**	•	•	•	•	•	•
	10.72 ★	163	1407	**159**	•	•	•	•	•	•
	9.72	180	1407	**159**	•	•	•	•	•	•
	8.85 ★	198	1407	**159**	•	•	•	•	•	•
	7.82	224	1407	**159**	•	•	•	•	•	•
	7.22 ★	242	1407	**159**	•	•	•	•	•	•
	6.22	281	1345	**152**	•	•	•	•	•	•
	5.65 ★	310	1309	**148**	•	•	•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
					Size						
	[-]	[rpm]	[lb in]	[Nm]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132
K.48-D.28	**13135**	0.13	3981	**450**		•					
3981 lb in	**11332** ★	0.15	3981	**450**		•	•				
	9735	0.17	3981	**450**		•	•				
	8963 ★	0.19	3981	**450**		•	•	•			
	8148	0.21	3981	**450**		•	•	•			
	7212 ★	0.23	3981	**450**		•	•	•			
	6041	0.28	3981	**450**		•	•	•			
	5151 ★	0.33	3981	**450**		•	•	•			
	4378 ★	0.38	3981	**450**		•	•	•			
	3805	0.44	3981	**450**		•	•	•			
	3312 ★	0.51	3981	**450**		•	•	•			
	2987	0.56	3981	**450**		•	•	•			
K.48-Z.28	**2798**	0.6	3981	**450**		•					
3981 lb in	**2360** ★	0.71	3981	**450**		•	•				
	2095	0.8	3981	**450**		•	•				
	1837 ★	0.92	3981	**450**		•	•	•			
	1644	1	3981	**450**		•	•	•			
	1459 ★	1.2	3981	**450**		•	•	•			
	1279	1.3	3981	**450**		•	•	•			
	1124 ★	1.5	3981	**450**		•	•	•			
	1015	1.7	3981	**450**		•	•	•	•		
	885 ★	1.9	3981	**450**		•	•	•			
	795	2.1	3981	**450**		•	•	•			
	717 ★	2.3	3981	**450**		•	•	•	•		
	651	2.6	3981	**450**		•	•	•	•		
	592 ★	2.8	3981	**450**		•	•	•	•		
	523	3.2	3981	**450**		•	•	•	•		
	483 ★	3.5	3981	**450**		•	•	•	•		
	416	4	3981	**450**		•	•	•	•		
	378 ★	4.4	3981	**450**		•	•	•	•		
	344 ★	4.9	3981	**450**		•	•	•	•		
	312	5.4	3981	**450**		•	•	•	•		
	284 ★	5.9	3981	**450**		•	•	•	•		
	251	6.7	3981	**450**		•	•	•	•		
	232 ★	7.3	3981	**450**		•	•	•	•		
	199	8.4	3981	**450**		•	•	•	•		
	181 ★	9.3	3981	**450**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230
					Size					
						56C		140TC	180TC	
					63	71	80	90	100	112
K.48	**169.53** ★	10.3	3981	**450**	•	•	•			
	150.76	11.6	3981	**450**	•	•	•			
3981 lb in	**130.78** ★	13.4	3981	**450**	•	•	•	•		
	122.19	14.3	3981	**450**	•	•	•	•		
	107.47 ★	16.3	3981	**450**	•	•	•	•		
	94.12	18.6	3981	**450**	•	•	•	•	•	
	83.25 ★	21	3981	**450**	•	•	•	•	•	•
	75.45	23	3981	**450**	•	•	•	•	•	•
	66.6 ★	26	3981	**450**	•	•	•	•	•	•
	60.08	29	3981	**450**	•	•	•	•	•	•
	54.49 ★	32	3981	**450**	•	•	•	•	•	•
	49.65	35	3981	**450**	•	•	•	•	•	•
	45.41 ★	39	3981	**450**	•	•	•	•	•	•
	40.6	43	3981	**450**	•	•	•	•	•	•
	37.28 ★	47	3981	**450**	•	•	•	•	•	•
	33.6	52	3981	**450**	•	•	•	•	•	•
	28.9 ★	61	3981	**450**	•	•	•	•	•	•
	27.55 ★	64	3981	**450**	•	•	•	•	•	•
	24.85	70	3981	**450**	•	•	•	•	•	•
	22.54 ★	78	3981	**450**	•	•	•	•	•	•
	20.54	85	3981	**450**	•	•	•	•	•	•
	18.78 ★	93	3981	**450**	•	•	•	•	•	•
	16.79	104	3981	**450**	•	•	•	•	•	•
	15.42 ★	113	3981	**450**	•	•	•	•	•	•
	13.9	126	3893	**440**	•	•	•	•	•	•
	11.95 ★	146	3716	**420**	•	•	•	•	•	•
	11.35 ★	154	2575	**291**	•	•	•	•	•	•
	10.15	172	2513	**284**	•	•	•	•	•	•
	9.32 ★	188	2451	**277**	•	•	•	•	•	•
	8.4	208	2371	**268**	•	•	•	•	•	•
	7.22 ★	242	2265	**256**	•	•	•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio		n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]						
						3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
						Size						
							56C		140TC	180TC		210TC
	[-]		[rpm]	[lb in]	[Nm]	63	71	80	90	100	112	132
K.68-D.28	**20103**		0.08	7255	**820**		•					
7255 lb in	**17343**	★	0.1	7255	**820**		•	•				
	14900		0.11	7255	**820**		•	•				
	13717	★	0.12	7255	**820**		•	•	•			
	12470		0.14	7255	**820**		•	•	•			
	11038	★	0.15	7255	**820**		•	•	•			
	9245		0.18	7255	**820**		•	•	•			
	7883	★	0.21	7255	**820**		•	•	•			
	6700	★	0.25	7255	**820**		•	•	•			
	5823		0.29	7255	**820**		•	•	•			
	5068	★	0.33	7255	**820**		•	•	•			
	4572		0.37	7255	**820**		•	•	•			
K.68-Z.28	**4282**		0.39	7255	**820**		•					
7255 lb in	**3611**	★	0.47	7255	**820**		•	•				
	3206		0.52	7255	**820**		•	•				
	2811	★	0.6	7255	**820**		•	•	•			
	2515		0.67	7255	**820**		•	•	•			
	2233	★	0.75	7255	**820**		•	•	•			
	1957		0.86	7255	**820**		•	•	•			
	1720	★	0.98	7255	**820**		•	•	•			
	1554		1.1	7255	**820**		•	•	•	•		
	1354	★	1.2	7255	**820**		•	•	•			
	1216		1.4	7255	**820**		•	•	•			
	1098	★	1.5	7255	**820**		•	•	•	•		
	996		1.7	7255	**820**		•	•	•	•		
	906	★	1.9	7255	**820**		•	•	•	•		
	801		2.1	7255	**820**		•	•	•	•		
	740	★	2.3	7255	**820**		•	•	•	•		
	637		2.6	7255	**820**		•	•	•	•		
	579	★	2.9	7255	**820**		•	•	•	•		
	526	★	3.2	7255	**820**		•	•	•	•		
	477		3.5	7255	**820**		•	•	•	•		
	434	★	3.9	7255	**820**		•	•	•	•		
	384		4.4	7255	**820**		•	•	•	•		
	354	★	4.7	7255	**820**		•	•	•	•		
	305		5.5	7255	**820**		•	•	•	•		
	277	★	6.1	7255	**820**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
					Size						
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132
K.68	**243.72**	7.2	7255	**820**	•	•	•				
	215.68 ★	8.1	7255	**820**	•	•	•	•			
7255 lb in	**196.07**	8.9	7255	**820**	•	•	•	•			
	176.14 ★	9.9	7255	**820**	•	•	•	•			
	150.98	11.6	7255	**820**	•	•	•	•	•		
	136.6 ★	12.8	7255	**820**	•	•	•	•	•	•	
	126.09	13.9	7255	**820**	•	•	•	•	•	•	
	109.64 ★	16	7255	**820**	•	•	•	•	•	•	•
	99.55	17.6	7255	**820**	•	•	•	•	•	•	•
	90.89 ★	19.3	7255	**820**	•	•	•	•	•	•	•
	83.4	21	7255	**820**	•	•	•	•	•	•	•
	76.84 ★	23	7255	**820**	•	•	•	•	•	•	•
	69.78	25	7255	**820**	•	•	•	•	•	•	•
	63.57 ★	28	7255	**820**	•	•	•	•	•	•	•
	58.23	30	7255	**820**	•	•	•	•	•	•	•
	51.96 ★	34	7255	**820**	•	•	•	•	•	•	•
	46.37	38	7255	**820**			•	•	•	•	•
	39.39	44	7255	**820**			•	•	•	•	•
	32.78 ★	53	7255	**820**			•	•	•	•	•
	30.38	58	7255	**820**	•	•	•	•	•	•	•
	27.99 ★	63	7255	**820**	•	•	•	•	•	•	•
	25.42	69	7255	**820**	•	•	•	•	•	•	•
	23.16 ★	76	7255	**820**	•	•	•	•	•	•	•
	21.22	82	7255	**820**	•	•	•	•	•	•	•
	18.93 ★	92	7255	**820**	•	•	•	•	•	•	•
	16.89	104	7255	**820**			•	•	•	•	•
	14.35	122	7184	**812**			•	•	•	•	•
	11.94 ★	147	6795	**768**			•	•	•	•	•
	11.41	153	3840	**434**	•	•	•	•	•	•	•
	10.4 ★	168	3734	**422**	•	•	•	•	•	•	•
	9.52	184	3636	**411**	•	•	•	•	•	•	•
	8.5 ★	206	3513	**397**	•	•	•	•	•	•	•
	7.58	231	3389	**383**			•	•	•	•	•
	6.44	272	3229	**365**			•	•	•	•	•
	5.36 ★	326	3052	**345**			•	•	•	•	•

4

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio		n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]						
						3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
						Size						
							56C		140TC	180TC		210TC
	[-]		[rpm]	[lb in]	[Nm]	63	71	80	90	100	112	132
K.88-D.28	**24920**		0.07	14599	**1650**		•					
14599 lb in	**21499**	★	0.08	14599	**1650**		•	•				
	18470		0.09	14599	**1650**		•	•				
	17005	★	0.1	14599	**1650**		•	•	•			
	15459		0.11	14599	**1650**		•	•	•			
	13683	★	0.12	14599	**1650**		•	•	•			
	11460		0.15	14599	**1650**		•	•	•			
	9772	★	0.17	14599	**1650**		•	•	•			
	8306	★	0.2	14599	**1650**		•	•	•			
	7218		0.23	14599	**1650**		•	•	•			
	6283	★	0.27	14599	**1650**		•	•	•			
	5667		0.3	14599	**1650**		•	•	•			
K.88-Z.28	**5309**		0.32	14599	**1650**		•					
14599 lb in	**4477**	★	0.38	14599	**1650**		•	•				
	3975		0.42	14599	**1650**		•	•				
	3485	★	0.48	14599	**1650**		•	•	•			
	3118		0.54	14599	**1650**		•	•	•			
	2768	★	0.61	14599	**1650**		•	•	•			
	2426		0.69	14599	**1650**		•	•	•			
	2133	★	0.79	14599	**1650**		•	•	•			
	1926		0.87	14599	**1650**		•	•	•	•		
	1679	★	1	14599	**1650**		•	•	•			
	1508		1.1	14599	**1650**		•	•	•			
	1361	★	1.2	14599	**1650**		•	•	•	•		
	1234		1.4	14599	**1650**		•	•	•	•		
	1123	★	1.5	14599	**1650**		•	•	•	•		
	993		1.7	14599	**1650**		•	•	•	•		
	917	★	1.8	14599	**1650**		•	•	•	•		
	789		2.1	14599	**1650**		•	•	•	•		
	718	★	2.3	14599	**1650**		•	•	•	•		
	652	★	2.6	14599	**1650**		•	•	•	•		
	591		2.8	14599	**1650**		•	•	•	•		
	538	★	3.1	14599	**1650**		•	•	•	•		
	476		3.5	14599	**1650**		•	•	•	•		
	439	★	3.8	14599	**1650**		•	•	•	•		
	378		4.4	14599	**1650**		•	•	•	•		
	344	★	4.9	14599	**1650**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]							
					3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867
					Size							
						56C		140TC	180TC		210TC	250TC
	[-]	[rpm]	[lb in]	[Nm]	63	71	80	90	100	112	132	160
K.88	**302.68** ★	5.8	13625	**1540**	•	•	•	•				
	272.95	6.4	14599	**1650**	•	•	•	•				
14599 lb in	**246.13** ★	7.1	14599	**1650**	•	•	•	•				
	215.25	8.1	14599	**1650**	•	•	•	•	•			
	193.24 ★	9.1	14599	**1650**	•	•	•	•	•	•		
	176.5	9.9	14599	**1650**	•	•	•	•	•	•		
	156.63 ★	11.2	14599	**1650**	•	•	•	•	•	•	•	
	144.58	12.1	14599	**1650**	•	•	•	•	•	•	•	
	130.77 ★	13.4	14599	**1650**	•	•	•	•	•	•	•	
	120.42	14.5	14599	**1650**	•	•	•	•	•	•	•	
	111.37 ★	15.7	14599	**1650**	•	•	•	•	•	•	•	•
	103.38	16.9	14599	**1650**	•	•	•	•	•	•	•	•
	91.22 ★	19.2	14599	**1650**	•	•	•	•	•	•	•	•
	84.21	21	14599	**1650**	•	•	•	•	•	•	•	•
	75.45 ★	23	14599	**1650**	•	•	•	•	•	•	•	•
	69.57	25	14599	**1650**			•	•	•	•	•	•
	58.37	30	14599	**1650**			•	•	•	•	•	•
	49.8 ★	35	14599	**1650**			•	•	•	•	•	•
	41.5	42	14599	**1650**					•	•	•	•
	34.4 ★	51	14599	**1650**					•	•	•	•
	30.87 ★	57	14599	**1650**	•	•	•	•	•	•	•	•
	28.5	61	14599	**1650**	•	•	•	•	•	•	•	•
	25.53 ★	69	14599	**1650**	•	•	•	•	•	•	•	•
	23.54	74	14599	**1650**			•	•	•	•	•	•
	19.75	89	13909	**1572**			•	•	•	•	•	•
	16.85 ★	104	13254	**1498**			•	•	•	•	•	•
	14.04	125	12537	**1417**					•	•	•	•
	11.64 ★	150	11847	**1339**					•	•	•	•
	11.21	156	7131	**806**			•	•	•	•	•	•
	9.41	186	6760	**764**			•	•	•	•	•	•
	8.03 ★	218	6441	**728**			•	•	•	•	•	•
	6.69	262	6096	**689**					•	•	•	•
	5.54 ★	316	5760	**651**					•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867
					Size							
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
K.108-D38	**58914**	0.03	26543	**3000**	•	•	•					
	52306	0.03	26543	**3000**	•	•	•					
26543 lb in	**45858**	0.04	26543	**3000**	•	•	•	•				
	41037	0.04	26543	**3000**	•	•	•	•				
	36423	0.05	26543	**3000**	•	•	•	•				
	31918	0.05	26543	**3000**	•	•	•	•				
	28064	0.06	26543	**3000**	•	•	•	•				
	25354	0.07	26543	**3000**	•	•	•	•				
	22093	0.08	26543	**3000**	•	•	•	•				
	19842	0.09	26543	**3000**	•	•	•	•				
	17913	0.1	26543	**3000**	•	•	•	•				
	16241	0.11	26543	**3000**	•	•	•	•				
	14778	0.12	26543	**3000**	•	•	•	•				
	13066	0.13	26543	**3000**	•	•	•	•				
K.108-Z38	**13556**	0.13	26543	**3000**	•	•	•					
	12055	0.15	26543	**3000**	•	•	•					
26543 lb in	**10457**	0.17	26543	**3000**	•	•	•	•				
	9771	0.18	26543	**3000**	•	•	•	•				
	8593	0.2	26543	**3000**	•	•	•	•				
	7526	0.23	26543	**3000**	•	•	•	•	•			
	6657	0.26	26543	**3000**	•	•	•	•	•			
	6033	0.29	26543	**3000**	•	•	•	•	•			
	5326	0.33	26543	**3000**	•	•	•	•	•			
	4804	0.36	26543	**3000**	•	•	•	•	•			
	4357	0.4	26543	**3000**	•	•	•	•	•			
	3970	0.44	26543	**3000**	•	•	•	•	•			
	3631	0.48	26543	**3000**	•	•	•	•	•			
	3247	0.54	26543	**3000**	•	•	•	•	•			
	2981	0.59	26543	**3000**	•	•	•	•	•			
	2687	0.65	26543	**3000**	•	•	•	•	•			
	2311	0.76	26543	**3000**	•	•	•	•	•			
	2060	0.85	26543	**3000**	•	•	•	•	•			
	1892	0.92	26543	**3000**	•	•	•	•	•			
	1705	1.03	26543	**3000**	•	•	•	•	•			
	1466	1.19	26543	**3000**	•	•	•	•	•			
K.108-Z48	**1343**	1.3	26543	**3000**	•	•	•	•	•	•		
	1233	1.42	26543	**3000**	•	•	•	•	•	•		
3000 lb in	**1136**	1.54	26543	**3000**	•	•	•	•	•	•		
	1031	1.7	26543	**3000**	•	•	•	•	•	•		
	940	1.86	26543	**3000**	•	•	•	•	•	•		
	861	2.03	26543	**3000**	•	•	•	•	•	•		
	768	2.28	26543	**3000**	•	•	•	•	•	•		
	685	2.55	26543	**3000**			•	•	•	•		
	582	3.01	26543	**3000**			•	•	•	•		
	485	3.61	26543	**3000**			•	•	•	•		
	477	3.67	26543	**3000**	•	•	•	•	•	•		
	426	4.11	26543	**3000**			•	•	•	•		
	361	4.85	26543	**3000**			•	•	•	•		
	301	5.81	26543	**3000**			•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 5 / 44 — Size 80	10 / 88 — 140TC 90	20 / 177 — 180TC 100	26 / 230 — 112	61 / 540 — 210TC 132	98 / 867 — 250TC 160	198 / 1752 — 180
K. 108	**307.24**	5.7	25711	**2906**	•	•					
	278.10 ★	6.3	25039	**2830**	•	•					
26543 lb in	**243.47**	7.2	26543	**3000**	•	•	•				
	219.64 ★	8	26543	**3000**	•	•	•	•			
	201.11	8.7	26543	**3000**	•	•	•	•			
	178.90 ★	9.8	26543	**3000**	•	•	•	•	•		
	163.51	10.7	26543	**3000**	•	•	•	•	•		
	150.31 ★	11.6	26543	**3000**	•	•	•	•	•		
	138.87	12.6	26543	**3000**	•	•	•	•	•		
	128.86 ★	13.6	26543	**3000**	•	•	•	•	•	•	
	120.03	14.6	26543	**3000**	•	•	•	•	•	•	
	108.52 ★	16.1	26543	**3000**	•	•	•	•	•	•	•
	99.90	17.5	26543	**3000**	•	•	•	•	•	•	•
	89.85 ★	19.5	26543	**3000**	•	•	•	•	•	•	•
	82.90	21	26543	**3000**	•	•	•	•	•	•	•
	70.24	25	26543	**3000**	•	•	•	•	•	•	•
	61.22 ★	29	26543	**3000**	•	•	•	•	•	•	•
	52.08	34	26543	**3000**			•	•	•	•	•
	44.44 ★	39	26543	**3000**			•	•	•	•	•
	36.44 ★	48	25057	**2832**			•	•	•	•	•
	33.87 ★	52	26543	**3000**	•	•	•	•	•	•	•
	31.25	56	26543	**3000**	•	•	•	•	•	•	•
	26.48	66	25499	**2882**	•	•	•	•	•	•	•
	23.08 ★	76	24455	**2764**	•	•	•	•	•	•	•
	19.63	89	23287	**2632**			•	•	•	•	•
	16.75 ★	104	22199	**2509**			•	•	•	•	•
	13.74 ★	127	20898	**2362**			•	•	•	•	•
	12.90 ★	136	17147	**1938**	•	•	•	•	•	•	•
	10.97	160	16324	**1845**			•	•	•	•	•
	9.36 ★	187	15563	**1759**			•	•	•	•	•
	7.68 ★	228	14652	**1656**			•	•	•	•	•

4

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867
					Size							
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
K.128-D38	**56640** ★	0.03	41584	**4700**	•	•	•					
	50287	0.03	41584	**4700**	•	•	•					
41584 lb in	**44087** ★	0.04	41584	**4700**	•	•	•	•				
	39453	0.04	41584	**4700**	•	•	•	•				
	35017 ★	0.05	41584	**4700**	•	•	•	•				
	30686	0.06	41584	**4700**	•	•	•	•				
	26980 ★	0.06	41584	**4700**	•	•	•	•				
	24375	0.07	41584	**4700**	•	•	•	•				
	21240 ★	0.08	41584	**4700**	•	•	•	•				
	19076	0.09	41584	**4700**	•	•	•	•				
	17221 ★	0.1	41584	**4700**	•	•	•	•				
	15614	0.11	41584	**4700**	•	•	•	•				
	14208 ★	0.12	41584	**4700**	•	•	•	•				
	12562	0.14	41584	**4700**	•	•	•	•				
K.128-Z38	**13032** ★	0.13	41584	**4700**	•	•	•					
	11590	0.15	41584	**4700**	•	•	•					
41584 lb in	**10054** ★	0.17	41584	**4700**	•	•	•	•				
	9394	0.19	41584	**4700**	•	•	•	•				
	8262 ★	0.21	41584	**4700**	•	•	•	•				
	7236	0.24	41584	**4700**	•	•	•	•	•			
	6400 ★	0.27	41584	**4700**	•	•	•	•	•			
	5800	0.3	41584	**4700**	•	•	•	•	•			
	5120 ★	0.34	41584	**4700**	•	•	•	•	•			
	4619	0.38	41584	**4700**	•	•	•	•	•			
	4189 ★	0.42	41584	**4700**	•	•	•	•	•			
	3817	0.46	41584	**4700**	•	•	•	•	•			
	3491 ★	0.5	41584	**4700**	•	•	•	•	•			
	3121	0.56	41584	**4700**	•	•	•	•	•			
	2866 ★	0.61	41584	**4700**	•	•	•	•	•			
	2583	0.68	41584	**4700**	•	•	•	•	•			
	2221 ★	0.79	41584	**4700**	•	•	•	•	•			
	1981	0.88	41584	**4700**	•	•	•	•	•			
	1819 ★	0.96	41584	**4700**	•	•	•	•	•			
	1639	1.07	41584	**4700**	•	•	•	•	•			
	1410 ★	1.24	41584	**4700**	•	•	•	•	•			
K.128-Z48	**1400**	1.25	41584	**4700**	•	•	•	•	•	•		
	1284	1.36	41584	**4700**	•	•	•	•	•	•		
41584 lb in	**1183**	1.48	41584	**4700**	•	•	•	•	•	•		
	1074	1.63	41584	**4700**	•	•	•	•	•	•		
	979	1.79	41584	**4700**	•	•	•	•	•	•		
	897	1.95	41584	**4700**	•	•	•	•	•	•		
	800	2.19	41584	**4700**	•	•	•	•	•	•		
	714	2.45	41584	**4700**			•	•	•	•		
	606	2.89	41584	**4700**			•	•	•	•		
	505	3.47	41584	**4700**			•	•	•	•		
	497	3.52	41584	**4700**	•	•	•	•	•	•		
	443	3.95	41584	**4700**			•	•	•	•		
	377	4.64	41584	**4700**			•	•	•	•		
	313	5.59	41584	**4700**			•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752	291 / 2575
					Size							
					140TC	180TC		210TC	250TC		280TC	320TC
					90	100	112	132	160	180	200	225
K.128	**295.38** ★	5.9	41584	**4700**	•	•	•					
	270.9	6.5	41584	**4700**	•	•	•					
41584 lb in	**242.02** ★	7.2	41584	**4700**	•	•	•	•				
	221.64	7.9	41584	**4700**	•	•	•	•				
	204.18 ★	8.6	41584	**4700**	•	•	•	•				
	189.04	9.3	41584	**4700**	•	•	•	•				
	175.8 ★	10	41584	**4700**	•	•	•	•	•			
	164.11	10.7	41584	**4700**	•	•	•	•	•			
	146.84 ★	11.9	41584	**4700**	•	•	•	•	•	•	•	
	136.06	12.9	41584	**4700**	•	•	•	•	•	•	•	
	124.73 ★	14	41584	**4700**	•	•	•	•	•	•	•	•
	114.34	15.3	41584	**4700**	•	•	•	•	•	•	•	•
	97.44	18	41584	**4700**	•	•	•	•	•	•	•	•
	85.98 ★	20	41584	**4700**	•	•	•	•	•	•	•	•
	73.18	24	41584	**4700**		•	•	•	•	•	•	•
	63.41 ★	28	41584	**4700**		•	•	•	•	•	•	•
	53.36 ★	33	41584	**4700**		•	•	•	•	•	•	•
	48.14	36	41584	**4700**				•	•	•	•	•
	41.38 ★	42	41584	**4700**				•	•	•	•	•
	39.19 ★	45	41584	**4700**	•	•	•	•	•	•	•	•
	35.92	49	41584	**4700**	•	•	•	•	•	•	•	•
	30.61	57	41584	**4700**	•	•	•	•	•	•	•	•
	27.02 ★	65	41584	**4700**	•	•	•	•	•	•	•	•
	22.99	76	41584	**4700**		•	•	•	•	•	•	•
	19.92 ★	88	41584	**4700**		•	•	•	•	•	•	•
	16.76 ★	104	41584	**4700**		•	•	•	•	•	•	•
	15.13	116	40929	**4626**				•	•	•	•	•
	13 ★	135	39098	**4419**				•	•	•	•	•
	12.56	139	28463	**3217**		•	•	•	•	•	•	•
	10.88 ★	161	27260	**3081**		•	•	•	•	•	•	•
	9.16 ★	191	25871	**2924**		•	•	•	•	•	•	•
	8.26	212	25074	**2834**				•	•	•	•	•
	7.1 ★	246	23951	**2707**				•	•	•	•	•

4

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867
					Size							
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
K.148-D38	**58692**	0.03	70782	**8000**	•	•	•					
	52109	0.03	70782	**8000**	•	•	•					
70782 lb in	**45684**	0.04	70782	**8000**	•	•	•	•				
	40882	0.04	70782	**8000**	•	•	•	•				
	36286	0.05	70782	**8000**	•	•	•	•				
	31797	0.06	70782	**8000**	•	•	•	•				
	27958	0.06	70782	**8000**	•	•	•	•				
	25258	0.07	70782	**8000**	•	•	•	•				
	22009	0.08	70782	**8000**	•	•	•	•				
	19767	0.09	70782	**8000**	•	•	•	•				
	17845	0.1	70782	**8000**	•	•	•	•				
	16180	0.11	70782	**8000**	•	•	•	•				
	14722	0.12	70782	**8000**	•	•	•	•				
	13017	0.13	70782	**8000**	•	•	•	•				
K.148-Z38	**13505**	0.13	70782	**8000**	•	•	•					
	12009	0.15	70782	**8000**	•	•	•					
70782 lb in	**10418**	0.17	70782	**8000**	•	•	•	•				
	9734	0.18	70782	**8000**	•	•	•	•				
	8561	0.2	70782	**8000**	•	•	•	•				
	7498	0.23	70782	**8000**	•	•	•	•	•			
	6632	0.26	70782	**8000**	•	•	•	•	•			
	6010	0.29	70782	**8000**	•	•	•	•	•			
	5305	0.33	70782	**8000**	•	•	•	•	•			
	4786	0.37	70782	**8000**	•	•	•	•	•			
	4341	0.4	70782	**8000**	•	•	•	•	•			
	3955	0.44	70782	**8000**	•	•	•	•	•			
	3617	0.48	70782	**8000**	•	•	•	•	•			
	3234	0.54	70782	**8000**	•	•	•	•	•			
	2970	0.59	70782	**8000**	•	•	•	•	•			
	2677	0.65	70782	**8000**	•	•	•	•	•			
	2302	0.76	70782	**8000**	•	•	•	•	•			
	2053	0.85	70782	**8000**	•	•	•	•	•			
	1885	0.93	70782	**8000**	•	•	•	•	•			
	1699	1.03	70782	**8000**	•	•	•	•	•			
	1466	1.2	70782	**8000**	•	•	•	•	•			
K.148-Z68	**1392**	1.26	70782	**8000**	•	•	•	•	•	•	•	
	1247	1.4	70782	**8000**	•	•	•	•	•	•	•	
70782 lb in	**1150**	1.52	70782	**8000**			•	•	•	•	•	
	965	1.81	70782	**8000**			•	•	•	•	•	
	823	2.13	70782	**8000**			•	•	•	•	•	
	686	2.55	70782	**8000**					•	•	•	
	569	3.08	70782	**8000**					•	•	•	
	502	3.49	70782	**8000**			•	•	•	•	•	
	428	4.09	70782	**8000**			•	•	•	•	•	
	357	4.9	70782	**8000**					•	•	•	
	296	5.91	70782	**8000**					•	•	•	

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 20 / 177 — Size 180TC 100	26 / 230 — 112	61 / 540 — 210TC 132	98 / 867 — 250TC 160	198 / 1752 — 180	198 / 1752 — 280TC 200	291 / 2575 — 320TC 225	356 / 3150 — 360 TC 250
K.148	**306.08**	5.7	70782	**8000**	•	•						
	274.42 ★	6.4	70782	**8000**	•	•	•					
70782 lb in	**251.55**	7	70782	**8000**	•	•	•					
	231.95 ★	7.5	70782	**8000**	•	•	•					
	214.96	8.1	70782	**8000**	•	•	•					
	204.38 ★	8.6	70782	**8000**	•	•	•	•				
	191.02	9.2	70782	**8000**	•	•	•	•				
	168.5 ★	10.4	70782	**8000**	•	•	•	•	•	•		
	158.93	11	70782	**8000**	•	•	•	•	•	•		
	142.41 ★	12.3	70782	**8000**	•	•	•	•	•	•	•	
	131.49	13.3	70782	**8000**	•	•	•	•	•	•	•	
	112.35	15.6	70782	**8000**	•	•	•	•	•	•	•	•
	101.53 ★	17.2	70782	**8000**	•	•	•	•	•	•	•	•
	97.82	17.9	70782	**8000**		•	•	•	•	•	•	•
	84.61	21	70782	**8000**	•	•	•	•	•	•	•	•
	73.8 ★	24	70782	**8000**	•	•	•	•	•	•	•	•
	63.16 ★	28	70782	**8000**	•	•	•	•	•	•	•	•
	56.57	31	70782	**8000**			•	•	•	•	•	•
	47.91 ★	37	70782	**8000**			•	•	•	•	•	•
	41.38	42	70782	**8000**				•	•	•	•	•
	31.1 ★	56	70782	**8000**				•	•	•	•	•
	30.74	57	70782	**8000**		•	•	•	•	•	•	•
	26.58	66	70782	**8000**	•	•	•	•	•	•	•	•
	23.19 ★	75	70782	**8000**	•	•	•	•	•	•	•	•
	19.84 ★	88	70782	**8000**	•	•	•	•	•	•	•	•
	17.77	98	70782	**8000**			•	•	•	•	•	•
	15.05 ★	116	67269	**7603**			•	•	•	•	•	•
	13	135	64349	**7273**				•	•	•	•	•
	9.77 ★	179	59014	**6670**				•	•	•	•	•
	8.79	199	35214	**3980**			•	•	•	•	•	•
	7.44 ★	235	33489	**3785**			•	•	•	•	•	•
	6.43	272	32029	**3620**				•	•	•	•	•
	4.83 ★	362	29374	**3320**				•	•	•	•	•

4

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867
					Size							
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
K.168-D48	**60115** ★	0.03	119444	**13500**	•	•	•					
	53459	0.03	119444	**13500**	•	•	•					
119444 lb in	**46374** ★	0.04	119444	**13500**	•	•	•	•				
	43330	0.04	119444	**13500**	•	•	•	•				
	38109 ★	0.05	119444	**13500**	•	•	•	•				
	33375	0.05	119444	**13500**	•	•	•	•	•			
	29521 ★	0.06	119444	**13500**	•	•	•	•	•			
	26754	0.07	119444	**13500**	•	•	•	•	•			
	23617 ★	0.07	119444	**13500**	•	•	•	•	•			
	21304	0.08	119444	**13500**	•	•	•	•	•			
	19323 ★	0.09	119444	**13500**	•	•	•	•	•			
	17605	0.1	119444	**13500**	•	•	•	•	•			
	16102 ★	0.11	119444	**13500**	•	•	•	•	•			
	14397	0.12	119444	**13500**	•	•	•	•	•			
K.168-Z48	**14767**	0.12	119444	**13500**	•	•	•					
	13068 ★	0.13	119444	**13500**	•	•	•	•				
119444 lb in	**11880**	0.15	119444	**13500**	•	•	•	•				
	10673 ★	0.16	119444	**13500**	•	•	•	•				
	9148	0.19	119444	**13500**	•	•	•	•	•			
	8277 ★	0.21	119444	**13500**	•	•	•	•	•	•		
	7640	0.23	119444	**13500**	•	•	•	•	•	•		
	6643 ★	0.26	119444	**13500**	•	•	•	•	•	•		
	6032	0.29	119444	**13500**	•	•	•	•	•	•		
	5507 ★	0.32	119444	**13500**	•	•	•	•	•	•		
	5053	0.35	119444	**13500**	•	•	•	•	•	•		
	4656 ★	0.38	119444	**13500**	•	•	•	•	•	•		
	4228	0.41	119444	**13500**	•	•	•	•	•	•		
	3852 ★	0.45	119444	**13500**	•	•	•	•	•	•		
	3528	0.5	119444	**13500**	•	•	•	•	•	•		
	3148 ★	0.56	119444	**13500**	•	•	•	•	•	•		
	2810	0.62	119444	**13500**	•	•	•	•	•	•		
	2386	0.73	119444	**13500**	•	•	•	•	•	•		
	1986 ★	0.88	119444	**13500**	•	•	•	•	•	•		
	1955 ★	0.9	119444	**13500**	•	•	•	•	•	•		
	1745	1	119444	**13500**			•	•	•	•		
	1482	1.18	119444	**13500**			•	•	•	•		
	1233 ★	1.42	119444	**13500**			•	•	•	•		
K.168-Z68	**1033**	1.69	119444	**13500**			•	•	•	•	•	
	881	1.99	119444	**13500**			•	•	•	•	•	
119444 lb in	**735**	2.38	119444	**13500**					•	•	•	
	609	2.87	119444	**13500**					•	•	•	
	537	3.26	119444	**13500**			•	•	•	•	•	
	458	3.82	119444	**13500**			•	•	•	•	•	
	382	4.58	119444	**13500**					•	•	•	
	317	5.52	119444	**13500**					•	•	•	

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 61 / 540	98 / 867	198 / 1752	198 / 1752	291 / 2575	356 / 3150	580 / 5132	1290 / 11414
					Size							
					210TC	250TC		280TC	320TC	360TC		
					132	160	180	200	225	250	280	315
K.168	**287.95** ★	6.1	119444	**13500**	•							
	264.18	6.6	119444	**13500**	•							
119444 lb in	**243.8** ★	7.2	119444	**13500**	•							
	226.15	7.7	119444	**13500**	•							
	213.33 ★	8.2	119444	**13500**	•	•						
	199.54	8.8	119444	**13500**	•	•						
	177.43 ★	9.9	119444	**13500**	•	•	•	•				
	167.5	10.4	119444	**13500**	•	•	•	•				
	150.36 ★	11.6	119444	**13500**	•	•	•	•	•			
	138	12.7	119444	**13500**	•	•	•	•	•			
	119.09	14.7	119444	**13500**	•	•	•	•	•	•		
	104.18	16.8	119444	**13500**	•	•	•	•	•	•		
	90.6	19.3	119444	**13500**	•	•	•	•	•	•		
	79.49 ★	22	119444	**13500**	•	•	•	•	•	•		
	67.22 ★	26	119444	**13500**	•	•	•	•	•	•		
	60.99	29	119444	**13500**	•	•	•	•	•	•		
	53.18 ★	33	119444	**13500**	•	•	•	•	•	•		
	45.15	39	119444	**13500**		•	•	•	•	•		
	34.55 ★	51	119444	**13500**		•	•	•	•	•	•	
	32.53	54	119444	**13500**	•	•	•	•	•	•	•	
	28.54 ★	61	119444	**13500**	•	•	•	•	•	•	•	
	24.14 ★	72	119444	**13500**	•	•	•	•	•	•	•	
	21.9	80	115781	**13086**	•	•	•	•	•	•	•	
	19.09 ★	92	111065	**12553**	•	•	•	•	•	•	•	
	16.21	108	105695	**11946**		•	•	•	•	•	•	
	12.41 ★	141	97466	**11016**		•	•	•	•	•	•	
	11.67	150	61695	**6973**	•	•	•	•	•	•	•	
	10.17 ★	172	59182	**6689**	•	•	•	•	•	•	•	
	8.64	203	56324	**6366**		•	•	•	•	•	•	
	6.61 ★	265	51936	**5870**		•	•	•	•	•	•	

4

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867
					Size							
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
K.188-D68	**53767**	0.03	176954	**20000**	•	•	•					
	47582 ★	0.04	176954	**20000**	•	•	•	•				
176954 lb in	**43256**	0.04	176954	**20000**	•	•	•	•				
	38858 ★	0.05	176954	**20000**	•	•	•	•				
	33307	0.05	176954	**20000**	•	•	•	•	•			
	30135 ★	0.06	176954	**20000**	•	•	•	•	•			
	27817	0.06	176954	**20000**	•	•	•	•	•			
	24187 ★	0.07	176954	**20000**	•	•	•	•	•			
	21961	0.08	176954	**20000**	•	•	•	•	•			
	20052 ★	0.09	176954	**20000**	•	•	•	•	•			
	18398	0.1	176954	**20000**	•	•	•	•	•			
	16951 ★	0.1	176954	**20000**	•	•	•	•	•			
	15394	0.11	176954	**20000**	•	•	•	•	•			
	14024 ★	0.12	176954	**20000**	•	•	•	•	•			
	12847	0.14	176954	**20000**	•	•	•	•	•			
	11463 ★	0.15	176954	**20000**	•	•	•	•	•			
	10230	0.17	176954	**20000**			•	•	•			
	8689	0.2	176954	**20000**			•	•	•			
K.188-Z68	**9201** ★	0.19	176954	**20000**	•	•	•	•				
	8047	0.22	176954	**20000**	•	•	•	•	•			
176954 lb in	**7224** ★	0.24	176954	**20000**	•	•	•	•	•	•		
	6598	0.27	176954	**20000**	•	•	•	•	•	•		
	5855 ★	0.3	176954	**20000**	•	•	•	•	•	•	•	
	5405	0.32	176954	**20000**	•	•	•	•	•	•	•	
	4889 ★	0.36	176954	**20000**	•	•	•	•	•	•	•	
	4502	0.39	176954	**20000**	•	•	•	•	•	•	•	
	4163 ★	0.42	176954	**20000**	•	•	•	•	•	•	•	
	3865	0.45	176954	**20000**	•	•	•	•	•	•	•	
	3410 ★	0.51	176954	**20000**	•	•	•	•	•	•	•	
	3148	0.56	176954	**20000**	•	•	•	•	•	•	•	
	2821 ★	0.62	176954	**20000**	•	•	•	•	•	•	•	
	2601	0.67	176954	**20000**			•	•	•	•	•	
	2182	0.8	176954	**20000**			•	•	•	•	•	
	1862 ★	0.94	176954	**20000**			•	•	•	•	•	
	1551	1.1	176954	**20000**					•	•	•	
	1286 ★	1.4	176954	**20000**					•	•	•	
	1135	1.5	176954	**20000**			•	•	•	•	•	
	968 ★	1.8	176954	**20000**			•	•	•	•	•	
	807	2.2	176954	**20000**					•	•	•	
	669 ★	2.6	176954	**20000**					•	•	•	
K.188-Z88	**669** ★	2.6	176954	**20000**					•	•	•	•
	548 ★	3.2	176954	**20000**					•	•	•	•
176954 lb in	**503**	3.5	176954	**20000**					•	•	•	•
	429 ★	4.1	176954	**20000**					•	•	•	•
	352 ★	5	176954	**20000**					•	•	•	•
	321	5.5	176954	**20000**					•	•	•	•
	274 ★	6.4	176954	**20000**					•	•	•	•
	225 ★	7.8	176954	**20000**					•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

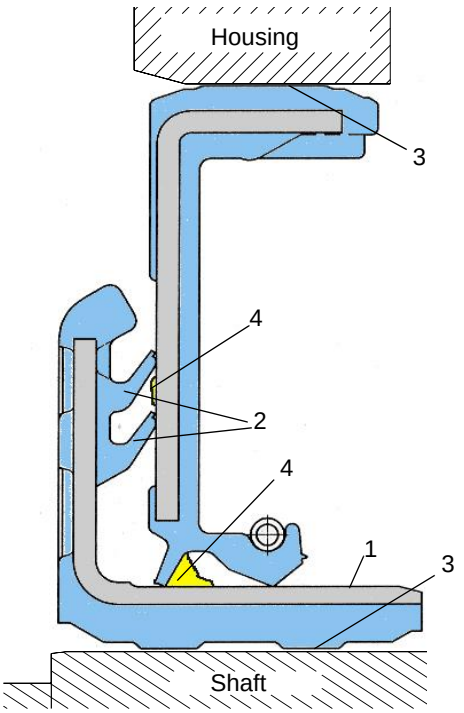
Legend / explanations see page 4 - 10
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]							
					61 / 540	98 / 867	198 / 1752	198 / 1752	291 / 2575	356 / 3150	580 / 5132	1290 / 11414
					Size							
					210TC	250TC		280TC	320TC	360TC		
	[-]	[rpm]	[lb in]	[Nm]	132	160	180	200	225	250	280	315
K. 188	**191.34**	9.1	176954	**20000**	•	•	•	•	•			
176954 lb in	**172.78**	10.1	176954	**20000**			•	•	•			
	161.92	10.8	176954	**20000**		•	•	•	•	•		
	139.08 ★	12.6	176954	**20000**		•	•	•	•	•		
	120.16	14.6	176954	**20000**	•	•	•	•	•	•	•	
	106.07	16.5	176954	**20000**	•	•	•	•	•	•	•	
	95.48 ★	18.3	176954	**20000**	•	•	•	•	•	•	•	
	79.23 ★	22	176954	**20000**	•	•	•	•	•	•	•	
	72.24	24	176954	**20000**	•	•	•	•	•	•	•	
	63.38 ★	28	176954	**20000**	•	•	•	•	•	•	•	
	54.47	32	176954	**20000**		•	•	•	•	•	•	•
	42.43 ★	41	176954	**20000**		•	•	•	•	•	•	•
	34.28 ★	51	176954	**20000**	•	•	•	•	•	•	•	
	28.45 ★	62	176954	**20000**	•	•	•	•	•	•	•	
	25.94	67	176954	**20000**	•	•	•	•	•	•	•	
	22.76 ★	77	176954	**20000**	•	•	•	•	•	•	•	
	19.56	89	176954	**20000**		•	•	•	•	•	•	•
	15.23 ★	115	168106	**19000**		•	•	•	•	•	•	•
	12.10 ★	145	154835	**17500**			•	•	•	•	•	•

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Quadrilip seals (optional)

Improvement of Sealing Quality K.38-168



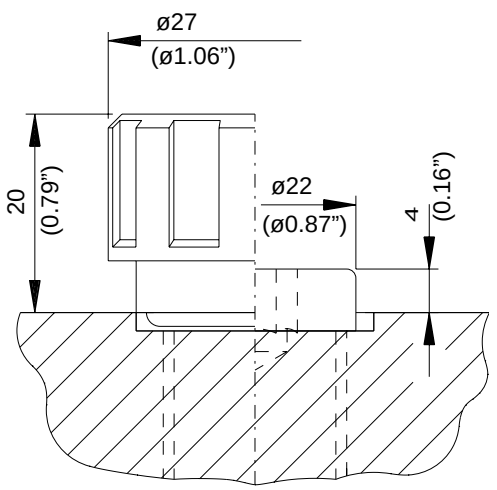
- Protected running surface for shaft seal **1**
- No risk of damage during assembly
- Additional seal-lips against dust **2**
- Separate sealing system prevents damage to the shaft through corrosion and dust
- Rubber coated inner ring and outer ring **3**
- Grease prevents dry run of lips of seals **4**

B.28, B.38 und K.188 double sealing optional.

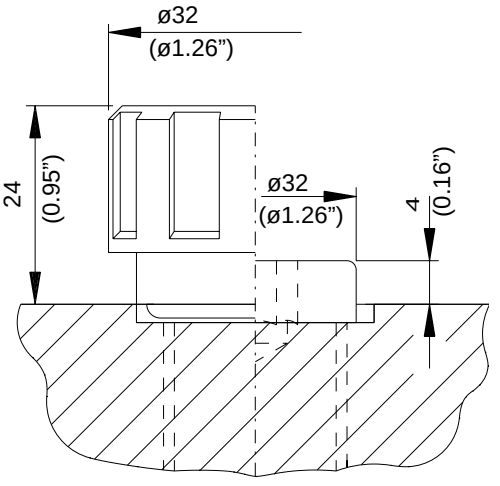
Breather Element

The position of the plug screw is shown in the dimension sheets for the horizontal mounting position (B3, B5). When running the gear box, in sizes K.48 ... K.188 a breather must replace the plug screw. The breather dimensions are as follows.
Please note that the breather plug must be inserted at other locations for other mounting positions.

K. 48 ... 128

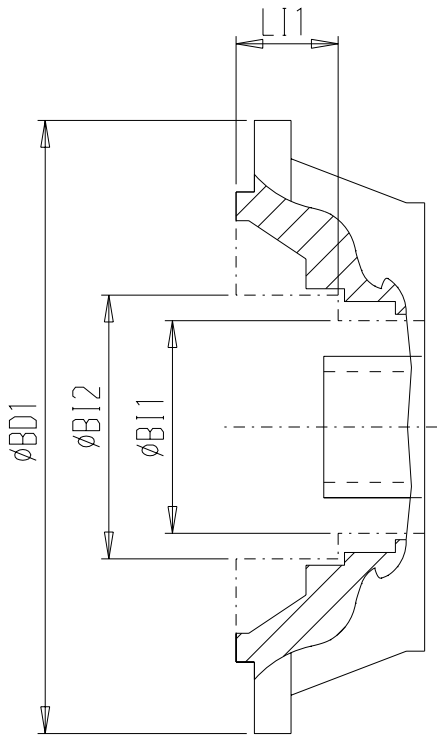


K. 148 ... 188



Flange mounted (A-Type)

Detail inner outline
Design reference for the appearance of the customer side e.g. for plug-in shaft at hollow shaft configuration.

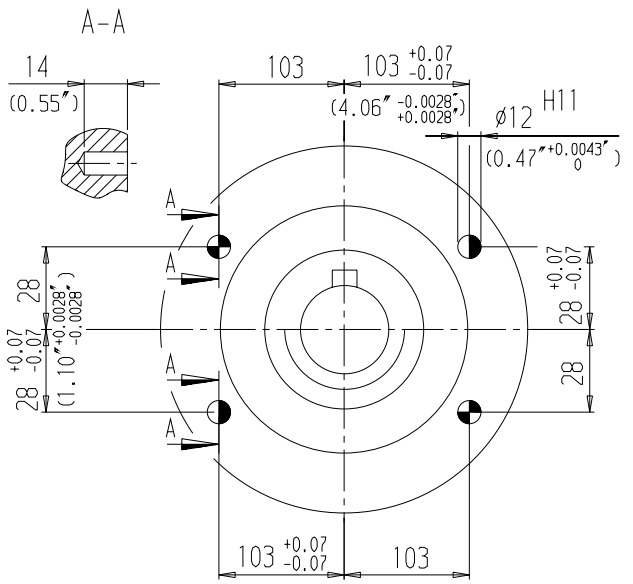


Types	øBD1		øBI1		øBI2		lI1	
	[*mm*]	[inch]	[*mm*]	[inch]	[*mm*]	[inch]	[*mm*]	[inch]
B.F28	*120*	4.72	*70*	2.76	*72*	2.84	*24*	0.95
B.F28	*160*	6.30	*70*	2.76	*103*	4.06	*8.5*	0.34
B.F38	*160*	6.30	*95*	3.74	*98*	3.86	*27*	1.06
B.F38	*200*	7.87	*84*	3.31	*90*	3.54	*22.5*	0.89
K.F38	*160*	6.30	*70*	2.76	*77*	3.03	*20*	0.79
K.F48	*200*	7.87	*84*	3.31	*90*	3.54	*22.5*	0.89
K.F68	*250*	9.84	*96*	3.78	*96*	3.78	-	-
K.F88	*300*	11.81	*126*	4.96	*138*	5.43	*31*	1.22
K.F108	*350*	13.78	*176*	6.93	*185*	7.28	*32*	1.26
K.F128	*450*	17.72	*226*	8.90	*234*	9.21	*38.5*	1.52
K.F148	*450*	17.72	*246*	9.69	*262*	10.31	*34*	1.34
K.F168	*550*	21.65	*296*	11.65	*313*	12.32	*39*	1.54
K . F188	*660*	25.98	*296*	11.65	*296*	11.65	-	-

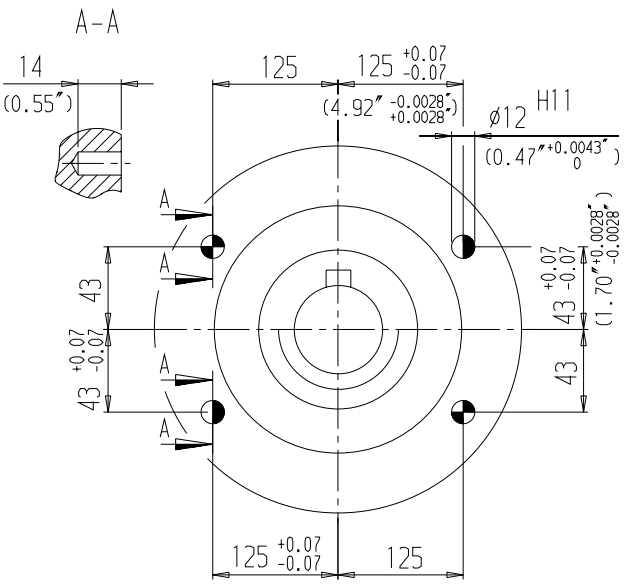
Pin holes

With housing flange (C-Type) for sizes K.Z.108-188, the output side can be pinned.
The output flanges are designed in a manner, that the permissible torques and radial loads can be transmitted safely by screw connection.
When there is need for additional safety, e.g. operation with heavy shock load, the existing pin holes can be used.
The gear box can also be bored and pinned together with the machine. In this case the given dimensions should be observed.

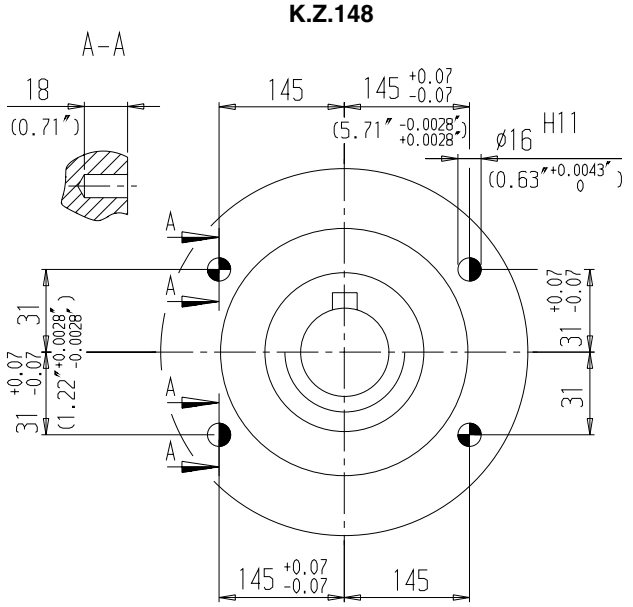
K.Z. 108



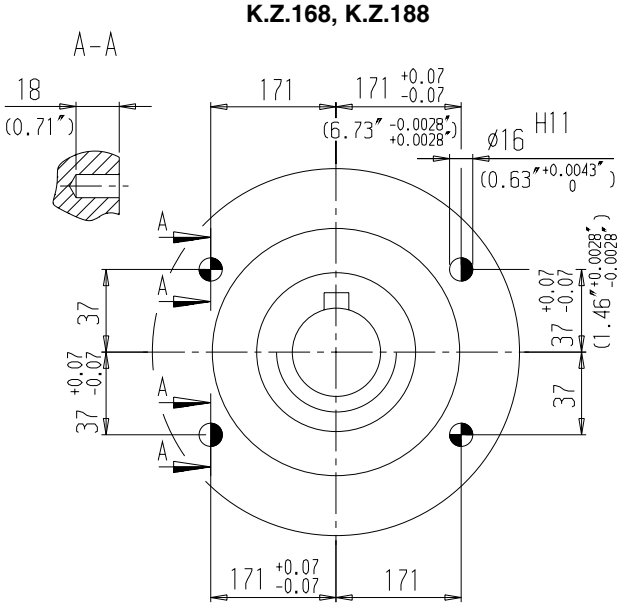
K.Z. 128



K.Z.148



K.Z.168, K.Z.188



◑ With heavy straight pins to DIN 1481: Use existing pinholes in the housing flange.

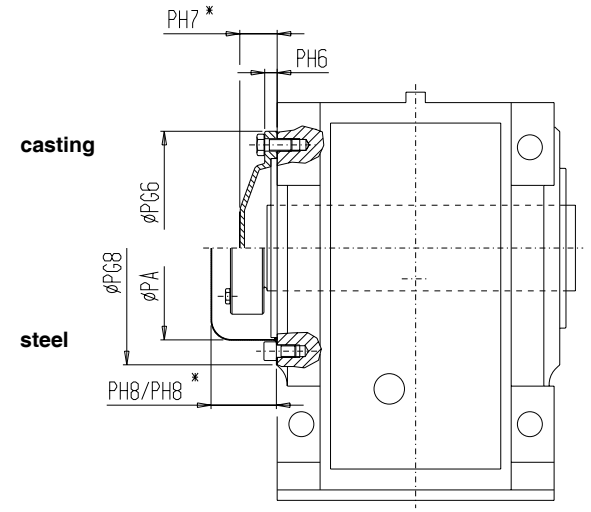
◒ With dowel pins to DIN EN 28740 / ISO 8740:

Note: Bore the mating part together with the housing.

Helical Bevel Gear Units
Cover B-Side (optional)

KA, KAS [1], KAT **Dimensions in** **Inch**
mm

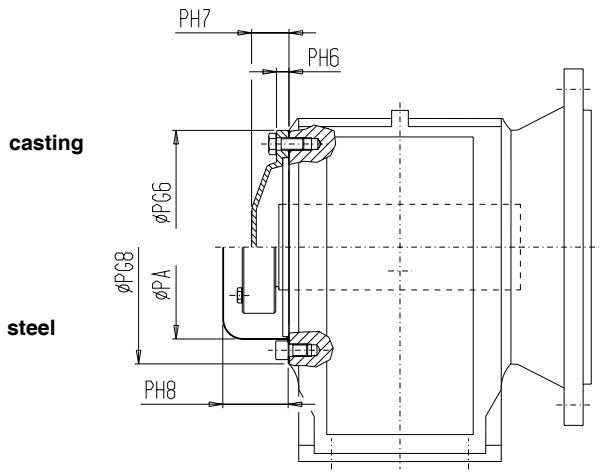
Model	Steel cover				Casting cover		
	PA	PG8	PH8*	PH8	PG6	PH6	PH7*
K.38	-	-	-	-	-	-	-
K.48	3.90 *99*	5.12 *130*	1.73 *44*	1.73 *44*	5.20 *132*	0.39 *10*	1.30 *33*
K.68	4.53 *115*	5.91 *150*	2.46 *62.5*	2.72 *69*	5.91 *150*	0.39 *10*	1.46 *37*
K.88	5.39 *137*	7.48 *190*	2.76 *70*	2.76 *70*	7.48 *190*	0.51 *13*	1.97 *50*
K.108	7.36 *187*	9.45 *240*	3.15 *80*	3.62 *92*	9.65 *245*	0.51 *13*	2.17 *55*
K.128	9.17 *233*	11.50 *292*	3.35 *85*	3.82 *97*	11.61 *295*	0.63 *16*	1.89 *48*
K.148	10.14 *257.5*	13.15 *334*	3.94 *100*	4.45 *113*	13.19 *335*	0.51 *13*	1.97 *50*
K.168	12.19 *309.5*	15.35 *390*	5.10 *129.5*	6.08 *154.5*	15.75 *400*	0.51 *13*	1.97 *50*
K.188	12.19 *309.5*	15.35 *390*	5.10 *129.5*	5.10 *129.5*	15.75 *400*	0.51 *13*	1.97 *50*



4

BAF, BAZ, BAFS, BAZS, BAFT, BAZT, KAF, KAZ, KAFS[1], KAZS[1], KAFT, KAZT

Model	Steel cover			Casting cover		
	PA	PG8	PH8	PG6	PH6	PH7
B. 28	2.28 *58*	4.02 *102*	1.42 *36*	-	-	-
B. 38	3.90 *99*	5.12 *130*	1.73 *44*	5.20 *132*	0.39 *10*	1.30 *33*
K. 38	3.24 *82.2*	4.53 *115*	1.57 *40*	4.72 *120*	0.39 *10*	1.30 *33*
K. 48	3.90 *99*	5.12 *130*	1.73 *44*	5.20 *132*	0.39 *10*	1.30 *33*
K. 68	4.53 *115*	5.91 *150*	2.46 *62.5*	5.91 *150*	0.39 *10*	1.46 *37*
K. 88	5.39 *137*	7.48 *190*	2.76 *70*	7.48 *190*	0.51 *13*	1.97 *50*
K.108	7.36 *187*	9.45 *240*	3.15 *80*	9.65 *245*	0.51 *13*	2.17 *55*
K.128	9.17 *233*	11.50 *292*	3.35 *85*	11.61 *295*	0.63 *16*	1.89 *48*
K.148	10.14 *257.5*	13.15 *334*	3.94 *100*	13.19 *335*	0.51 *13*	1.97 *50*
K.168	12.19 *309.5*	15.35 *390*	5.10 *129.5*	15.75 *400*	0.51 *13*	1.97 *50*
K. 188	12.19 *309.5*	15.35 *390*	5.10 *129.5*	15.75 *400*	0.51 *13*	1.97 *50*

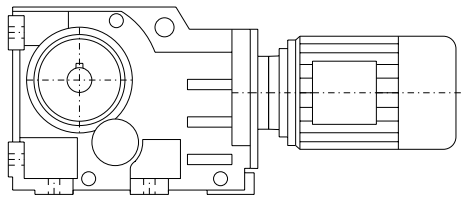
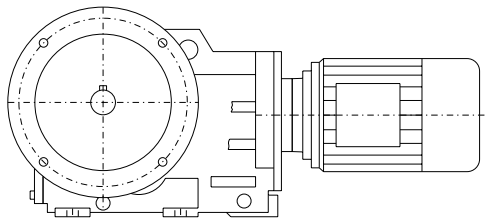
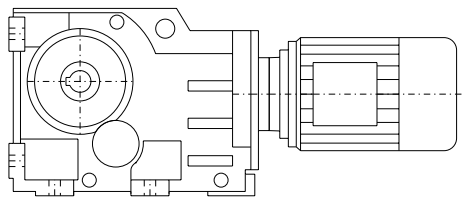
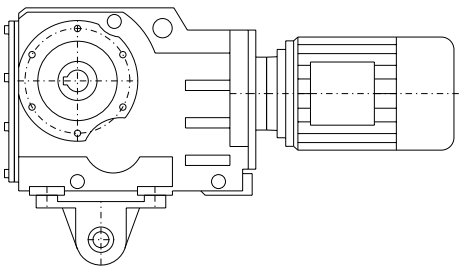


Cover not usable with backstop KX.

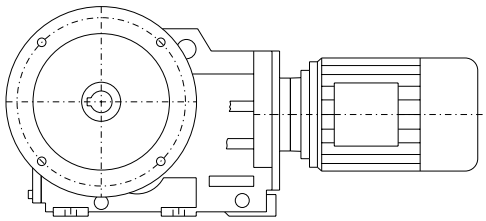
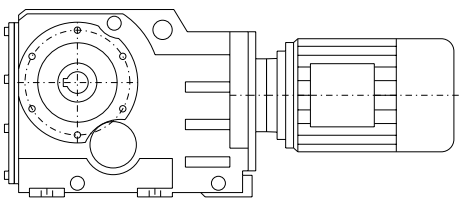
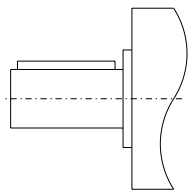
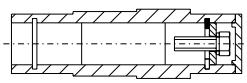
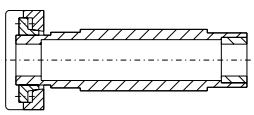
1) For KAS, KADS, KAFS and KAZS only steel protection cover is possible.
For size 28 protection cover is standard.

PH7*/PH8* = protection cover
PH7/PH8 = protection provided with sealing

Dimension Sheets-Overview

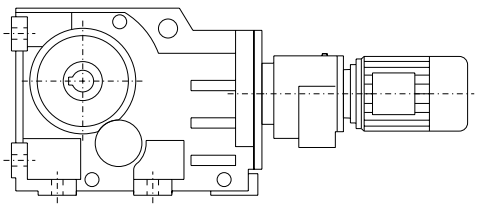
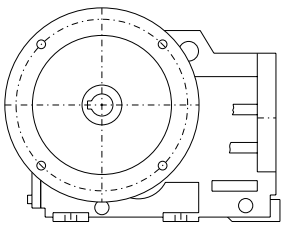
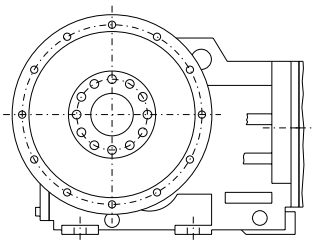
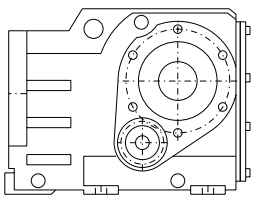
	Typ(e)	Dimension sheet see page
	B28 / BZ28	4 - 76
	B38 / BZ38	4 - 86
	K38	4 - 96
	K48	4 - 108
	K68	4 - 120
	K88	4 - 132
	K108	4 - 144
	K128	4 - 156
	K148	4 - 168
	K168	4 - 180
	K188	4 - 192
	BF28	4 - 78
	BF38	4 - 88
	KF38	4 - 98
	KF48	4 - 110
	KF68	4 - 122
	KF88	4 - 134
	KF108	4 - 146
	KF128	4 - 158
	KF148	4 - 170
	KF168	4 - 182
	KF188	4 - 194
	BA28 / BAZ28	4 - 80
	BA38 / BAZ38	4 - 90
	KA38	4 - 100
	KA48	4 - 112
	KA68	4 - 124
	KA88	4 - 136
	KA108	4 - 148
	KA128	4 - 160
	KA148	4 - 172
	KA168	4 - 184
	KA188	4 - 196
	BAD28	4 - 82
	BAD38	4 - 92
	KAD38	4 - 102
	KAD48	4 - 114
	KAD68	4 - 126
	KAD88	4 - 138
	KAD108	4 - 150
	KAD128	4 - 162
	KAD148	4 - 174
	KAD168	4 - 186
	KAD188	4 - 198

Dimension Sheets-Overview

	Typ(e)	Dimension sheet see page
	BAF28	4 - 84
	BAF38	4 - 94
	KAF38	4 - 104
	KAF48	4 - 116
	KAF68	4 - 128
	KAF88	4 - 140
	KAF108	4 - 152
	KAF128	4 - 164
	KAF148	4 - 176
	KAF168	4 - 188
	KAF188	4 - 200
	KAZ38	4 - 106
	KAZ48	4 - 118
	KAZ68	4 - 130
	KAZ88	4 - 142
	KAZ108	4 - 154
	KAZ128	4 - 166
	KAZ148	4 - 178
	KAZ168	4 - 190
	KAZ188	4 - 202
	Available Output solid shaft	4 - 204
	Available Output hollow shaft	4 - 205
	KA.S38 ... KA.S188	4 - 207

4

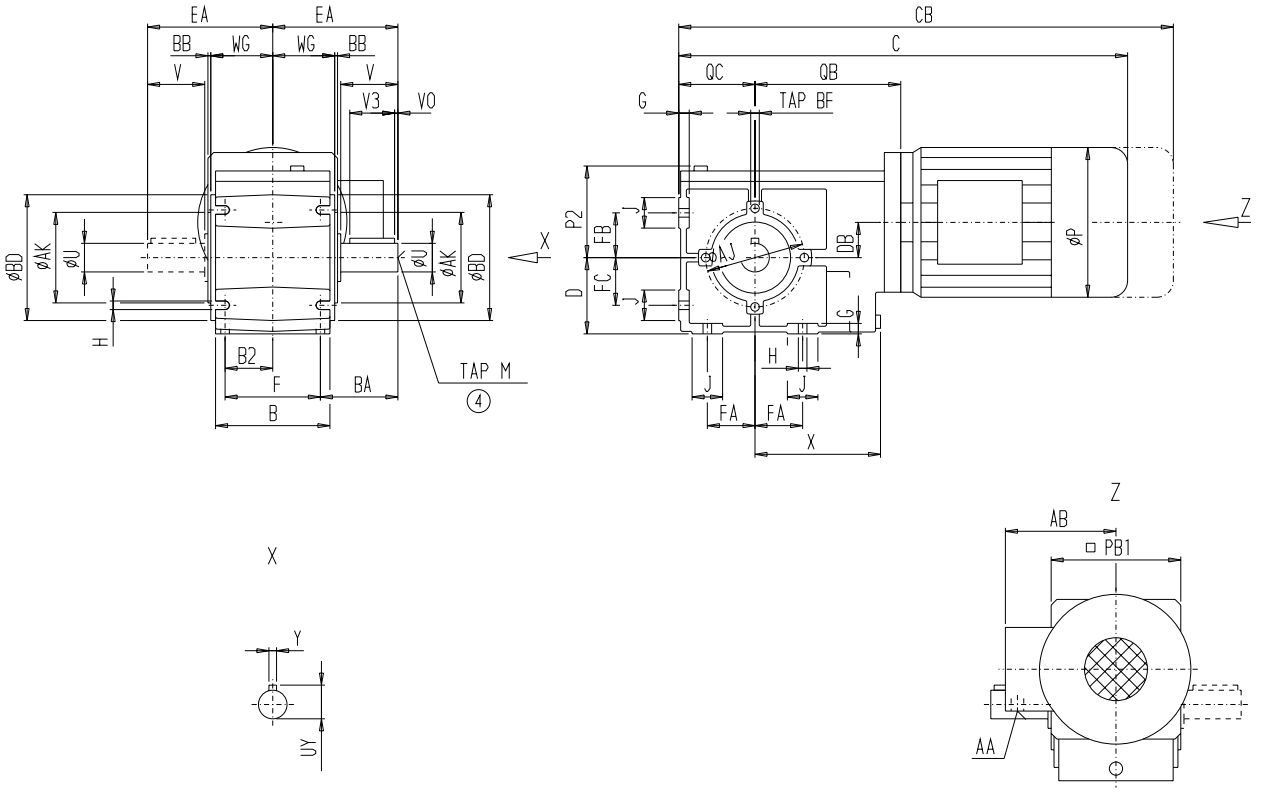
Dimension Sheets-Overview

	Typ(e)	Dimension sheet see page
	K. 38-Z28 ... K. 188-Z68	4 - 208
	K.M 88 ... K.M 168	4 - 212
	K.E 68 ... K.E 168	4 - 214
	K.X 88 ... K.X 168	4 - 218

Bevel Helical Gear Motors
Foot mounted
Housing flange (C-type)

B28
BZ28

B 510
BZ 510
[inch]



Mounting

BD	AK	AJ	BB	TAP BF
4.02	2.91	3.39	0.12	M8x16

Output Shaft

U	V	V3	VO	UY	Y	BA	EA	TAP M
0.75	1.57	1.25	0.01	0.83	0.1875	2.17	100	1/4-20UNC

Gearcase

FA	F	B2	G	B	D	FC	FB	DB	J	QC	QB	WG	X	H	P2	PB1
1.38	3.54	1.77	0.31	4.13	2.48	1.38	1.38	1.4	0.98	2.48	4.57	2.17	4.21	0.35	3.03	4.57

Motor

	B.28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.1	16.83	5.43	4.67	2x1/2“	27
M71MP	15.69	17.86	5.43	4.67	2x1/2“	30
M90S	18.43	21.03	6.93	5.91	2x3/4“	41
M90L	18.43	21.03	6.93	5.91	2x3/4“	49
M100L	21.62	24.45	7.64	6.3	2x3/4“	65

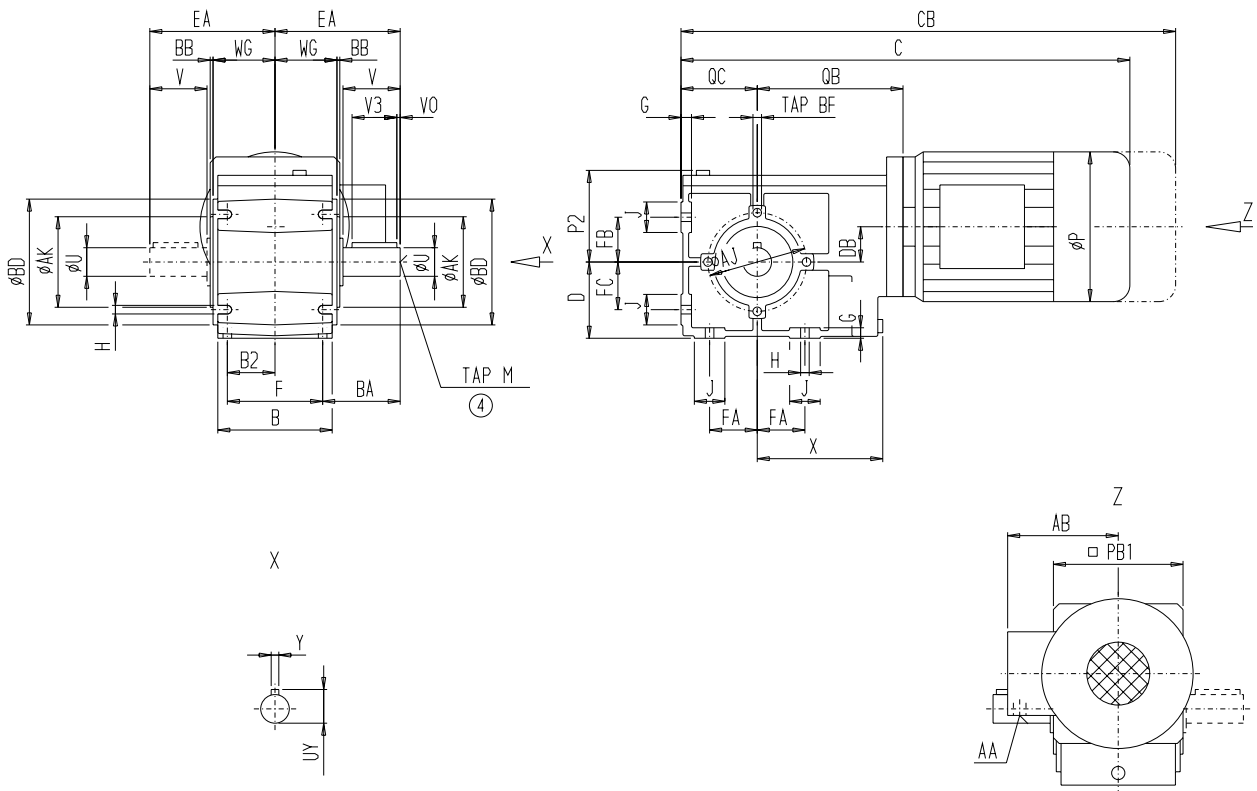
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted
Housing flange (C-type)

B28
BZ28

B 510
BZ 510
[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
102	*74*	*86*	*3*	*M8x16*

Output Shaft

U	V	V3	VO	UY	Y	BA	EA	TAP M
19,05	*40*	*31,75*	*0,254*	*21,082*	*4,763*	*55*	*100*	*1/4"-20UNC*

Gearcase

FA	F	B2	G	B	D	FC	FB	DB	J	QC	QB	WG	X	H	P2	PB1
35	*90*	*45*	*8*	*105*	*63*	*35*	*35*	*35,5*	*25*	*63*	*116*	*55*	*107*	*9*	*77*	*116*

Motor

	B.28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*384,5*	*428,5*	*138*	*118,5*	*2x1/2"*	*12*
M71MP	*399,5*	*454,5*	*138*	*118,5*	*2x1/2"*	*14*
M90S	*469*	*535*	*176*	*150*	*2x3/4"*	*19*
M90L	*469*	*535*	*176*	*150*	*2x3/4"*	*22*
M100L	*550*	*622*	*194*	*160*	*2x3/4"*	*29*

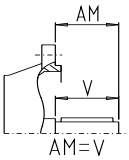
Tolerances see page 1 - 4

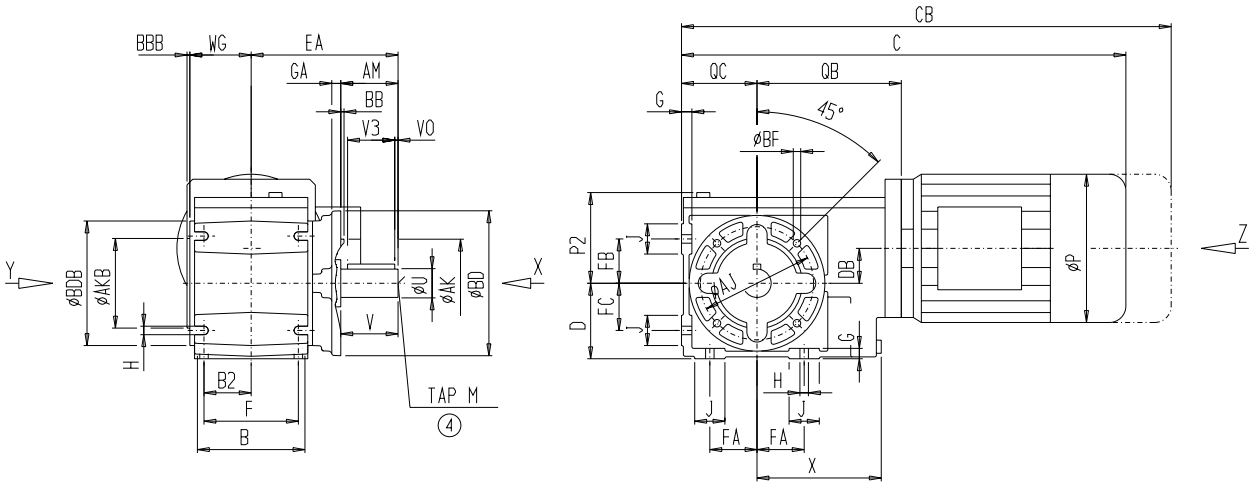
④ Tap specification see page 1 - 7

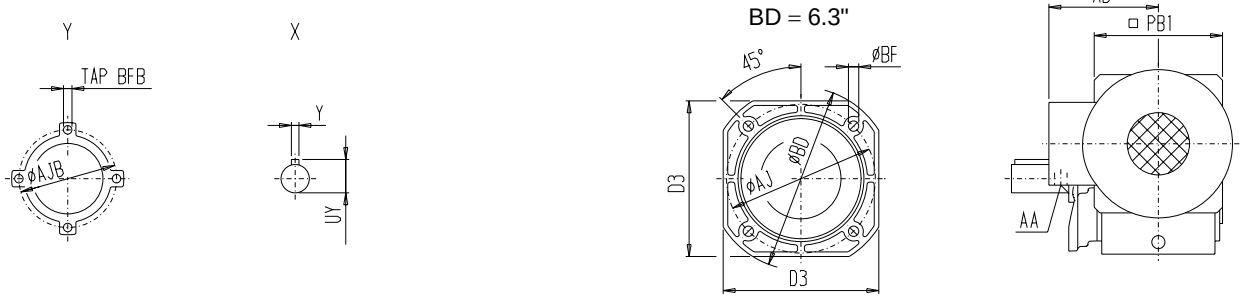
Bevel Helical Gear Motors
Flange mounted

BF28

BF 510
[inch]







Flange

BD	AK	GA	AJ	BB	BF	D3
4.72	3.15	0.31	3.94	0.12	0.25	-
6.3	4.33	0.35	5.12	0.14	0.35	5,35

Output Shaft

U	V	V3	VO	UY	Y	AM	EA	TAP M
0.75	1.57	1.25	0.01	0.83	0.1875	1.57	4.72	1/4-20UNC

Gearcase

BDB	FA	F	AKB	AJB	B2	G	B	BBB	D	FC	FB	DB	J	QC	QB	WG	X	H	P2	PB1	TAP BFB
4.02	1.38	3.54	2.91	3.39	1.77	0.31	4.13	0.12	2.48	1.38	1.38	1.4	0.98	2.48	4.57	2.17	4.21	0.35	3.03	4.57	M8x16

Motor

	BF28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.1	16.83	5.43	4.67	2x1/2“	28
M71MP	15.69	17.86	5.43	4.67	2x1/2“	31
M90S	18.43	21.03	6.93	5.91	2x3/4“	42
M90L	18.43	21.03	6.93	5.91	2x3/4“	50
M100L	21.62	24.45	7.64	6.3	2x3/4“	66

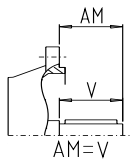
Tolerances see page 1 - 4

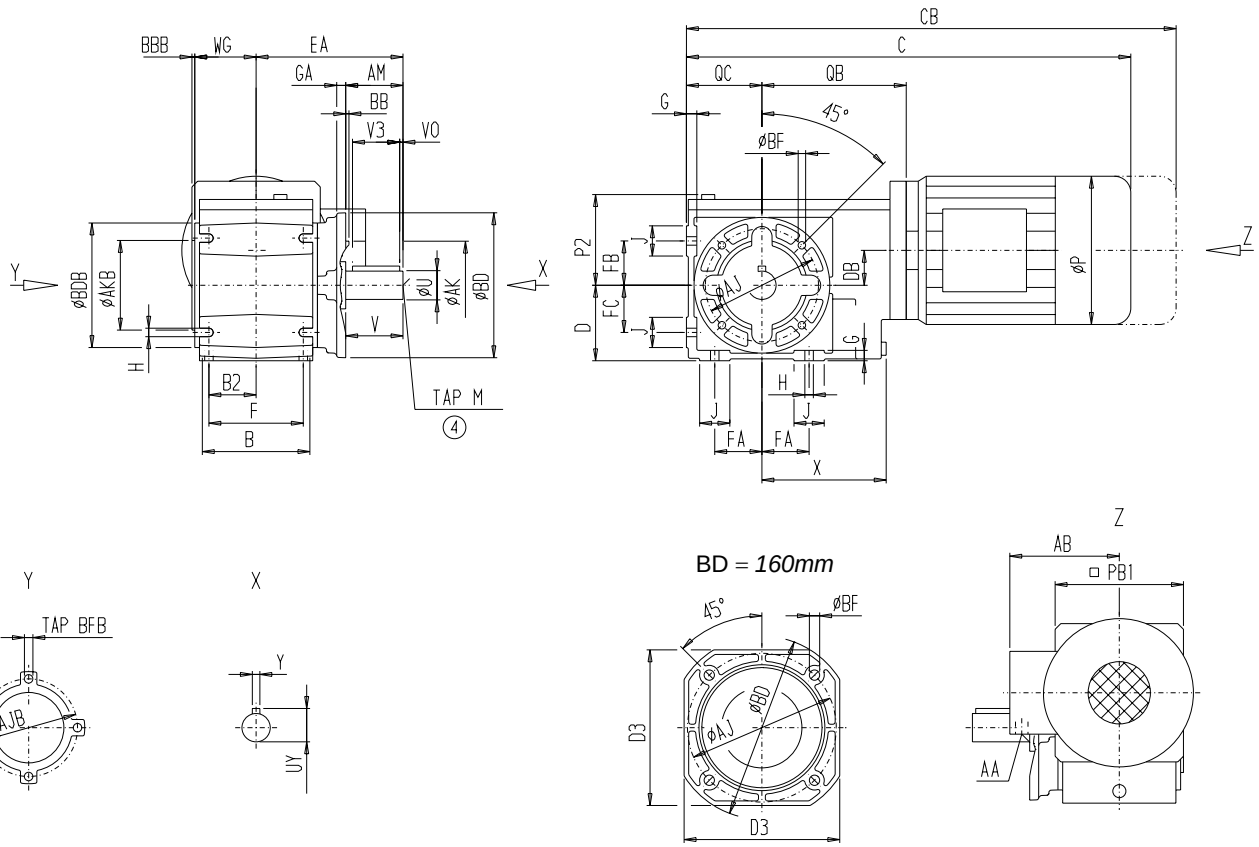
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Flange mounted

BF28

BF 510
[*mm*]





Flange

BD	AK	GA	AJ	BB	BF	D3
120	*80*	*8*	*100*	*3*	*6,6*	-
160	*110*	*9*	*130*	*3,5*	*9*	*136*

Output Shaft

U	V	V3	VO	UY	Y	AM	EA	TAP M
19,05	*40*	*31,75*	*0,254*	*21,082*	*4,763*	*40*	*120*	*1/4-20UNC*

Gearcase

BDB	FA	F	AKB	AJB	B2	G	B	BBB	D	FC	FB	DB	J	QC	QB	WG	X	H	P2	PB1	TAP BFB
102	*35*	*90*	*74*	*86*	*45*	*8*	*105*	*3*	*63*	*35*	*35*	*35,5*	*25*	*63*	*116*	*55*	*107*	*9*	*77*	*116*	*M8x16*

Motor

	BF28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*384,5*	*428,5*	*138*	*118,5*	*2x1/2“*	*13*
M71MP	*399,5*	*454,5*	*138*	*118,5*	*2x1/2“*	*14*
M90S	*469*	*535*	*176*	*150*	*2x3/4“*	*19*
M90L	*469*	*535*	*176*	*150*	*2x3/4“*	*23*
M100L	*550*	*622*	*194*	*160*	*2x3/4“*	*30*

Tolerances see page 1 - 4

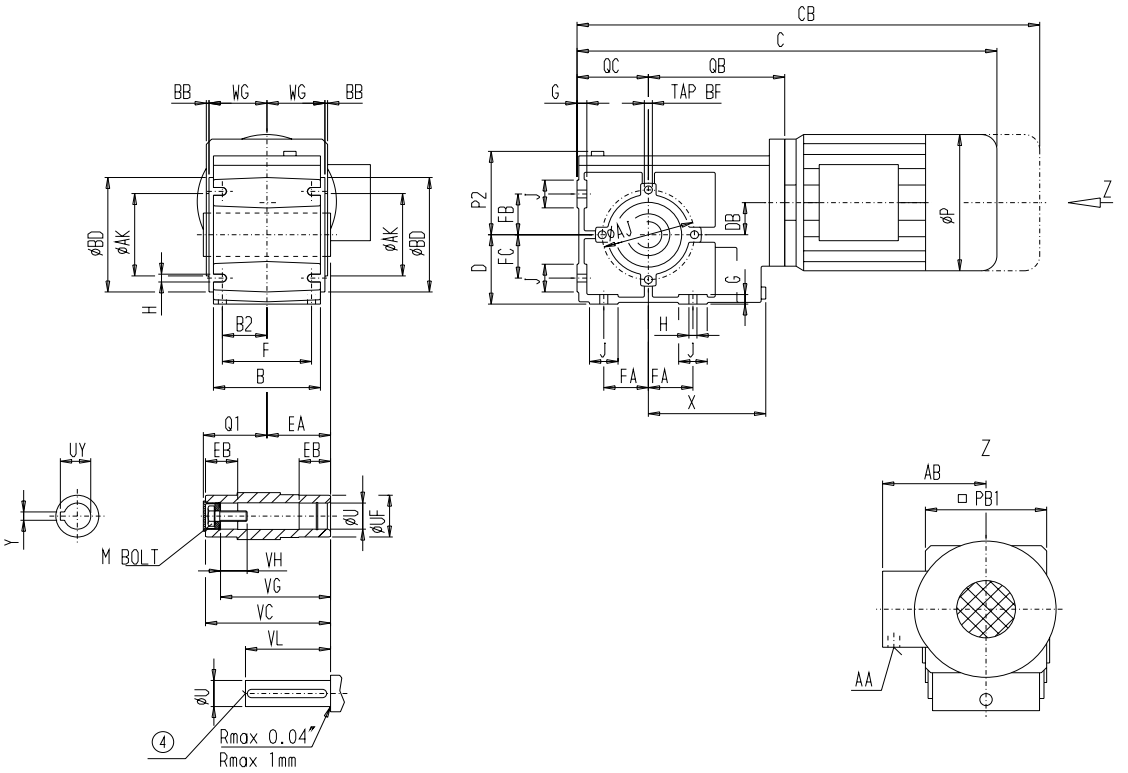
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

BA28
BAZ28

BA 510
BAZ 510

[inch]



4

Mounting

BD	AK	AJ	BB	TAP BF
4.02	2.91	3.39	0.12	M8x16

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
0.75	1.575	4.724	4.173	1.047	3.74	1/2-13UNC	0.847	0.188	2.36	1.575	2.44

Gearcase

FA	F	B2	G	B	D	FC	FB	DB	J	QC	QB	WG	X	H	P2	PB1
1.38	3.54	1.77	0.31	4.13	2.48	1.38	1.38	1.4	0.98	2.48	4.57	2.17	4.21	0.35	3.03	4.57

Motor

	BA.28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.1	16.83	5.43	4.67	2x1/2“	26
M71MP	15.69	17.86	5.43	4.67	2x1/2“	29
M90S	18.43	21.03	6.93	5.91	2x3/4“	41
M90L	18.43	21.03	6.93	5.91	2x3/4“	48
M100L	21.62	24.45	7.64	6.3	2x3/4“	64

Tolerances see page 1 - 4

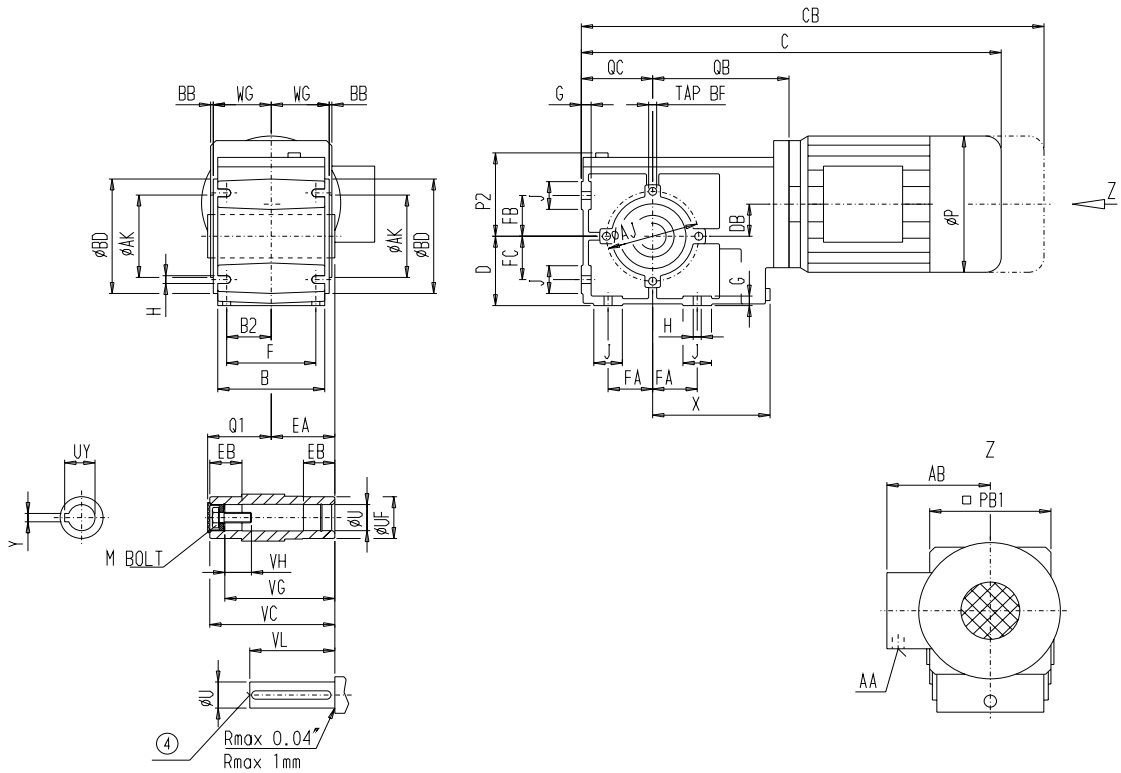
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

BA28
BAZ28

BA 510
BAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
102	*74*	*86*	*3*	*M8x16*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
19,05	*40*	*119,99*	*106*	*26,6*	*95*	*1/2"-13UNC*	*21,51*	*4,775*	*60*	*40*	*62*

Gearcase

FA	F	B2	G	B	D	FC	FB	DB	J	QC	QB	WG	X	H	P2	PB1
35	*90*	*45*	*8*	*105*	*63*	*35*	*35*	*35,5*	*25*	*63*	*116*	*55*	*107*	*9*	*77*	*116*

Motor

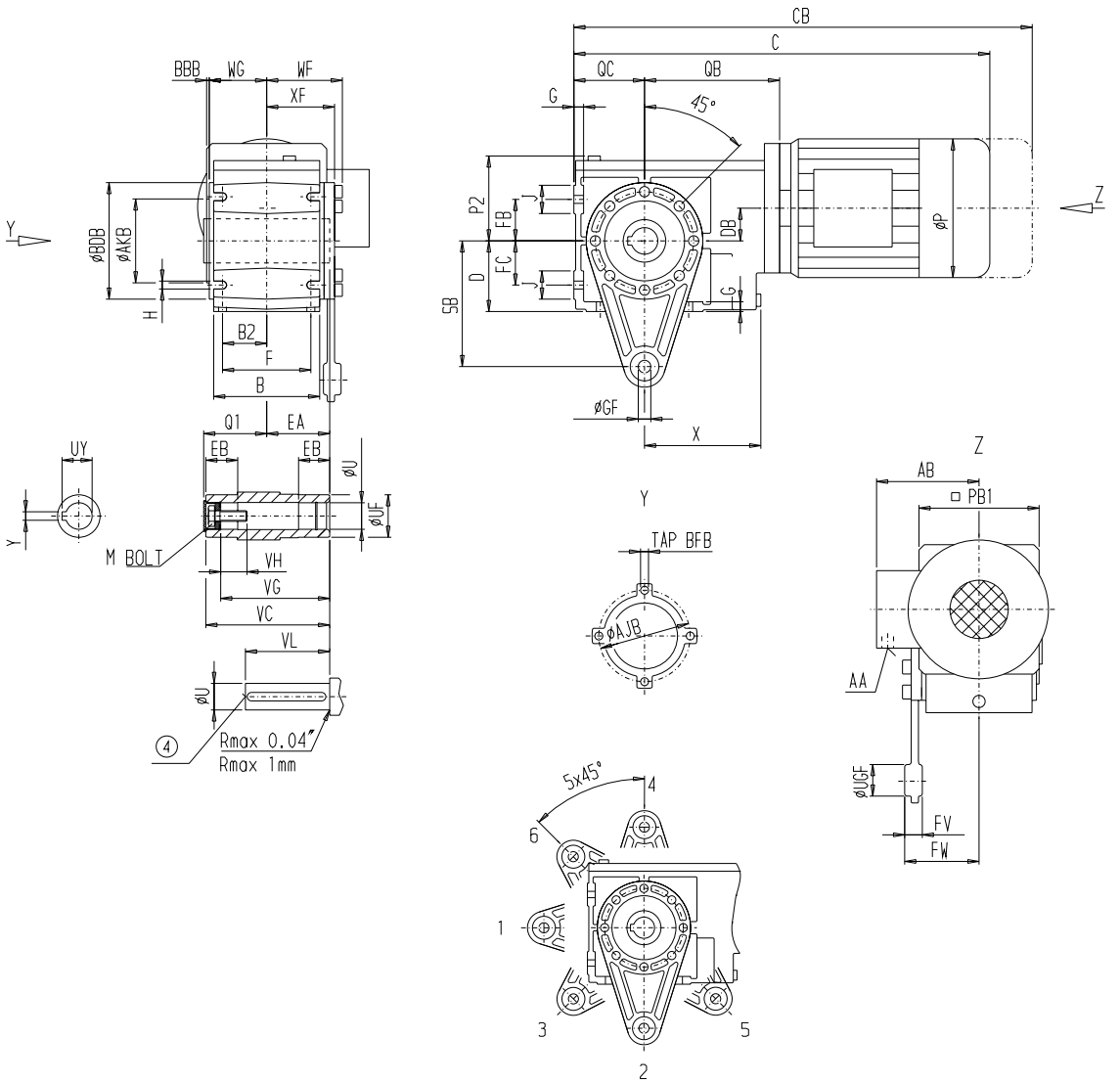
	BA.28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*384,5*	*428,5*	*138*	*118,5*	*2x1/2"*	*12*
M71MP	*399,5*	*454,5*	*138*	*118,5*	*2x1/2"*	*13*
M90S	*469*	*535*	*176*	*150*	*2x3/4"*	*18*
M90L	*469*	*535*	*176*	*150*	*2x3/4"*	*22*
M100L	*550*	*622*	*194*	*160*	*2x3/4"*	*29*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

BAD28

BAD 510
[inch]



Mounting

BDB	AKB	AJB	BBB	WG	TAP BFB
4.02	2.91	3.39	0.12	2.17	M8x16

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
0.75	1.575	4.724	4.173	1.047	3.74	1/2-13UNC	0.847	0.188	2.36	1.575	2.44

Gearcase

F	G	B	D	DB	J	B2	P2	PB1	FC	FB	QC	QB	X	H
3.54	0.31	4.13	2.48	1.4	0.98	1.77	3.03	4.57	1.38	1.38	2.48	4.57	4.21	0.35

Torque Arm

FV	GF	SB	UGF	FW	WF	XF
0.51	0.43	4.33	0.98	2.52	2.62	2.40

Motor

	BAD28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.1	16.83	5.43	4.67	2x1/2“	26
M71MP	15.69	17.86	5.43	4.67	2x1/2“	30
M90S	18.43	21.03	6.93	5.91	2x3/4“	41
M90L	18.43	21.03	6.93	5.91	2x3/4“	49
M100L	21.62	24.45	7.64	6.3	2x3/4“	64

Tolerances see page 1 - 4

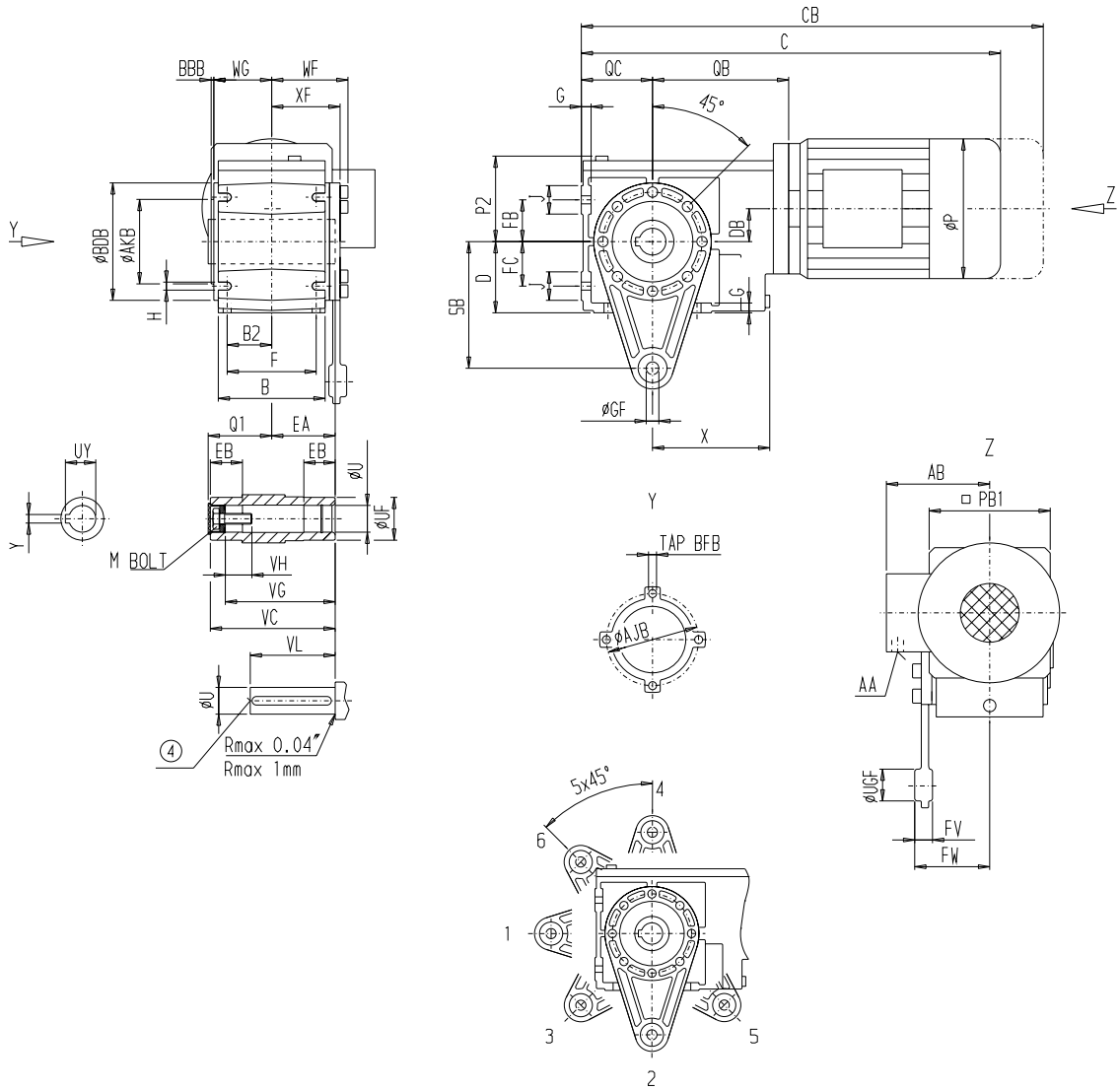
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

BAD28

BAD 510

[*mm*]



Mounting

BDB	AKB	AJB	BBB	WG	TAP BFB
102	*74*	*86*	*3*	*55*	*M8x16*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
19,05	*40*	*120*	*106*	*26,6*	*95*	*1/2"-13UNC*	*21,51*	*4,775*	*60*	*40*	*62*

Gearcase

F	G	B	D	DB	J	B2	P2	PB1	FC	FB	QC	QB	X	H
90	*8*	*105*	*63*	*35,5*	*25*	*45*	*77*	*116*	*35*	*35*	*63*	*116*	*107*	*9*

Torque Arm

FV	GF	SB	UGF	FW	WF	XF
13	*11*	*110*	*25*	*64*	*66,5*	*61*

Motor

	BAD28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*384,5*	*428,5*	*138*	*118,5*	*2x1/2"*	*12*
M71MP	*399,5*	*454,5*	*138*	*118,5*	*2x1/2"*	*13*
M90S	*469*	*535*	*176*	*150*	*2x3/4"*	*19*
M90L	*469*	*535*	*176*	*150*	*2x3/4"*	*22*
M100L	*550*	*622*	*194*	*160*	*2x3/4"*	*29*

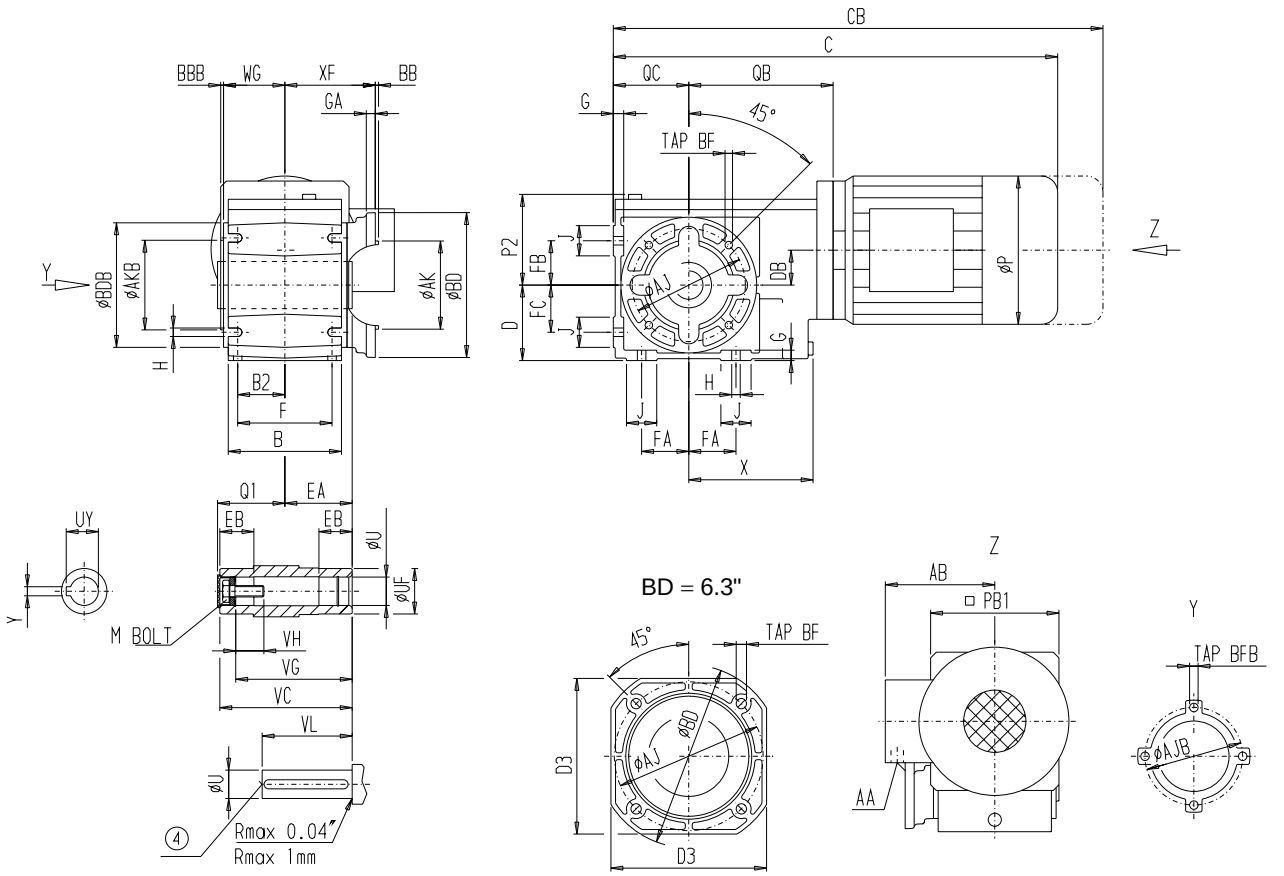
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with flange

BAF28

BAF 510
[inch]



Flange

BD	AK	GA	AJ	BB	XF	TAP BF
4.72	3.15	0.31	3.94	0.12	3.15	0.26
6.3	4.33	0.35	5.12	0.14	3.15	0.35

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
0.75	1.575	4.724	4.173	1.047	3.74	1/2-13UNC	0.847	0.188	2.36	1.575	2.44

Gearcase

BDB	FA	F	AKB	AJB	B2	G	B	BBB	D	FC	FB	DB	J	QC	QB	WG	X	H	P2	PB1	TAP BFB
4.02	1.38	3.54	2.91	3.39	1.77	0.31	4.13	0.12	2.48	1.38	1.38	1.4	0.98	2.48	4.57	2.17	4.21	0.35	3.03	4.57	M8x16

Motor

	BAF28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.1	16.83	5.43	4.67	2x1/2“	26
M71MP	15.69	17.86	5.43	4.67	2x1/2“	29
M90S	18.43	21.03	6.93	5.91	2x3/4“	42
M90L	18.43	21.03	6.93	5.91	2x3/4“	46
M100L	21.62	24.45	7.64	6.3	2x3/4“	64

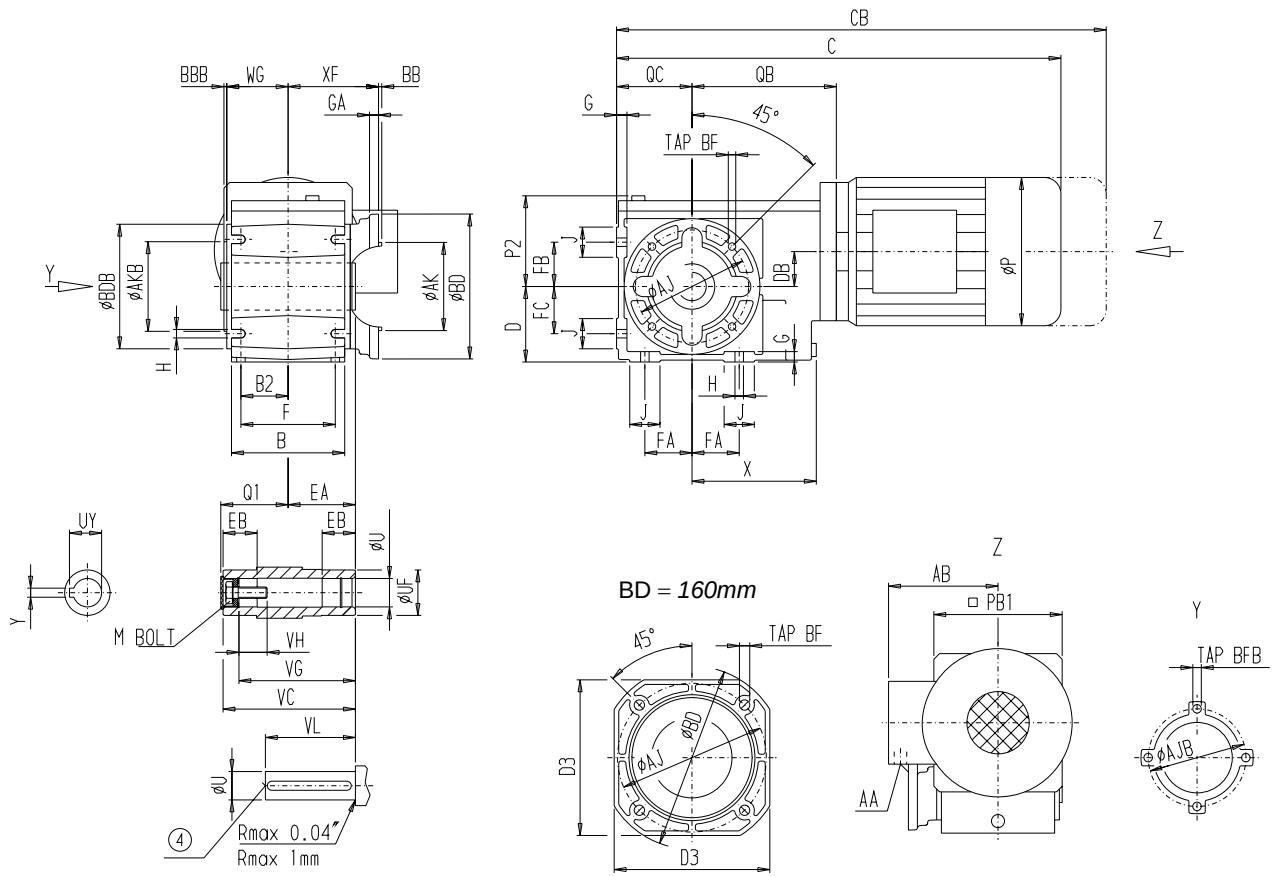
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with flange

BAF28

BAF 510
[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	TAP BF
120	*80*	*8*	*100*	*3*	*80*	*6,6*
160	*110*	*9*	*130*	*3,5*	*80*	*9*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
19,05	*40*	*119,99*	*106*	*26,6*	*95*	*1/2"-13UNC*	*21,51*	*4,775*	*60*	*95*	*62*

Gearcase

BDB	FA	F	AKB	AJB	B2	G	B	BBB	D	FC	FB	DB	J	QC	QB	WG	X	H	P2	PB1	TAP BFB
102	*35*	*90*	*74*	*86*	*45*	*8*	*105*	*3*	*63*	*35*	*35*	*35,5*	*25*	*63*	*116*	*55*	*107*	*9*	*77*	*116*	*M8x16*

Motor

	BAF28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*384,5*	*428,5*	*138*	*118,5*	*2x1/2"*	*12*
M71MP	*399,5*	*454,5*	*138*	*118,5*	*2x1/2"*	*13*
M90S	*469*	*535*	*176*	*150*	*2x3/4"*	*19*
M90L	*469*	*535*	*176*	*150*	*2x3/4"*	*21*
M100L	*550*	*622*	*194*	*160*	*2x3/4"*	*29*

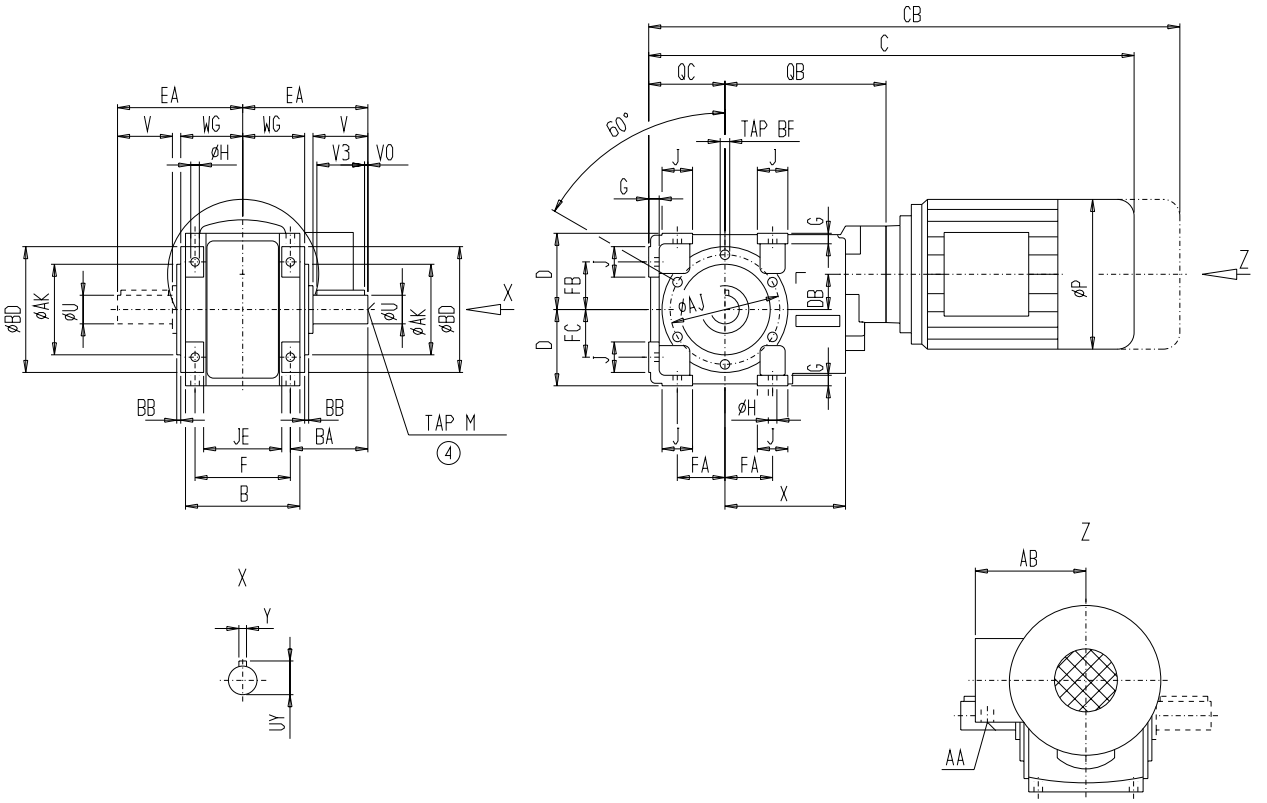
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted
Housing flange (C-type)

B38
BZ38

B 510
BZ 510
[inch]



Mounting

BD	AK	AJ	BB	TAP BF
5.2	3.74	4.53	0.12	M10x17

Output Shaft

U	V	V3	VO	UY	Y	BA	EA	TAP M
1	1.97	1.5	0.252	1.11	0.25	2.76	120	3/8-16UNC

Gearcase

FA	F	JE	G	B	D	FC	FB	DB	J	QC	QB	WG	X	H
1.97	3.94	2.68	0.43	4.72	3.15	1.97	1.97	1.46	1.26	3.15	6.65	2.56	5.18	0.35

Motor

	B.38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	18.78	20.51	5.43	4.67	2x1/2“	56
M71MP	19.62	21.79	6.22	4.98	2x1/2“	63
M90S	21.24	23.83	6.93	5.91	2x3/4“	69
M90L	21.24	23.83	6.93	5.91	2x3/4“	74
M100L	23.01	25.84	7.64	6.3	2x3/4“	89

Tolerances see page 1 - 4

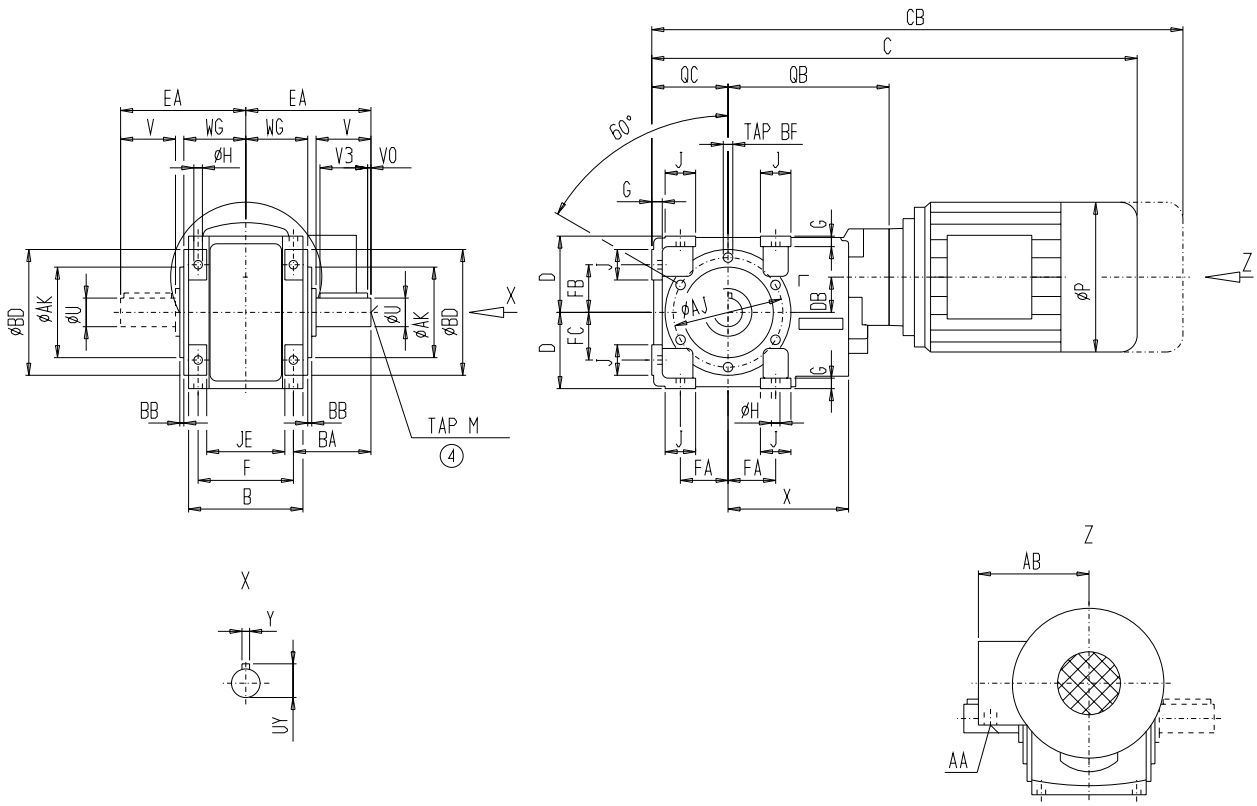
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted
Housing flange (C-type)

B38
BZ38

B 510
BZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
132	*95*	*115*	*3*	*M10x17*

Output Shaft

U	V	V3	VO	UY	Y	BA	EA	TAP M
25,4	*50*	*38,1*	*6,401*	*28,194*	*6,35*	*70*	*120*	*3/8"-16UNC*

Gearcase

FA	F	JE	G	B	D	FC	FB	DB	J	QC	QB	WG	X	H
50	*100*	*68*	*11*	*120*	*80*	*50*	*50*	*37*	*32*	*80*	*169*	*65*	*131,5*	*9*

Motor

	B.38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*478.5*	*522.5*	*138*	*118.5*	*2x1/2"*	*25*
M71MP	*499.5*	*554.5*	*158*	*126.5*	*2x1/2"*	*28*
M90S	*540.5*	*606.5*	*176*	*150*	*2x3/4"*	*31*
M90L	*540.5*	*606.5*	*176*	*150*	*2x3/4"*	*33*
M100L	*585.5*	*657.5*	*194*	*160*	*2x3/4"*	*40*

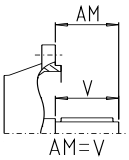
Tolerances see page 1 - 4

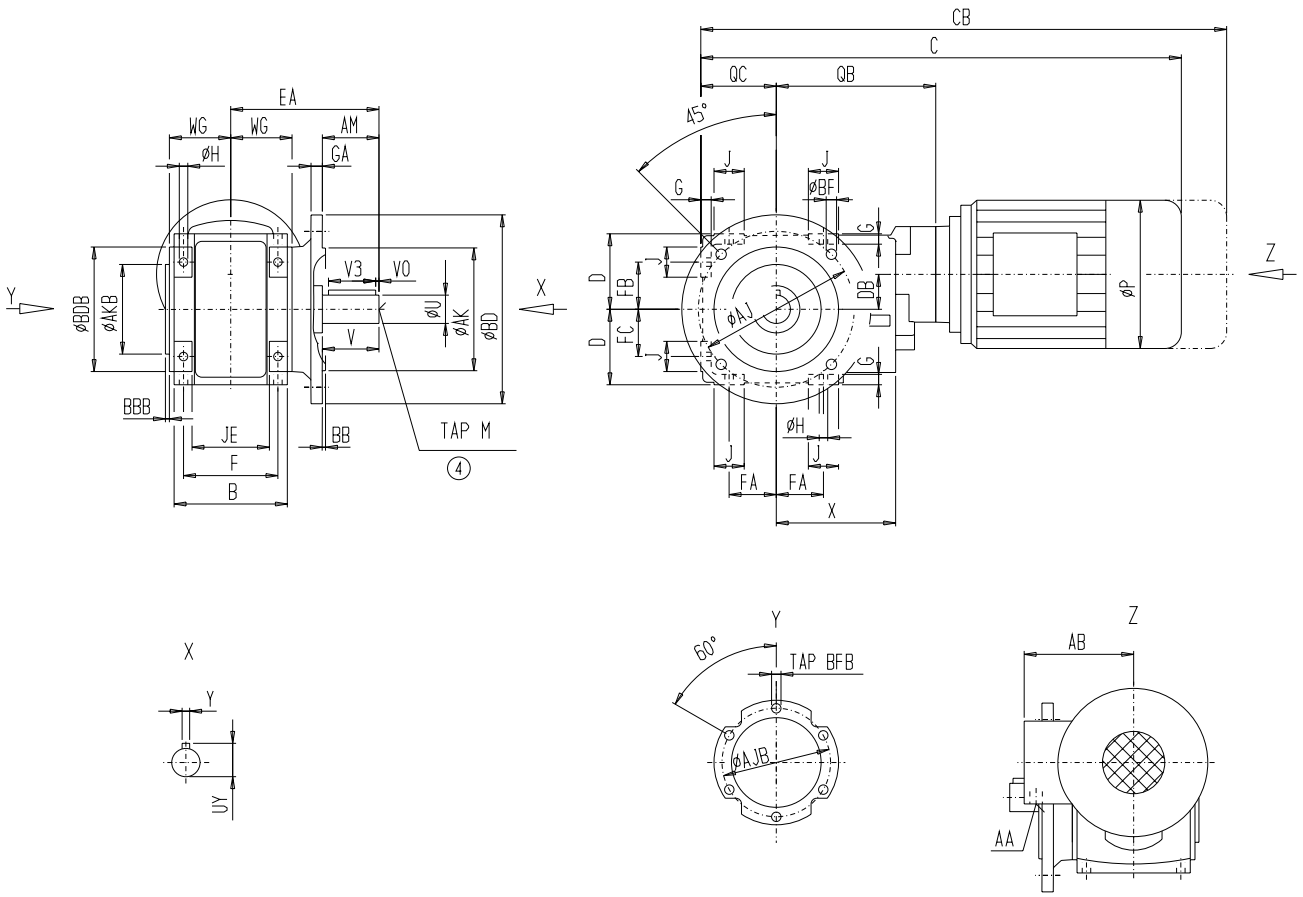
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Flange mounted

BF38

BF 510
[inch]





4

Flange

BD	AK	GA	AJ	BB	BF
6.3	4.33	0.39	5.12	0.12	0.35
7.87	5.12	0.47	6.5	0.14	0.43

Output Shaft

U	V	V3	VO	UY	Y	AM	EA	TAP M
1	1.97	1.5	0.252	1.11	0.25	1.97	4.72	3/8-16UNC

Gearcase

BDB	FA	F	AKB	AJB	JE	G	B	BBB	D	FC	FB	DB	J	QC	QB	WG	X	H	TAP BFB
5.2	1.97	3.94	3.74	3.74	2.68	0.43	4.72	0.12	3.15	1.97	1.97	1.46	1.26	3.15	6.65	2.56	5.18	0.35	M10x17

Motor

	BF38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	18.78	20.51	5.43	4.67	2x1/2“	63
M71MP	19.62	21.79	6.22	4.98	2x1/2“	69
M90S	21.24	23.83	6.93	5.91	2x3/4“	76
M90L	21.24	23.83	6.93	5.91	2x3/4“	80
M100L	23.01	25.84	7.64	6.3	2x3/4“	96

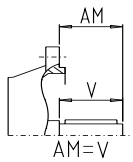
Tolerances see page 1 - 4

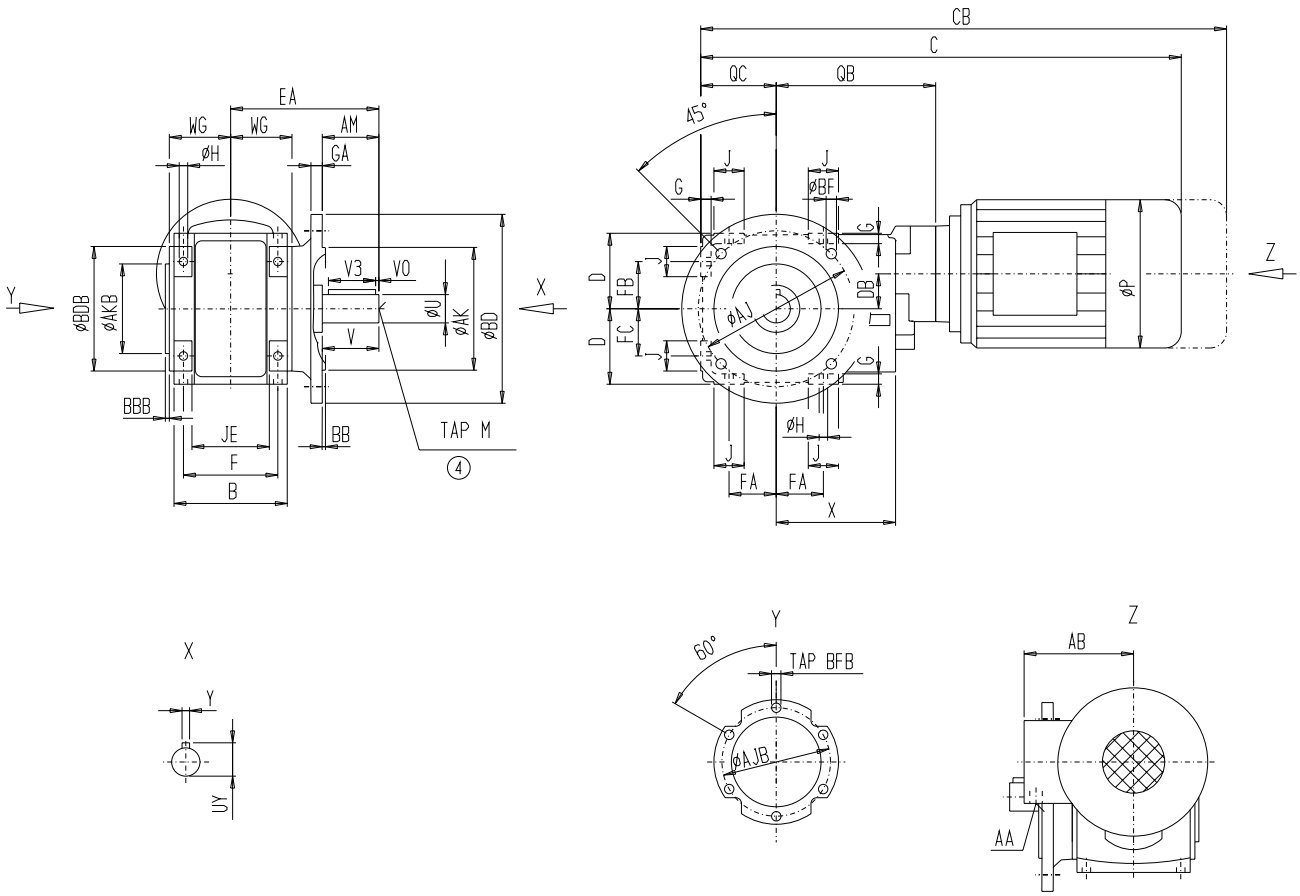
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Flange mounted

BF38

BF 510
[*mm*]





Flange

BD	AK	GA	AJ	BB	BF
160	*110*	*10*	*130*	*3*	*9*
200	*130*	*12*	*165*	*3,5*	*11*

Output Shaft

U	V	V3	VO	UY	Y	AM	EA	TAP M
25,4	*50*	*38,1*	*6,401*	*28,194*	*6,35*	*50*	*120*	*3/8-16UNC*

Gearcase

BDB	FA	F	AKB	AJB	JE	G	B	BBB	D	FC	FB	DB	J	QC	QB	WG	X	H	TAP BFB
132	*50*	*100*	*95*	*115*	*68*	*11*	*120*	*3*	*80*	*50*	*50*	*37*	*32*	*80*	*169*	*65*	*131,5*	*9*	*M10x17*

Motor

	BF38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*478,5*	*522,5*	*138*	*118,5*	*2x1/2“*	*28*
M71MP	*499,5*	*554,5*	*158*	*126,5*	*2x1/2“*	*31*
M90S	*540,5*	*606,5*	*176*	*150*	*2x3/4“*	*34*
M90L	*540,5*	*606,5*	*176*	*150*	*2x3/4“*	*36*
M100L	*585,5*	*657,5*	*194*	*160*	*2x3/4“*	*43*

Tolerances see page 1 - 4

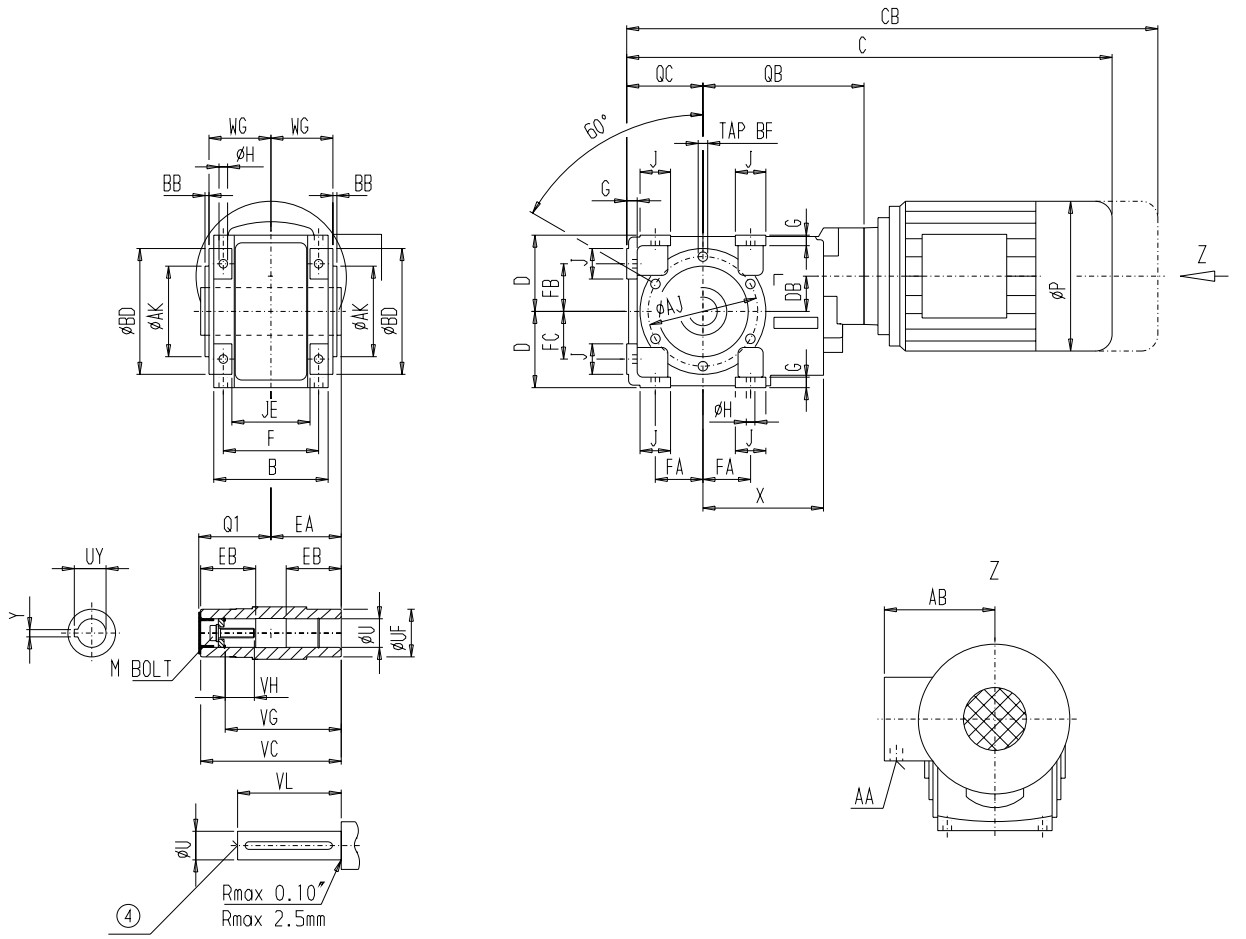
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

BA38
BAZ38

BA 510
BAZ 510

[inch]



Mounting

BD	AK	AJ	BB	TAP BF
5.2	3.74	4.53	0.12	M10x17

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.25	1.969	5.512	4.646	1.465	3.937	3/8-1 3/4UNC	1.377	0.25	2.76	2.126	2.85

Gearcase

FA	F	JE	G	B	D	FC	FB	DB	J	QC	QB	WG	X	H
1.97	3.94	2.68	0.43	4.72	3.15	1.97	1.97	1.46	1.26	3.15	6.65	2.56	5.18	0.35

Motor

	BA.38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	18.78	20.51	5.43	4.67	2x1/2“	54
M71MP	19.62	21.79	6.22	4.98	2x1/2“	59
M90S	21.24	23.83	6.93	5.91	2x3/4“	67
M90L	21.24	23.83	6.93	5.91	2x3/4“	72
M100L	23.01	25.84	7.64	6.3	2x3/4“	87

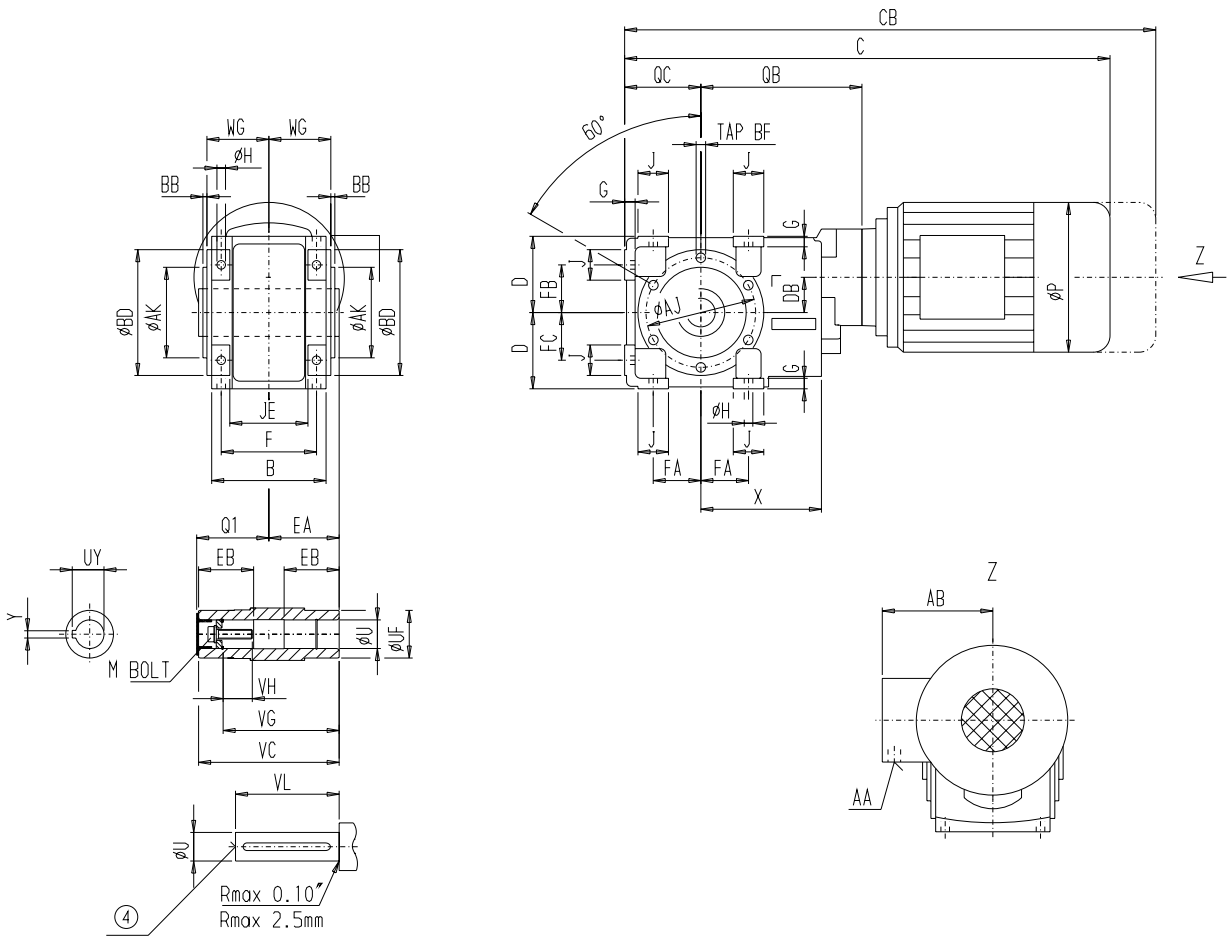
Tolerances see page 1 - 4
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

BA38
BAZ38

BA 510
BAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
132	*95*	*115*	*3*	*M10x17*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
31,75	*50*	*140*	*118*	*37,2*	*100*	*3/8"-1 3/4"UNC*	*34,98*	*6,35*	*70*	*54*	*72,5*

Gearcase

FA	F	JE	G	B	D	FC	FB	DB	J	QC	QB	WG	X	H
50	*100*	*68*	*11*	*120*	*80*	*50*	*50*	*37*	*32*	*80*	*169*	*65*	*131,5*	*9*

Motor

	BA.38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*478,5*	*522,5*	*138*	*118,5*	*2x1/2"*	*25*
M71MP	*499,5*	*554,5*	*158*	*126,5*	*2x1/2"*	*27*
M90S	*540,5*	*606,5*	*176*	*150*	*2x3/4"*	*31*
M90L	*540,5*	*606,5*	*176*	*150*	*2x3/4"*	*33*
M100L	*585,5*	*657,5*	*194*	*160*	*2x3/4"*	*40*

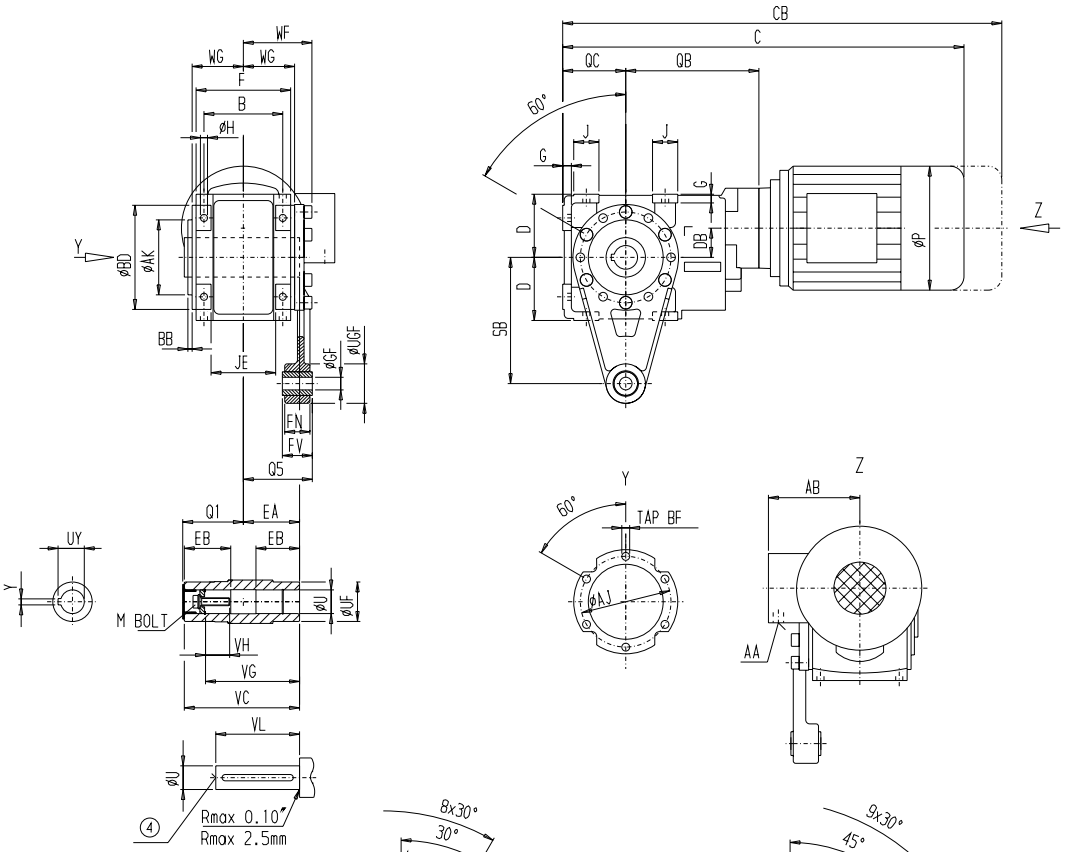
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

BAD38

BAD 510
[inch]



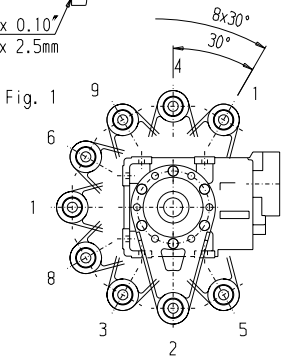


Fig. 1

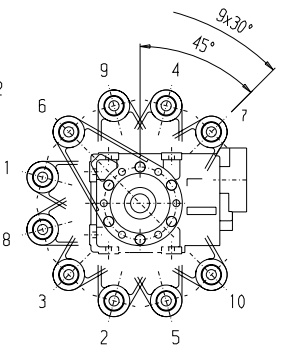


Fig.2

Mounting

BD	AK	AJ	BB	WG	TAP BF
5.2	3.74	4.53	0.12	2.56	M10x17

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.25	1.969	5.512	4.646	1.465	3.937	3/8-1 3/4UNC	1.377	0.25	2.76	2.126	2.85

Gearcase

F	JE	G	B	D	DB	J	QC	QB	H
4.72	2.68	0.43	3.94	3.15	1.46	1.26	3.15	6.65	0.35

Torque Arm

FN	FV	GF	SB	UGF	Q5	WF
1.26	1.5	0.63	6.3	1.97	3.44	3.43

Motor

	BAD38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	18.78	20.51	5.43	4.67	2x1/2“	58
M71MP	19.62	21.79	6.22	4.98	2x1/2“	64
M90S	21.24	23.83	6.93	5.91	2x3/4“	71
M90L	21.24	23.83	6.93	5.91	2x3/4“	75
M100L	23.01	25.84	7.64	6.3	2x3/4“	91

Tolerances see page 1 - 4

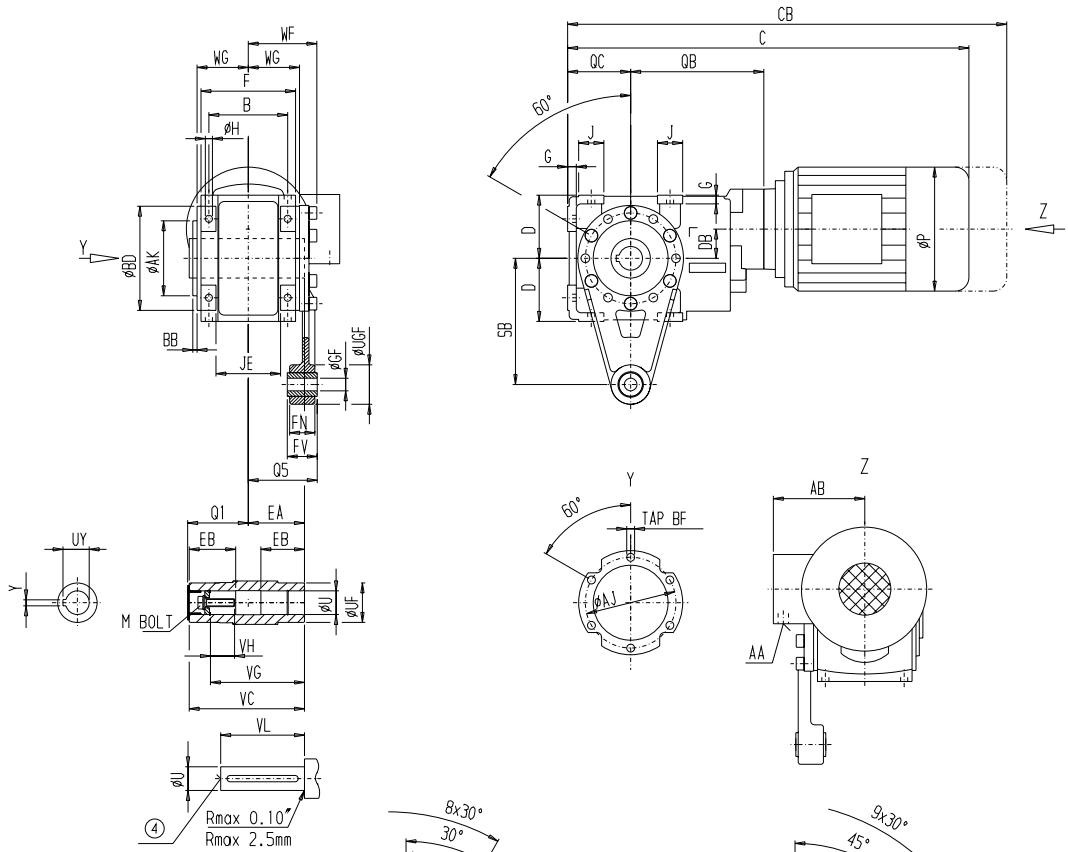
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

BAD38

BAD 510

[*mm*]



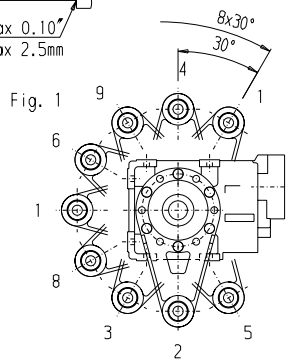


Fig. 1

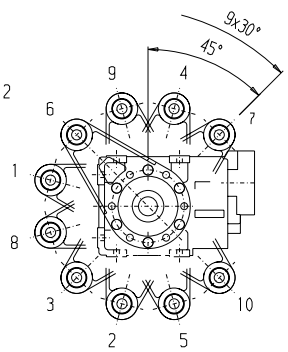


Fig.2

Mounting

BD	AK	AJ	BB	WG	TAP BF
132	*95*	*115*	*3*	*65*	*M10x17*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
31,75	*50*	*140*	*118*	*37*	*100*	*3/8"-1 3/4"UNC*	*34,98*	*6,35*	*70*	*54*	*72,5*

Gearcase

F	JE	G	B	D	DB	J	QC	QB	H
120	*68*	*11*	*100*	*80*	*37*	*32*	*80*	*169*	*9*

Torque Arm

FN	FV	GF	SB	UGF	Q5	WF
32	*38*	*16*	*160*	*50*	*87,5*	*87*

Motor

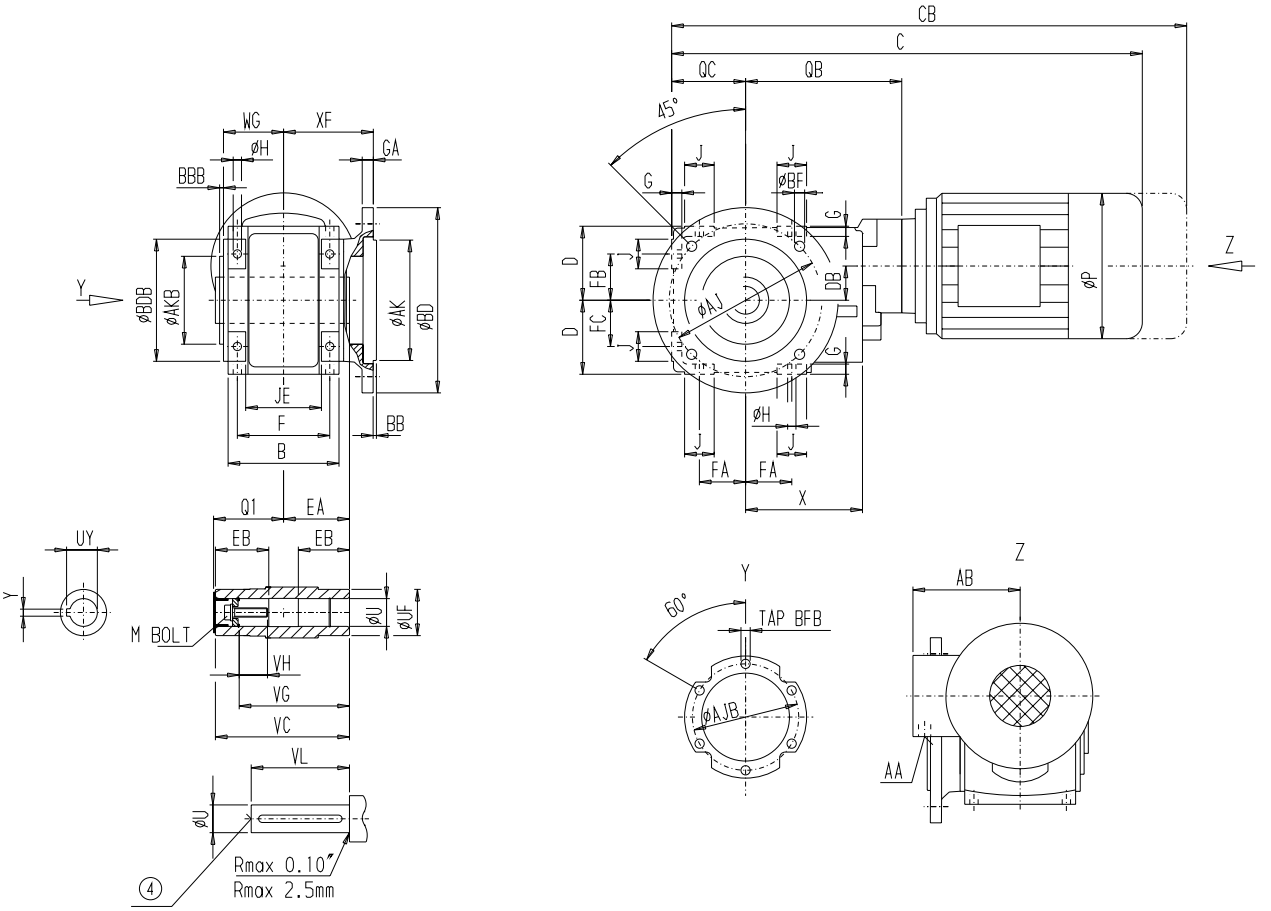
	BAD38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*478,5*	*522,5*	*138*	*118,5*	*2x1/2"*	*26*
M71MP	*499,5*	*554,5*	*158*	*126,5*	*2x1/2"*	*29*
M90S	*540,5*	*606,5*	*176*	*150*	*2x3/4"*	*32*
M90L	*540,5*	*606,5*	*176*	*150*	*2x3/4"*	*34*
M100L	*585,5*	*657,5*	*194*	*160*	*2x3/4"*	*41*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with flange

BAF38

BAF 510
[inch]



4

Flange

BD	AK	GA	AJ	BB	XF	BF
6.3	4.33	0.39	5.12	0.12	3.82	0.35
7.87	5.12	0.47	6.5	0.14	3.82	0.43

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.25	1.969	5.512	4.646	1.465	3.937	3/8-1 3/4UNC	1.377	0.25	2.76	2.126	2.85

Gearcase

BDB	FA	F	AKB	AJB	JE	G	B	BBB	D	FC	FB	DB	J	QC	QB	WG	X	H	TAP BFB
5.2	1.97	3.94	3.74	4.53	2.68	0.43	4.72	0.12	3.15	1.97	1.97	1.46	1.26	3.15	6.65	2.56	5.18	0.35	M10x17

Motor

	BAF38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	18.78	20.51	5.43	4.67	2x1/2“	59
M71MP	19.62	21.79	6.22	4.98	2x1/2“	64
M90S	21.24	23.83	6.93	5.91	2x3/4“	68
M90L	21.24	23.83	6.93	5.91	2x3/4“	73
M100L	23.01	25.84	7.64	6.3	2x3/4“	93

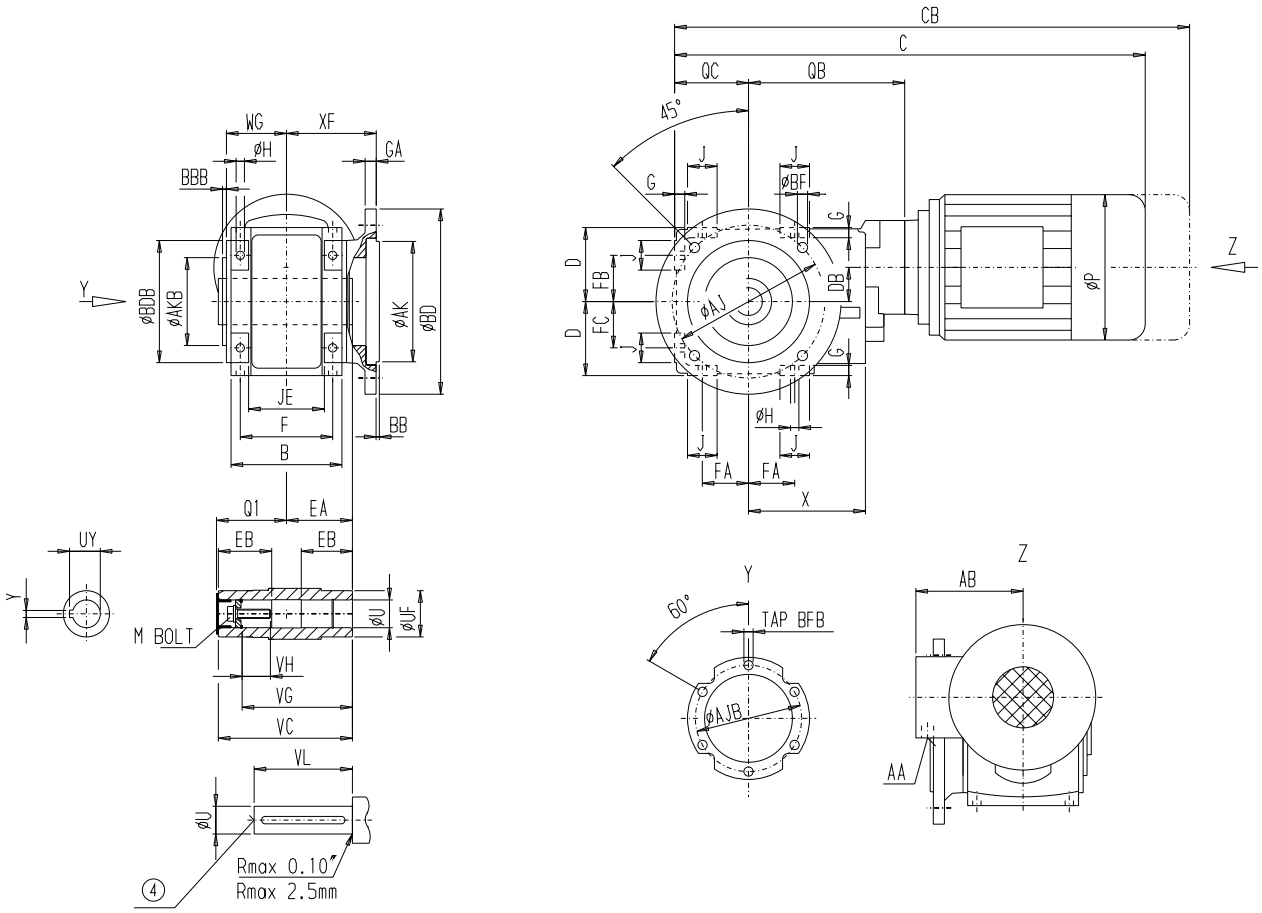
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with flange

BAF38

BAF 510
[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	TAP BF
160	*110*	*10*	*130*	*3*	*97*	*9*
200	*130*	*12*	*165*	*3,5*	*97*	*11*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
31,75	*50*	*140*	*118*	*37,2*	*100*	*3/8"-1 3/4"UNC*	*34,98*	*6,35*	*70*	*100*	*72,5*

Gearcase

BDB	FA	F	AKB	AJB	JE	G	B	BBB	D	FC	FB	DB	J	QC	QB	WG	X	H	TAP BFB
132	*50*	*100*	*95*	*115*	*68*	*11*	*120*	*3*	*80*	*50*	*50*	*37*	*32*	*80*	*169*	*65*	*131,5*	*9*	*M10x17*

Motor

	BAF38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*478,5*	*522,5*	*138*	*118,5*	*2x1/2"*	*27*
M71MP	*499,5*	*554,5*	*158*	*126,5*	*2x1/2"*	*29*
M90S	*540,5*	*606,5*	*176*	*150*	*2x3/4"*	*31*
M90L	*540,5*	*606,5*	*176*	*150*	*2x3/4"*	*33*
M100L	*585,5*	*657,5*	*194*	*160*	*2x3/4"*	*42*

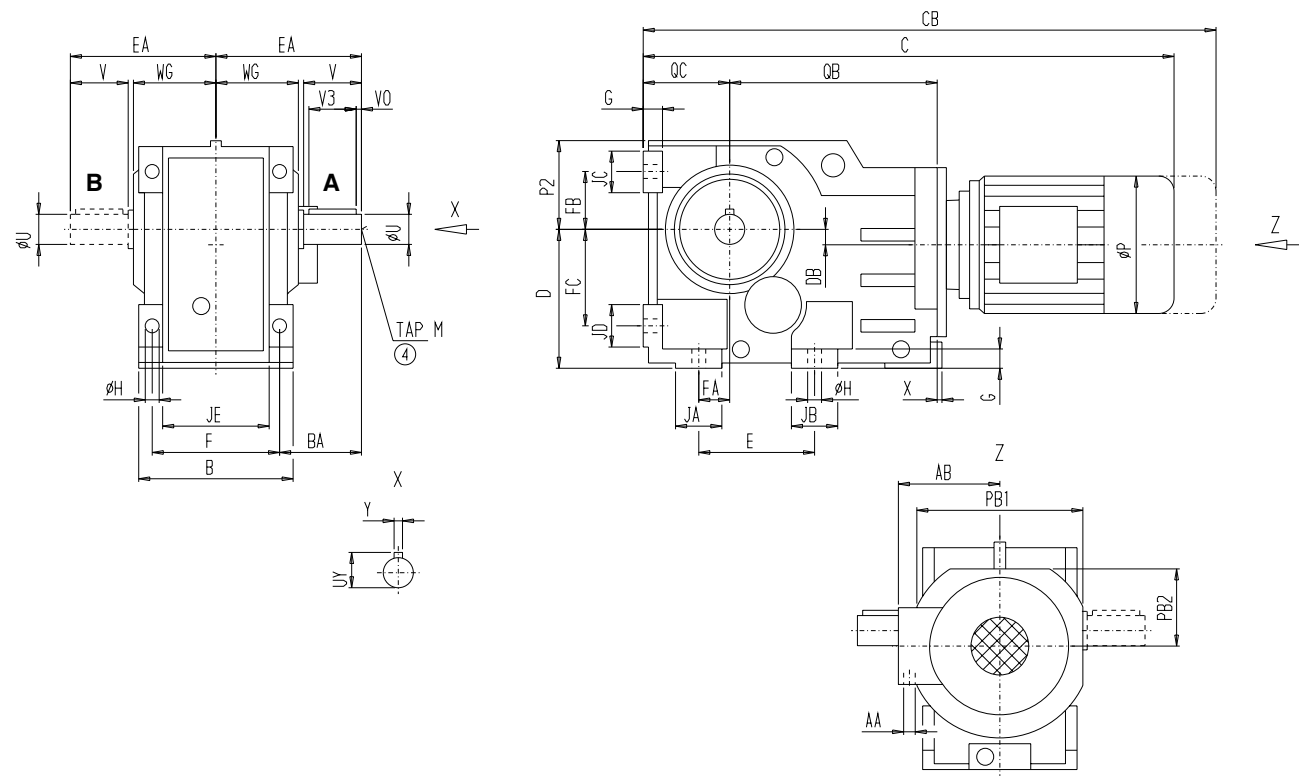
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted

K38

K 510
[inch]



4

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1	1.97	1.5	0.252	1.11	0.25	2.36	3/8-16UNC

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
4.33	1.1	3.94	0.63	3.23	4.72	3.94	2.68	1.85	2.46	0.37	1.26	1.38	1.22	1.3	4.92	0	2.48	6.46	2.24	2.64	4.33	0.43

Motor

	K38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	18.92	20.65	5.43	4.67	2x1/2“	52
M80	19.76	21.93	6.22	4.98	2x3/4“	59
M90S	21.38	23.97	6.93	5.91	2x3/4“	66
M90L	21.38	23.97	6.93	5.91	2x3/4“	70
M100L	23.15	25.98	7.64	6.3	2x3/4“	85
M112M	25.2	28.39	8.58	6.59	2x3/4“	103

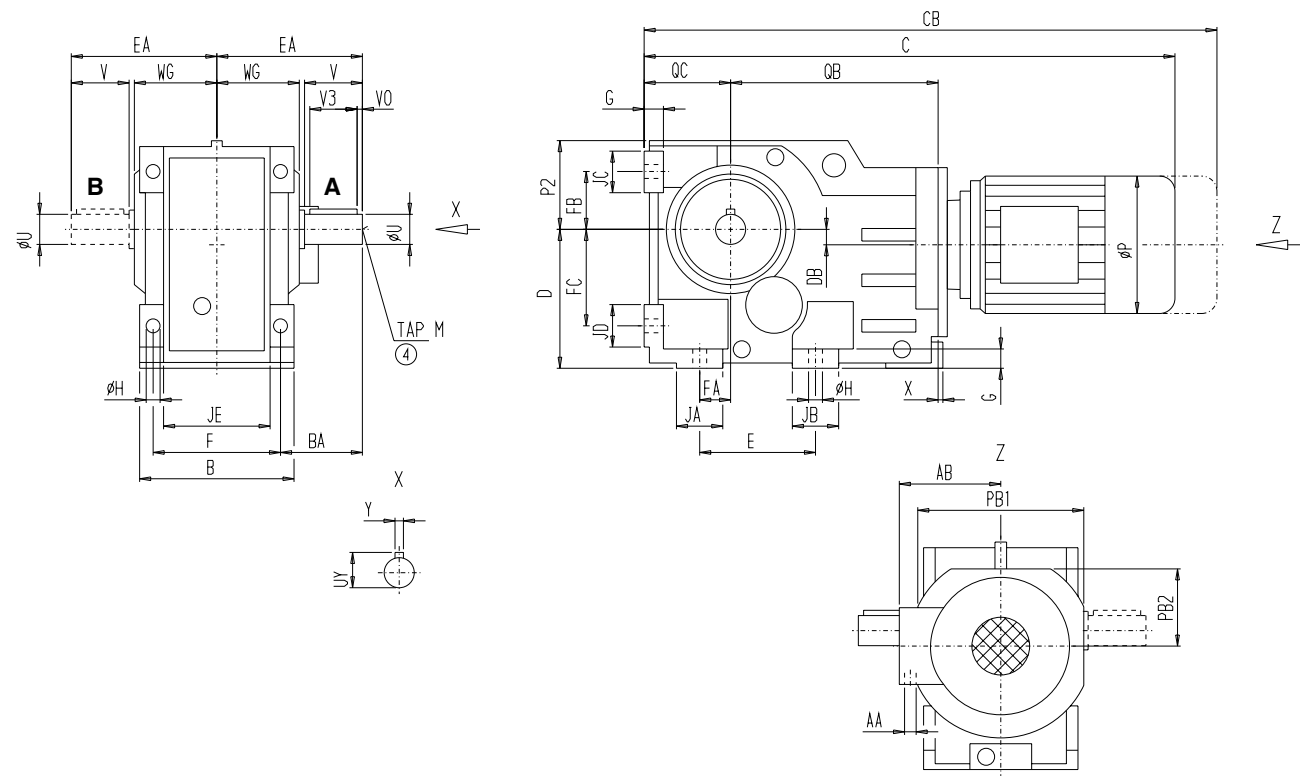
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted

K38

K 510
[*mm*]



Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
25,4	*50*	*38,1*	*6,401*	*28,19*	*6,35*	*60*	*3/8"-16UNC*

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
110	*28*	*100*	*16*	*82*	*120*	*100*	*68*	*47*	*62,5*	*9,5*	*32*	*35*	*31*	*33*	*125*	*0*	*63*	*164*	*57*	*67*	*110*	*11*

Motor

	K38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*481,5*	*525,5*	*138*	*118,5*	*2x1/2"*	*24*
M80	*503*	*558*	*158*	*126,5*	*2x1/2"*	*26*
M90S	*544*	*610*	*176*	*150*	*2x3/4"*	*28*
M90L	*544*	*610*	*176*	*150*	*2x3/4"*	*30*
M100L	*589*	*661*	*194*	*160*	*2x3/4"*	*39*
M112M	*641*	*722*	*218*	*167,5*	*2x3/4"*	*47*

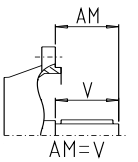
Tolerances see page 1 - 4

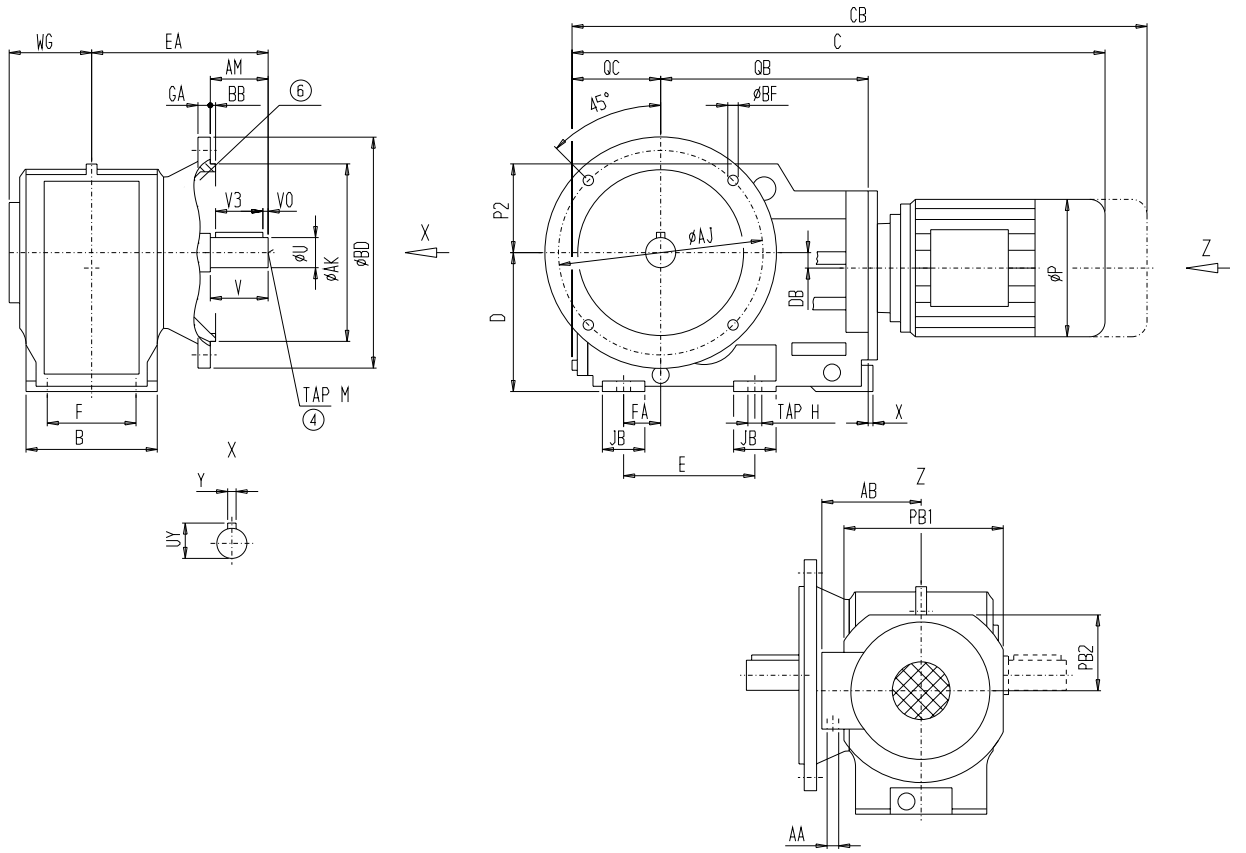
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Flange mounted

KF38

KF 510
[inch]





4

Flange

BD	AK	GA	AJ	BB	BF
6.3	4.33	0.39	5.12	0.14	0.35

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1	1.97	1.5	0.252	1.11	0.25	1.97	3/8-16UNC

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
4.61	1.38	2.36	3.94	3.94	2.46	0.37	1.26	4.92	0	2.76	6.46	2.24	2.64	5.28	M10x17

Motor

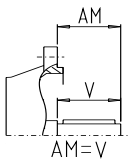
	KF38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	19.2	20.93	5.43	4.67	2x1/2“	56
M80	20.04	22.21	6.22	4.98	2x1/2“	62
M90S	21.66	24.25	6.93	5.91	2x3/4“	69
M90L	21.66	24.25	6.93	5.91	2x3/4“	73
M100L	23.43	26.26	7.64	6.3	2x3/4“	89
M112M	25.47	28.66	8.58	6.59	2x3/4“	106

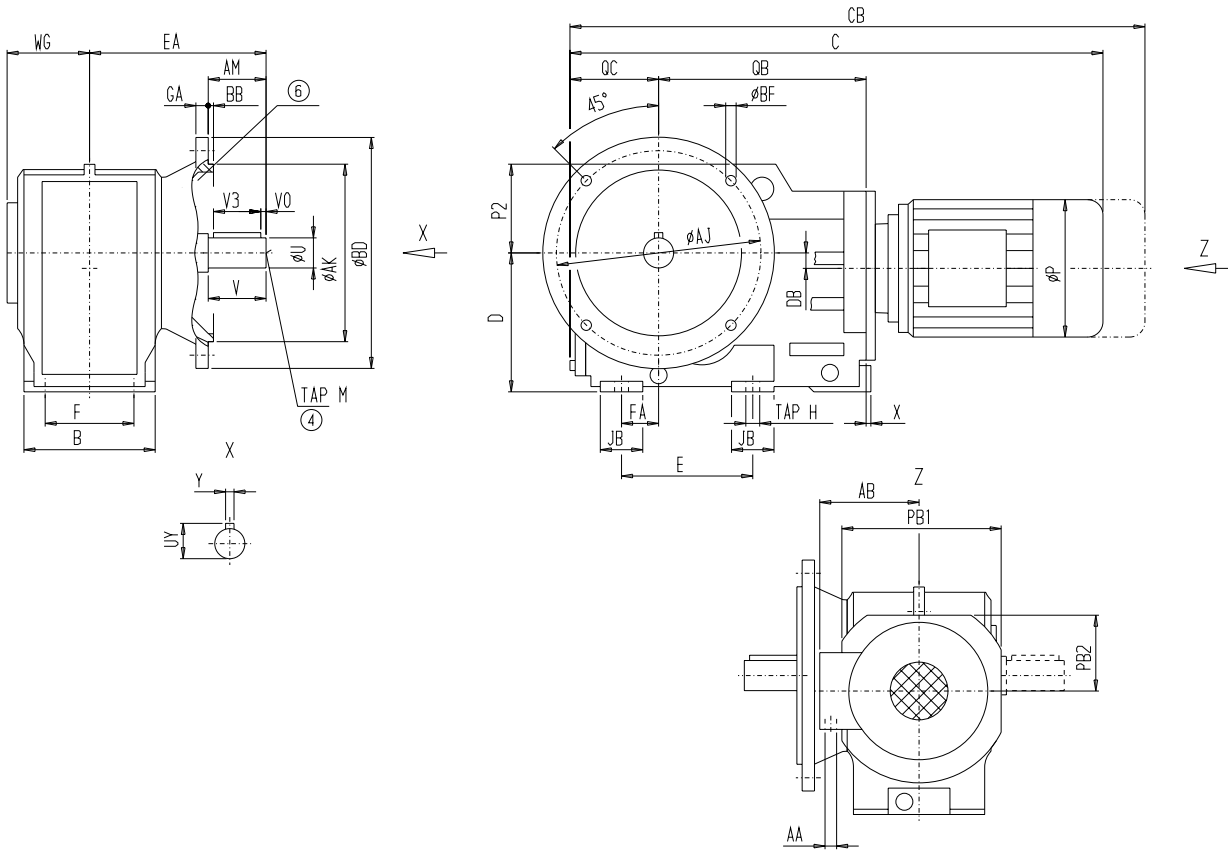
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Flange mounted

KF38

KF 510
[*mm*]





Flange

BD	AK	GA	AJ	BB	BF
160	*110*	*10*	*130*	*3,5*	*9*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
25,4	*50*	*38,1*	*6,401*	*28,19*	*6,35*	*50*	*3/8"-16UNC*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
117	*35*	*60*	*100*	*100*	*62,5*	*9,5*	*32*	*125*	*0*	*70*	*164*	*57*	*67*	*134*	*M10x17*

Motor

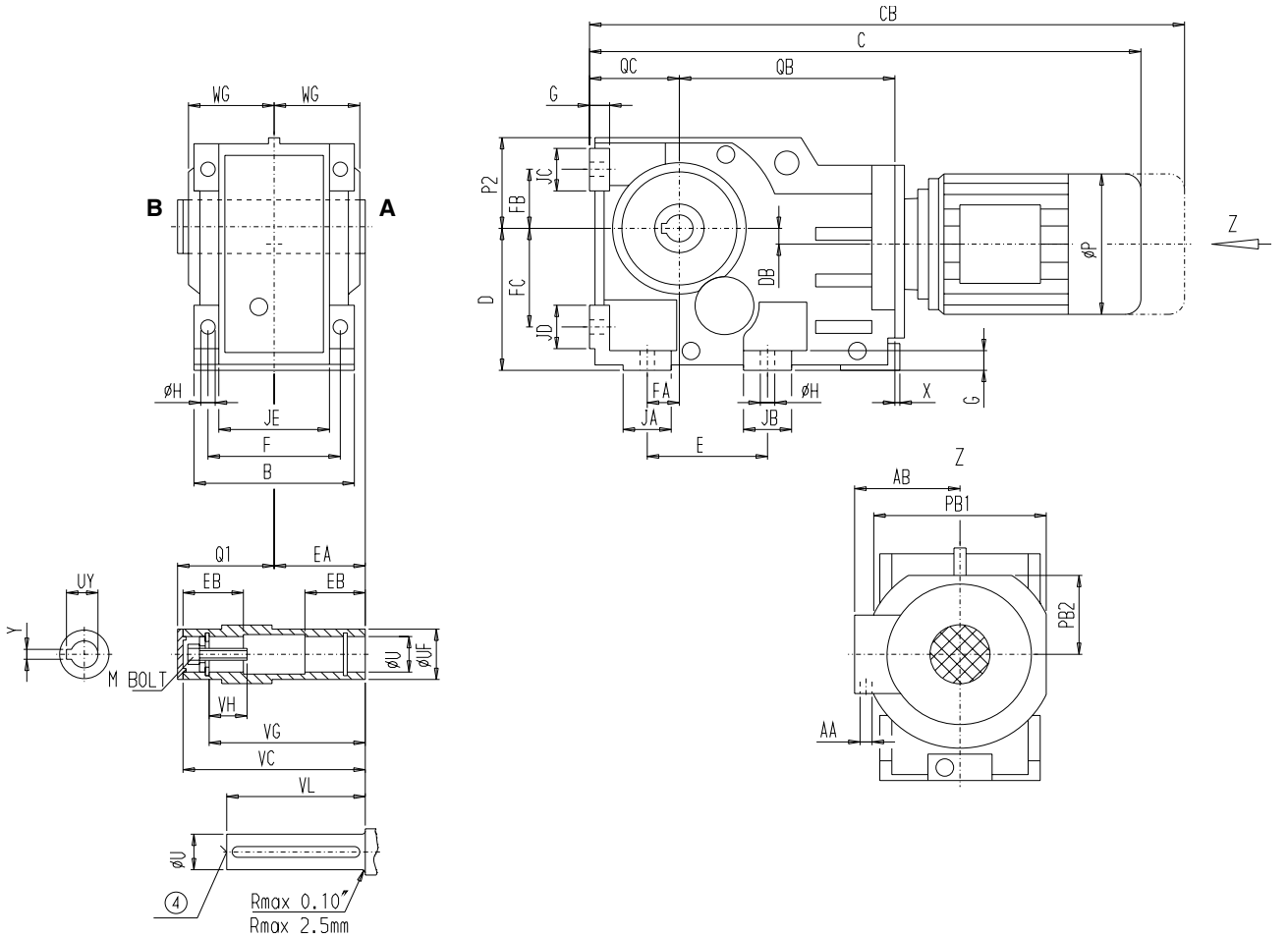
	KF38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*488,5*	*532,5*	*138*	*118,5*	*2x1/2"*	*25*
M80	*510*	*565*	*158*	*126,5*	*2x1/2"*	*27*
M90S	*551*	*617*	*176*	*150*	*2x3/4"*	*29*
M90L	*551*	*617*	*176*	*150*	*2x3/4"*	*31*
M100L	*596*	*668*	*194*	*160*	*2x3/4"*	*40*
M112M	*648*	*729*	*218*	*167,5*	*2x3/4"*	*48*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted

KA38

KA 510
[inch]



Mounting

E	F	FA	G	H
4.33	3.94	1.1	0.63	0.43

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1	1.772	4.72	4.134	1.547	3.35	3/8-1 3/4UNC	1.124	0.25	2.36	1.732	2.48

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	QC	QB	WG	P2
3.23	4.72	3.94	2.68	1.85	2.46	0.37	1.26	1.38	1.22	1.3	4.92	2.48	6.46	2.24	2.64

Motor

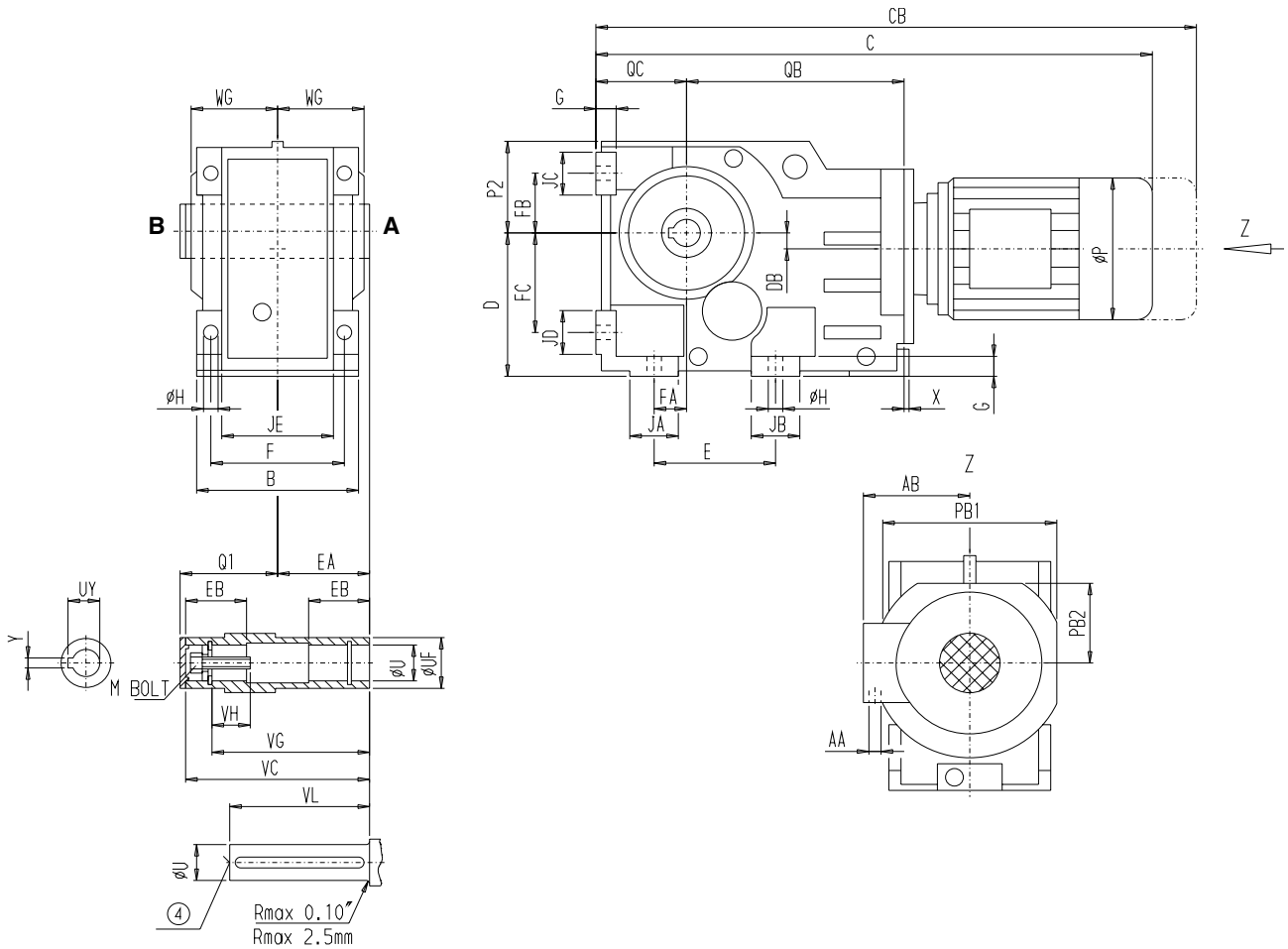
	KA38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	18.92	20.65	5.43	4.67	2x1/2“	50
M80	19.76	21.93	6.22	4.98	2x1/2“	56
M90S	21.38	23.97	6.93	5.91	2x3/4“	63
M90L	21.38	23.97	6.93	5.91	2x3/4“	67
M100L	23.15	25.98	7.64	6.3	2x3/4“	83
M112M	25.2	28.39	8.58	6.59	2x3/4“	100

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted

KA38

KA 510
[*mm*]



Mounting

E	F	FA	G	H
110	*100*	*28*	*16*	*11*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
25,4	*45*	*120*	*105*	*39*	*85*	*3/8"-1 3/4"UNC*	*28,55*	*6,35*	*60*	*44*	*63*

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	QC	QB	WG	P2
82	*120*	*100*	*68*	*47*	*62,5*	*9,5*	*32*	*35*	*31*	*33*	*125*	*63*	*164*	*57*	*67*

Motor

	KA38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*481,5*	*525,5*	*138*	*118,5*	*2x1/2"*	*22*
M71MP	*503*	*558*	*158*	*126,5*	*2x1/2"*	*24*
M90S	*544*	*610*	*176*	*150*	*2x3/4"*	*26*
M90L	*544*	*610*	*176*	*150*	*2x3/4"*	*28*
M100L	*589*	*661*	*194*	*160*	*2x3/4"*	*37*
M112M	*641*	*722*	*218*	*167,5*	*2x3/4"*	*45*

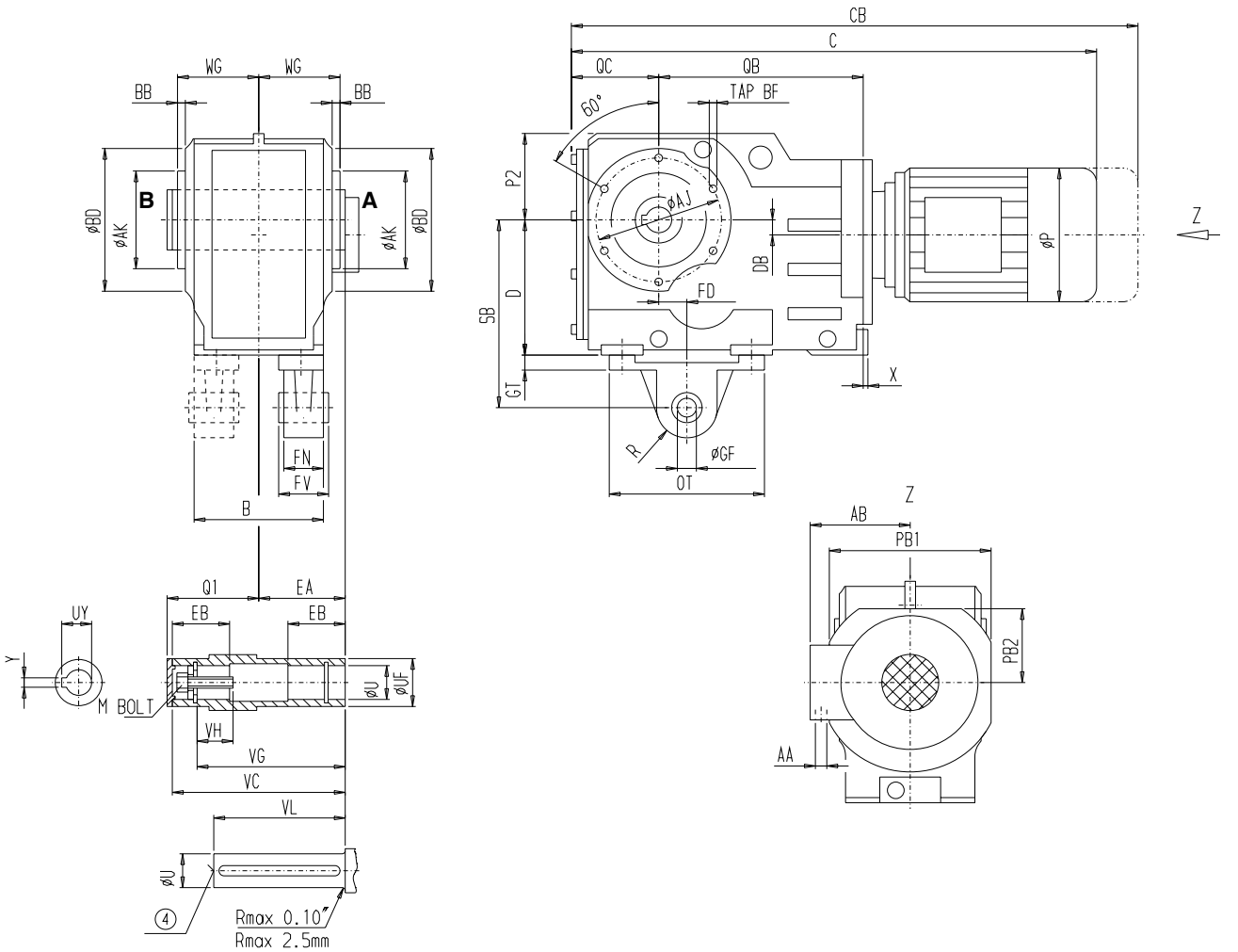
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD38

KAD 510
[inch]



4

Mounting

BD	AK	AJ	BB	WG	TAP BF
4.72	3.15	3.94	0.12	2.24	M8x14

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1	1.772	4.724	4.134	1.547	3.35	3/8-1 3/4UNC	1.124	0.25	2.36	1.732	2.48

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
3.94	2.46	0.37	4.92	0	2.76	6.46	2.64

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
0.94	1.1	0.47	5.51	3.94	0.93	0.51	5.79	R0.87

Motor

	KAD38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	19.2	20.93	5.43	4.67	2x1/2“	51
M80	20.04	22.21	6.22	4.98	2x1/2“	57
M90S	21.66	24.25	6.93	5.91	2x3/4“	64
M90L	21.66	24.25	6.93	5.91	2x3/4“	68
M100L	23.43	26.26	7.64	6.3	2x3/4“	84
M112M	25.47	28.66	8.58	6.59	2x3/4“	101

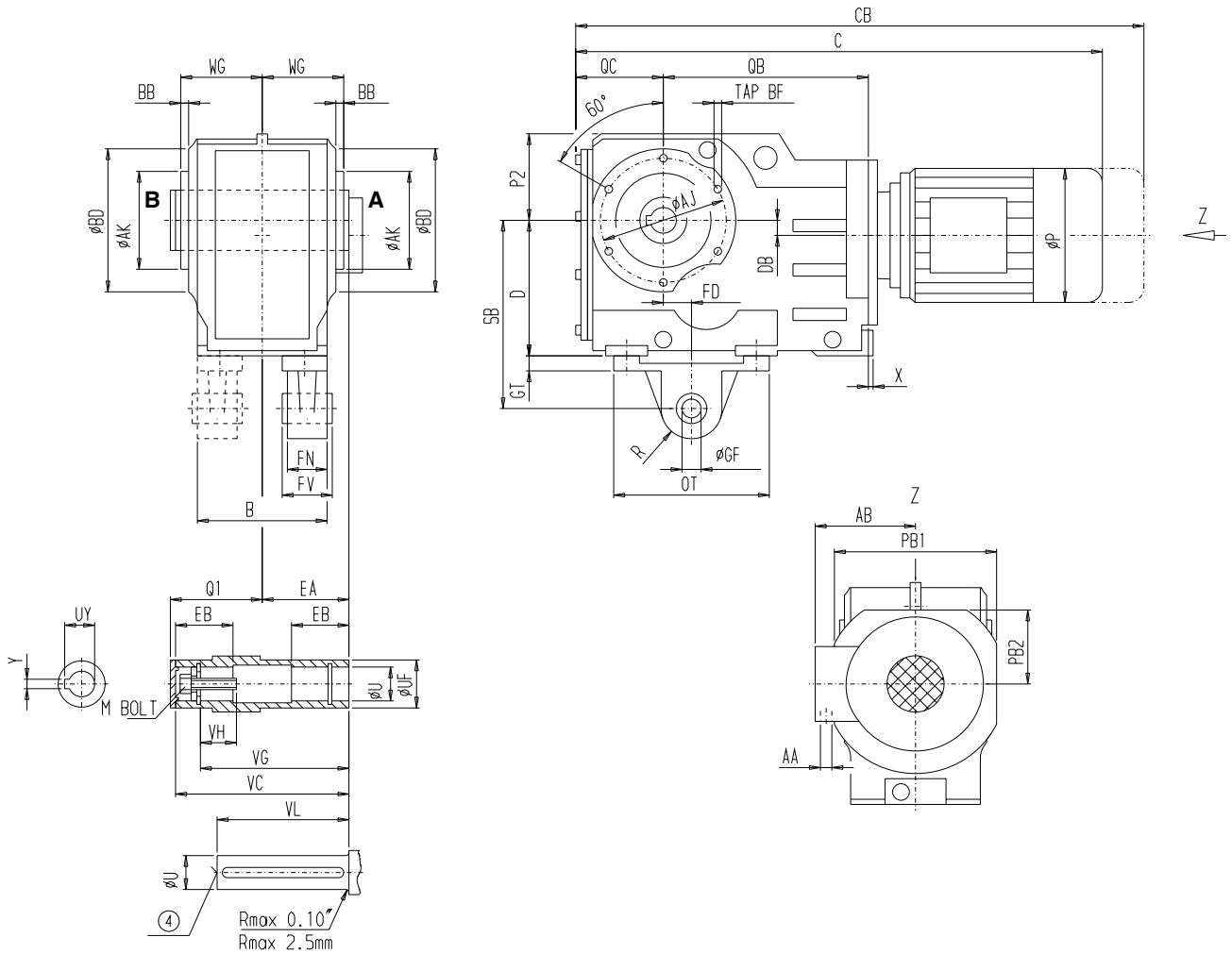
Tolerances see page 1 - 4
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD38

KAD 510

[*mm*]



Mounting

BD	AK	AJ	BB	WG	TAP BF
120	*80*	*100*	*3*	*57*	*M8x14*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
25,4	*45*	*120*	*105*	*39*	*85*	*3/8"-1 3/4"UNC*	*28,55*	*6,35*	*60*	*44*	63

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
100	*62,5*	*9,5*	*125*	*0*	*70*	*164*	*67*

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
24	*28*	*12*	*140*	*100*	*23,5*	*13*	*147*	*R22*

Motor

	KAD38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*488,5*	*532,5*	*138*	*118,5*	*2x1/2"*	*23*
M80	*510*	*565*	*158*	*126,5*	*2x1/2"*	*25*
M90S	*551*	*617*	*176*	*150*	*2x3/4"*	*27*
M90L	*551*	*617*	*176*	*150*	*2x3/4"*	*29*
M100L	*596*	*668*	*194*	*160*	*2x3/4"*	*38*
M112M	*648*	*729*	*218*	*167,5*	*2x3/4"*	*46*

Tolerances see page 1 - 4

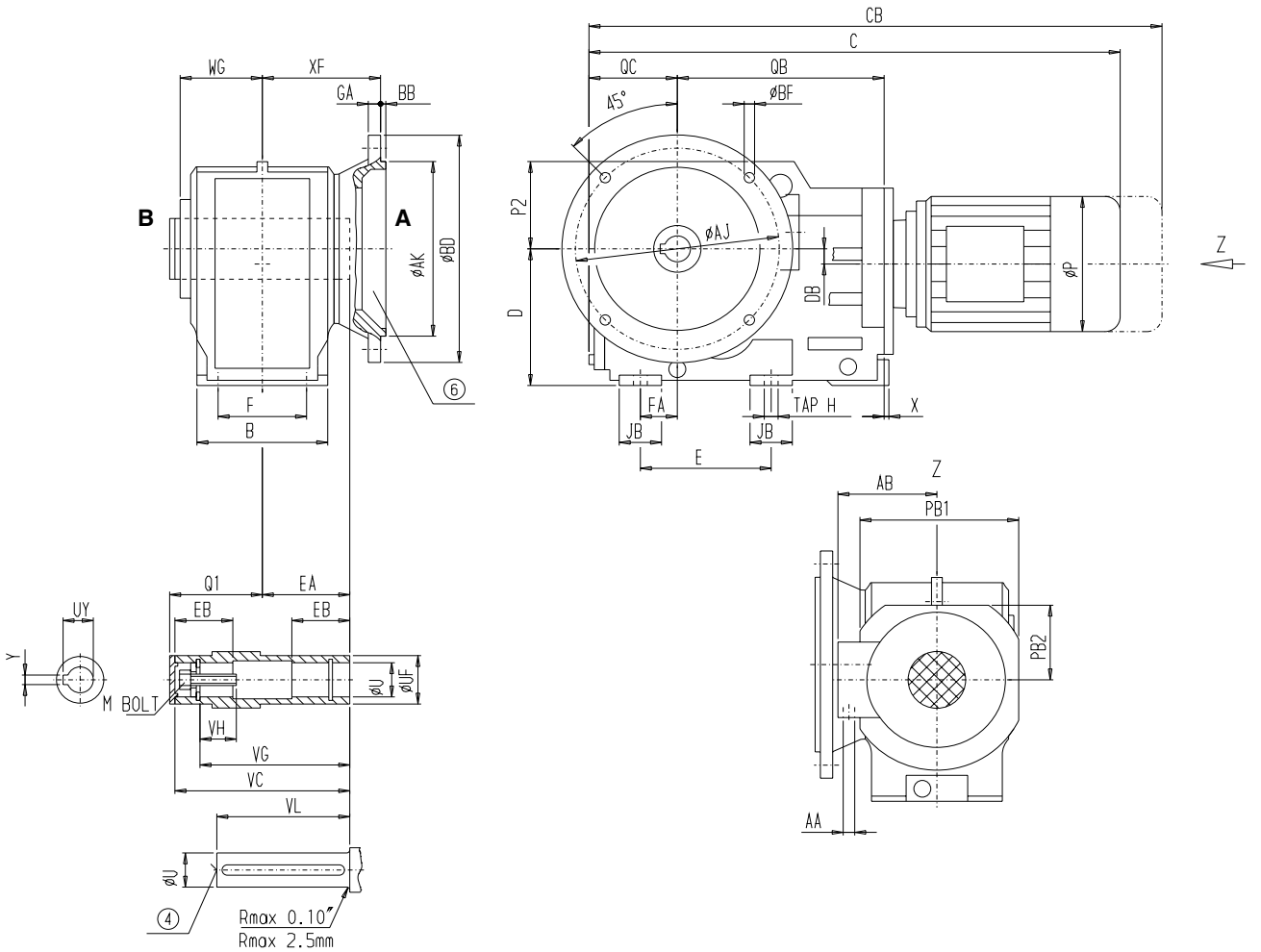
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with flange

KAF38

KAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	XF	BF
6.3	4.33	0.39	5.12	0.14	3.31	0.35

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1	1.772	4.724	0.059	1.547	3.35	3/8-1 3/4UNC	1.124	0.25	2.36	1.732	2.48

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
4.61	1.38	2.36	3.94	3.94	2.46	0.37	1.26	4.92	0	2.76	6.46	2.24	2.64	M10x17

Motor

	KAF38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	19.2	20.93	5.43	4.67	2x1/2“	53
M80	20.04	22.21	6.22	4.98	2x1/2“	60
M90S	21.66	24.25	6.93	5.91	2x3/4“	66
M90L	21.66	24.25	6.93	5.91	2x3/4“	71
M100L	23.43	26.26	7.64	6.3	2x3/4“	86
M112M	25.47	28.66	8.58	6.59	2x3/4“	103

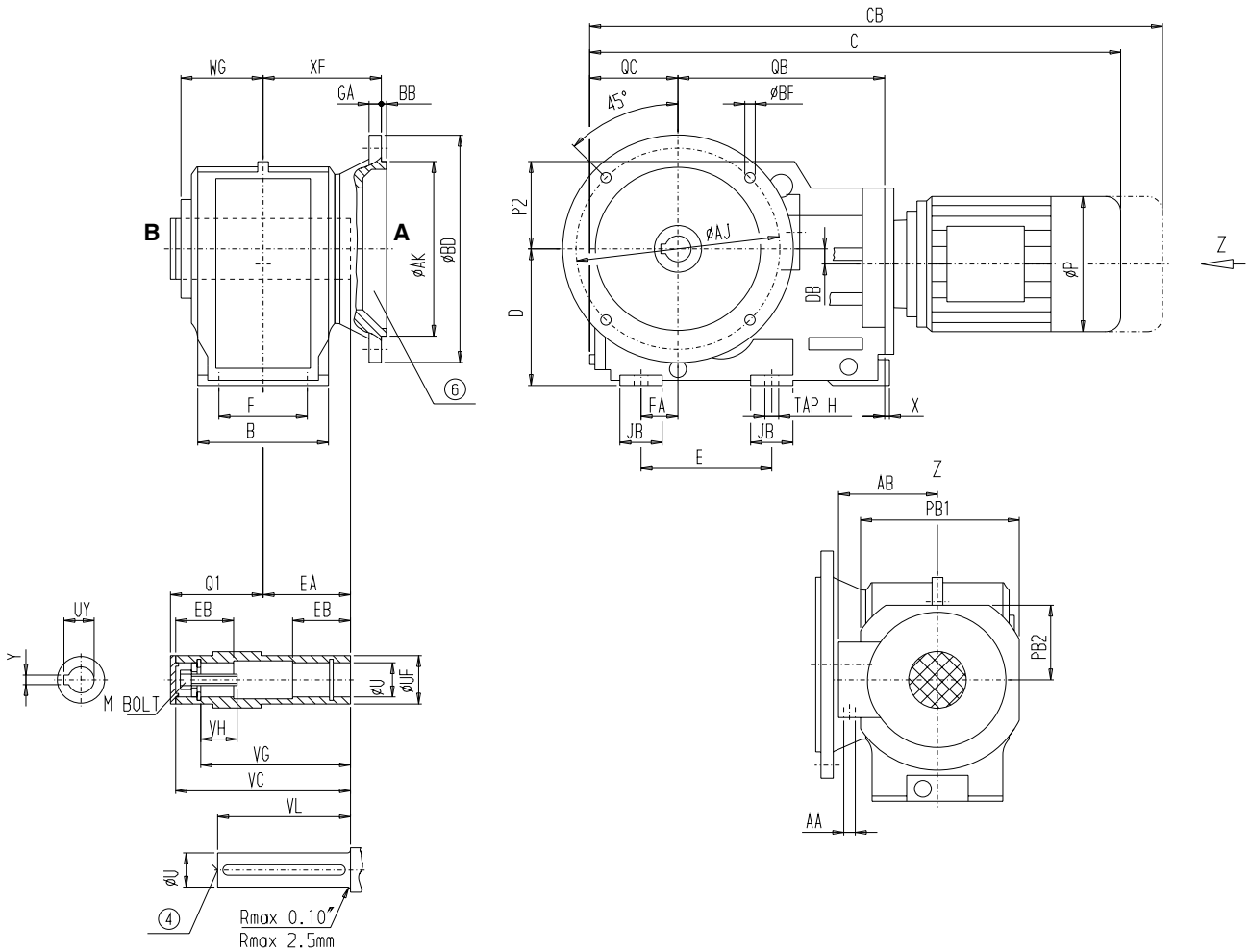
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted with flange

KAF38

KAF 510

[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	BF
160	*110*	*10*	*130*	*3,5*	*84*	*9*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
25,4	*45*	*120*	*1,5*	*39*	*85*	*3/8"-1 3/4"UNC*	*28,55*	*6,35*	*60*	*44*	*63*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
117	*35*	*60*	*100*	*100*	*62,5*	*9,5*	*32*	*125*	*0*	*70*	*164*	*57*	*67*	*M10x17*

Motor

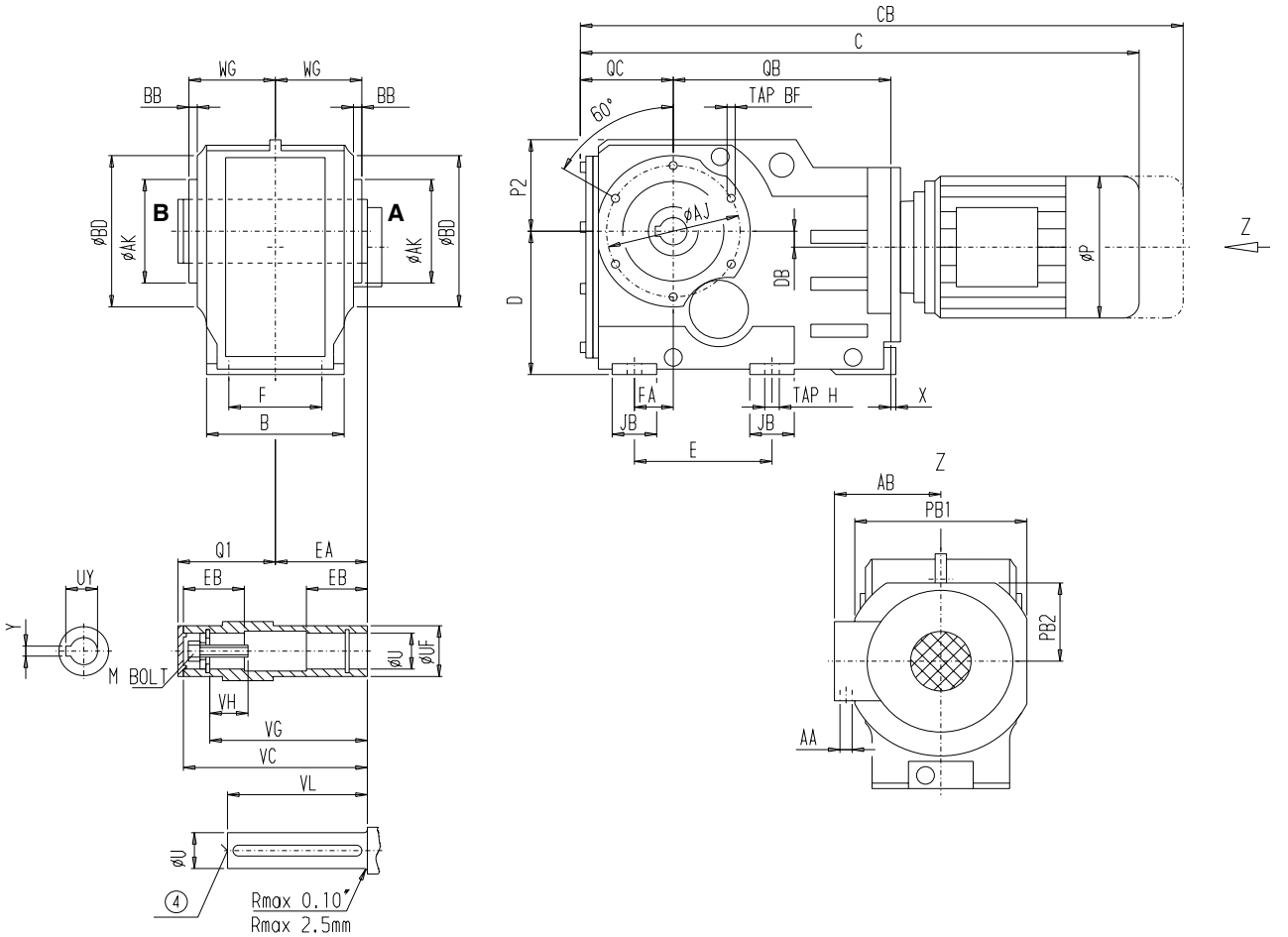
	KAF38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*488,5*	*532,5*	*138*	*118,5*	*2x1/2"*	*24*
M80	*510*	*565*	*158*	*126,5*	*2x1/2"*	*26*
M90S	*551*	*617*	*176*	*150*	*2x3/4"*	*28*
M90L	*551*	*617*	*176*	*150*	*2x3/4"*	*30*
M100L	*596*	*668*	*194*	*160*	*2x3/4"*	*39*
M112M	*648*	*729*	*218*	*167,5*	*2x3/4"*	*47*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ38

KAZ 510
[inch]



Mounting

BD	AK	AJ	BB	TAP BF
4.72	3.15	3.94	0.12	M8x14

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1	1.772	4.724	4.134	1.547	3.35	3/8-1 3/4UNC	1.124	0.25	2.36	1.732	2.48

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
4.61	1.38	2.36	3.94	3.94	2.46	0.37	1.26	4.92	0	2.76	6.46	2.24	2.64	M10x17

Motor

	KAZ38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	19.2	20.93	5.43	4.67	2x1/2“	49
M80	20.04	22.21	6.22	4.98	2x1/2“	56
M90S	21.66	24.25	6.93	5.91	2x3/4“	63
M90L	21.66	24.25	6.93	5.91	2x3/4“	67
M100L	23.43	26.26	7.64	6.3	2x3/4“	82
M112M	25.47	28.66	8.58	6.59	2x3/4“	100

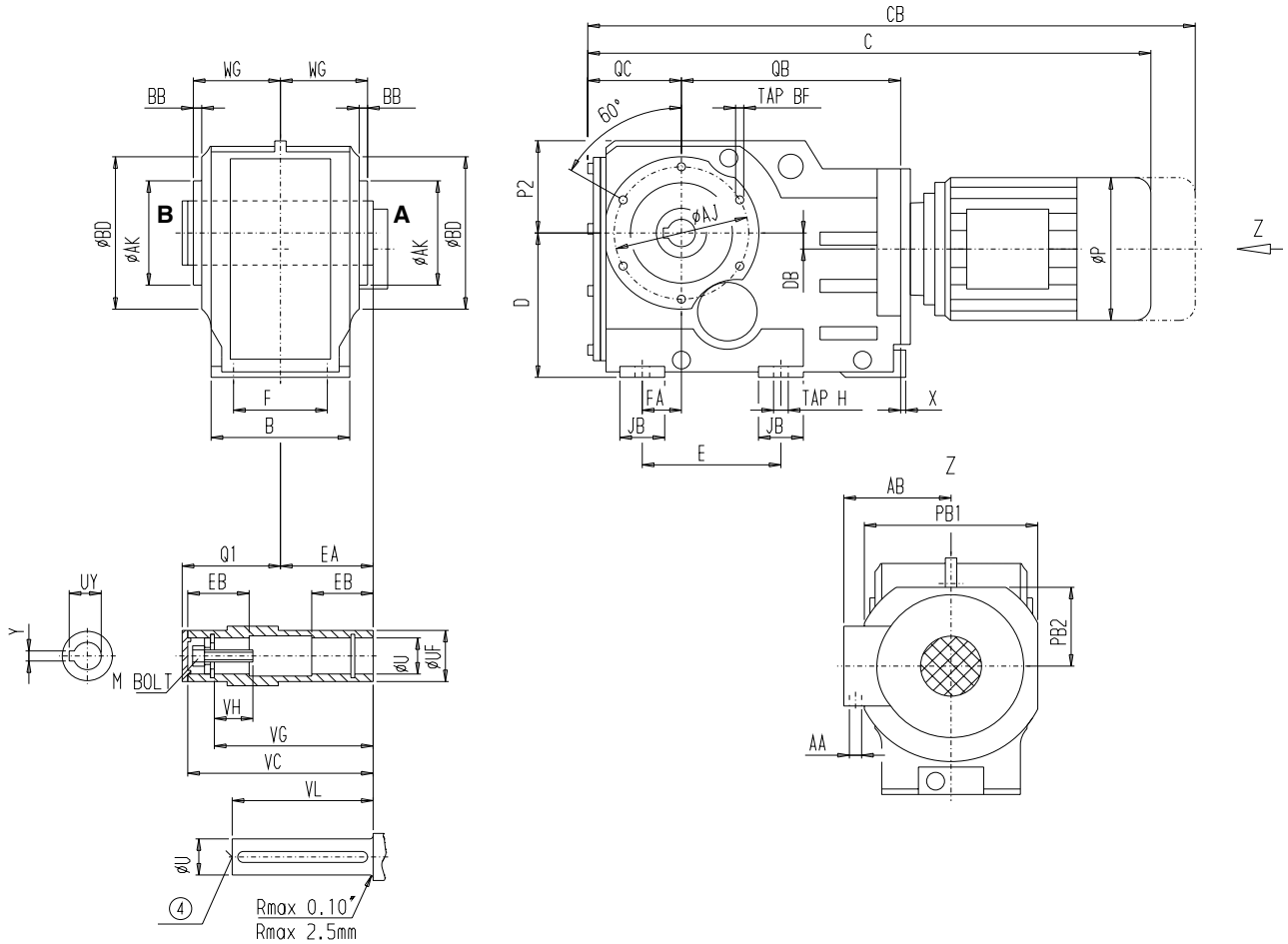
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ38

KAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
120	*80*	*100*	*3*	*M8x14*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
25.4	*45*	*120*	*105*	*39*	*85*	*3/8"-1 3/4"UNC*	*28,55*	*6,35*	*60*	*44*	*63*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
117	*35*	*60*	*100*	*100*	*62,5*	*9,5*	*32*	*125*	*0*	*70*	*164*	*57*	*67*	*M10x17*

Motor

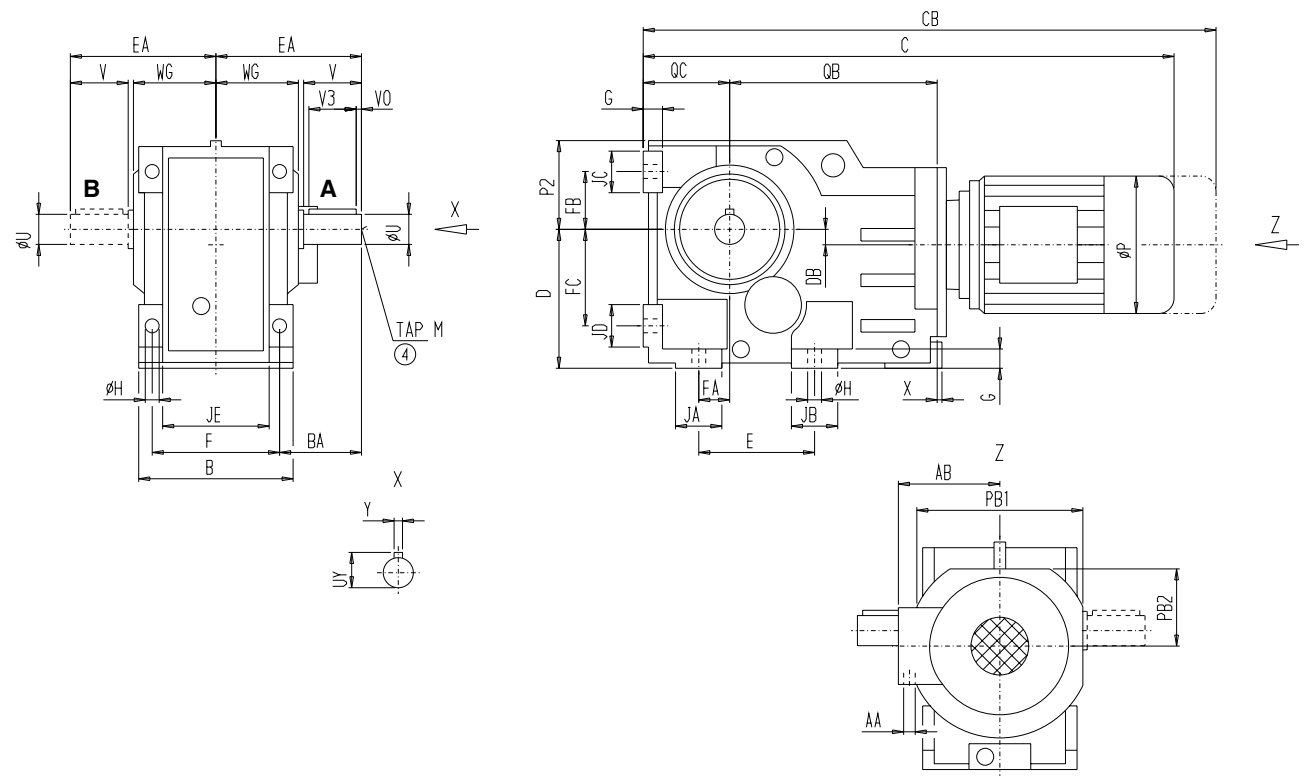
	KAZ38					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*488.5*	*532.5*	*138*	*118.5*	*2x1/2"*	*22*
M71MP	*510*	*565*	*158*	*126.5*	*2x1/2"*	*24*
M90S	*551*	*617*	*176*	*150*	*2x3/4"*	*26*
M90L	*551*	*617*	*176*	*150*	*2x3/4"*	*28*
M100L	*596*	*668*	*194*	*160*	*2x3/4"*	*37*
M112M	*648*	*729*	*218*	*167.5*	*2x3/4"*	*45*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted

K48

K 510
[inch]



4

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1.25	2.36	1.875	0.133	1.36	0.25	2.95	5/8-11UNC

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
5.12	1.38	4.72	0.71	3.86	5.71	4.41	2.95	2.17	2.46	0.43	1.57	1.54	1.42	1.57	4.92	0.12	2.8	7.32	2.8	2.95	5.31	0.43

Motor

	K48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	20.1	21.83	5.43	4.67	2x1/2“	62
M80	20.94	23.11	6.22	4.98	2x1/2“	69
M90S	22.56	25.15	6.93	5.91	2x3/4“	75
M90L	22.56	25.15	6.93	5.91	2x3/4“	80
M100L	24.33	27.16	7.64	6.3	2x3/4“	95
M112M	26.38	29.57	8.58	6.59	2x3/4“	113

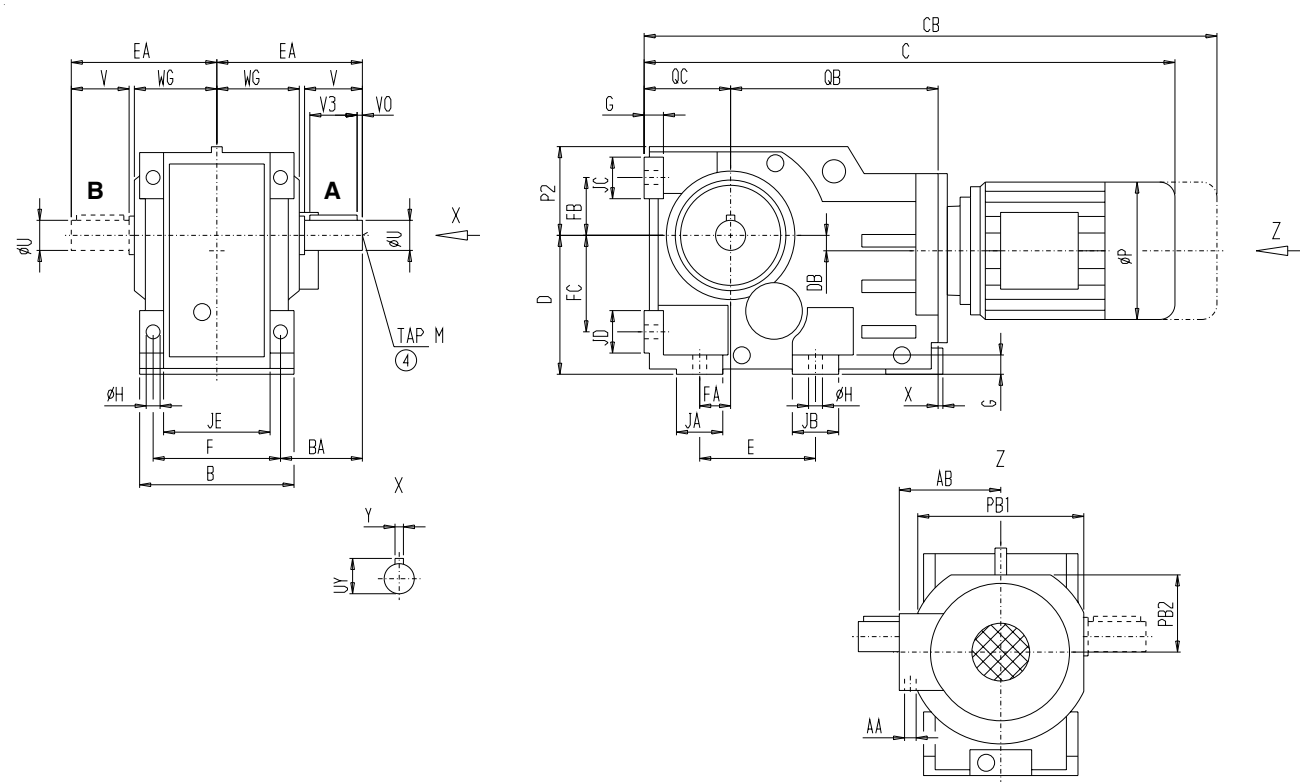
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted

K48

K 510
[*mm*]



4

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
31,75	*60*	*47,625*	*3,378*	*34,54*	*6,35*	*75*	*5/8"-11UNC*

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
130	*35*	*120*	*18*	*98*	*145*	*112*	*75*	*55*	*62,5*	*11*	*40*	*39*	*36*	*40*	*125*	*3*	*71*	*186*	*71*	*75*	*135*	*11*

Motor

	K48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*511,5*	*555,5*	*138*	*118,5*	*2x1/2"*	*28*
M80	*533*	*588*	*158*	*126,5*	*2x1/2"*	*30*
M90S	*574*	*640*	*176*	*150*	*2x3/4"*	*32*
M90L	*574*	*640*	*176*	*150*	*2x3/4"*	*34*
M100L	*619*	*691*	*194*	*160*	*2x3/4"*	*43*
M112M	*671*	*752*	*218*	*167,5*	*2x3/4"*	*51*

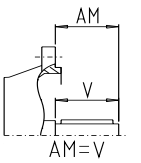
Tolerances see page 1 - 4

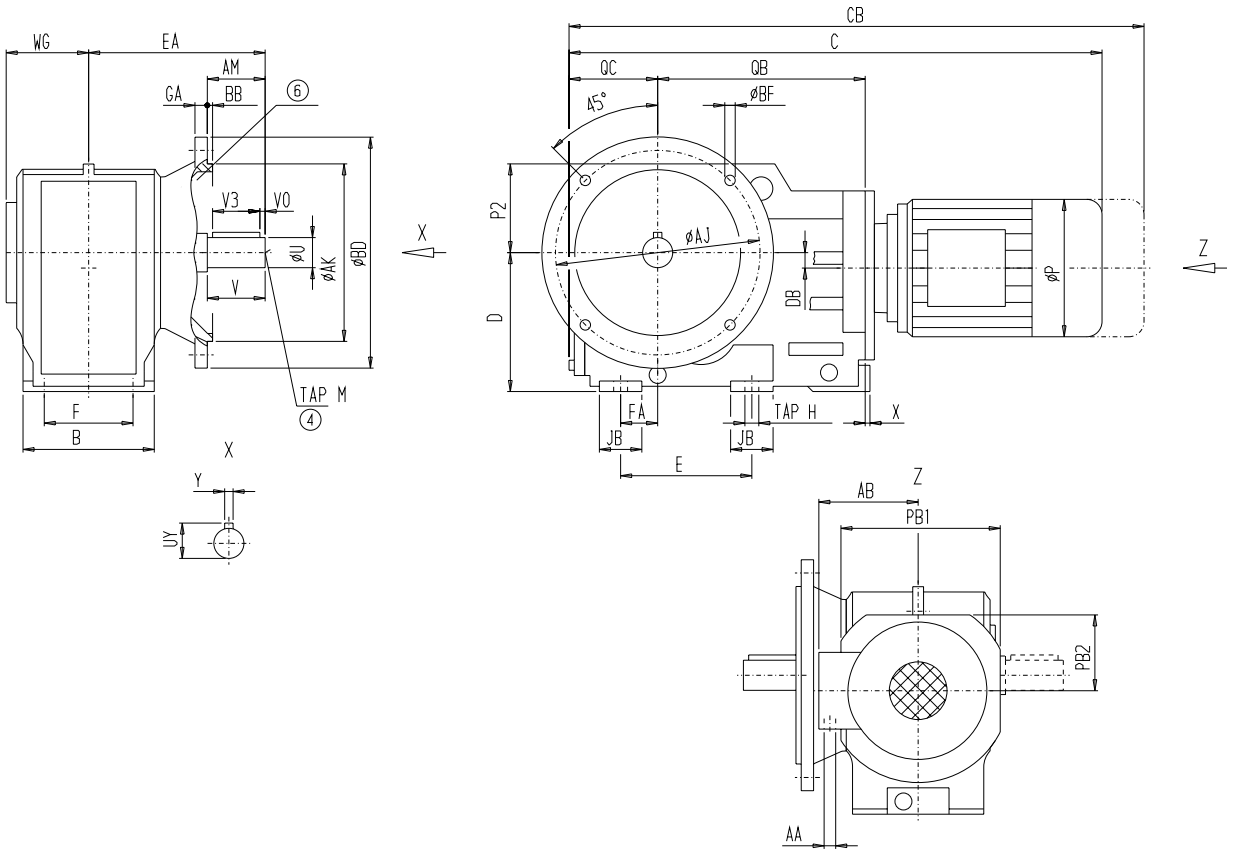
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Flange mounted

KF48

KF 510
[inch]





Flange

BD	AK	GA	AJ	BB	BF
7.87	5.12	0.47	6.5	0.14	0.43

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.25	2.36	1.875	0.133	1.36	0.25	2.36	3/8-16UNC

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
5.51	1.57	2.76	4.33	4.41	2.46	0.43	1.18	4.92	0.12	3.05	7.32	2.8	2.95	6.3	M10x17

Motor

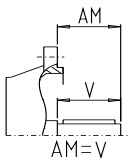
	KF48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	20.36	22.09	5.43	4.67	2x1/2“	67
M80	21.2	23.37	6.22	4.98	2x1/2“	74
M90S	22.82	25.41	6.93	5.91	2x3/4“	80
M90L	22.82	25.41	6.93	5.91	2x3/4“	85
M100L	24.59	27.42	7.64	6.3	2x3/4“	100
M112M	26.63	29.82	8.58	6.59	2x3/4“	118

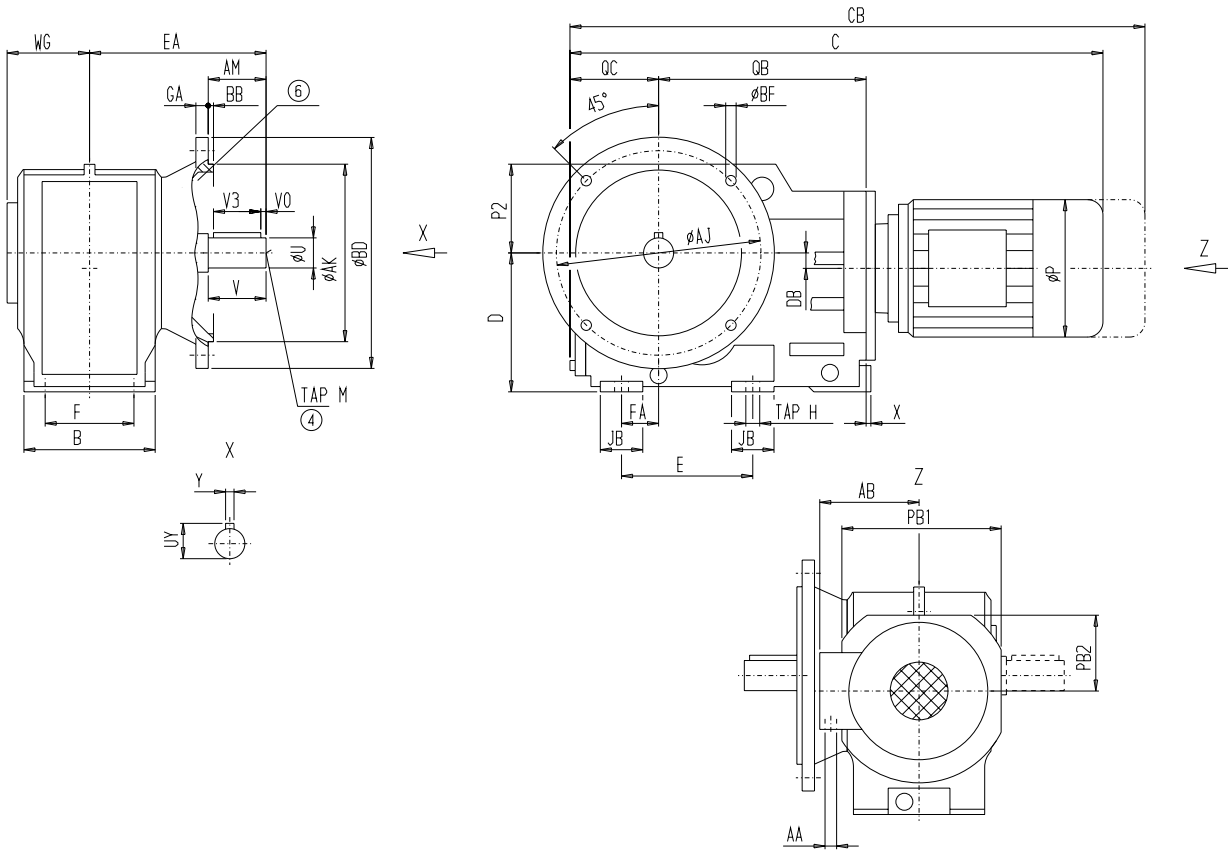
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Flange mounted

KF48

KF 510
[*mm*]





Flange

BD	AK	GA	AJ	BB	BF
200	*130*	*12*	*165*	*3,5*	*11*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
31,75	*60*	*47,625*	*3,378*	*34,54*	*6,35*	*60*	*3/8"-16UNC*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
140	*40*	*70*	*110*	*112*	*62,5*	*11*	*30*	*125*	*3*	*77,5*	*186*	*71*	*75*	*160*	*M10x17*

Motor

	KF48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*518*	*562*	*138*	*118,5*	*2x1/2"*	*30*
M80	*539,5*	*594,5*	*158*	*126,5*	*2x1/2"*	*32*
M90S	*580,5*	*646,5*	*176*	*150*	*2x3/4"*	*34*
M90L	*580,5*	*646,5*	*176*	*150*	*2x3/4"*	*36*
M100L	*625,5*	*697,5*	*194*	*160*	*2x3/4"*	*45*
M112M	*677,5*	*758,5*	*218*	*167,5*	*2x3/4"*	*53*

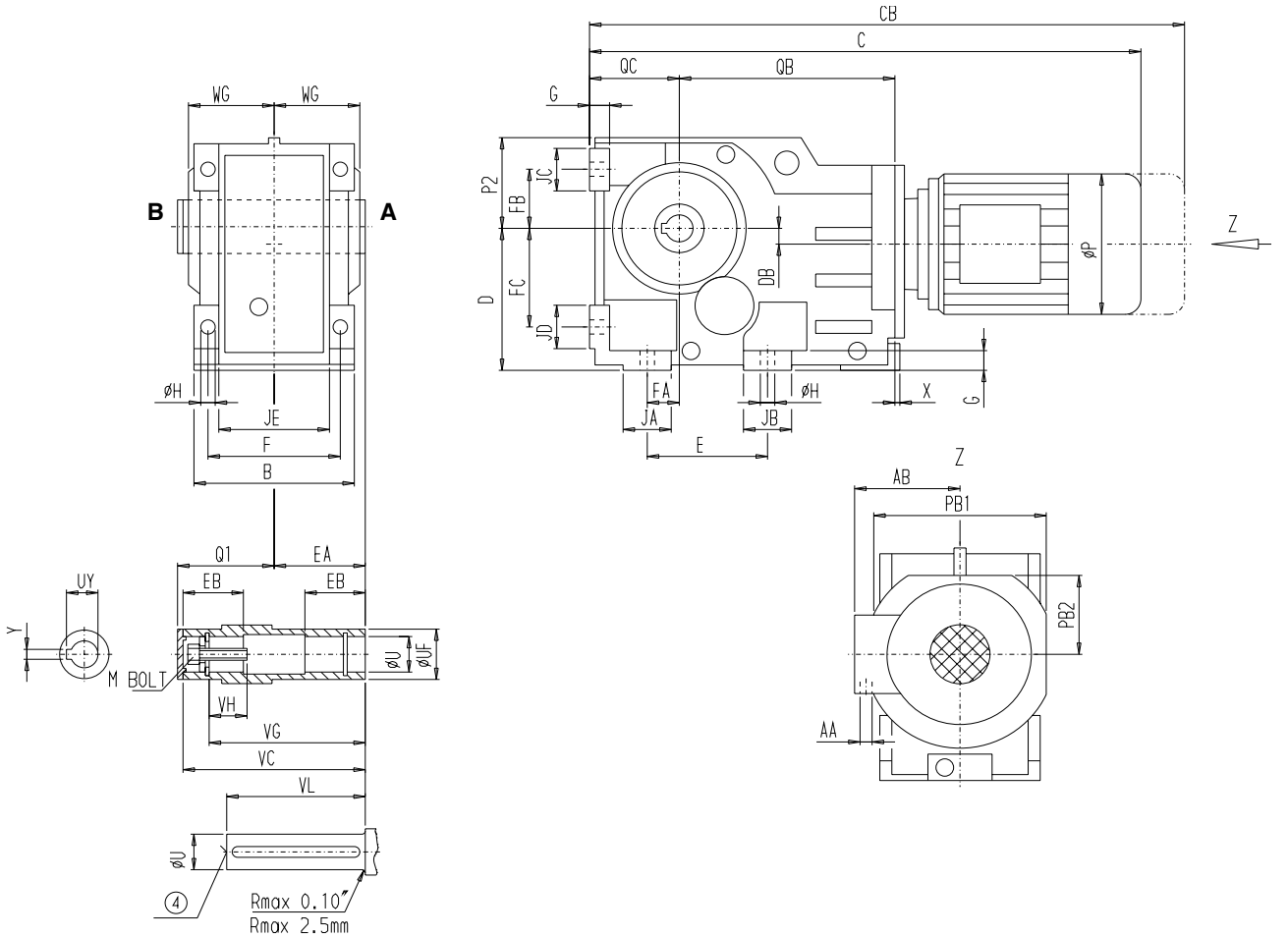
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted

KA48

KA 510

[inch]



Mounting

E	F	FA	G	H
5.12	4.72	1.38	0.71	0.43

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.375	2.165	5.91	5.039	1.37	4.53	3/8-16UNC	1.53	0.31	2.95	2.283	3.07

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
3.86	5.71	4.41	2.95	2.17	2.46	0.43	1.57	1.54	1.42	1.57	4.92	0.12	2.8	7.32	2.8	2.95

Motor

	KA48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	20.1	21.83	5.43	4.67	2x1/2“	59
M80	20.94	23.11	6.22	4.98	2x1/2“	65
M90S	22.56	25.15	6.93	5.91	2x3/4“	72
M90L	22.56	25.15	6.93	5.91	2x3/4“	77
M100L	24.33	27.16	7.64	6.3	2x3/4“	92
M112M	26.38	29.57	8.58	6.59	2x3/4“	109

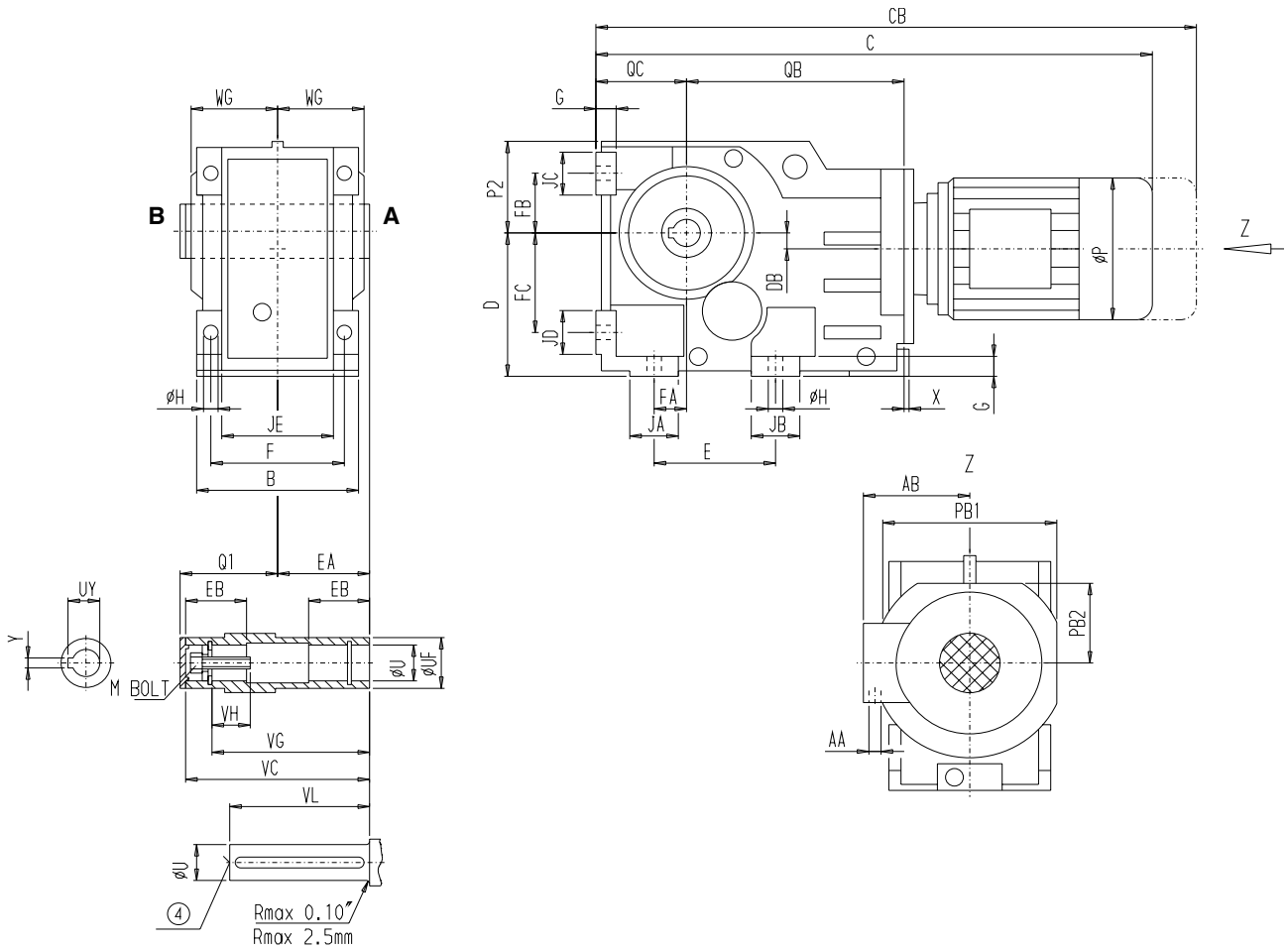
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted

KA48

KA 510

[*mm*]



4

Mounting

E	F	FA	G	H
130	*120*	*35*	*18*	*11*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
34,925	*55*	*150*	*128*	*35*	*115*	*3/8"-16UNC*	*38,86*	*7,874*	*75*	*58*	*78*

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
98	*145*	*112*	*75*	*55*	*62,5*	*11*	*40*	*39*	*36*	*40*	*125*	*3*	*71*	*186*	*71*	*75*

Motor

	KA48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*511,5*	*555,5*	*138*	*118,5*	*2x1/2"*	*27*
M71MP	*533*	*588*	*158*	*126,5*	*2x1/2"*	*29*
M90S	*574*	*640*	*176*	*150*	*2x3/4"*	*31*
M90L	*574*	*640*	*176*	*150*	*2x3/4"*	*35*
M100L	*619*	*691*	*194*	*160*	*2x3/4"*	*42*
M112M	*671*	*752*	*218*	*167,5*	*2x3/4"*	*50*

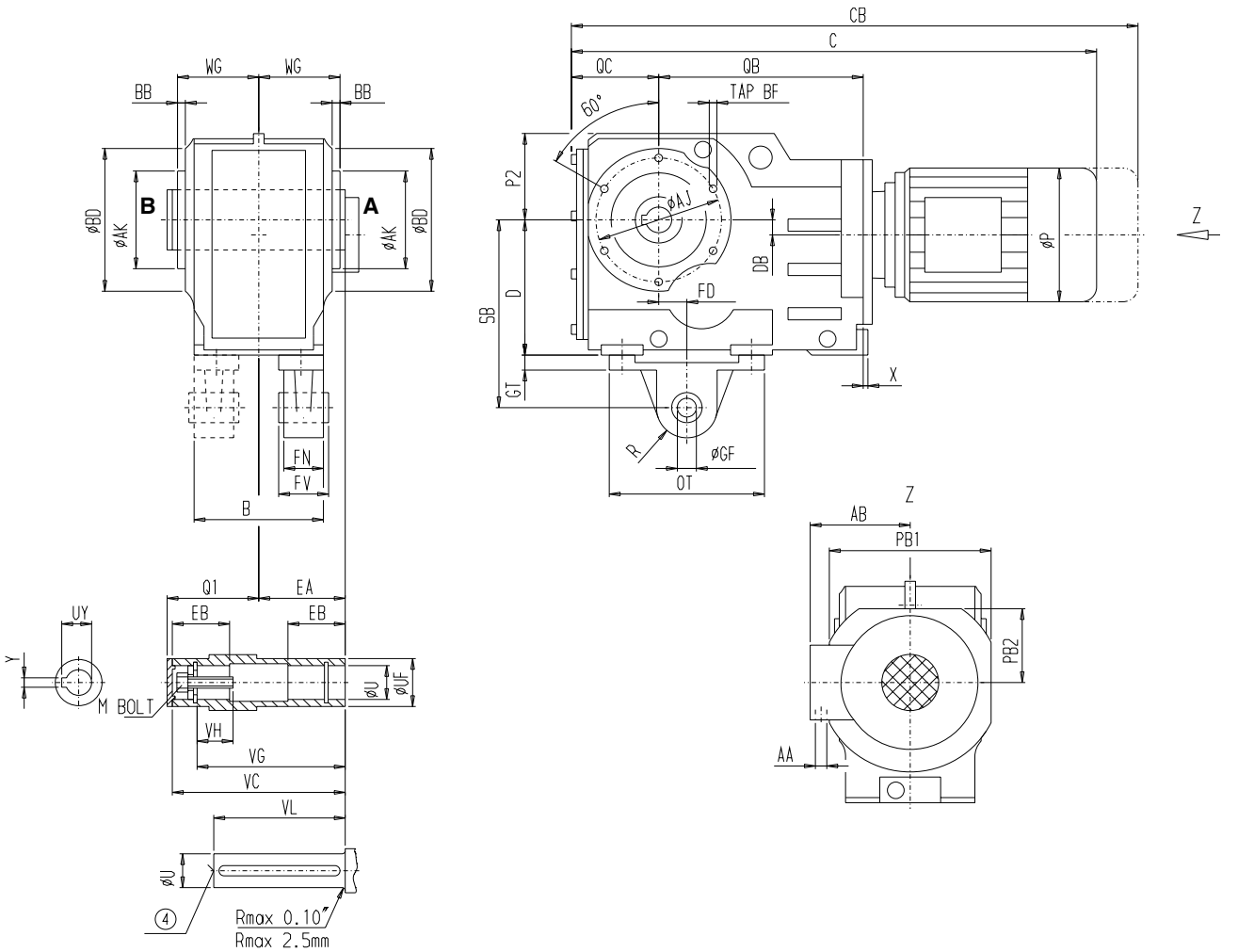
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD48

KAD 510
[inch]



4

Mounting

BD	AK	AJ	BB	WG	TAP BF
5.2	3.74	4.53	0.12	2.8	M10x17

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.375	2.165	5.91“	5.039	1.37	4.53	3/8-16UNC	1.53	0.31	2.95	2.283	3.07

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
4.41	2.46	0.43	4.92	0.12	3.05	7.32	2.95

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
1.42	1.65	0.71	6.3	4.33	1.18	0.51	6.69	R1.34

Motor

	KAD48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	20.36	22.09	5.43	4.67	2x1/2“	61
M80	21.2	23.37	6.22	4.98	2x1/2“	68
M90S	22.82	25.41	6.93	5.91	2x3/4“	74
M90L	22.82	25.41	6.93	5.91	2x3/4“	79
M100L	24.59	27.42	7.64	6.3	2x3/4“	94
M112M	26.63	29.82	8.58	6.59	2x3/4“	112

Tolerances see page 1 - 4

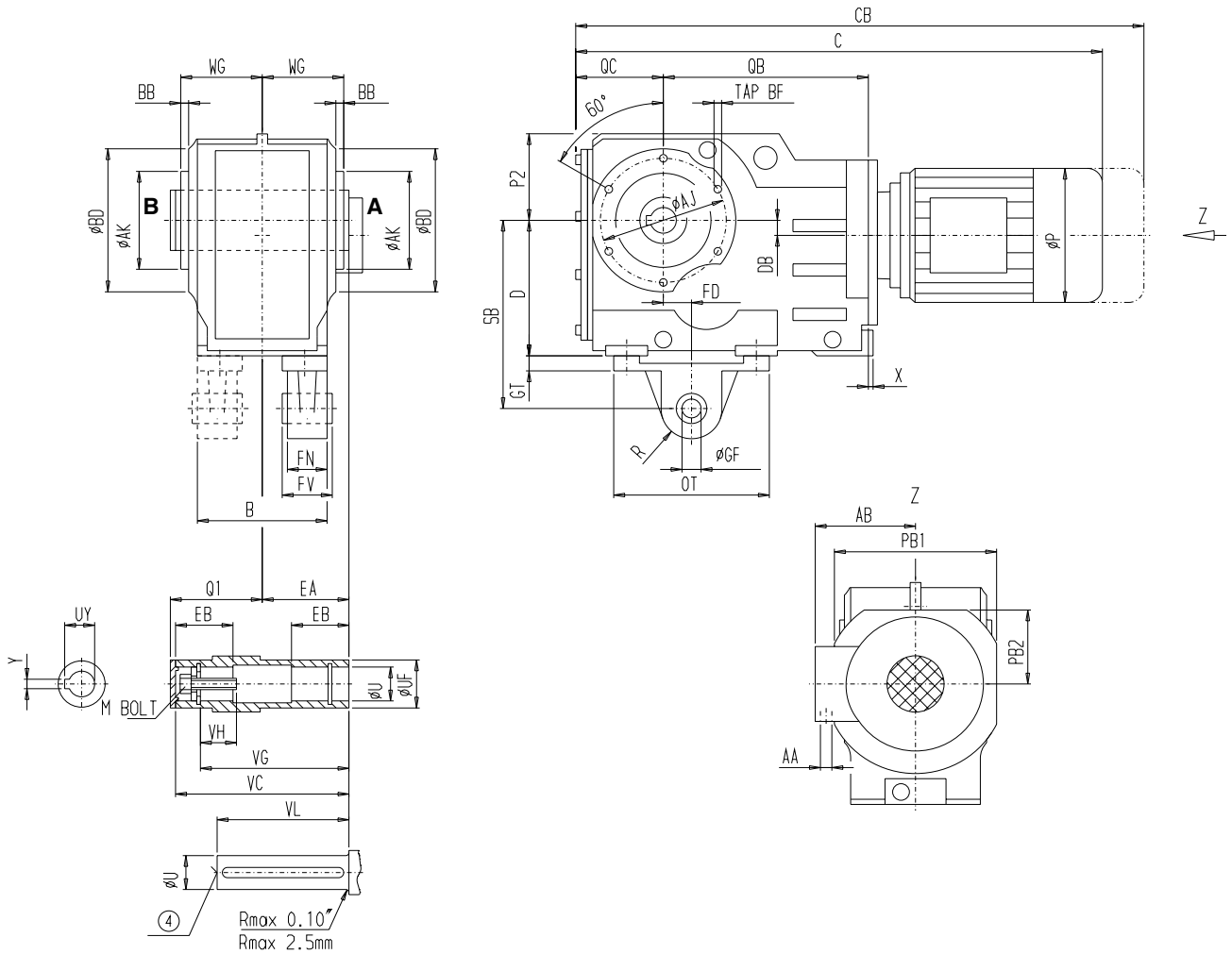
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD48

KAD 510

[*mm*]



4

Mounting

BD	AK	AJ	BB	WG	TAP BF
132	*95*	*115*	*3*	*71*	*M10x17*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
34,925	*55*	*150*	*128*	*35*	*115*	*3/8"-16UNC*	*38,86*	*7,874*	*75*	*58*	*78*

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
112	*62,5*	*11*	*125*	*3*	*77,5*	*186*	*75*

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
36	*42*	*18*	*160*	*110*	*30*	*13*	*170*	*R34*

Motor

	KAD48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*518*	*562*	*138*	*118,5*	*2x1/2"*	*28*
M80	*539,5*	*594,5*	*158*	*126,5*	*2x1/2"*	*30*
M90S	*580,5*	*646,5*	*176*	*150*	*2x3/4"*	*32*
M90L	*580,5*	*646,5*	*176*	*150*	*2x3/4"*	*34*
M100L	*625,5*	*697,5*	*194*	*160*	*2x3/4"*	*43*
M112M	*677,5*	*758,5*	*218*	*167,5*	*2x3/4"*	*51*

Tolerances see page 1 - 4

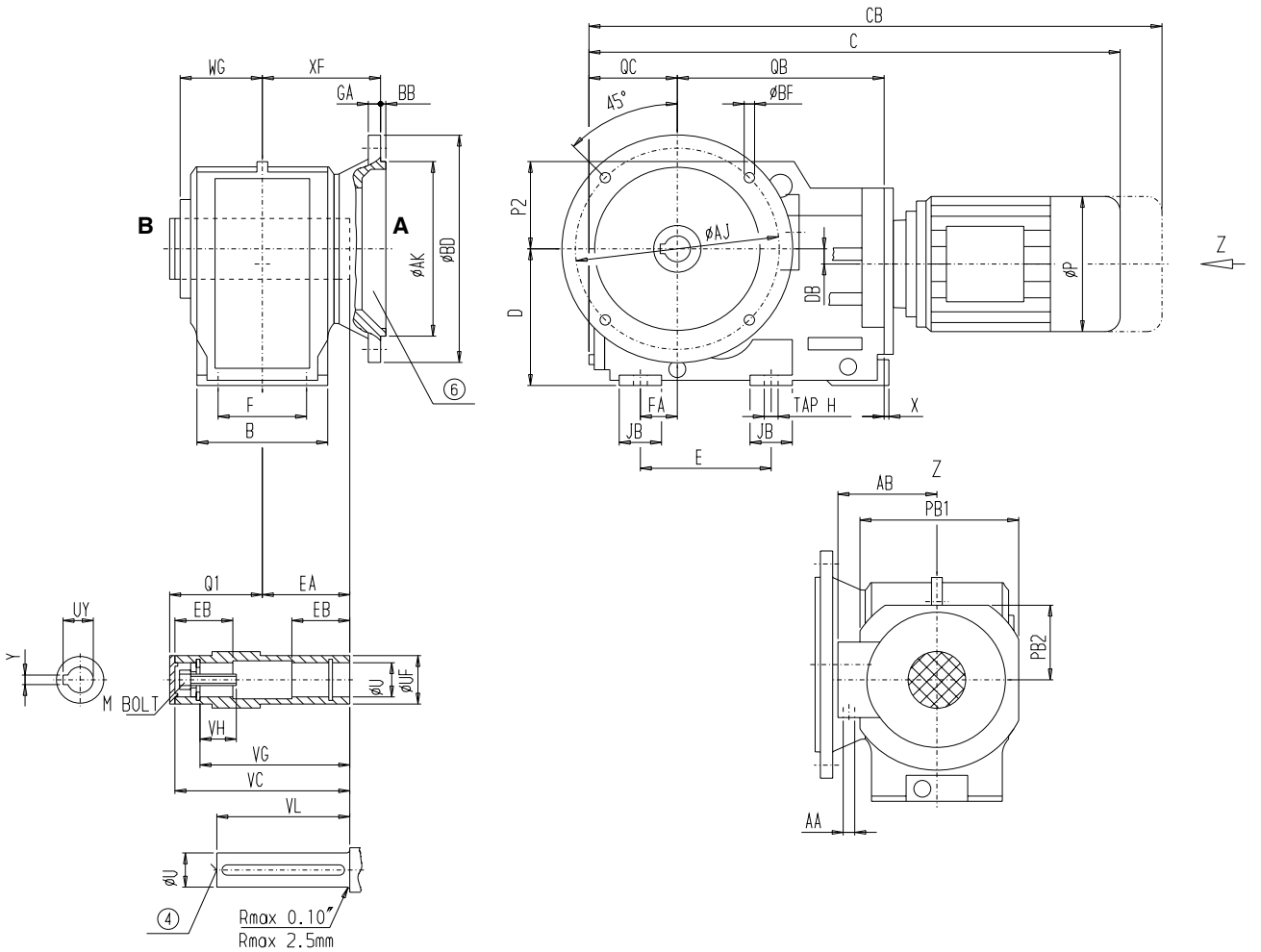
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with flange

KAF48

KAF 510

[inch]



4

Flange

BD	AK	GA	AJ	BB	XF	BF
7.87	5.12	0.47	6.5	0.14	3.94	0.43

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.375	2.165	5.91“	5.039	1.37	4.53	3/8-16UNC	1.53	0.31	2.95	2.283	3.07

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
5.51	1.57	2.76	4.33	4.41	2.46	0.43	1.18	4.92	0.12	3.05	7.32	2.8	2.95	M10x17

Motor

	KAF48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	20.36	22.09	5.43	4.67	2x1/2“	64
M80	21.2	23.37	6.22	4.98	2x1/2“	71
M90S	22.82	25.41	6.93	5.91	2x3/4“	77
M90L	22.82	25.41	6.93	5.91	2x3/4“	82
M100L	24.59	27.42	7.64	6.3	2x3/4“	97
M112M	26.63	29.82	8.58	6.59	2x3/4“	114

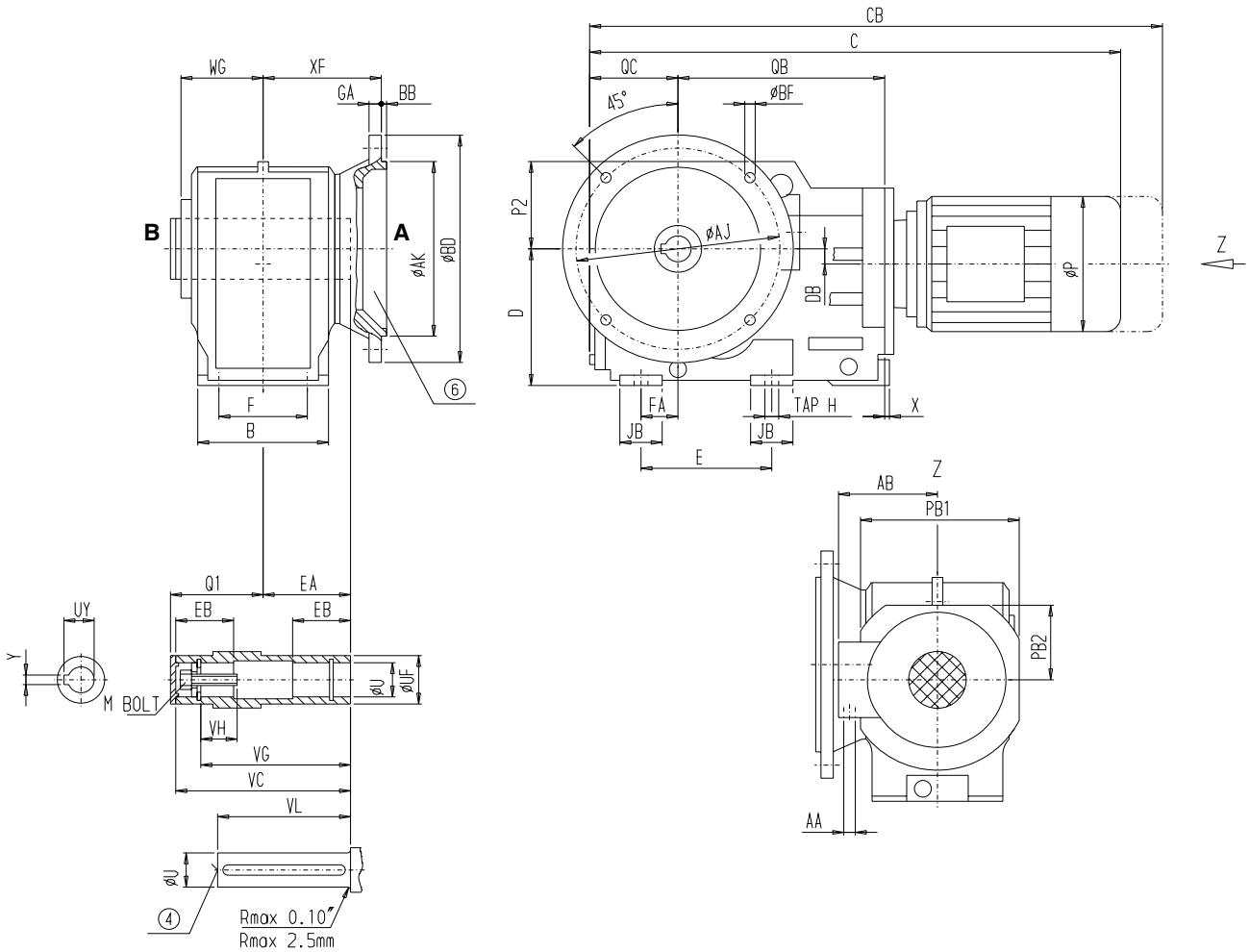
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted with flange

KAF48

KAF 510

[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	BF
200	*130*	*12*	*165*	*3,5*	*100*	*11*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
34,925	*55*	*150*	*128*	*35*	*115*	*3/8"-16UNC*	*38,86*	*7,874*	*75*	*58*	*78*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
140	*40*	*70*	*110*	*112*	*62,5*	*11*	*30*	*125*	*3*	*77,5*	*186*	*71*	*75*	*M10x17*

Motor

	KAF48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*518*	*562*	*138*	*118,5*	*2x1/2"*	*29*
M80	*539,5*	*594,5*	*158*	*126,5*	*2x1/2"*	*31*
M90S	*580,5*	*646,5*	*176*	*150*	*2x3/4"*	*33*
M90L	*580,5*	*646,5*	*176*	*150*	*2x3/4"*	*35*
M100L	*625,5*	*697,5*	*194*	*160*	*2x3/4"*	*44*
M112M	*677,5*	*758,5*	*218*	*167,5*	*2x3/4"*	*52*

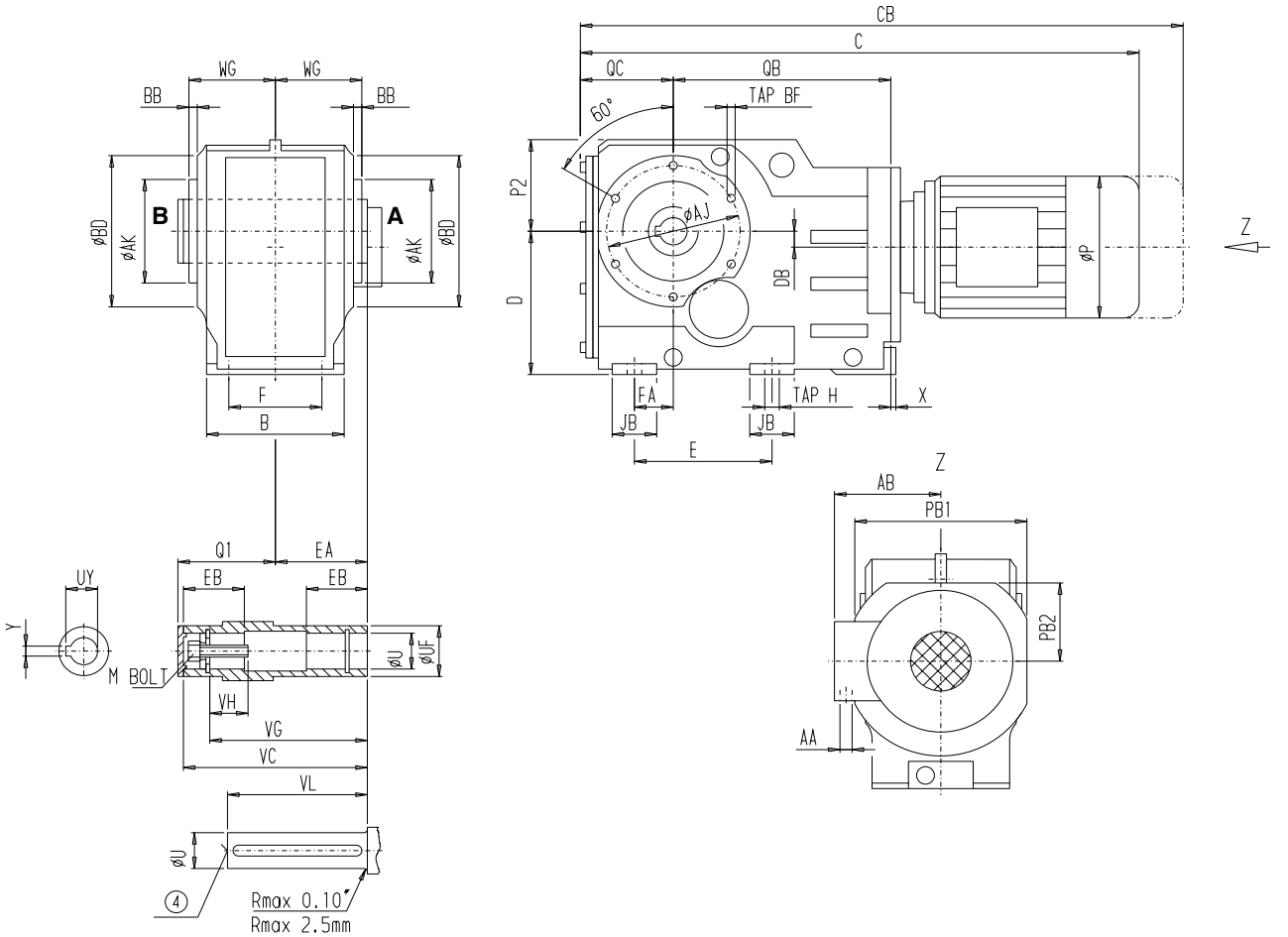
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ48

KAZ 510

[inch]



Mounting

BD	AK	AJ	BB	TAP BF
5.2	3.74	4.53	0.12	M10x17

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.375	2.165	5.91“	5.039	1.37	4.53	3/8-16UNC	1.53	0.31	2.95	2.283	3.07

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
5.51	1.57	2.76	4.33	4.41	2.46	0.43	1.18	4.92	0.12	3.05	7.32	2.8	2.95	M10x17

Motor

	KAZ48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	20.36	22.09	5.43	4.67	2x1/2“	58
M80	21.2	23.37	6.22	4.98	2x1/2“	65
M90S	22.82	25.41	6.93	5.91	2x3/4“	71
M90L	22.82	25.41	6.93	5.91	2x3/4“	76
M100L	24.59	27.42	7.64	6.3	2x3/4“	91
M112M	26.63	29.82	8.58	6.59	2x3/4“	109

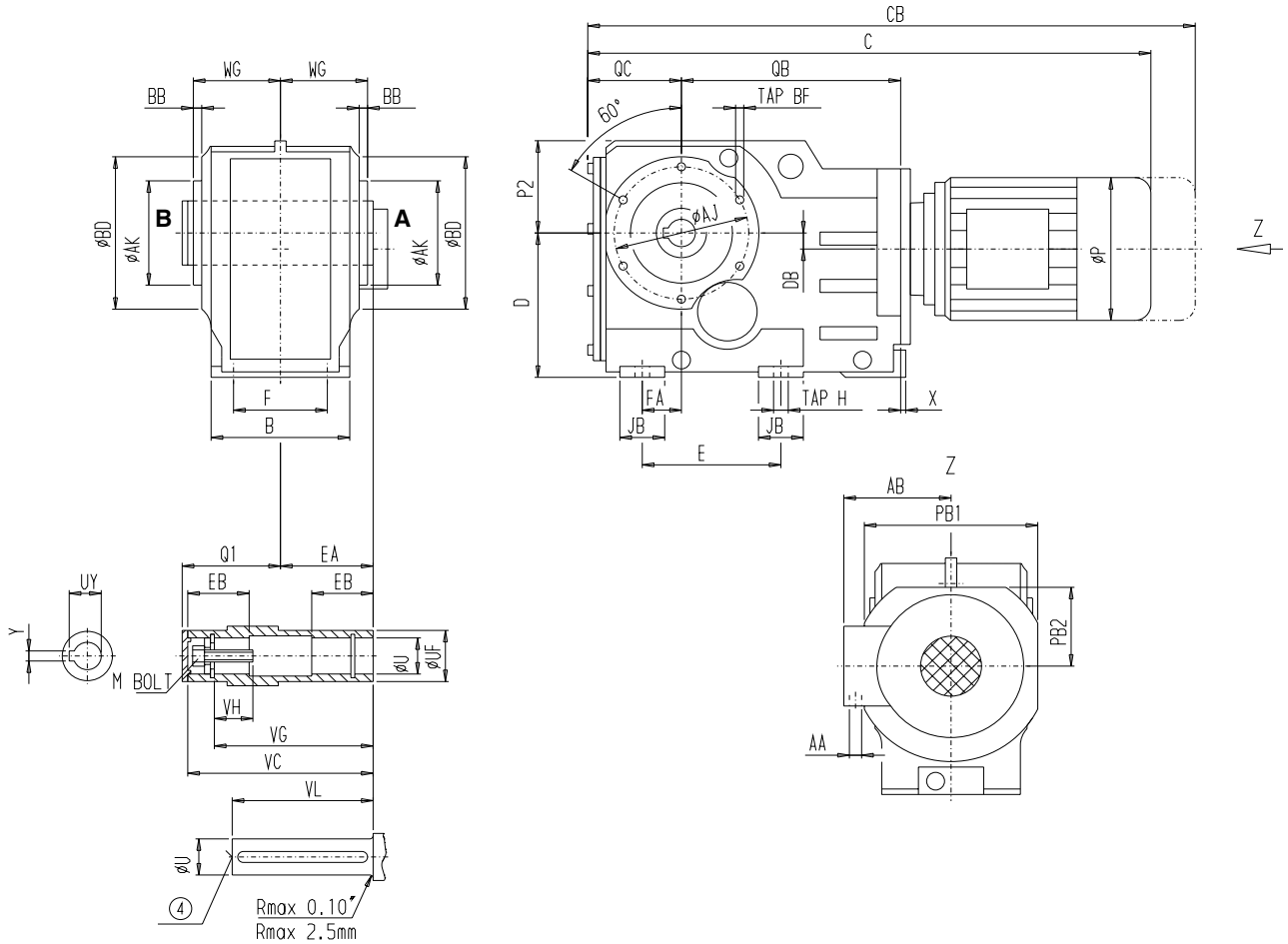
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ48

KAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
132	*95*	*115*	*3*	*M10x17*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
34,925	*55*	*150*	*128*	*35*	*115*	*3/8"-16UNC*	*38,86*	*7,874*	*75*	*58*	*78*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
140	*40*	*70*	*110*	*112*	*62,5*	*11*	*30*	*125*	*3*	*77,5*	*186*	*71*	*75*	*M10x17*

Motor

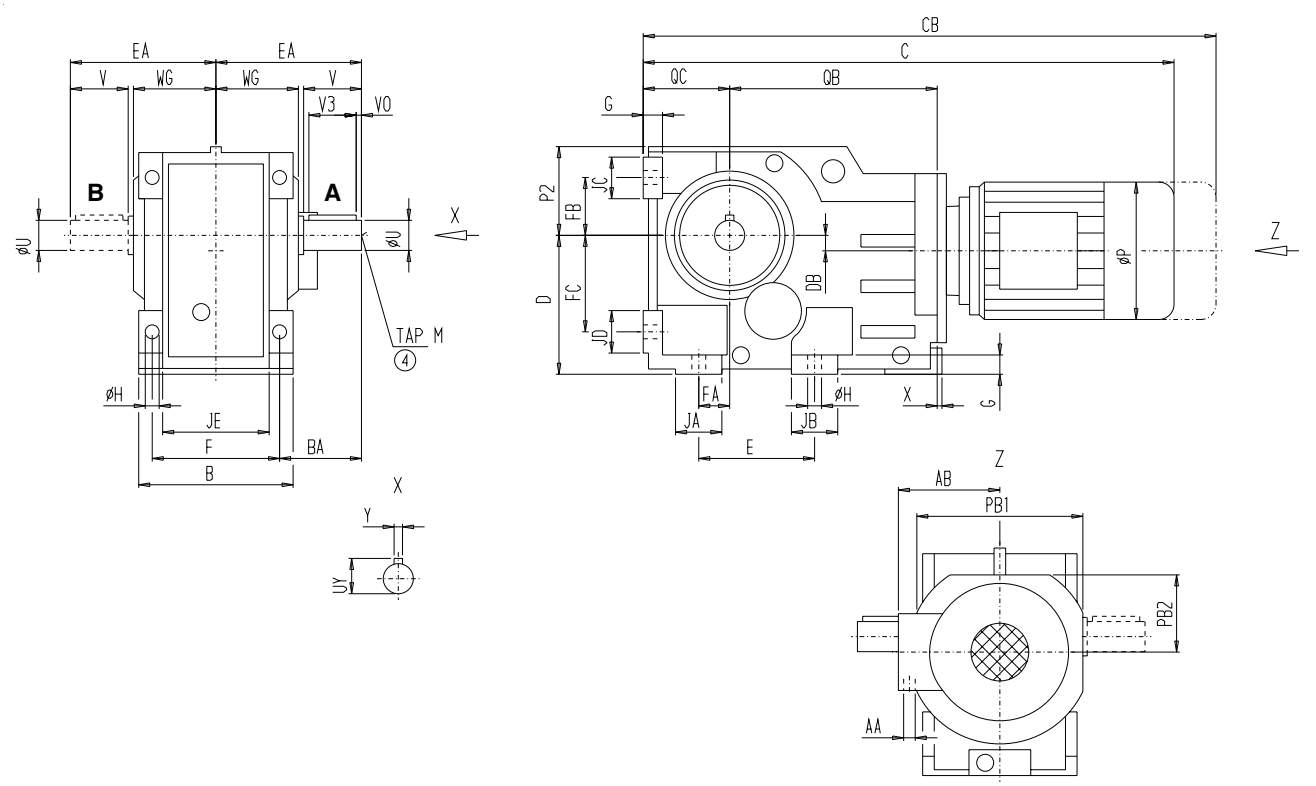
	KAZ48					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*518*	*562*	*138*	*118,5*	*2x1/2"*	*26*
M71MP	*539,5*	*594,5*	*158*	*126,5*	*2x1/2"*	*28*
M90S	*580,5*	*646,5*	*176*	*150*	*2x3/4"*	*30*
M90L	*580,5*	*646,5*	*176*	*150*	*2x3/4"*	*32*
M100L	*625,5*	*697,5*	*194*	*160*	*2x3/4"*	*41*
M112M	*677,5*	*758,5*	*218*	*167,5*	*2x3/4"*	*49*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted

K68

K 510
[inch]



4

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1.625	3.15	2.75	0.065	1.79	0.375	3.935	5/8-11UNC

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
4.72	1.18	5.51	0.87	4.67	6.69	5.51	3.74	2.56	3.15	0.26	1.97	1.97	1.89	1.97	6.3	0.51	3.54	8.66	3.39	3.58	6.69	0.53

Motor

	K68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	21.97	23.7	5.43	4.67	2x1/2“	105
M80	22.81	24.98	6.22	4.98	2x1/2“	112
M90S	24.43	27.02	6.93	5.91	2x3/4“	118
M90L	24.43	27.02	6.93	5.91	2x3/4“	123
M100L	26.2	29.03	7.64	6.3	2x3/4“	138
M112M	28.23	31.42	8.58	6.59	2x3/4“	156
M132S	31.88	35.81	10.16	7.13	1“+3/4“	179
M132M	31.88	35.81	10.16	7.13	1“+3/4“	225

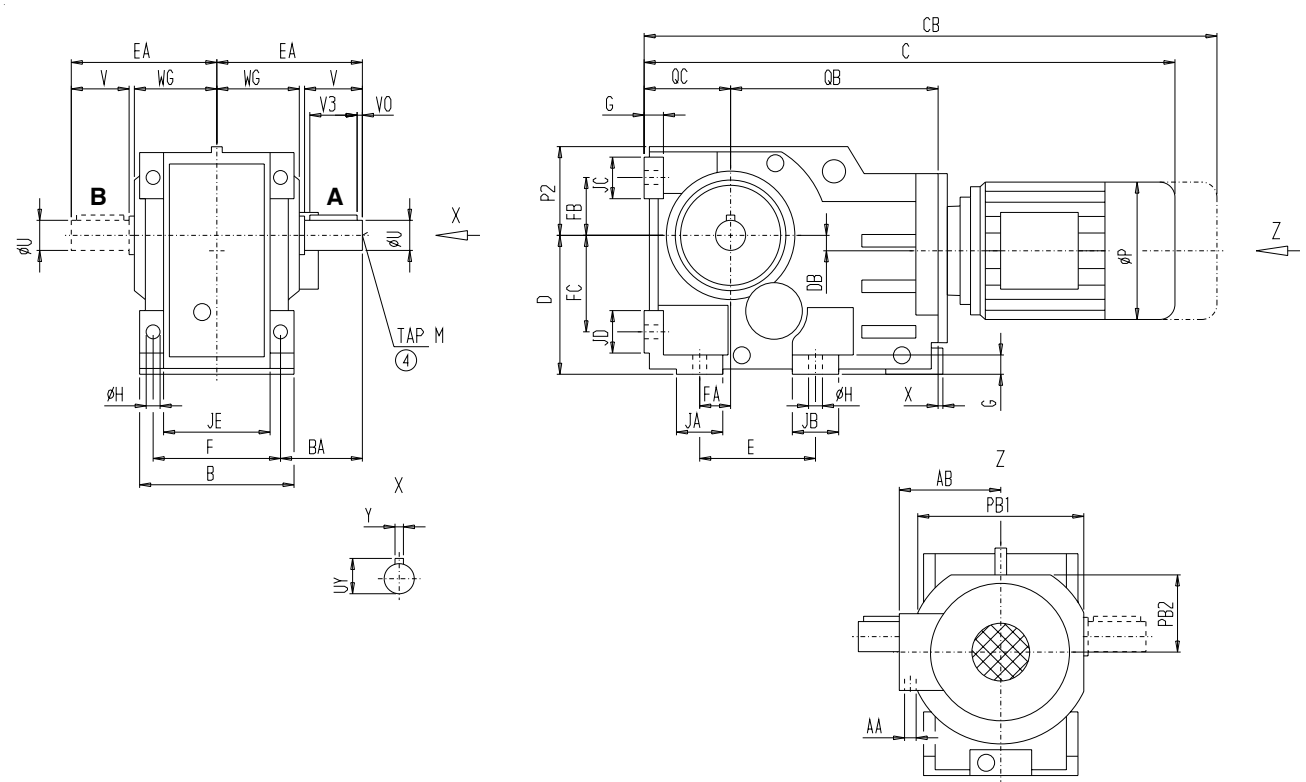
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted

K68

K 510
[*mm*]



Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
41,275	*80*	*69,85*	*1,651*	*45,47*	*9,525*	*100*	*5/8"-11UNC*

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
120	*30*	*140*	*22*	*118,5*	*170*	*140*	*95*	*65*	*80*	*6,5*	*50*	*50*	*48*	*50*	*160*	*13*	*90*	*220*	*86*	*91*	*170*	*13,5*

Motor

	K68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*559*	*603*	*138*	*118,5*	*2x1/2"*	*48*
M80	*580,5*	*635,5*	*158*	*126,5*	*2x1/2"*	*50*
M90S	*621,5*	*687,5*	*176*	*150*	*2x3/4"*	*52*
M90L	*621,5*	*687,5*	*176*	*150*	*2x3/4"*	*54*
M100L	*666,5*	*738,5*	*194*	*160*	*2x3/4"*	*63*
M112M	*718*	*799*	*218*	*167,5*	*2x3/4"*	*71*
M132S	*810,5*	*910,5*	*258*	*181*	*1"+3/4"*	*81*
M132M	*810,5*	*910,5*	*258*	*181*	*1"+3/4"*	*102*

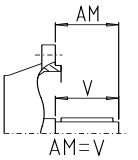
Tolerances see page 1 - 4

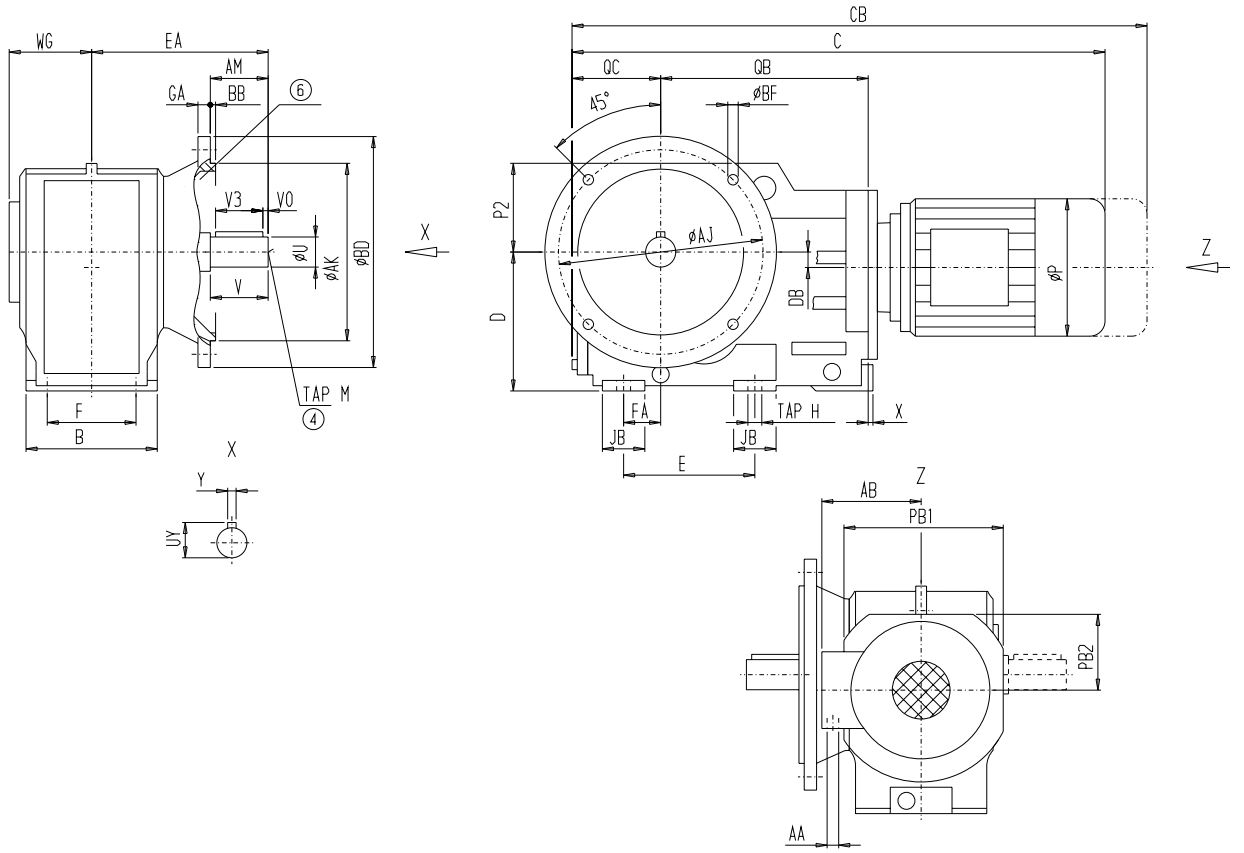
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Flange mounted

KF68

KF 510
[inch]





4

Flange

BD	AK	GA	AJ	BB	BF
9.84	7.09	0.59	8.46	0.16	0.53

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.625	3.15	2.75	0.065	1.79	0.375	3.15	5/8-11UNC

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
5.98	1.65	3.46	5.51	5.51	3.15	0.26	1.97	6.3	0.51	3.48	8.66	3.39	3.58	7.6	M12x21

Motor

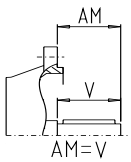
	KF68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	21.91	23.64	5.43	4.67	2x1/2“	116
M80	22.75	24.92	6.22	4.98	2x1/2“	123
M90S	24.37	26.96	6.93	5.91	2x3/4“	129
M90L	24.37	26.96	6.93	5.91	2x3/4“	134
M100L	26.14	28.97	7.64	6.3	2x3/4“	149
M112M	28.17	31.36	8.58	6.59	2x3/4“	166
M132S	31.82	35.75	10.16	7.13	1“+3/4“	189
M132M	31.82	35.75	10.16	7.13	1“+3/4“	236

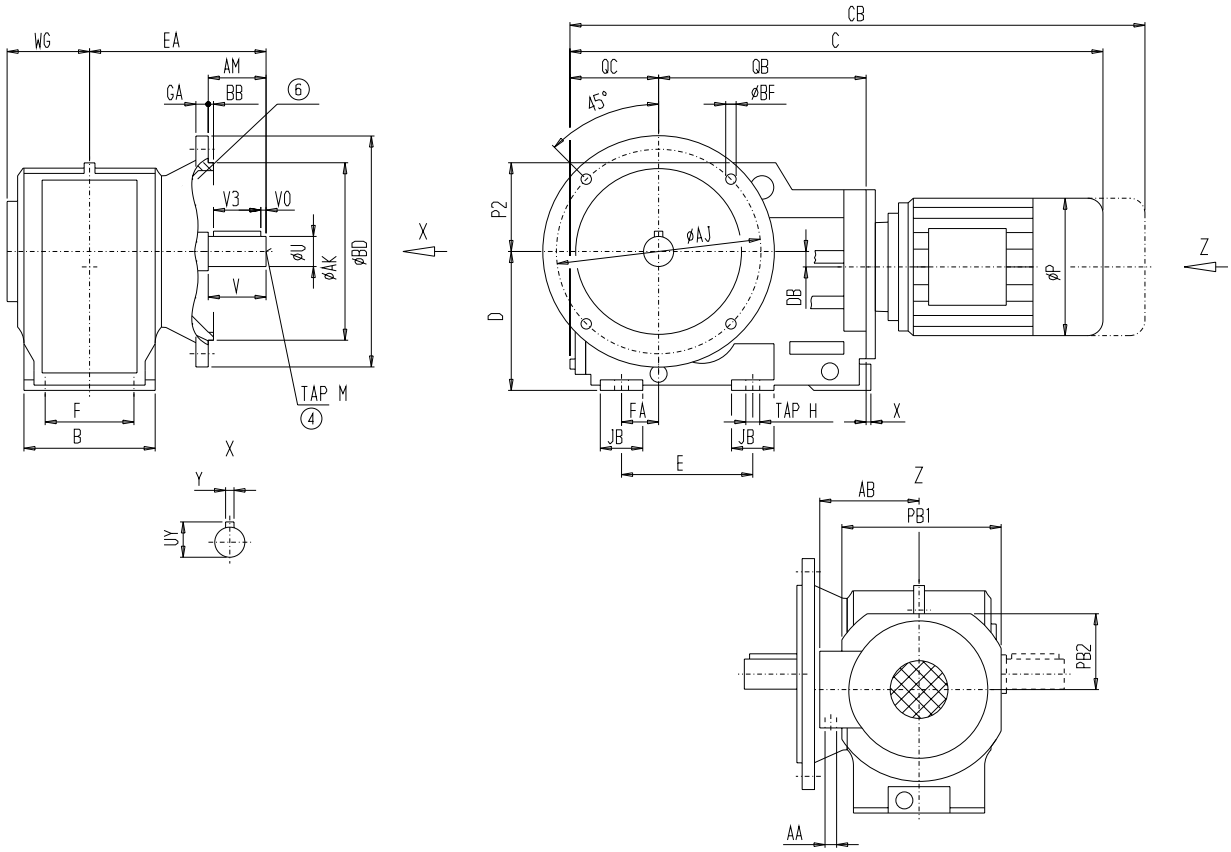
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Flange mounted

KF68

KF 510
[*mm*]





4

Flange

BD	AK	GA	AJ	BB	BF
250	*180*	*15*	*215*	*4*	*13,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
41,275	*80*	*69,85*	*1,651*	*45,47*	*9,525*	*80*	*5/8"-11UNC*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
152	*42*	*88*	*140*	*140*	*80*	*6,5*	*50*	*160*	*13*	*88,5*	*220*	*86*	*91*	*193*	*M12x21*

Motor

	KF68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*557,5*	*601,5*	*138*	*118,5*	*2x1/2"*	*53*
M80	*579*	*634*	*158*	*126,5*	*2x1/2"*	*55*
M90S	*620*	*686*	*176*	*150*	*2x3/4"*	*57*
M90L	*620*	*686*	*176*	*150*	*2x3/4"*	*59*
M100L	*665*	*737*	*194*	*160*	*2x3/4"*	*68*
M112M	*716,5*	*797,5*	*218*	*167,5*	*2x3/4"*	*75*
M132S	*809*	*909*	*258*	*181*	*1"„+3/4"*	*86*
M132M	*809*	*909*	*258*	*181*	*1"„+3/4"*	*107*

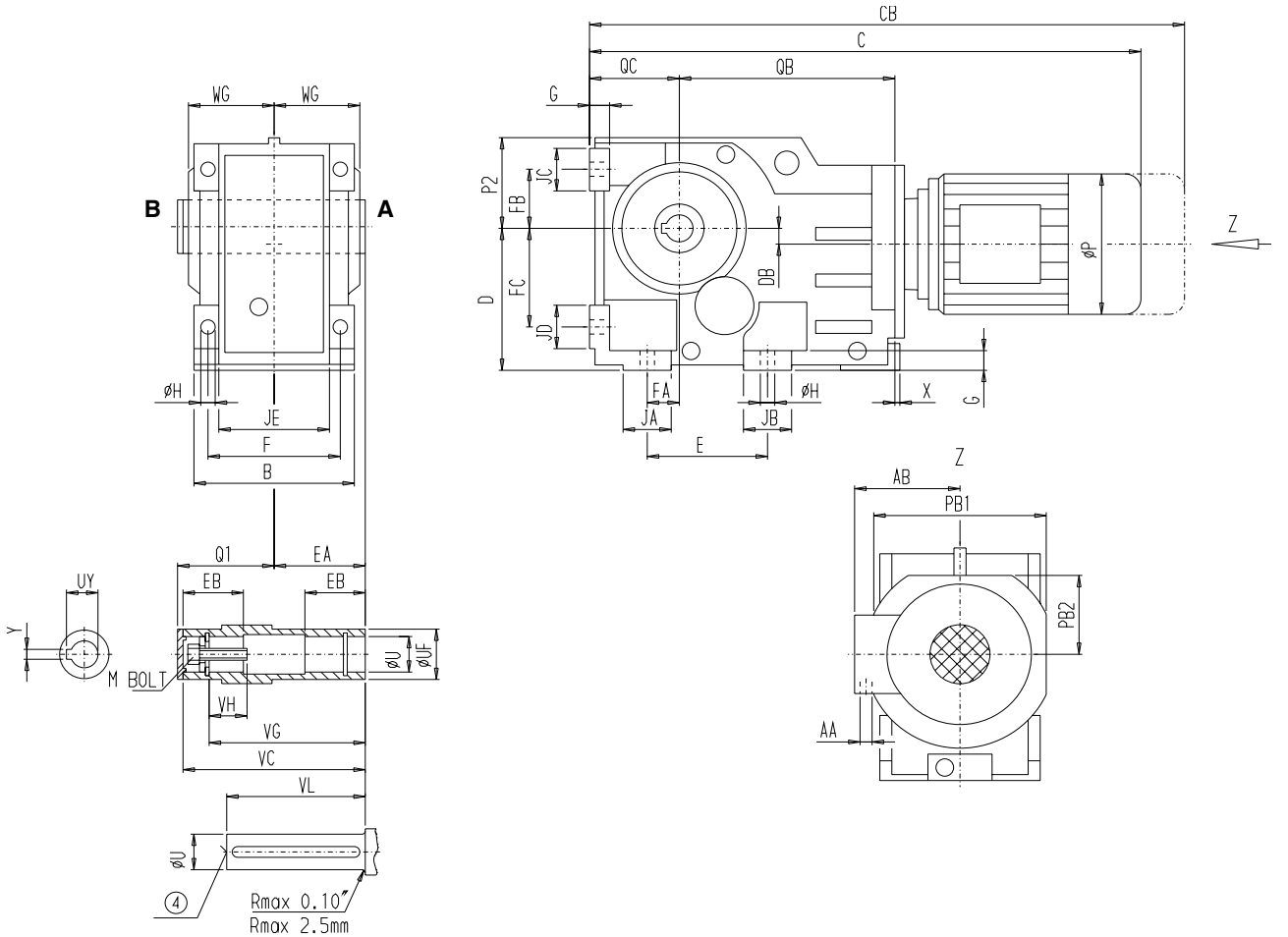
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted

KA68

KA 510

[inch]



4

Mounting

E	F	FA	G	H
4.72	5.51	1.18	0.87	0.53

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.5	2.559	7.09	5.906	1.93	5.31	5/8-11UNC	1.68	0.38	3.54	2.717	3.66

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
4.67	6.69	5.51	3.74	2.56	3.15	0.26	1.97	1.97	1.89	1.97	6.3	0.51	3.54	8.66	3.39	3.58

Motor

	KA68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	21.97	23.7	5.43	4.67	2x1/2“	98
M80	22.81	24.98	6.22	4.98	2x1/2“	105
M90S	24.43	27.02	6.93	5.91	2x3/4“	111
M90L	24.43	27.02	6.93	5.91	2x3/4“	116
M100L	26.2	29.03	7.64	6.3	2x3/4“	131
M112M	28.23	31.42	8.58	6.59	2x3/4“	148
M132S	31.88	35.81	10.16	7.13	1“+3/4“	171
M132M	31.88	35.81	10.16	7.13	1“+3/4“	218

Tolerances see page 1 - 4

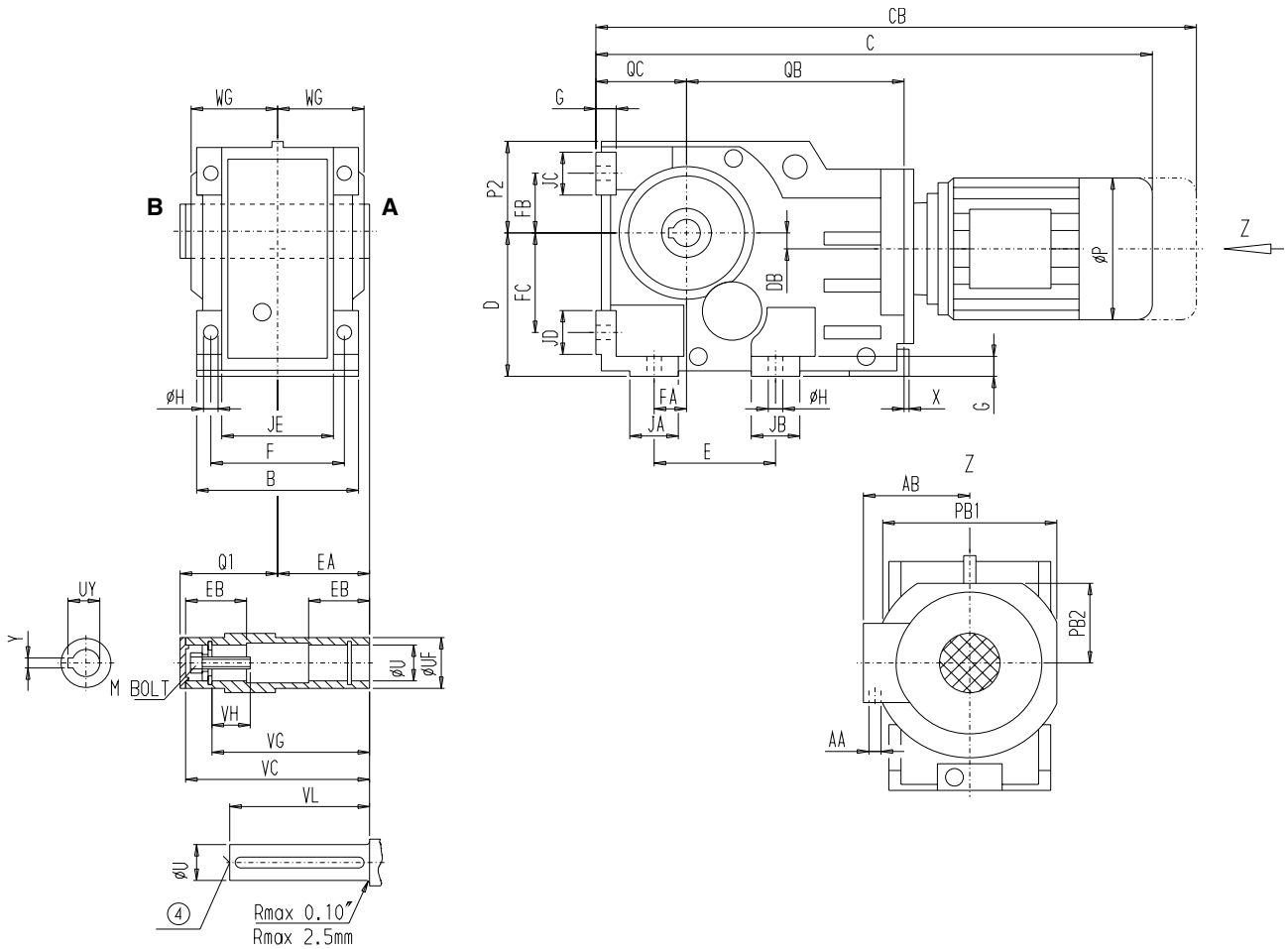
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted

KA68

KA 510

[*mm*]



4

Mounting

E	F	FA	G	H
120	*140*	*30*	*22*	*13,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
38,1	*65*	*180*	*150*	*49*	*135*	*5/8"-11UNC*	*42,67*	*9,652*	*90*	*69*	*93*

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
118,5	*170*	*140*	*95*	*65*	*80*	*6,5*	*50*	*50*	*48*	*50*	*160*	*13*	*90*	*220*	*86*	*91*

Motor

	KA68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*559*	*603*	*138*	*118,5*	*2x1/2"*	*44*
M80	*580,5*	*635,5*	*158*	*126,5*	*2x1/2"*	*46*
M90S	*621,5*	*687,5*	*176*	*150*	*2x3/4"*	*48*
M90L	*621,5*	*687,5*	*176*	*150*	*2x3/4"*	*50*
M100L	*666,5*	*738,5*	*194*	*160*	*2x3/4"*	*59*
M112M	*718*	*799*	*218*	*167,5*	*2x3/4"*	*67*
M132S	*810,5*	*910,5*	*258*	*181*	*1"+3/4"*	*78*
M132M	*810,5*	*910,5*	*258*	*181*	*1"+3/4"*	*99*

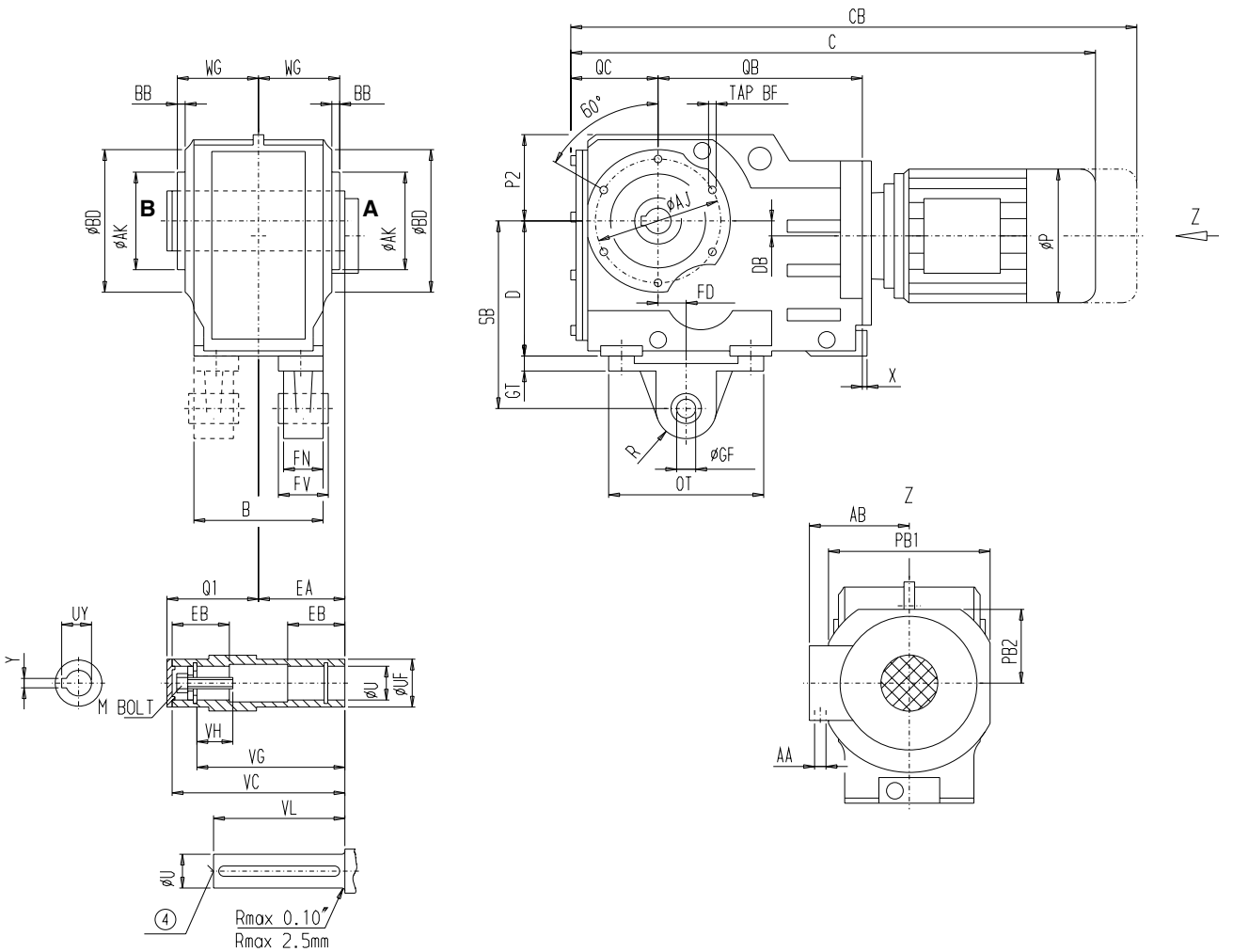
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD68

KAD 510

[inch]



Mounting

BD	AK	AJ	BB	WG	TAP BF
5.91	4.33	5.12	0.14	3.39	M12x21

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.5	2.559	7.09	5.906	1.93	5.31	5/8-11UNC	1.68	0.38	3.54	2.717	3.66

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
5.51	3.15	0.26	6.3	0.51	3.48	8.66	3.58

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
1.42	1.65	0.71	7.87	5.51	1.34	0.59	7.17	R1.34

Motor

	KAD68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	21.91	23.64	5.43	4.67	2x1/2“	102
M80	22.75	24.92	6.22	4.98	2x1/2“	109
M90S	24.37	26.96	6.93	5.91	2x3/4“	116
M90L	24.37	26.96	6.93	5.91	2x3/4“	120
M100L	26.14	28.97	7.64	6.3	2x3/4“	135
M112M	28.17	31.36	8.58	6.59	2x3/4“	153
M132S	31.82	35.75	10.16	7.13	1“+3/4“	176
M132M	31.82	35.75	10.16	7.13	1“+3/4“	222

Tolerances see page 1 - 4

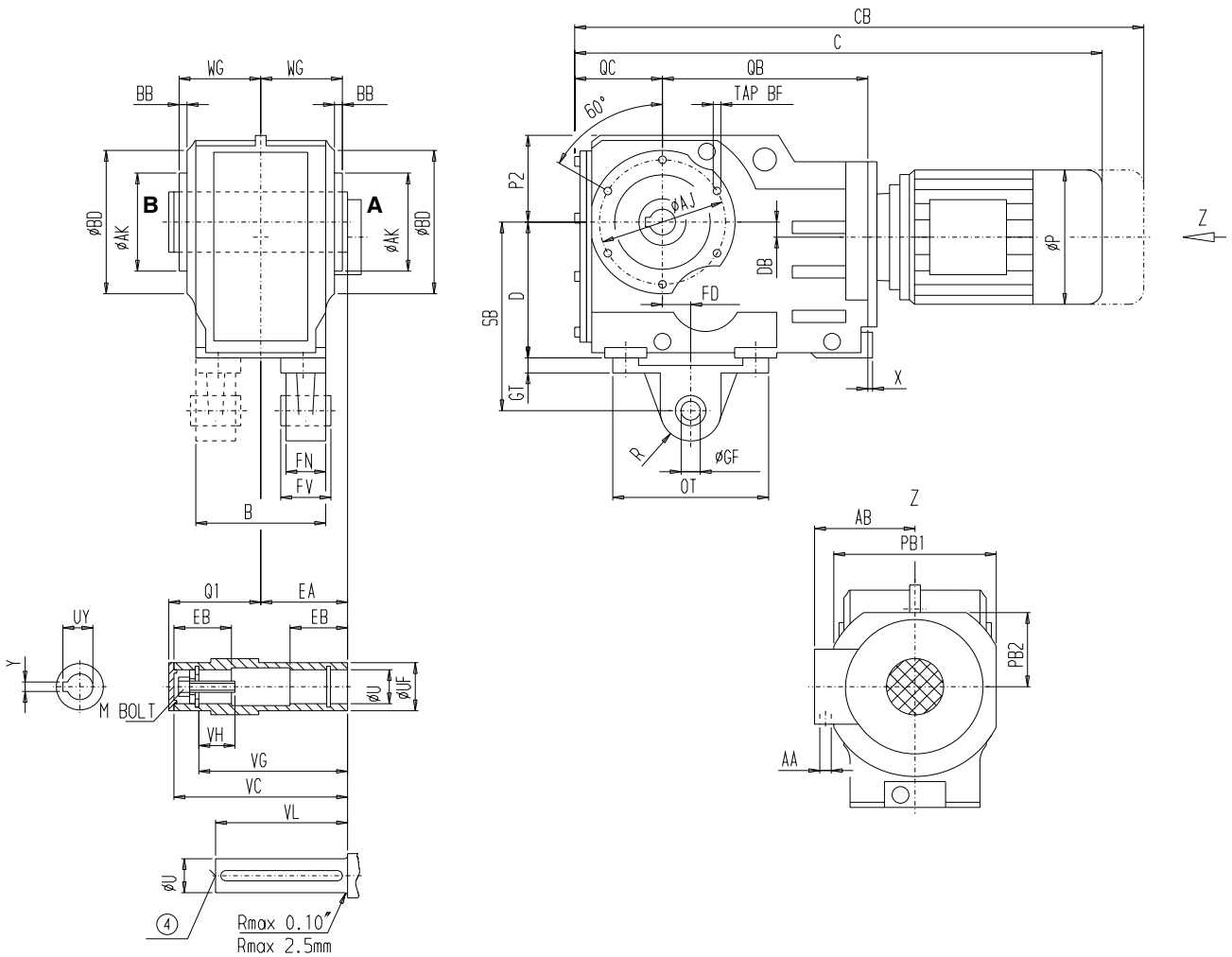
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD68

KAD 510

[*mm*]



Mounting

BD	AK	AJ	BB	WG	TAP BF
150	*110*	*130*	*3,5*	*86*	*M12x21*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
38,1	*65*	*180*	*150*	*49*	*135*	*5/8"-11UNC*	*42,67*	*9,652*	*90*	*69*	*93*

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
140	*80*	*6,5*	*160*	*13*	*88,5*	*220*	*91*

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
36	*42*	*18*	*200*	*140*	*34*	*15*	*182*	*R34*

Motor

	KAD68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*557,5*	*601,5*	*138*	*118,5*	*2x1/2"*	*46*
M80	*579*	*634*	*158*	*126,5*	*2x1/2"*	*48*
M90S	*620*	*686*	*176*	*150*	*2x3/4"*	*50*
M90L	*620*	*686*	*176*	*150*	*2x3/4"*	*52*
M100L	*665*	*737*	*194*	*160*	*2x3/4"*	*61*
M112M	*716,5*	*797,5*	*218*	*167,5*	*2x3/4"*	*69*
M132S	*809*	*909*	*258*	*181*	*1"+3/4"*	*80*
M132M	*809*	*909*	*258*	*181*	*1"+3/4"*	*101*

Tolerances see page 1 - 4

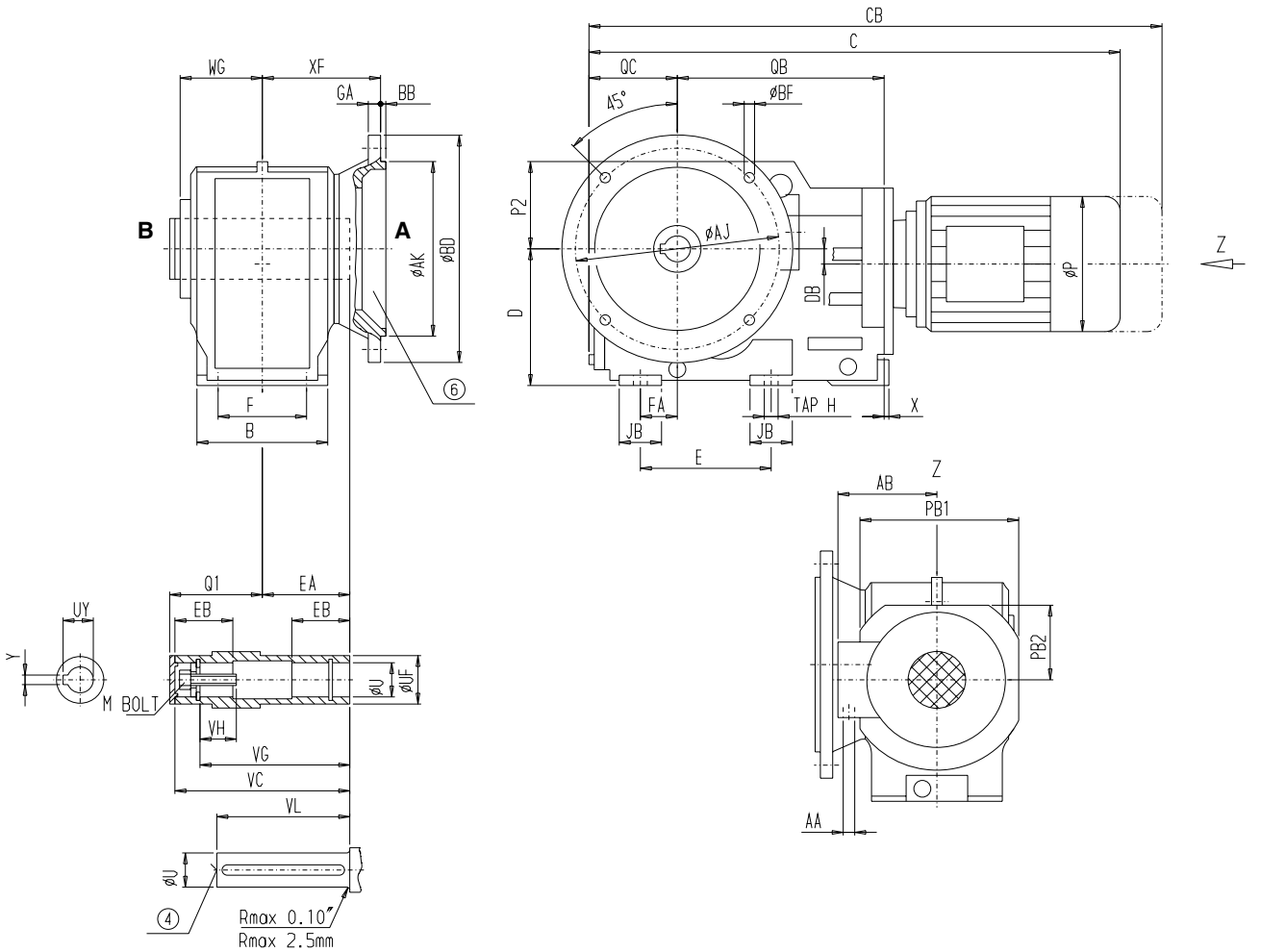
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with flange

KAF68

KAF 510

[inch]



4

Flange

BD	AK	GA	AJ	BB	XF	BF
9.84	7.09	0.59	8.46	0.16	4.45	0.53

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.5	2.559	7.09“	5.906	1.93	5.31	5/8-11UNC	1.68	0.38	3.54	2.717	3.66

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
5.98	1.65	3.46	5.51	5.51	3.15	0.26	1.97	6.3	0.51	3.48	8.66	3.39	3.58	M12x21

Motor

	KAF68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	21.91	23.64	5.43	4.67	2x1/2“	109
M80	22.75	24.92	6.22	4.98	2x1/2“	115
M90S	24.37	26.96	6.93	5.91	2x3/4“	122
M90L	24.37	26.96	6.93	5.91	2x3/4“	126
M100L	26.14	28.97	7.64	6.3	2x3/4“	142
M112M	28.17	31.36	8.58	6.59	2x3/4“	159
M132S	31.82	35.75	10.16	7.13	1“+3/4“	182
M132M	31.82	35.75	10.16	7.13	1“+3/4“	228

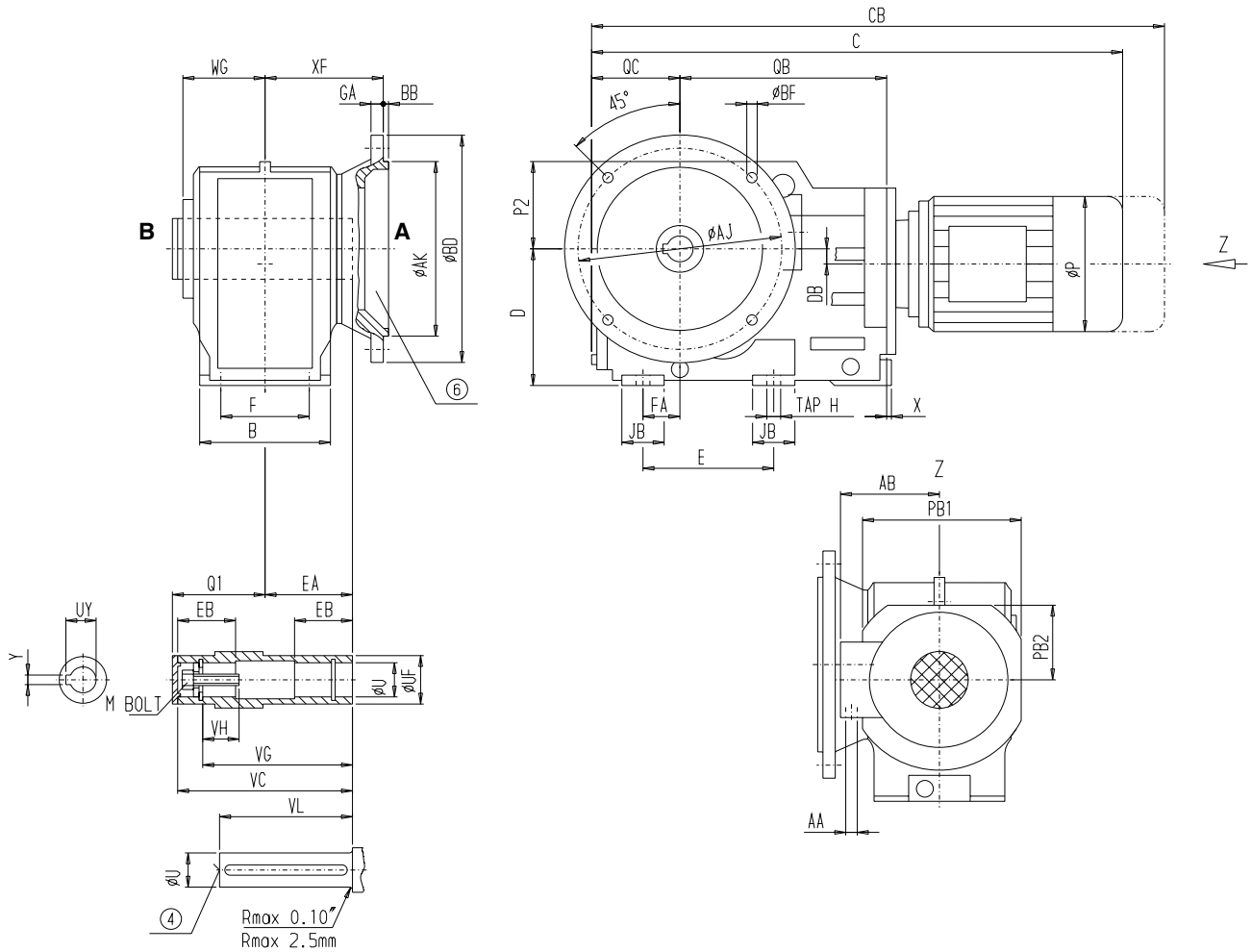
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted with flange

KAF68

KAF 510

[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	BF
250	*180*	*15*	*215*	*4*	*113*	*13,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
38,1	*65*	*180*	*150*	*49*	*135*	*5/8"-11UNC*	*42,67*	*9,652*	*90*	*69*	*93*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
152	*42*	*88*	*140*	*140*	*80*	*6,5*	*50*	*160*	*13*	*88,5*	*220*	*86*	*91*	*M12x21*

Motor

	KAF68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*557,5*	*601,5*	*138*	*118,5*	*2x1/2"*	*49*
M80	*579*	*634*	*158*	*126,5*	*2x1/2"*	*51*
M90S	*620*	*686*	*176*	*150*	*2x3/4"*	*53*
M90L	*620*	*686*	*176*	*150*	*2x3/4"*	*55*
M100L	*665*	*737*	*194*	*160*	*2x3/4"*	*64*
M112M	*716,5*	*797,5*	*218*	*167,5*	*2x3/4"*	*72*
M132S	*809*	*909*	*258*	*181*	*1"+3/4"*	*83*
M132M	*809*	*909*	*258*	*181*	*1"+3/4"*	*104*

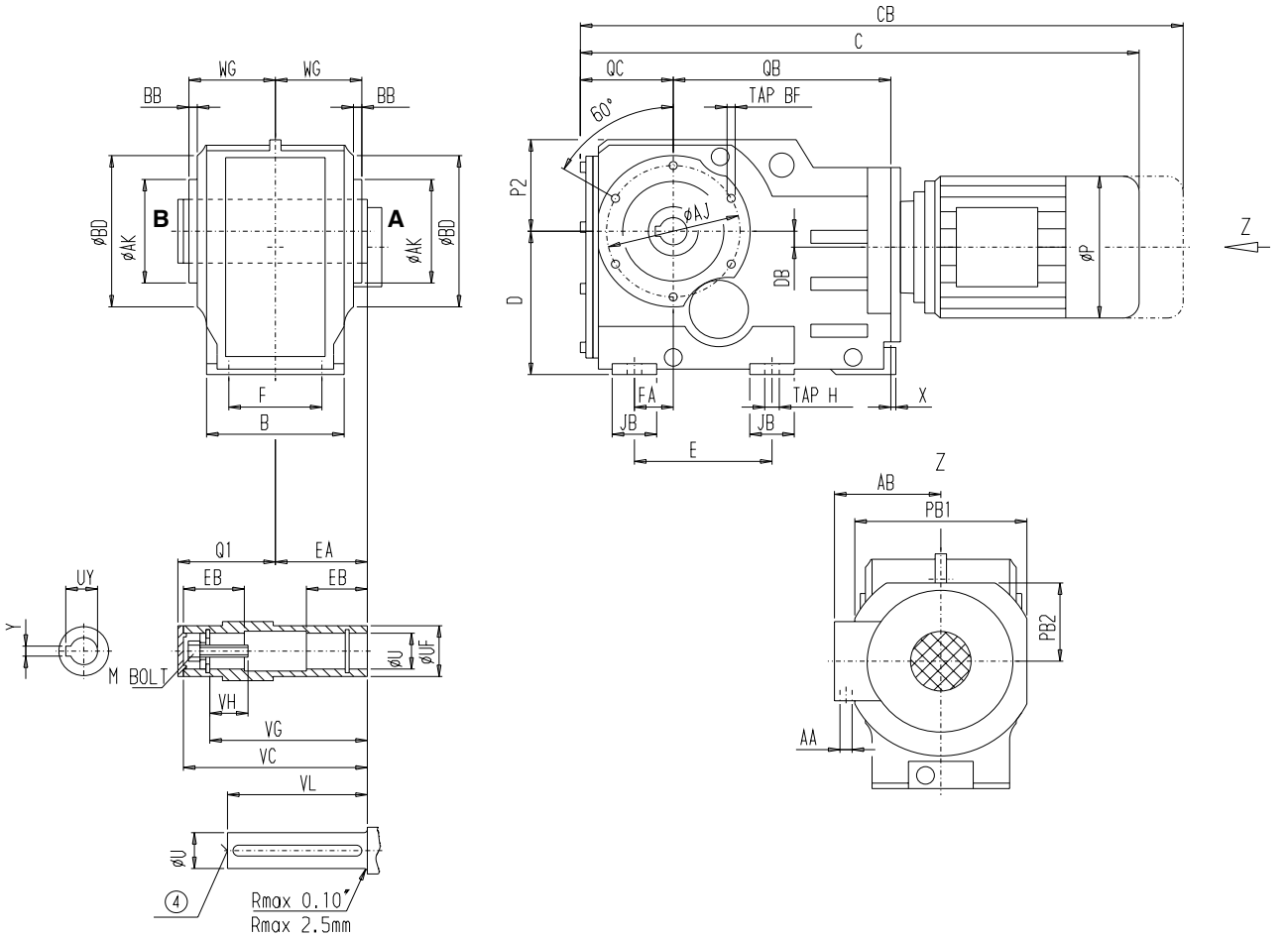
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ68

KAZ 510

[inch]



4

Mounting

BD	AK	AJ	BB	TAP BF
5.91	4.33	5.12	0.14	M12x21

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
1.5	2.559	7.09	5.906	1.93	5.31	5/8-11UNC	1.68	0.38	3.54	2.717	3.66

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
5.98	1.65	3.46	5.51	5.51	3.15	0.26	1.97	6.3	0.51	3.48	8.66	3.39	3.58	M12x21

Motor

	KAZ68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	21.91	23.64	5.43	4.67	2x1/2“	99
M80	22.75	24.92	6.22	4.98	2x1/2“	105
M90S	24.37	26.96	6.93	5.91	2x3/4“	112
M90L	24.37	26.96	6.93	5.91	2x3/4“	116
M100L	26.14	28.97	7.64	6.3	2x3/4“	132
M112M	28.17	31.36	8.58	6.59	2x3/4“	149
M132S	31.82	35.75	10.16	7.13	1“+3/4“	172
M132M	31.82	35.75	10.16	7.13	1“+3/4“	218

Tolerances see page 1 - 4

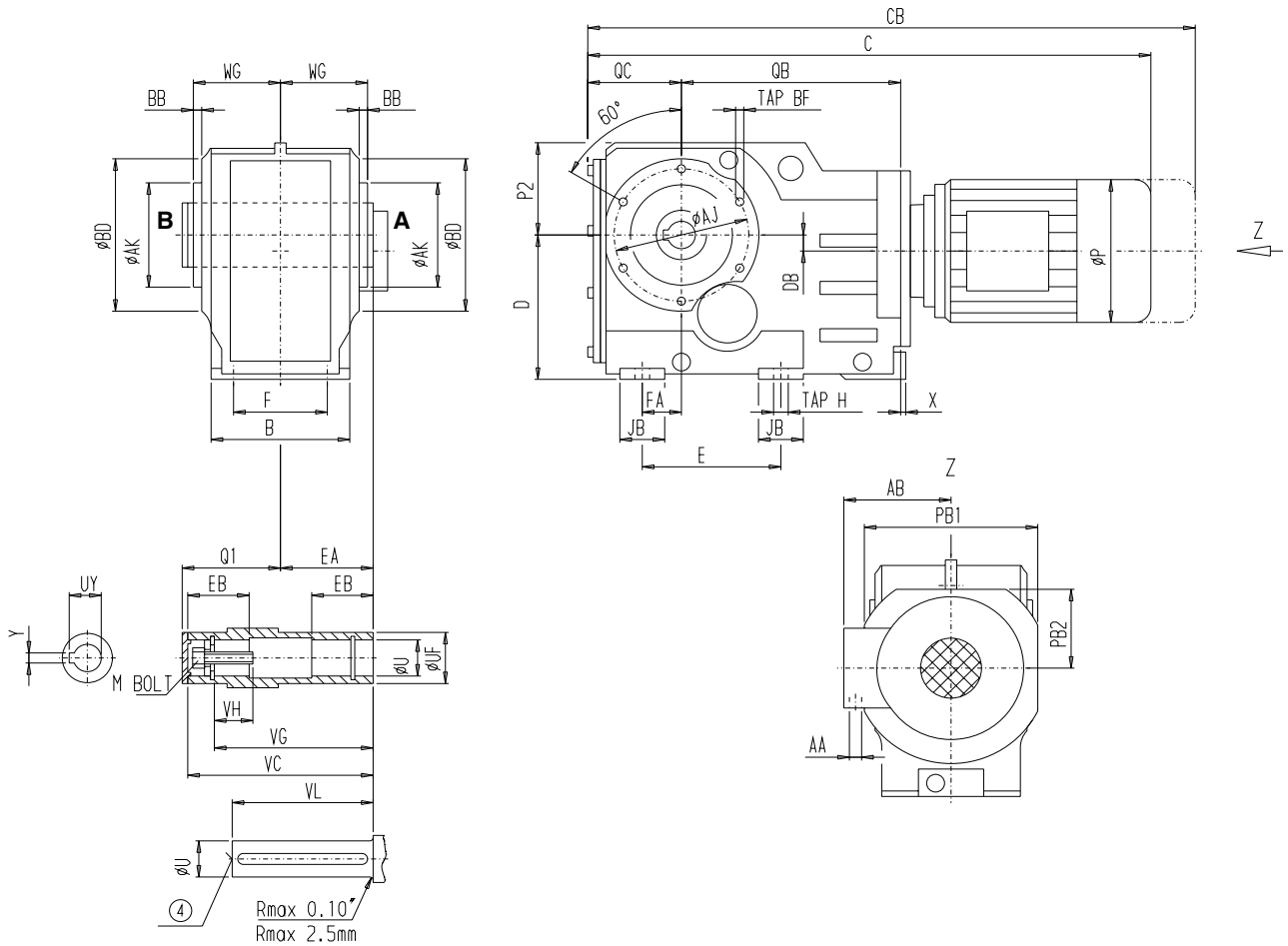
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ68

KAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
150	*110*	*130*	*3,5*	*M12x21*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
38,1	*65*	*180*	*150*	*49*	*135*	*5/8"-11UNC*	*42,67*	*9,652*	*90*	*69*	*93*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
152	*42*	*88*	*140*	*140*	*80*	*6,5*	*50*	*160*	*13*	*88,5*	*220*	*86*	*91*	*M12x21*

Motor

	KAZ68					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*579*	*634*	*158*	*126,5*	*2x1/2"*	*47*
M80	*579*	*634*	*158*	*126,5*	*2x1/2"*	*47*
M90S	*620*	*686*	*176*	*150*	*2x3/4"*	*49*
M90L	*620*	*686*	*176*	*150*	*2x3/4"*	*51*
M100L	*665*	*737*	*194*	*160*	*2x3/4"*	*60*
M112M	*716,5*	*797,5*	*218*	*167,5*	*2x3/4"*	*68*
M132S	*809*	*909*	*258*	*181*	*1"+3/4"*	*78*
M132M	*809*	*909*	*258*	*181*	*1"+3/4"*	*99*

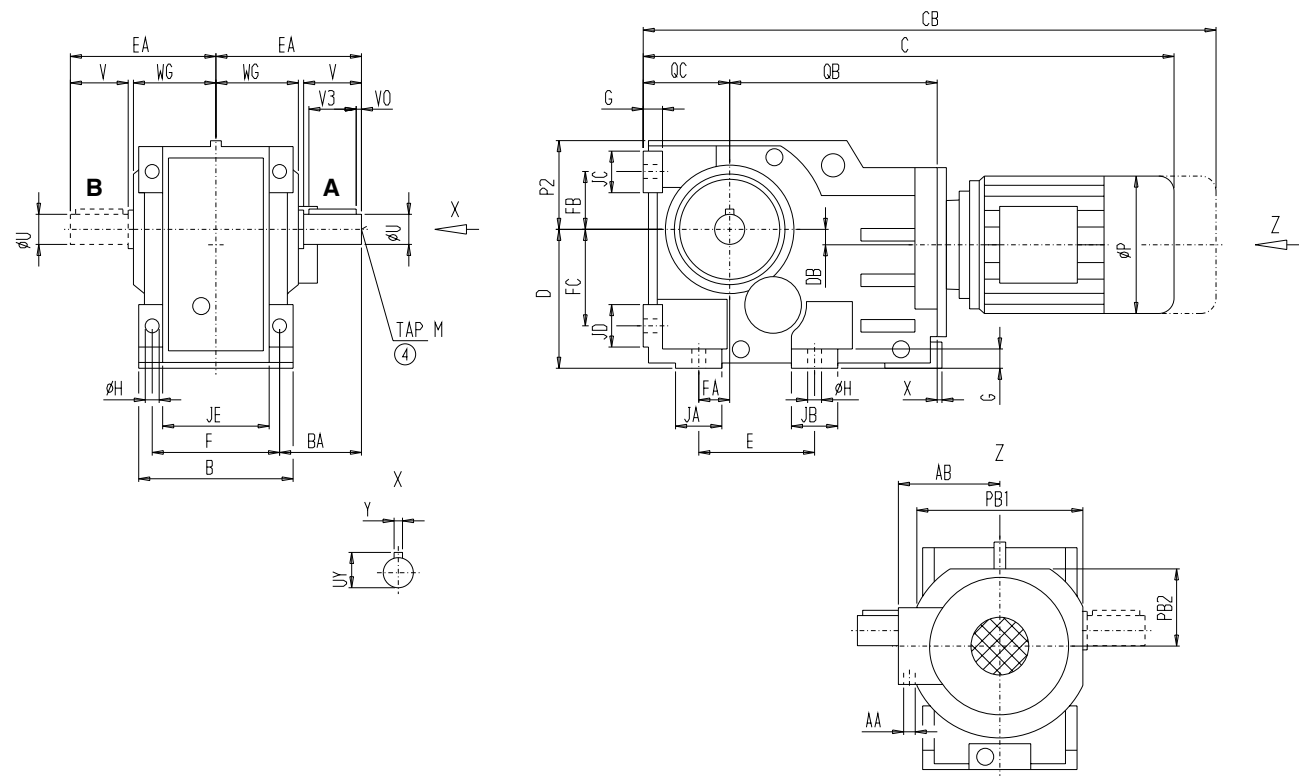
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted

K88

K 510
[inch]



4

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
2	3.94“	3.5	0.004	2.22	0.5	4.82	3/4-10UNC

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
5.91	1.57	6.5	0.98	5.43	7.87	7.09	4.92	2.95	3.94	0.79	2.17	2.17	2.56	2.17	7.87	0.51	4.41	10.31	3.94	4.53	8.07	0.71

Motor

	K88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	24.26	25.99	5.43	4.67	2x1/2“	171
M80	25.1	27.27	6.22	4.98	2x1/2“	177
M90S	26.72	29.31	6.93	5.91	2x3/4“	184
M90L	26.72	29.31	6.93	5.91	2x3/4“	188
M100L	28.49	31.32	7.64	6.3	2x3/4“	204
M112M	30.43	33.62	8.58	6.59	2x3/4“	222
M132S	34	37.97	10.16	7.13	1“+3/4“	271
M132M	34	37.97	10.16	7.13	1“+3/4“	295
M160M	37.28	41.89	12.2	7.83	1“+3/4“	328
M160L	37.28	41.89	12.2	7.83	1“+3/4“	359

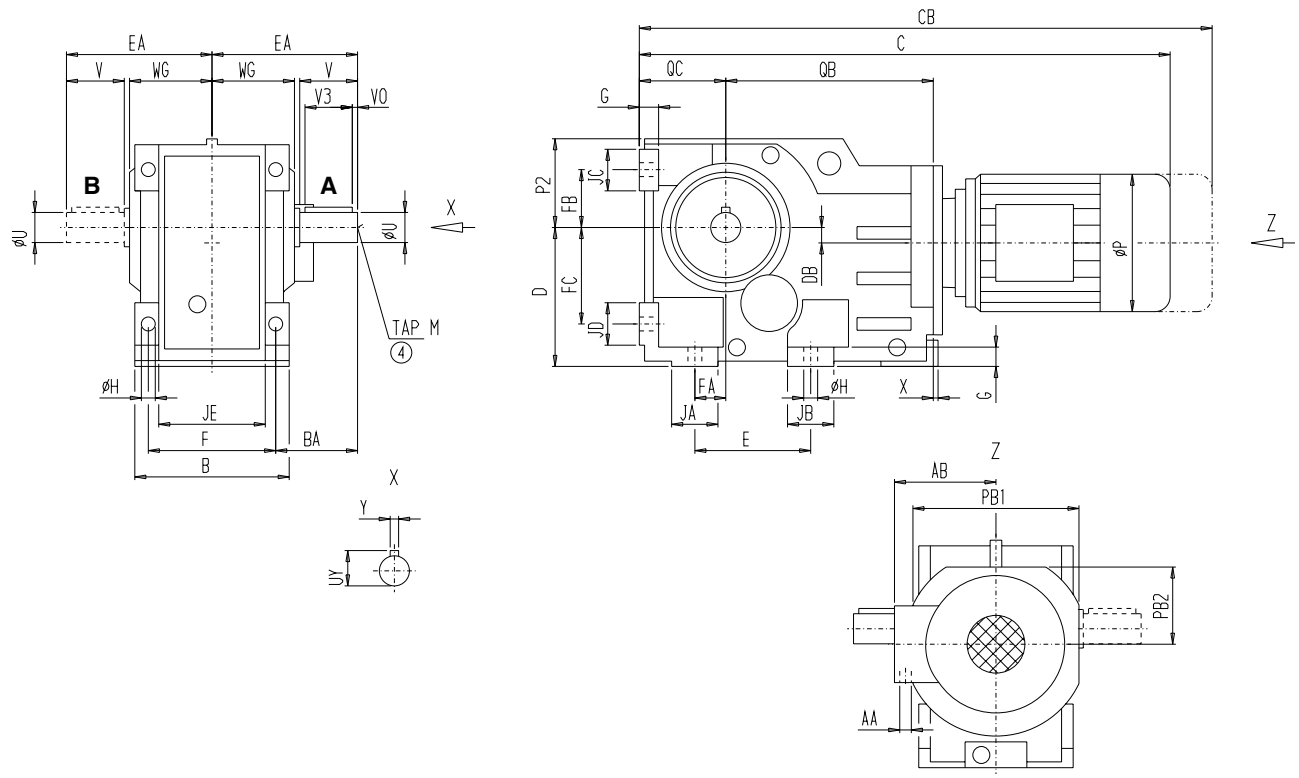
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted

K88

K 510
[*mm*]



Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
50,8	*100*	*88,9*	*0,102*	*56,39*	*12,7*	*122,5*	*3/4"-10UNC*

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
150	*40*	*165*	*25*	*138*	*200*	*180*	*125*	*75*	*100*	*20*	*55*	*55*	*65*	*55*	*200*	*13*	*112*	*262*	*100*	*115*	*205*	*18*

Motor

	K88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*617*	*661*	*138*	*118,5*	*2x1/2"*	*77*
M80	*638,5*	*693,5*	*158*	*126,5*	*2x1/2"*	*79*
M90S	*679,5*	*745,5*	*176*	*150*	*2x3/4"*	*81*
M90L	*679,5*	*745,5*	*176*	*150*	*2x3/4"*	*83*
M100L	*724,5*	*796,5*	*194*	*160*	*2x3/4"*	*92*
M112M	*774*	*855*	*218*	*167,5*	*2x3/4"*	*100*
M132S	*864,5*	*964,5*	*258*	*181*	*1"+3/4"*	*112*
M132M	*864,5*	*964,5*	*258*	*181*	*1"+3/4"*	*133*
M160M	*948*	*1065*	*310*	*199*	*1"+3/4"*	*149*
M160L	*948*	*1065*	*310*	*199*	*1"+3/4"*	*163*

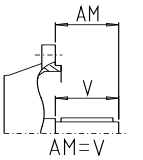
Tolerances see page 1 - 4

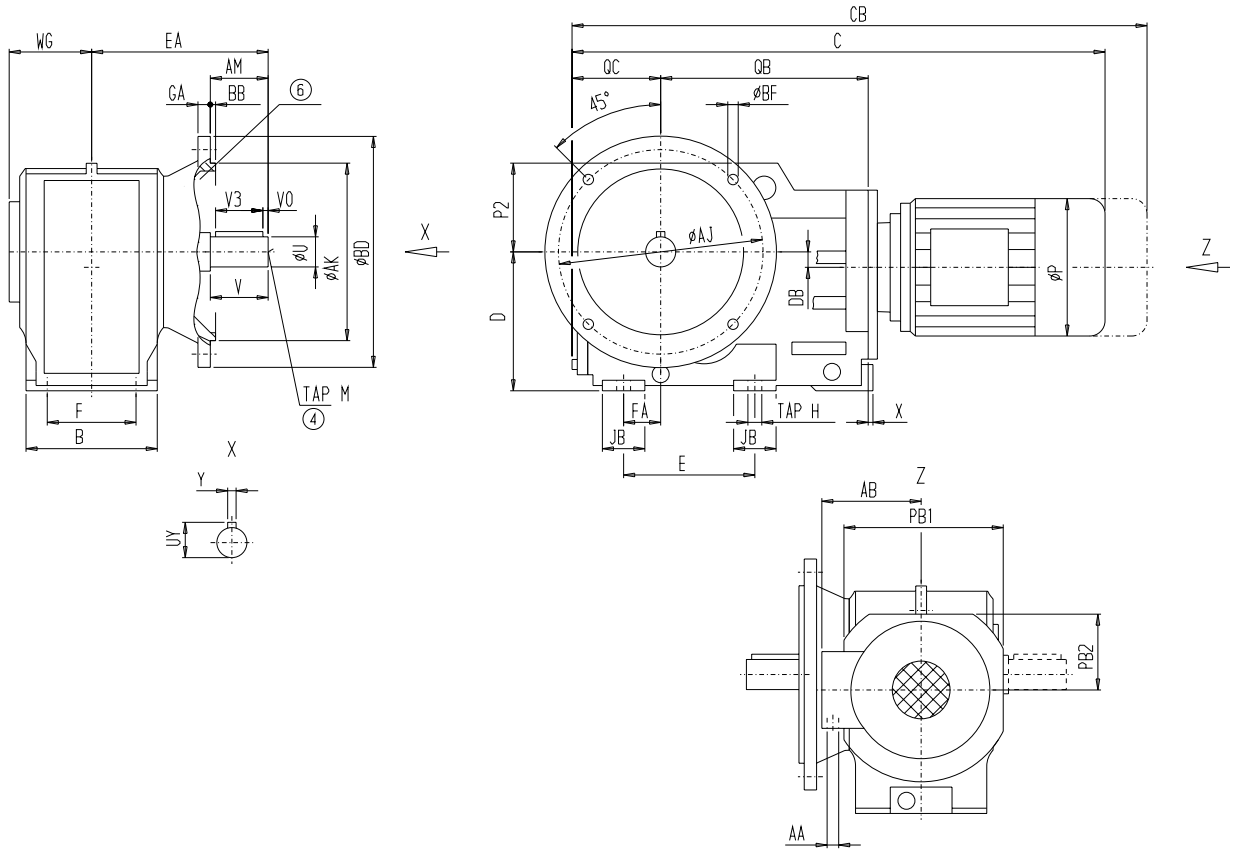
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Flange mounted

KF88

KF 510
[inch]





4

Flange

BD	AK	GA	AJ	BB	BF
11.81	9.06	0.63	10.43	0.16	0.53

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2	3.94	3.5	0.004	2.22	0.5	3.94	3/4-10UNC

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
6.69	1.89	4.53	6.69	7.09	3.94	0.79	2.17	7.87	0.51	4.33	10.31	3.94	4.53	9.53	M16x26

Motor

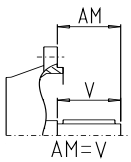
	KF88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	24.18	25.91	5.43	4.67	2x1/2“	185
M80	25.02	27.19	6.22	4.98	2x1/2“	192
M90S	26.64	29.23	6.93	5.91	2x3/4“	198
M90L	26.64	29.23	6.93	5.91	2x3/4“	203
M100L	28.41	31.24	7.64	6.3	2x3/4“	218
M112M	30.35	33.54	8.58	6.59	2x3/4“	236
M132S	33.92	37.89	10.16	7.13	1“+3/4“	286
M132M	33.92	37.89	10.16	7.13	1“+3/4“	310
M160M	37.21	41.82	12.2	7.83	1“+3/4“	343
M160L	37.21	41.82	12.2	7.83	1“+3/4“	374

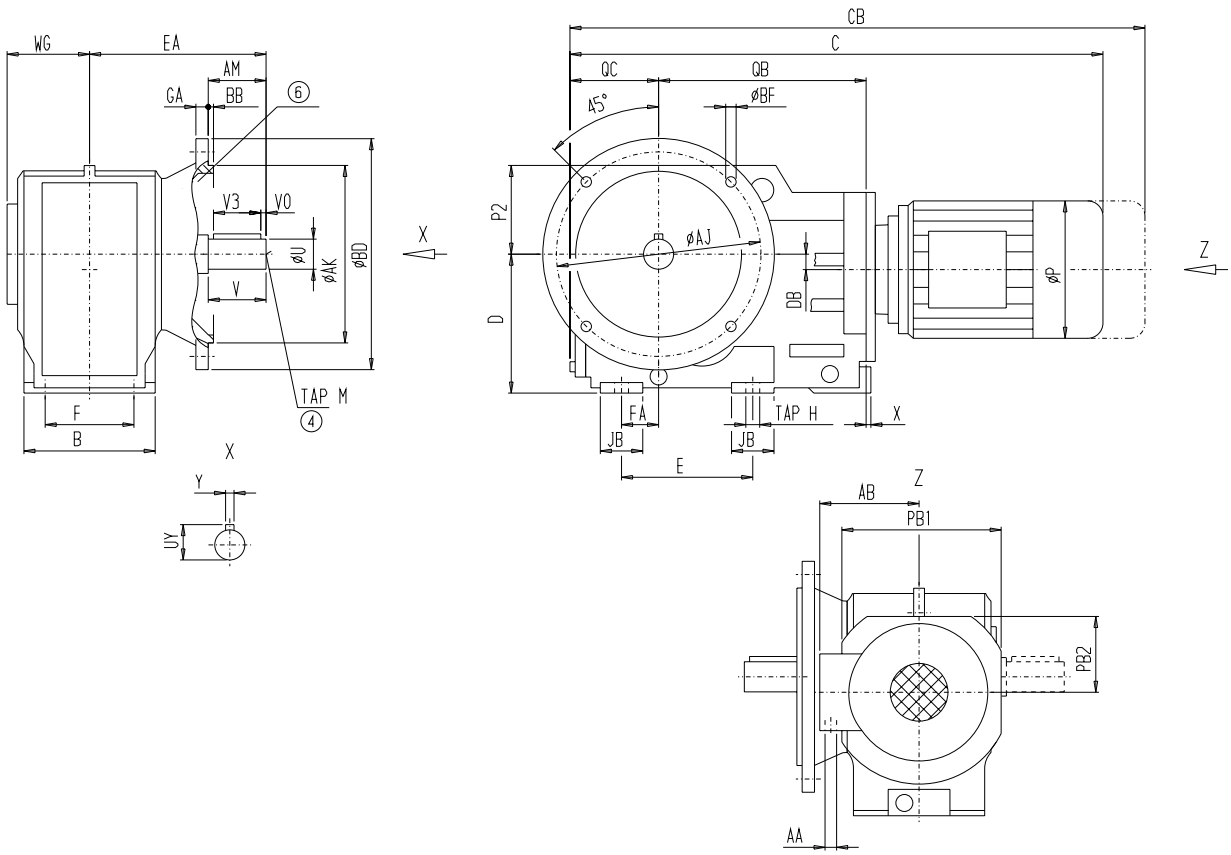
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Flange mounted

KF88

KF 510
[*mm*]





Flange

BD	AK	GA	AJ	BB	TAP BF
300	*230*	*16*	*265*	*4*	*13,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	M
50,8	*100*	*88,9*	*0,102*	*56,39*	*12,7*	*100*	*3/4"-10UNC*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
170	*48*	*115*	*170*	*180*	*100*	*20*	*55*	*200*	*13*	*110*	*262*	*100*	*115*	*242*	*M16x26*

Motor

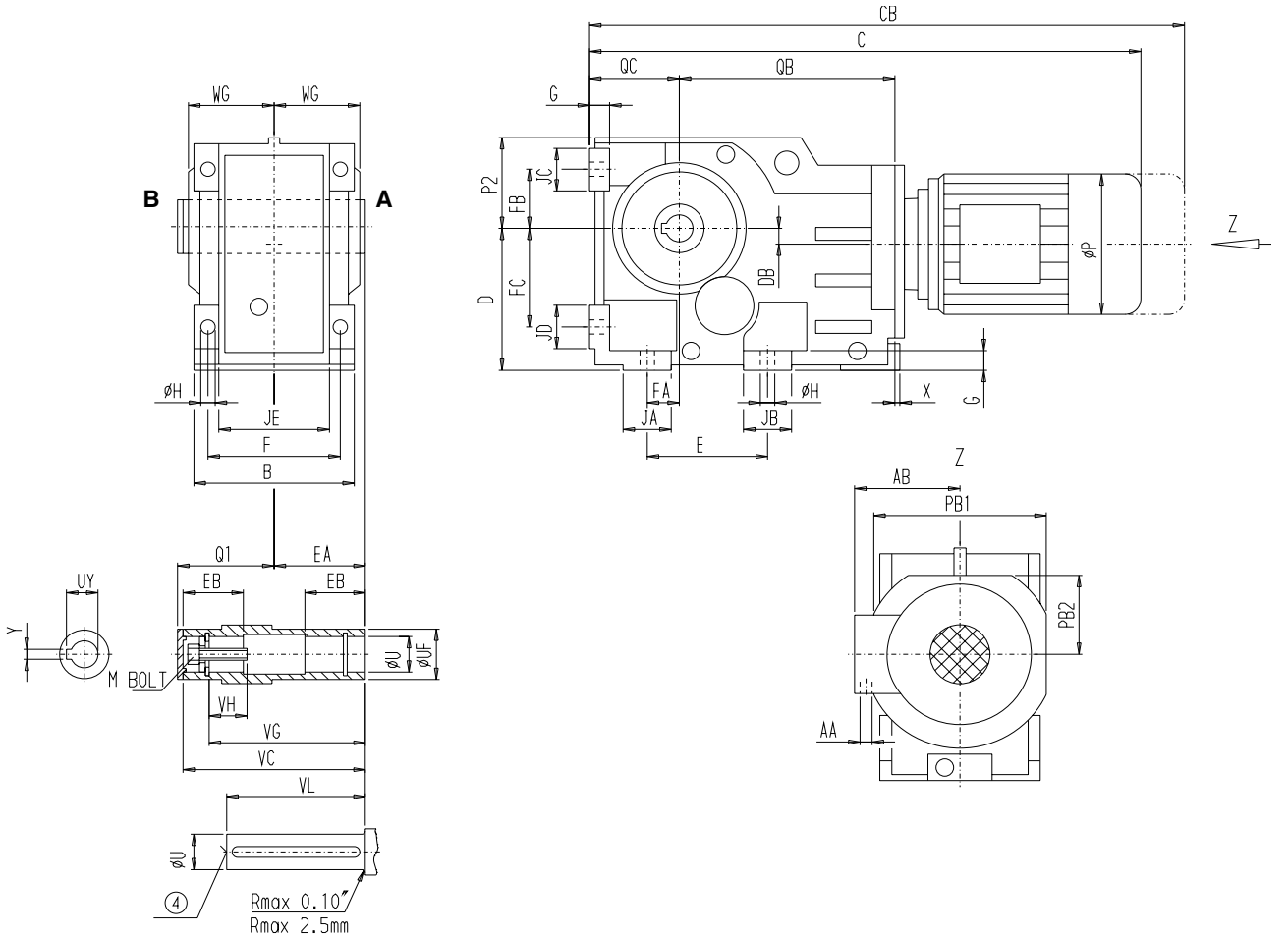
	KF88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*615*	*659*	*138*	*118,5*	*2x1/2"*	*84*
M80	*636,5*	*691,5*	*158*	*126,5*	*2x1/2"*	*86*
M90S	*677,5*	*743,5*	*176*	*150*	*2x3/4"*	*88*
M90L	*677,5*	*743,5*	*176*	*150*	*2x3/4"*	*90*
M100L	*722,5*	*794,5*	*194*	*160*	*2x3/4"*	*99*
M112M	*772*	*853*	*218*	*167,5*	*2x3/4"*	*107*
M132S	*862,5*	*962,5*	*258*	*181*	*1"+3/4"*	*119*
M132M	*862,5*	*962,5*	*258*	*181*	*1"+3/4"*	*140*
M160M	*946*	*1063*	*310*	*199*	*1"+3/4"*	*156*
M160L	*946*	*1063*	*310*	*199*	*1"+3/4"*	*170*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted

KA88

KA 510
[inch]



4

Mounting

E	F	FA	G	H
5.91	6.5	1.57	0.98	0.71

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2	3.15	8.27	7.087	1.62	6.5	3/4-10UNC	2.23	0.5	4.13	3.071	4.25

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
5.43	7.87	7.09	4.92	2.95	3.94	0.79	2.17	2.17	2.56	2.17	7.87	0.51	4.41	10.31	3.94	4.53

Motor

	KA88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	24.26	25.99	5.43	4.67	2x1/2“	153
M80	25.1	27.27	6.22	4.98	2x1/2“	159
M90S	26.72	29.31	6.93	5.91	2x3/4“	166
M90L	26.72	29.31	6.93	5.91	2x3/4“	170
M100L	28.49	31.32	7.64	6.3	2x3/4“	186
M112M	30.43	33.62	8.58	6.59	2x3/4“	204
M132S	34	37.97	10.16	7.13	1“+3/4“	253
M132M	34	37.97	10.16	7.13	1“+3/4“	277
M160M	37.28	41.89	12.2	7.83	1“+3/4“	311
M160L	37.28	41.89	12.2	7.83	1“+3/4“	341

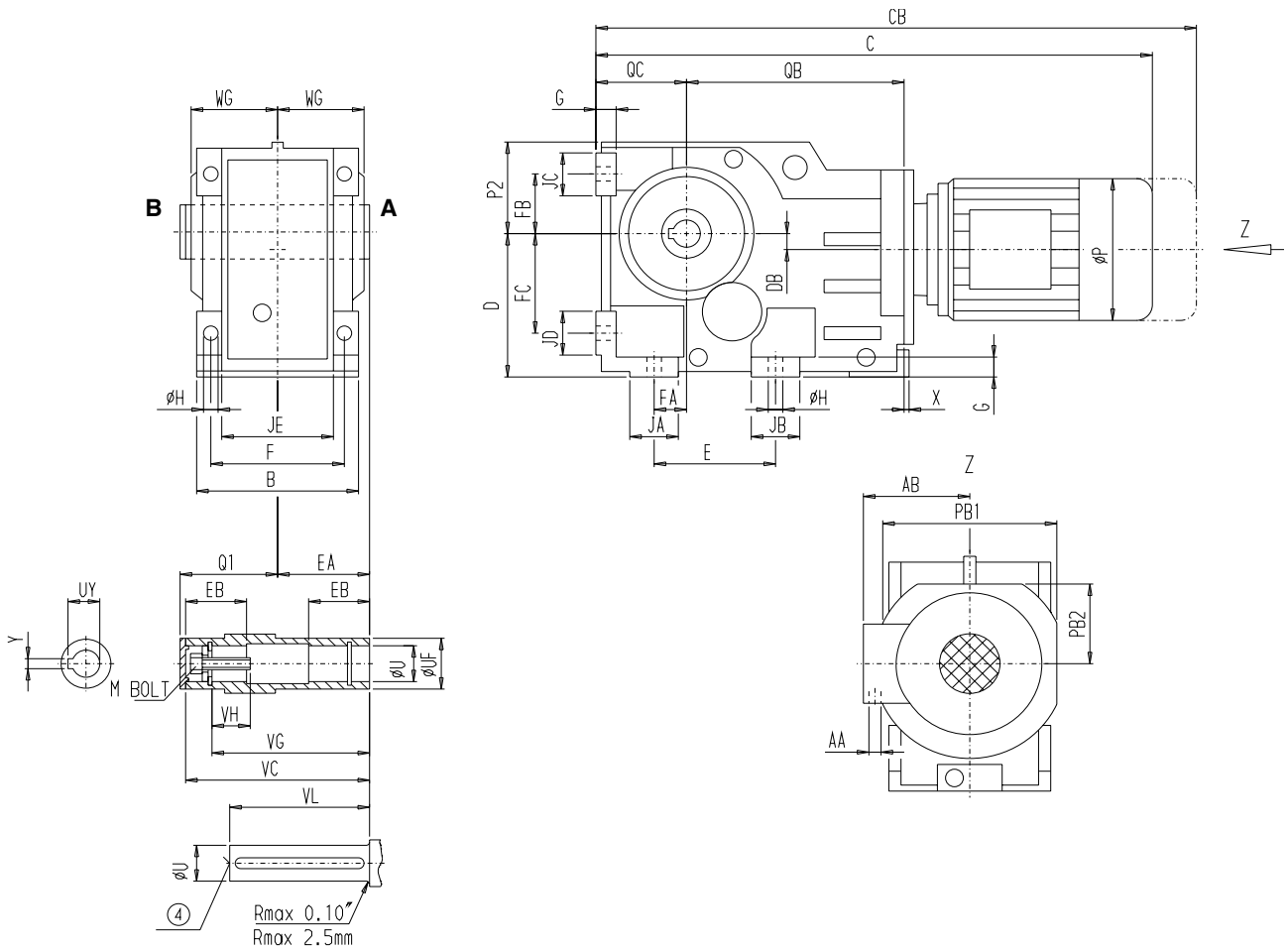
Tolerances see page 1 - 4
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted

KA88

KA 510

[*mm*]



Mounting

E	F	FA	G	H
150	*165*	*40*	*25*	*18*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
50,8	*80*	*210*	*180*	*41*	*165*	*3/4"-10UNC*	*56,64*	*12,7*	*105*	*78*	*108*

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
138	*200*	*180*	*125*	*75*	*100*	*20*	*55*	*55*	*65*	*55*	*200*	*13*	*112*	*262*	*100*	*115*

Motor

	KA88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*617*	*661*	*138*	*118,5*	*2x1/2"*	*69*
M80	*638,5*	*693,5*	*158*	*126,5*	*2x1/2"*	*71*
M90S	*679,5*	*745,5*	*176*	*150*	*2x3/4"*	*73*
M90L	*679,5*	*745,5*	*176*	*150*	*2x3/4"*	*75*
M100L	*724,5*	*796,5*	*194*	*160*	*2x3/4"*	*84*
M112M	*774*	*855*	*218*	*167,5*	*2x3/4"*	*92*
M132S	*864,5*	*964,5*	*258*	*181*	*1"+3/4"*	*104*
M132M	*864,5*	*964,5*	*258*	*181*	*1"+3/4"*	*125*
M160M	*948*	*1065*	*310*	*199*	*1"+3/4"*	*141*
M160L	*948*	*1065*	*310*	*199*	*1"+3/4"*	*155*

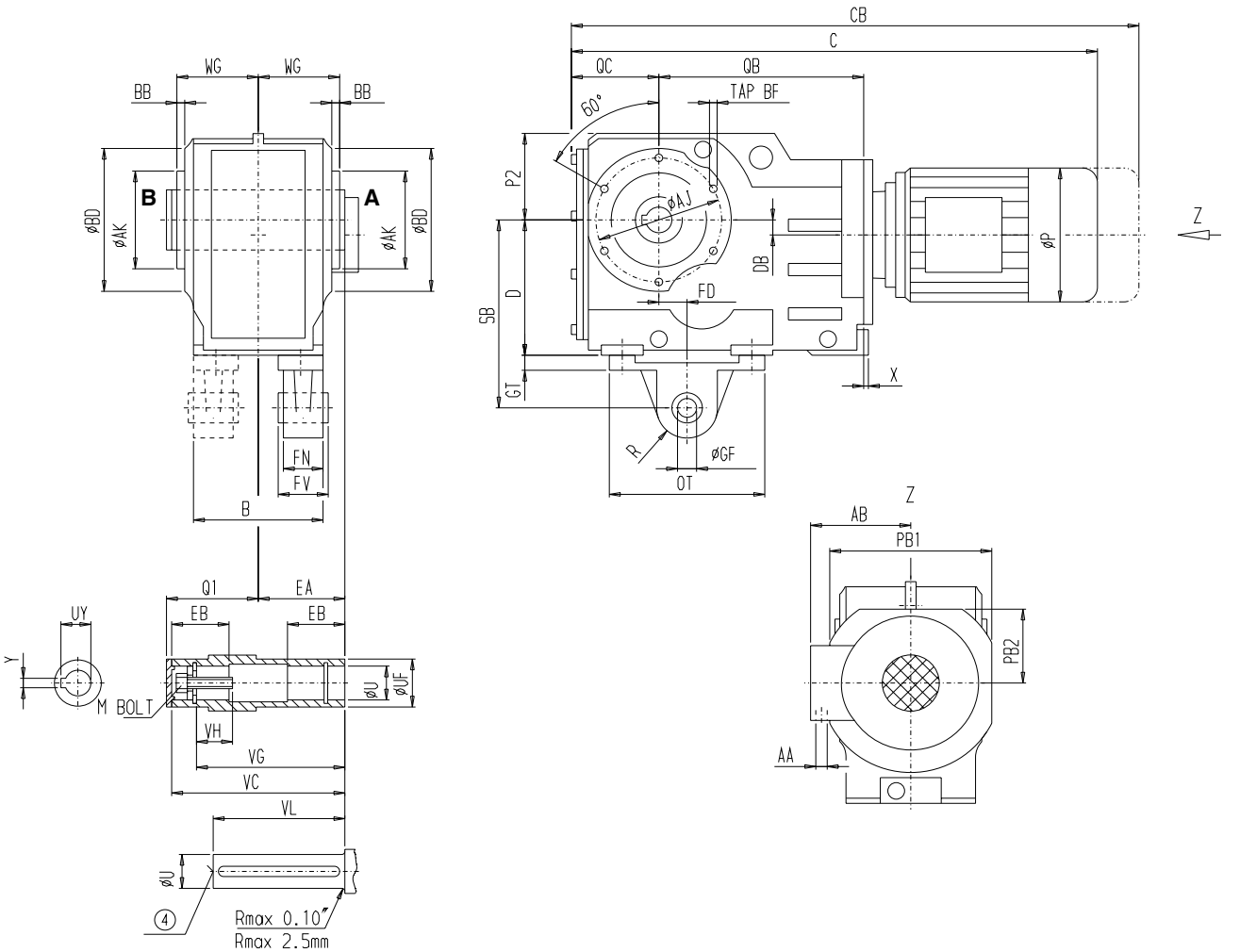
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD88

KAD 510

[inch]



4

Mounting

BD	AK	AJ	BB	WG	TAP BF
7.48	5.12	6.5	0.14	3.94	M12x21

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2	3.15	8.27	7.087	1.62	6.5	3/4-10UNC	2.23	0.5	4.13	3.071	4.25

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
7.09	3.94	0.79	7.87	0.51	4.33	10.31	4.53

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
1.97	2.2	0.98	9.84	6.69	1.46	0.79	8.03	R1.57

Motor

	KAD88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	24.18	25.91	5.43	4.67	2x1/2“	158
M80	25.02	27.19	6.22	4.98	2x1/2“	165
M90S	26.64	29.23	6.93	5.91	2x3/4“	172
M90L	26.64	29.23	6.93	5.91	2x3/4“	176
M100L	28.41	31.24	7.64	6.3	2x3/4“	192
M112M	30.35	33.54	8.58	6.59	2x3/4“	209
M132S	33.92	37.89	10.16	7.13	1“+3/4“	259
M132M	33.92	37.89	10.16	7.13	1“+3/4“	283
M160M	37.21	41.82	12.2	7.83	1“+3/4“	316
M160L	37.21	41.82	12.2	7.83	1“+3/4“	347

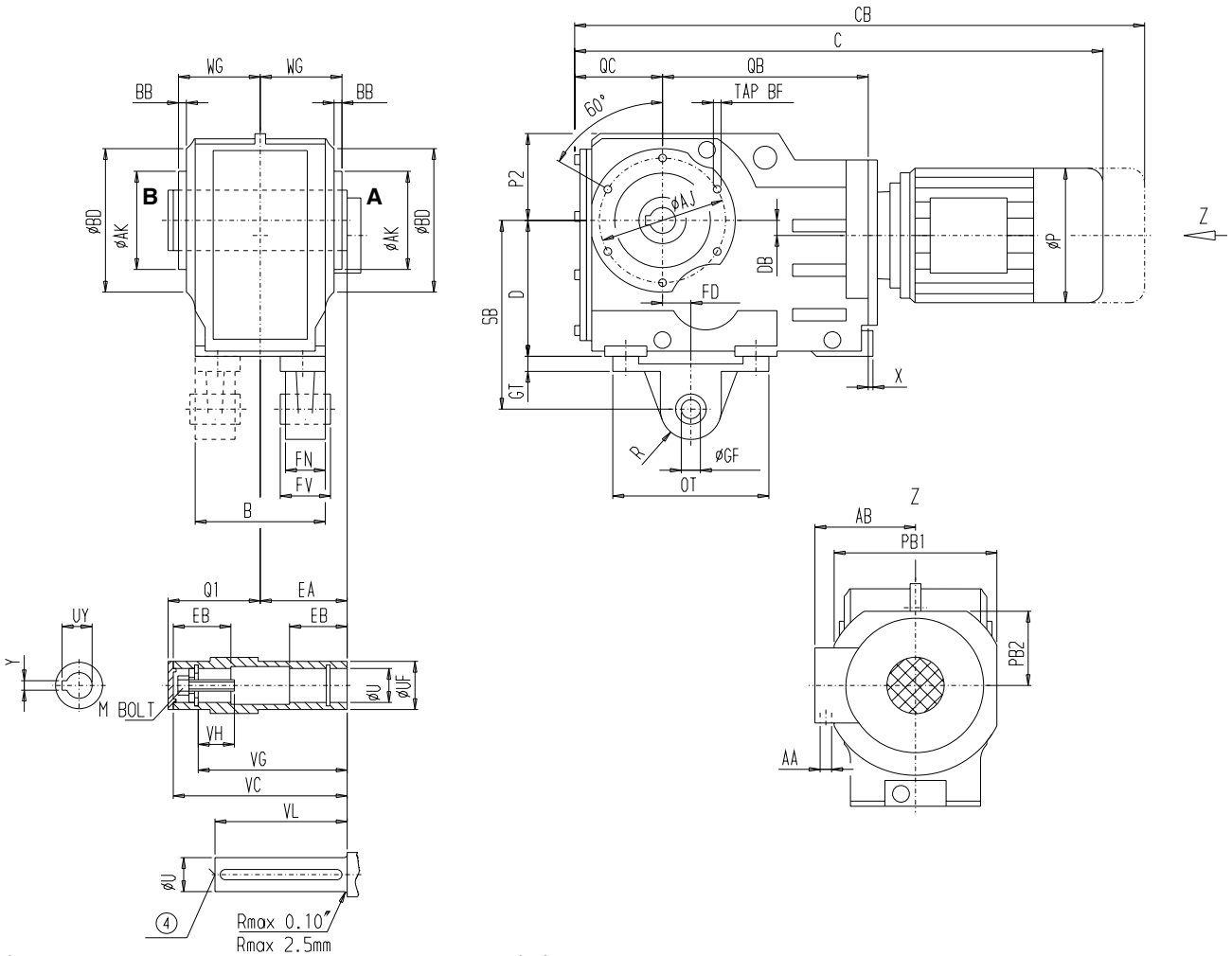
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD88

KAD 510

[*mm*]



Mounting

BD	AK	AJ	BB	WG	TAP BF
190	*130*	*165*	*3,5*	*100*	*M12x21*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
50,8	*80*	*210*	*180*	*41*	*165*	*3/4"-10UNC*	*56,64*	*12,7*	*105*	*78*	*108*

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
180	*100*	*20*	*200*	*13*	*110*	*262*	*115*

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
50	*56*	*25*	*250*	*170*	*37*	*20*	*204*	*R40*

Motor

	KAD88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*615*	*659*	*138*	*118,5*	*2x1/2"*	*72*
M80	*636,5*	*691,5*	*158*	*126,5*	*2x1/2"*	*74*
M90S	*677,5*	*743,5*	*176*	*150*	*2x3/4"*	*76*
M90L	*677,5*	*743,5*	*176*	*150*	*2x3/4"*	*78*
M100L	*722,5*	*794,5*	*194*	*160*	*2x3/4"*	*87*
M112M	*772*	*853*	*218*	*167,5*	*2x3/4"*	*95*
M132S	*862,5*	*962,5*	*258*	*181*	*1"+3/4"*	*106*
M132M	*862,5*	*962,5*	*258*	*181*	*1"+3/4"*	*127*
M160M	*946*	*1063*	*310*	*199*	*1"+3/4"*	*143*
M160L	*946*	*1063*	*310*	*199*	*1"+3/4"*	*157*

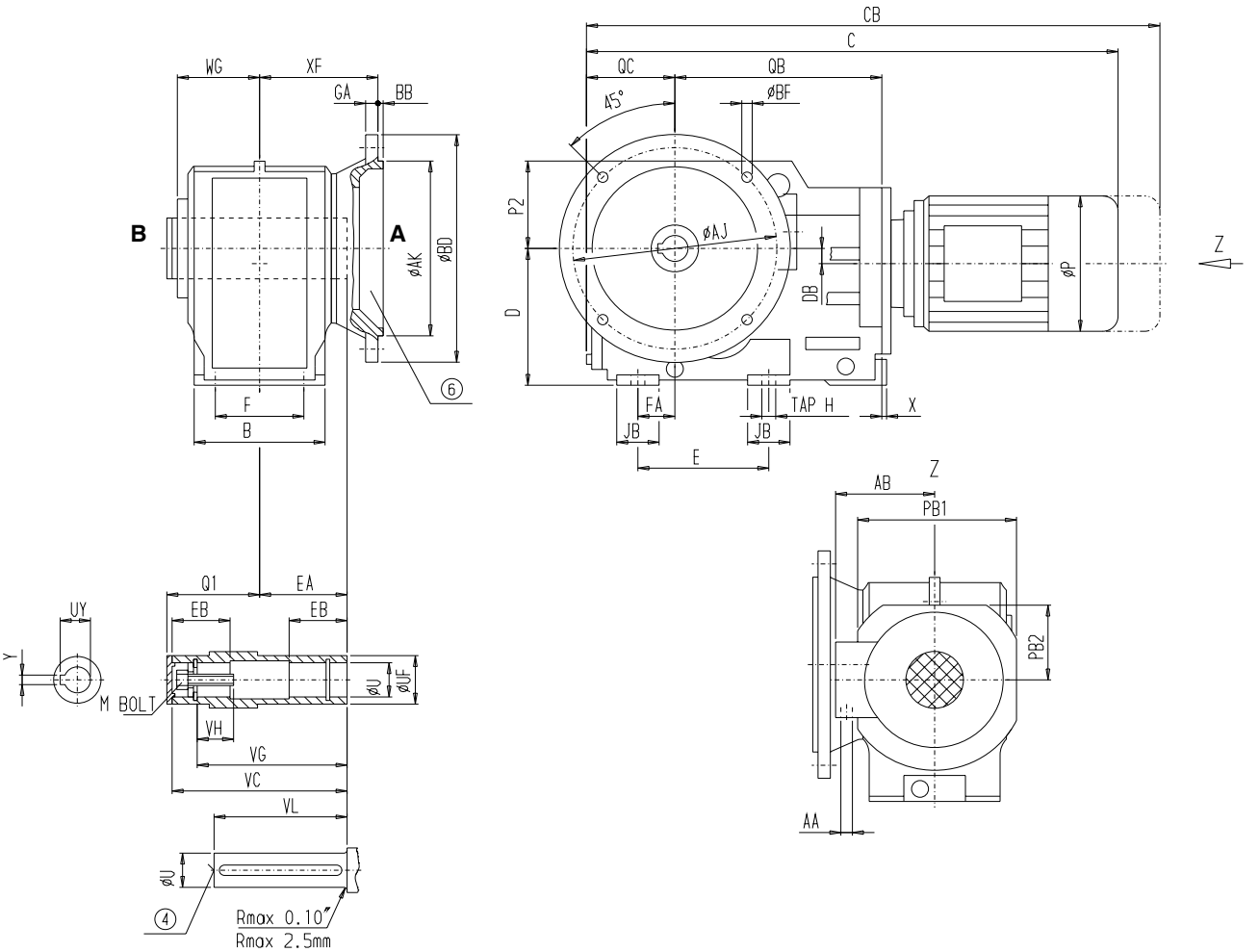
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with flange

KAF88

KAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	XF	BF
11.81	9.06	0.63	10.43	0.16	5.59	0.53

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2	3.15	8.27	7.087	1.62	6.5	3/4-10UNC	2.23	0.5	4.13	3.071	4.25

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
6.69	1.89	4.53	6.69	7.09	3.94	0.79	2.17	7.87	0.51	4.33	10.31	3.94	4.53	M16x26

Motor

	KAF88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	24.18	25.91	5.43	4.67	2x1/2“	167
M80	25.02	27.19	6.22	4.98	2x1/2“	174
M90S	26.64	29.23	6.93	5.91	2x3/4“	180
M90L	26.64	29.23	6.93	5.91	2x3/4“	185
M100L	28.41	31.24	7.64	6.3	2x3/4“	200
M112M	30.35	33.54	8.58	6.59	2x3/4“	218
M132S	33.92	37.89	10.16	7.13	1“+3/4“	268
M132M	33.92	37.89	10.16	7.13	1“+3/4“	292
M160M	37.21	41.82	12.2	7.83	1“+3/4“	325
M160L	37.21	41.82	12.2	7.83	1“+3/4“	356

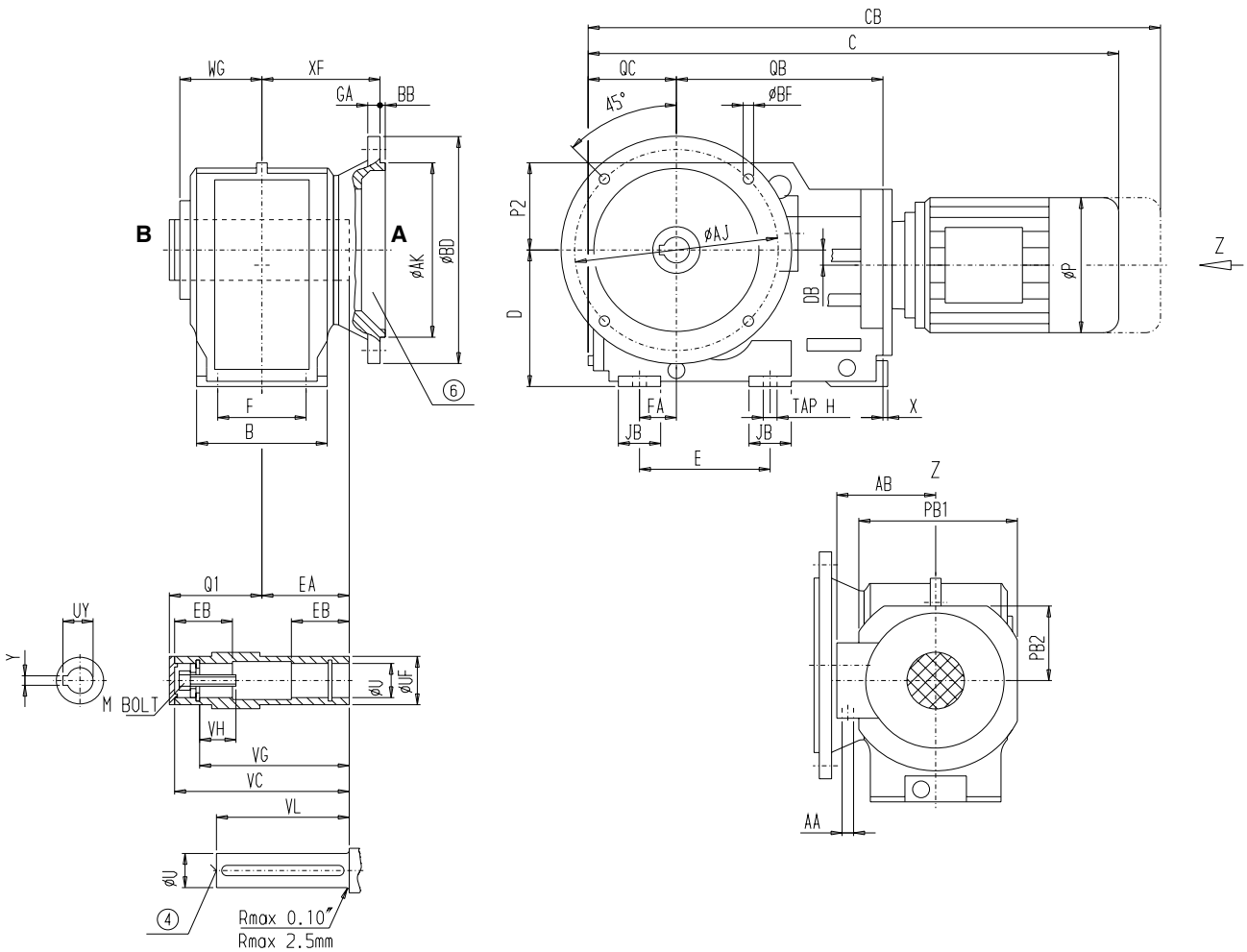
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted with flange

KAF88

KAF 510

[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	BF
300	*230*	*16*	*265*	*4*	*142*	*13,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
50,8	*80*	*210*	*180*	*41*	*165*	*3/4"-10UNC*	*56,64*	*12,7*	*105*	*78*	*108*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
170	*48*	*115*	*170*	*180*	*100*	*20*	*55*	*200*	*13*	*110*	*262*	*100*	*115*	*M16x26*

Motor

	KAF88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*615*	*659*	*138*	*118,5*	*2x1/2"*	*76*
M80	*636,5*	*691,5*	*158*	*126,5*	*2x1/2"*	*78*
M90S	*677,5*	*743,5*	*176*	*150*	*2x3/4"*	*80*
M90L	*677,5*	*743,5*	*176*	*150*	*2x3/4"*	*82*
M100L	*722,5*	*794,5*	*194*	*160*	*2x3/4"*	*91*
M112M	*772*	*853*	*218*	*167,5*	*2x3/4"*	*99*
M132S	*862,5*	*962,5*	*258*	*181*	*1"+3/4"*	*110*
M132M	*862,5*	*962,5*	*258*	*181*	*1"+3/4"*	*131*
M160M	*946*	*1063*	*310*	*199*	*1"+3/4"*	*147*
M160L	*946*	*1063*	*310*	*199*	*1"+3/4"*	*161*

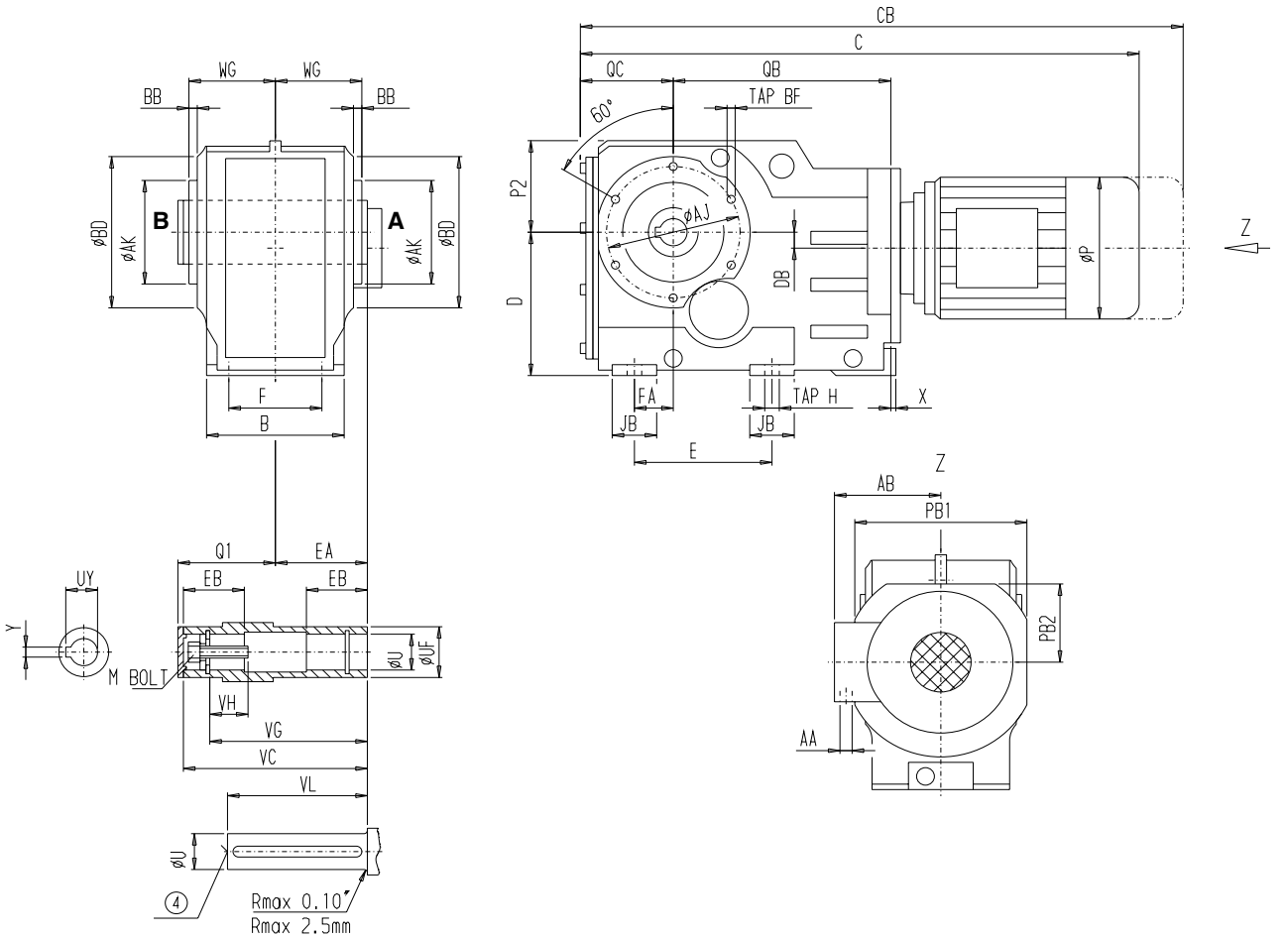
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ88

KAZ 510

[inch]



Mounting

BD	AK	AJ	BB	TAP BF
7.48	5.12	6.5	0.14	M12x21

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2	3.15	8.27	7.087	1.62	6.5	3/4-10UNC	2.23	0.5	4.13	3.071	4.25

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
6.69	1.89	4.53	6.69	7.09	3.94	0.79	2.17	7.87	0.51	4.33	10.31	3.94	4.53	M16x26

Motor

	KAZ88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	24.18	25.91	5.43	4.67	2x1/2“	152
M80	25.02	27.19	6.22	4.98	2x1/2“	159
M90S	26.64	29.23	6.93	5.91	2x3/4“	165
M90L	26.64	29.23	6.93	5.91	2x3/4“	170
M100L	28.41	31.24	7.64	6.3	2x3/4“	185
M112M	30.35	33.54	8.58	6.59	2x3/4“	203
M132S	33.92	37.89	10.16	7.13	1“+3/4“	253
M132M	33.92	37.89	10.16	7.13	1“+3/4“	277
M160M	37.21	41.82	12.2	7.83	1“+3/4“	310
M160L	37.21	41.82	12.2	7.83	1“+3/4“	341

Tolerances see page 1 - 4

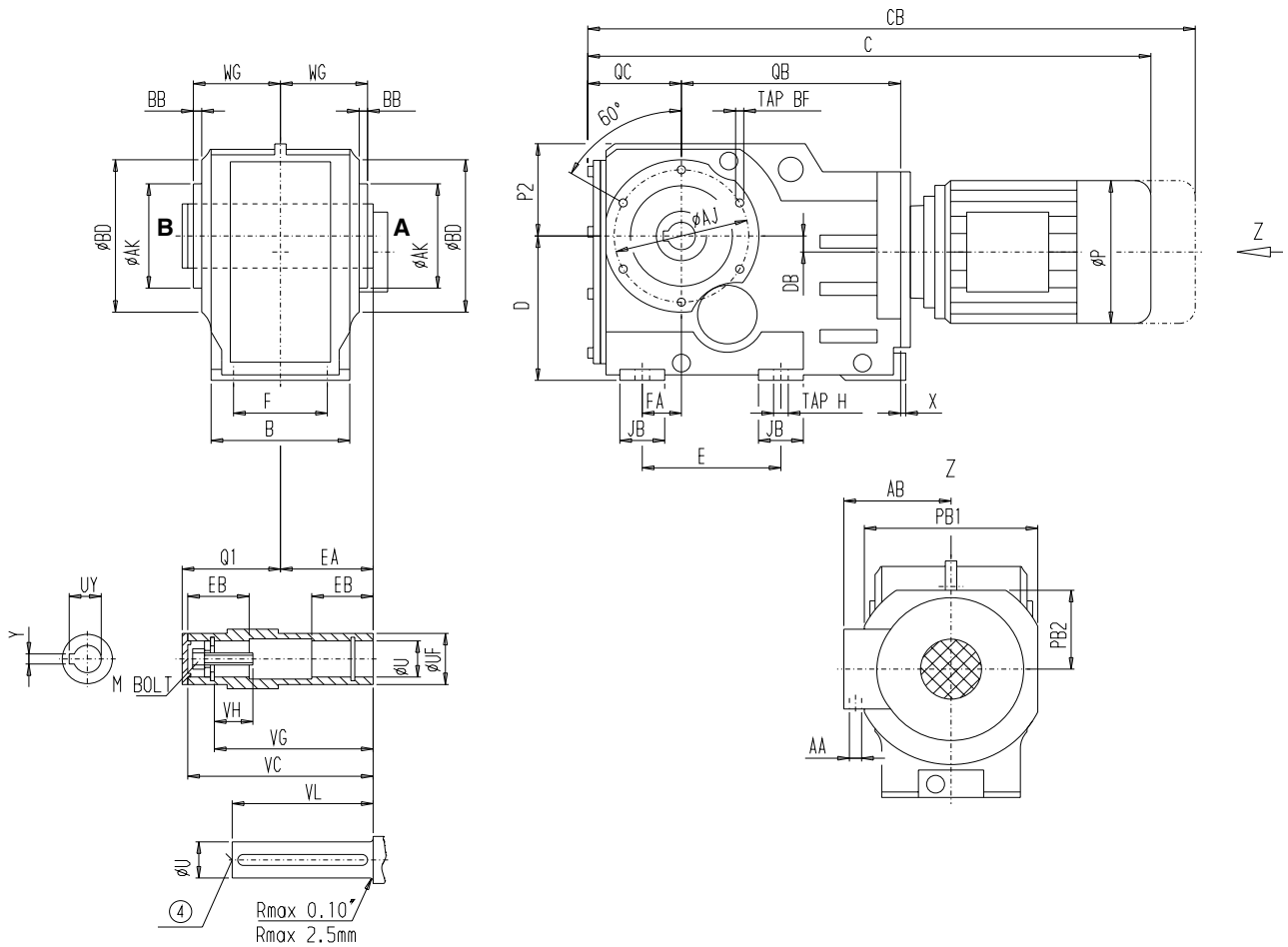
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ88

KAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
190	*130*	*165*	*3,5*	*M12x21*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
50,8	*80*	*210*	*180*	*41*	*165*	*3/4"-10UNC*	*56,64*	*12,7*	*105*	*78*	*108*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
170	*48*	*115*	*170*	*180*	*100*	*20*	*55*	*200*	*13*	*110*	*262*	*100*	*115*	*M16x26*

Motor

	KAZ88					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*615*	*659*	*138*	*118,5*	*2x1/2"*	*69*
M80	*636,5*	*691,5*	*158*	*126,5*	*2x1/2"*	*71*
M90S	*677,5*	*743,5*	*176*	*150*	*2x3/4"*	*73*
M90L	*677,5*	*743,5*	*176*	*150*	*2x3/4"*	*75*
M100L	*722,5*	*794,5*	*194*	*160*	*2x3/4"*	*84*
M112M	*772*	*853*	*218*	*167,5*	*2x3/4"*	*92*
M132S	*862,5*	*962,5*	*258*	*181*	*1"+3/4"*	*104*
M132M	*862,5*	*962,5*	*258*	*181*	*1"+3/4"*	*125*
M160M	*946*	*1063*	*310*	*199*	*1"+3/4"*	*141*
M160L	*946*	*1063*	*310*	*199*	*1"+3/4"*	*155*

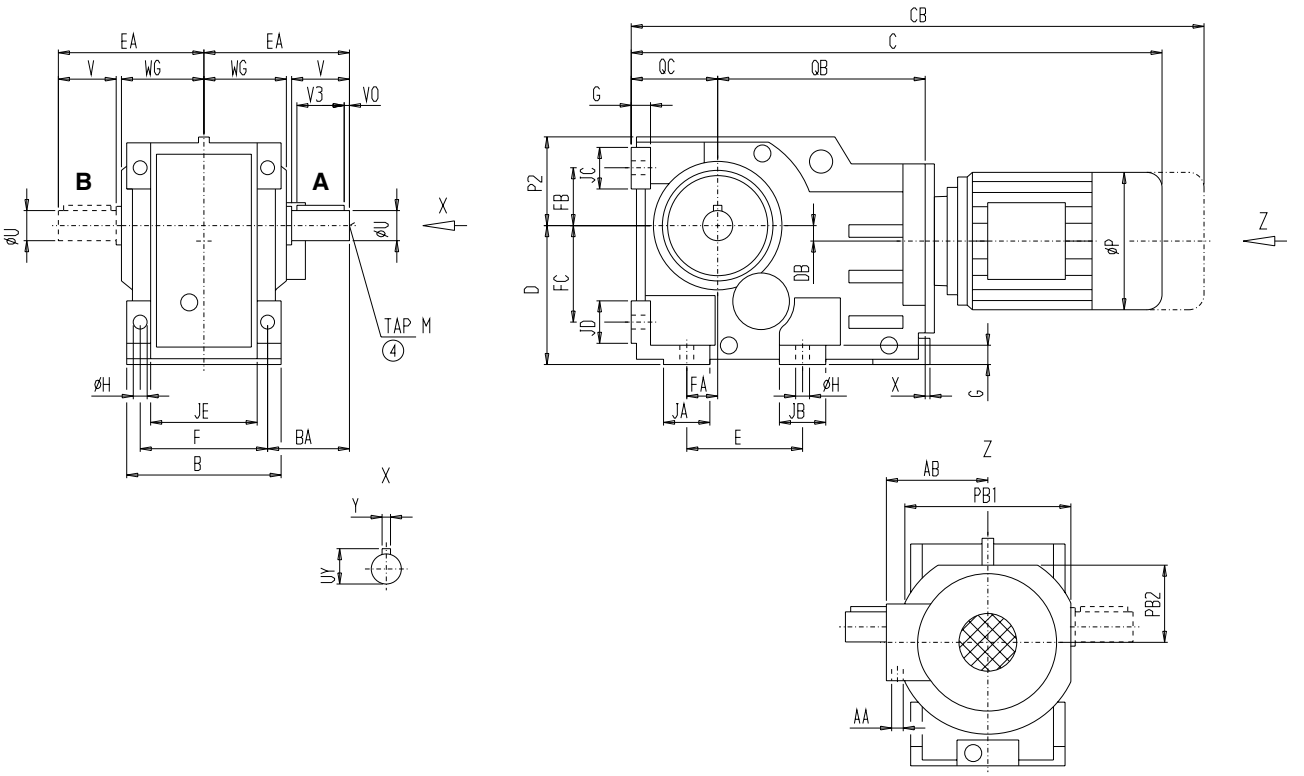
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted

K108

K 510
[inch]



4

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
2.375	4.72	4.25	0.002	2.65	0.625	5.905	3/4-10UNC

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
7.09	2.17	7.09	1.18	5.51	9.06	8.35	5.59	3.58	4.92	0.51	3.15	2.76	2.91	2.76	9.84	0.79	5.2	12.91	4.53	5.24	9.45	0.87

Motor

	K108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M80	27.89	30.06	6.22	4.98	2x1/2“	296
M90S	29.51	32.1	6.93	5.91	2x3/4“	305
M90L	29.51	32.1	6.93	5.91	2x3/4“	309
M100L	31.18	34.01	7.64	6.3	2x3/4“	322
M112M	33.09	36.28	8.58	6.59	2x3/4“	341
M132S	36.66	40.63	10.16	7.13	1“+3/4“	387
M132M	36.66	40.63	10.16	7.13	1“+3/4“	412
M160M	40.01	44.62	12.2	7.83	1“+3/4“	467
M160L	40.01	44.62	12.2	7.83	1“+3/4“	498
M180M	42.03	46.67	13.7	9.69	1 1/4“+3/4“	533
M180L	42.03	46.67	13.7	9.69	1 1/4“+3/4“	548

Tolerances see page 1 - 4

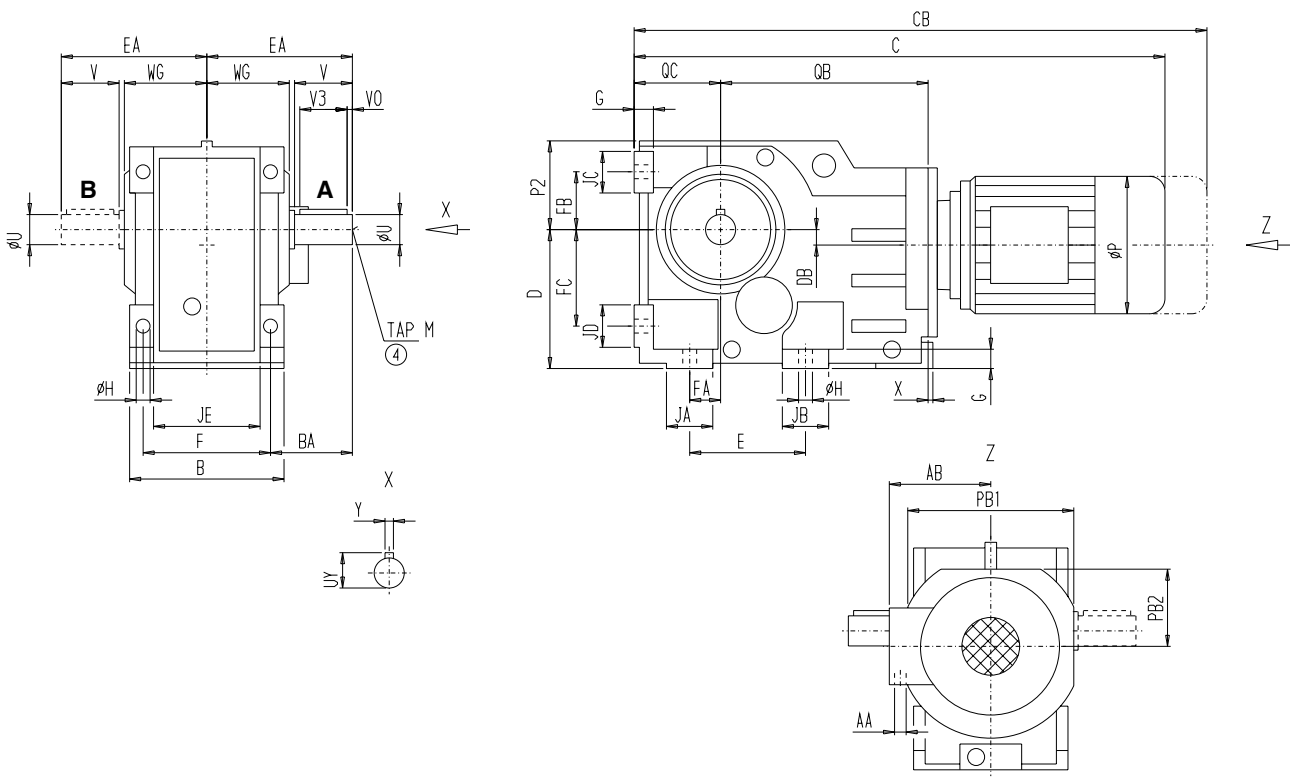
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Foot mounted

K108

K 510

[*mm*]



Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
60,325	*120*	*107,95*	*0,051*	*67,31*	*15,875*	*150*	*3/4"-10UNC*

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
180	*55*	*180*	*30*	*140*	*230*	*212*	*142*	*91*	*125*	*13*	*80*	*70*	*74*	*70*	*250*	*20*	*132*	*328*	*115*	*133*	*240*	*22*

Motor

	K108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M80	*709,5*	*764,5*	*158*	*126,5*	*2x1/2"*	*134*
M90S	*750,5*	*816,5*	*176*	*150*	*2x3/4"*	*136*
M90L	*750,5*	*816,5*	*176*	*150*	*2x3/4"*	*138*
M100L	*793*	*865*	*194*	*160*	*2x3/4"*	*146*
M112M	*841,5*	*922,5*	*218*	*167,5*	*2x3/4"*	*155*
M132S	*932*	*1032*	*258*	*181*	*1"+3/4"*	*165*
M132M	*932*	*1032*	*258*	*181*	*1"+3/4"*	*186*
M160M	*1017,5*	*1134,5*	*310*	*199*	*1"+3/4"*	*200*
M160L	*1017,5*	*1134,5*	*310*	*199*	*1"+3/4"*	*214*
M180M	*1068,5*	*1186,5*	*348*	*246*	*1 1/4"+3/4"*	*242*
M180L	*1068,5*	*1186,5*	*348*	*246*	*1 1/4"+3/4"*	*249*

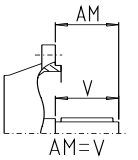
Tolerances see page 1 - 4

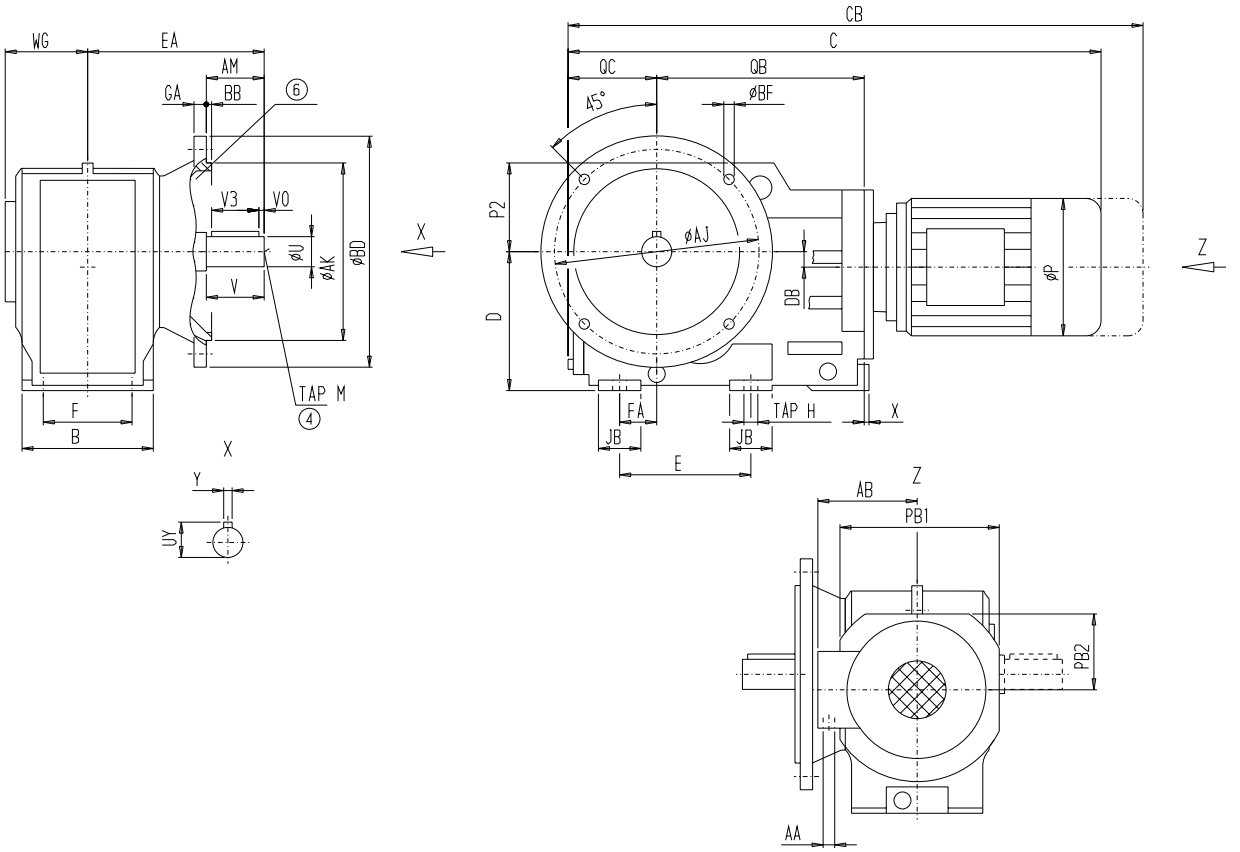
④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Flange mounted

KF108

KF 510
[inch]





Flange

BD	AK	GA	AJ	BB	BF
13.78	9.84	0.71	11.81	0.2	0.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.375	4.72	4.25	0.002	2.65	0.625	4.72	3/4-10UNC

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
8.86	2.56	6.1	8.27	8.35	4.92	0.51	2.76	9.84	0.79	5.33	12.91	4.53	5.24	10.87	M16x28

Motor

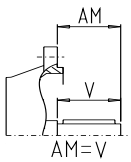
	KF108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M80	28.03	30.2	6.22	4.98	2x1/2“	325
M90S	29.65	32.24	6.93	5.91	2x3/4“	334
M90L	29.65	32.24	6.93	5.91	2x3/4“	338
M100L	31.32	34.15	7.64	6.3	2x3/4“	351
M112M	33.23	36.42	8.58	6.59	2x3/4“	370
M132S	36.8	40.77	10.16	7.13	1“+3/4“	416
M132M	36.8	40.77	10.16	7.13	1“+3/4“	441
M160M	40.15	44.76	12.2	7.83	1“+3/4“	496
M160L	40.15	44.76	12.2	7.83	1“+3/4“	527
M180M	42.17	46.81	13.7	9.69	1 1/4“+3/4“	562
M180L	42.17	46.81	13.7	9.69	1 1/4“+3/4“	577

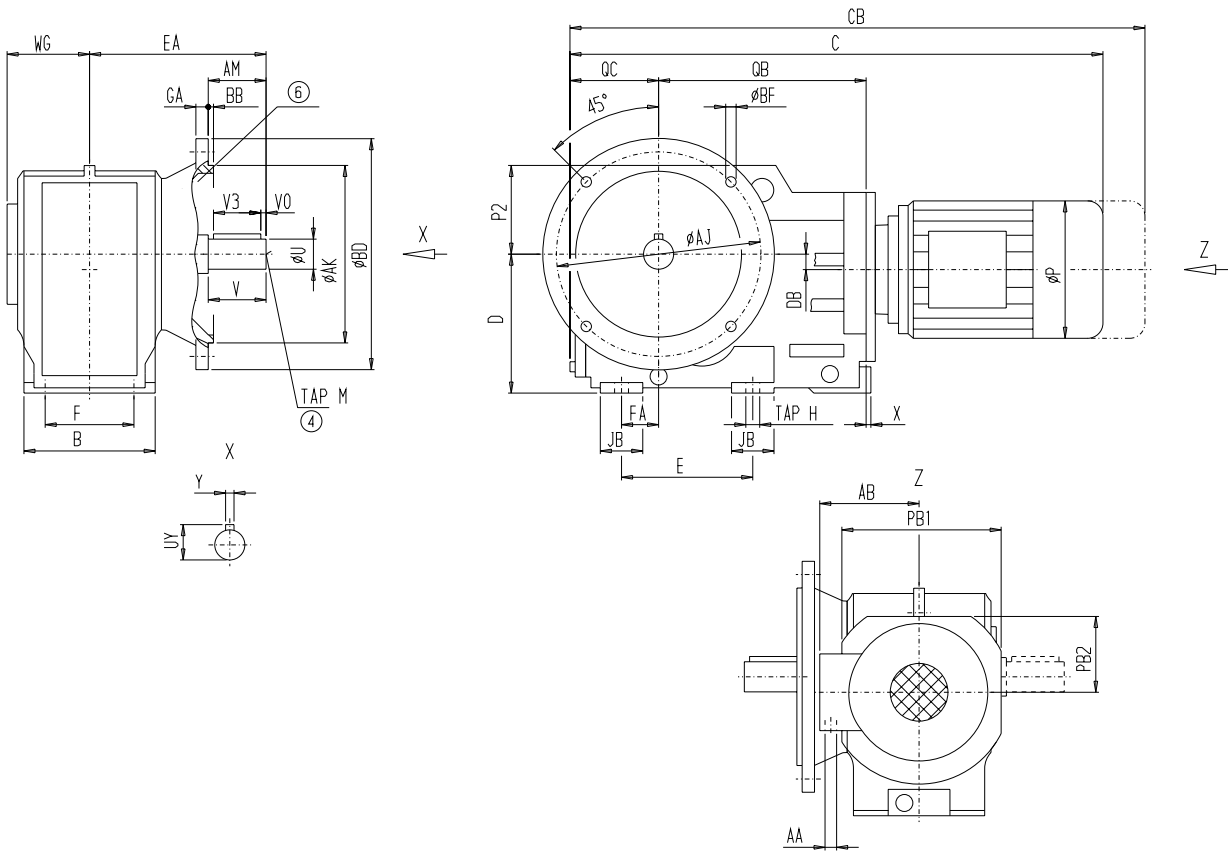
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Flange mounted

KF108

KF 510
[*mm*]





Flange

BD	AK	GA	AJ	BB	BF
350	*250*	*18*	*300*	*5*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
60,325	*120*	*107,95*	*0,051*	*67,31*	*15,875*	*120*	*3/4"-10UNC*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
225	*65*	*155*	*210*	*212*	*125*	*13*	*70*	*250*	*20*	*135,5*	*328*	*115*	*133*	*276*	*M16x28*

Motor

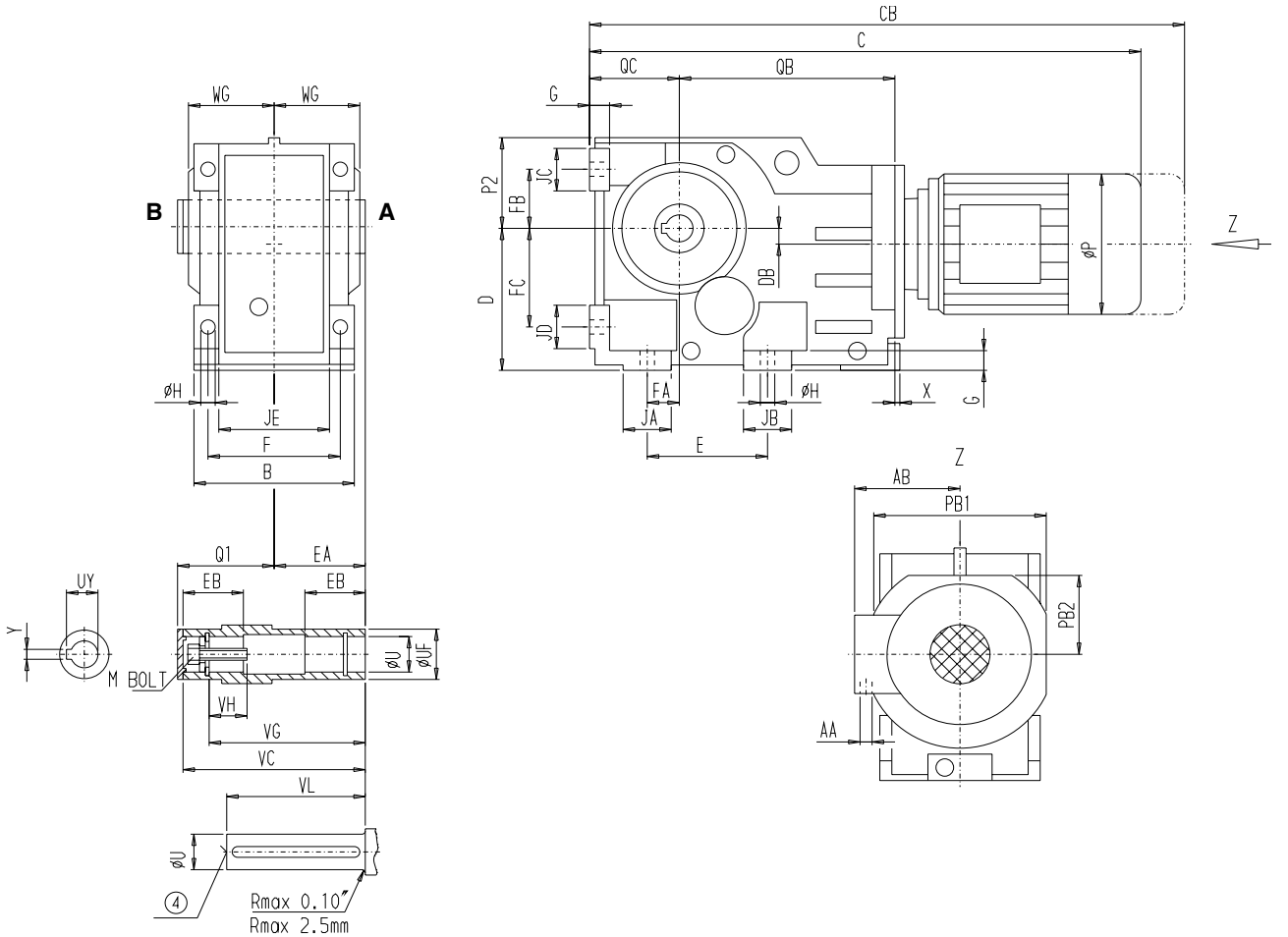
	KF108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M80	*713*	*768*	*158*	*126,5*	*2x1/2"*	*147*
M90S	*754*	*820*	*176*	*150*	*2x3/4"*	*149*
M90L	*754*	*820*	*176*	*150*	*2x3/4"*	*151*
M100L	*796,5*	*868,5*	*194*	*160*	*2x3/4"*	*159*
M112M	*845*	*926*	*218*	*167,5*	*2x3/4"*	*168*
M132S	*935,5*	*1035,5*	*258*	*181*	*1"+3/4"*	*178*
M132M	*935,5*	*1035,5*	*258*	*181*	*1"+3/4"*	*199*
M160M	*1021*	*1138*	*310*	*199*	*1"+3/4"*	*213*
M160L	*1021*	*1138*	*310*	*199*	*1"+3/4"*	*227*
M180M	*1072*	*1190*	*348*	*246*	*1 1/4"+3/4"*	*255*
M180L	*1072*	*1190*	*348*	*246*	*1 1/4"+3/4"*	*262*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted

KA108

KA 510
[inch]



Mounting

E	F	FA	G	H
7.09	7.09	2.17	1.18	0.87

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2.375	3.74	9.45	8.189	2.37	7.28	3/4-10UNC	2.66	0.63	4.72	3.661	4.88

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
5.51	9.06	8.35	5.59	3.58	4.92	0.51	3.15	2.76	2.91	2.76	9.84	0.79	5.2	12.91	4.53	5.24

Motor

	KA108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M80	27.89	30.06	6.22	4.98	2x1/2“	268
M90S	29.51	32.1	6.93	5.91	2x3/4“	276
M90L	29.51	32.1	6.93	5.91	2x3/4“	281
M100L	31.18	34.01	7.64	6.3	2x3/4“	294
M112M	33.09	36.28	8.58	6.59	2x3/4“	313
M132S	36.66	40.63	10.16	7.13	1“+3/4“	359
M132M	36.66	40.63	10.16	7.13	1“+3/4“	383
M160M	40.01	44.62	12.2	7.83	1“+3/4“	438
M160L	40.01	44.62	12.2	7.83	1“+3/4“	469
M180M	42.03	46.67	13.7	9.69	1 1/4“+3/4“	505
M180L	42.03	46.67	13.7	9.69	1 1/4“+3/4“	520

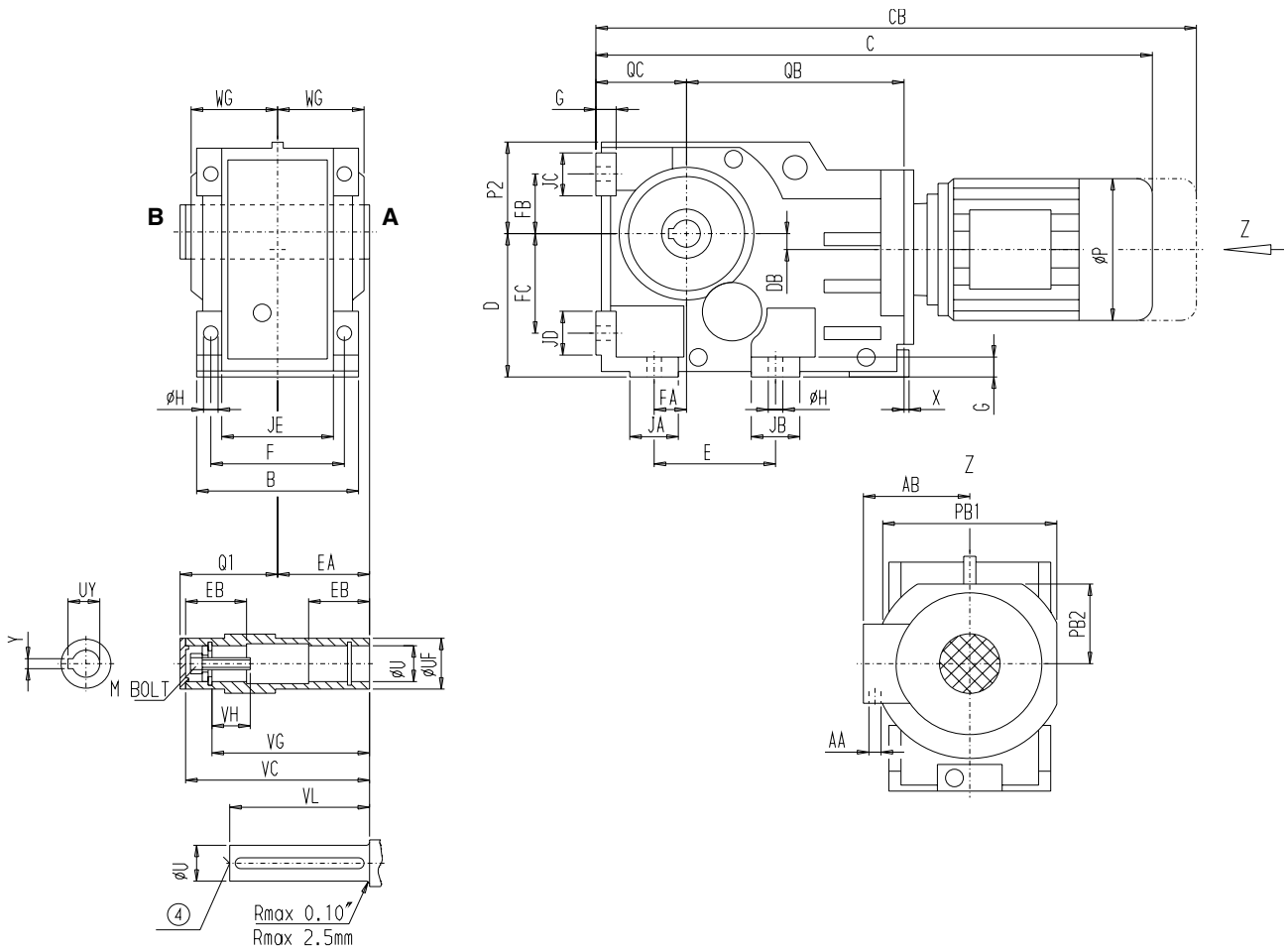
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted

KA108

KA 510

[*mm*]



Mounting

E	F	FA	G	H
180	*180*	*55*	*30*	*22*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
60,325	*95*	*240*	*208*	*60*	*185*	*3/4"-10UNC*	*67,56*	*16,002*	*120*	*93*	*124*

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
140	*230*	*212*	*142*	*91*	*125*	*13*	*80*	*70*	*74*	*70*	*250*	*20*	*132*	*328*	*115*	*133*

Motor

	KA108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M80	*709,5*	*764,5*	*158*	*126,5*	*2x1/2"*	*121*
M90S	*750,5*	*816,5*	*176*	*150*	*2x3/4"*	*123*
M90L	*750,5*	*816,5*	*176*	*150*	*2x3/4"*	*125*
M100L	*793*	*865*	*194*	*160*	*2x3/4"*	*133*
M112M	*841,5*	*922,5*	*218*	*167,5*	*2x3/4"*	*142*
M132S	*932*	*1032*	*258*	*181*	*1"+3/4"*	*152*
M132M	*932*	*1032*	*258*	*181*	*1"+3/4"*	*173*
M160M	*1017,5*	*1134,5*	*310*	*199*	*1"+3/4"*	*187*
M160L	*1017,5*	*1134,5*	*310*	*199*	*1"+3/4"*	*201*
M180M	*1068,5*	*1186,5*	*348*	*246*	*1 1/4"+3/4"*	*229*
M180L	*1068,5*	*1186,5*	*348*	*246*	*1 1/4"+3/4"*	*236*

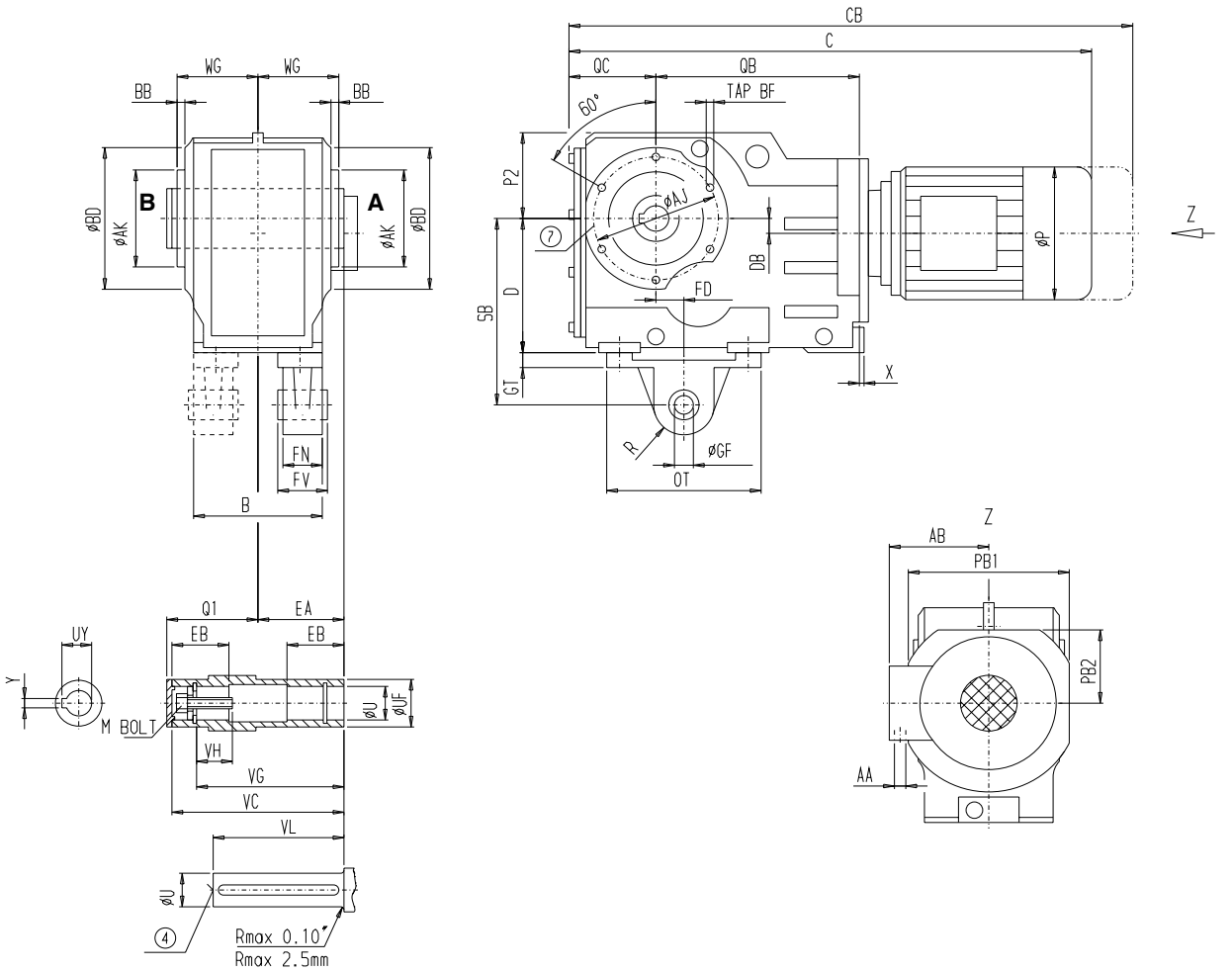
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD108

KAD 510

[inch]



4

Mounting

BD	AK	AJ	BB	WG	TAP BF
9.65	7.09	8.46	0.16	4.53	M16x28

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2.375	3.74	9.45	8.189	2.37	7.28	3/4-10UNC	2.66	0.63	4.72	3.661	4.88

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
8.35	4.92	0.51	9.84	0.79	5.33	12.91	5.24

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
1.97	2.2	0.98	11.81	8.27	1.87	0.98	10.83	R1.57

Motor

	KAD108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M80	28.03	30.2	6.22	4.98	2x1/2“	287
M90S	29.65	32.24	6.93	5.91	2x3/4“	294
M90L	29.65	32.24	6.93	5.91	2x3/4“	298
M100L	31.32	34.15	7.64	6.3	2x3/4“	311
M112M	33.23	36.42	8.58	6.59	2x3/4“	330
M132S	36.8	40.77	10.16	7.13	1“+3/4“	376
M132M	36.8	40.77	10.16	7.13	1“+3/4“	400
M160M	40.15	44.76	12.2	7.83	1“+3/4“	456
M160L	40.15	44.76	12.2	7.83	1“+3/4“	486
M180M	42.17	46.81	13.7	9.69	1 1/4“+3/4“	522
M180L	42.17	46.81	13.7	9.69	1 1/4“+3/4“	537

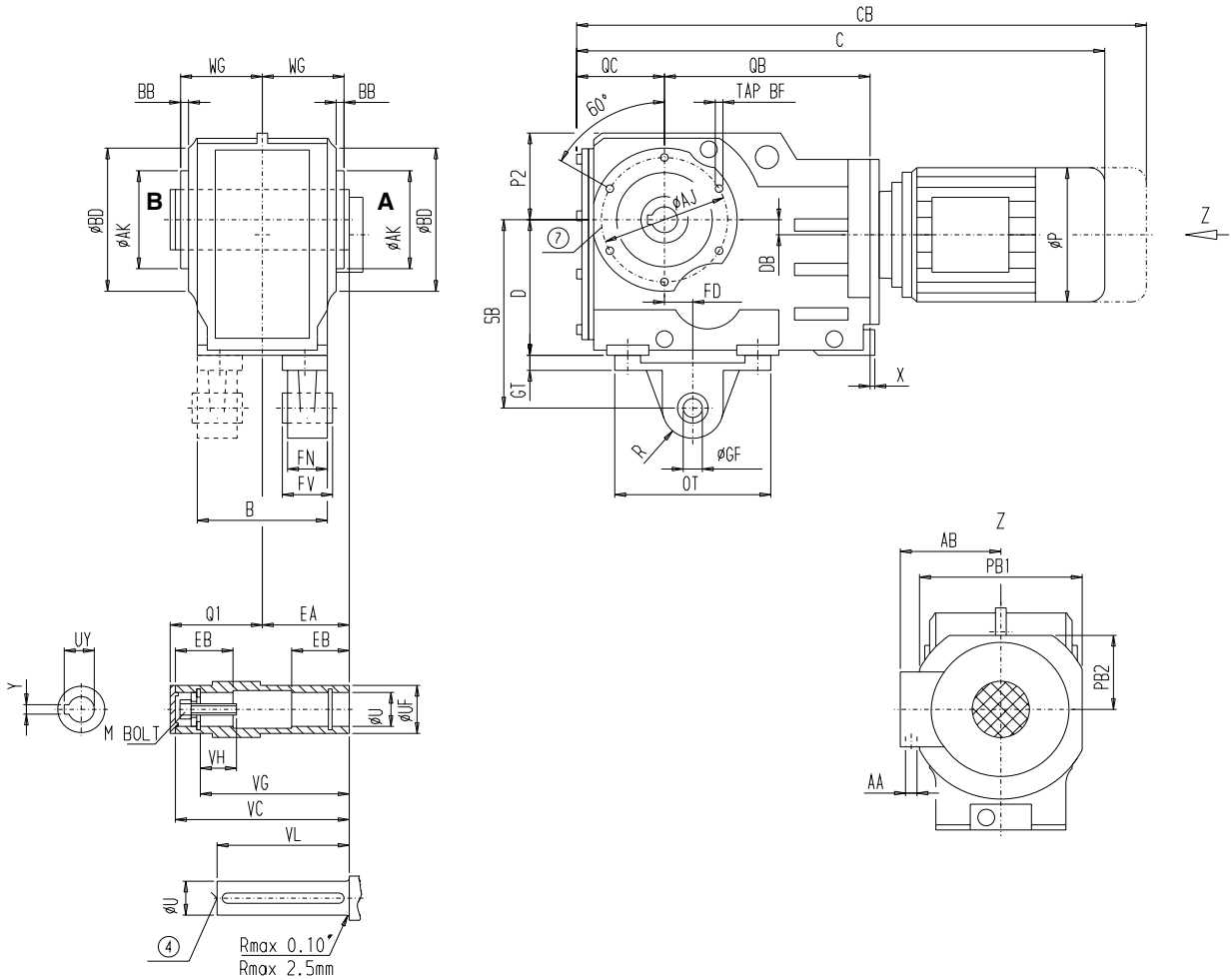
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD108

KAD 510

[*mm*]



Mounting

BD	AK	AJ	BB	WG	TAP BF
245	*180*	*215*	*4*	*115*	*M16x28*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
60,325	*95*	*240*	*208*	*60*	*185*	*3/4"-10UNC*	*67,56*	*16,002*	*120*	*93*	*124*

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
212	*125*	*13*	*250*	*20*	*135,5*	*328*	*133*

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
50	*56*	*25*	*300*	*210*	*47,5*	*25*	*275*	*R40*

Motor

	KAD108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M80	*713*	*768*	*158*	*126,5*	*2x1/2"*	*129*
M90S	*754*	*820*	*176*	*150*	*2x3/4"*	*131*
M90L	*754*	*820*	*176*	*150*	*2x3/4"*	*133*
M100L	*796,5*	*868,5*	*194*	*160*	*2x3/4"*	*141*
M112M	*845*	*926*	*218*	*167,5*	*2x3/4"*	*150*
M132S	*935,5*	*1035,5*	*258*	*181*	*1"+3/4"*	*160*
M132M	*935,5*	*1035,5*	*258*	*181*	*1"+3/4"*	*181*
M160M	*1021*	*1138*	*310*	*199*	*1"+3/4"*	*195*
M160L	*1021*	*1138*	*310*	*199*	*1"+3/4"*	*209*
M180M	*1072*	*1190*	*348*	*246*	*1 1/4"+3/4"*	*224*
M180L	*1072*	*1190*	*348*	*246*	*1 1/4"+3/4"*	*231*

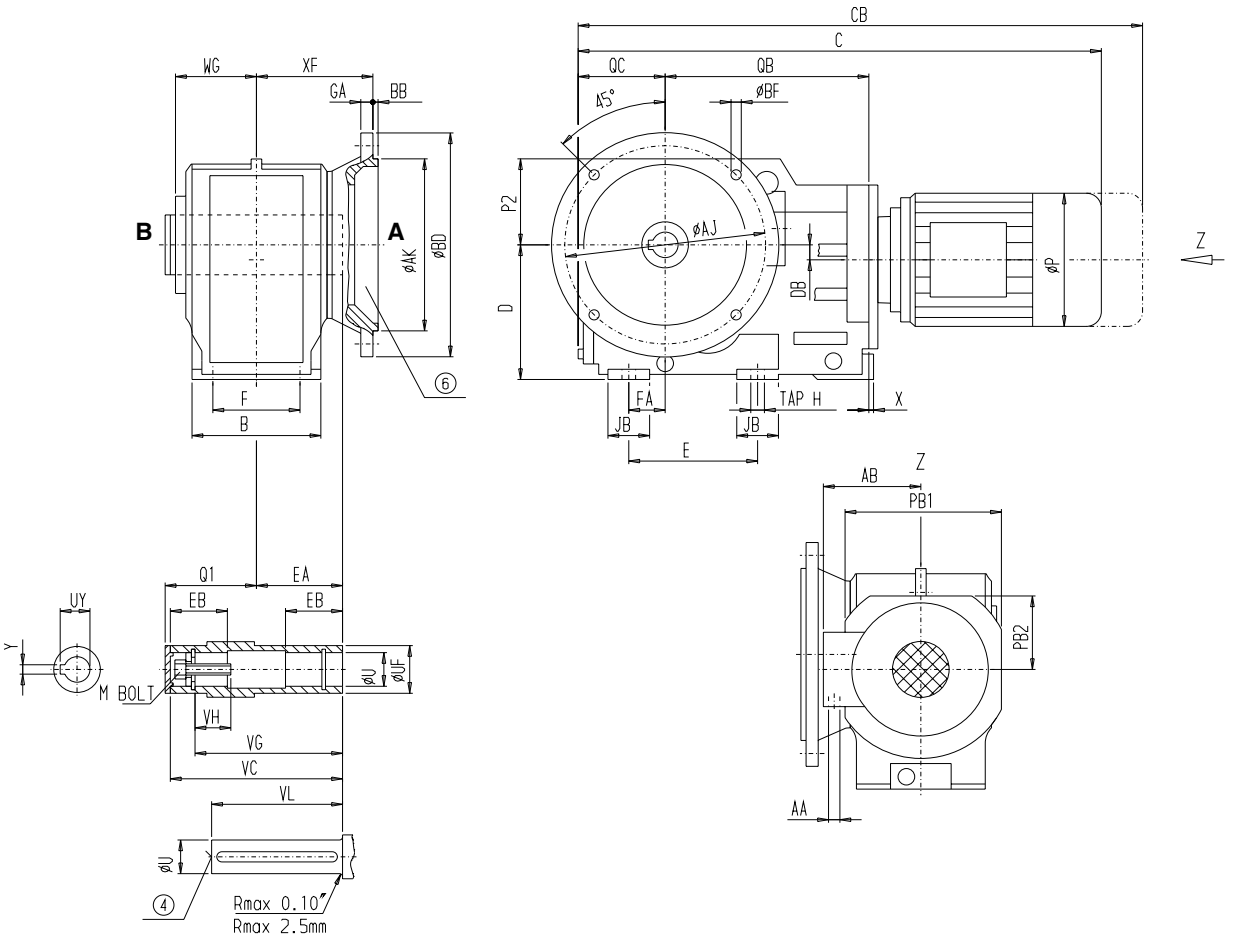
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70

Bevel Helical Gear Motors
Shaft mounted with flange

KAF108

KAF 510

[inch]



4

Flange

BD	AK	GA	AJ	BB	XF	BF
13.78	9.84	0.71	11.81	0.2	6.14	0.69

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2.375	3.74	9.45	8.189	2.37	7.28	3/4-10UNC	2.66	0.63	4.72	3.661	4.88

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
8.86	2.56	6.1	8.27	8.35	4.92	0.51	2.76	9.84	0.79	5.33	12.91	4.53	5.24	M16x28

Motor

	KAF108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M80	28.03	30.2	6.22	4.98	2x1/2“	297
M90S	29.65	32.24	6.93	5.91	2x3/4“	305
M90L	29.65	32.24	6.93	5.91	2x3/4“	310
M100L	31.32	34.15	7.64	6.3	2x3/4“	323
M112M	33.23	36.42	8.58	6.59	2x3/4“	342
M132S	36.8	40.77	10.16	7.13	1“+3/4“	388
M132M	36.8	40.77	10.16	7.13	1“+3/4“	412
M160M	40.15	44.76	12.2	7.83	1“+3/4“	468
M160L	40.15	44.76	12.2	7.83	1“+3/4“	498
M180M	42.17	46.81	13.7	9.69	1 1/4“+3/4“	534
M180L	42.17	46.81	13.7	9.69	1 1/4“+3/4“	549

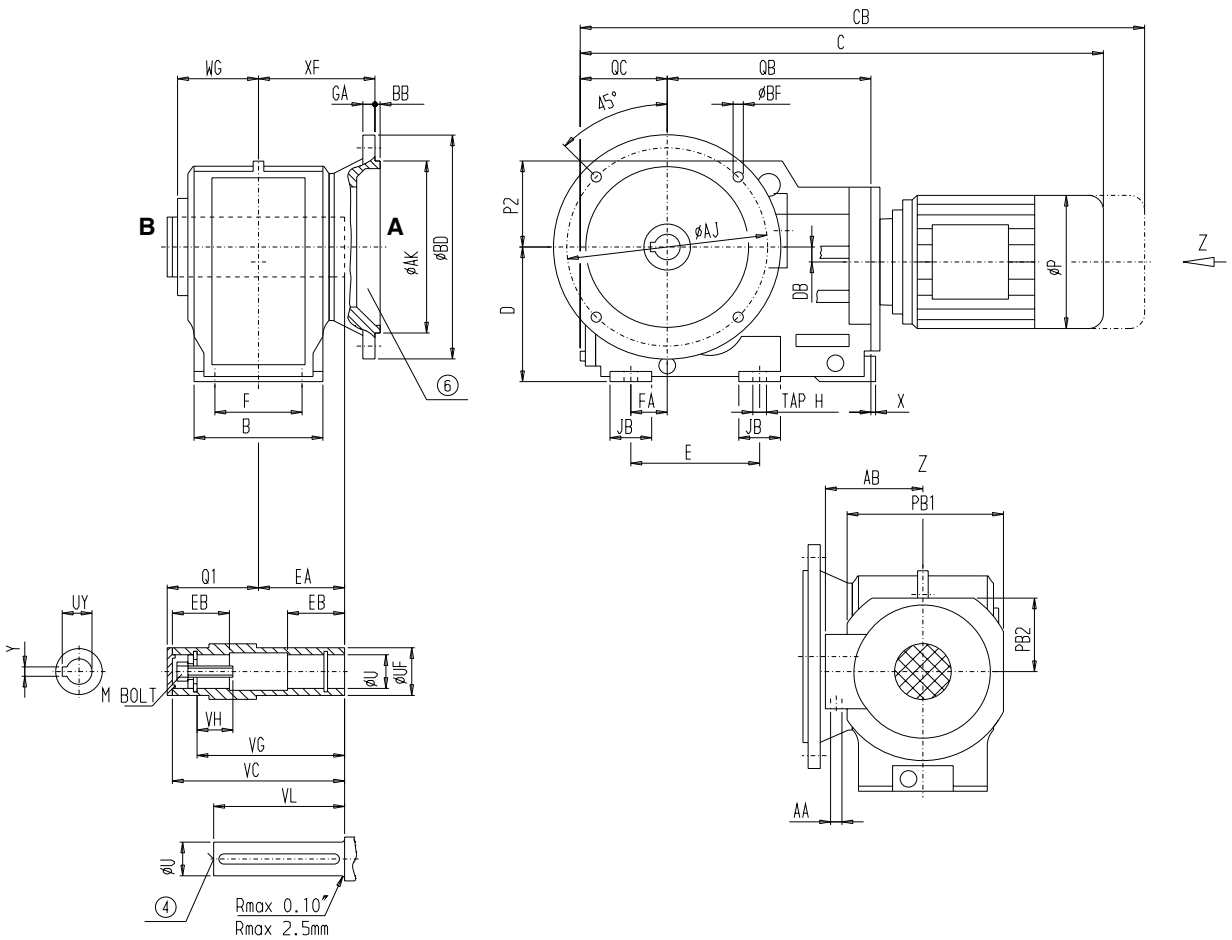
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted with flange

KAF108

KAF 510

[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	TAP BF
350	*250*	*18*	*300*	*5*	*156*	*17,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
60,325	*95*	*240*	*208*	*60*	*185*	*3/4"-10UNC*	*67,56*	*16,002*	*120*	*93*	*124*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
225	*65*	*155*	*210*	*212*	*125*	*13*	*70*	*250*	*20*	*135,5*	*328*	*115*	133	M16x28

Motor

	KAF108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M80	*713*	*768*	*158*	*126,5*	*2x1/2"*	*135*
M90S	*754*	*820*	*176*	*150*	*2x3/4"*	*137*
M90L	*754*	*820*	*176*	*150*	*2x3/4"*	*139*
M100L	*796,5*	*868,5*	*194*	*160*	*2x3/4"*	*146*
M112M	*845*	*926*	*218*	*167,5*	*2x3/4"*	*155*
M132S	*935,5*	*1035,5*	*258*	*181*	*1"+3/4"*	*165*
M132M	*935,5*	*1035,5*	*258*	*181*	*1"+3/4"*	*186*
M160M	*1021*	*1138*	*310*	*199*	*1"+3/4"*	*200*
M160L	*1021*	*1138*	*310*	*199*	*1"+3/4"*	*214*
M180M	*1072*	*1190*	*348*	*246*	*1 1/4"+3/4"*	*242*
M180L	*1072*	*1190*	*348*	*246*	*1 1/4"+3/4"*	*249*

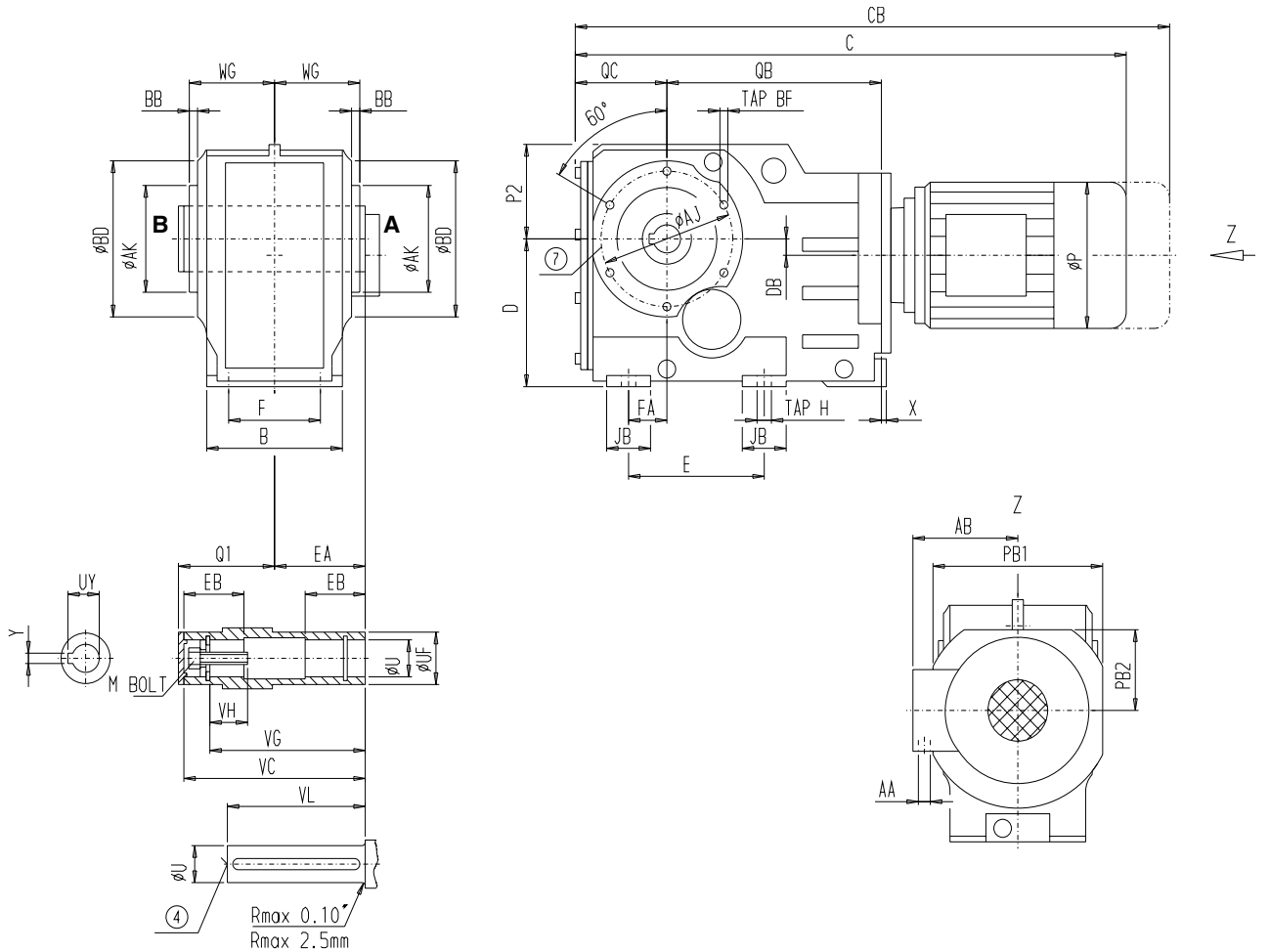
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ108

KAZ 510

[inch]



4

Mounting

BD	AK	AJ	BB	TAP BF
9.65	7.09	8.46	0.16	M16x28

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2.375	3.74	9.45	8.189	2.37	7.28	3/4-10UNC	2.66	0.63	4.72	3.661	4.88

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
8.86	2.56	6.1	8.27	8.35	4.92	0.51	2.76	9.84	0.79	5.33	12.91	4.53	5.24	M16x28

Motor

	KAZ108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M80	28.03	30.2	6.22	4.98	2x1/2“	274
M90S	29.65	32.24	6.93	5.91	2x3/4“	283
M90L	29.65	32.24	6.93	5.91	2x3/4“	287
M100L	31.32	34.15	7.64	6.3	2x3/4“	300
M112M	33.23	36.42	8.58	6.59	2x3/4“	320
M132S	36.8	40.77	10.16	7.13	1“+3/4“	366
M132M	36.8	40.77	10.16	7.13	1“+3/4“	390
M160M	40.15	44.76	12.2	7.83	1“+3/4“	445
M160L	40.15	44.76	12.2	7.83	1“+3/4“	476
M180M	42.17	46.81	13.7	9.69	1 1/4“+3/4“	511
M180L	42.17	46.81	13.7	9.69	1 1/4“+3/4“	527

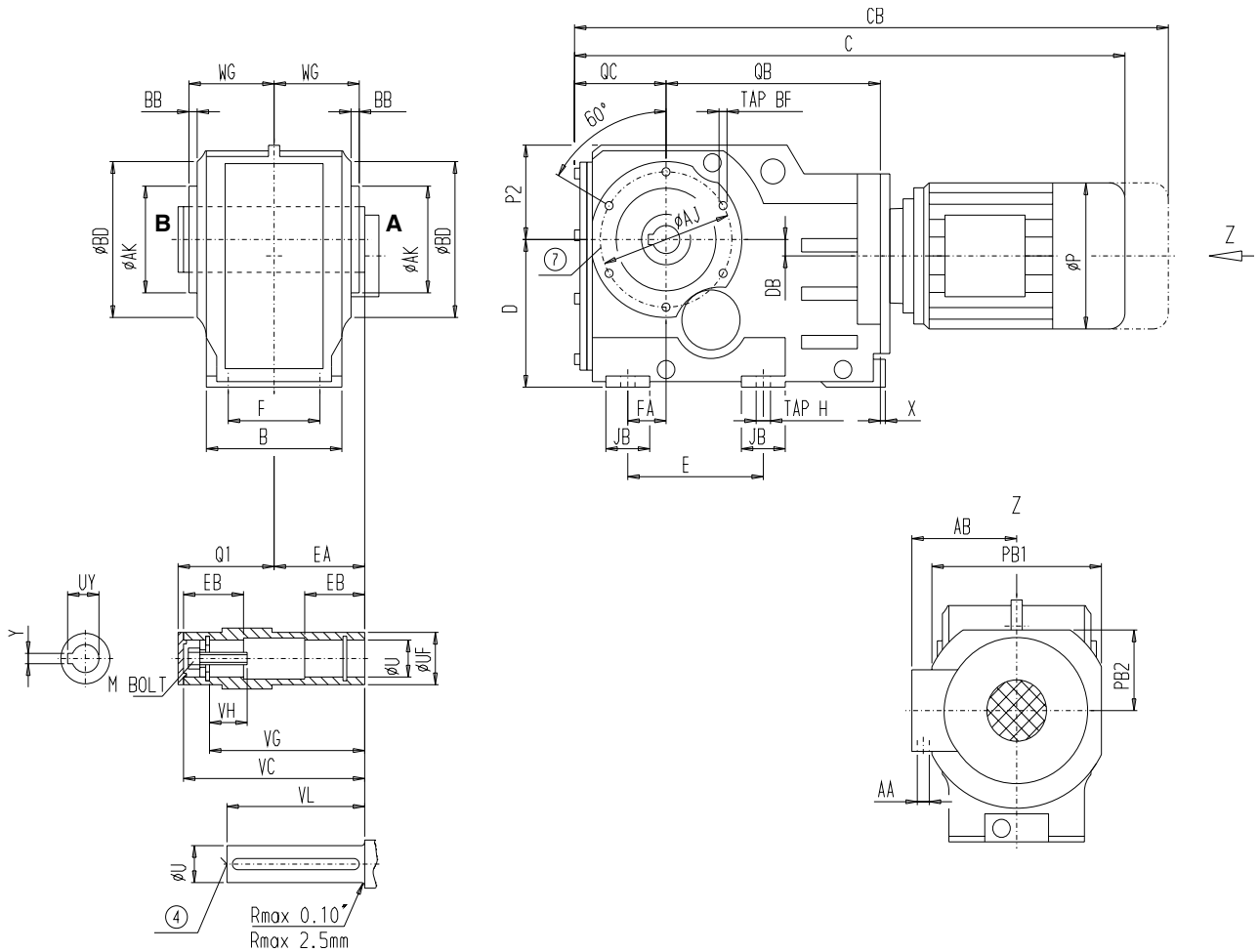
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ108

KAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
245	*180*	*215*	*4*	*M16x28*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
60,325	*95*	*240*	*208*	*60*	*185*	*3/4"-10UNC*	*67,56*	*16,002*	*120*	*93*	*124*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
225	*65*	*155*	*210*	*212*	*125*	*13*	*70*	*250*	*20*	*135,5*	*328*	*115*	*133*	*M16x28*

Motor

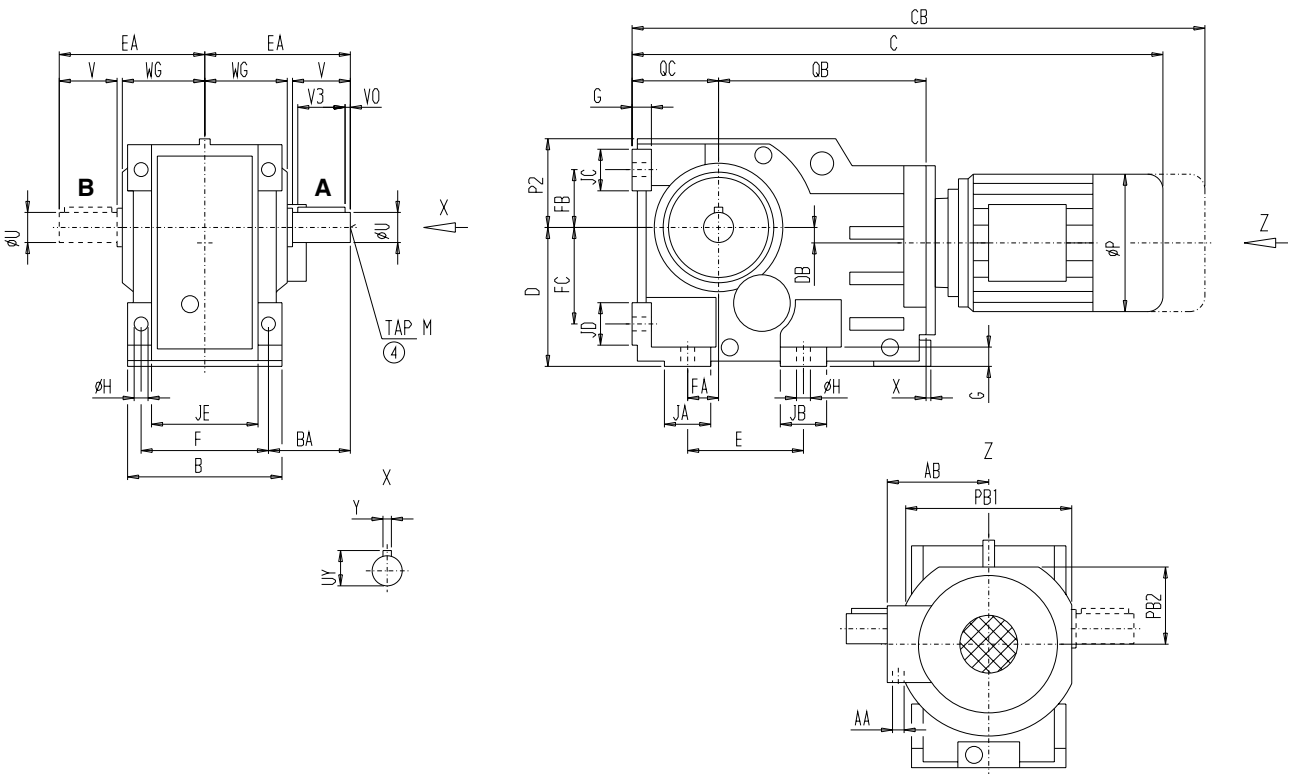
	KAZ108					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M80	*713*	*768*	*158*	*126,5*	*2x1/2"*	*124*
M90S	*754*	*820*	*176*	*150*	*2x3/4"*	*126*
M90L	*754*	*820*	*176*	*150*	*2x3/4"*	*128*
M100L	*796,5*	*868,5*	*194*	*160*	*2x3/4"*	*136*
M112M	*845*	*926*	*218*	*167,5*	*2x3/4"*	*145*
M132S	*935,5*	*1035,5*	*258*	*181*	*1"+3/4"*	*155*
M132M	*935,5*	*1035,5*	*258*	*181*	*1"+3/4"*	*176*
M160M	*1021*	*1138*	*310*	*199*	*1"+3/4"*	*190*
M160L	*1021*	*1138*	*310*	*199*	*1"+3/4"*	*204*
M180M	*1072*	*1190*	*348*	*246*	*1 1/4"+3/4"*	*232*
M180L	*1072*	*1190*	*348*	*246*	*1 1/4"+3/4"*	*239*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70

Bevel Helical Gear Motors
Foot mounted

K128

K 510
[inch]



4

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
2.875	5.51	4.875	0.046	3.2	0.75	6.695	3/4-10UNC

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
9.45	2.95	9.45	1.38	7.48	11.42	10.43	7.48	4.13	5.91	0.79	3.15	3.15	3.54	3.15	11.81	0.67	6.3	14.61	5.71	6.22	11.42	1.02

Motor

	K128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M90S	31.85	34.44	6.93	5.91	5.91	2x3/4“	464
M90L	31.85	34.44	6.93	5.91	5.91	2x3/4“	468
M100L	33.51	36.34	7.64	6.3	6.3	2x3/4“	481
M112M	35.43	38.62	8.58	6.59	6.59	2x3/4“	499
M132S	38.96	42.93	10.16	7.13	7.13	1“+3/4“	543
M132M	38.96	42.93	10.16	7.13	7.13	1“+3/4“	568
M160M	42.36	46.97	12.2	7.83	7.83	1“+3/4“	622
M160L	42.36	46.97	12.2	7.83	7.83	1“+3/4“	653
M180M	44.33	48.98	13.7	9.69	9.69	1 1/4“+3/4“	698
M180L	44.33	48.98	13.7	9.69	9.69	1 1/4“+3/4“	714
M200L	45.32	50.44	15.16	10.24	10.24	1 1/4“+3/4“	822
LG225S incl. adapter	56.13	on request	17.4	12.8	on request	2x1 1/2“	1243
LG225ZM incl. adapter	57.31	on request	17.4	12.8	on request	2x1 1/2“	1330

Tolerances see page 1 - 4

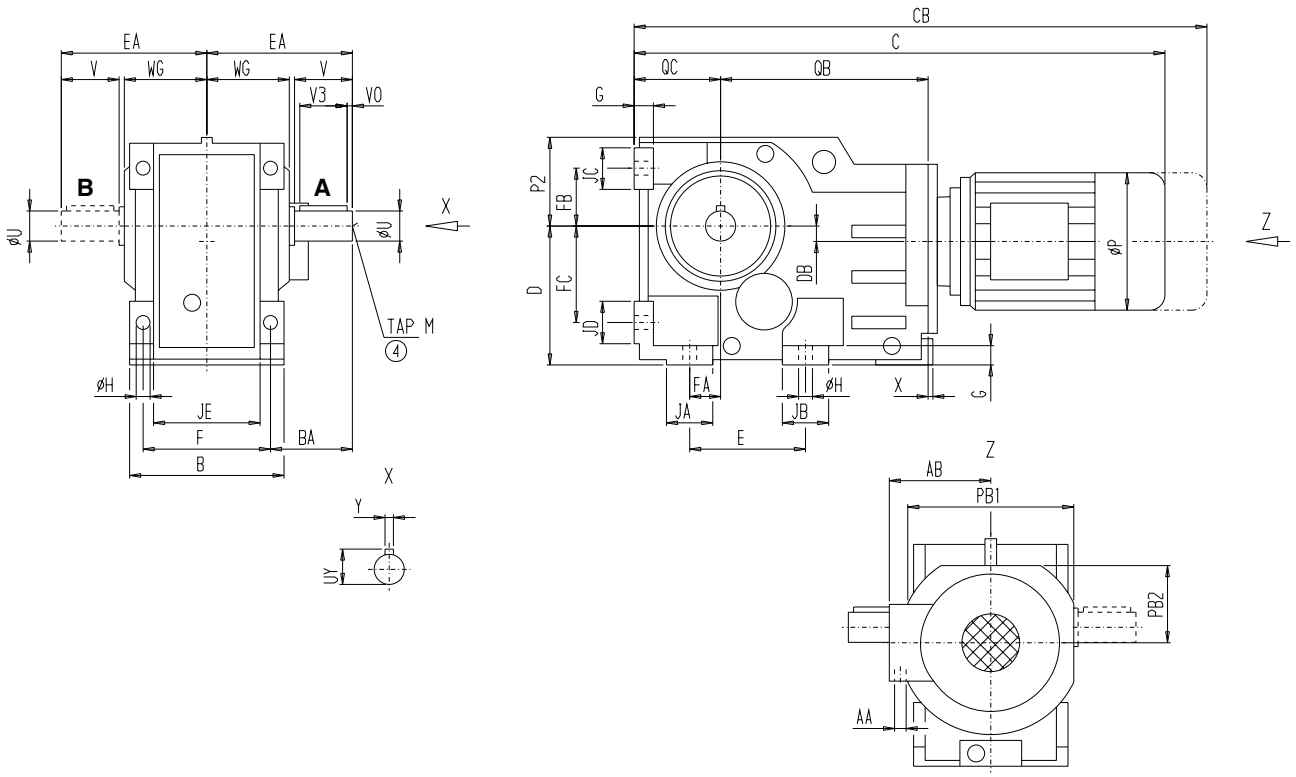
④ Tap specification see page 1 - 7

** for voltage ratio 1:2

Bevel Helical Gear Motors
Foot mounted

K128

K 510
[*mm*]



Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
73,025	*140*	*123,825*	*1,168*	*81,28*	*19,05*	*170*	*3/4"-10UNC*

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
240	*75*	*240*	*35*	*190*	*290*	*265*	*190*	*105*	*150*	*20*	*80*	*80*	*90*	*80*	*300*	*17*	*160*	*371*	*145*	*158*	*290*	*26*

Motor

	K128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M90S	*810*	*876*	*176*	*150*	*150*	*2x3/4"*	*208*
M90L	*810*	*876*	*176*	*150*	*150*	*2x3/4"*	*210*
M100L	*852*	*924*	*194*	*160*	*160*	*2x3/4"*	*218*
M112M	*901*	*982*	*218*	*167,5*	*167,5*	*2x3/4"*	*226*
M132S	*990,5*	*1090,5*	*258*	*181*	*181*	*1"+3/4"*	*235*
M132M	*990,5*	*1090,5*	*258*	*181*	*181*	*1"+3/4"*	*256*
M160M	*1077*	*1194*	*310*	*199*	*199*	*1"+3/4"*	*270*
M160L	*1077*	*1194*	*310*	*199*	*199*	*1"+3/4"*	*284*
M180M	*1127*	*1245*	*348*	*246*	*246*	*1 1/4"+3/4"*	*317*
M180L	*1127*	*1245*	*348*	*246*	*246*	*1 1/4"+3/4"*	*324*
M200L	*1152*	*1282*	*385*	*260*	*260*	*1 1/4"+3/4"*	*373*
LG225S incl. adapter	*1426*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*564*
LG225ZM incl. adapter	*1456*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*604*

Tolerances see page 1 - 4

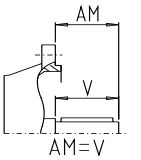
④ Tap specification see page 1 - 7

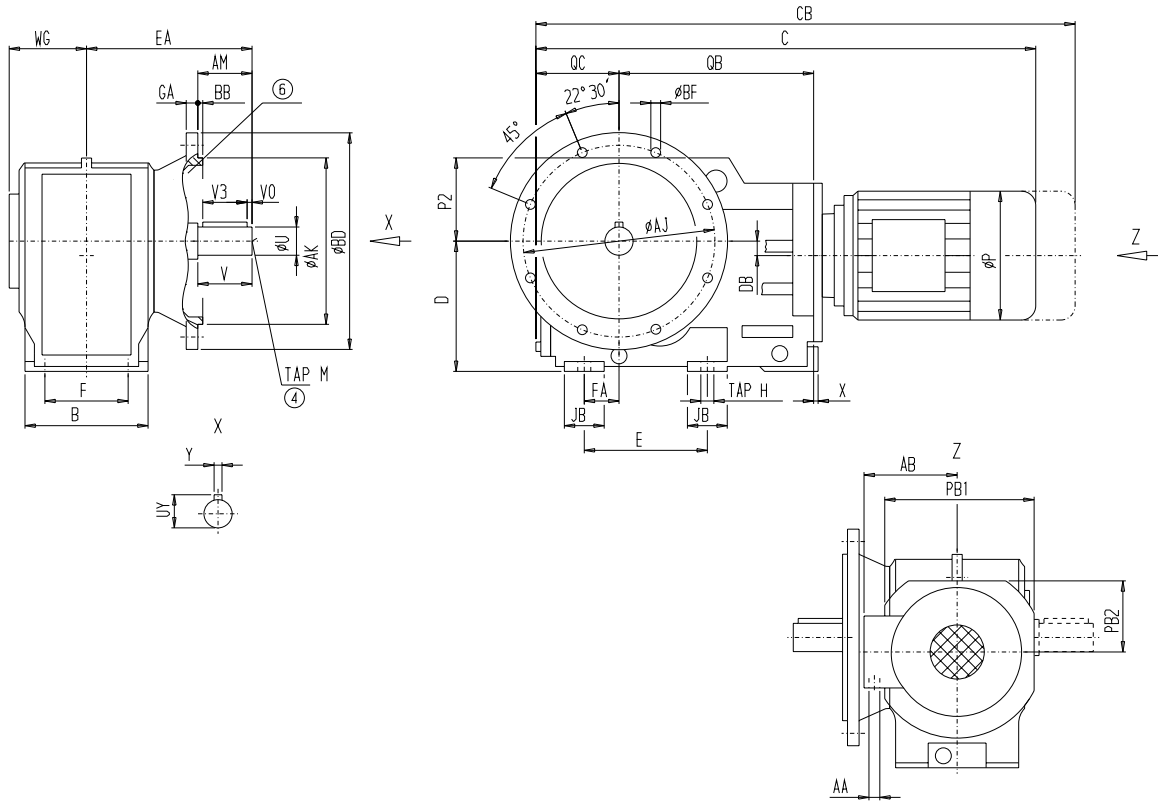
** for voltage ratio 1:2

Bevel Helical Gear Motors
Flange mounted

KF128

KF 510
[inch]





Flange

BD	AK	GA	AJ	BB	BF
17.72	13.78	0.87	15.75	0.2	0.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2.875	5.51	4.875	0.046	3.2	0.75	5.51	3/4-10UNC

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
9.76	3.27	7.68	10.04	10.43	5.91	0.79	3.15	11.81	0.67	6.16	14.61	5.71	6.22	13.05	M20x34

Motor

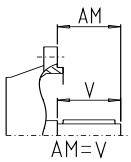
	KF128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M90S	31.72	34.31	6.93	5.91	5.91	2x3/4“	519
M90L	31.72	34.31	6.93	5.91	5.91	2x3/4“	524
M100L	33.37	36.2	7.64	6.3	6.3	2x3/4“	537
M112M	35.3	38.49	8.58	6.59	6.59	2x3/4“	555
M132S	38.82	42.79	10.16	7.13	7.13	1“+3/4“	599
M132M	38.82	42.79	10.16	7.13	7.13	1“+3/4“	623
M160M	42.22	46.83	12.2	7.83	7.83	1“+3/4“	678
M160L	42.22	46.83	12.2	7.83	37.83	1“+3/4“	709
M180M	44.19	48.84	13.7	9.69	9.69	1 1/4“+3/4“	754
M180L	44.19	48.84	13.7	9.69	9.69	1 1/4“+3/4“	770
M200L	45.18	50.3	15.16	10.24	10.24	1 1/4“+3/4“	878
LG225S incl. adapter	55.99	on request	17.4	12.8	on request	2x1 1/2“	1298
LG225ZM incl. adapter	57.17	on request	17.4	12.8	on request	2x1 1/2“	1384

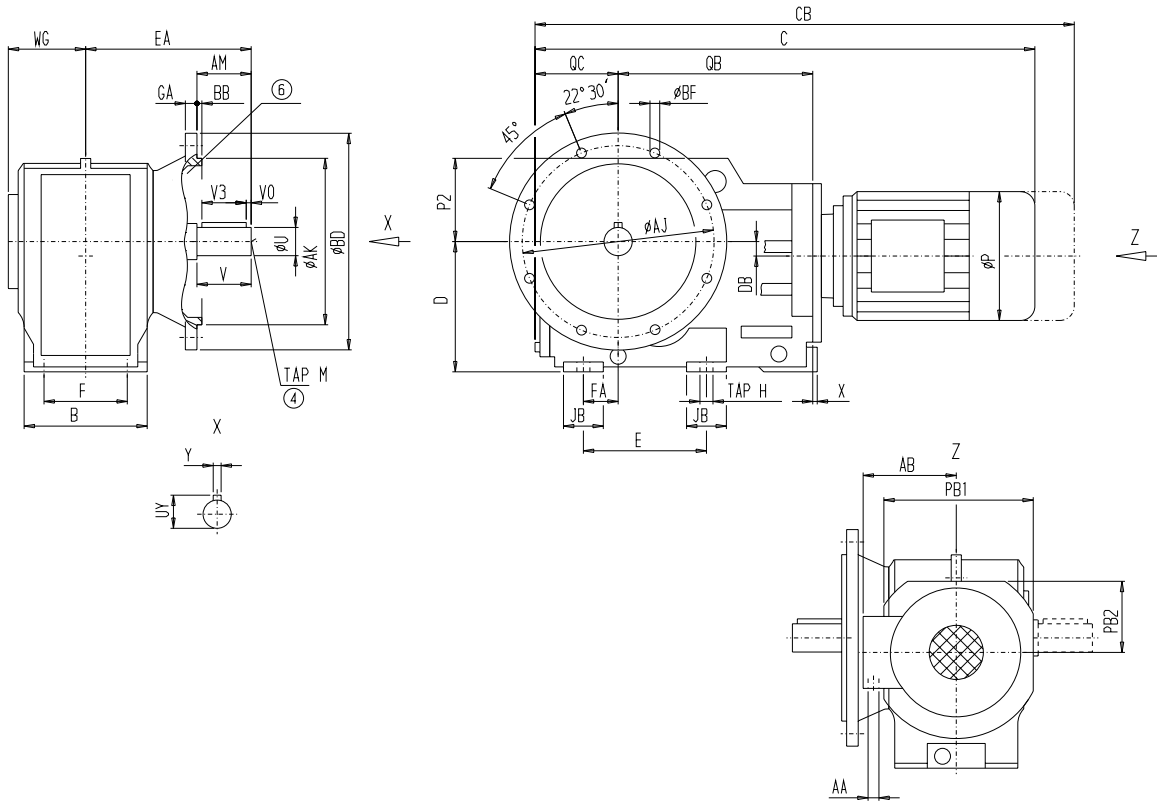
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Flange mounted

KF128

KF 510
[*mm*]





Flange

BD	AK	GA	AJ	BB	BF
450	*350*	*22*	*400*	*5*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
73,025	*140*	*123,825*	*1,168*	*81,28*	*19,05*	*140*	*3/4"-10UNC*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
248	*83*	*195*	*255*	*265*	*150*	*20*	*80*	*300*	*17*	*156,5*	*371*	*145*	*158*	*331,5*	*M20x34*

Motor

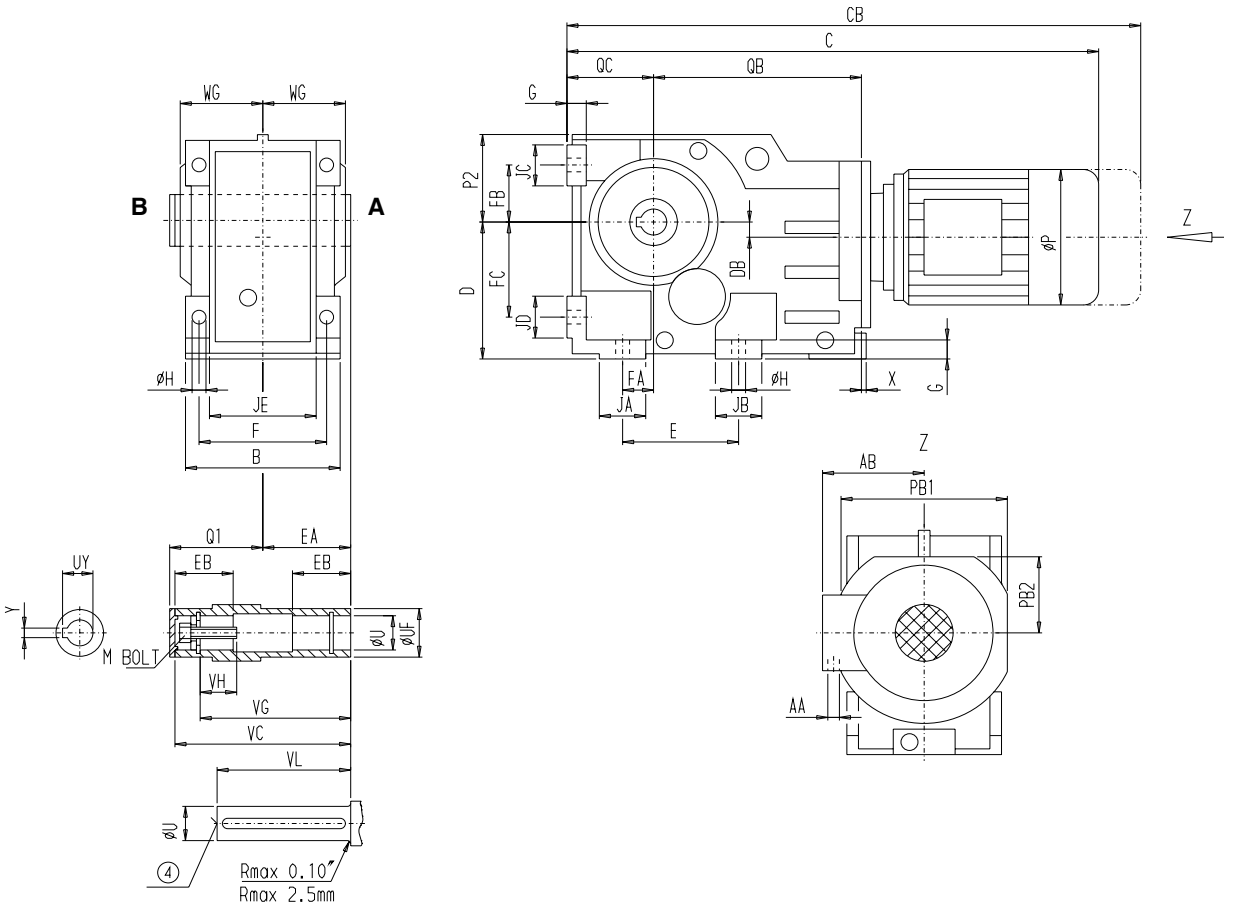
	KF128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M90S	*806,5*	*872,5*	*176*	*150*	*150*	*2x3/4"*	*234*
M90L	*806,5*	*872,5*	*176*	*150*	*150*	*2x3/4"*	*236*
M100L	*848,5*	*920,5*	*194*	*160*	*160*	*2x3/4"*	*243*
M112M	*897,5*	*978,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*252*
M132S	*987*	*1087*	*258*	*181*	*181*	*1"+3/4"*	*261*
M132M	*987*	*1087*	*258*	*181*	*181*	*1"+3/4"*	*282*
M160M	*1073,5*	*1190,5*	*310*	*199*	*199*	*1"+3/4"*	*296*
M160L	*1073,5*	*1190,5*	*310*	*199*	*199*	*1"+3/4"*	*310*
M180M	*1123,5*	*1241,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*343*
M180L	*1123,5*	*1241,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*350*
M200L	*1148,5*	*1278,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*399*
LG225S incl. adapter	*1422*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*589*
LG225ZM incl. adapter	*1452*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*629*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted

KA128

KA 510
[inch]



4

Mounting

E	F	FA	G	H
9.45	9.45	2.95	1.38	1.02

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2.75	4.331	11.81	10.354	2.35	9.45	3/4-10UNC	3.04	0.63	5.91	4.843	6.06

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
7.48	11.42	10.43	7.48	4.13	5.91	0.79	3.15	3.15	3.54	3.15	11.81	0.67	6.3	14.61	5.71	6.22

Motor

	KA128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M90S	31.85	34.44	6.93	5.91	5.91	2x3/4“	420
M90L	31.85	34.44	6.93	5.91	5.91	2x3/4“	425
M100L	33.51	36.34	7.64	6.3	6.3	2x3/4“	438
M112M	35.43	38.62	8.58	6.59	6.59	2x3/4“	456
M132S	38.96	42.93	10.16	7.13	7.13	1“+3/4“	500
M132M	38.96	42.93	10.16	7.13	7.13	1“+3/4“	524
M160M	42.36	46.97	12.2	7.83	7.83	1“+3/4“	579
M160L	42.36	46.97	12.2	7.83	7.83	1“+3/4“	610
M180M	44.33	48.98	13.7	9.69	9.69	1 1/4“+3/4“	655
M180L	44.33	48.98	13.7	9.69	9.69	1 1/4“+3/4“	670
M200L	45.32	50.44	15.16	10.24	10.24	1 1/4“+3/4“	779
LG225S incl. adapter	56.13	on request	17.4	12.8	on request	2x1 1/2“	1199
LG225ZM incl. adapter	57.31	on request	17.4	12.8	on request	2x1 1/2“	1287

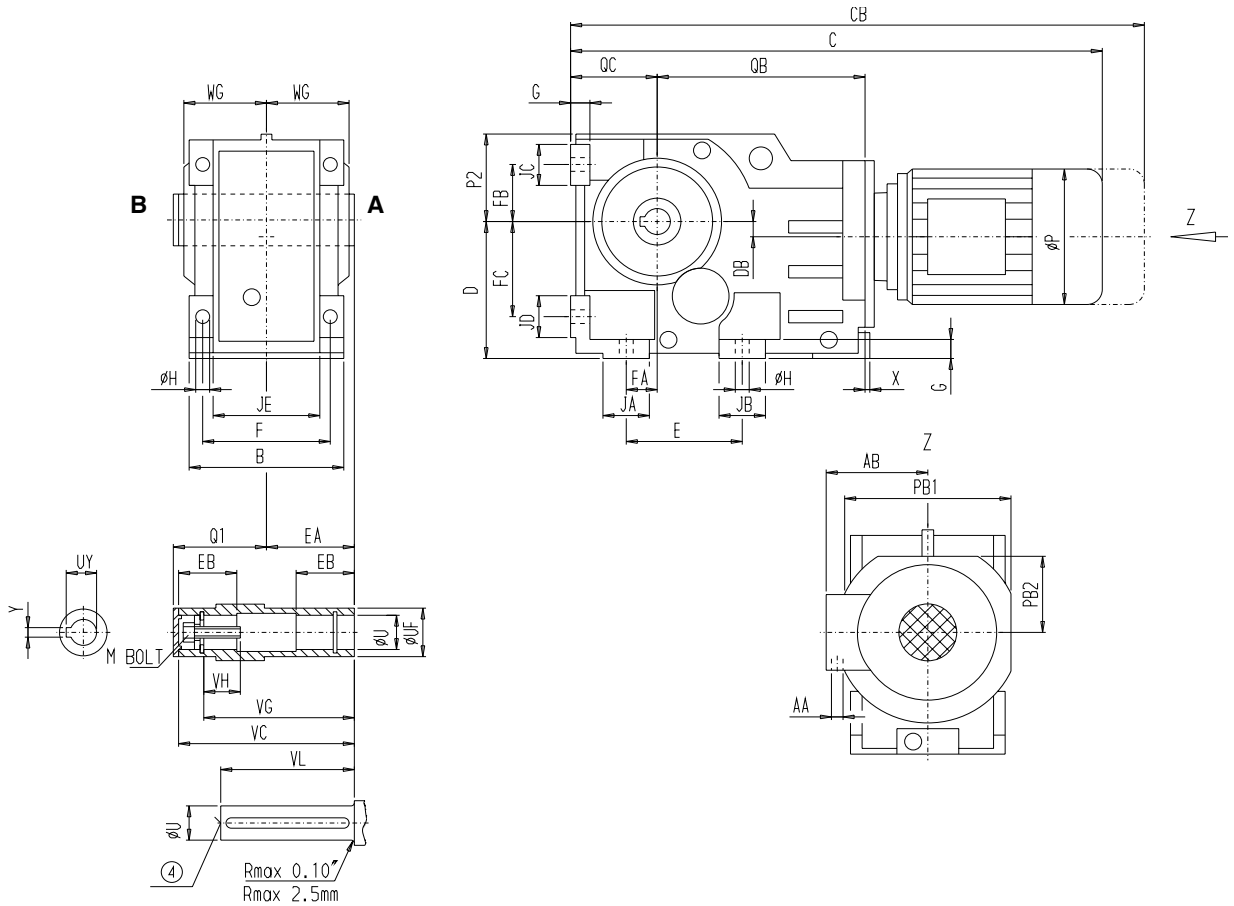
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted

KA128

KA 510

[*mm*]



Mounting

E	F	FA	G	H
240	*240*	*75*	*35*	*26*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
69,85	*110*	*300*	*263*	*60*	*240*	*3/4"-10UNC*	*77,22*	*16,002*	*150*	*123*	*154*

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
190	*290*	*265*	*190*	*105*	*150*	*20*	*80*	*80*	*90*	*80*	*300*	*17*	*160*	*371*	*145*	*158*

Motor

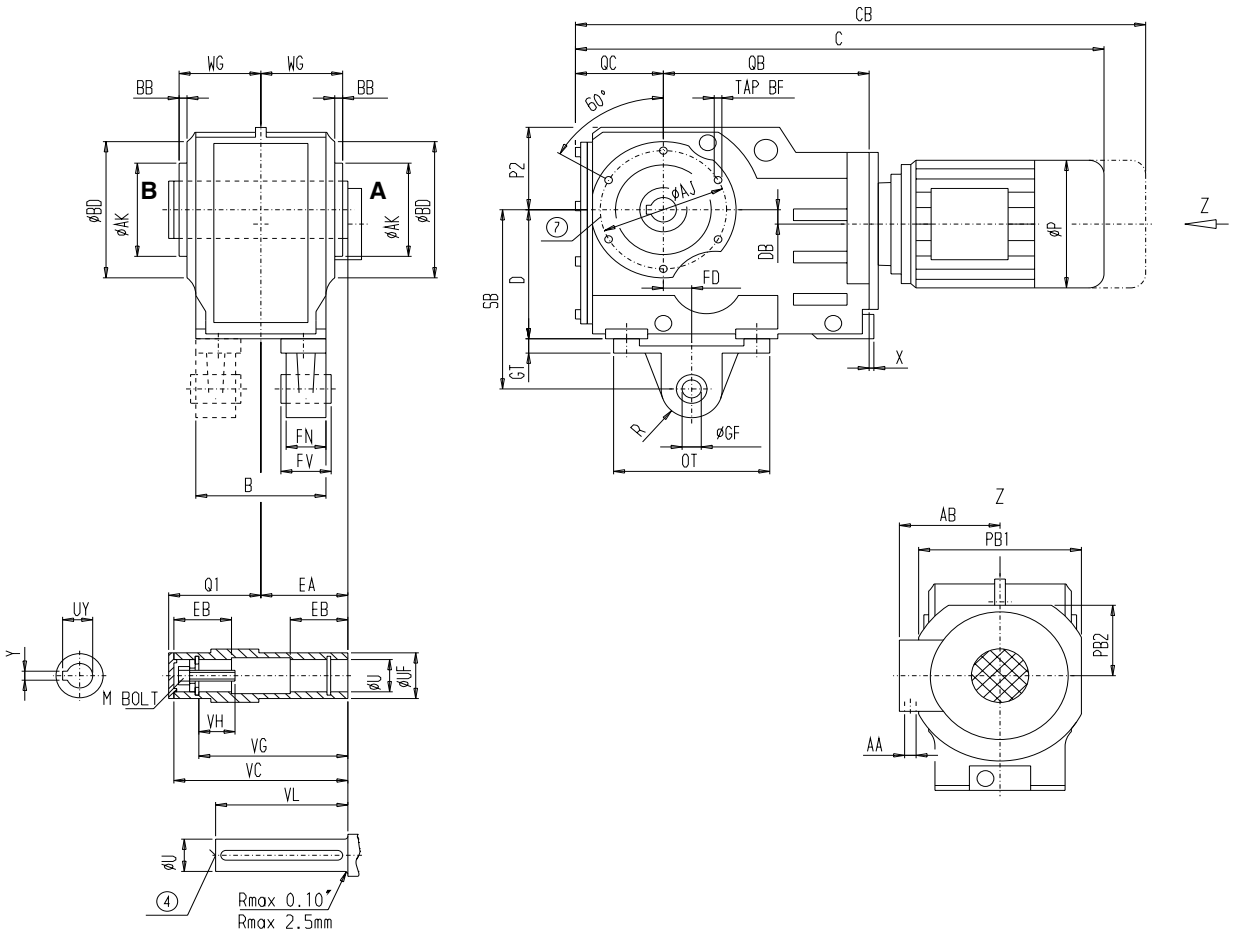
	KA128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M90S	*810*	*876*	*176*	*150*	*150*	*2x3/4"*	*189*
M90L	*810*	*876*	*176*	*150*	*150*	*2x3/4"*	*191*
M100L	*852*	*924*	*194*	*160*	*160*	*2x3/4"*	*198*
M112M	*901*	*982*	*218*	*167,5*	*167,5*	*2x3/4"*	*207*
M132S	*990,5*	*1090,5*	*258*	*181*	*181*	*1"+3/4"*	*216*
M132M	*990,5*	*1090,5*	*258*	*181*	*181*	*1"+3/4"*	*237*
M160M	*1077*	*1194*	*310*	*199*	*199*	*1"+3/4"*	*251*
M160L	*1077*	*1194*	*310*	*199*	*199*	*1"+3/4"*	*265*
M180M	*1127*	*1245*	*348*	*246*	*246*	*1 1/4"+3/4"*	*336*
M180L	*1127*	*1245*	*348*	*246*	*246*	*1 1/4"+3/4"*	*343*
M200L	*1152*	*1282*	*385*	*260*	*260*	*1 1/4"+3/4"*	*392*
LG225S incl. adapter	*1426*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*544*
LG225ZM incl. adapter	*1456*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*584*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD128

KAD 510
[inch]



4

Mounting

BD	AK	AJ	BB	WG	TAP BF
11.61	9.06	10.43	0.16	5.71	M16x28

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2.75	4.331	11.81	10.354	2.35	9.45	3/4-10UNC	3.04	0.63	5.91	4.843	6.06

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
10.43	5.91	0.79	11.81	0.67	6.16	14.61	6.22

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
1.97	2.2	0.98	13.78	10.04	1.61	1.18	12.91	R1.57

Motor

	KAD128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M90S	31.72	34.31	6.93	5.91	5.91	2x3/4“	452
M90L	31.72	34.31	6.93	5.91	5.91	2x3/4“	456
M100L	33.37	36.2	7.64	6.3	6.3	2x3/4“	469
M112M	35.3	38.49	8.58	6.59	6.59	2x3/4“	487
M132S	38.82	42.79	10.16	7.13	7.13	1“+3/4“	531
M132M	38.82	42.79	10.16	7.13	7.13	1“+3/4“	556
M160M	42.22	46.83	12.2	7.83	7.83	1“+3/4“	610
M160L	42.22	46.83	12.2	7.83	7.83	1“+3/4“	641
M180M	44.19	48.84	13.7	9.69	9.69	1 1/4“+3/4“	687
M180L	44.19	48.84	13.7	9.69	9.69	1 1/4“+3/4“	702
M200L	45.18	50.3	15.16	10.24	10.24	1 1/4“+3/4“	810
LG225S incl. adapter	55.99	on request	17.4	12.8	on request	2x1 1/2“	1230
LG225ZM incl. adapter	57.17	on request	17.4	12.8	on request	2x1 1/2“	1318

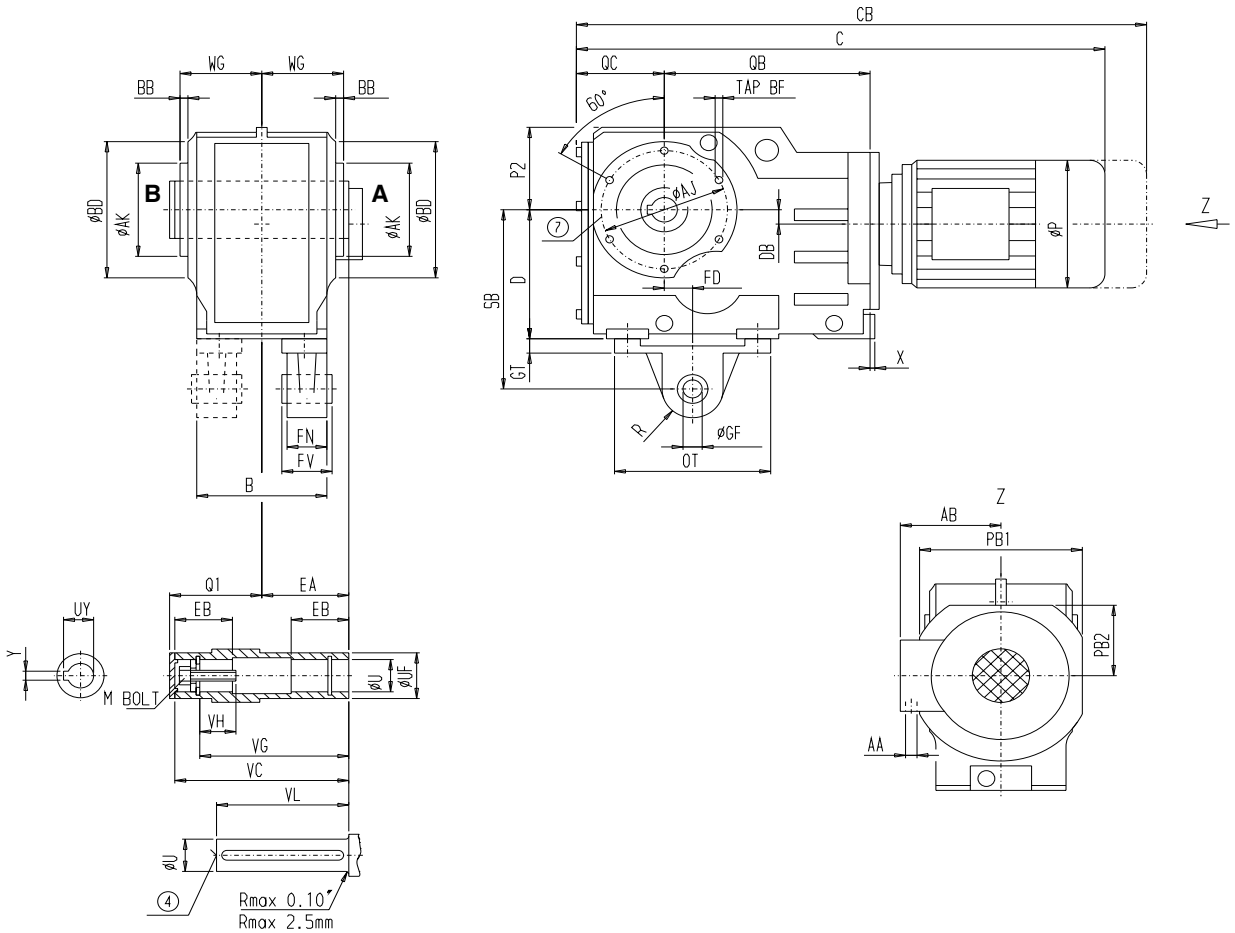
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD128

KAD 510

[*mm*]



Mounting

BD	AK	AJ	BB	WG	TAP BF
295	*230*	*265*	*4*	*145*	*M16x28*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
69,85	*110*	*300*	*263*	*60*	*240*	*3/4"-10UNC*	*77,22*	*16,002*	*150*	*123*	*154*

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
265	*150*	*20*	*300*	*17*	*156,5*	*371*	*158*

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
50	56	25	350	255	41	30	328	R40

Motor

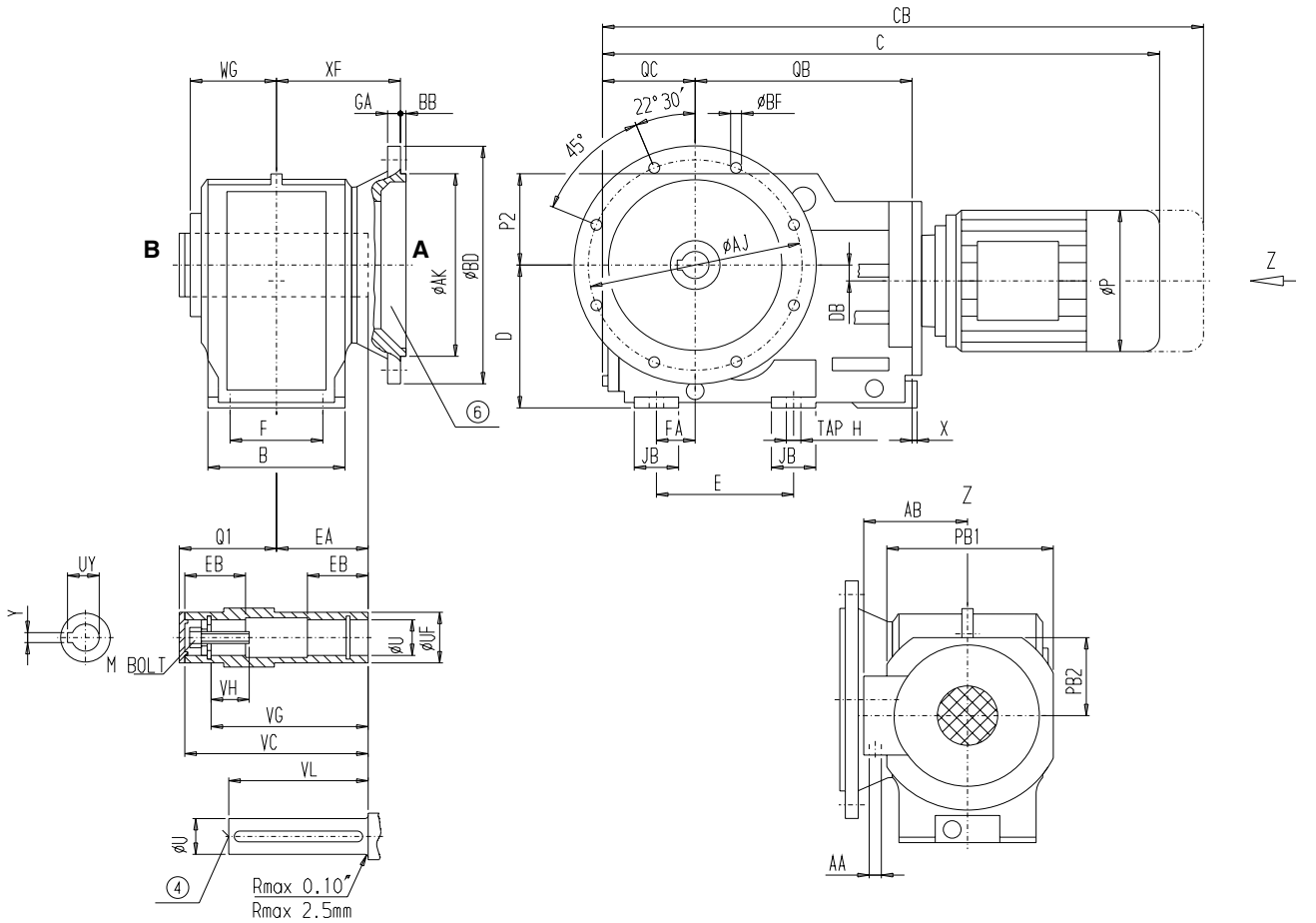
	KAD128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M90S	*806,5*	*872,5*	*176*	*150*	*150*	*2x3/4"*	*203*
M90L	*806,5*	*872,5*	*176*	*150*	*150*	*2x3/4"*	*205*
M100L	*848,5*	*920,5*	*194*	*160*	*160*	*2x3/4"*	*213*
M112M	*897,5*	*978,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*221*
M132S	*987*	*1087*	*258*	*181*	*181*	*1"+3/4"*	*230*
M132M	*987*	*1087*	*258*	*181*	*181*	*1"+3/4"*	*251*
M160M	*1073,5*	*1190,5*	*310*	*199*	*199*	*1"+3/4"*	*265*
M160L	*1073,5*	*1190,5*	*310*	*199*	*199*	*1"+3/4"*	*279*
M180M	*1123,5*	*1241,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*312*
M180L	*1123,5*	*1241,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*319*
M200L	*1148,5*	*1278,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*368*
LG225S incl. adapter	*1422*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*558*
LG225ZM incl. adapter	*1452*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*598*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with flange

KAF128

KAF 510
[inch]



Flange

BD	AK	GA	AJ	BB	XF	BF
17.72	13.78	0.87	15.75	0.2	7.54	0.69

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2.75	4.331	11.81	10.354	2.35	9.45	3/4-10UNC	3.04	0.63	5.91	4.843	6.06

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
9.76	3.27	7.68	10.04	10.43	5.91	0.79	3.15	11.81	0.67	6.16	14.61	5.71	6.22	M20x34

Motor

	KAF128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M90S	31.72	34.31	6.93	5.91	5.91	2x3/4“	476
M90L	31.72	34.31	6.93	5.91	5.91	2x3/4“	480
M100L	33.37	36.2	7.64	6.3	6.3	2x3/4“	493
M112M	35.3	38.49	8.58	6.59	6.59	2x3/4“	512
M132S	38.82	42.79	10.16	7.13	7.13	1“+3/4“	556
M132M	38.82	42.79	10.16	7.13	7.13	1“+3/4“	580
M160M	42.22	46.83	12.2	7.83	7.83	1“+3/4“	635
M160L	42.22	46.83	12.2	7.83	7.83	1“+3/4“	666
M180M	44.19	48.84	13.7	9.69	9.69	1 1/4“+3/4“	711
M180L	44.19	48.84	13.7	9.69	9.69	1 1/4“+3/4“	726
M200L	45.18	50.3	15.16	10.24	10.24	1 1/4“+3/4“	834
LG225S incl. adapter	55.99	on request	17.4	12.8	on request	2x1 1/2“	1254
LG225ZM incl. adapter	57.17	on request	17.4	12.8	on request	2x1 1/2“	1352

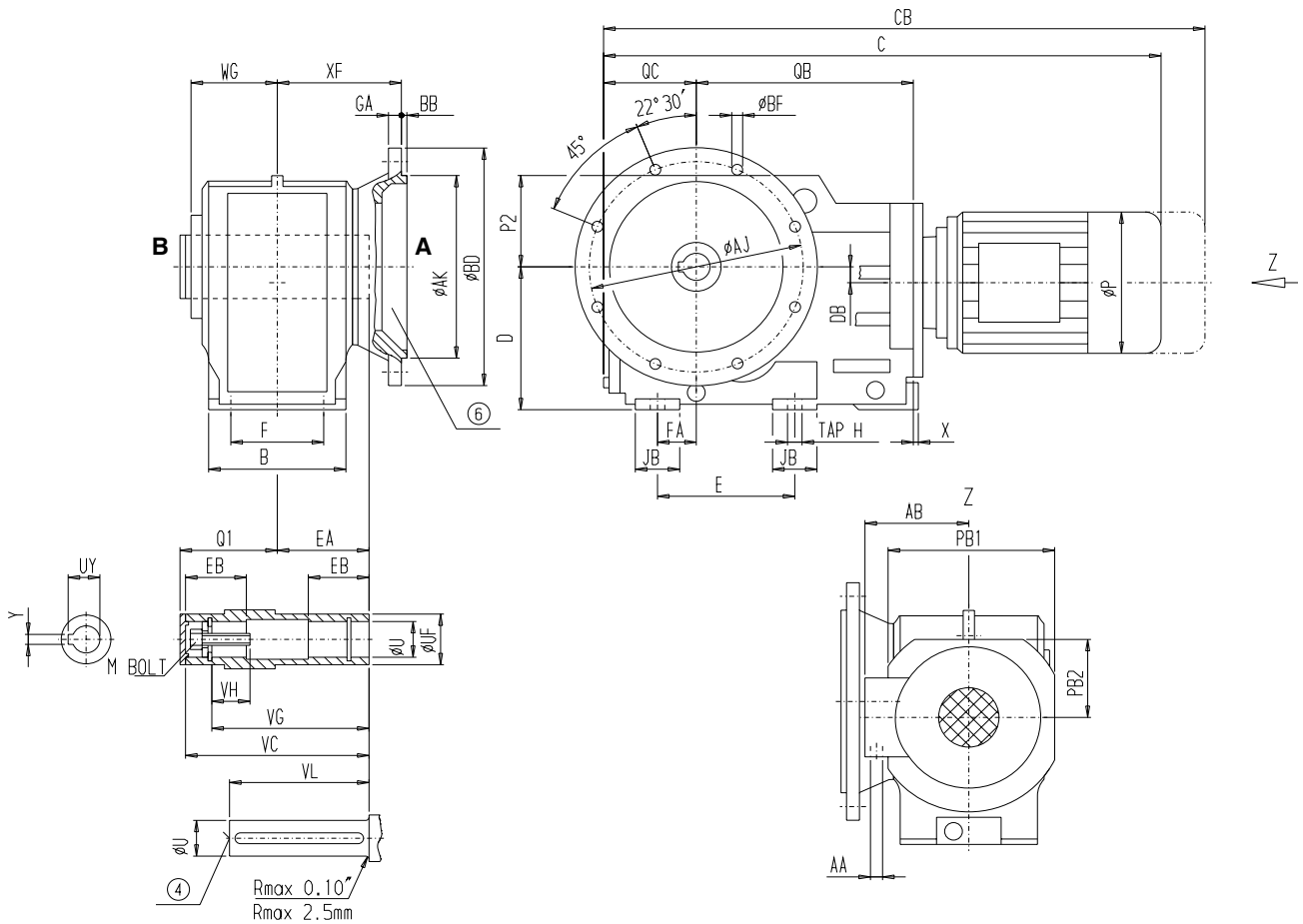
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with flange

KAF128

KAF 510

[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	BF
450	*350*	*22*	*400*	*5*	*191,5*	*17,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
69,85	*110*	*300*	*263*	*60*	*240*	*3/4"-10UNC*	*77,22*	*16,002*	*150*	*123*	*154*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
248	*83*	*195*	*255*	*265*	*150*	*20*	*80*	*300*	*17*	*156,5*	*371*	*145*	*158*	*M20x34*

Motor

	KAF128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M90S	*806,5*	*872,5*	*176*	*150*	*150*	*2x3/4"*	*214*
M90L	*806,5*	*872,5*	*176*	*150*	*150*	*2x3/4"*	*216*
M100L	*848,5*	*920,5*	*194*	*160*	*160*	*2x3/4"*	*224*
M112M	*897,5*	*978,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*232*
M132S	*987*	*1087*	*258*	*181*	*181*	*1"+3/4"*	*241*
M132M	*987*	*1087*	*258*	*181*	*181*	*1"+3/4"*	*262*
M160M	*1073,5*	*1190,5*	*310*	*199*	*199*	*1"+3/4"*	*276*
M160L	*1073,5*	*1190,5*	*310*	*199*	*199*	*1"+3/4"*	*290*
M180M	*1123,5*	*1241,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*323*
M180L	*1123,5*	*1241,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*330*
M200L	*1148,5*	*1278,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*379*
LG225S incl. adapter	*1422*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*568*
LG225ZM incl. adapter	*1452*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*608*

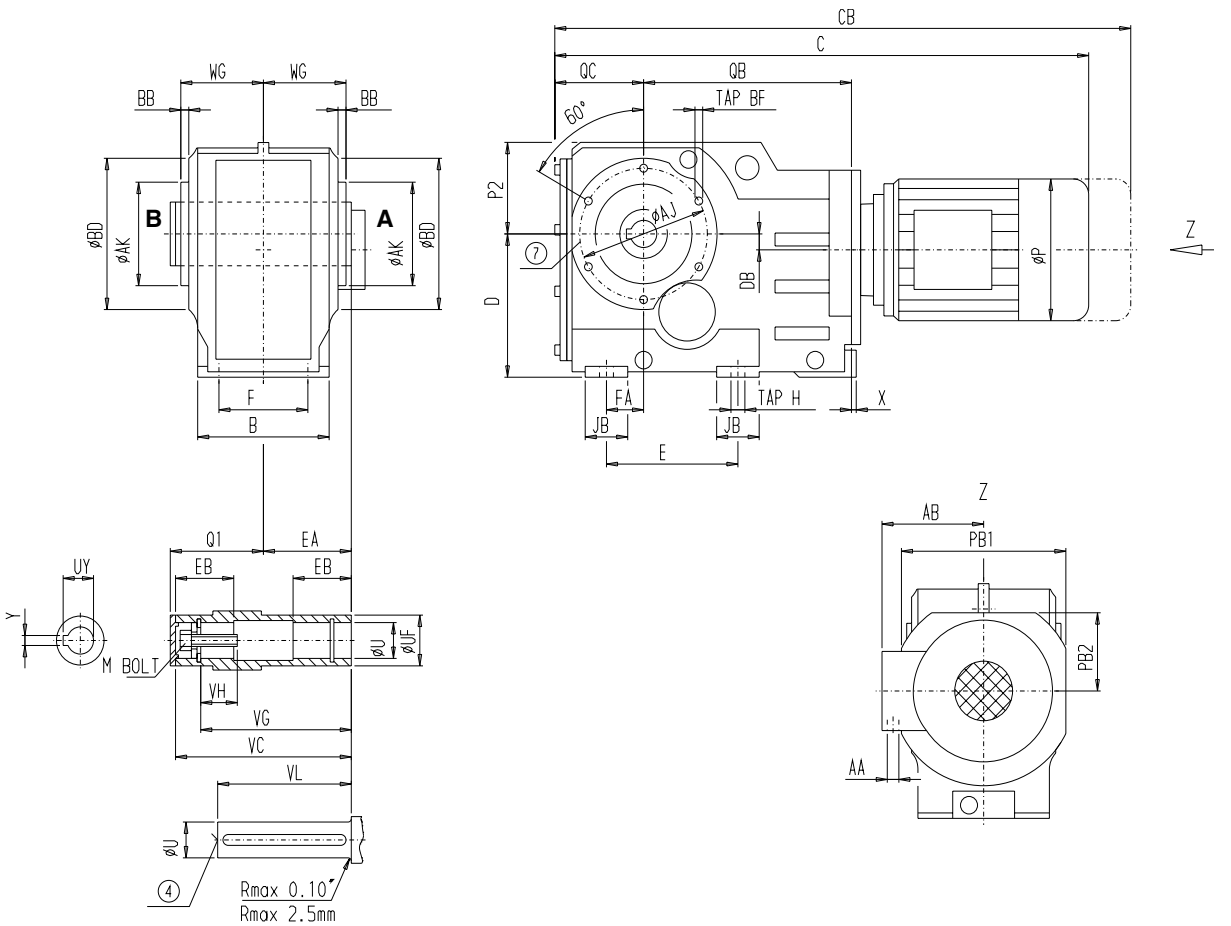
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ128

KAZ 510

[inch]



4

Mounting

BD	AK	AJ	BB	TAP BF
11.61	9.06	10.43	0.16	M16x28

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
2.75	4.331	11.81	10.354	2.35	9.45	3/4-10UNC	3.04	0.63	5.91	4.843	6.06

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
9.76	3.27	7.68	10.04	10.43	5.91	0.79	3.15	11.81	0.67	6.16	14.61	5.71	6.22	M20x34

Motor

	KAZ128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M90S	31.72	34.31	6.93	5.91	5.91	2x3/4“	438
M90L	31.72	34.31	6.93	5.91	5.91	2x3/4“	442
M100L	33.37	36.2	7.64	6.3	6.3	2x3/4“	455
M112M	35.3	38.49	8.58	6.59	6.59	2x3/4“	473
M132S	38.82	42.79	10.16	7.13	7.13	1“+3/4“	518
M132M	38.82	42.79	10.16	7.13	7.13	1“+3/4“	542
M160M	42.22	46.83	12.2	7.83	7.83	1“+3/4“	597
M160L	42.22	46.83	12.2	7.83	7.83	1“„3/4“	627
M180M	44.19	48.84	13.7	9.69	9.69	1 1/4“+3/4“	673
M180L	44.19	48.84	13.7	9.69	9.69	1 1/4“+3/4“	688
M200L	45.18	50.3	15.16	10.24	10.24	1 1/4“+3/4“	796
LG225S incl. adapter	55.99	on request	17.4	12.8	on request	2x1 1/2“	1216
LG225ZM incl. adapter	57.17	on request	17.4	12.8	on request	2x1 1/2“	1316

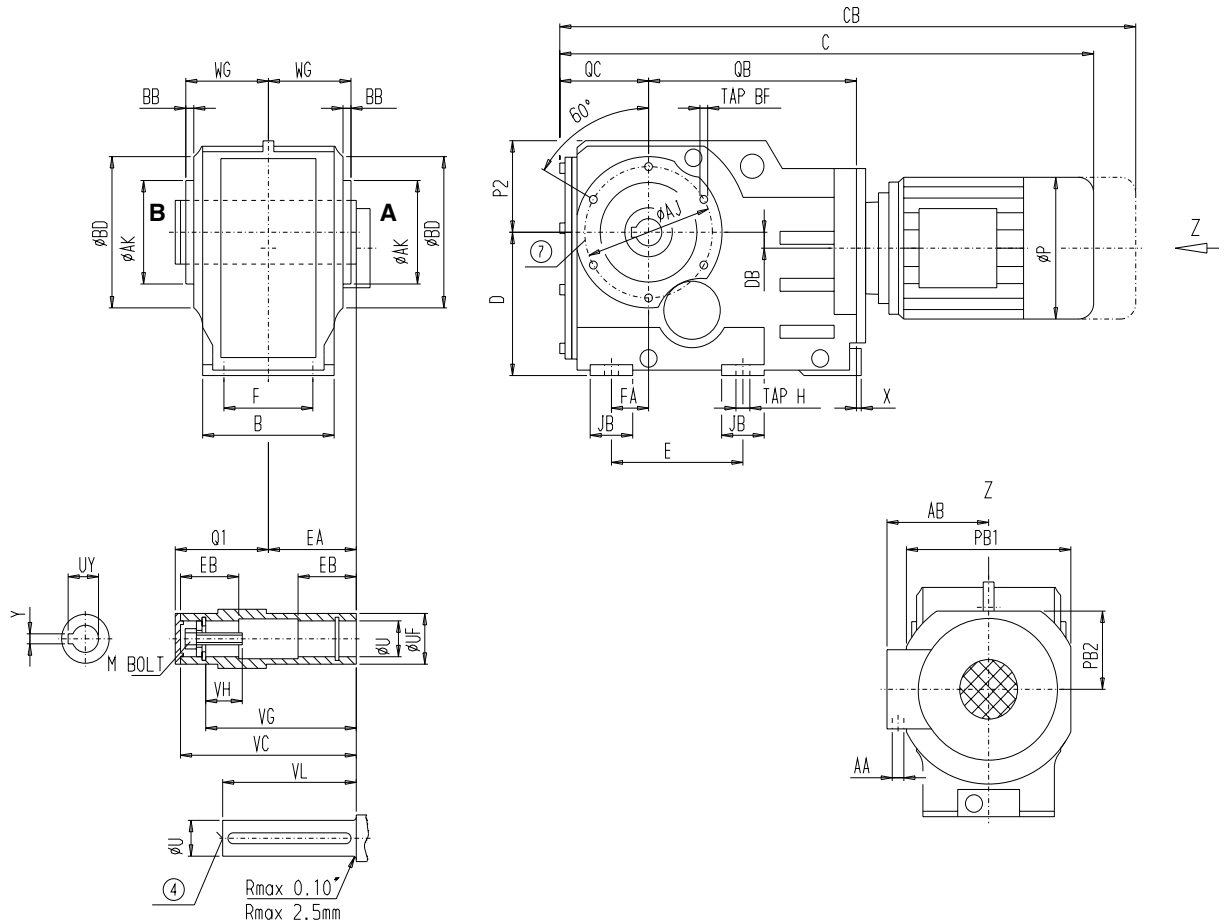
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ128

KAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
295	*230*	*265*	*4*	*M16x28*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
69,85	*110*	*300*	*263*	*60*	*240*	*3/4"-10UNC*	*77,22*	*16,002*	*150*	*123*	*154*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
248	*83*	*195*	*255*	*265*	*150*	*20*	*80*	*300*	*17*	*156,5*	*371*	*145*	*158*	*M20x34*

Motor

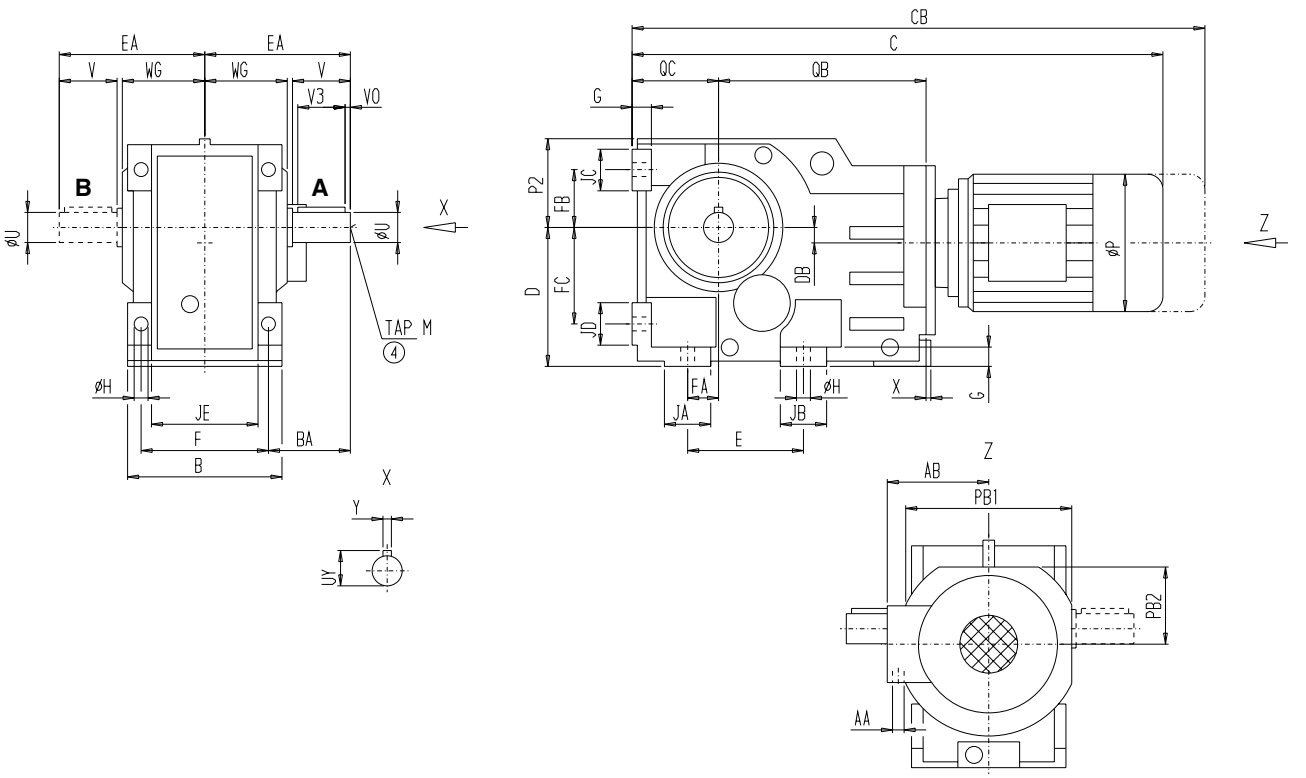
	KAZ128						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M90S	*806,5*	*872,5*	*176*	*150*	*150*	*2x3/4"*	*197*
M90L	*806,5*	*872,5*	*176*	*150*	*150*	*2x3/4"*	*199*
M100L	*848,5*	*920,5*	*194*	*160*	*160*	*2x3/4"*	*206*
M112M	*897,5*	*978,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*215*
M132S	*987*	*1087*	*258*	*181*	*181*	*1"+3/4"*	*224*
M132M	*987*	*1087*	*258*	*181*	*181*	*1"+3/4"*	*245*
M160M	*1073,5*	*1190,5*	*310*	*199*	*199*	*1"+3/4"*	*259*
M160L	*1073,5*	*1190,5*	*310*	*199*	*199*	*1"+3/4"*	*273*
M180M	*1123,5*	*1241,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*306*
M180L	*1123,5*	*1241,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*313*
M200L	*1148,5*	*1278,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*362*
LG225S incl. adapter	*1422*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*551*
LG225ZM incl. adapter	*1452*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*597*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Foot mounted

K148

K 510
[inch]



4

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
3.625	6.69	5.5	0.602	4.01	0.875	8.265	1-8UNC

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
11.02	3.74	10.63	1.57	8.58	13.39	12.4	8.66	5.51	7.09	1.46	4.17	3.54	3.5	3.54	14.17	0.79	7.87	16.61	6.65	7.4	13.58	1.3

Motor

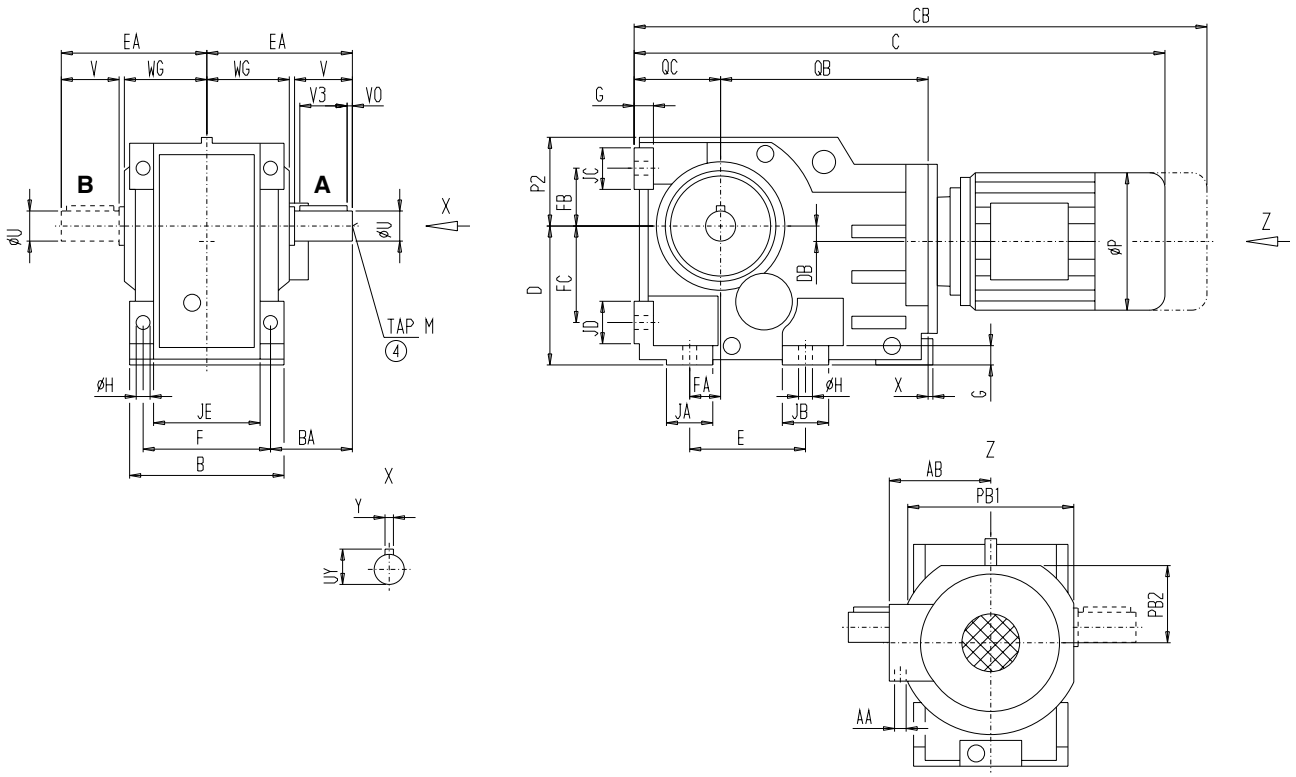
	K148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M100L	36.71	39.54	7.64	6.3	6.3	2x3/4“	705
M112M	38.6	41.79	8.58	6.59	6.59	2x3/4“	722
M132S	42.13	46.1	10.16	7.13	7.13	1“+3/4“	763
M132M	42.13	46.1	10.16	7.13	7.13	1“+3/4“	788
M160M	45.29	49.9	12.2	7.83	7.83	1“+3/4“	853
M160L	45.29	49.9	12.2	7.83	7.83	1“+3/4“	883
M180M	47.38	52.03	13.7	9.69	9.69	1 1/4“+3/4“	917
M180L	47.38	52.03	13.7	9.69	9.69	1 1/4“+3/4“	932
M200L	48.37	53.49	15.16	10.24	10.24	1 1/4“+3/4“	1040
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl. adapter	63.01	on request	19.49	15.43	on request	2x2	2137

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Foot mounted

K148

K 510
[*mm*]



Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
92,075	*170*	*139,7*	*15,291*	*101,85*	*22,225*	*210*	*1“-8UNC*

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
280	*95*	*270*	*40*	*218*	*340*	*315*	*220*	*140*	*180*	*37*	*106*	*90*	*89*	*90*	*360*	*20*	*200*	*422*	*169*	*188*	*345*	*33*

Motor

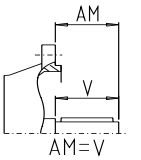
	K148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M100L	*933,5*	*1005,5*	*194*	*160*	*160*	*2x3/4“*	*320*
M112M	*981,5*	*1062,5*	*218*	*167,5*	*167,5*	*2x3/4“*	*327*
M132S	*1071*	*1171*	*258*	*181*	*181*	*1“+3/4“*	*345*
M132M	*1071*	*1171*	*258*	*181*	*181*	*1“+3/4“*	*356*
M160M	*1151,5*	*1268,5*	*310*	*199*	*199*	*1“+3/4“*	*375*
M160L	*1151,5*	*1268,5*	*310*	*199*	*199*	*1“+3/4“*	*386*
M180M	*1204,5*	*1322,5*	*348*	*246*	*246*	*1 1/4“+3/4“*	*416*
M180L	*1204,5*	*1322,5*	*348*	*246*	*246*	*1 1/4“+3/4“*	*423*
M200L	*1229,5*	*1359,5*	*385*	*260*	*260*	*1 1/4“+3/4“*	*472*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2“*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2“*	*on request*
LG250ZM incl. adapter	*1601*	*on request*	*495*	*392*	*on request*	*2x2“*	*922*

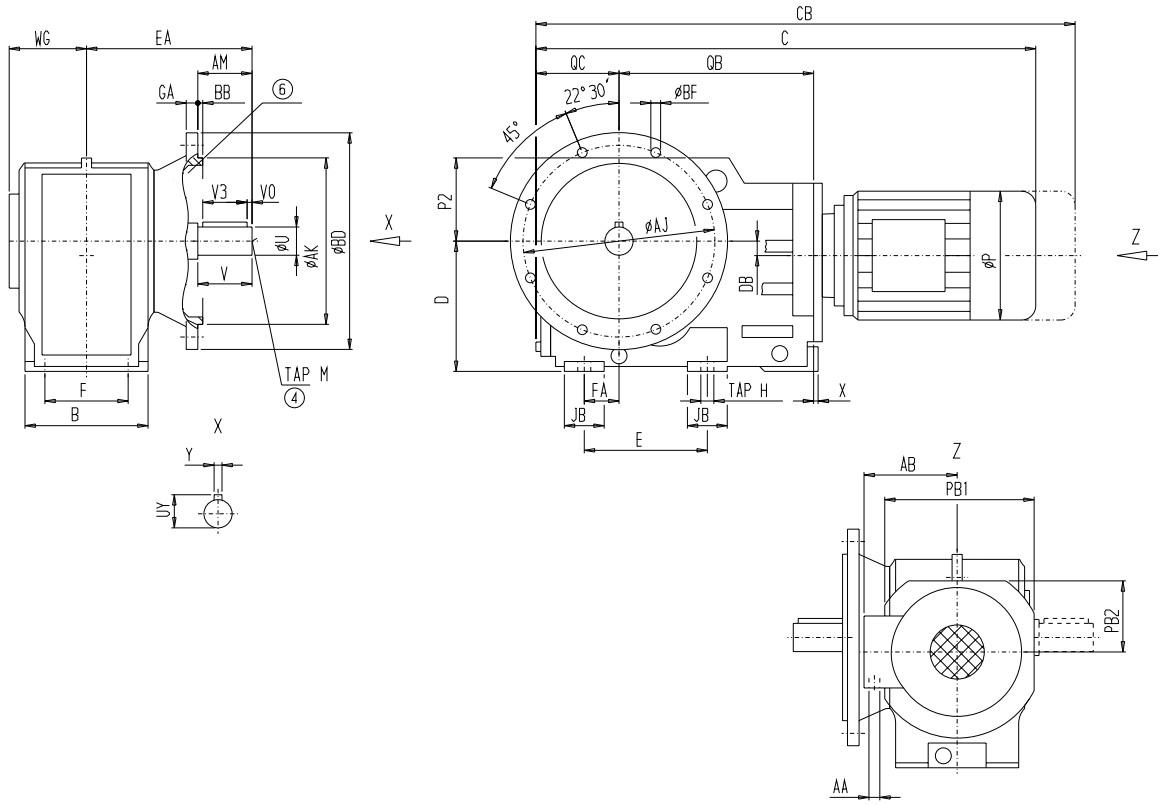
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Flange mounted

KF148

KF 510
[inch]





Flange

BD	AK	GA	AJ	BB	BF
17.72	13.78	0.87	15.75	0.2	0.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
3.625	6.69	5.5	0.602	4.01	0.875	6.69	1-8UNC

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
11.42	3.94	8.27	11.26	12.4	7.09	1.46	3.54	14.17	0.79	7.72	16.61	6.65	7.4	15.2	M24x41

Motor

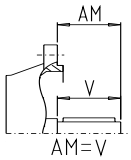
	KF148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M100L	36.56	39.39	7.64	6.3	6.3	2x3/4“	771
M112M	38.44	41.63	8.58	6.59	6.59	2x3/4“	789
M132S	41.97	45.94	10.16	7.13	7.13	1“+3/4“	830
M132M	41.97	45.94	10.16	7.13	7.13	1“+3/4“	854
M160M	45.13	49.74	12.2	7.83	7.83	1“+3/4“	919
M160L	45.13	49.74	12.2	7.83	7.83	1“+3/4“	950
M180M	47.22	51.87	13.7	9.69	9.69	1 1/4“+3/4“	983
M180L	47.22	51.87	13.7	9.69	9.69	1 1/4“+3/4“	999
M200L	48.21	53.33	15.16	10.24	10.24	1 1/4“+3/4“	1107
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl. adapter	62.85	on request	19.49	15.43	on request	2x2“	2202

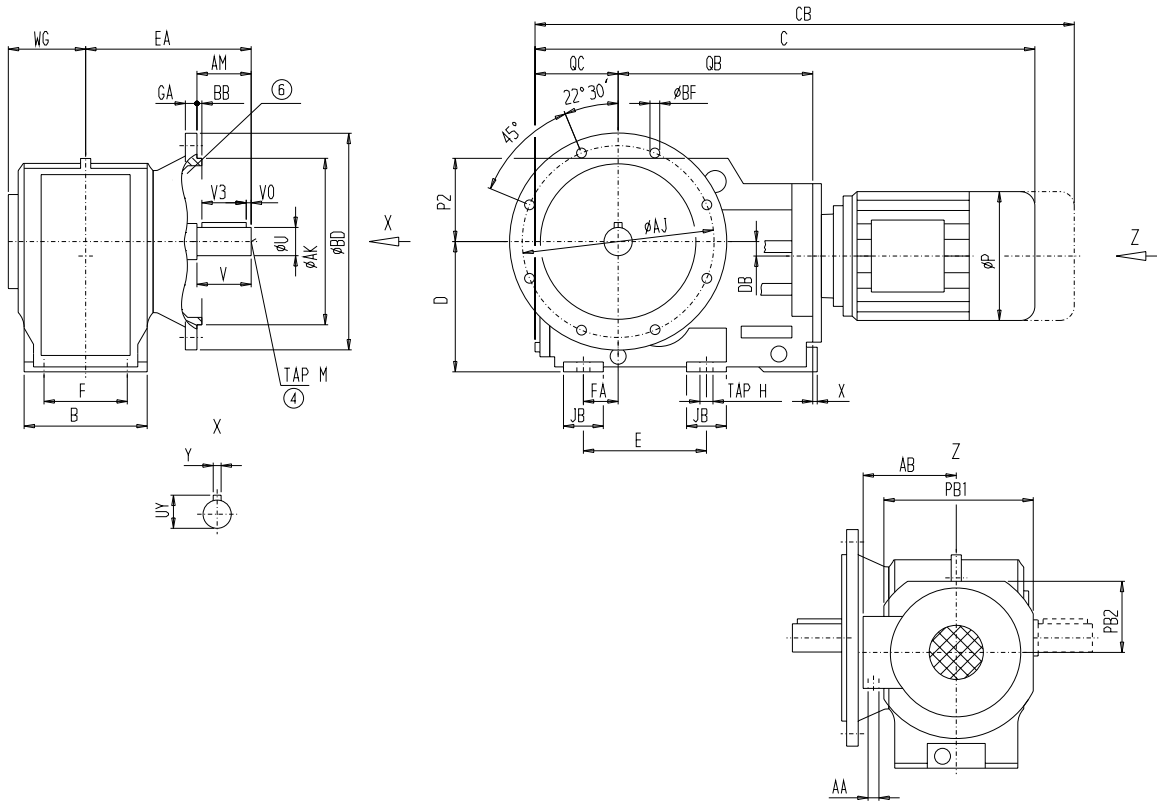
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Flange mounted

KF148

KF 510
[*mm*]





Flange

BD	AK	GA	AJ	BB	BF
450	*350*	*22*	*400*	*5*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
92,075	*170*	*139,7*	*15,291*	*101,85*	*22,225*	*170*	*14"-8UNC*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
290	*100*	*210*	*286*	*315*	*180*	*37*	*90*	*360*	*20*	*196*	*422*	*169*	*188*	*386*	*M24x41*

Motor

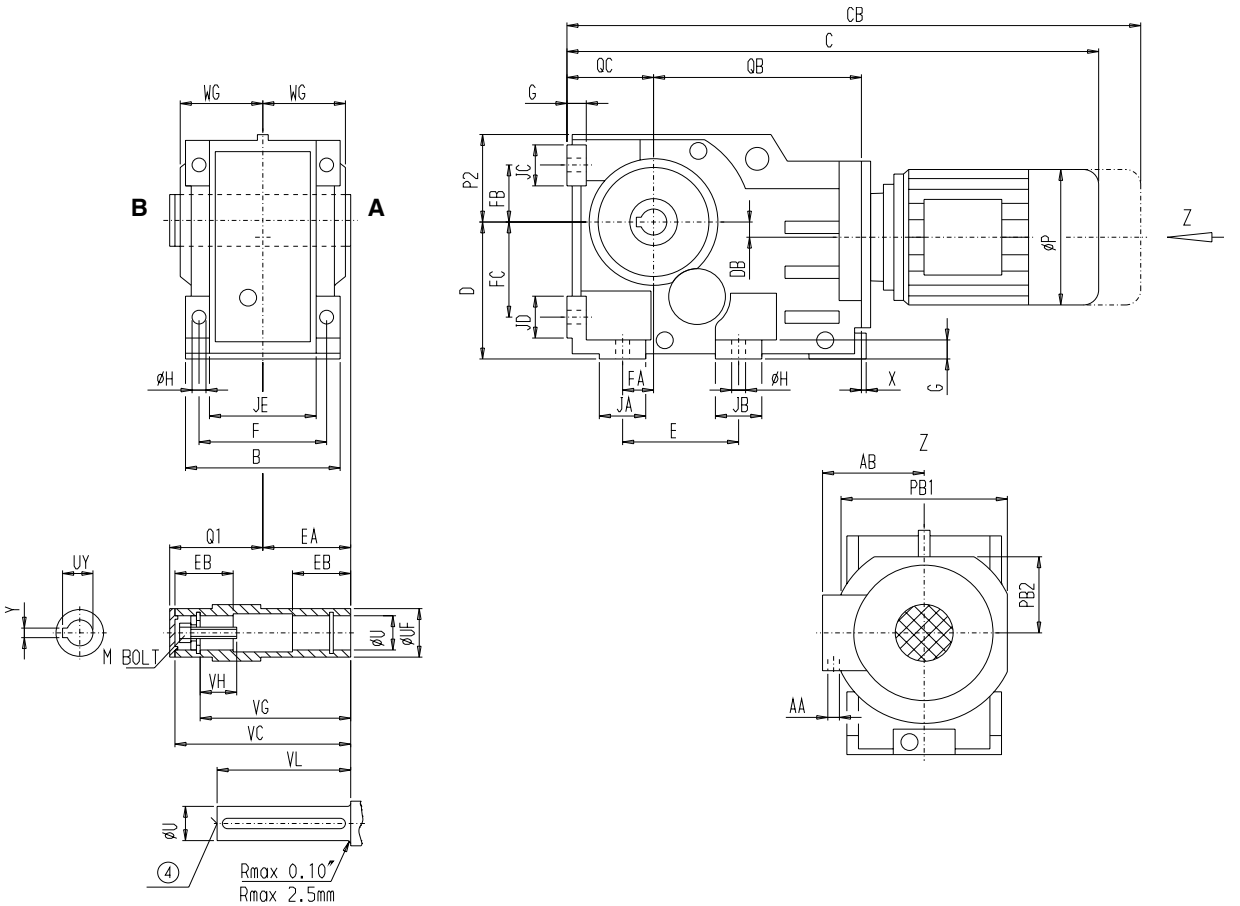
	KF148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M100L	*929,5*	*1001,5*	*194*	*160*	*160*	*2x3/4"*	*350*
M112M	*977,5*	*1058,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*358*
M132S	*1067*	*1167*	*258*	*181*	*181*	*1"+3/4"*	*386*
M132M	*1067*	*1167*	*258*	*181*	*181*	*1"+3/4"*	*386*
M160M	*1147,5*	*1264,5*	*310*	*199*	*199*	*1"+3/4"*	*405*
M160L	*1147,5*	*1264,5*	*310*	*199*	*199*	*1"+3/4"*	*419*
M180M	*1200,5*	*1318,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*446*
M180L	*1200,5*	*1318,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*453*
M200L	*1225,5*	*1355,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*502*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl. adapter	*1597*	*on request*	*495*	*392*	*on request*	*2x2"*	*1001*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted

KA148

KA 510
[inch]



4

Mounting

E	F	FA	G	H
11.02	10.63	3.74	1.57	1.3

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
3.625	4.724	13.78	12.205	2.1	11.22	1-8UNC	3.84	0.88	6.89	5.827	7.05

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
8.58	13.39	12.4	8.66	5.51	7.09	1.46	4.17	3.54	3.5	3.54	14.17	0.79	7.87	16.61	6.65	7.4

Motor

	KA148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M100L	36.71	39.54	7.64	6.3	6.3	2x3/4“	643
M112M	38.6	41.79	8.58	6.59	6.59	2x3/4“	660
M132S	42.13	46.1	10.16	7.13	7.13	1“+3/4“	702
M132M	42.13	46.1	10.16	7.13	7.13	1“+3/4“	726
M160M	45.29	49.9	12.2	7.83	7.83	1“+3/4“	791
M160L	45.29	49.9	12.2	7.83	7.83	1“+3/4“	822
M180M	47.38	52.03	13.7	9.69	9.69	1 1/4“+3/4“	855
M180L	47.38	52.03	13.7	9.69	9.69	1 1/4“+3/4“	870
M200L	48.37	53.49	15.16	10.24	10.24	1 1/4“+3/4“	978
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl. adapter	63.01	on request	19.49	15.43	on request	2x2“	2075

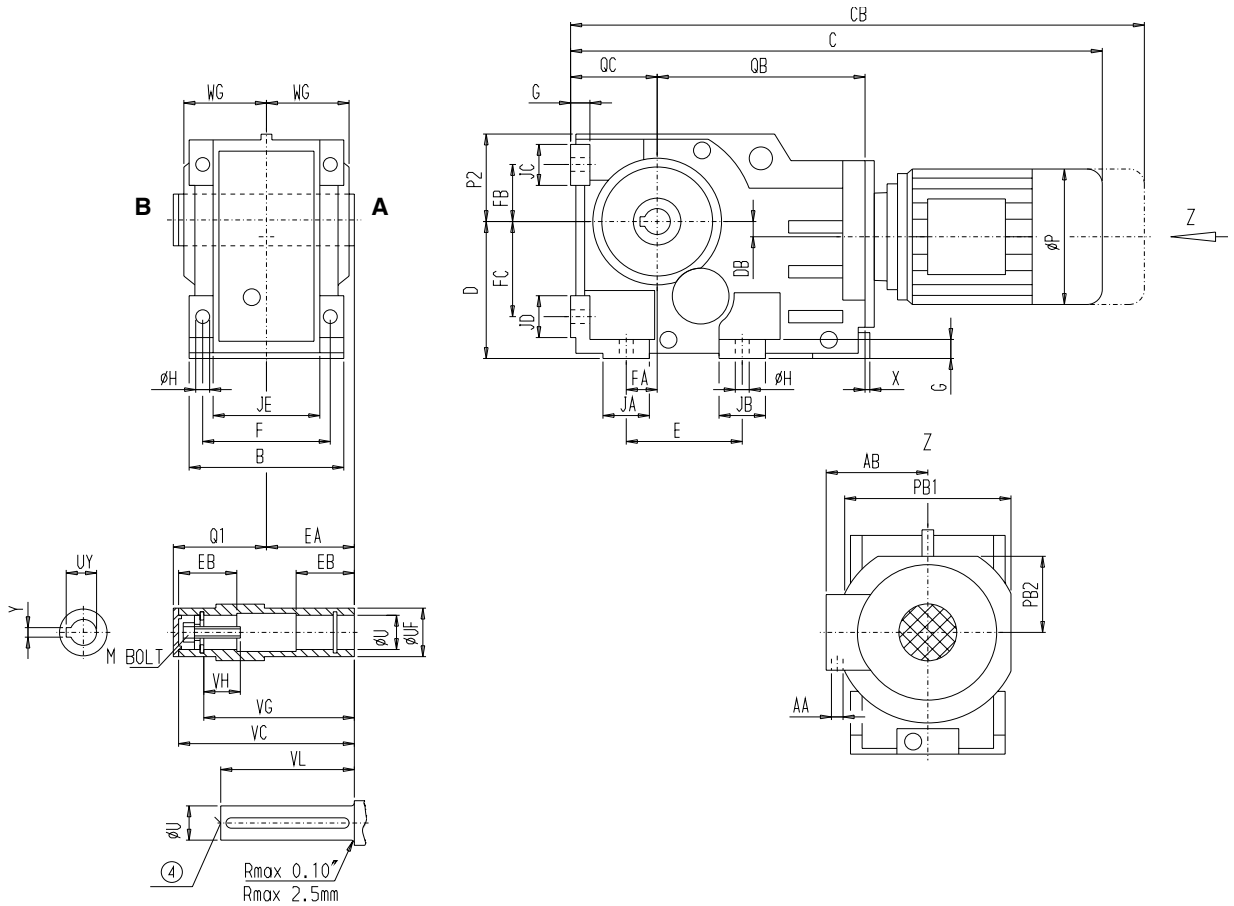
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted

KA148

KA 510

[*mm*]



Mounting

E	F	FA	G	H
280	*270*	*95*	*40*	*33*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
92,075	*120*	*350*	*310*	*53*	*285*	*1“-8UNC*	*97,54*	*22,352*	*175*	*148*	*179*

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
218	*340*	*315*	*220*	*140*	*180*	*37*	*106*	*90*	*89*	*90*	*360*	*20*	*200*	*422*	*169*	*188*

Moto

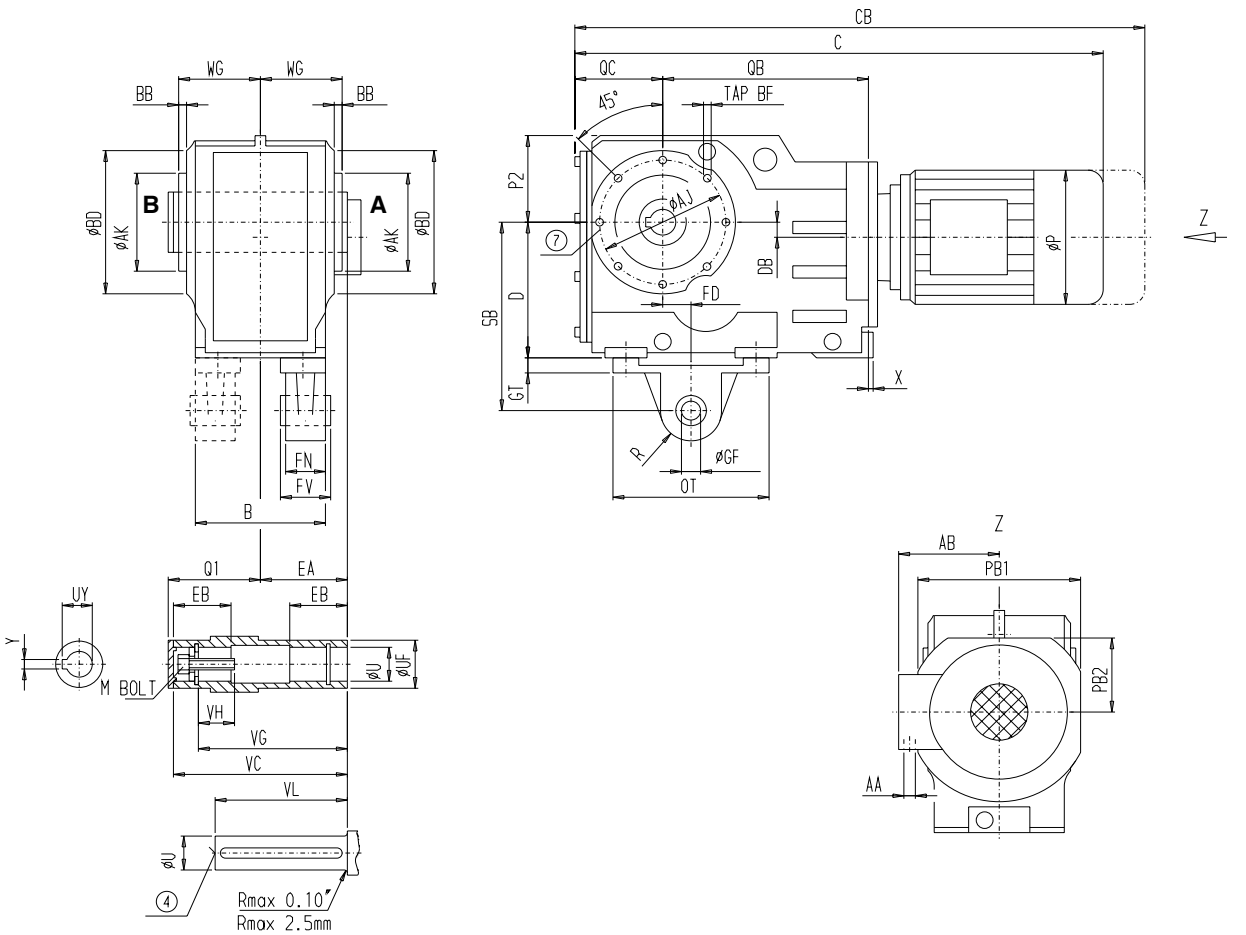
	KA148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M100L	*933,5*	*1005,5*	*194*	*160*	*160*	*2x3/4“*	*292*
M112M	*981,5*	*1062,5*	*218*	*167,5*	*167,5*	*2x3/4“*	*300*
M132S	*1071*	*1171*	*258*	*181*	*181*	*1“+3/4“*	*307*
M132M	*1071*	*1171*	*258*	*181*	*181*	*1“+3/4“*	*328*
M160M	*1151,5*	*1268,5*	*310*	*199*	*199*	*1“+3/4“*	*347*
M160L	*1151,5*	*1268,5*	*310*	*199*	*199*	*1“+3/4“*	*361*
M180M	*1204,5*	*1322,5*	*348*	*246*	*246*	*1 1/4“+3/4“*	*388*
M180L	*1204,5*	*1322,5*	*348*	*246*	*246*	*1 1/4“+3/4“*	*395*
M200L	*1229,5*	*1359,5*	*385*	*260*	*260*	*1 1/4“+3/4“*	*444*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2“*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2“*	*on request*
LG250ZM incl. adapter	*1601*	*on request*	*495*	*392*	*on request*	*2x2“*	*894*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD148

KAD 510
[inch]



4

Mounting

BD	AK	AJ	BB	WG	TAP BF
13.19	9.84	11.81	0.2	6.65	M20x34

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
3.625	4.724	13.78“	12.205	2.1	11.22	1-8UNC	3.84	0.88	6.89	5.827	7.05

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
12.4	7.09	1.46	14.17	0.79	7.72	16.61	7.4

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
3.15	3.46	1.57	17.72	11.26	1.77	1.42	14.96	R2.56

Motor

	KAD148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M100L	36.56	39.39	7.64	6.3	6.3	2x3/4“	704
M112M	38.44	41.63	8.58	6.59	6.59	2x3/4“	721
M132S	41.97	45.94	10.16	7.13	7.13	1“+3/4“	762
M132M	41.97	45.94	10.16	7.13	7.13	1“+3/4“	787
M160M	45.13	49.74	12.2	7.83	7.83	1“+3/4“	852
M160L	45.13	49.74	12.2	7.83	7.83	1“+3/4“	883
M180M	47.22	51.87	13.7	9.69	9.69	1 1/4“+3/4“	916
M180L	47.22	51.87	13.7	9.69	9.69	1 1/4“+3/4“	931
M200L	48.21	53.33	15.16	10.24	10.24	1 1/4“+3/4“	1039
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl. adapter	62.85	on request	19.49	15.43	on request	2x2“	2136

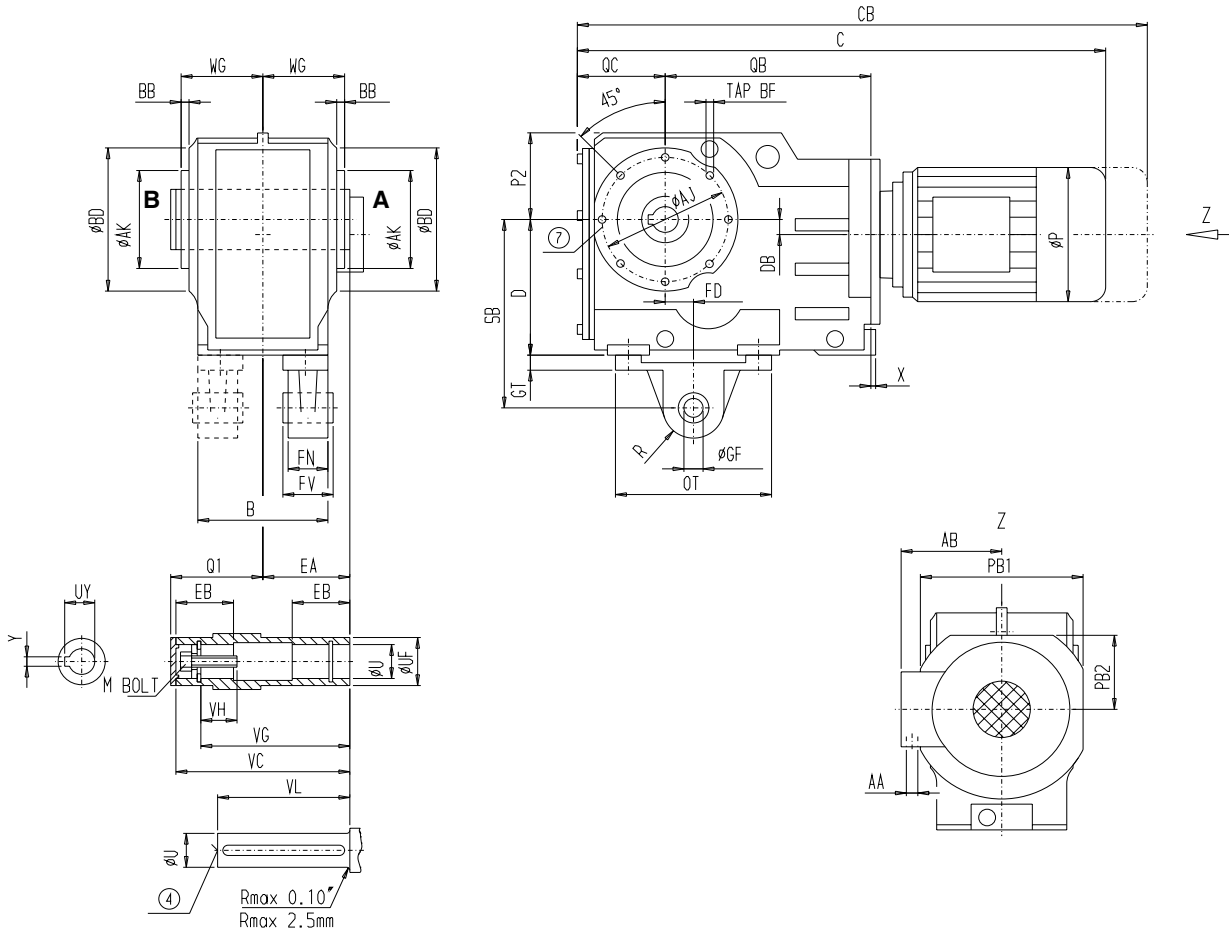
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD148

KAD 510

[*mm*]



Mounting

BD	AK	AJ	BB	WG	TAP BF
335	*250*	*300*	*5*	*169*	*M20x34*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
92,075	*120*	*350*	*310*	*53*	*285*	*1"-8UNC*	*97,54*	*22,352*	*175*	*148*	*179*

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
315	*180*	*37*	*360*	*20*	*196*	*422*	*188*

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
80	*88*	*40*	*450*	*286*	*45*	*36*	*380*	*R65*

Motor

	KAD148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M100L	*929,5*	*1001,5*	*194*	*160*	*160*	*2x3/4"*	*319*
M112M	*977,5*	*1058,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*327*
M132S	*1067*	*1167*	*258*	*181*	*181*	*1"+3/4"*	*356*
M132M	*1067*	*1167*	*258*	*181*	*181*	*1"+3/4"*	*356*
M160M	*1147,5*	*1264,5*	*310*	*199*	*199*	*1"+3/4"*	*374*
M160L	*1147,5*	*1264,5*	*310*	*199*	*199*	*1"+3/4"*	*388*
M180M	*1200,5*	*1318,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*415*
M180L	*1200,5*	*1318,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*422*
M200L	*1225,5*	*1355,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*471*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl. adapter	*1597*	*on request*	*495*	*392*	*on request*	*2x2"*	*970*

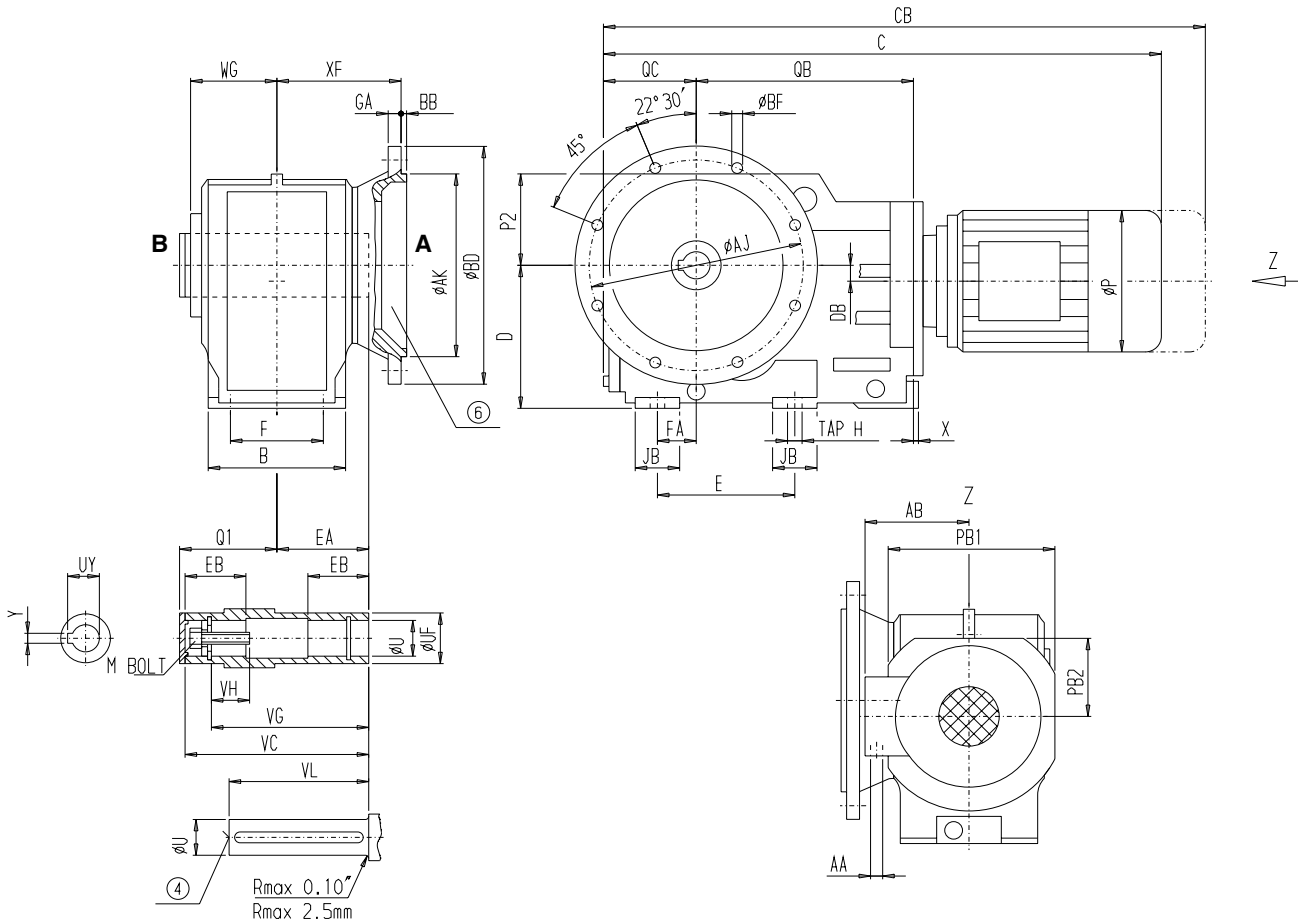
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with flange

KAF148

KAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	XF	BF
17.72	13.78	0.87	15.75	0.2	8.5	0.69

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
3.625	4.724	13.78	12.205	2.1	11.22	1-8UNC	3.84	0.88	6.89	5.827	7.05

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
11.42	3.94	8.27	11.26	12.4	7.09	1.46	3.54	14.17	0.79	7.72	16.61	6.65	7.4	M24x41

Motor

	KAF148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M100L	36.56	39.39	7.64	6.3	6.3	2x3/4“	710
M112M	38.44	41.63	8.58	6.59	6.59	2x3/4“	727
M132S	41.97	45.94	10.16	7.13	7.13	1“+3/4“	768
M132M	41.97	45.94	10.16	7.13	7.13	1“+3/4“	793
M160M	45.13	49.74	12.2	7.83	7.83	1“+3/4“	858
M160L	45.13	49.74	12.2	7.83	7.83	1“+3/4“	889
M180M	47.22	51.87	13.7	9.69	9.69	1 1/4“+3/4“	922
M180L	47.22	51.87	13.7	9.69	9.69	1 1/4“+3/4“	937
M200L	48.21	53.33	15.16	10.24	10.24	1 1/4“+3/4“	1045
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl. adapter	62.85	on request	19.49	15.43	on request	2x2“	2136

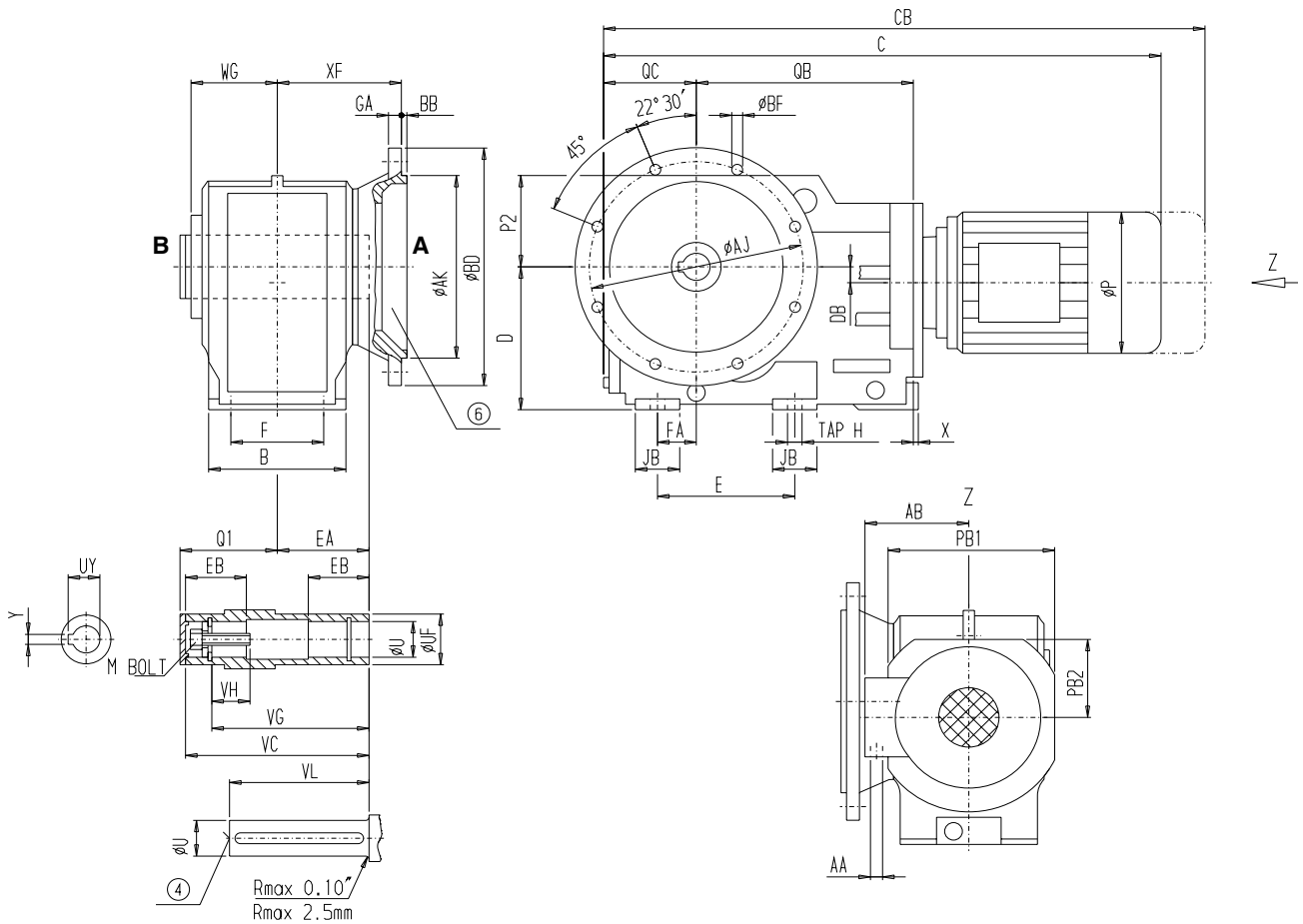
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with flange

KAF148

KAF 510

[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	BF
450	*350*	*22*	*400*	*5*	*216*	*17,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
92,075	*120*	*350*	*310*	*53*	*285*	*1"-8UNC*	*97,54*	*22,352*	*175*	*148*	*179*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
290	*100*	*210*	*286*	*315*	*180*	*37*	*90*	*360*	*20*	*196*	*422*	*169*	*188*	*M24x41*

Motor

	KAF148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M100L	*929,5*	*1001,5*	*194*	*160*	*160*	*2x3/4"*	*322*
M112M	*977,5*	*1058,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*330*
M132S	*1067*	*1167*	*258*	*181*	*181*	*1"+3/4"*	*337*
M132M	*1067*	*1167*	*258*	*181*	*181*	*1"+3/4"*	*358*
M160M	*1147,5*	*1264,5*	*310*	*199*	*199*	*1"+3/4"*	*377*
M160L	*1147,5*	*1264,5*	*310*	*199*	*199*	*1"+3/4"*	*391*
M180M	*1200,5*	*1318,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*418*
M180L	*1200,5*	*1318,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*425*
M200L	*1225,5*	*1355,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*474*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl. adapter	*1597*	*on request*	*495*	*392*	*on request*	*2x2"*	*973*

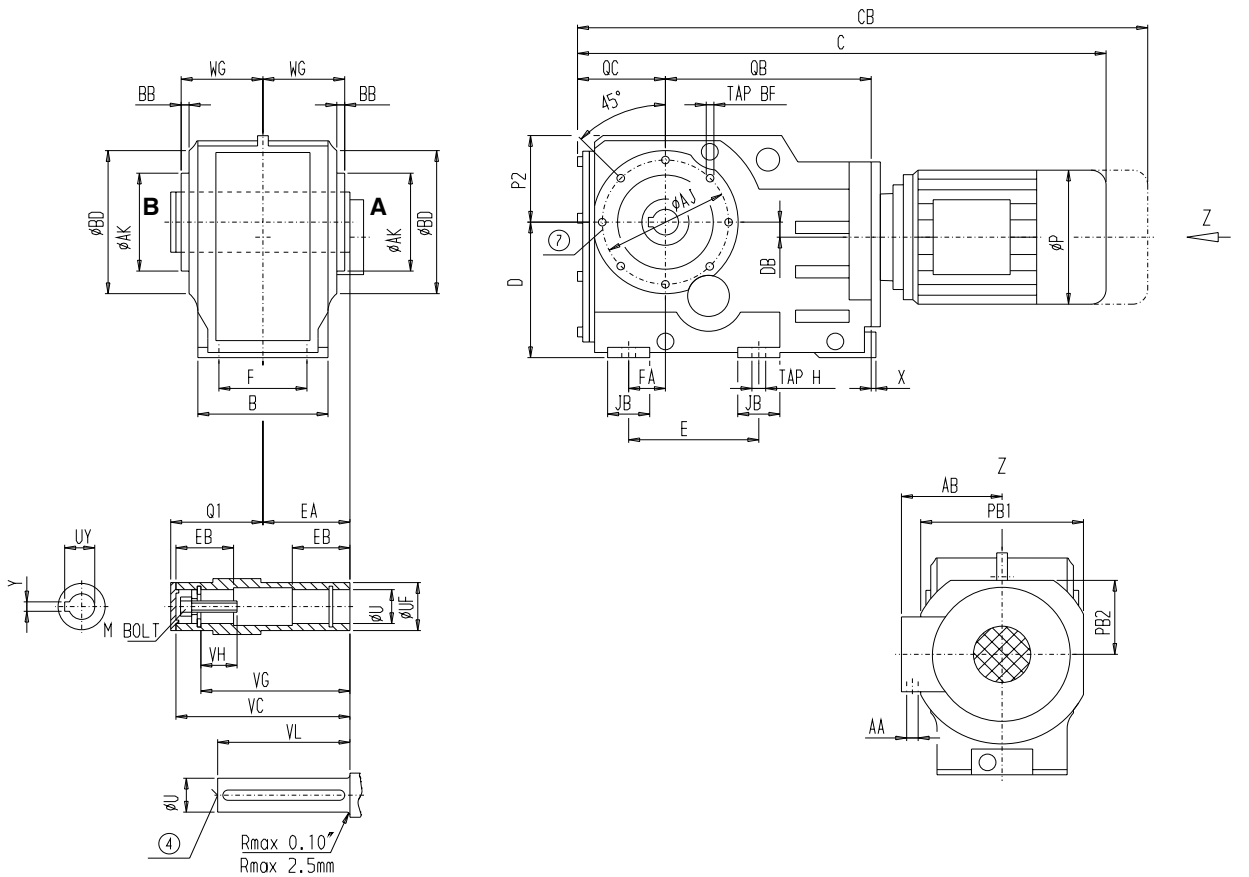
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ148

KAZ 510

[inch]



4

Mounting

BD	AK	AJ	BB	TAP BF
13.19	9.84	11.81	0.2	M20x34

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
3.625	4.724	13.78	12.205	2.1	11.22	1-8UNC	3.84	0.88	6.89	5.827	7.05

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
11.42	3.94	8.27	11.26	12.4	7.09	1.46	3.54	14.17	0.79	7.72	16.61	6.65	7.4	M24x41

Motor

	KAZ148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M100L	36.56	39.39	7.64	6.3	6.3	2x3/4“	667
M112M	38.44	41.63	8.58	6.59	6.59	2x3/4“	685
M132S	41.97	45.94	10.16	7.13	7.13	1“+3/4“	726
M132M	41.97	45.94	10.16	7.13	7.13	1“+3/4“	750
M160M	45.13	49.74	12.2	7.83	7.83	1“+3/4“	815
M160L	45.13	49.74	12.2	7.83	7.83	1“+3/4“	846
M180M	47.22	51.87	13.7	9.69	9.69	1 1/4“+3/4“	879
M180L	47.22	51.87	13.7	9.69	9.69	1 1/4“+3/4“	895
M200L	48.21	53.33	15.16	10.24	10.24	1 1/4“+3/4“	1003
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl. adapter	62.85	on request	19.49	15.43	on request	2x2“	2094

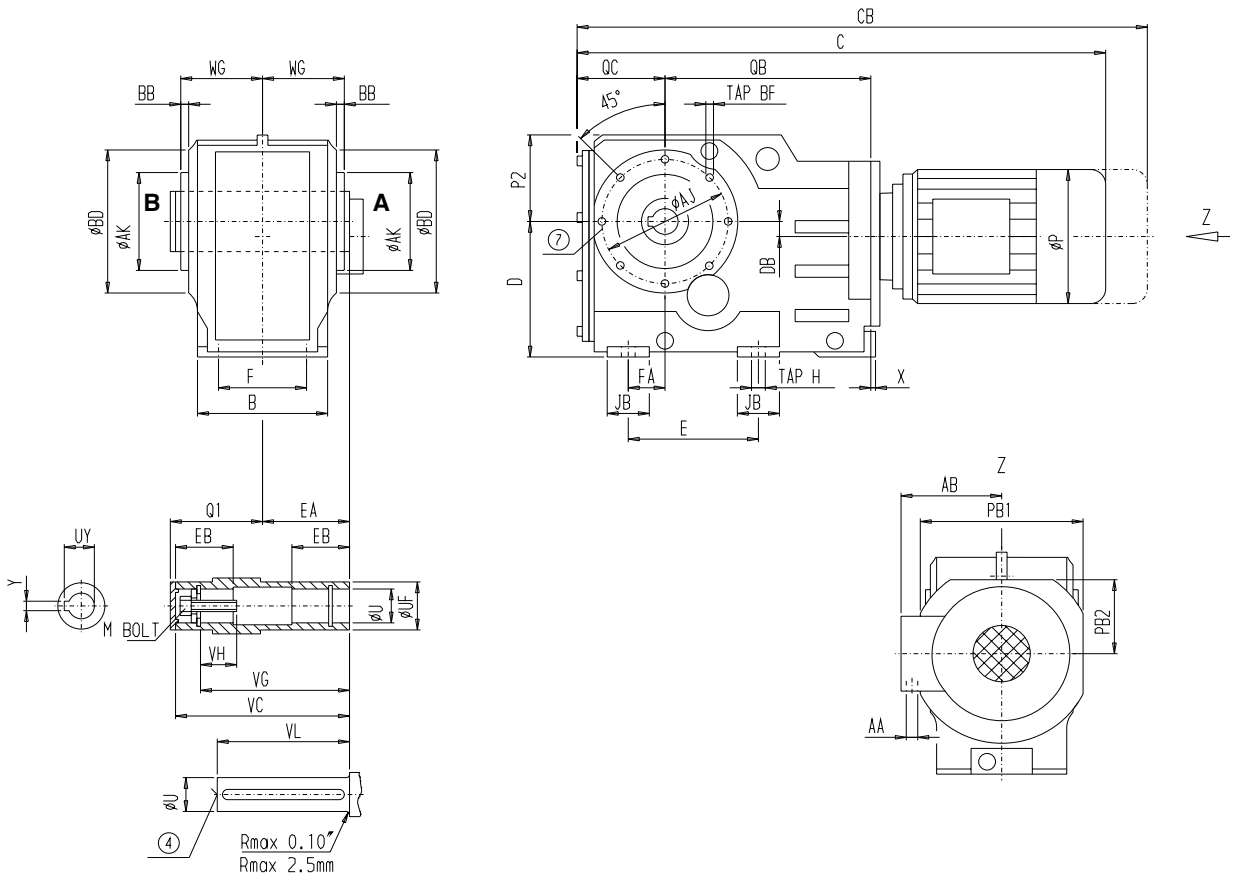
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ148

KAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
335	*250*	*300*	*5*	*M20x34*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
92,075	*120*	*350*	*310*	*53*	*285*	*1"-8UNC*	*97,54*	*22,352*	*175*	*148*	*179*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
290	*100*	*210*	*286*	*315*	*180*	*37*	*90*	*360*	*20*	*196*	*422*	*169*	*188*	*M24x41*

Motor

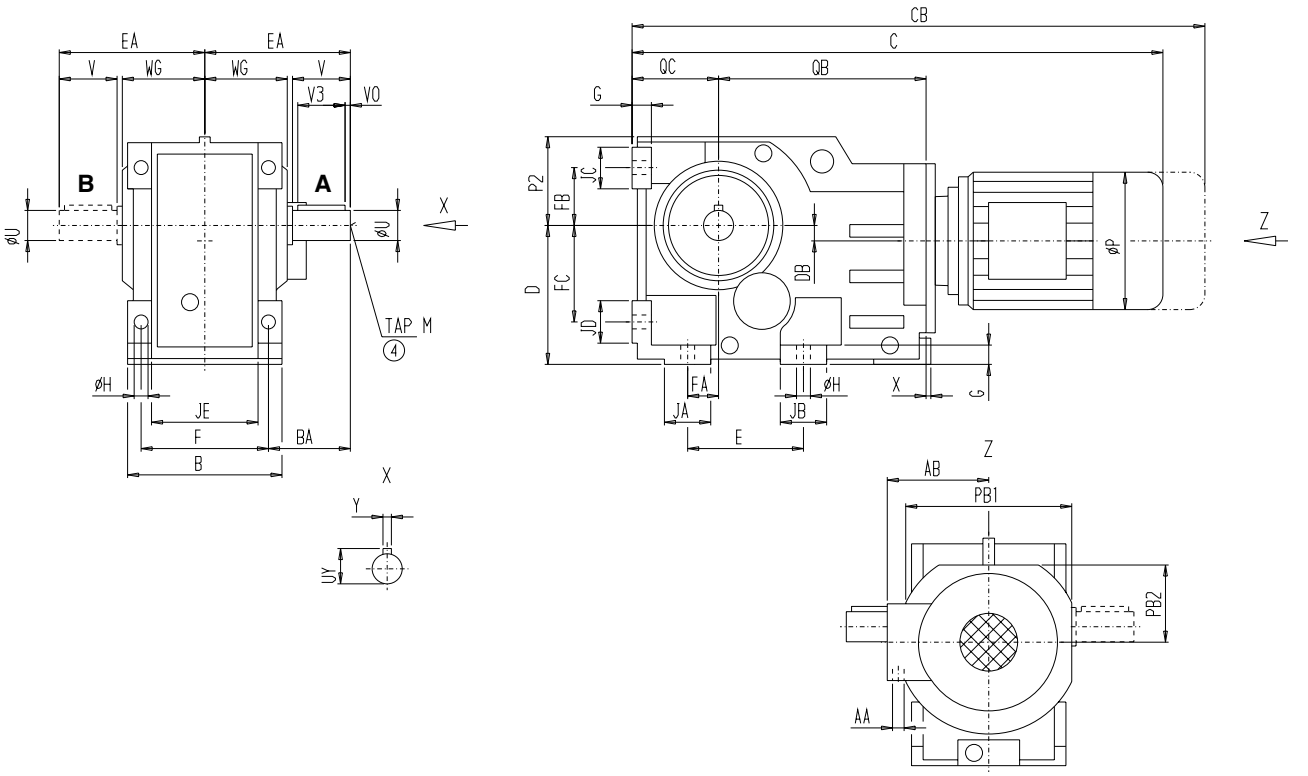
	KAZ148						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M100L	*929,5*	*1001,5*	*194*	*160*	*160*	*2x3/4"*	*303*
M112M	*977,5*	*1058,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*311*
M132S	*1067*	*1167*	*258*	*181*	*181*	*1"+3/4"*	*318*
M132M	*1067*	*1167*	*258*	*181*	*181*	*1"+3/4"*	*339*
M160M	*1147,5*	*1264,5*	*310*	*199*	*199*	*1"+3/4"*	*358*
M160L	*1147,5*	*1264,5*	*310*	*199*	*199*	*1"+3/4"*	*372*
M180M	*1200,5*	*1318,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*399*
M180L	*1200,5*	*1318,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*406*
M200L	*1225,5*	*1355,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*455*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl. adapter	*1597*	*on request*	*495*	*392*	*on request*	*2x2"*	*954*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Foot mounted

K168

K 510
[inch]



4

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
4.375	8.27	7	0.677	4.82	1	9.845	1-8UNC

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
13.78	4.53	12.99	1.77	10.43	15.75	14.76	10.43	6.1	8.03	1.97	4.33	4.33	4.33	4.33	16.06	0.87	8.86	19.61	7.83	8.86	16.34	1.54

Motor

	K168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	45.79	49.76	10.16	7.13	7.13	1“+3/4“	1141
M132M	45.79	49.76	10.16	7.13	7.13	1“+3/4“	1165
M160M	48.97	53.58	12.2	7.83	7.83	1“+3/4“	1218
M160L	48.97	53.58	12.2	7.83	7.83	1“+3/4“	1249
M180M	51.06	55.71	13.7	9.69	9.69	1 1/4“+3/4“	1293
M180L	51.06	55.71	13.7	9.69	9.69	1 1/4“+3/4“	1308
M200L	52.05	57.17	15.16	10.24	10.24	1 1/4“+3/4“	1416
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	60.72	on request	21.85	17.01	on request	2x2“	2703
LG280ZM incl. adapter	74.38	on request	21.85	17.01	on request	2x2“	2924

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

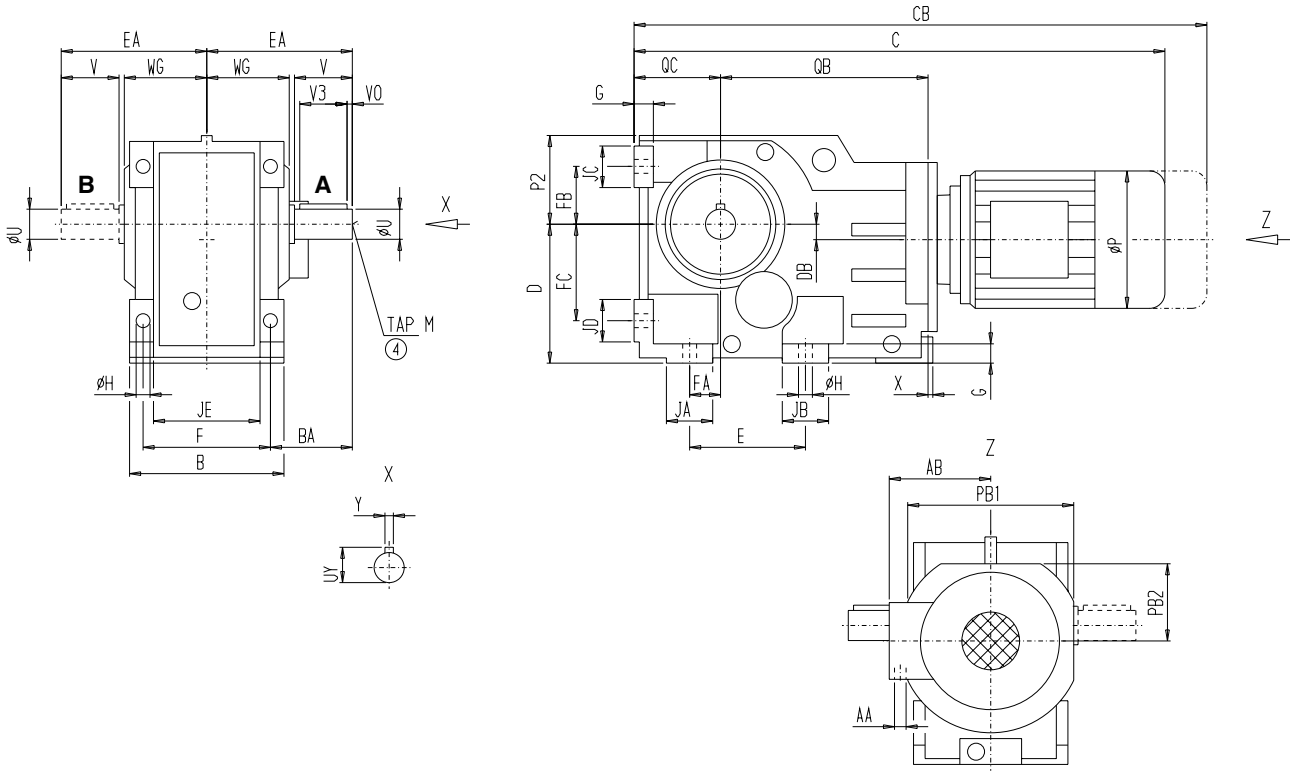
** for voltage ratio 1:2

Bevel Helical Gear Motors
Foot mounted

K168

K 510

[*mm*]



Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
111,125	*210*	*177,8*	*17,196*	*122,43*	*25,4*	*250*	*1“-8UNC*

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2	EA	H
350	*115*	*330*	*45*	*265*	*400*	*375*	*265*	*155*	*204*	*50*	*110*	*110*	*110*	*110*	*408*	*22*	*225*	*498*	*199*	*225*	*415*	*39*

Motor

	K168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1164*	*1265*	*258*	*181*	*181*	*1“+3/4“*	*506*
M132M	*1164*	*1265*	*258*	*181*	*181*	*1“+3/4“*	*527*
M160M	*1245*	*1362*	*310*	*199*	*199*	*1“+3/4“*	*541*
M160L	*1245*	*1362*	*310*	*199*	*199*	*1“+3/4“*	*555*
M180M	*1298*	*1416*	*348*	*246*	*246*	*1 1/4“+3/4“*	*586*
M180L	*1298*	*1416*	*348*	*246*	*246*	*1 1/4“+3/4“*	*593*
M200L	*1323*	*1453*	*385*	*260*	*260*	*1 1/4“+3/4“*	*642*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2“*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2“*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2“*	*on request*
LG280S incl. adapter	*1543*	*on request*	*555*	*432*	*on request*	*2x2“*	*1254*
LG280ZM incl. adapter	*1890*	*on request*	*555*	*432*	*on request*	*2x2“*	*1354*

Tolerances see page 1 - 4

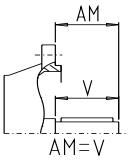
④ Tap specification see page 1 - 7

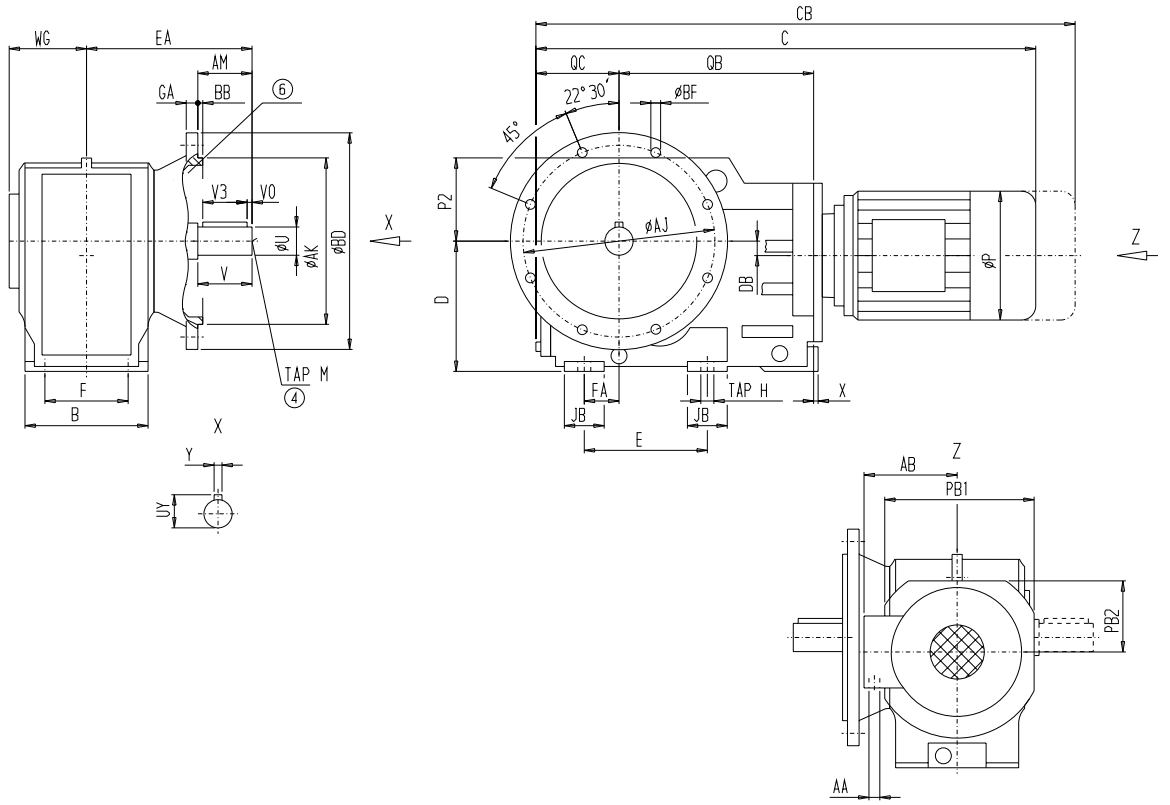
** for voltage ratio 1:2

Bevel Helical Gear Motors
Flange mounted

KF168

KF 510
[inch]





Flange

BD	AK	GA	AJ	BB	BF
21.65	17.72	0.98	19.69	0.2	0.69

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
4.375	8.27	7	0.677	4.82	1	8.27	1-8UNC

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
13.78	4.53	9.45	12.76	14.76	8.03	1.97	4.33	16.06	0.87	8.68	19.61	7.83	8.86	18.35	M30x48

Motor

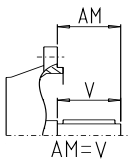
	KF168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	45.61	49.58	10.16	7.13	7.13	1"+3/4"	1278
M132M	45.61	49.58	10.16	7.13	7.13	1"+3/4"	1302
M160M	48.79	53.4	12.2	7.83	7.83	1"+3/4"	1355
M160L	48.79	53.4	12.2	7.83	7.83	1"+3/4"	1386
M180M	50.88	55.53	13.7	9.69	9.69	1 1/4"+3/4"	1429
M180L	50.88	55.53	13.7	9.69	9.69	1 1/4"+3/4"	1445
M200L	51.87	56.99	15.16	10.24	10.24	1 1/4"+3/4"	1553
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2"	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2"	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2"	on request
LG280S incl. adapter	60.55	on request	21.85	17.01	on request	2x2"	2892
LG280ZM incl. adapter	74.21	on request	21.85	17.01	on request	2x2"	3121

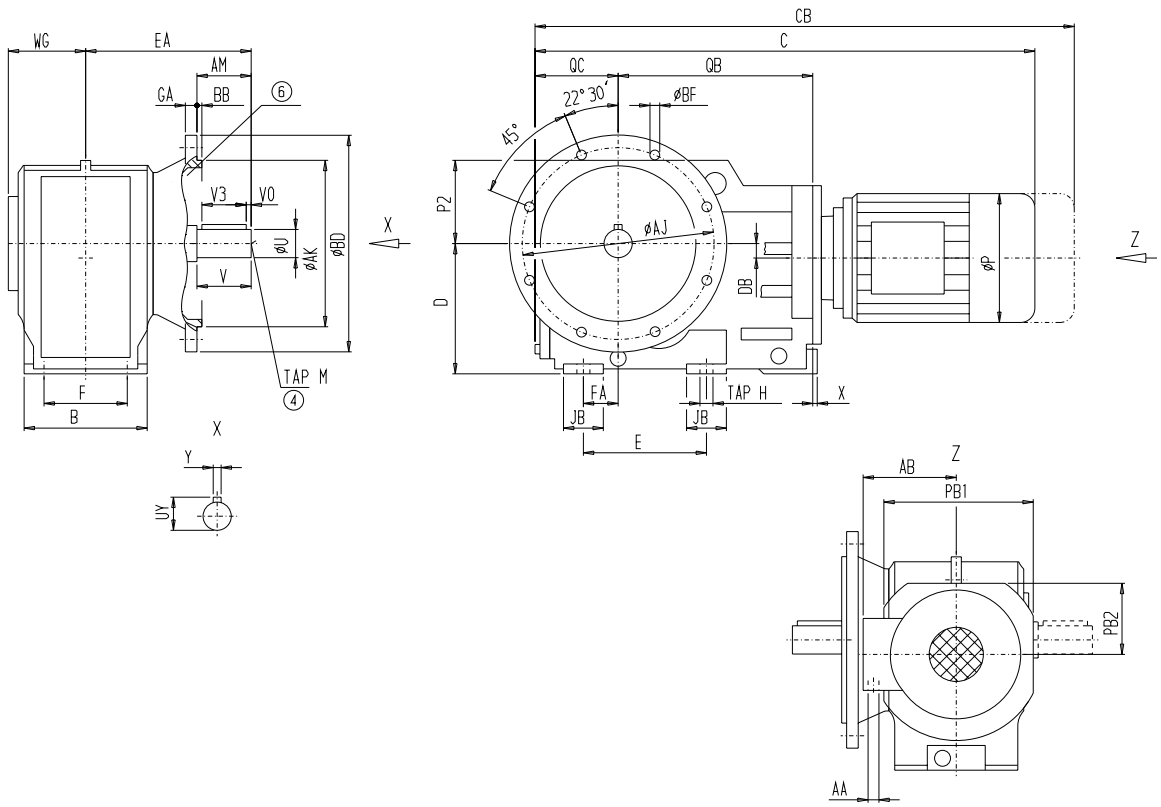
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Flange mounted

KF168

KF 510
[*mm*]





Flange

BD	AK	GA	AJ	BB	BF
550	*450*	*25*	*500*	*5*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
111,125	*210*	*177,8*	*17,196*	*122,43*	*25,4*	*210*	*1"-8UNC*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	EA	TAP H
350	*115*	*240*	*324*	*375*	*204*	*50*	*110*	*408*	*22*	*220,5*	*498*	*199*	*225*	*466*	*M30x48*

Motor

	KF168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1159,5*	*1260,5*	*258*	*181*	*181*	*1"+3/4"*	*568*
M132M	*1159,5*	*1260,5*	*258*	*181*	*181*	*1"+3/4"*	*589*
M160M	*1240,5*	*1357,5*	*310*	*199*	*199*	*1"+3/4"*	*603*
M160L	*1240,5*	*1357,5*	*310*	*199*	*199*	*1"+3/4"*	*617*
M180M	*1293,5*	*1411,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*648*
M180L	*1293,5*	*1411,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*655*
M200L	*1318,5*	*1448,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*704*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*1538*	*on request*	*555*	*432*	*on request*	*2x2"*	*1316*
LG280ZM incl. adapter	*1885*	*on request*	*555*	*432*	*on request*	*2x2"*	*1416*

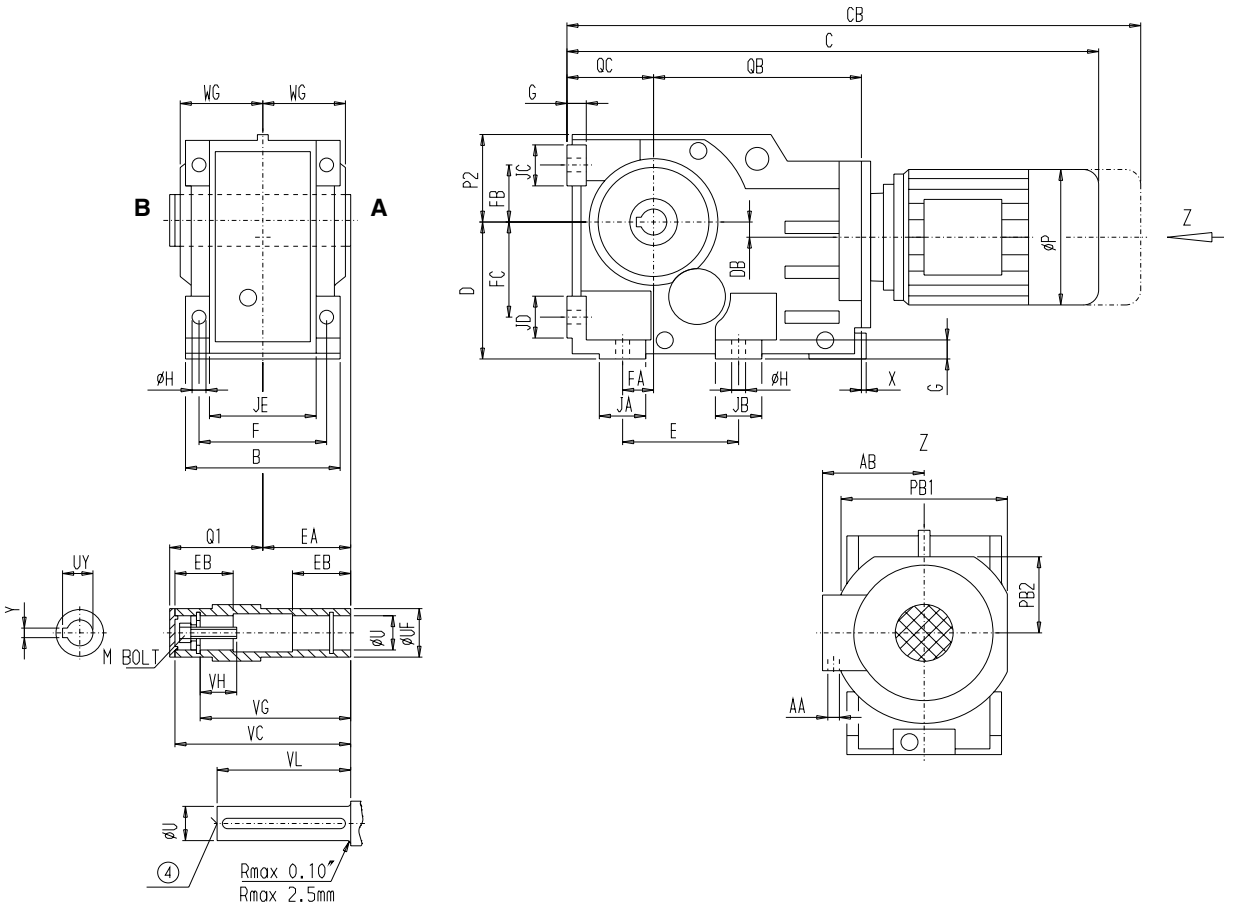
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted

KA168

KA 510

[inch]



4

Mounting

E	F	FA	G	H
13.78	12.99	4.53	1.77	1.54

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
4	5.906	16.14	14.409	2.09	13.39	1-8UNC	4.45	1	8.07	6.89	8.23

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
10.43	15.75	14.76	10.43	6.1	8.03	1.97	4.33	4.33	4.33	4.33	16.06	0.87	8.86	19.61	7.83	8.86

Motor

	KA168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	45.79	49.76	10.16	7.13	7.13	1“+3/4“	1079
M132M	45.79	49.76	10.16	7.13	7.13	1“+3/4“	1104
M160M	48.97	53.58	12.2	7.83	7.83	1“+3/4“	1157
M160L	48.97	53.58	12.2	7.83	7.83	1“+3/4“	1188
M180M	51.06	55.71	13.7	9.69	9.69	1 1/4“+3/4“	1231
M180L	51.06	55.71	13.7	9.69	9.69	1 1/4“+3/4“	1246
M200L	52.05	57.17	15.16	10.24	10.24	1 1/4“+3/4“	1354
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	60.72	on request	21.85	17.01	on request	2x2“	2703
LG280ZM incl. adapter	74.38	on request	21.85	17.01	on request	2x2“	2924

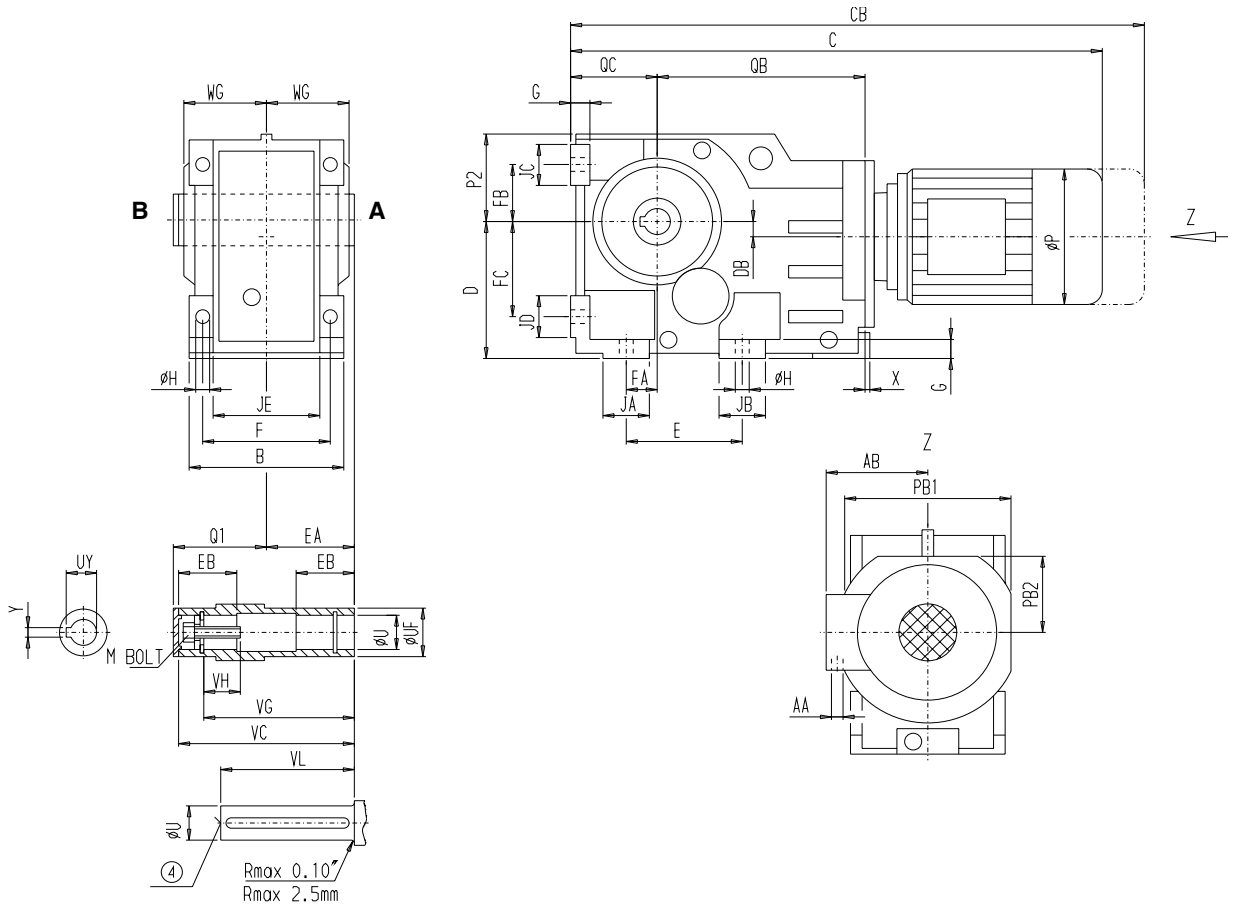
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted

KA168

KA 510

[*mm*]



Mounting

E	F	FA	G	H
350	*330*	*115*	*45*	*39*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
101,6	*150*	*410*	*366*	*53*	*340*	*1"-8UNC*	*113,03*	*25,4*	*205*	*175*	*209*

Gearcase

JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	X	QC	QB	WG	P2
265	*400*	*375*	*265*	*155*	*204*	*50*	*110*	*110*	*110*	*110*	*408*	*22*	*225*	*498*	*199*	*225*

Motor

	KA168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1164*	*1265*	*258*	*181*	*181*	*1"+3/4"*	*478*
M132M	*1164*	*1265*	*258*	*181*	*181*	*1"+3/4"*	*499*
M160M	*1245*	*1362*	*310*	*199*	*199*	*1"+3/4"*	*513*
M160L	*1245*	*1362*	*310*	*199*	*199*	*1"+3/4"*	*527*
M180M	*1298*	*1416*	*348*	*246*	*246*	*1 1/4"+3/4"*	*558*
M180L	*1298*	*1416*	*348*	*246*	*246*	*1 1/4"+3/4"*	*565*
M200L	*1323*	*1453*	*385*	*260*	*260*	*1 1/4"+3/4"*	*614*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*1543*	*on request*	*555*	*432*	*on request*	*2x2"*	*1226*
LG280ZM incl. adapter	*1890*	*on request*	*555*	*432*	*on request*	*2x2"*	*1326*

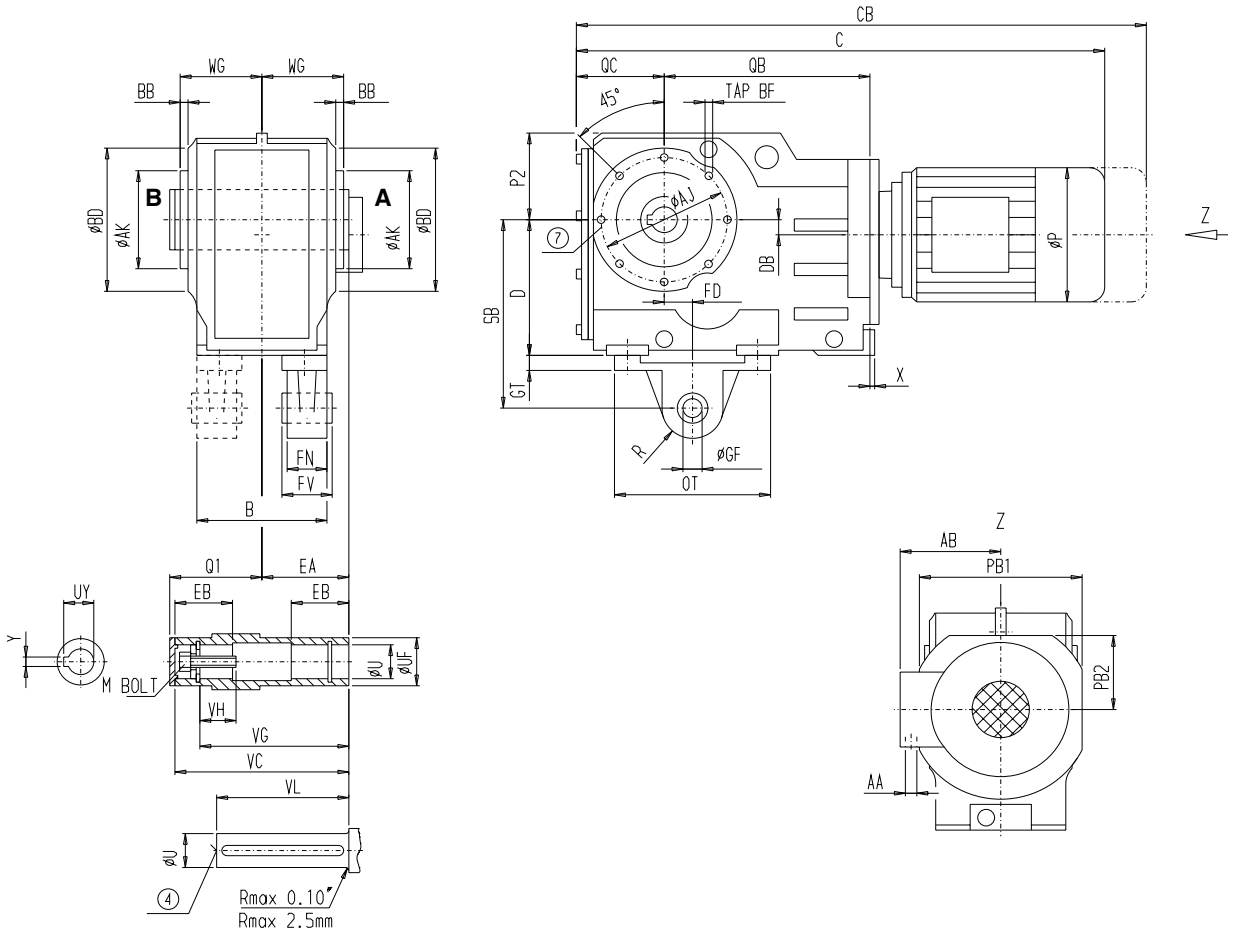
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD168

KAD 510

[inch]



Mounting

BD	AK	AJ	BB	WG	TAP BF
15.75	11.81	13.78	0.2	7.83	M20x34

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
4	5.906	16.14	14.409	2.09	13.39	1-8UNC	4.45	1	8.07	6.89	8.23

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
14.76	8.03	1.97	16.06	0.87	8.68	19.61	8.86

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
3.15	3.46	1.57	21.65	12.76	2.36	1.57	18.11	R2.56

Motor

	KAD168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	45.61	49.58	10.16	7.13	7.13	1"+3/4"	1159
M132M	45.61	49.58	10.16	7.13	7.13	1"+3/4"	1183
M160M	48.79	53.4	12.2	7.83	7.83	1"+3/4"	1237
M160L	48.79	53.4	12.2	7.83	7.83	1"+3/4"	1268
M180M	50.88	55.53	13.7	9.69	9.69	1 1/4"+3/4"	1311
M180L	50.88	55.53	13.7	9.69	9.69	1 1/4"+3/4"	1326
M200L	51.87	56.99	15.16	10.24	10.24	1 1/4"+3/4"	1434
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2"	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2"	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2"	on request
LG280S incl. adapter	60.55	on request	21.85	17.01	on request	2x2"	2783
LG280ZM incl. adapter	74.21	on request	21.85	17.01	on request	2x2"	3004

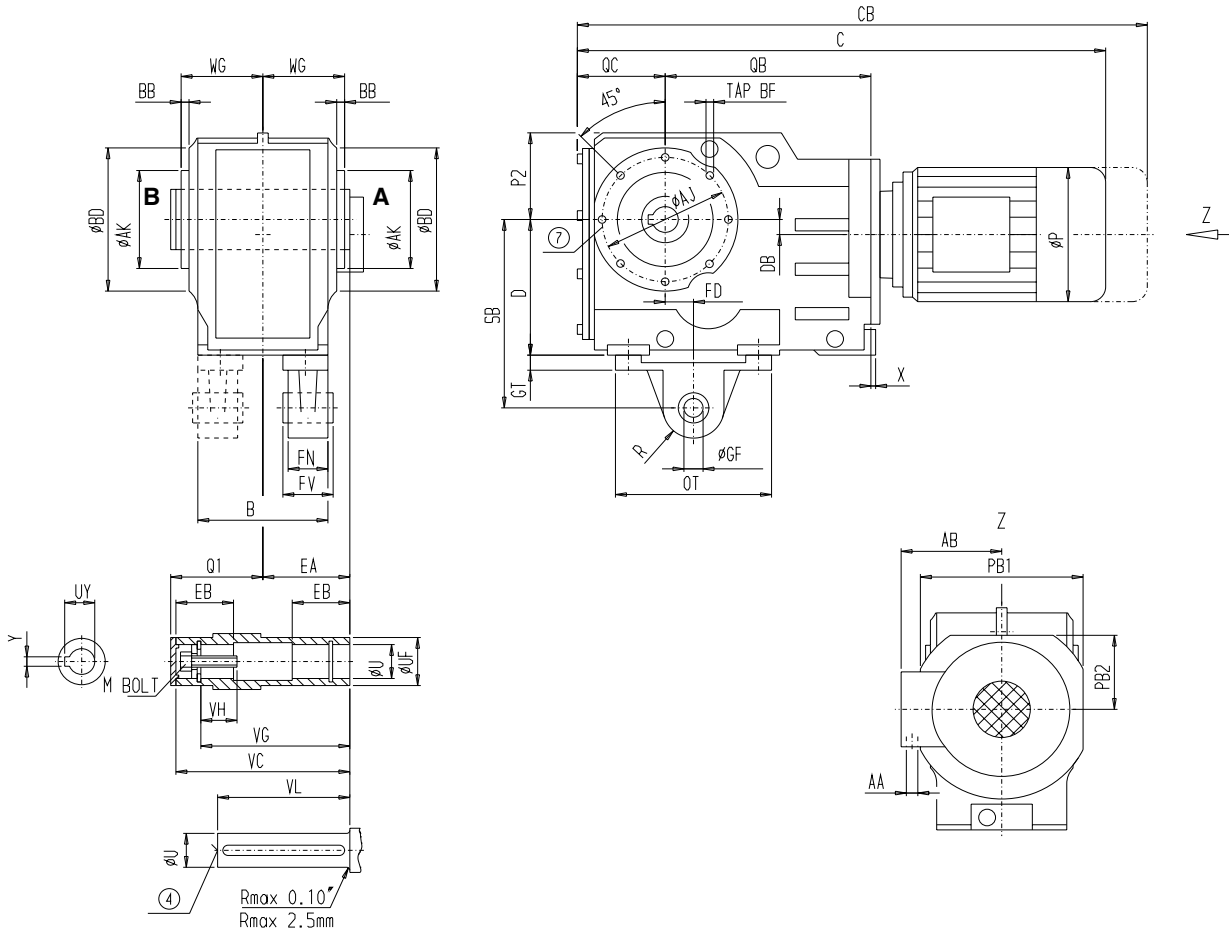
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD168

KAD 510

[*mm*]



Mounting

BD	AK	AJ	BB	WG	TAP BF
400	*300*	*350*	*5*	*199*	*M20x34*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
101,6	*150*	*410*	*366*	*53*	*340*	*1"-8UNC*	*113,03*	*25,4*	*205*	*175*	*209*

Gearcase

D	PB2	DB	PB1	X	QC	QB	P2
375	*204*	*50*	*408*	*22*	*220,5*	*498*	*225*

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R
80	*88*	*40*	*550*	*324*	*60*	*40*	*460*	*R65*

Motor

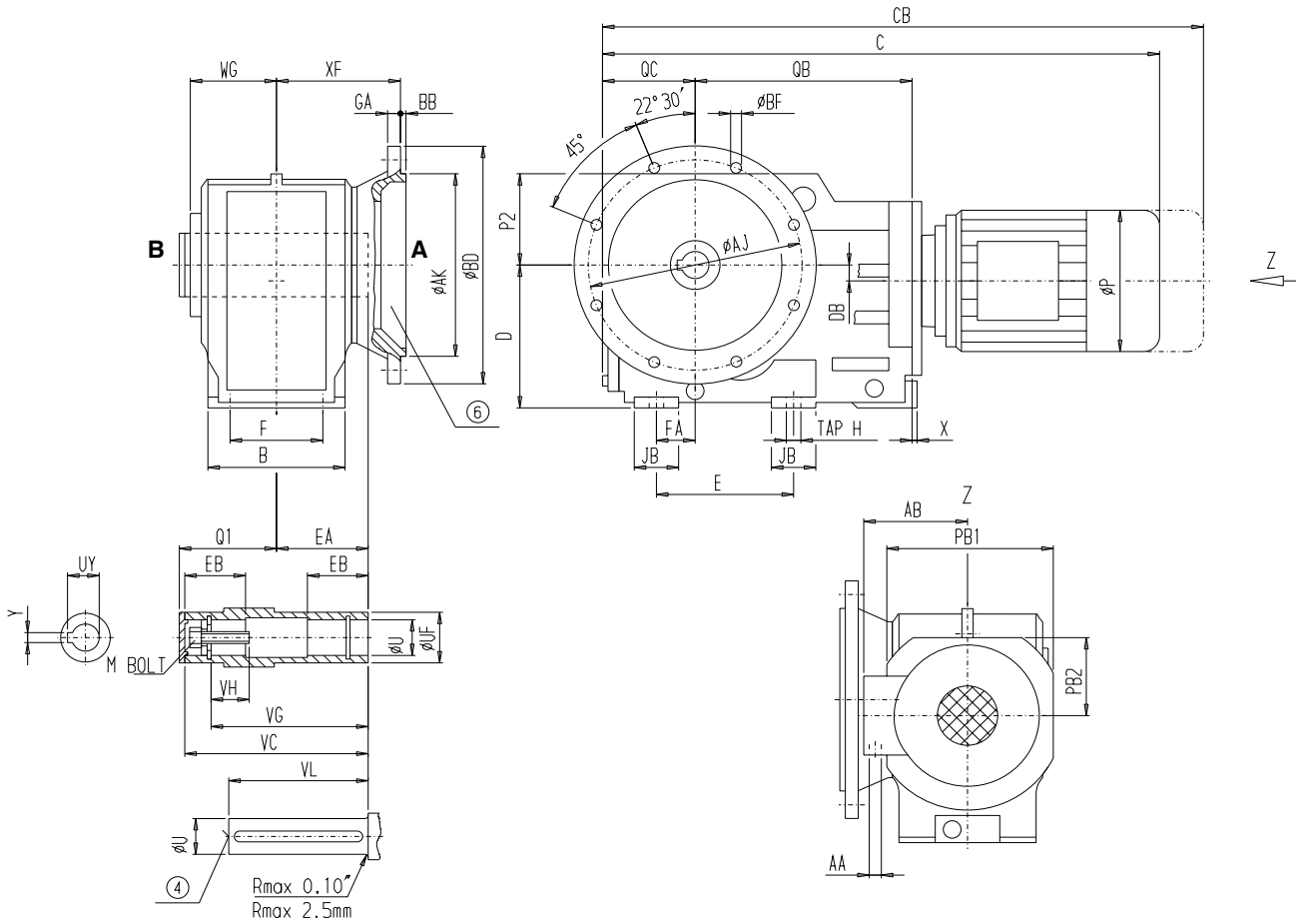
	KAD168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1159,5*	*1260,5*	*258*	*181*	*181*	*1"+3/4"*	*515*
M132M	*1159,5*	*1260,5*	*258*	*181*	*181*	*1"+3/4"*	*536*
M160M	*1240,5*	*1357,5*	*310*	*199*	*199*	*1"+3/4"*	*549*
M160L	*1240,5*	*1357,5*	*310*	*199*	*199*	*1"+3/4"*	*563*
M180M	*1293,5*	*1411,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*595*
M180L	*1293,5*	*1411,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*602*
M200L	*1318,5*	*1448,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*651*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*1538*	*on request*	*555*	*432*	*on request*	*2x2"*	*1262*
LG280ZM incl. adapter	*1885*	*on request*	*555*	*432*	*on request*	*2x2"*	*1362*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with flange

KAF168

KAF 510
[inch]



Flange

BD	AK	GA	AJ	BB	XF	BF
21.65	17.72	0.98	19.69	0.2	10.08	0.69

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
4	5.906	16.14	14.409	2.09	13.39	1-8UNC	4.45	1	8.07	6.89	8.23

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
13.78	4.53	9.45	12.76	14.76	8.03	1.97	4.33	16.06	0.87	8.68	19.61	7.83	8.86	M30x48

Motor

	KAF168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	45.61	49.58	10.16	7.13	7.13	1“+3/4“	1178
M132M	45.61	49.58	10.16	7.13	7.13	1“+3/4“	1203
M160M	48.79	53.4	12.2	7.83	7.83	1“+3/4“	1256
M160L	48.79	53.4	12.2	7.83	7.83	1“+3/4“	1287
M180M	50.88	55.53	13.7	9.69	9.69	1 1/4“+3/4“	1330
M180L	50.88	55.53	13.7	9.69	9.69	1 1/4“+3/4“	1345
M200L	51.87	56.99	15.16	10.24	10.24	1 1/4“+3/4“	1454
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	60.55	on request	21.85	17.01	on request	2x2“	2803
LG280ZM incl. adapter	74.21	on request	21.85	17.01	on request	2x2“	3024

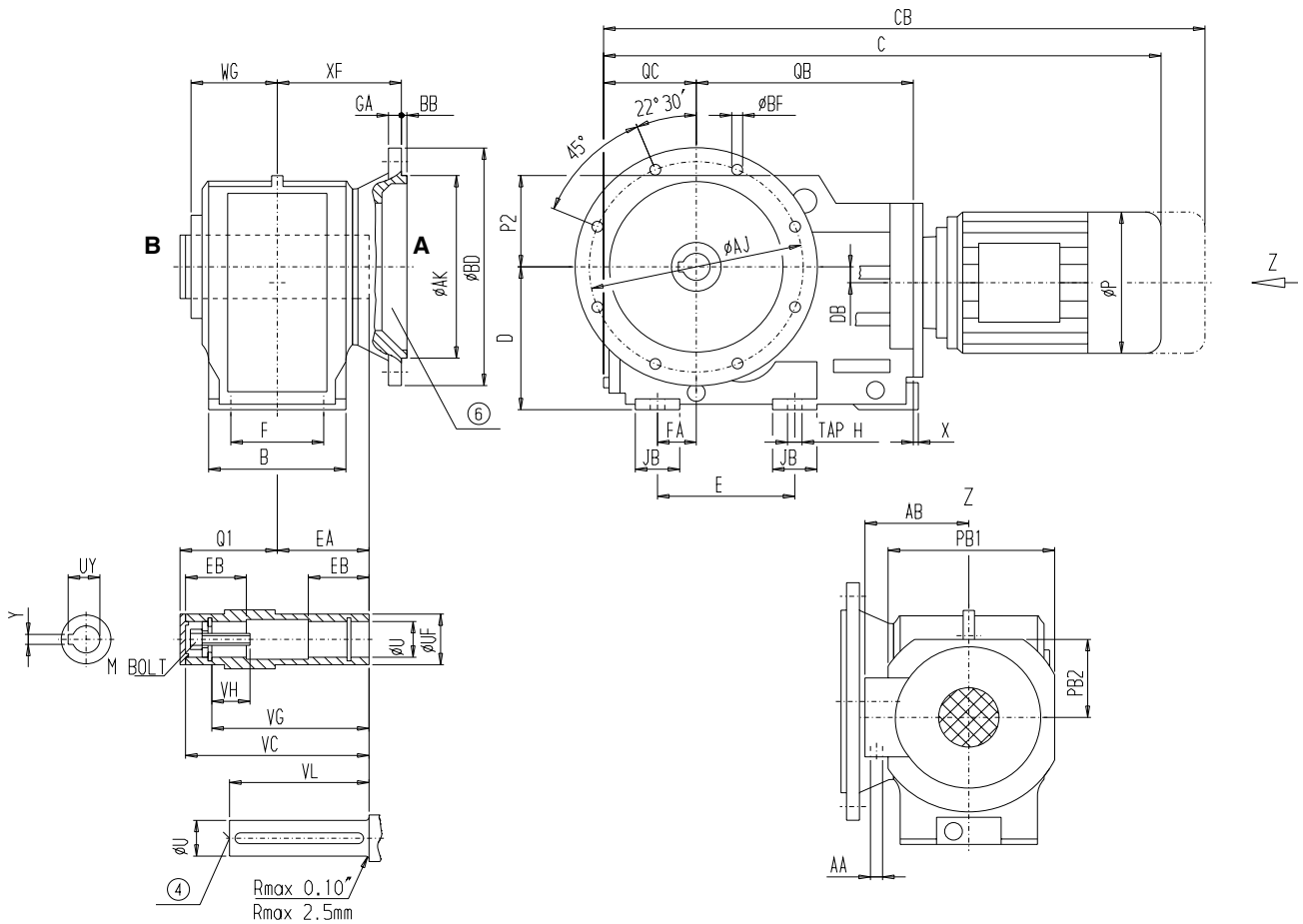
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with flange

KAF168

KAF 510

[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	BF
550	*450*	*25*	*500*	*5*	*256*	*17,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
101,6	*150*	*410*	*366*	*53*	*340*	*1"-8UNC*	*113,03*	*25,4*	*205*	*175*	*209*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
350	*115*	*240*	*324*	*375*	*204*	*50*	*110*	*408*	*22*	*220,5*	*498*	*199*	*225*	*M30x48*

Motor

	KAF168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1159,5*	*1260,5*	*258*	*181*	*181*	*1"+3/4"*	*523*
M132M	*1159,5*	*1260,5*	*258*	*181*	*181*	*1"+3/4"*	*544*
M160M	*1240,5*	*1357,5*	*310*	*199*	*199*	*1"+3/4"*	*558*
M160L	*1240,5*	*1357,5*	*310*	*199*	*199*	*1"+3/4"*	*572*
M180M	*1293,5*	*1411,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*603*
M180L	*1293,5*	*1411,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*610*
M200L	*1318,5*	*1448,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*659*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*1538*	*on request*	*555*	*432*	*on request*	*2x2"*	*1262*
LG280ZM incl. adapter	*1885*	*on request*	*555*	*432*	*on request*	*2x2"*	*1362*

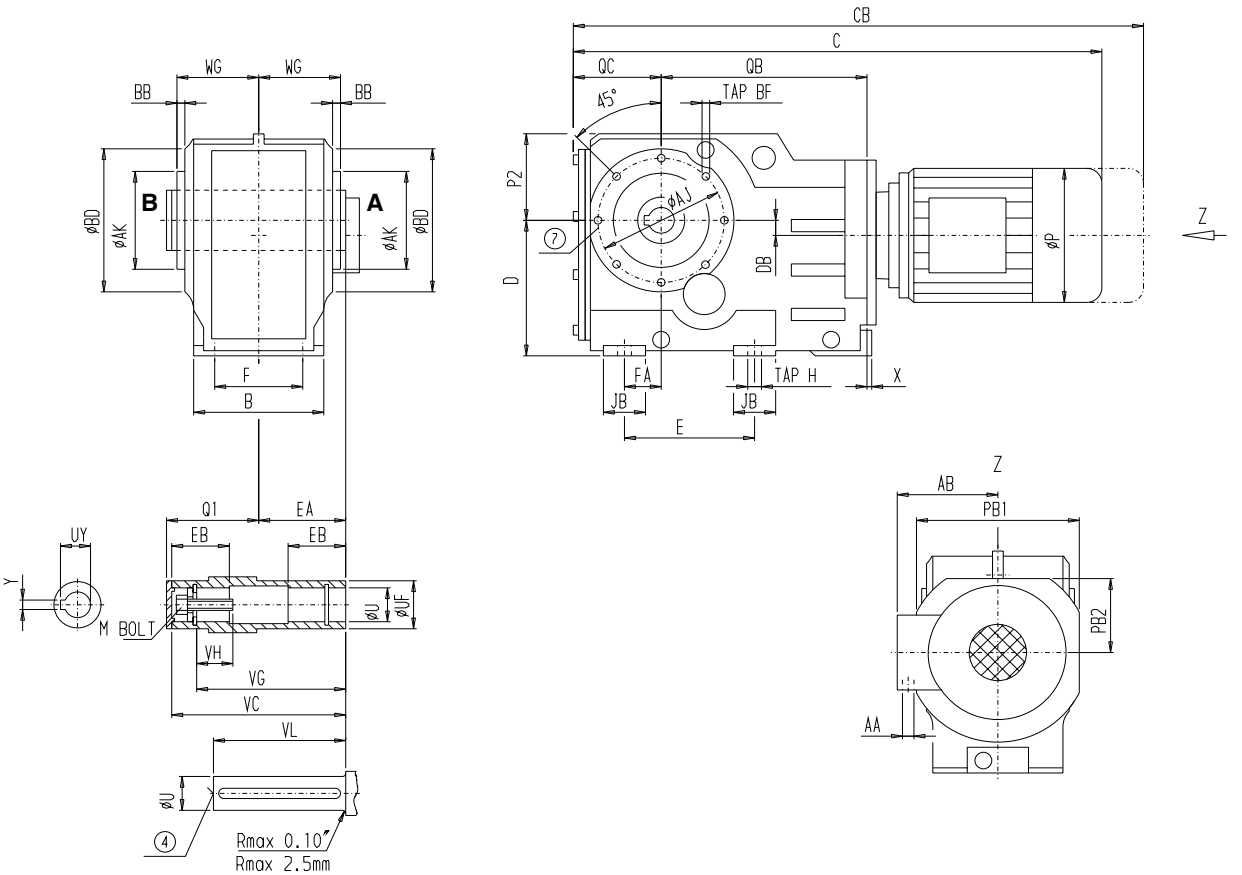
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ168

KAZ 510

[inch]



Mounting

BD	AK	AJ	BB	TAP BF
15.75	11.81	13.78	0.2	M20x34

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
4	5.906	16.14	14.409	2.09	13.39	1-8UNC	4.45	1	8.07	6.89	8.23

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
13.78	4.53	9.45	12.76	14.76	8.03	1.97	4.33	16.06	0.87	8.68	19.61	7.83	8.86	M30x48

Motor

	KAZ168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	45.61	49.58	10.16	7.13	7.13	1“+3/4“	1107
M132M	45.61	49.58	10.16	7.13	7.13	1“+3/4“	1131
M160M	48.79	53.4	12.2	7.83	7.83	1“+3/4“	1185
M160L	48.79	53.4	12.2	7.83	7.83	1“+3/4“	1216
M180M	50.88	55.53	13.7	9.69	9.69	1 1/4“+3/4“	1259
M180L	50.88	55.53	13.7	9.69	9.69	1 1/4“+3/4“	1274
M200L	51.87	56.99	15.16	10.24	10.24	1 1/4“+3/4“	1382
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	60.55	on request	21.85	17.01	on request	2x2“	2731
LG280ZM incl. adapter	74.21	on request	21.85	17.01	on request	2x2“	2952

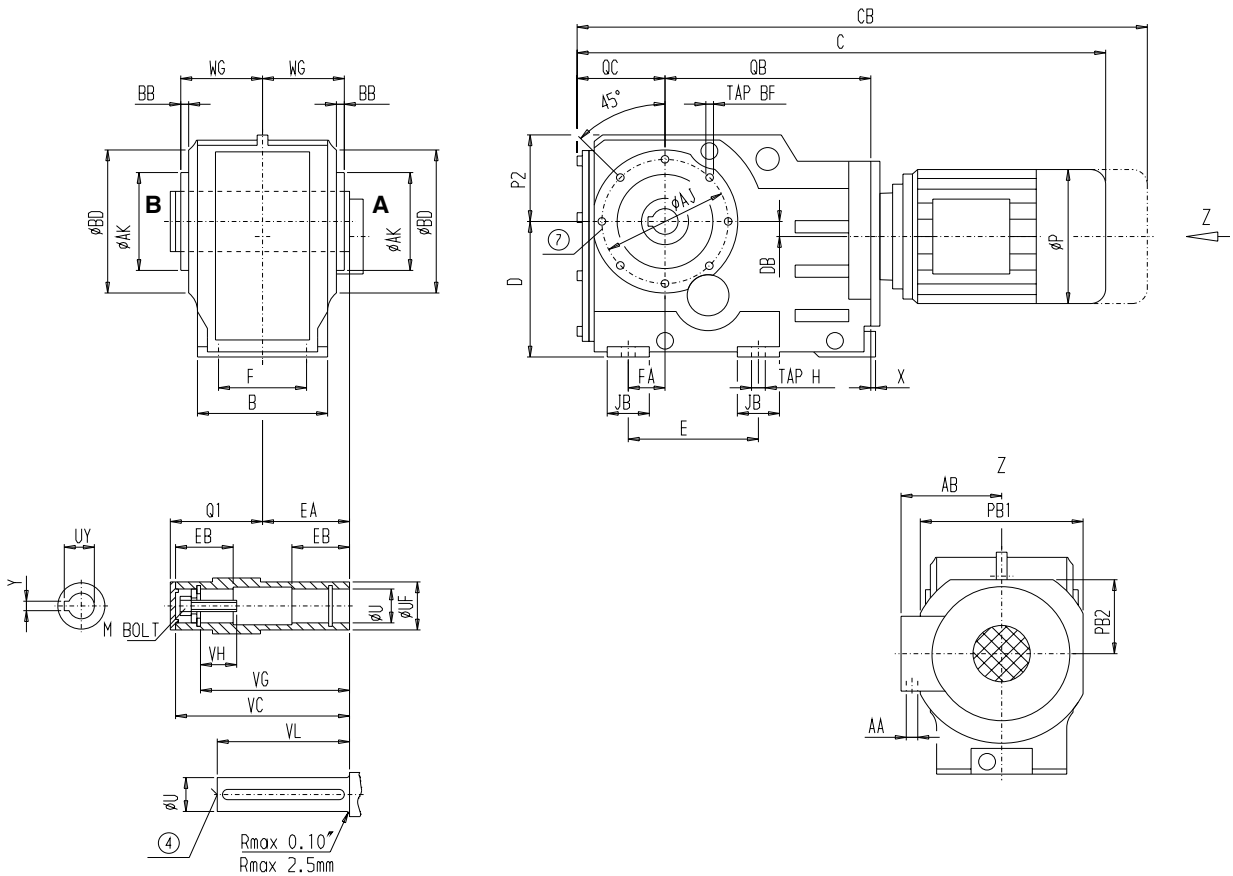
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ168

KAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
400	*300*	*350*	*5*	*M20x34*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
101,6	*150*	*410*	*366*	*53*	*340*	*1"-8UNC*	*113,03*	*25,4*	*205*	*175*	*209*

Gearcase

E	FA	F	B	D	PB2	DB	JB	PB1	X	QC	QB	WG	P2	TAP H
350	*115*	*240*	*324*	*375*	*204*	*50*	*110*	*408*	*22*	*220,5*	*498*	*199*	*225*	*M30x48*

Motor

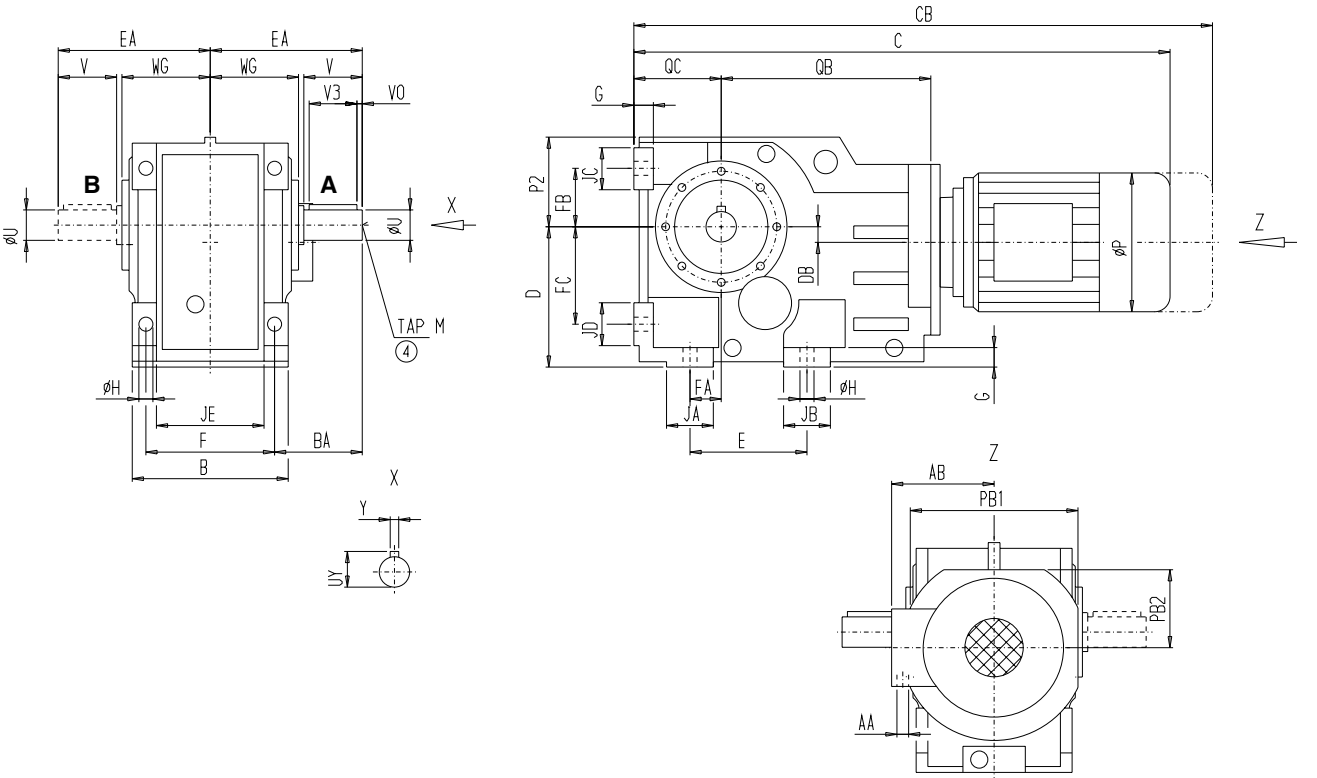
	KAZ168						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1159,5*	*1260,5*	*258*	*181*	*181*	1"+3/4"	*491*
M132M	*1159,5*	*1260,5*	*258*	*181*	*181*	1"+3/4"	*512*
M160M	*1240,5*	*1357,5*	*310*	*199*	*199*	1"+3/4"	*525*
M160L	*1240,5*	*1357,5*	*310*	*199*	*199*	1"+3/4"	*539*
M180M	*1293,5*	*1411,5*	*348*	*246*	*246*	1 1/4"+3/4"	*571*
M180L	*1293,5*	*1411,5*	*348*	*246*	*246*	1 1/4"+3/4"	*578*
M200L	*1318,5*	*1448,5*	*385*	*260*	*260*	1 1/4"+3/4"	*627*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	2x1 1/2"	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	2x1 1/2"	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	2x2"	*on request*
LG280S incl. adapter	*1538*	*on request*	*555*	*432*	*on request*	2x2"	*1230*
LG280ZM incl. adapter	*1885*	*on request*	*555*	*432*	*on request*	2x2"	*1330*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Foot mounted

K188

K 510
[inch]



4

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
4.75	8.27	7	0.677	5.29	1.25	9.84	1-8UNC

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	QC	QB	WG	P2	EA	H
14.96	5.51	16.54	1.97	13.39	19.69	17.72	12.6	7.09	8.86	2.7	5.12	5.12	5.12	5.12	17.72	11.02	21.1	9.49	10.06	18.11	1.54

Motor

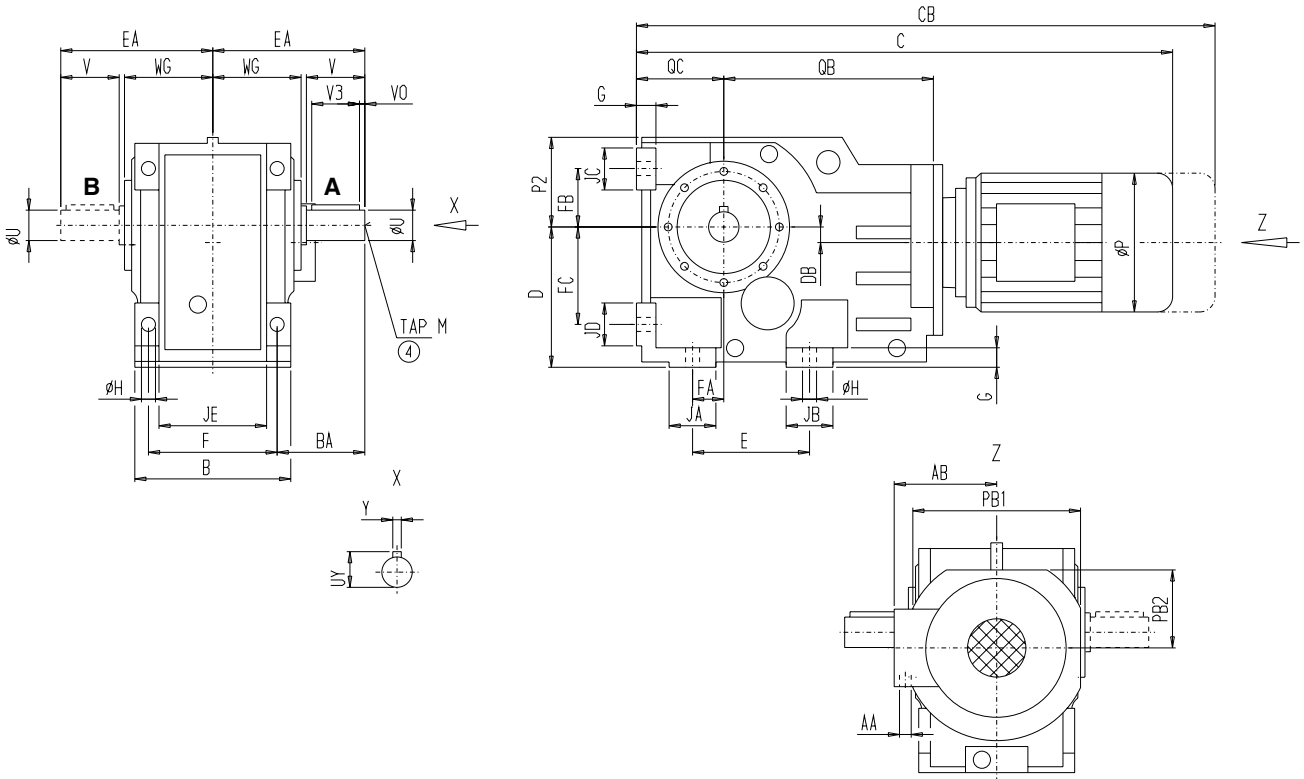
	K188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1728
M132M	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1753
M160M	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1805
M160L	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1836
M180M	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1879
M180L	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1894
M200L	55.14	60.26	15.16	10.24	10.24	1 1/4“+3/4“	2002
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	64.39	on request	21.85	17.01	on request	2x2“	3134
LG280ZM incl. adapter	77.5	on request	21.85	17.01	on request	2x2“	3354

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Foot mounted

K188

K 510
[*mm*]



Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
120,65	*210*	*177,8*	*17,196*	*134,37*	*31,75*	*250*	*1“-8UNC*

Gearcase

E	FA	F	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	QC	QB	WG	P2	EA	H
380	*140*	*420*	*50*	*340*	*500*	*450*	*320*	*180*	*225*	*68,5*	*130*	*130*	*130*	*130*	*450*	*280*	*536*	*241*	*255,5*	*460*	*39*

Motor

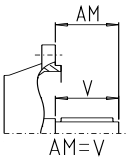
	K188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1242,5*	*1343,5*	*258*	*181*	*181*	*1“+3/4“*	*784*
M132M	*1242,5*	*1343,5*	*258*	*181*	*181*	*1“+3/4“*	*795*
M160M	*1323,5*	*1440,5*	*310*	*199*	*199*	*1“+3/4“*	*819*
M160L	*1323,5*	*1440,5*	*310*	*199*	*199*	*1“+3/4“*	*833*
M180M	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4“+3/4“*	*852*
M180L	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4“+3/4“*	*859*
M200L	*1401,5*	*1531,5*	*385*	*260*	*260*	*1 1/4“+3/4“*	*908*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2“*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2“*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2“*	*on request*
LG280S incl. adapter	*1635,5*	*on request*	*555*	*432*	*on request*	*2x2“*	*1421*
LG280ZM incl. adapter	*1968,5*	*on request*	*555*	*432*	*on request*	*2x2“*	*1521*

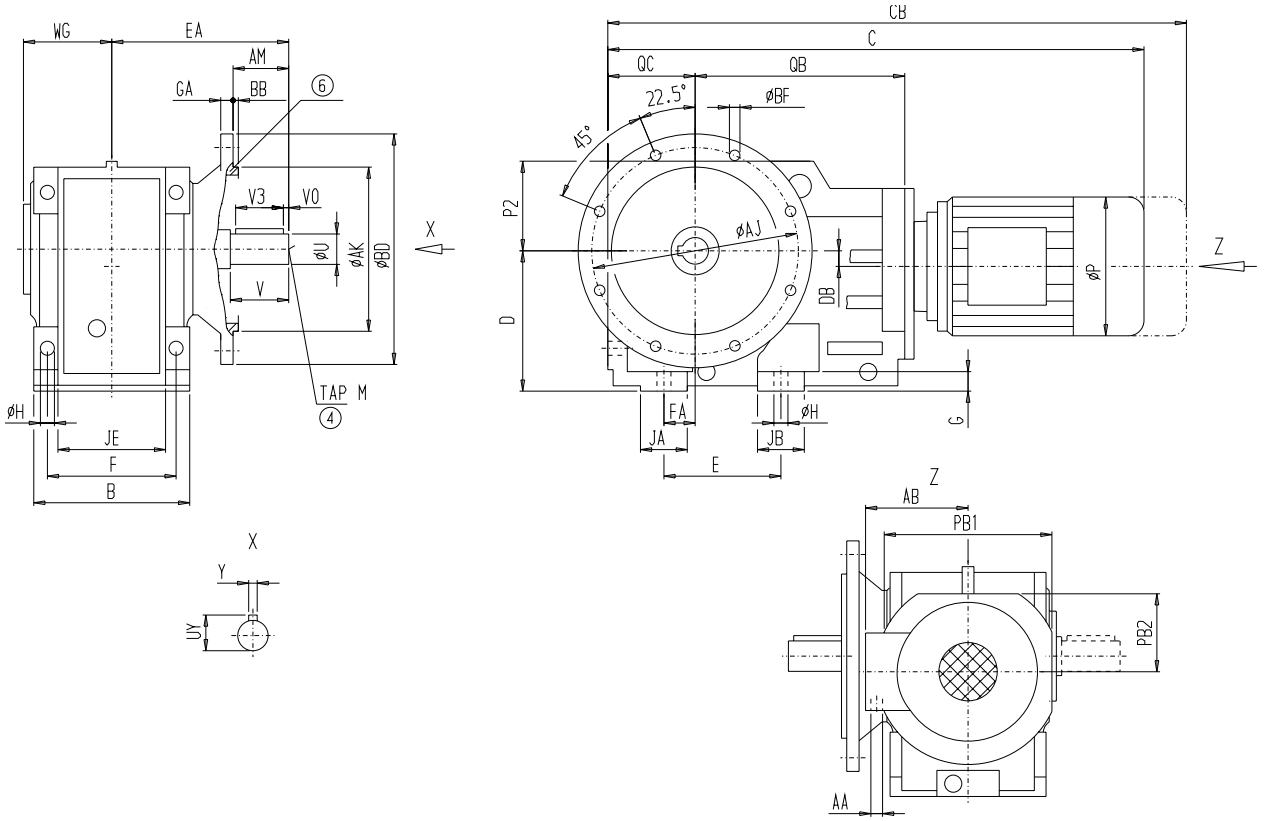
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Flange mounted

KF188

KF 510
[inch]





4

Flange

BD	AK	GA	AJ	BB	BF
25.98	21.65	1.1	23.62	0.24	0.87

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
4.75	8.27	7	0.677	5.29	1.25	8.27	1-8UNC

Gearcase

E	FA	F	G	JE	B	D	PB2	DB	JB	JA	PB1	QC	QB	WG	P2	EA	H
14.96	5.51	16.54	1.97	13.39	19.69	17.72	8.86	2.7	5.12	5.12	17.72	11.02	21.1	9.49	10.06	20.12	1.54

Motor

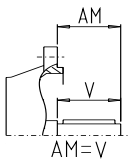
	KF188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1719
M132M	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1744
M160M	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1796
M160L	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1827
M180M	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1870
M180L	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1885
M200L	55.14	60.26	15.16	10.24	10.24	1 1/4“+3/4“	1993
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	64.39	on request	21.85	17.01	on request	2x2“	3134
LG280ZM incl. adapter	77.5	on request	21.85	17.01	on request	2x2“	3354

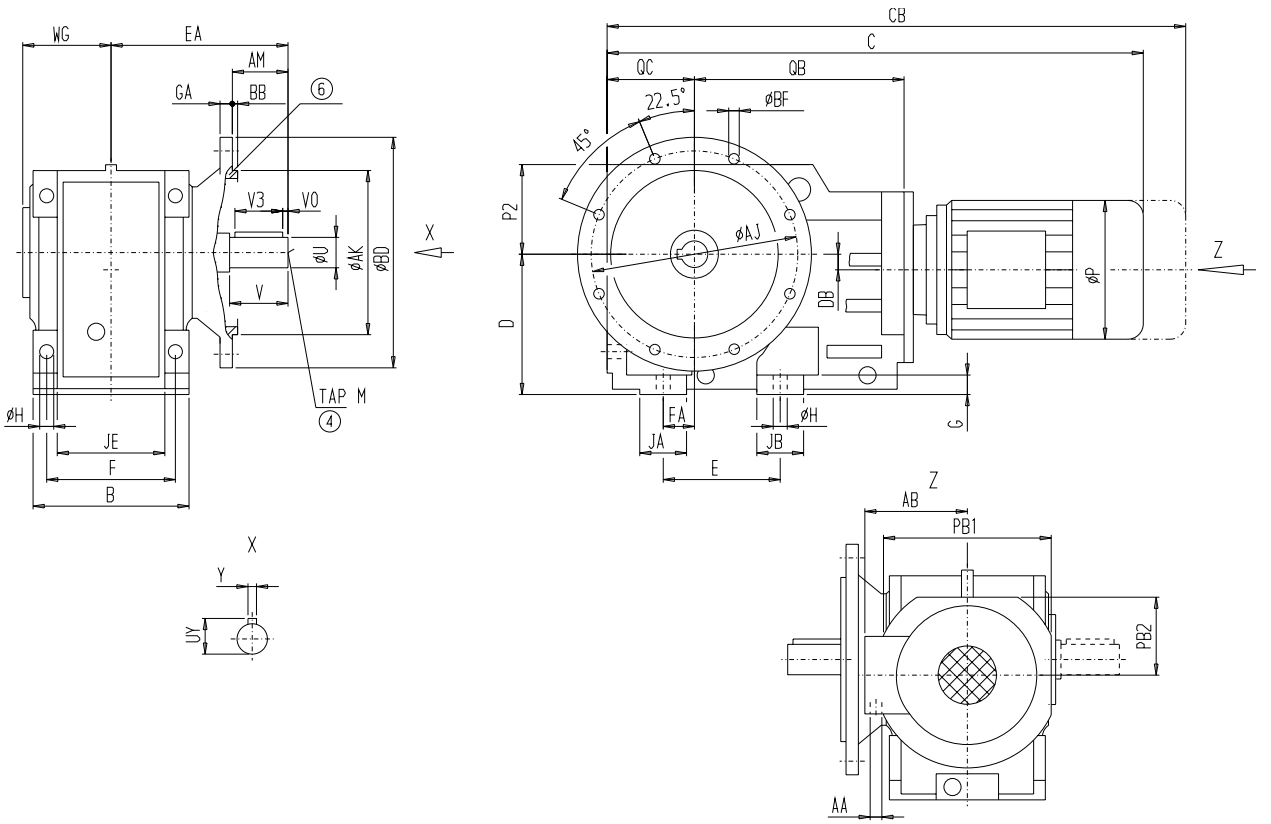
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Flange mounted

KF188

KF 510
[*mm*]





Flange

BD	AK	GA	AJ	BB	BF
660	*550*	*28*	*600*	*6*	*22*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
120,65	*210*	*177,8*	*17,196*	*134,37*	*31,75*	*210*	*1“-8UNC*

Gearcase

E	FA	F	G	JE	B	D	PB2	DB	JB	JA	PB1	QC	QB	WG	P2	EA	H
380	*140*	*420*	*50*	*340*	*500*	*450*	*225*	*68,5*	*130*	*130*	*450*	*280*	*536*	*241*	*255,5*	*511*	*39*

Motor

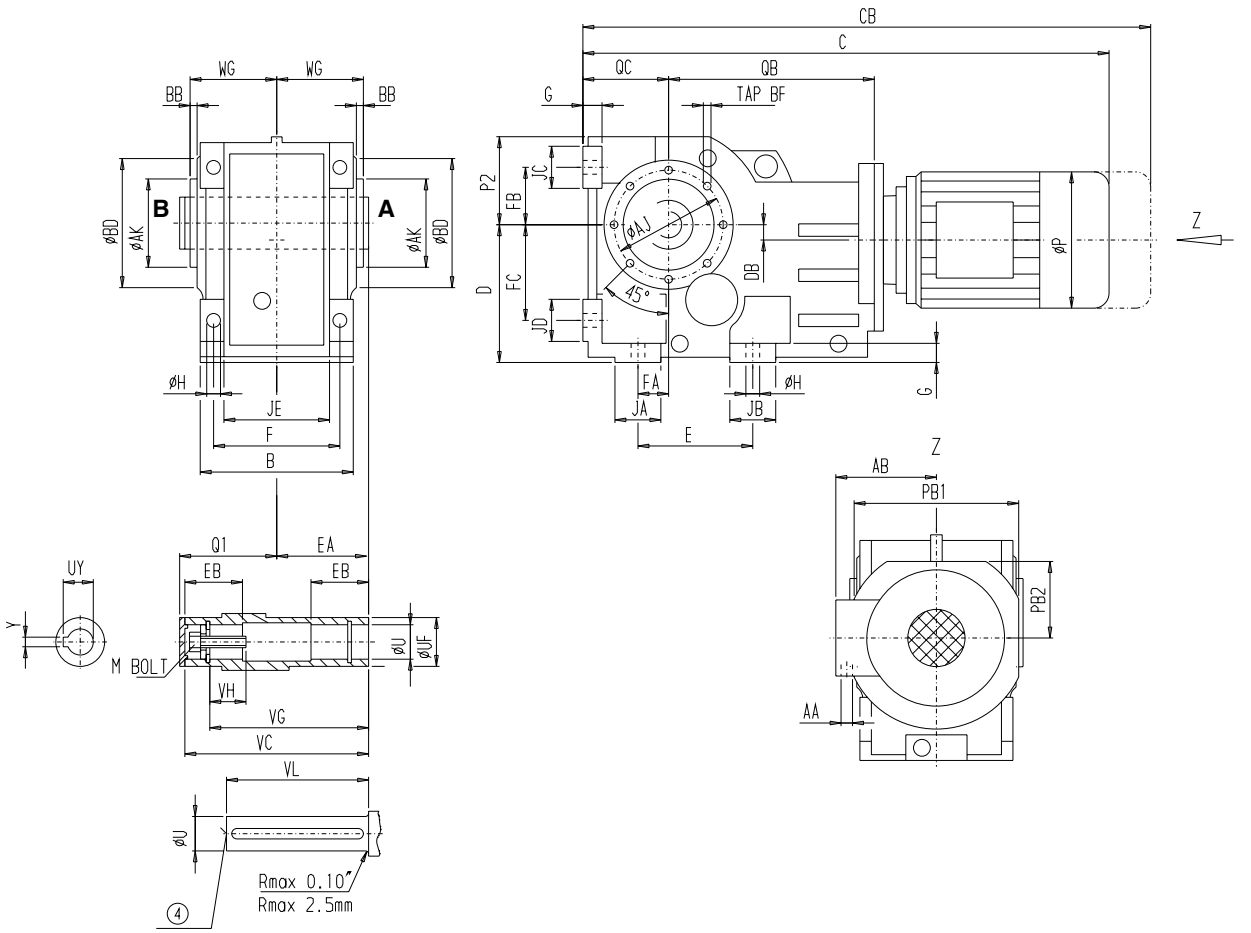
	KF188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1242,5*	*1343,5*	*258*	*181*	*181*	*1“+3/4“*	*839*
M132M	*1242,5*	*1343,5*	*258*	*181*	*181*	*1“+3/4“*	*850*
M160M	*1323,5*	*1440,5*	*310*	*199*	*199*	*1“+3/4“*	*874*
M160L	*1323,5*	*1440,5*	*310*	*199*	*199*	*1“+3/4“*	*888*
M180M	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4“+3/4“*	*907*
M180L	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4“+3/4“*	*914*
M200L	*1401,5*	*1531,5*	*385*	*260*	*260*	*1 1/4“+3/4“*	*963*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2“*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2“*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2“*	*on request*
LG280S incl. adapter	*1635,5*	*on request*	*555*	*432*	*on request*	*2x2“*	*1417*
LG280ZM incl. adapter	*1968,5*	*on request*	*555*	*432*	*on request*	*2x2“*	*1517*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted

KA188

KA 510
[inch]



Mounting

AK	BD	BB	AJ	TAP BF
11.81	15.75	0.2	13.78	M24x32

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
4.5	6.299	19.685	18.11	3.134	16.93	1-8UNC	4.959	1	9.84	8.661	10.2

Gearcase

E	F	FA	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	QC	QB	WG	P2	H
14.96	16.54	5.51	1.97	13.39	19.69	17.72	12.6	7.09	8.86	2.7	5.12	5.12	5.12	5.12	17.72	11.02	21.1	9.49	10.06	1.54

Motor

	KA188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1499
M132M	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1524
M160M	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1576
M160L	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1607
M180M	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1650
M180L	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1665
M200L	55.14	60.26	15.16	10.24	10.24	1 1/4“+3/4“	1773
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	64.39	on request	21.85	17.01	on request	2x2“	2905
LG280ZM incl. adapter	77.5	on request	21.85	17.01	on request	2x2“	3125

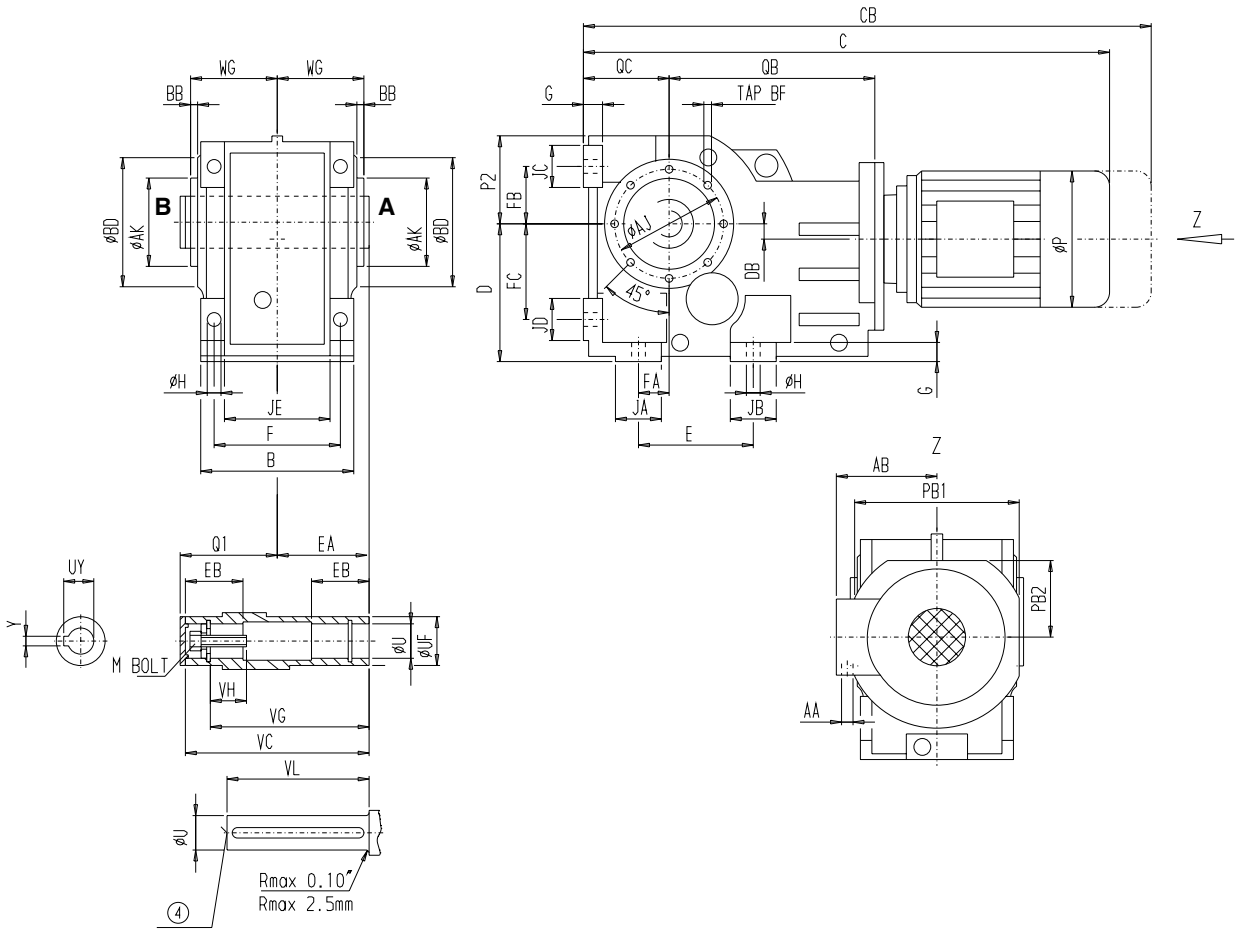
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted

KA188

KA 510

[*mm*]



4

Mounting

AK	BD	BB	AJ	TAP BF
300	*400*	*5*	*350*	*M24x32*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
114,3	*160*	*500*	*460*	*80*	*430*	*1"-8UNC*	*125,96*	*25,4*	*250*	*220*	*259*

Gearcase

E	F	FA	G	JE	B	D	FC	FB	PB2	DB	JB	JA	JC	JD	PB1	QC	QB	WG	P2	H
380	*420*	*140*	*50*	*340*	*500*	*450*	*320*	*180*	*225*	*68,5*	*130*	*130*	*130*	*130*	*450*	*280*	*536*	*241*	*255,5*	*39*

Motor

	KA188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1242,5*	*1343,5*	*258*	*181*	*181*	*1"+3/4"*	*680*
M132M	*1242,5*	*1343,5*	*258*	*181*	*181*	*1"+3/4"*	*691*
M160M	*1323,5*	*1440,5*	*310*	*199*	*199*	*1"+3/4"*	*715*
M160L	*1323,5*	*1440,5*	*310*	*199*	*199*	*1"+3/4"*	*729*
M180M	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*748*
M180L	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*755*
M200L	*1401,5*	*1531,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*804*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*1635,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1317*
LG280ZM incl. adapter	*1968,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1417*

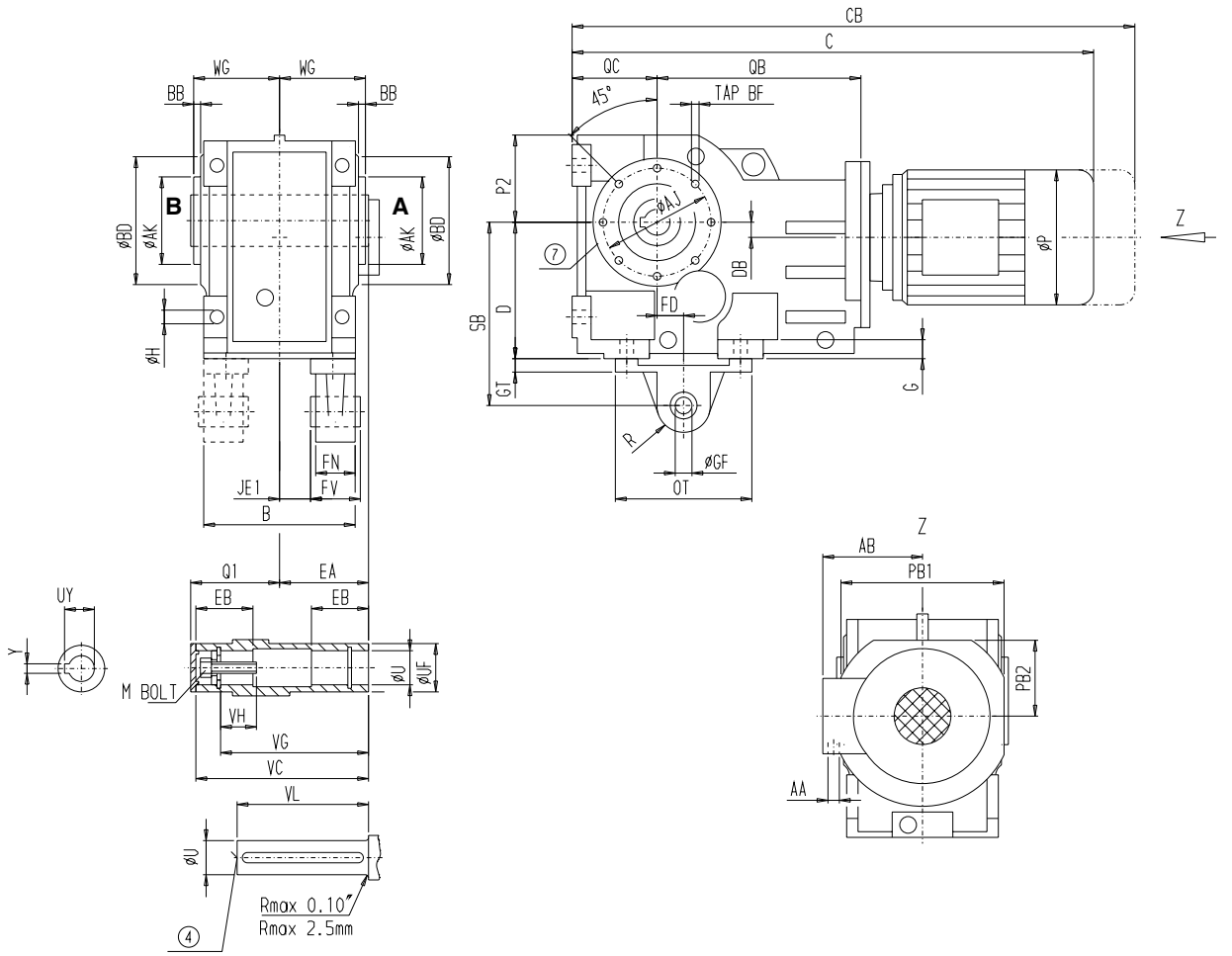
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD188

KAD 510

[inch]



Mounting

BD	AK	AJ	BB	WG	TAP BF
15.75	11.81	13.78	0.2	9.49	M24x32

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
4.5	6.299	19.685	18.11	3.134	16.93	1-8UNC	4.959	1	9.84	8.661	10.2

Gearcase

D	PB2	DB	PB1	QC	QB	P2
17.72	8.86	2.7	17.72	11.02	21.1	10.06

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R	JE
4.65	4.72	2.76	27.56	19.69	1.97	1.77	20.08	R4.13	5.08

Motor

	KAD188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1720
M132M	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1766
M160M	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1795
M160L	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1826
M180M	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1879
M180L	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1894
M200L	55.14	60.26	15.16	10.24	10.24	1 1/4“+3/4“	2002
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	64.39	on request	21.85	17.01	on request	2x2“	3134
LG280ZM incl. adapter	77.5	on request	21.85	17.01	on request	2x2“	3354

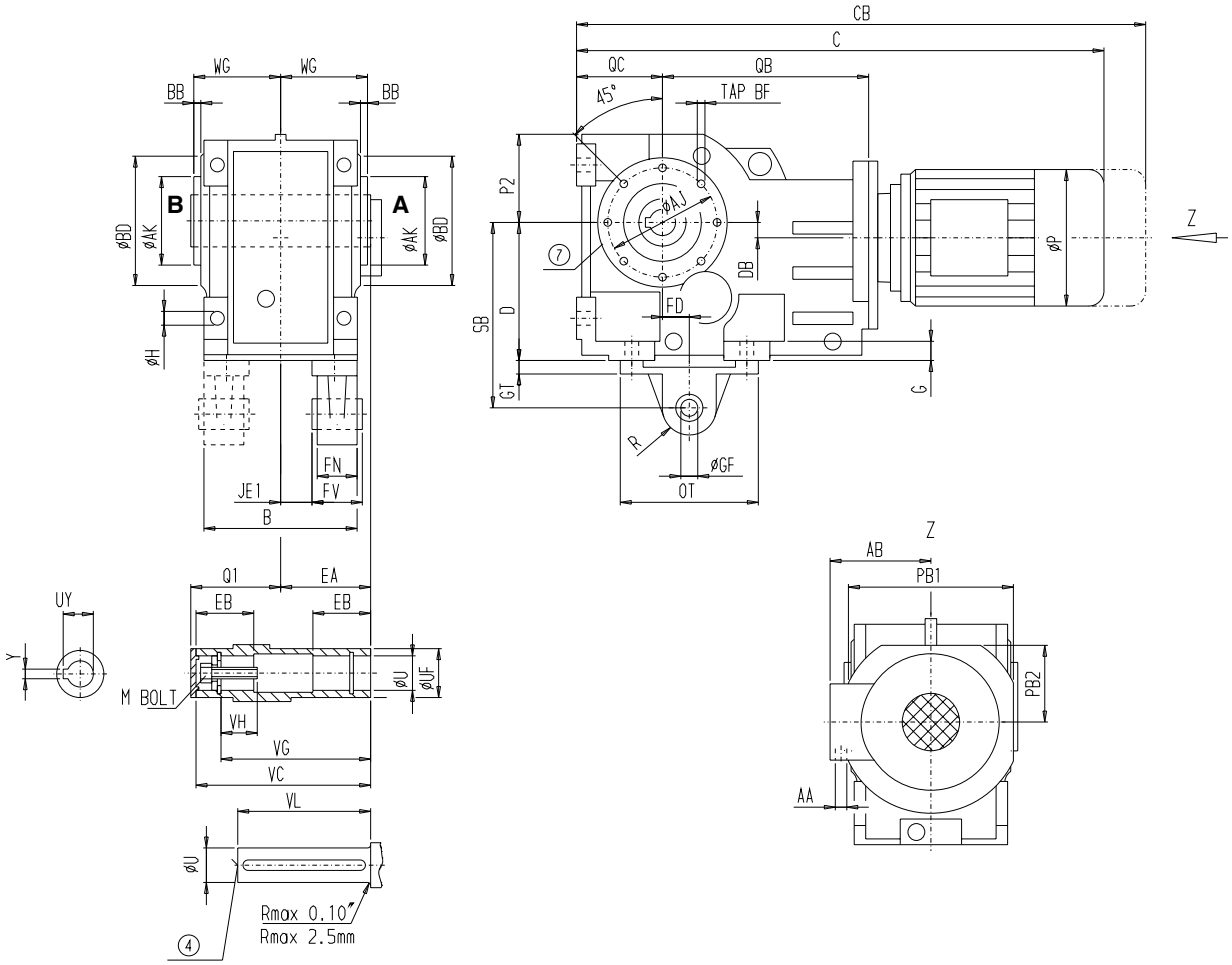
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with torque arm

KAD188

KAD 510

[*mm*]



Mounting

BD	AK	AJ	BB	WG	TAP BF
400	*300*	*350*	*5*	*241*	*M24x32*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
114,3	*160*	*500*	*460*	*80*	*430*	*1"-8UNC*	*125,96*	*25,4*	*250*	*220*	*259*

Gearcase

D	PB2	DB	PB1	QC	QB	P2
450	*225*	*68,5*	*450*	*280*	*536*	*255,5*

Torque Arm

FN	FV	GF	SB	B	FD	GT	OT	R	JE
118	*120*	*70*	*700*	*500*	*50*	*45*	*510*	*R105*	*129*

Motor

	KAD188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1242,5*	*1343,5*	*258*	*181*	*181*	*1"+3/4"*	*704*
M132M	*1242,5*	*1343,5*	*258*	*181*	*181*	*1"+3/4"*	*715*
M160M	*1323,5*	*1440,5*	*310*	*199*	*199*	*1"+3/4"*	*739*
M160L	*1323,5*	*1440,5*	*310*	*199*	*199*	*1"+3/4"*	*753*
M180M	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*772*
M180L	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*779*
M200L	*1401,5*	*1531,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*828*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*1635,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1421*
LG280ZM incl. adapter	*1968,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1521*

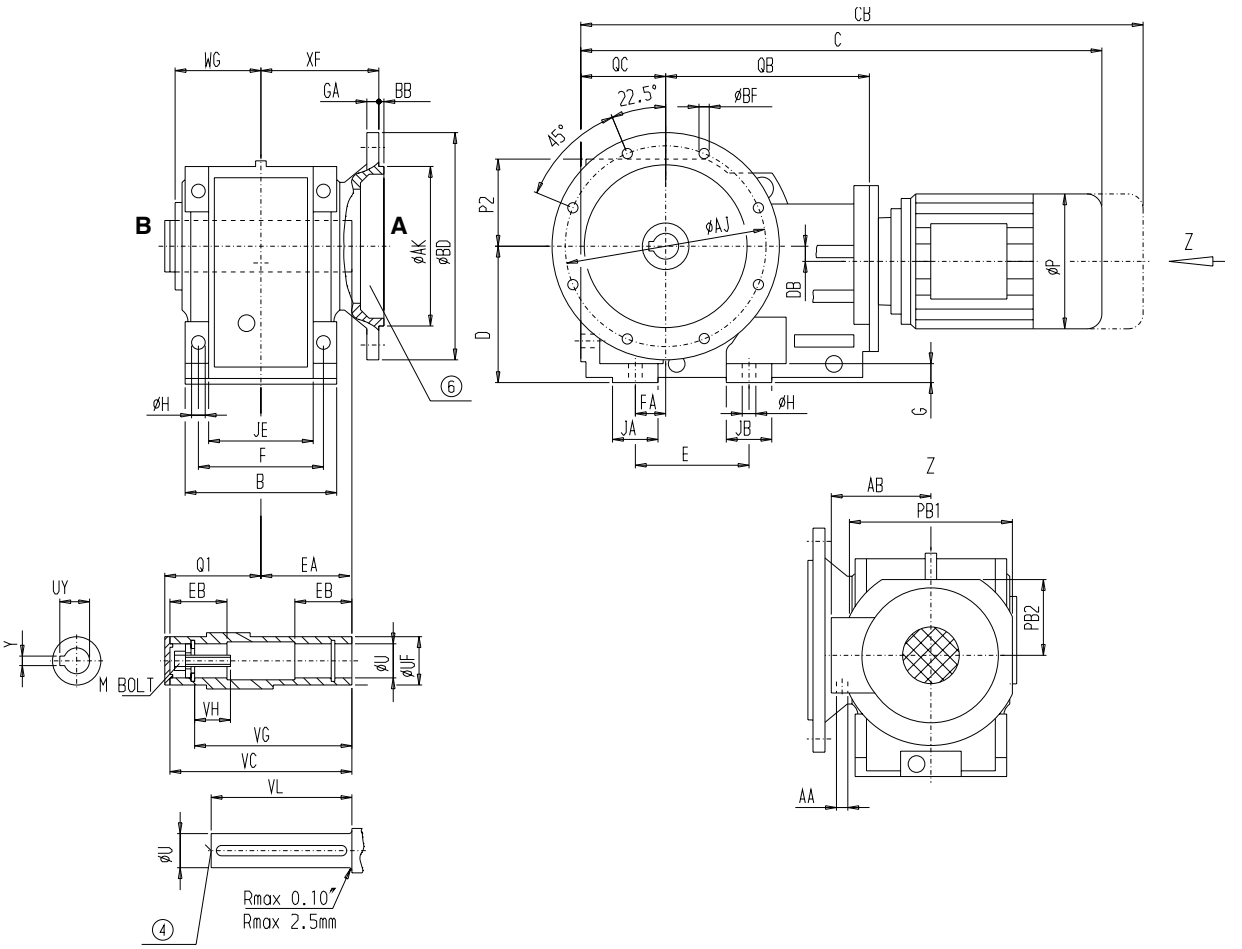
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with flange

KAF188

KAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	XF	BF
25.98	21.65	1.1	23.62	0.24	12.2	0.87

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
4.5	6.299	19.685“	18.11	3.134	16.93	1-8UNC	4.959	1	9.84	8.661	10.2

Gearcase

E	FA	F	B	JE	G	D	PB2	DB	JB	JA	PB1	QC	QB	WG	P2	H
14.96	5.51	16.54	19.69	13.38	1.97	17.72	8.86	2.7	5.12	5.12	17.72	11.02	21.1	9.49	10.06	1.535

Motor

	KAF188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1571
M132M	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1595
M160M	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1647
M160L	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1678
M180M	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1721
M180L	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1737
M200L	55.14	60.26	15.16	10.24	10.24	1 1/4“+3/4“	1845
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	64.39	on request	21.85	17.01	on request	2x2“	2777
LG280ZM incl. adapter	77.5	on request	21.85	17.01	on request	2x2“	2997

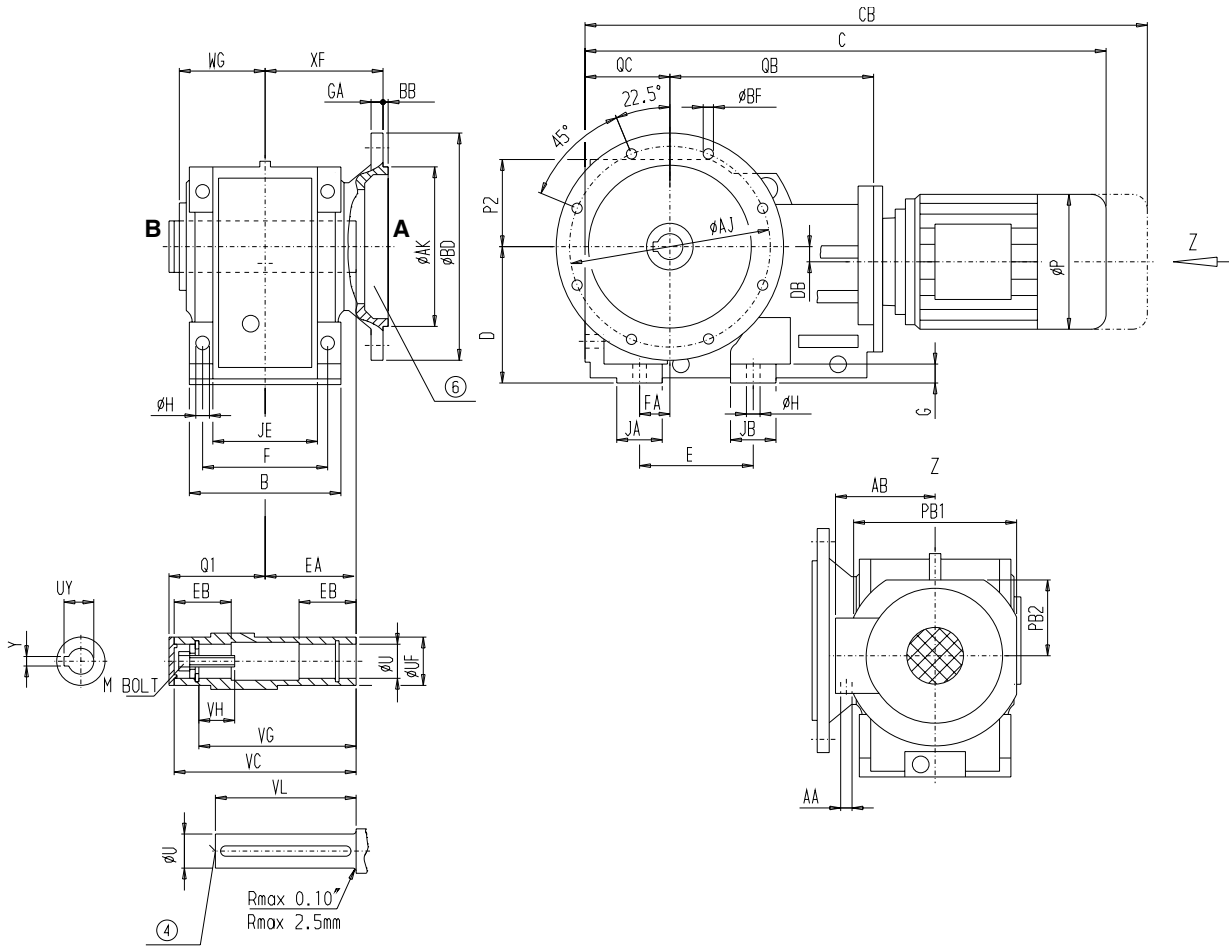
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with flange

KAF188

KAF 510

[*mm*]



Flange

BD	AK	GA	AJ	BB	XF	BF
660	*550*	*28*	*600*	*6*	*310*	*22*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
114,3	*160*	*500*	*460*	*80*	*430*	*1"-8UNC*	*125,96*	*25,4*	*250*	*220*	*259*

Gearcase

E	FA	F	B	JE	G	D	PB2	DB	JB	JA	PB1	QC	QB	WG	P2	H
380	*140*	*420*	*500*	*340*	*50*	*450*	*225*	*68,5*	*130*	*130*	*450*	*280*	*536*	*241*	*255,5*	*39*

Motor

	KAF188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1242,5*	*1343,5*	*258*	*181*	*181*	*1"+3/4"*	*715*
M132M	*1242,5*	*1343,5*	*258*	*181*	*181*	*1"+3/4"*	*726*
M160M	*1323,5*	*1440,5*	*310*	*199*	*199*	*1"+3/4"*	*750*
M160L	*1323,5*	*1440,5*	*310*	*199*	*199*	*1"+3/4"*	*764*
M180M	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*783*
M180L	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*790*
M200L	*1401,5*	*1531,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*839*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*1635,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1350*
LG280ZM incl. adapter	*1968,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1450*

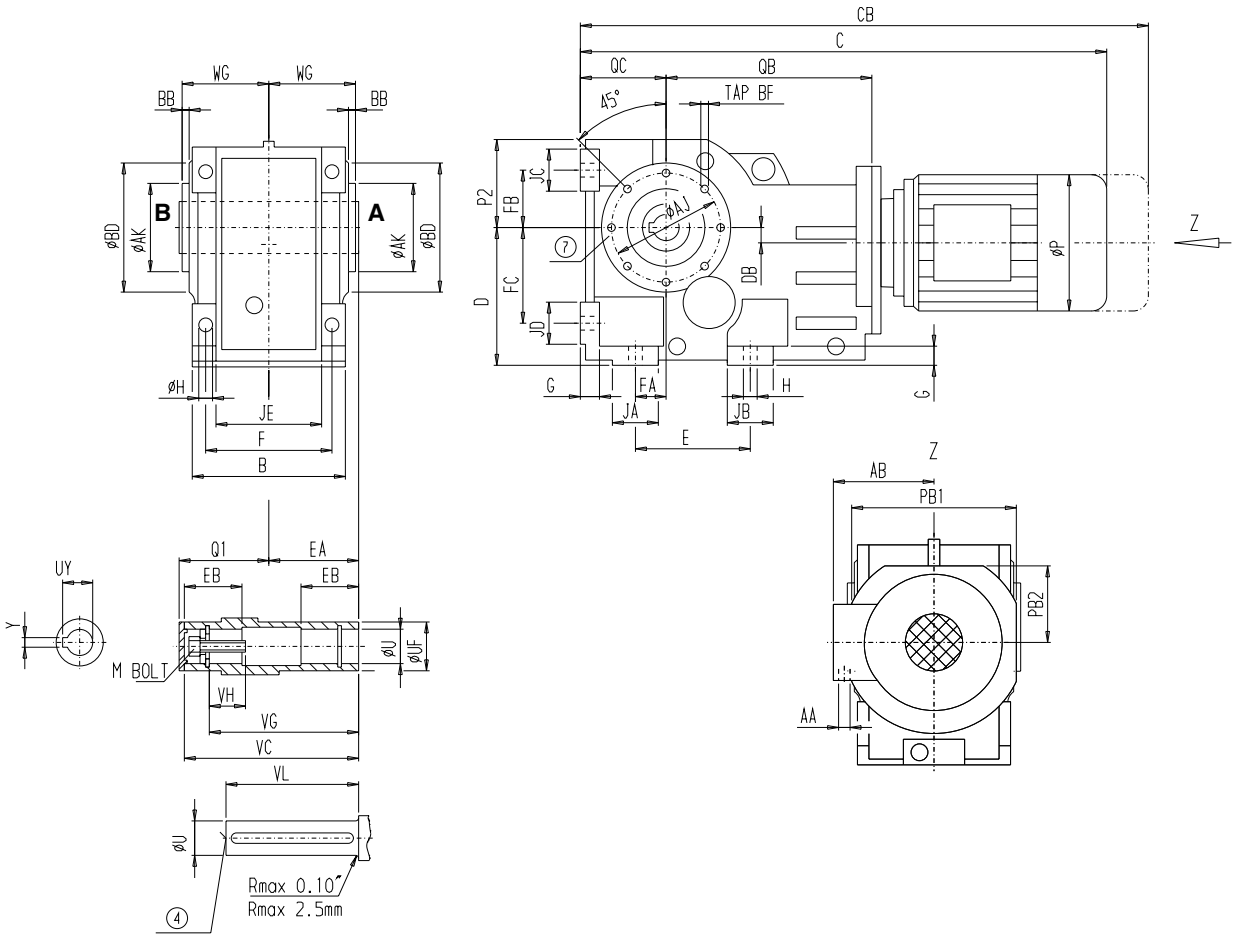
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 4 - 69 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ188

KAZ 510

[inch]



4

Mounting

BD	AK	AJ	BB	TAP BF
15.75	11.81	13.78	0.2	M24x32

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
4.5“	6.299	19.685“	18.11	3.134	16.93	1-8UNC	4.959	1	9.84	8.661	10.2

Gearcase

E	FA	F	FC	FB	G	JE	B	D	PB2	DB	JB	JA	JC	JD	PB1	QC	QB	WG	P2	H
14.96	5.51	11.02	12.6	7.09	1.97	13.38	19.69	17.72	8.86	2.7	5.12	5.12	5.12	5.12	17.72	11.02	21.1	9.49	10.06	1.54

Motor

	KAZ188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1720
M132M	48.88	52.85	10.16	7.13	7.13	1“+3/4“	1766
M160M	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1795
M160L	52.06	56.67	12.2	7.83	7.83	1“+3/4“	1825
M180M	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1879
M180L	54.15	58.8	13.7	9.69	9.69	1 1/4“+3/4“	1894
M200L	55.14	60.26	15.16	10.24	10.24	1 1/4“+3/4“	2002
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	64.39	on request	21.85	17.01	on request	2x2“	2777
LG280ZM incl. adapter	77.5	on request	21.85	17.01	on request	2x2“	2997

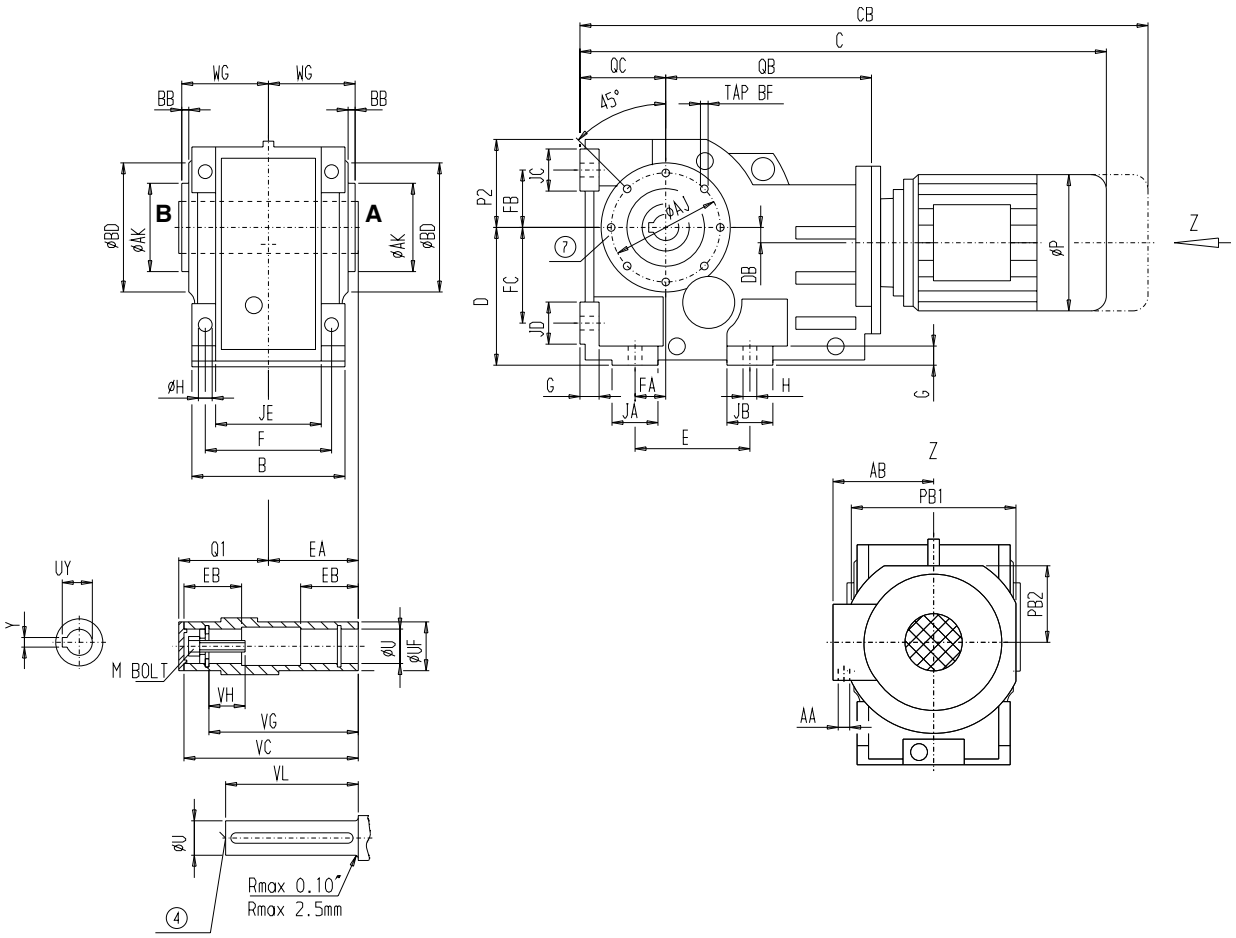
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Bevel Helical Gear Motors
Shaft mounted with housing flange (C-type)

KAZ188

KAZ 510

[*mm*]



Mounting

BD	AK	AJ	BB	TAP BF
400	*300*	*350*	*5*	*M24x32*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
114,3	*160*	*500*	*460*	*80*	*430*	*1"-8UNC*	*125,96*	*25,4*	*250*	*220*	*259*

Gearcase

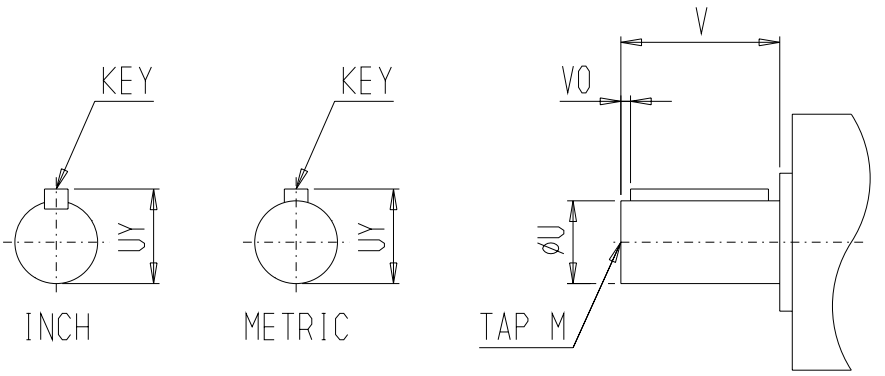
E	FA	F	FC	FB	G	JE	B	D	PB2	DB	JB	JA	JC	JD	PB1	QC	QB	WG	P2	H
380	*140*	*420*	*320*	*180*	*50*	*340*	*500*	*450*	*225*	*68,5*	*130*	*130*	*130*	*130*	*450*	*280*	*536*	*241*	*255,5*	*39*

Motor

	KAZ188						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*1242,5*	*1343,5*	*258*	*181*	*181*	*1"+3/4"*	*680*
M132M	*1242,5*	*1343,5*	*258*	*181*	*181*	*1"+3/4"*	*691*
M160M	*1323,5*	*1440,5*	*310*	*199*	*199*	*1"+3/4"*	*715*
M160L	*1323,5*	*1440,5*	*310*	*199*	*199*	*1"+3/4"*	*729*
M180M	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*748*
M180L	*1376,5*	*1494,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*755*
M200L	*1401,5*	*1531,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*804*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*1635,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1350*
LG280ZM incl. adapter	*1968,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1450*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 4 - 70 ** for voltage ratio 1:2

Available Output Solid Shafts



INCH

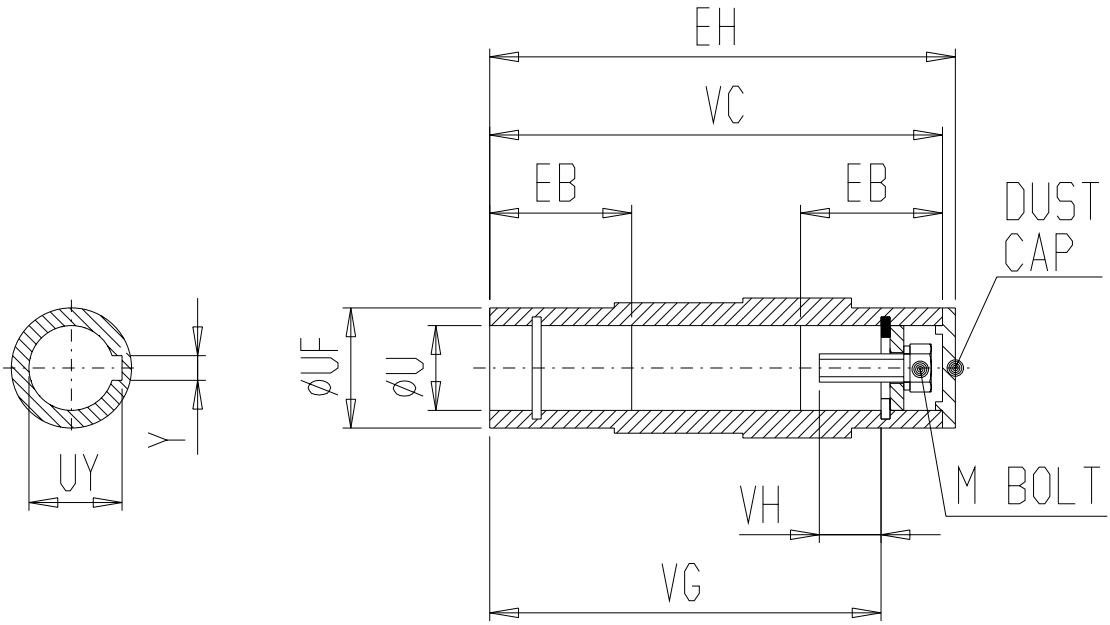
Size	U [inch]	UY [inch]	V [inch]	VO [inch]	KEY [inch]	TAP M [inch]
B./B.F28	3/4	0.83	1.57	0.01	3/16 x 3/16 x 1 1/4	1/4 - 20 x 0.63
B./B.F38	1	1.11	1.97	0.252	1/4 x 1/4 x 1 1/2	3/8 - 16 x 0.87
K./K.F38 *						
K./K.F48 *	1 1/4	1.36	2.36	0.133	1/4 x 1/4 x 1 7/8	3/8 - 16 x 0.87
K.38	1 3/8	1.51	2.76	0.027	5/16 x 5/16 x 2 3/8	3/8 - 16 x 0.87
K.48	1 5/8	1.79	3.15	0.065	3/8 x 3/8 x 2 3/4	5/8 - 11 x 1.42
K./K.F68 *						
K.68	2	2.22	3.94	0.004	1/2 x 1/2 x 3 1/2	3/4 - 10 x 1.65
K./K.F88 *						
K./K.F108 *	2 3/8	2.65	4.72	0.002	5/8 x 5/8 x 4 1/4	3/4 - 10 x 1.65
K.88	2 3/4	3.03	5.51	0.671	5/8 x 5/8 x 4 1/4	3/4 - 10 x 1.65
K./K.F128 *	2 7/8	3.20	5.51	0.046	3/4 x 3/4 x 4 7/8	3/4 - 10 x 1.65
K.108	3 3/16	3.52	6.69	0.834	3/4 x 3/4 x 4 7/8	3/4 - 10 x 1.65
K.128	3 5/8	4.01	6.69	0.602	7/8 x 7/8 x 5 1/2	1 - 8 x 1.97
K./K.F148 *						
K.148	4	4.44	8.27	0.677	1 x 1 x 7	1 - 8 x 1.97
K./K.F168 *	4 3/8	4.82	8.27	0.677	1 x 1 x 7	1 - 8 x 1.97
K.168	4 3/4	5.29	8.27	0.677	1 1/4 x 1 1/4 x 7	1 - 8 x 1.97
K./K.F188 *						

METRIC

Size	U [*mm*]	UY [*mm*]	V [*mm*]	VO [*mm*]	KEY [*mm*]	TAP M [*mm*]
B./B.F28	*20*	*22.5*	*40*	*4*	*6 x 6 x 32*	*M6 x 16*
B./B.F38	*30*	*33*	*60*	*3.5*	*8 x 7 x 50*	*M10 x 22*
K./K.F38 *	*25*	*28*	*50*	*5*	*8 x 7 x 40*	*M10 x 22*
K./K.F48 *	*30*	*33*	*60*	*3.5*	*8 x 7 x 50*	*M10 x 22*
K./K.F68 *	*40*	*43*	*80*	*5*	*12 x 8 x 70*	*M16 x 36*
K./K.F88 *	*50*	*53.5*	*100*	*10*	*14 x 9 x 80*	*M16 x 36*
K./K.F108 *	*60*	*64*	*120*	*5*	*18 x 11 x 110*	*M20 x 42*
K./K.F128 *	*70*	*74.5*	*140*	*7.5*	*20 x 12 x 125*	*M20 x 42*
K./K.F148 *	*90*	*95*	*170*	*15*	*25 x 14 x 140*	*M24 x 50*
K./K.F168 *	*110*	*116*	*210*	*15*	*28 x 16 x 180*	*M24 x 50*
K./K.F188 *	*120*	*127*	*210*	*15*	*32 x 18 x 180*	*M24 x 50*

***** Second Shaft Extension possible (not for KF) Tolerances see page 1- 4. Tap specification see page 1 - 7.

Available Output Hollow Shafts Inch



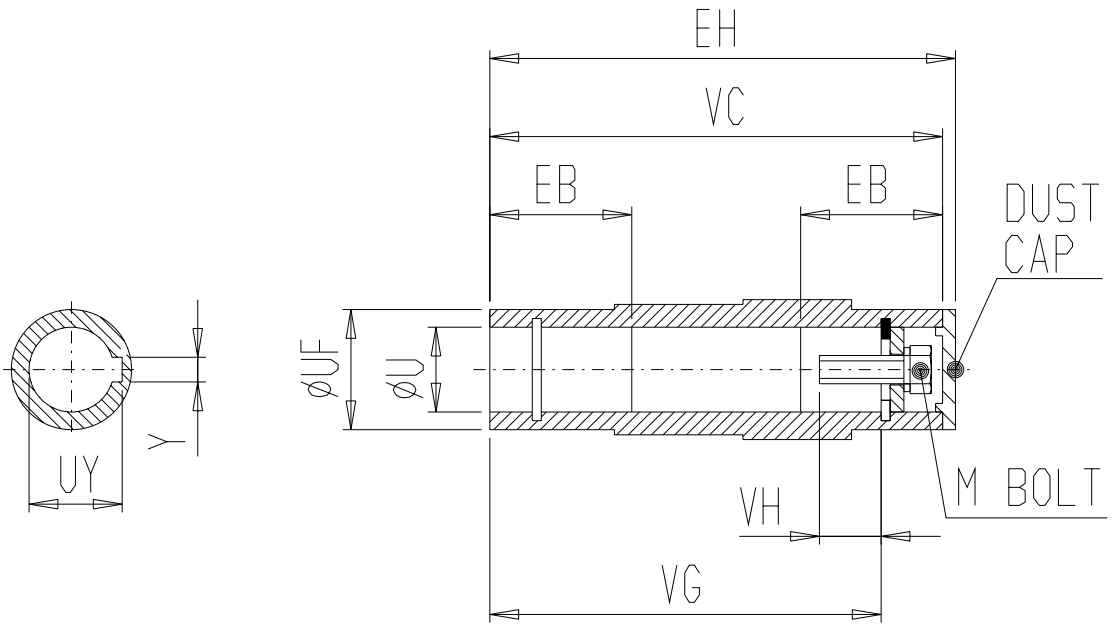
INCH

Size	VC [inch]	EH [inch]	EB [inch]	U [inch]	UF [inch]	UY [inch]	Y [inch]	VG [inch]	VH [inch]	M BOLT [inch]
BA. 28	4.72	4.82	1.58	3/4	1.58	0.85	3/16	4.18	1.047	1/2 - 13 UNC
KA. 38		4.84	1.73	1	1.77	1.12	1/4	4.13	1.547	3/8 - 16 UNC
				1 1/4		1.38		4.02		
BA. 38	5.51	5.61	2.13	1 1/4	1.97	1.38	1/4	4.65	1.465	3/8 - 16 UNC
KA. 48	5.91	6.02	2.28	1 3/8	2.17	1.53	5/16	5.04	1.37	3/8 - 16 UNC
				1 1/2		1.68	3/8		1.93	
KA. 68	7.09	7.20	2.72	1 1/2	2.56	1.68	3/8	5.91	1.93	5/8 - 11 UNC
				1 3/4		1.87 *				
KA. 88	8.27	8.39	3.07	2	3.15	2.23	1/2	7.09	1.62	3/4 - 10 UNC
				2 3/8		2.47 *	5/8			
KA. 108	9.45	9.61	3.66	2 3/8	3.74	2.66	5/8	8.19	2.37	3/4 - 10 UNC
				2 7/16		2.72				
				2 3/4		2.92 *			2.35	
KA. 128	11.81	11.97	4.84	2 3/4	4.33	3.04	5/8	10.35	2.35	3/4 - 10 UNC
				2 15/16		3.28	3/4		2.27	
				2 1/4		3.41 *			2.15	
KA. 148	13.78	13.94	5.83	3 7/16	4.72	3.70 *	7/8	12.2	2.10	1 - 8 UNC
				3 5/8		3.84 *				
KA. 168	16.14	16.30	6.89	4	5.91	4.45	1	14.41	2.09	1 - 8 UNC
				4 1/2		4.83 *			1.94	
KA. 188	19.69	20.04	8.66	4 1/2	6.30	4.95	1	18.11	3.134	1 - 8 UNC

Tolerances see page 1- 4.

* rectangular key have to be used

Available Output Hollow Shafts Metric



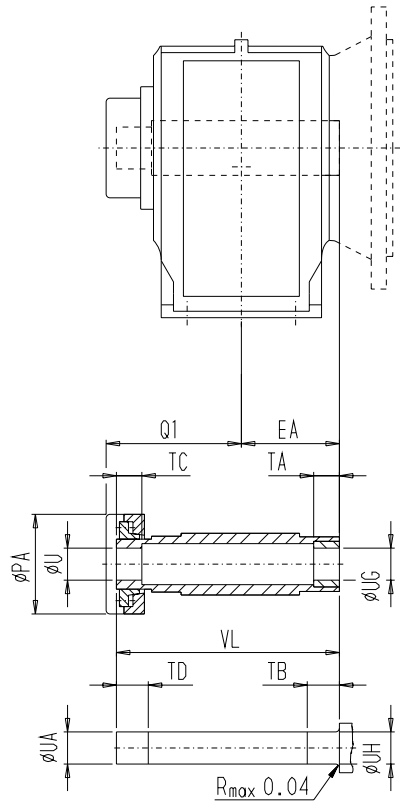
4

METRIC

Size	VC [mm]	EH [mm]	EB [mm]	U [mm]	UF [mm]	UY [mm]	Y [mm]	VG [mm]	VH [mm]	M BOLT [mm]
BA. 28	120	122	40	25	40	28.3	8	105	27.6	M10 x 35
KA. 38		123	44	30	45	33.3		102	31	M10 x 40
BA. 38	140	142	54	30	50	33.3	8	118	31	M10 x 25
KA. 48	150	153	58	40	55	43.3	12	128	48	M16 x 60
				35		38.3	10		40	M12 x 50
KA. 68	180	183	69	45	65	48.8	14	150	47	M16 x 60
				40		43.3	12		48	
KA. 88	210	213	78	60	80	64.4	18	180	54	M20 x 70
				50		53.8	14		44.5	M16 x 60
KA. 108	240	244	93	70	95	74.9	20	208	63.5	M20 x 80
				60		64.4	18		64	
KA. 128	300	304	123	80	110	85.4	22	263	63.5	M20 x 85
				70		74.9	20			M20 x 80
KA. 148	350	354	148	90	120	95.4	25	310	72	M24 x 95
				80		85.4	22		63.5	M20 x 85
KA. 168	410	414	175	110	150	116.4	28	366	73	M24 x 100
				100		106.4			72	M24 x 95
KA. 188	500	510	220	120	160	127.4	32	460	71	M24 x 100

Tolerances see page 1- 4.

Helical Bevel Gear Motors shaft mounted with shrink disk



Model	U UA [inch] [*mm*]	UG UH [inch] [*mm*]	VL [inch] [*mm*]	TA [inch] [*mm*]	TB [inch] [*mm*]	TC [inch] [*mm*]	TD [inch] [*mm*]	PA [inch] [*mm*]	EA [inch] [*mm*]	Q1 [inch] [*mm*]	1) Motor size
BA.S 28	-	-	5.59	0.79	0.98	0.91	0.98	2.28	2.36	3.58	
	20	*20*	*142*	*20*	*25*	*23*	*25*	*58*	*60*	*91*	*100 **
BA.S 38	-	-	6.54	0.79	0.98	1.06	1.26	3.03	2.76	4.09	
	30	*30*	*166*	*20*	*25*	*27*	*32*	*77*	*70*	*104*	*100*
KA.S 38	-	-	5.75	0.79	0.98	0.87	1.06	3.03	2.36	3.70	
	30	*30*	*146*	*20*	*25*	*22*	*27*	*77*	*60*	*94*	*100*
KA.S 48	-	-	6.97	0.79	0.98	0.98	1.18	3.66	2.95	4.29	
	40	*40*	*177*	*20*	*25*	*25*	*30*	*93*	*75*	*109*	*112*
KA.S 68	-	-	8.23	0.79	0.98	1.06	1.26	4.41	3.54	4.96	
	50	*50*	*209*	*20*	*25*	*27*	*32*	*112*	*90*	*126*	*132*
KA.S 88	-	-	9.49	1.18	1.38	1.14	1.34	5.20	4.13	5.67	
	60	*60*	*241*	*30*	*35*	*29*	*34*	*132*	*105*	*144*	*160*
KA.S 108	-	-	11.02	1.57	1.77	1.18	1.38	5.67	4.72	6.61	
	70	*70*	*280*	*40*	*45*	*30*	*35*	*144*	*120*	*168*	*200*
KA.S 128	-	-	13.58	1.97	2.17	1.57	1.77	7.09	5.91	8.15	
	80	*80*	*345*	*50*	*55*	*40*	*45*	*180*	*150*	*207*	*225*
KA.S 148	-	-	15.91	2.36	2.56	1.93	2.13	8.27	6.89	9.57	
	95	*95*	*404*	*60*	*65*	*49*	*54*	*210*	*175*	*243*	*250*
KA.S 168	-	-	19.02	2.76	2.95	2.13	2.32	9.33	8.07	11.46	
	105	*105*	*483*	*70*	*75*	*54*	*59*	*237*	*205*	*291*	*280*
KA.S 188	-	-	22.83	3.15	3.35	2.44	2.64	10.35	9.84	13.47	
	125	*125*	*580*	*80*	*85*	*62*	*67*	*263*	*250*	*342*	*315*

1) Largest mountable motor size

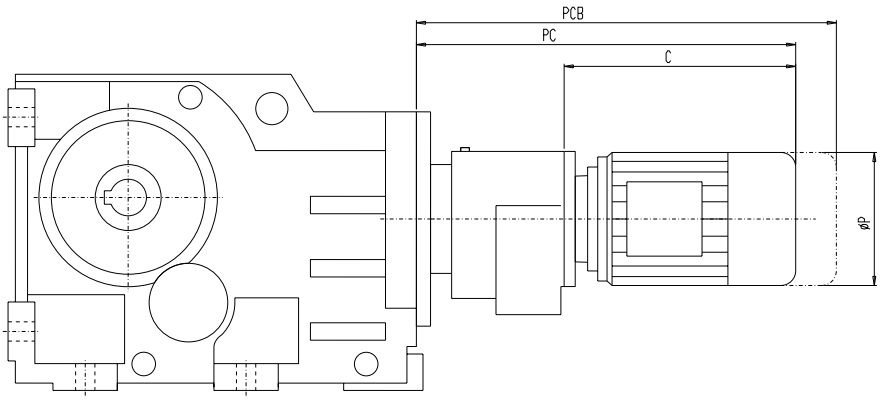
*) B.A.S 28-90 not possible

Tolerances see page 1-4.

Minimum strength of machines drive shaft 50000 psi (360 N/mm^2)

Tandem-Bevel Helical Gear Motors

K 710
[inch]

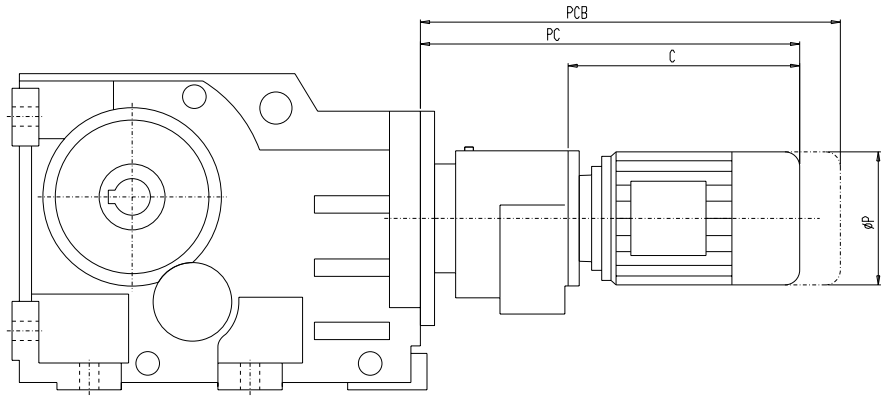


Gear Units		P	PC	PCB	C
K.38-Z28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
	M100L	7.64	20.87	23.7	14.57
K.38-D28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
K.48-Z28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
	M100L	7.64	20.87	23.7	14.57
K.48-D28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
K.68-Z28	M71	5.43	14.14	15.87	8.09
	M71MP	5.43	14.73	16.9	8.68
	M90S	6.93	17.47	20.07	11.42
	M90L	6.93	17.47	20.07	11.42
	M100L	7.64	20.66	23.49	14.57
K.68-D28	M71	5.43	14.14	15.87	8.09
	M71MP	5.43	14.73	16.9	8.68
	M90S	6.93	17.47	20.07	11.42
	M90L	6.93	17.47	20.07	11.42
K.88-Z28	M71	5.43	13.9	15.63	8.09
	M71MP	5.43	14.49	16.66	8.68
	M90S	6.93	17.23	19.83	11.42
	M90L	6.93	17.23	19.83	11.42
	M100L	7.64	20.42	23.25	14.57
K.88-D28	M71	5.43	13.9	15.63	8.09
	M71MP	5.43	14.49	16.66	8.68
	M90S	6.93	17.23	19.83	11.42
	M90L	6.93	17.23	19.83	11.42

Gear Units		P	PC	PCB	C
K.108-Z38	M71	5.43	18.11	19.84	10.02
	M80	6.22	18.95	21.12	10.87
	M90S	6.93	20.57	23.16	12.48
	M90L	6.93	20.57	23.16	12.48
	M100L	7.64	22.34	25.17	14.25
	M112M	8.58	24.39	27.58	16.3
K.108-D38	M71	5.43	18.71	20.44	10.61
	M80	6.22	19.55	21.72	11.46
	M90S	6.93	21.17	23.76	13.07
	M90L	6.93	21.17	23.76	13.07
K.108-Z48	M71	5.43	21.23	22.96	9.8
	M80	6.22	22.07	24.24	10.65
	M90S	6.93	23.69	26.28	12.26
	M90L	6.93	23.69	26.28	12.26
	M100L	7.64	25.46	28.29	14.04
	M112M	8.58	27.48	30.67	16.06
	M132S	10.16	31.13	35.06	19.7
	M132M	10.16	31.13	35.06	19.7
K.128-Z38	M71	5.43	17.83	19.56	10.02
	M80	6.22	18.67	20.84	10.87
	M90S	6.93	20.29	22.88	12.48
	M90L	6.93	20.29	22.88	12.48
	M100L	7.64	22.06	24.89	14.25
	M112M	8.58	24.11	27.3	16.3
K.128-D38	M71	5.43	18.43	20.16	10.61
	M80	6.22	19.27	21.44	11.46
	M90S	6.93	20.89	23.48	13.07
	M90L	6.93	20.89	23.48	13.07
K.128-Z48	M71	5.43	20.74	22.47	9.8
	M80	6.22	21.58	23.75	10.65
	M90S	6.93	23.2	25.79	12.26
	M90L	6.93	23.2	25.79	12.26
	M100L	7.64	24.97	27.8	14.04
	M112M	8.58	26.99	30.18	16.06
	M132S	10.16	30.64	34.57	19.7
	M132M	10.16	30.64	34.57	19.7

Tandem-Bevel Helical Gear Motors

K 710
[inch]

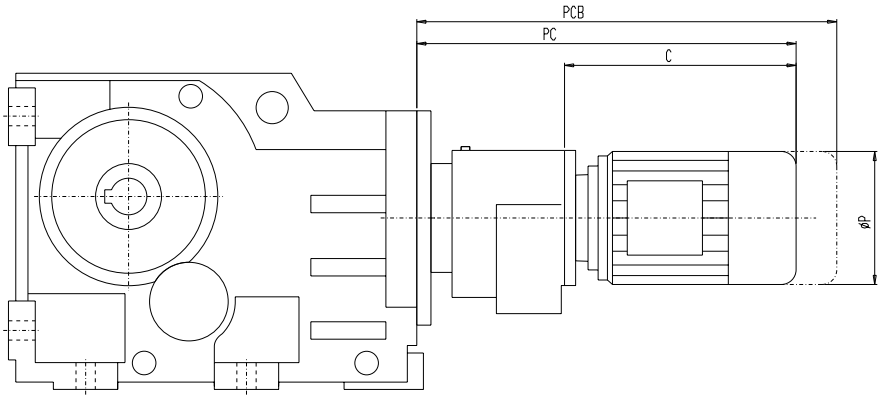


Gear Units		P	PC	PCB	C
K.148-Z38	M71	5.43	17.65	19.38	10.02
	M80	6.22	18.49	20.66	10.87
	M90S	6.93	20.11	22.7	12.48
	M90L	6.93	20.11	22.7	12.48
	M100L	7.64	21.88	24.71	14.25
	M112M	8.58	23.93	27.12	16.3
K.148-D38	M71	5.43	18.25	19.98	10.61
	M80	6.22	19.09	21.26	11.46
	M90S	6.93	20.71	23.3	13.07
	M90L	6.93	20.71	23.3	13.07
K.148-Z68	M71	5.43	23.03	24.76	9.57
	M80	6.22	23.87	26.04	10.41
	M90S	6.93	25.49	28.08	12.03
	M90L	6.93	25.49	28.08	12.03
	M100L	7.64	27.26	30.09	13.8
	M112M	8.58	29.21	32.4	15.75
	M132S	10.16	32.78	36.71	19.31
	M132M	10.16	32.78	36.71	20.96
	M160M	12.2	36.06	40.67	22.6
	M160L	12.2	36.06	40.67	22.6
K.168-Z48	M71	5.43	20.01	21.74	9.8
	M80	6.22	20.85	23.02	10.65
	M90S	6.93	22.47	25.06	12.26
	M90L	6.93	22.47	25.06	12.26
	M100L	7.64	24.24	27.07	14.04
	M112M	8.58	26.26	29.45	16.06
	M132S	10.16	29.91	33.84	19.7
	M132M	10.16	29.91	33.84	19.7
K.168-D48	M71	5.43	20.68	22.41	10.47
	M80	6.22	21.52	23.69	11.32
	M90S	6.93	23.14	25.73	12.93
	M90L	6.93	23.14	25.73	12.93
	M100L	7.64	24.91	27.74	14.7

Gear Units		P	PC	PCB	C
K.168-Z68	M71	5.43	23.39	25.12	9.57
	M80	6.22	24.23	26.4	10.41
	M90S	6.93	25.85	28.44	12.03
	M90L	6.93	25.85	28.44	12.03
	M100L	7.64	27.62	30.45	13.8
	M112M	8.58	29.57	32.76	15.75
	M132S	10.16	33.14	37.07	19.31
	M132M	10.16	33.14	37.07	19.31
	M160M	12.2	36.42	41.03	22.6
	M160L	12.2	36.42	41.03	22.6
K.188-Z68	M71	5.43	22.17	23.9	9.57
	M80	6.22	23.01	25.18	10.41
	M90S	6.93	24.63	27.22	12.03
	M90L	6.93	24.63	27.22	12.03
	M100L	7.64	26.4	29.23	13.8
	M112M	8.58	28.35	31.54	15.75
	M132S	10.16	31.92	35.85	19.31
	M132M	10.16	31.92	35.85	19.31
	M160M	12.2	35.2	39.81	22.6
	M160L	12.2	35.2	39.81	22.6
K.188-D68	M71	5.43	22.9	24.63	10.3
	M80	6.22	23.74	25.91	11.02
	M90S	6.93	25.36	27.95	12.76
	M90L	6.93	25.36	27.95	12.76
	M100L	7.64	27.13	29.96	14.53
K.188-Z88	M90S	6.93	30.15	32.74	11.44
	M90L	6.93	30.15	32.74	11.44
	M100L	7.64	31.82	34.65	13.11
	M112M	8.58	33.73	36.92	15.02
	M132S	10.16	37.3	41.23	18.58
	M132M	10.16	37.3	41.23	18.58
	M160M	12.2	40.65	45.26	21.95
	M160L	12.2	40.65	45.26	21.95
	M180M	13.7	42.67	47.31	22.26
	M180L	13.7	42.67	47.31	22.26

K 710

[*mm*]



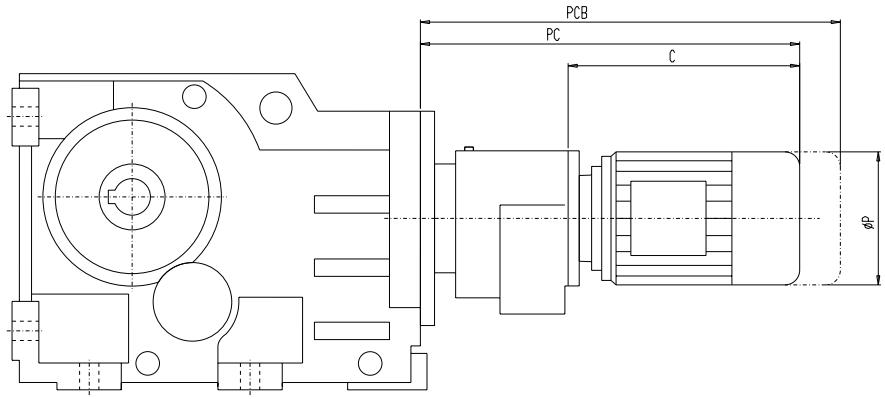
Gear Units		P	PC	PCB	C
K.38-Z28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
	M100L	194	531,5	603,5	370
K.38-D28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
K.48-Z28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
	M100L	194	531,5	603,5	370
K.48-D28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
K.68-Z28	M71	138	360,5	404,5	205,5
	M71MP	138	375,5	430,5	220,5
	M90S	176	445	511	290
	M90L	176	445	511	290
	M100L	194	526	598	370
K.68-D28	M71	138	360,5	404,5	205,5
	M71MP	138	375,5	430,5	220,5
	M90S	176	445	511	290
	M90L	176	445	511	290
K.88-Z28	M71	138	354,5	398,5	205,5
	M71MP	138	369,5	424,5	220,5
	M90S	176	439	505	290
	M90L	176	439	505	290
	M100L	194	520	592	370
K.88-D28	M71	138	354,5	398,5	205,5
	M71MP	138	369,5	424,5	220,5
	M90S	176	439	505	290
	M90L	176	439	505	290

Gear Units		P	PC	PCB	C
K.108-Z38	M71	138	461,5	505,5	254,5
	M80	158	483	538	276
	M90S	176	524	590	317
	M90L	176	524	590	317
	M100L	194	569	641	362
	M112M	218	621	702	414
K.108-D38	M71	138	476,5	520,5	269,5
	M80	158	498	553	291
	M90S	176	539	605	332
	M90L	176	539	605	332
K.108-Z48	M71	138	540,5	584,5	249
	M80	158	562	617	270,5
	M90S	176	603	669	311,5
	M90L	176	603	669	311,5
	M100L	194	648	720	356,5
	M112M	218	699,5	780,5	408
	M132S	258	792	892	500,5
	M132M	258	792	892	500,5
K.128-Z38	M71	138	454,5	498,5	254,5
	M80	158	476	531	276
	M90S	176	517	583	317
	M90L	176	517	583	317
	M100L	194	562	634	362
	M112M	218	614	695	414
K.128-D38	M71	138	469,5	513,5	269,5
	M80	158	491	546	291
	M90S	176	532	598	332
	M90L	176	532	598	332
K.128-Z48	M71	138	528	572	249
	M80	158	549,5	604,5	270,5
	M90S	176	590,5	656,5	311,5
	M90L	176	590,5	656,5	311,5
	M100L	194	635,5	707,5	356,5
	M112M	218	687	768	408
	M132S	258	779,5	879,5	500,5
	M132M	258	779,5	879,5	500,5

Tandem-Bevel Helical Gear Motors

K 710

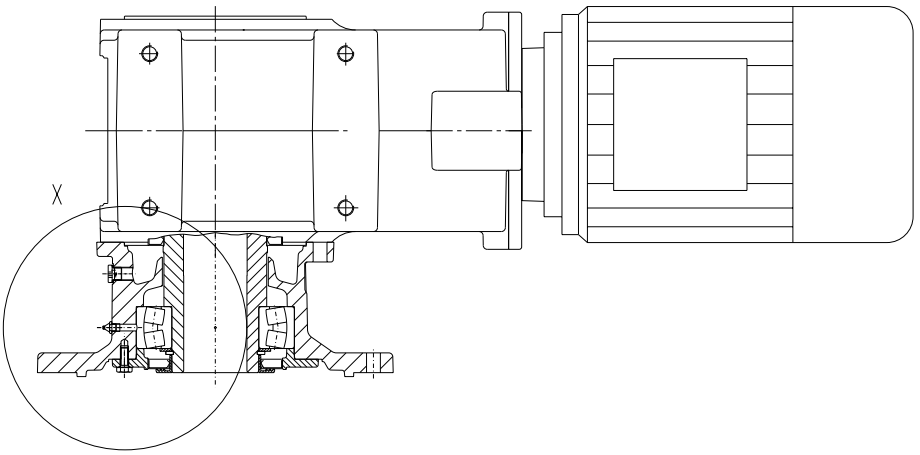
[*mm*]

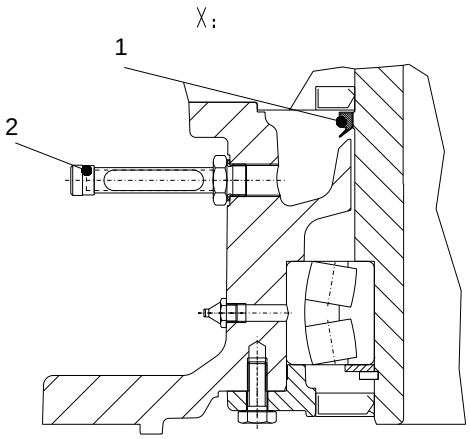


Gear Units		P	PC	PCB	C
K.148-Z38	M71	138	450	494	254,5
	M80	158	471,5	526,5	276
	M90S	176	512,5	578,5	317
	M90L	176	512,5	578,5	317
	M100L	194	557,5	629,5	362
	M112M	218	609,5	690,5	414
K.148-D38	M71	138	465	509	269,5
	M80	158	486,5	541,5	291
	M90S	176	527,5	593,5	332
	M90L	176	527,5	593,5	332
K.148-Z68	M71	138	586,5	630,5	243
	M80	158	608	663	264,5
	M90S	176	649	715	305,5
	M90L	176	649	715	305,5
	M100L	194	694	766	350,5
	M112M	218	743,5	824,5	400
	M132S	258	834	934	490,5
	M132M	258	834	934	532,5
	M160M	310	917,5	1034,5	574
	M160L	310	917,5	1034,5	574
K.168-Z48	M71	138	509,5	553,5	249
	M80	158	531	586	270,5
	M90S	176	572	638	311,5
	M90L	176	572	638	311,5
	M100L	194	617	689	356,5
	M112M	218	668,5	749,5	408
	M132S	258	761	861	500,5
	M132M	258	761	861	500,5
K.168-D48	M71	138	526,5	570,5	266
	M80	158	548	603	287,5
	M90S	176	589	655	328,5
	M90L	176	589	655	328,5
	M100L	194	634	706	373,5

Gear Units		P	PC	PCB	C
K.168-Z68	M71	138	595,5	639,5	243
	M80	158	617	672	264,5
	M90S	176	658	724	305,5
	M90L	176	658	724	305,5
	M100L	194	703	775	350,5
	M112M	218	752,5	833,5	400
	M132S	258	843	943	490,5
	M132M	258	843	943	490,5
	M160M	310	926,5	1043,5	574
	M160L	310	926,5	1043,5	574
K.188-Z68	M71	138	564,5	608,5	243
	M80	158	586	641	264,5
	M90S	176	627	693	305,5
	M90L	176	627	693	305,5
	M100L	194	672	744	350,5
	M112M	218	721,5	802,5	400
	M132S	258	812	912	490,5
	M132M	258	812	912	490,5
	M160M	310	895,5	1012,5	574
	M160L	310	895,5	1012,5	574
K.188-D68	M71	138	583	627	261,5
	M80	158	604,5	659,5	280
	M90S	176	645,5	711,5	324
	M90L	176	645,5	711,5	324
	M100L	194	690,5	762,5	369
K.188-Z88	M90S	176	767	833	290,5
	M90L	176	767	833	290,5
	M100L	194	809,5	881,5	333
	M112M	218	858	939	381,5
	M132S	258	948,5	1048,5	472
	M132M	258	948,5	1048,5	472
	M160M	310	1034	1151	557,5
	M160L	310	1034	1151	557,5
	M180M	348	1085	1203	565,5
	M180L	348	1085	1203	565,5

Bevel Helical Gear Units flange mounted for Mixer/Agitator





Mixer-Design KAM/KM

Heavy-Duty Design

Large fixed bearing with long distance between bearings on the output shaft to carry heavy radial and axial loads, especially for long shafts of mixer or agitator.

Optimized design resulting in no axial force transmission through the gear-housing.

Optional Dry-Well Design

For mounting position V1-00, safety against possible oil-leakage is made possible by diverting any leaked oil to a safety chamber with an additional „V"-Ring (1) and detecting the leakage either through a sight glass or electronic sensor (2).

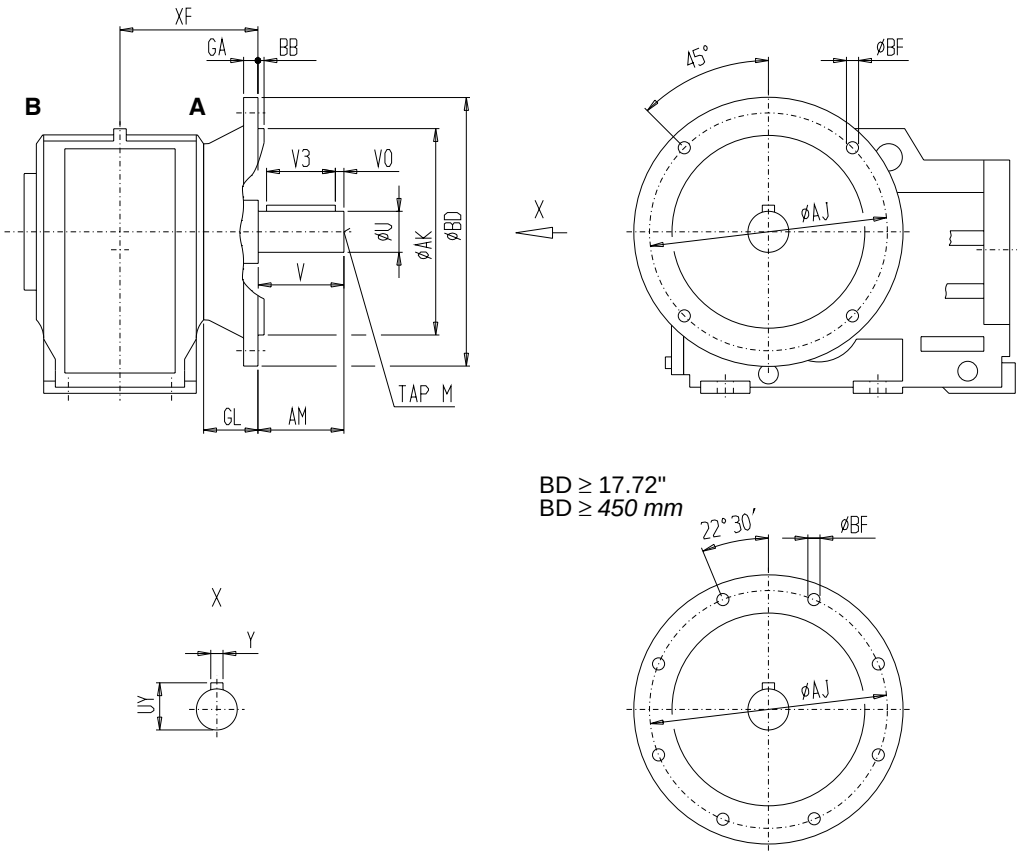
Optional Re-Greasing System

Various Output Shaft Sealing System Possible.

Bearing Life Time Calculation

on request or in electronic cataloque.

Helical Bevel Gear Units Flange mounted for Mixer / Agitator



for KM108 - KM168 only output side B is possible.

Dimensions in **Inch**
mm

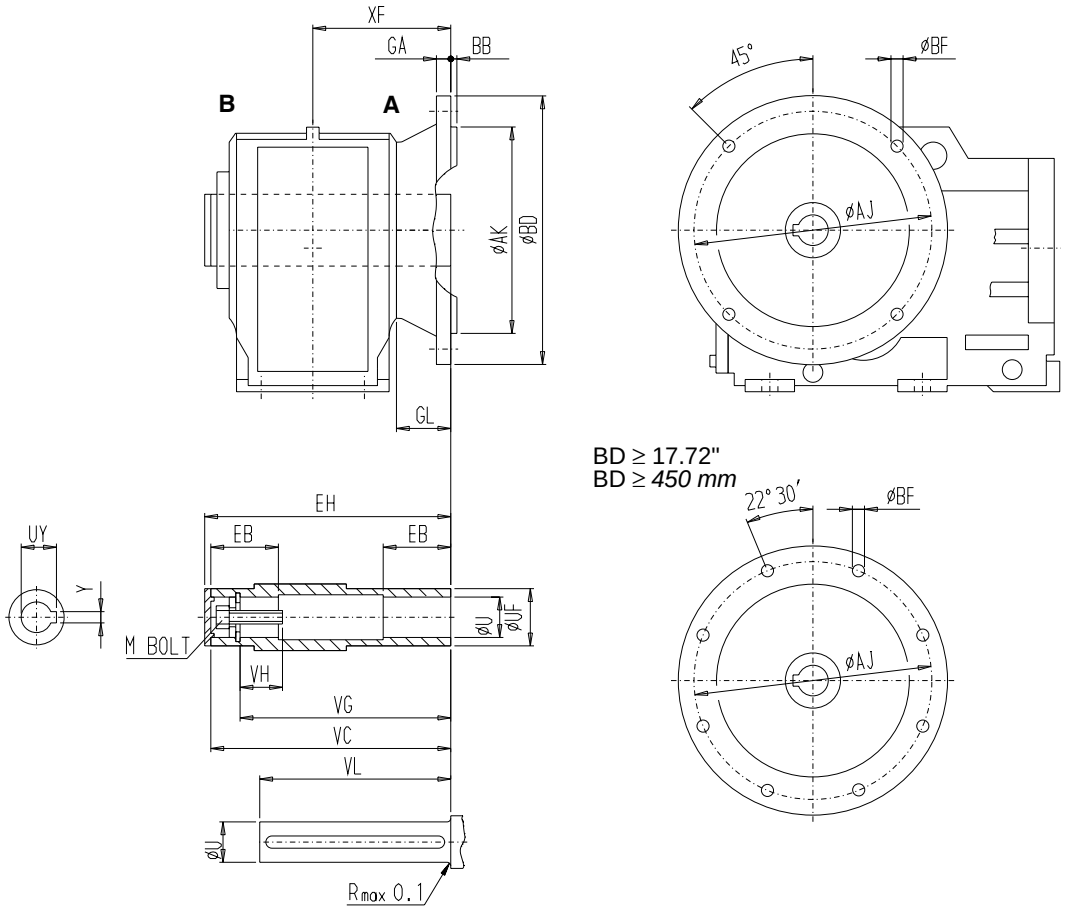
Model	BD	AK	GA	AJ	BB	BF	GL	XF	AM	U	V	V3	VO	UY	Y	TAP M	Add.Weight*
KM88	11.81	9.06	0.79	10.43	0.16	0.53	4.72	8.52	5.51		5.51	4.33	0.59	2.93			64
	300	*230*	*20*	*265*	*4*	*13.5*	*120*	*216.5*	*140*	*70*	*140*	*110*	*15*	*74.5*	*20*	*M20 x 42*	*29*
KM108	13.78	9.84	0.79	11.81	0.20	0.69	5.31	9.69	6.69		6.69	4.92	0.79	3.35			105
	350	*250*	*20*	*300*	*5*	*17.5*	*135*	*246*	*170*	*80*	*170*	*125*	*20*	*85*	*22*	*M20 x 42*	*48*
KM128	17.72	13.78	0.98	15.75	0.20	0.69	6.50	12.05	6.69		6.69	5.51	0.59	3.74			182
	450	*350*	*25*	*400*	*5*	*17.5*	*165*	*306*	*170*	*90*	*170*	*140*	*15*	*95*	*25*	*M24 x 50*	*82*
KM148	17.72	13.78	0.98	15.75	0.20	0.69	7.28	13.74	8.27		8.27	7.09	0.59	4.17			234
	450	*350*	*25*	*400*	*5*	*17.5*	*185*	*349*	*210*	*100*	*210*	*180*	*15*	*106*	*28*	*M24 x 50*	*106*
KM168	21.65	17.72	1.10	19.69	0.20	0.69	8.27	15.91	8.27		8.27	7.09	0.59	5.00			389
	550	*450*	*28*	*500*	*5*	*17.5*	*210*	*404*	*210*	*120*	*210*	*180*	*15*	*127*	*32*	*M24 x 50*	*177*

Tolerances see page 1 - 4.
Tap specification see page 1 - 7.

***** To get the weight of the complete drive, the additional weight must be added to the weight of the gear unit in flange design KAZ

Eg:- Weight KAZ88-M112M (203 lb / 92 kg) + additional weight KM88 (64 lb / 29 kg) = total weight KM88-M112M (267 lb / 121 kg)

Helical Bevel Gear Units Shaft mounted with flange for Mixer / Agitator



for KAM108 - KAM168 only output side B is possible.

Dimensions in **Inch** / ***mm***

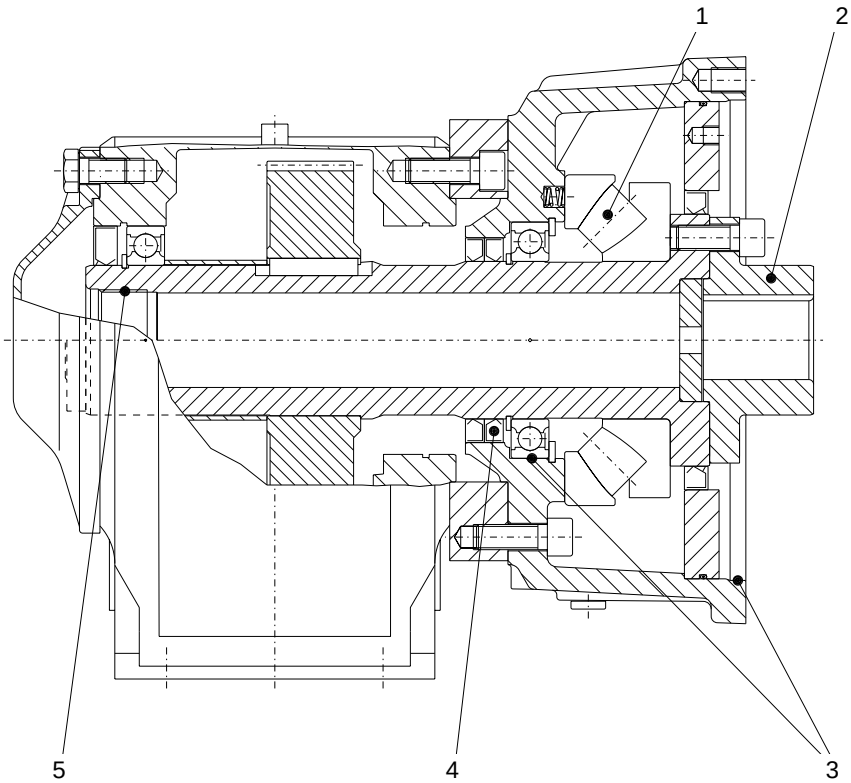
Model	BD	AK	GA	AJ	BB	BF	GL	XF	EH	U	UF	VC	EB	VG	VH	VL	UY	Y	M BOLT	Add. Weight*
KAM88	11.81	9.06	0.79	10.43	0.16	0.53	4.72	8.52	12.76		3.15	12.64	3.07	11.46	2.13	10.83	2.54			39
	300	*230*	*20*	*265*	*4*	*13.5*	*120*	*216.5*	*324*	*60*	*80*	*321*	*78*	*291*	*54*	*275*	*64.4*	*18*	*M20*	*18*
KAM108	13.78	9.84	0.79	11.81	0.20	0.69	5.31	9.69	14.55		3.74	14.41	3.66	13.15	2.50	12.20	2.95			66
	350	*250*	*20*	*300*	*5*	*17.5*	*135*	*246*	*369.5*	*70*	*95*	*366*	*93*	*334*	*63.5*	*310*	*74.9*	*20*	*M20*	*30*
KAM128	17.72	13.78	0.98	15.75	0.20	0.69	6.50	12.05	18.03		4.33	17.95	4.84	16.50	2.50	15.55	3.36			123
	450	*350*	*25*	*400*	*5*	*17.5*	*165*	*306*	*458*	*80*	*110*	*456*	*123*	*419*	*63.5*	*395*	*85.4*	*22*	*M20*	*56*
KAM148	17.72	13.78	0.98	15.75	0.20	0.69	7.28	13.74	20.71		4.72	20.63	5.83	19.06	2.83	18.11	3.76			148
	450	*350*	*25*	*400*	*5*	*17.5*	*185*	*349*	*526*	*90*	*120*	*524*	*148*	*484*	*72*	*460*	*95.4*	*25*	*M24*	*67*
KAM168	21.65	17.72	1.10	19.69	0.20	0.69	8.27	15.91	24.06		5.91	23.98	6.89	22.24	2.87	21.26	4.58			248
	550	*450*	*28*	*500*	*5*	*17.5*	*210*	*404*	*611*	*110*	*150*	*609*	*175*	*565*	*73*	*540*	*116.4*	*28*	*M24*	*113*

Tolerances see page 1 - 4.
Tap specification see page 1 - 7.

***** To get the weight of the complete drive, the additional weight must be added to the weight of the gear unit in flange design KAZ

Eg:- Weight KAZ88-M112M (203 lb / 92 kg) + additional weight KAM88 (39 lb / 18 kg) = total weight KAM88-M112M (242 lb / 110 kg)

Helical Bevel Gear Units with Extruder Flange



1. Large Spherical Roller Bearing - 294... Series of Spherical Roller Bearings to carry heavy Axial Loads.

2. Simple, Cost-effective Design - Customer Connecting Hub without any Grinding Process. Standard Shaft-Hub Connection by Key acc. DIN 6885/1.

3. High Accuracy - Customer-side Centering and Radial Bearing Bore machined in One Setting and from One Direction.

4. Optimized Lubrication - Extruder Flange Lubrication isolated from Gearbox Lubrication.

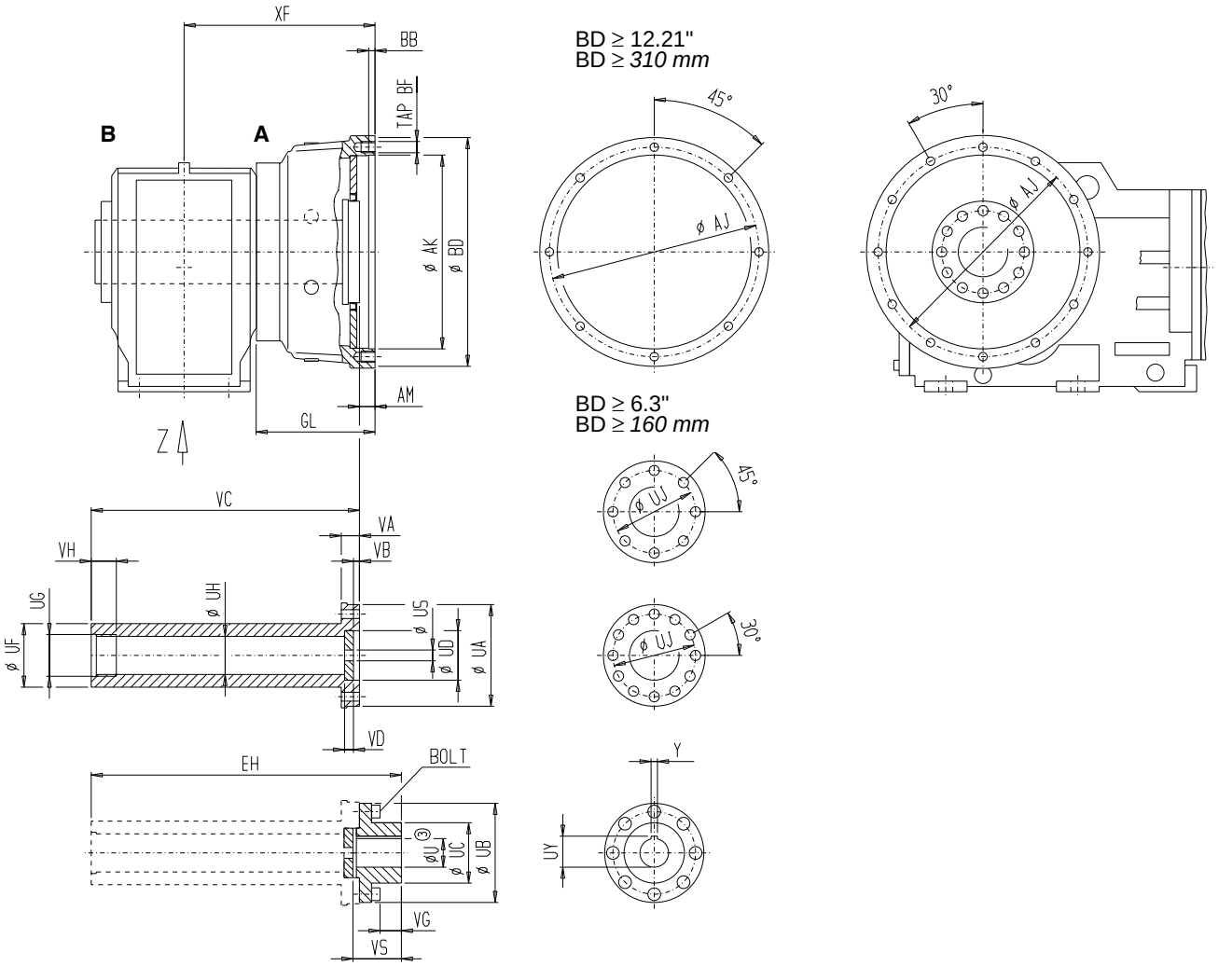
5. Standard Connections - Metric thread for support of extruder screw (disassembly of extruder screw to the back end).

	Helical Bevel Gear Unit		KAE68	KAE88	KAE108	KAE128	KAE148	KAE168
	Maximum Power	[hp]	12.5	20	30	60	75	120
	Min / Max Ratio	[2-stage]	5.36 / 243.72	5.54 / 302.68	7.68 / 307.24	7.1 / 295.38	4.83 / 306.08	6.61 / 287.95
	Maximum Torque	[lb-in]	7300	14600	26600	41600	70800	119500
	Thrust Bearing	[.]	29414E	29417E	29420E	29424E	29426E	29432E
Scope of Application	**Screw-ø [*mm*]**							
	20		X					
	25		X					
	30		X	X				
	35		O	X				
	38			X				
	40			X	X			
	45			O	X	X		
	50			O	X	X		
	60				O	X	X	
	70					O	X	X
	75						X	X
	80						O	X
	90							X
	100							O

X Extruder Screw Extraction towards the front / back end

O Extruder Screw Extraction only towards the front end

Helical Bevel Gear Motors with Extruder Flange



for KAE108 - KAE168 only output side B is possible

Flange **Dimensions in** **Inch** / ***mm***

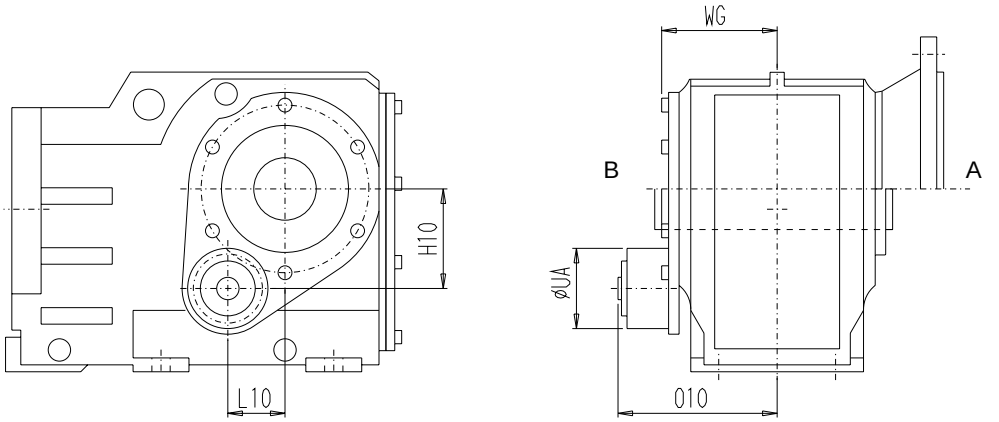
Model	BD	AK		AJ	BB	TAP BF	GL	AM	XF
KAE 68	10.24 *260*	8.66 *220*	+0.0018 / 0 *+0.046 / 0*	9.29 *236*	0.39 *10*	*M12x17*	5.81 *147.5*	0.59 *15*	9.01 *230*
KAE 88	12.21 *310*	10.04 *255*	+0.0021 / 0 *+0.052 / 0*	11.02 *280*	0.39 *10*	*M16x22*	6.73 *171*	0.61 *15.5*	10.53 *267.5*
KAE 108	14.17 *360*	12.01 *305*	+0.0021 / 0 *+0.052 / 0*	12.99 *330*	0.39 *10*	*M16x22*	7.40 *188*	0.91 *23*	9.02 *229*
KAE 128	16.54 *420*	13.58 *345*	+0.0023 / 0 *+0.057 / 0*	14.96 *380*	0.39 *10*	*M20x27*	8.11 *206*	0.98 *25*	13.66 *347*
KAE 148	17.72 *450*	14.17 *360*	+0.0023 / 0 *+0.057 / 0*	15.75 *400*	0.39 *10*	*M24x32*	8.86 *225*	1.06 *27*	15.32 *389*
KAE 168	20.08 *510*	16.54 *420*	+0.0025 / 0 *+0.063 / 0*	18.11 *460*	0.59 *15*	*M24x32*	10.32 *262*	1.50 *38*	17.95 *456*

Shaft — **Dimensions in** Inch / *mm*

Model	U	VS	UF	UH	VH	UG	EH / VC	UA / UB	VA	UJ	UD	US	VD	UC	VB	VG	BOLT	UY	Y
KAE 68	-	1.89	2.56	1.50	1.18		13.74	4.13	0.55	3.47	1.89 +0.001 / 0	0.43	0.43	2.56	0.16	0.79		0.90	0.24
	20						*349*	*105*										*22.8*	*6*
	-						12.01	4.09										1.11	0.32
	25																	*28.3*	*8*
	-	*48*	*65*	*38*	*30*	*M42x2*			*14*	*88*	*48 +0.025 / 0*	*11*	*11*	*65*	*4*	*20*	*M10x25*	1.31	0.32
	30						*305*	*104*										*33.3*	*8*
KAE 88	-	2.28	3.15	1.93	1.54		16.16	5.12	0.91	4.33	2.48 +0.0012 / 0	0.67	0.47	3.15	0.18	0.93		1.31	0.32
	30						*410.5*	*130*										*33.3*	*8*
	-						14.06	5.08										1.51	0.39
	35																	*38.3*	*10*
	-	*58*	*80*	*49*	*39*	*M56x2*			*23*	*110*	*63 +0.030 / 0*	*17*	*12*	*80*	*4.5*	*23.5*	*M12x35*	1.71	0.47
	40						*357*	*129*										*43.3*	*12*
KAE 108	-	2.80	3.74	2.36	1.54		18.19	6.30	0.98	5.12	3.07 +0.0012 / 0	0.67	0.55	3.74	0.20	1.22		1.71	0.47
	40						*462*	*160*										*43.3*	*12*
	-						15.59	6.14										1.92	0.55
	45																	*48.8*	*14*
	-	*71*	*95*	*60*	*39*	*M64x2*			*25*	*130*	*78 +0.030 / 0*	*17*	*14*	*95*	*5*	*31*	*M16x45*	2.12	0.55
	50						*396*	*156*										*53.8*	*14*
KAE 128	-	3.43	4.33	2.80	1.93		21.81	6.89	1.22	5.91	3.47 +0.0014 / 0	0.87	0.67	4.33	0.20	1.65		1.92	0.55
	45						*554*	*175*										*48.8*	*14*
	-						18.58	6.85										2.12	0.55
	50																	*53.8*	*14*
	-	*87*	*110*	*71*	*49*	*M80x3*			*31*	*150*	*88 +0.035 / 0*	*22*	*17*	*110*	*5*	*42*	*M16x45*	2.54	0.71
	60						*472*	*174*										*64.4*	*18*
KAE 148	-	3.74	4.72	3.47	2.05		24.65	7.48	1.30	6.30	4.13 +0.0014 / 0	0.87	0.79	4.72	0.24	1.77		2.54	0.71
	60						*626*	*190*										*64.4*	*18*
	-						21.14	7.44										2.95	0.79
	70																	*74.9*	*20*
	-	*95*	*120*	*88*	*52*	*M95x3*			*33*	*160*	*105 +0.035 / 0*	*22*	*20*	*120*	*6*	*45*	*M16x55*	3.15	0.79
	75						*537*	*189*										*79.9*	*20*
KAE 168	-	4.13	5.91	4.09	2.24		28.43	9.06	1.65	7.68	4.92 +0.0016 / 0	0.98	0.87	5.91	0.24	1.93		2.95	0.79
	70						*722*	*230*										*74.9*	*20*
	-						24.53	9.02										3.36	0.87
	80																	*85.4*	*22*
	-	*105*	*150*	*104*	*57*	*M110x3*			*42*	*195*	*125 +0.040 / 0*	*25*	*22*	*150*	*6*	*49*	*M20x55*	3.76	0.98
	90						*623*	*229*										*95.4*	*25*

Bevel Helical Gear Units with Backstop in the intermediate shaft

The bevel helical gear units KF, KAD, KAF, KAZ, KADS, KAFS and KAZS could be supplied with a backstop in the intermediate shaft. It is only possible to assemble the backstop at the opposite side of the output shaft in A respectively B.



Gear Units	UA [inch] [*mm*]	O10 [inch] [*mm*]	L10 [inch] [*mm*]	H10 [inch] [*mm*]	WG [inch] [*mm*]
K.X88	3.11 *79*	6.54 *166*	2.22 *56,3*	3.86 *98*	4.59 *116,5*
K.X108	4.33 *110*	7.58 *192,5*	2.79 *70,8*	4.41 *112*	5.39 *137*
K.X128	5.20 *132*	9.39 *238,5*	3.18 *80,8*	5.55 *141*	6.65 *169*
K.X148	5.71 *145*	10.89 *276,5*	2.80 *71*	6.81 *173*	7.83 *199*
K.X168	7.48 *190*	12.62 *320,5*	3.54 *89,9*	7.99 *203*	9.02 *229*

Application support

Gear Units	i_{ges} [-]	T_{2x} [Nm]	T_{2x} [lb in]	L [liter]
K.X88	5,54 - 11,21	2036	18014	0,04
	11,64 - 302,68	4275 *)	37824 *)	
K.X108	7,68 - 12,90	3828	33869	0,06
	13,74 - 307,24	6852 *)	60624 *)	
K.X128	7,1 - 12,56	7595	67198	0,09
	13,00 - 295,38	13907 *)	123045 *)	
K.X148	4,83 - 8,79	10450	92458	0,11
	9,77 - 306,08	21139 *)	187031 *)	
K.X168	6,61 - 11,67	16386	144978	0,44
	12,41 - 287,95	30750 *)	272067 *)	

i_{ges} = Ratio main gear
T_{2x} = Maximum permissible output torque of backstop at service factor SF=1
L = Oil Quantity
*) Information for tandem gears

Bevel Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

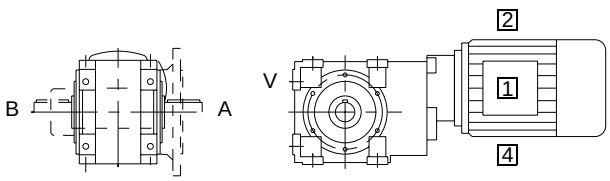
Frame size 28:

These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.

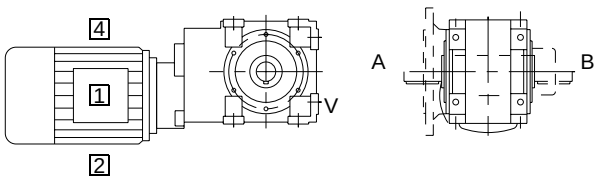
V Oil fitter inlet / Oil drain

A, B position of solid shaft or assembly shaft of customer

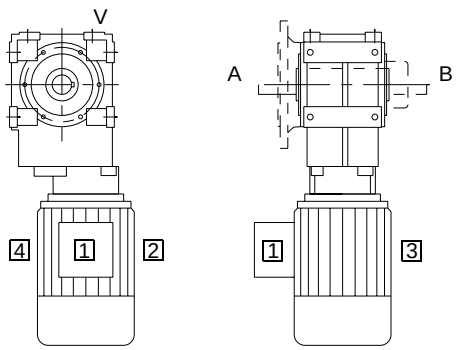
B **B3-00 (IM B3-00)**
BF **B5-01 (IM B5-01)**
BA, BAS, BAT **H-01**



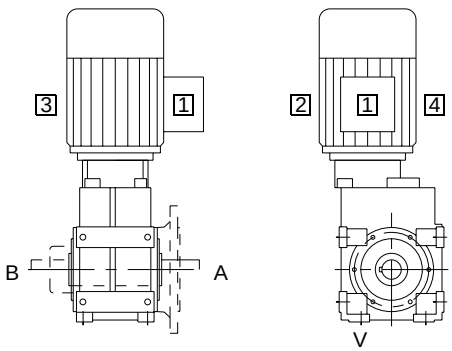
B **B8-00 (IM B8-00)**
BF **B5-03 (IM B5-03)**
BA, BAS, BAT **H-02**



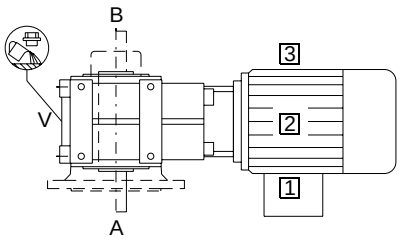
B **B6-00 (IM B6-00)**
BF **B5-00 (IM B5-00)**
BA, BAS, BAT **H-04**



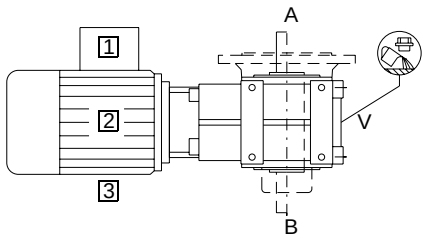
B **B7-00 (IM B7-00)**
BF **B5-02 (IM B5-02)**
BA, BAS, BAT **H-03**



B **V5-00 (IM V5-00)**
BF **V1-00 (IM V1-00)**
BA, BAS, BAT **H-05**



B **V6-00 (IM V6-00)**
BF **V3-00 (IM V3-00)**
BA, BAS, BAT **H-06**



4

Bevel Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

Frame size 28:
These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.

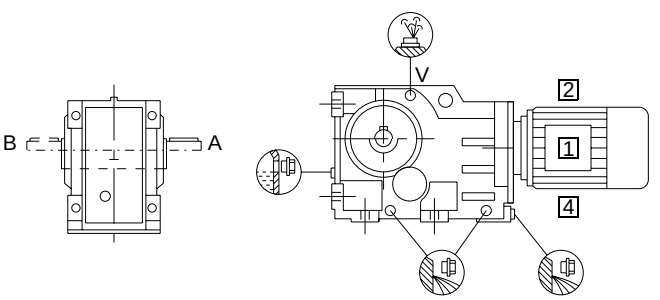
Frame size 38:
V Oil fitter inlet / Oil drain

From frame size 48:

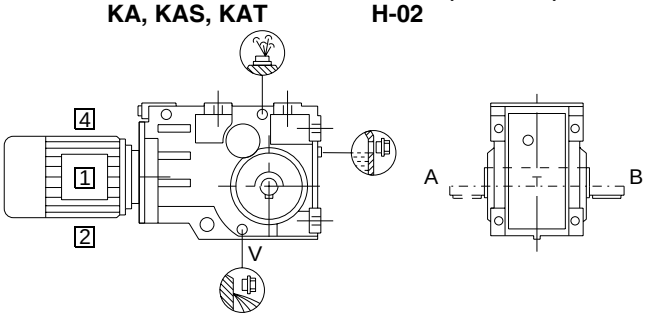
Oil level Ventilation Oil drain

* on opposite side
A, B position of solid shaft or assembly shaft of customer

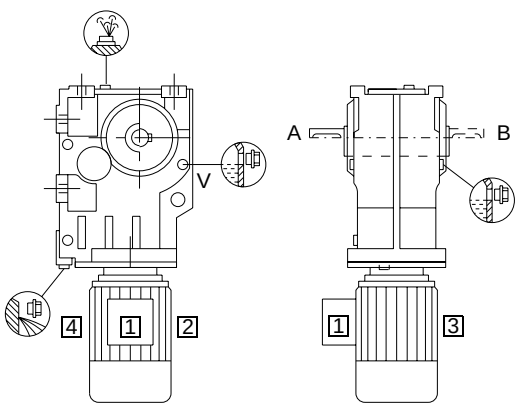
K
KA, KAS, KAT
B3-00 (IM B3-00)
H-01



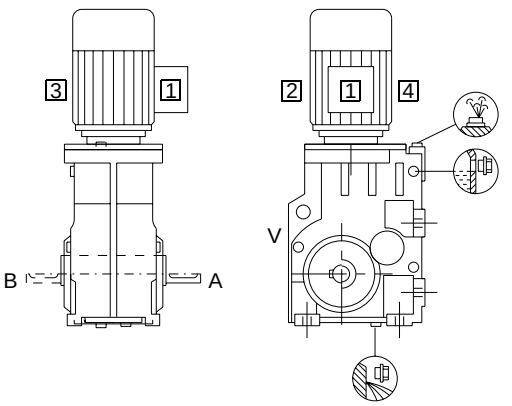
K
KA, KAS, KAT
B8-00 (IM B8-00)
H-02



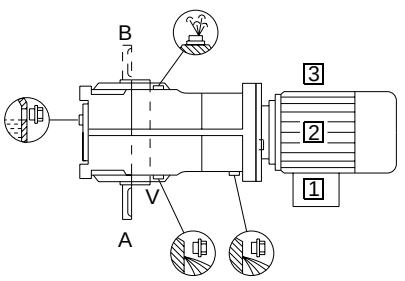
K
KA, KAS, KAT
B6-00 (IM B6-00)
H-04



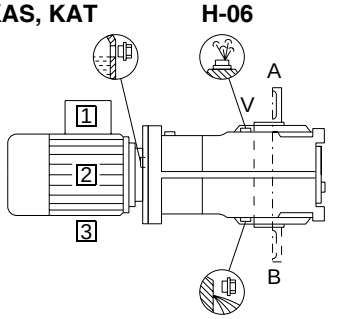
K
KA, KAS, KAT
B7-00 (IM B7-00)
H-03



K
KA, KAS, KAT
V5-00 (IM V5-00)
H-05



K
KA, KAS, KAT
V6-00 (IM V6-00)
H-06



Bevel Helical Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

Frame size 28:
These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.

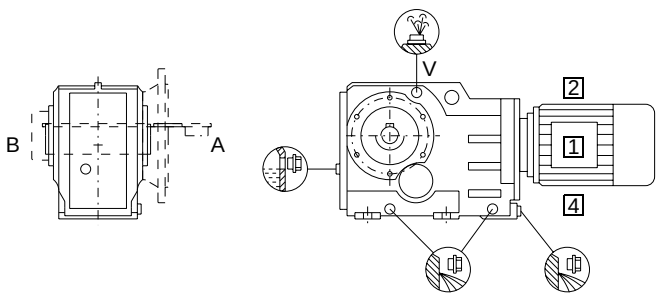
Frame size 38:
V Oil fitter inlet / Oil drain

From frame size 48:

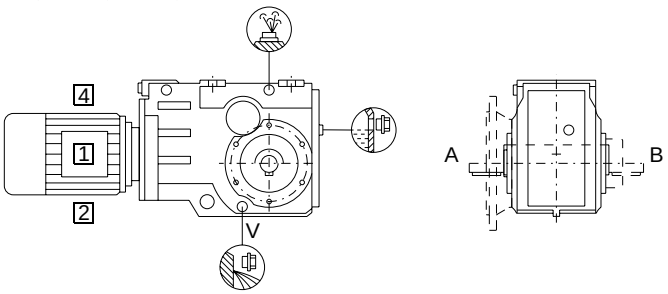
Oil level Ventilation Oil drain

* on opposite side
A, B position of solid shaft or assembly shaft of customer

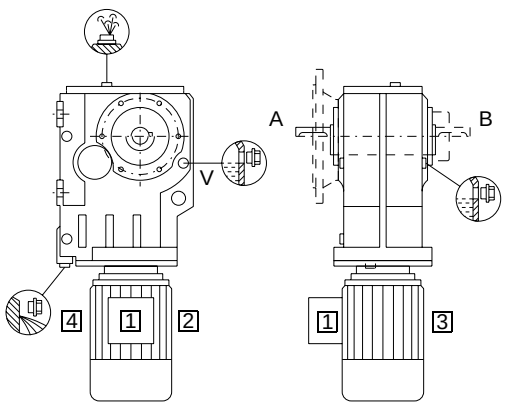
KF, KM88-KM168 **B5-01 (IM B5-01)**
KAD., KAF., KAZ., KAM88-KAM168 **H-01**



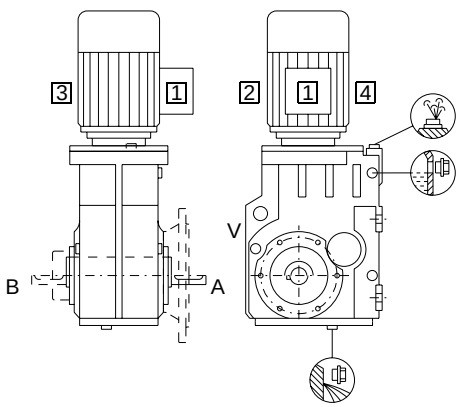
KF, KM88-KM168 **B5-03 (IM B5-03)**
KAD., KAF., KAZ., KAM88-KAM168 **H-02**



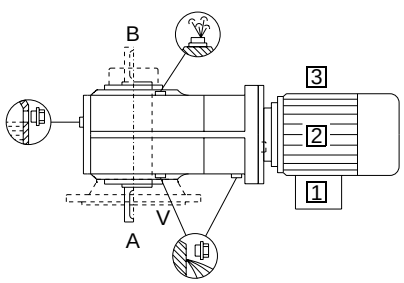
KF, KM88-KM168 **B5-00 (IM B5-00)**
KAD., KAF., KAZ., KAM88-KAM168 **H-04**



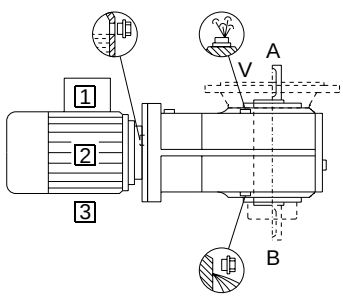
KF, KM88-KM168 **B5-02 (IM B5-02)**
KAD., KAF., KAZ., KAM88-KAM168 **H-03**



KF, KM88-KM168 **V1-00 (IM V1-00)**
KAD., KAF., KAZ., KAM88-KAM168 **H-05**



KF, KM88-KM168 **V3-00 (IM V3-00)**
KAD., KAF., KAZ., KAM88-KAM168 **H-06**



4

Tandem-Bevel Helical Gear Motors and Tandem-Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

Note:
In a horizontal mounting position the smaller gear unit generally is turned to the bottom.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

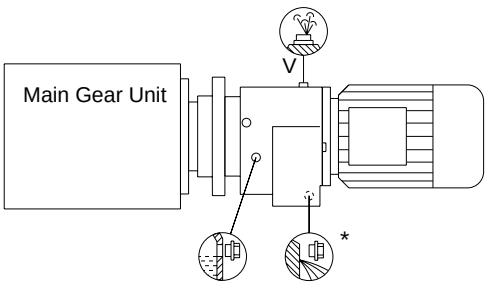
Frame size 28/38 (smaller gear unit):

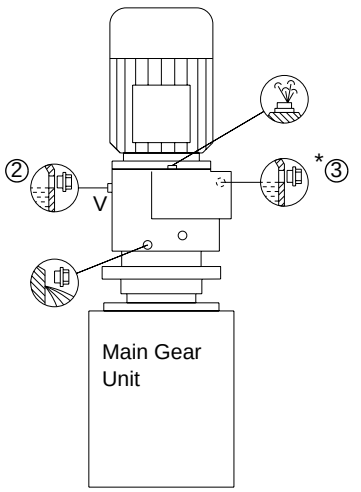
These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.

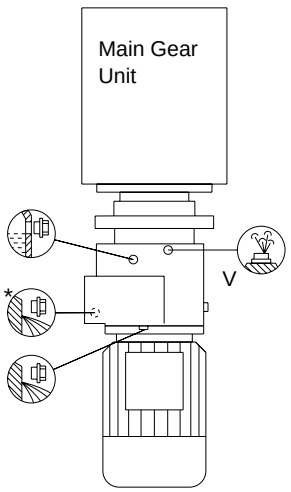
From frame size 48:

Oil level Ventilation Oil drain

* on opposite side
② 2-stage Gear Units
③ 3-stage Gear Units

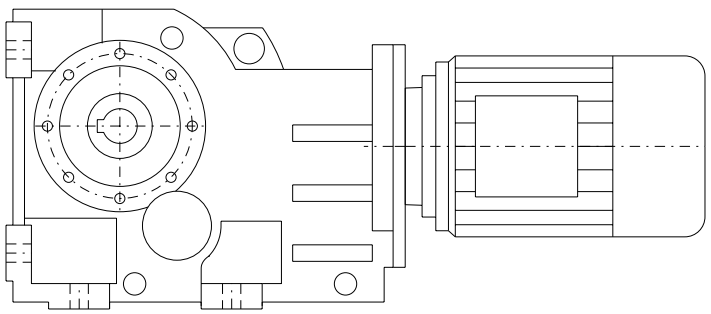






Note mounting positions

The mounting positions shown are also possible for foot-flange housings of size 188.



Lubrication

MOTOX-N-Bevel Helical Gear Units of sizes 48...188 are furnished with filler, oil level and drain plug. Before starting operations the separately supplied breather plug has to replace the filler plug.
The size 28 have no venting, oil level and oil drain plug. Because of the low thermal load, no lubricant-change is necessary
B.38/K. 38 gear units have one oil plug, ventilation of this gear units is not necessary.
Speed reducers are shipped with their lubricant, ready for operation. In order to fill the housings with adequate **amount of lubricant, working conditions have to be specified in the order**. Only blended, age-resistant and non-foaming EP oils (FZG test DIN 51354 load stage > 12) are used. Do not mix oils of different manufacturers. We recommend the oils listed. This is, of course, no exclusive recommendation and equivalent lubricants of other manufacturers can be used. During an oil change, only oils of the same type (for example CLP) and with the same viscosity class (for example VG 220) may be mixed. **Do not mix differing types of oil (e.g. CLP and PGLP) under any circumstances.**
MOTOX-N Bevel Helical Gear Units B.28 / B.38 are supplied with long term lubrication. The synthetic oil filling is added at the works. The unit's name plate refers oil type (PGLP) and ISO-viskosity class.
Biologically decomposable, environment-friendly oils based on synthetic or native ester with water hazard class 1 or 2 respectively or oils with USDA -H1/-H2 acceptance can be supplied on request.

Maintenance

of the bevel helical gear units has to be carried out in accordance with the Operating Instructions manual supplied with the units.

Lubricant selection table

Ambient temperature °C	Marking according to DIN 51502	Examples of Lubricants									
		ADDINOL	ARAL	bp	Castrol	DEA	Esso	FUCHS	KLÜBER LUBRICATION	Mobil	Shell
-10 ... + 40	CLP ISO VG 220	CLP 220S	Degol BG 220	Energol GR-XP 220	Alpha SP 220 Optigear BM220 Tribol 1100/220	Falcon CLP220	Spartan EP220	Renolin CLP 220	Klüberoil GEM 1-220	Mobilgear XMP 220	Omala 220
-20* ... + 50	CLP PG ISO VG 220	-	Degol GS 220	Enersyn SG-XP 220	Optiflex A220 Tribol 800/220	Polydea PGLP 220	Glycolube 220	Renolin PG 220	Syntheso D 220 EP	-	Tivela S 220
0* ... + 60*	CLP PG ISO VG 460	-	Degol GS 450	Enersyn SG-XP 460	Optiflex A460 Tribol 800/460	Polydea PGLP 460	Glycolube 460	Renolin PG 460	Syntheso D 460 EP	-	Tivela S 460

Other brands on request or see operating instruction BA7300.

* **Note:**
Ambient temperatures for motors according to EN 60034-1; see "Greasing of the bearings" in electrical section of this catalogue.

Oil quantities (*litre* / US gallon)

The quantities listed in the following tables are reference values.
The exact oil quantities are specified on the rating plates of the drives.

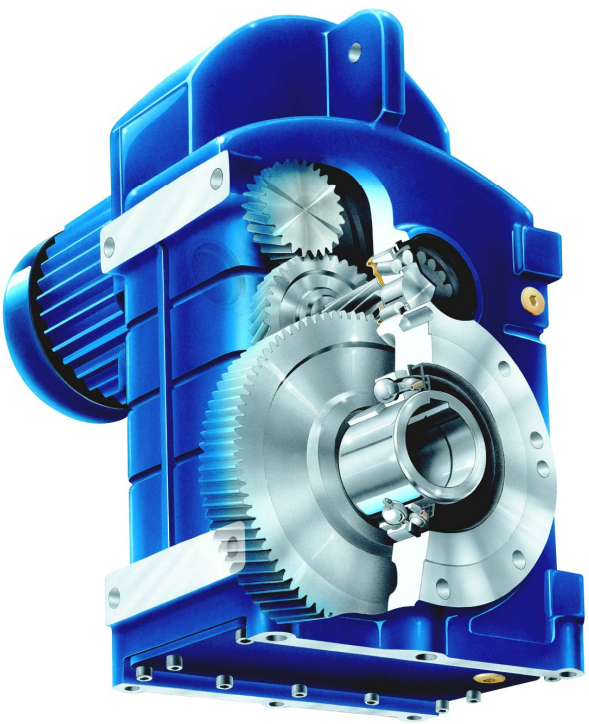
Important:
The value on the left (*italic*) is in litres; the value on the right is in U.S. gallons.

Types of gear units
B
K, KA, KAS, KAT

Type	Mounting position					
	B3-00 H-01	B8-00 H-02	B7-00 H-03	B6-00 H-04	V5-00 H-05	V6-00 H-06
B.28	*0.25* / 0.07	*0.60* / 0.16	*0.90* / 0.24	*0.55* / 0.15	*0.50* / 0.13	*0.50* / 0.13
B.38	*0.70* / 0.18	*1.1* / 0.29	*1.6* / 0.42	*1.00* / 0.26	*0.95* / 0.25	*0.80* / 0.21
K.38	*0.50* / 0.13	*1.1* / 0.29	*1.4* / 0.37	*0.80* / 0.21	*1.00* / 0.26	*0.90* / 0.24
K.48	*0.70* / 0.18	*1.6* / 0.42	*2.0* / 0.53	*1.4* / 0.37	*1.5* / 0.4	*1.8* / 0.48
K.68	*1.6* / 0.42	*3.2* / 0.85	*3.9* / 1.03	*2.7* / 0.71	*3.0* / 0.79	*3.0* / 0.79
K. 88	*2.6* / 0.69	*5.7* / 1.51	*7.4* / 1.95	*5.0* / 1.32	*4.9* / 1.29	*5.2* / 1.37
K.108	*5.5* / 1.45	*9.5* / 2.51	*12.6* / 3.33	*8.8* / 2.32	*8.7* / 2.3	*8.3* / 2.19
K.128	*8.3* / 2.19	*19.6* / 5.18	*24.4* / 6.45	*15.8* / 4.17	*16.9* / 4.46	*16.1* / 4.25
K.148	*14.8* / 3.91	*30.2* / 7.98	*39.5* / 10.43	*22.0* / 5.81	*25.8* / 6.82	*27.0* / 7.13
K.168	*21.6* / 5.71	*45.6* / 12.05	*60.5* / 15.98	*34.2* / 9.03	*40.2* / 10.62	*38.5* / 10.17
K.188	*33.8* / 8.93	*82.5* / 21.79	*104.2* / 27.53	*63.4* / 16.75	*70.7* / 18.68	*69.4* / 18.33

Types of gear units
BF, BAD, BAF, BAZ, BADS, BAFS, BAZS, BADT, BAFT, BAZT
KF, KM, KAD, KAF, KAM, KAZ, KADS, KAFS, KAZS, KADT, KAFT, KAZT

Type	Mounting position					
	B5-01 H-01	B5-03 H-02	B5-02 H-03	B5-00 H-04	V1-00 H-05	V3-00 H-06
B.28	*0.25* / 0.07	*0.6* / 0.16	*0.9* / 0.24	*0.55* / 0.15	*0.5* / 0.13	*0.5* / 0.13
B.38	*0.7* / 0.18	*1.1* / 0.29	*1.6* / 0.42	*1.0* / 0.26	*0.95* / 0.25	*0.8* / 0.21
K.38	*0.50* / 0.13	*1.1* / 0.29	*1.5* / 0.4	*0.80* / 0.21	*1.00* / 0.26	*0.90* / 0.24
K.48	*0.70* / 0.18	*1.7* / 0.45	*2.0* / 0.53	*1.4* / 0.37	*1.6* / 0.42	*1.8* / 0.48
K.68	*1.6* / 0.42	*3.2* / 0.85	*3.9* / 1.03	*2.6* / 0.69	*2.8* / 0.74	*3.0* / 0.79
K. 88	*2.6* / 0.69	*5.8* / 1.53	*7.7* / 2.03	*5.0* / 1.32	*5.1* / 1.35	*5.0* / 1.32
K.108	*6.2* / 1.64	*9.9* / 2.62	*13.7* / 3.62	*8.9* / 2.35	*10.0* / 2.64	*8.9* / 2.35
K.128	*8.7* / 2.3	*19.6* / 5.18	*25.0* / 6.6	*14.8* / 3.91	*17.5* / 4.62	*16.6* / 4.39
K.148	*14.8* / 3.91	*30.1* / 7.95	*41.0* / 10.83	*25.0* / 6.6	*26.0* / 6.87	*28.1* / 7.42
K.168	*21.7* / 5.73	*46.3* / 12.23	*62.6* / 16.54	*34.8* / 9.19	*41.1* / 10.86	*39.4* / 10.41
K.188	*33.8* / 8.93	*82.5* / 21.79	*104.2* / 27.53	*63.4* / 16.75	*70.7* / 18.68	*69.4* / 18.33



Parallel Shaft Gear Motors and Gear Units

5

Table of Contents **Page**

Parallel Shaft Gear Units

Technical description

MOTOX-N parallel shaft gear units are part of the MOTOX-N modular system which essentially comprises helical, helical bevel, parallel shaft, helical worm gear units or mechanical variable speed drives. With three or single phase AC motors with or without brake, all imaginable drive combinations up to electronic variable speed drives are possible.

MOTOX-N parallel shaft gear units are designed for continuous operation.

The housings made of grey cast iron or aluminium are developed in 3D-CAD and optimized for rigid and anti-vibration structure.

Lubricant loss and entry of dust and water are effectively prevented by high quality radial shaft seal.

All gears are hobbed, case hardened and profile ground or honed. Additionally, gear teeth are profile corrected and crowned for optimum performance.

Helical gearing provides for optimum quiet operation.

Helical gears are in compliance with ASME / AGMA Standard 2001-B88.
Helical gears have a hardness of 58-62 R_c.

The output and input shaft of the two or three stage gear units are parallel.

The maximum permissible radial and axial forces at the input and output shafts are to be considered.

Design Variations

The standard unit is available in foot, face, flange or shaft mounted versions for use in all mounting positions. The gear units are manufactured with a solid shaft or with a hollow shaft (fitted key or shrink disc).

Integrally mounted C-Face adapters, either in the clamp collar style (K5TC) or the elastic coupling style (KTC), are available for NEMA motors.

Electro-magnetic brakes, backstops, speed monitors and numerous integral options are available.

Output power, torque and speed

The horsepower, output torque and speeds shown in the selection tables are based on mounting position B3 (or a similar position), standard features, ambient temperature of 20°C (68°F), and standard lubricant.

The actual output speeds and torques may vary slightly from the figures in this catalogue due to motor variations, supply voltage, or reflected load.

Efficiency

The efficiency of helical gearing is determined by gearing and bearing friction and splash losses, and is approximately 96% for 2 stages units and 94% for 3 stages units.

Standards

The important dimensions correspond to the DIN standards, namely :

Shaft heights	DIN 747
Cylindrical shaft ends	DIN 748/1
Mounting flanges	DIN 42948
Coaxial concentricity and runout of shaft ends and of flange surface	DIN 42955
Parallel keys	DIN 6885/1
Second motor shaft extension	DIN 748/3
Centre holes in shaft ends	DIN 332/2

Direction of rotation of the gear motors

Three-phase a.c. motors are arranged so that the motor shaft turns to the right (IEC 60034-8).
The direction of rotation of the gear unit output shaft may be reversed by swapping over two external wires at the motor. For single-phase a.c. geared motors and for geared motors fitted with backstop, the required direction of rotation must be stated when the order is placed.

The Weights [lbs / kg] shown in the Dimension Sheets are average values and do not include Oil.

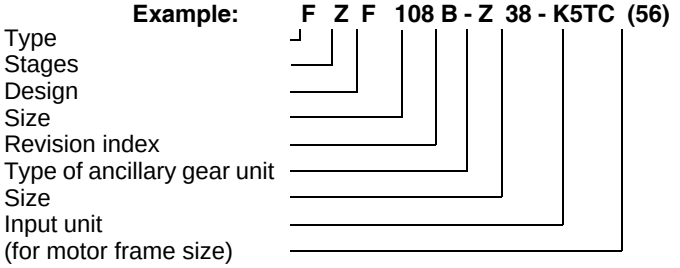
For Oil Quantities according to the operational mounting positions, see chapter “Lubrication, Oil Quantities”.

Specific Weights of Oils:
Mineral Oil (CLP) = 0.9 kg/l (2 lbs/l)
Synthetic Oil (PGLP) = 1.05 kg/l (2.3 lbs/l)

Type Designations

Gear Units

Example: **F Z F 108 B - Z 38 - K5TC (56)**



Type of gear unit

F Parallel Shaft Gear Unit

Stages

Z 2-stages
D 3-stages

Design

Shaft

(-) Solid shaft
A Hollow shaft

Fixing

(-) Foot-mounted
F Flange-mounted (A-type)
Z Housing flange (C-type)
D Torque arm
M Mixer/Agitator
E Extruder

Connection

(-) Parallel key
S Shrink Disc
T Splined hollow shaft

Type of ancillary gear unit

(-) Helical Gear Unit

Stages

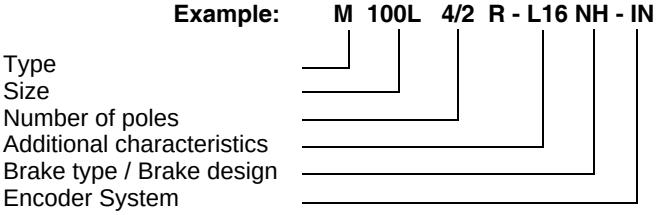
Z 2-stages
D 3-stages

Type of input unit

K4 Extended housing with shank assembly for IEC flange mounted motors
K2 Extended housing with elastic coupling for IEC flange mounted motor
A Input flange with free input shaft (metric)
P Design piggy back for IEC motors
K5TC Adapter with clamp collar for NEMA C-face motors
KTC Adapter 3 Piece Coupled for NEMA C-face mounted motors
A5 Input flange with free input shaft (imperial)
P5 Design piggy back for NEMA motors

Motors

Example: **M 100L 4/2 R - L16 NH - IN**



Types of motors

AM., M., MI.
Three phase motor

MB
Single phase motor with running capacitor

MK
Single phase motor with running and starting capacitor and starting relais

1MA, 1LA, 1LG
Three phase motors, explosion-proof EExe II

DNG., DVG., DBG.
Three phase motors, explosion-proof EExde II or EExd II

Additional characteristics

E Efficiency level class: eff1
R Resistance rotor
F Forced cooling
U Non ventilated
I High inertia fan
W Rain cover
H Reduced noise level
M MOTOX-Master (Integral Frequency Inverters)
X Backstop

Brake type / Brake design

L, KFB
Spring loaded-single disk brake, DC-excitation

16 Size = Nominal torque of brake
16/.. Adjusted braking torque

M Microswitch
N Normal design
G Encapsulated design

H Manual release
A Locking for manual release

Encoder system

IN Incremental encoder

Existing overhung loads

For the calculation of the existing radial load the type of drive element has to be taken into consideration.
For different drive elements the following factor C have to be considered.

Drive element	Factor C	Remarks
Gears	1.15	< 17 teeth
Chain sprockets	1.40	< 13 teeth
Chain sprockets	1.25	< 20 teeth
V-Belt	2.0	Pretension
Flat belt	2.50	Pretension
Toothed belt	1.50	Pretension
Agitator / Mixer	2.0	rotating radial force

$$F_{exist} = \frac{T_2 \cdot 2}{d_0}$$

F_{exist} = existing radial load [lbf]

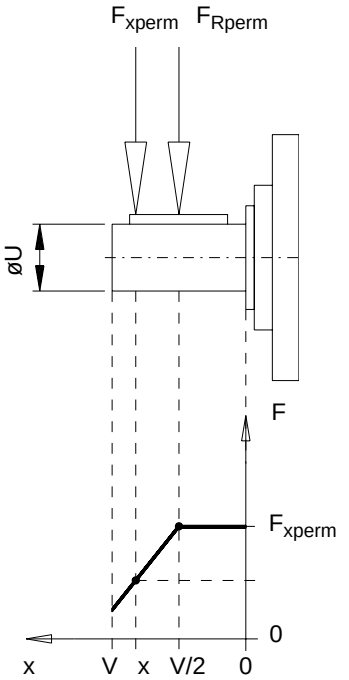
T_2 = existing torque [lb-in]

d_0 = average diameter of the drive element [in]

C = Factor for the drive element type [-]

$$F_{exist} \cdot C \leq F_{xperm}$$

Permissible overhung loads for parallel shaft gear units at Service Factor 1.0



Calculation based on bearing life

$$F_{xperm1} = F_{Rperm} \cdot \frac{y}{z + x} \qquad [lbf]$$

Calculation based on mechanical strength

$$F_{xperm2} = \frac{a \cdot 1000}{x} \qquad [lbf]$$

valid for x ≧ V/2
for x < V/2: $F_{xperm} = F_{Rperm}$

The dimension x is the distance from the shaft shoulder to the point where the load (F_{xperm}) is applied.
The lower value F_{xperm} of both calculation results is the permissible overhung load. Higher overhung loads are permitted under certain load conditions. If values on tables are not sufficient for the requirement, please consult FLENDER, stating the following criteria on overhung load:
- value
- direction / angle of force
- location (x) on shaft
- direction of rotation of shaft

Note:
The listed radial forces refer to worst case setup (FF). All setups can be calculated with Flender software (electronic cataloque).
For high or rotating radial load mixer- and agitator drives have to be used.

Standard Bearings

							F_{Rperm} in lbf for x = V/2 for output speeds n_2 in rpm							
Typ(e)	**y** [in.]	**z** [in.]	**a** [lb in]	**U** [in.]	**V** [in.]	*	≤ **16** [rpm]	≤ **25** [rpm]	≤ **40** [rpm]	≤ **63** [rpm]	≤ **100** [rpm]	≤ **160** [rpm]	≤ **250** [rpm]	≤ **400** [rpm]
F.F28	5.06	4.07	1.02	1	1.97	ccw	1035	1035	900	774	621	497	621	497
						cw	1035	1035	853	725	574	452	574	452
F.F38B	5.75	4.76	1.16	1	1.97	ccw	1180	1180	1058	821	668	644	668	644
						cw	1179	1136	963	713	560	558	560	558
F.F48B	6.93	5.75	2.16	1 1/4	2.36	ccw	1835	1835	1508	1181	1089	1019	1089	1019
						cw	1835	1712	1384	1055	990	963	990	963
F.F68B	8.39	6.81	3.16	1 5/8	3.15	ccw	2009	1728	1334	1062	828	853	828	853
						cw	2009	1537	1143	871	646	686	646	686
F.F88B	10.31	8.35	6.57	2	3.94	ccw	3336	2912	2219	1787	1589	1600	1589	1600
						cw	3215	2617	1926	1494	1316	1415	1316	1415
F.F108B	11.73	9.37	9.73	2 3/8	4.72	ccw	4041	3337	2408	1807	1404	1508	1404	1508
						cw	3575	2869	1942	1341	968	1132	968	1132
F.F128B	14.63	11.87	15.81	2 7/8	5.51	ccw	5688	4415	3562	2513	2061	2491	2061	2491
						cw	5150	3879	3026	1978	1528	2160	1528	2160
F.F148B	17.09	13.74	19.84	3 5/8	6.69	ccw	5126	3917	2869	1940	2030	2644	2030	2644
						cw	4448	3242	2214	1262	1411	2282	1411	2282
F.F168B	20.37	16.24	42.65	4 3/8	8.27	ccw	7742	6041	4869	2849	2921	3827	2921	3827
						cw	6856	5157	3985	1964	2093	3355	2093	3355
F.F188B	23.54	19.41	105.41	4 3/4	8.27	ccw	24554	24554	24554	22113	19008	17874	19008	17874
						cw	24554	24554	24554	20975	17876	17042	17876	17042

5

Heavy Duty Bearings

							F_{Rperm} in lbf for x = V/2 for output speeds n_2 in rpm							
Typ(e)	**y** [in.]	**z** [in.]	**a** [lb in]	**U** [in.]	**V** [in.]	*	≤ **16** [rpm]	≤ **25** [rpm]	≤ **40** [rpm]	≤ **63** [rpm]	≤ **100** [rpm]	≤ **160** [rpm]	≤ **250** [rpm]	≤ **400** [rpm]
F.F68B	8.39	6.81	4.83	1 5/8	3.15	ccw	3070	3070	3070	3070	3070	2981	3070	2981
						cw	3070	3070	3070	3070	2995	2853	2995	2853
F.F88B	10.31	8.35	10.38	2	3.94	ccw	5267	5267	5267	5267	5267	5027	5267	5027
						cw	5267	5267	5267	5267	5144	4856	5144	4856
F.F108B	11.73	9.37	15.25	2 3/8	4.72	ccw	6462	6462	6462	6462	6435	5891	6435	5891
						cw	6462	6462	6462	6462	5972	5630	5972	5630
F.F128B	14.63	11.87	22.26	2 7/8	5.51	ccw	8082	8082	8082	8082	8082	8082	8082	8082
						cw	8082	8082	8082	8082	8082	8082	8082	8082
F.F148B	17.09	13.74	50.79	3 5/8	6.69	ccw	11628	11628	11628	11628	11628	11036	11628	11036
						cw	11628	11628	11628	11628	11216	10708	11216	10708
F.F168B	20.37	16.24	84.75	4 3/8	8.27	ccw	16641	16641	16641	16641	16641	16265	16641	16265
						cw	16641	16641	16641	16641	16641	15874	16641	15874
F.F188B	23.54	19.41	105.41	4 3/4	8.27	ccw	25496	25496	25496	25496	25496	25496	25496	25496
						cw	25496	25496	25496	25496	25496	25496	25496	25496

* Direction of rotation with view on output shaft
cw = clockwise
ccw = counter clockwise

Legend / Explanations

Performance Data / Torque tables

P_{Motor} = Rated power of motor
(60Hz) = at mains frequency 60Hz

Ratio = Total ratio of the gear unit

★ = Ratio belonging to preferred list of MOTOX-N

n_2 = Output speed of gear unit
(60Hz) at mains frequency 60Hz (4pol.) and 4 pole motor

T_2 = Output torque of gear unit (SF=1) at Service Factor SF =1

T_1 = permisssible continuous input torque of input unit K., A., P.

SF = Service Factor of the drive

FU1 x V1 = Dimension of solid shaft of type if input unit A., P.

F_{RAperm} V1/2 = Permissible overhung load at type of input unit A., P. at 0.5 x V1

5

Prefered list

The preferred list offers short delivery through higher availability.

Performance Data

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.25 (60 Hz)	0.05	216419	0.82	31771		**FD.188B-D48-M71C4**
	0.06	191043	0.93	28045	★	
	0.07	156305	1.1	22946	★	
	0.07	172336	1	25299		
	0.08	142407	1.2	20906		
	0.09	130255	1.4	19122	★	
	0.1	122089	1.5	17537		**FD.188B-Z48-M71C4**
	0.11	108041	1.6	15519	★	
	0.12	98218	1.8	14108		
	0.13	88227	2	12674	★	
	0.08	142664	0.87	20944	★	**FD.168B-D48-M71C4**
	0.09	129989	0.95	19083		
	0.1	118891	1	17454	★	
	0.11	111433	1.1	16007		**FD.168B-Z48-M71C4**
	0.12	98608	1.3	14165	★	
	0.13	89653	1.4	12878		
	0.15	80530	1.5	11568	★	
	0.17	69033	1.8	9916		
	0.19	62452	2	8971	★	
	0.14	81487	0.98	11705		**FD.148B-Z38-M71C4**
	0.14	87209	0.91	12527	★	
	0.17	71673	1.1	10295	★	
	0.19	62762	1.3	9016		
	0.21	55517	1.4	7975	★	
	0.23	50309	1.6	7227		
	0.27	44419	1.8	6380	★	
	0.29	40061	2	5755		
	0.2	60539	0.89	8696		**FD.128B-Z38-M71C4**
	0.22	53542	1	7691	★	
	0.24	48529	1.1	6971		
	0.28	42833	1.3	6153	★	
	0.3	38644	1.4	5551		
	0.34	35048	1.5	5034	★	
	0.37	31930	1.7	4587		
	0.4	29202	1.9	4195	★	
	0.31	37572	0.8	5397		**FD.108B-Z38-M71C4**
	0.35	34074	0.88	4895	★	
	0.38	31044	0.97	4460		
	0.42	28396	1.1	4079	★	
	0.47	25393	1.2	3648		
	0.51	23312	1.3	3349	★	
	0.56	21018	1.4	3019		
	0.65	18068	1.7	2596	★	
	0.73	16120	1.9	2315		
	0.8	14800	2	2126	★	
	0.59	19893	0.85	2858	★	**FD.88B-Z28-M71C4**
	0.66	17971	0.94	2582		
	0.75	15659	1.1	2250	★	
	0.84	14065	1.2	2021		
	0.93	12701	1.3	1824	★	
	1	11514	1.5	1654		
	1.1	10478	1.6	1505	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.25 (60 Hz)	1.3	9264	1.8	1331		**FD.88B-Z28-M71C4**
	1.4	8556	2	1229	★	
	1.2	9805	0.9	1408	★	**FD.68B-Z28-M71C4**
	1.3	8804	1	1265		
	1.5	7953	1.1	1142	★	
	1.6	7209	1.2	1036		
	1.8	6554	1.4	942	★	
	2	5801	1.5	833		
	2.2	5349	1.7	769	★	
	2.6	4605	1.9	662		
	2.2	5464	0.88	785		**FD.48B-Z28-M71C4**
	2.3	5048	0.95	725	★	
	2.7	4340	1.1	624		
	3	3950	1.2	567	★	
	3.3	3596	1.3	516	★	
	3.6	3259	1.5	468		
	4	2967	1.6	426	★	
	4.5	2621	1.8	376		
	4.9	2418	2	347	★	
	6.3	2418	2	268.8	★	**FD.48B-M71C4**
	3.7	3232	0.8	459		**FZ.38B-Z28-M71C4**
	4.1	2922	0.88	415	★	
	4.5	2648	0.97	376		
	5	2409	1.1	342	★	
	5.6	2134	1.2	303		
	6	2515	1	280.41		**FD.38B-M71C4**
	7	2170	1.2	241.91	★	
	8.2	1868	1.4	207.83		
	8.9	1718	1.5	191.34	★	
	9.7	1558	1.6	173.94		
	11	1381	1.9	153.96	★	
	13.1	1160	2.2	128.95		
	9.8	1558	0.85	173.69		**FD.28-M71C4**
	11	1381	0.96	153.74	★	
	13.2	1160	1.1	128.77		
	15.4	983	1.3	109.79	★	
	18.2	841	1.6	93.32	★	
	21	726	1.8	81.1		
	24	637	2.1	70.59	★	
	27	575	2.3	63.68		
	30	504	2.6	56.2		
	28	531	2.5	59.65		**FZ.28-M71C4**
	34	451	2.9	50.3	★	
	38	398	3.3	44.66		
	43	354	3.8	39.15	★	
	48	318	4.2	35.04		
	54	283	4.8	31.1	★	
	62	248	5.4	27.25		
	71	212	6.2	23.96	★	
	78	194	6.8	21.64		
	90	168	7.8	18.86	★	
	100	150	8.7	16.94		
	111	141	9.7	15.29	★	
	122	124	10.7	13.87		
	134	115	11.6	12.62	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.25 (60 Hz)	152	97	12.5	11.16		**FZ.28-M71C4**
	165	88	13.2	10.3	★	
	191	79	14.6	8.87		
0.33 (60 Hz)	0.08	210104	0.84	20906		**FD.188B-D48-M71S4**
	0.09	192177	0.92	19122	★	
	0.1	180122	0.98	17537		**FD.188B-Z48-M71S4**
	0.11	159396	1.1	15519	★	
	0.12	144905	1.2	14108		
	0.13	130175	1.4	12674	★	
	0.15	111575	1.6	10863		
	0.17	100955	1.8	9829	★	
	0.19	93187	1.9	9073		
	0.12	145490	0.85	14165	★	**FD.168B-Z48-M71S4**
	0.13	132266	0.94	12878		
	0.15	118812	1	11568	★	
	0.17	101850	1.2	9916		
	0.19	92142	1.3	8971	★	
	0.2	85056	1.5	8281		
	0.23	73958	1.7	7201	★	
	0.26	67147	1.8	6538		
	0.28	61319	2	5970	★	
	0.19	92603	0.86	9016		**FD.148B-Z38-M71S4**
	0.21	81912	0.97	7975	★	
	0.23	74224	1.1	7227		
	0.26	65526	1.2	6380	★	
	0.29	59113	1.3	5755		
	0.32	53613	1.5	5220	★	
	0.35	48848	1.6	4756		
	0.39	44676	1.8	4350	★	
	0.43	39946	2	3889		
	0.27	63196	0.85	6153	★	**FD.128B-Z38-M71S4**
	0.3	57014	0.95	5551		
	0.34	51700	1	5034	★	
	0.37	47112	1.1	4587		
	0.4	43090	1.3	4195	★	
	0.45	38529	1.4	3751		
	0.49	35384	1.5	3445	★	
	0.54	31895	1.7	3105		
	0.63	27422	2	2670	★	
	0.46	37466	0.8	3648		**FD.108B-Z38-M71S4**
	0.5	34401	0.88	3349	★	
	0.56	31009	0.97	3019		
	0.65	26660	1.1	2596	★	
	0.73	23773	1.3	2315		
	0.79	21833	1.4	2126	★	
	0.88	19680	1.5	1916		
	1	16917	1.8	1647	★	
	1.1	15677	1.9	1526		
	0.83	20761	0.81	2021		**FD.88B-Z28-M71S4**
	0.92	18733	0.9	1824	★	
	1	16988	0.99	1654		
	1.1	15456	1.1	1505	★	
	1.3	13666	1.2	1331		
	1.4	12621	1.3	1229	★	
	1.6	10867	1.5	1058		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.33 (60 Hz)	1.8	9884	1.7	962	★	**FD.88B-Z28-M71S4**
	1.9	8972	1.9	874	★	
	1.6	10637	0.83	1036		**FD.68B-Z28-M71S4**
	1.8	9672	0.92	942	★	
	2	8556	1	833		
	2.2	7900	1.1	769	★	
	2.5	6802	1.3	662		
	2.8	6182	1.4	602	★	
	3.1	5615	1.6	547	★	
	3.4	5092	1.7	496		
	3.7	4641	1.9	452	★	
	3	5819	0.82	567	★	**FD.48B-Z28-M71S4**
	3.3	5296	0.9	516	★	
	3.6	4809	1	468		
	4	4375	1.1	426	★	
	4.5	3861	1.2	376		
	4.9	3560	1.3	347	★	
	5.6	3073	1.6	299		
	6.3	3374	1.4	268.8	★	**FD.48B-M71S4**
	7.1	2993	1.6	238.65		
	8.1	2621	1.8	209.23	★	
	9	2347	2	187.24		
	5.6	3144	0.82	303		**FZ.38B-Z28-M71S4**
	7	3038	0.85	241.91	★	**FD.38B-M71S4**
	8.1	2604	0.98	207.83		
	8.8	2400	1.1	191.34	★	
	9.7	2178	1.2	173.94		
	10.9	1930	1.3	153.96	★	
	13.1	1620	1.6	128.95		
	15.3	1381	1.9	109.95	★	
	18	1169	2.2	93.46	★	
	13.1	1612	0.82	128.77		**FD.28-M71S4**
	15.3	1381	0.96	109.79	★	
	18.1	1169	1.1	93.32	★	
	21	1018	1.3	81.1		
	24	885	1.5	70.59	★	
	26	797	1.7	63.68		
	30	708	1.9	56.2		
	28	744	1.8	59.65		**FZ.28-M71S4**
	34	628	2.1	50.3	★	
	38	558	2.4	44.66		
	43	496	2.7	39.15	★	
	48	442	3	35.04		
	54	389	3.4	31.1	★	
	62	345	3.9	27.25		
	70	301	4.4	23.96	★	
	78	274	4.9	21.64		
	89	239	5.6	18.86	★	
	100	212	6.2	16.94		
	110	194	6.9	15.29	★	
	121	177	7.6	13.87		
	134	159	8.3	12.62	★	
	151	141	9	11.16		
	164	132	9.5	10.3	★	
	190	115	10.4	8.87		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.33 (60 Hz)	209	97	11.1	8.06	★	**FZ.28-M71S4**
	234	88	12.4	7.2	★	
	258	82	13.2	6.53		
	284	74	14	5.94	★	
	321	65	14.9	5.25		
0.5 (60 Hz)	0.13	201176	0.88	12674	★	**FD.188B-Z48-M71M4**
	0.15	172434	1	10863		
	0.17	156021	1.1	9829	★	
	0.19	144019	1.2	9073		
	0.21	125224	1.4	7889	★	
	0.23	113701	1.6	7163		
	0.26	103807	1.7	6540	★	
	0.28	95251	1.9	6001		
	0.3	87767	2	5529	★	
	0.19	142399	0.87	8971	★	**FD.168B-Z48-M71M4**
	0.2	131442	0.94	8281		
	0.23	114303	1.1	7201	★	
	0.26	103781	1.2	6538		
	0.28	94764	1.3	5970	★	
	0.31	86934	1.4	5477		
	0.33	80096	1.5	5046	★	
	0.37	72745	1.7	4583		
	0.4	66270	1.9	4175	★	
	0.44	60716	2	3825		
	0.29	91354	0.87	5755		**FD.148B-Z38-M71M4**
	0.32	82860	0.96	5220	★	
	0.35	75490	1.1	4756		
	0.39	69051	1.2	4350	★	
	0.43	61735	1.3	3889		
	0.47	56686	1.4	3571	★	
	0.52	51097	1.6	3219		
	0.61	43941	1.8	2768	★	
	0.68	39175	2	2468		
	0.4	66589	0.81	4195	★	**FD.128B-Z38-M71M4**
	0.45	59538	0.91	3751		
	0.49	54685	0.99	3445	★	
	0.54	49290	1.1	3105		
	0.63	42382	1.3	2670	★	
	0.71	37794	1.4	2381		
	0.77	34702	1.6	2186	★	
	0.85	31266	1.7	1970		
	0.99	26890	2	1694	★	
	0.73	36749	0.82	2315		**FD.108B-Z38-M71M4**
	0.79	33746	0.89	2126	★	
	0.88	30416	0.99	1916		
	1	26146	1.2	1647	★	
	1.1	24224	1.2	1526		
	1.2	21966	1.4	1384	★	
	1.3	20017	1.5	1261		
	1.5	18299	1.6	1153	★	
	1.6	16368	1.8	1031		
	1.8	15030	2	947	★	
	1.3	21124	0.8	1331		**FD.88B-Z28-M71M4**
	1.4	19512	0.86	1229	★	
	1.6	16793	1	1058		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.5 (60 Hz)	1.8	15270	1.1	962	★	**FD.88B-Z28-M71M4**
	1.9	13870	1.2	874	★	
	2.1	12586	1.3	793		
	2.3	11443	1.5	721	★	
	2.6	10123	1.7	638		
	2.9	9353	1.8	589	★	
	2.5	10504	0.84	662		**FD.68B-Z28-M71M4**
	2.8	9557	0.93	602	★	
	3.1	8680	1	547	★	
	3.4	7874	1.1	496		
	3.7	7174	1.2	452	★	
	4.2	6332	1.4	399		
	4.6	5854	1.5	369	★	
	5.3	5030	1.8	317		
	5.7	5500	1.6	296.18	★	**FD.68B-M71M4**
	6.4	4889	1.8	263.39		
	7.4	4242	2.1	228.48	★	
	4.5	5969	0.8	376		**FD.48B-Z28-M71M4**
	4.9	5509	0.87	347	★	
	5.6	4747	1	299		
	6.3	4995	0.96	268.8	★	**FD.48B-M71M4**
	7.1	4428	1.1	238.65		
	8.1	3888	1.2	209.23	★	
	9	3480	1.4	187.24		
	10.1	3091	1.5	166.19	★	
	11.6	2701	1.8	145.63		
	13.2	2382	2	128.04	★	
	14.6	2152	2.2	115.68		
	9.7	3232	0.8	173.94		**FD.38B-M71M4**
	10.9	2860	0.9	153.96	★	
	13.1	2391	1.1	128.95		
	15.3	2046	1.3	109.95	★	
	18	1736	1.5	93.46	★	
	21	1505	1.7	81.22		
	24	1310	2	70.7	★	
	26	1186	2.2	63.77		
	30	1045	2.5	56.28		
	30	1054	1.8	56.72	★	**FZ.38B-M71M4**
	33	938	2.2	50.44		
	21	1505	0.88	81.1		**FD.28-M71M4**
	24	1310	1	70.59	★	
	26	1186	1.1	63.68		
	30	1045	1.3	56.2		
	28	1107	1.2	59.65		**FZ.28-M71M4**
	34	930	1.4	50.3	★	
	38	832	1.6	44.66		
	43	726	1.8	39.15	★	
	48	655	2	35.04		
	54	575	2.3	31.1	★	
	62	504	2.6	27.25		
	70	442	3	23.96	★	
0.75 (60 Hz)	0.19	220263	0.8	9073		**FD.188B-Z48-M71MB4**
	0.21	191521	0.92	7889	★	
	0.23	173895	1	7163		
	0.26	158767	1.1	6540	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.75 (60 Hz)	0.28	145685	1.2	6001		**FD.188B-Z48-M71MB4**
	0.3	134223	1.3	5529	★	
	0.34	121894	1.5	5021		
	0.37	111044	1.6	4574	★	
	0.4	101717	1.7	4190		
	0.45	90769	2	3739	★	
	0.28	144932	0.86	5970	★	**FD.168B-Z48-M71MB4**
	0.31	132966	0.93	5477		
	0.33	122496	1	5046	★	
	0.37	111256	1.1	4583		
	0.4	101354	1.2	4175	★	
	0.44	92860	1.3	3825		
	0.49	82860	1.5	3413	★	
	0.43	94410	0.84	3889		**FD.148B-Z38-M71MB4**
	0.47	86695	0.92	3571	★	
	0.52	78148	1	3219		
	0.61	67200	1.2	2768	★	
	0.68	59910	1.3	2468		
	0.74	55012	1.4	2266	★	
	0.82	49600	1.6	2043		
	0.96	42656	1.9	1757	★	
	1	39671	2	1634		**FD.148B-Z48-M71MB4**
	0.63	64817	0.83	2670	★	**FD.128B-Z38-M71MB4**
	0.71	57802	0.93	2381		
	0.77	53073	1	2186	★	
	0.85	47829	1.1	1970		
	0.99	41124	1.3	1694	★	
	1.1	36509	1.5	1504		**FD.128B-Z48-M71MB4**
	1.2	33259	1.6	1370	★	
	1.3	30469	1.8	1255		
	1.5	27191	2	1120	★	
	1.1	37050	0.81	1526		**FD.108B-Z38-M71MB4**
	1.2	33595	0.9	1384	★	
	1.3	30610	0.98	1261		
	1.5	27989	1.1	1153	★	
	1.6	25030	1.2	1031		
	1.8	22993	1.3	947	★	
	2	20708	1.5	853		
	2.3	17820	1.7	734	★	
	2.3	17767	1.7	732	★	
	2.6	15881	1.9	654		
	2.1	19255	0.87	793		**FD.88B-Z28-M71MB4**
	2.3	17502	0.96	721	★	
	2.6	15491	1.1	638		
	2.9	14295	1.2	589	★	
	3.3	12311	1.4	507		
	3.7	11195	1.5	461	★	
	4.2	11177	1.5	404.92		**FD.88B-M71MB4**
	4.7	9893	1.7	358.33	★	
	5.2	8990	1.9	325.76		
	5.8	8077	2.1	292.64	★	
	3.7	10974	0.81	452	★	**FD.68B-Z28-M71MB4**
	4.2	9689	0.91	399		
	4.6	8954	0.99	369	★	
	5.3	7697	1.2	317		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.75 (60 Hz)	5.7	8175	1.1	296.18	★	**FD.68B-M71MB4**
	6.4	7271	1.2	263.39		
	7.4	6306	1.4	228.48	★	
	7.9	5890	1.5	213.48		
	9	5181	1.7	187.76	★	
	10.2	4543	2	164.44		
	11.6	4012	2.2	145.44	★	
	8.1	5774	0.83	209.23	★	**FD.48B-M71MB4**
	9	5172	0.93	187.24		
	10.1	4588	1	166.19	★	
	11.6	4021	1.2	145.63		
	13.2	3534	1.4	128.04	★	
	14.6	3197	1.5	115.68		
	16.7	2781	1.7	100.8	★	
	18.6	2497	1.9	90.53		
	21	2258	2.1	81.73	★	
	23	2046	2.3	74.1		
	28	1674	2.1	60.71	★	**FZ.48B-M71MB4**
	15.3	3038	0.85	109.95	★	**FD.38B-M71MB4**
	18	2577	1	93.46	★	
	21	2240	1.1	81.22		
	24	1948	1.3	70.7	★	
	26	1762	1.5	63.77		
	30	1550	1.7	56.28		
	30	1567	1.2	56.72	★	**FZ.38B-M71MB4**
	33	1390	1.5	50.44		
	38	1204	1.8	43.75	★	
	41	1124	2.2	40.88		
	47	992	2.6	35.96	★	
	30	1550	0.86	56.2		**FD.28-M71MB4**
	28	1647	0.81	59.65		**FZ.28-M71MB4**
	34	1390	0.96	50.3	★	
	38	1231	1.1	44.66		
	43	1080	1.2	39.15	★	
	48	965	1.4	35.04		
	54	859	1.5	31.1	★	
	62	752	1.8	27.25		
	70	664	2	23.96	★	
	78	602	2.2	21.64		
	89	522	2.6	18.86	★	
	100	469	2.8	16.94		
	110	425	3.1	15.29	★	
	121	380	3.5	13.87		
	134	345	3.8	12.62	★	
1 (60 Hz)	0.26	217898	0.81	6540	★	**FD.188B-Z48-M80M4**
	0.28	199936	0.89	6001		
	0.31	184214	0.96	5529	★	
	0.34	167288	1.1	5021		
	0.37	152390	1.2	4574	★	
	0.41	139600	1.3	4190		
	0.46	124578	1.4	3739	★	
	0.51	111177	1.6	3337		
	0.6	94419	1.9	2834		
	0.37	152691	0.81	4583		**FD.168B-Z48-M80M4**
	0.41	139104	0.89	4175	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1 (60 Hz)	0.44	127439	0.97	3825		**FD.168B-Z48-M80M4**
	0.5	113710	1.1	3413	★	
	0.56	101487	1.2	3046		
	0.66	86190	1.4	2587		
	0.79	71735	1.7	2153	★	
	0.8	70601	1.8	2119	★	
	0.9	63002	2	1891		
	0.61	92222	0.86	2768	★	**FD.148B-Z38-M80M4**
	0.69	82231	0.97	2468		
	0.75	75499	1.1	2266	★	
	0.83	68068	1.2	2043		
	0.97	58538	1.4	1757	★	
	1	54437	1.5	1634		**FD.148B-Z48-M80M4**
	1.1	49609	1.6	1489	★	
	1.2	45446	1.8	1364		
	1.4	40548	2	1217	★	
	1.1	50105	1.1	1504		**FD.128B-Z48-M80M4**
	1.2	45641	1.2	1370	★	
	1.4	41815	1.3	1255		
	1.5	37315	1.4	1120	★	
	1.7	33285	1.6	999		
	2	28290	1.9	849		
	0.86	65632	0.82	1970		**FD.128B-Z38-M80M4**
	1	56438	0.96	1694	★	
	1.6	34348	0.88	1031		**FD.108B-Z38-M80M4**
	1.8	31549	0.95	947	★	
	2	28423	1.1	853		
	2.3	24384	1.2	732	★	
	2.3	24455	1.2	734	★	
	2.6	21789	1.4	654		
	2.8	20026	1.5	601	★	
	3.1	18024	1.7	541		
	3.6	15526	1.9	466	★	
	4	15836	1.9	424.49	★	**FD.108B-M80M4**
	2.9	19858	0.85	589	★	**FD.88B-Z28-M71MP4**
	3.3	17094	0.98	507		
	3.6	15544	1.1	461	★	
	4.2	15110	1.1	404.92		**FD.88B-M80M4**
	4.7	13374	1.3	358.33	★	
	5.2	12161	1.4	325.76		
	5.8	10921	1.5	292.64	★	
	6.8	9362	1.8	250.83		
	7.5	8467	2	226.94	★	
	5.3	10690	0.83	317		**FD.68B-Z28-M71MP4**
	5.7	11053	0.8	296.18	★	**FD.68B-M80M4**
	6.5	9831	0.9	263.39		
	7.4	8529	1	228.48	★	
	8	7962	1.1	213.48		
	9.1	7006	1.3	187.76	★	
	10.3	6138	1.4	164.44		
	11.7	5429	1.6	145.44	★	
	12.9	4915	1.8	131.82		
	14.6	4340	2	116.36	★	
	16.2	3914	2.3	104.96		
	11.7	5438	0.88	145.63		**FD.48B-M80M4**

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1 (60 Hz)	13.3	4774	1	128.04	★	**FD.48B-M80M4**
	14.7	4313	1.1	115.68		
	16.9	3764	1.3	100.8	★	
	18.8	3374	1.4	90.53		
	21	3046	1.6	81.73	★	
	23	2763	1.7	74.1		
	25	2515	1.9	67.43	★	
	28	2223	2.1	59.62		
	31	2054	2.3	55.06	★	
	28	2267	1.6	60.71	★	**FZ.48B-M80M4**
	31	2063	2.2	55.19		
	34	1851	2.6	49.58	★	
	21	3029	0.85	81.22		**FD.38B-M80M4**
	24	2639	0.97	70.7	★	
	27	2382	1.1	63.77		
	30	2099	1.2	56.28		
	30	2116	0.88	56.72	★	**FZ.38B-M80M4**
	34	1886	1.1	50.44		
	39	1629	1.4	43.75	★	
	42	1523	1.6	40.88		
	47	1346	1.9	35.96	★	
	54	1178	2.2	31.49		
	61	1036	2.5	27.85	★	
	67	938	2.7	25.24		
	76	832	3.1	22.28	★	
	43	1479	0.9	39.15	★	**FZ.28-M71MP4**
	48	1319	1	35.04		
	54	1178	1.1	31.1	★	
	62	1027	1.3	27.25		
	70	903	1.5	23.96	★	
	78	814	1.6	21.64		
	89	708	1.9	18.86	★	
	99	637	2.1	16.94		
	110	575	2.3	15.29	★	
	121	522	2.5	13.87		
	133	478	2.8	12.62	★	
	151	425	3	11.16		
	163	389	3.1	10.3	★	
	189	336	3.5	8.87		
	208	301	3.7	8.06	★	
	233	274	4.1	7.2	★	
	257	248	4.4	6.53		
	283	221	4.7	5.94	★	
	320	194	5	5.25		
1.5 (60 Hz)	0.41	205649	0.86	4190		**FD.188B-Z48-M90S4**
	0.46	183514	0.97	3739	★	
	0.51	163780	1.1	3337		
	0.6	139095	1.3	2834		
	0.73	115782	1.5	2359	★	
	0.74	113967	1.6	2322	★	
	0.83	101690	1.7	2072		
	1.3	63710	1.9	1298		**FD.168B-Z68-M90S4**
	0.56	149502	0.83	3046		**FD.168B-Z48-M90S4**
	0.66	126969	0.98	2587		
	0.8	105667	1.2	2153	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1.5 (60 Hz)	0.81	104002	1.2	2119	★	**FD.168B-Z48-M90S4**
	0.91	92806	1.3	1891		
	1.1	78821	1.6	1606		
	1.3	65623	1.9	1337	★	
	0.84	100273	0.8	2043		**FD.148B-Z38-M90S4**
	0.98	86234	0.92	1757	★	
	1	80194	0.99	1634		**FD.148B-Z48-M90S4**
	1.2	73081	1.1	1489	★	
	1.3	66943	1.2	1364		
	1.4	59733	1.3	1217	★	
	1.6	53303	1.5	1086		
	1.9	45252	1.8	922		
	1.3	67235	0.8	1370	★	**FD.128B-Z48-M90S4**
	1.4	61593	0.88	1255		
	1.5	54968	0.98	1120	★	
	1.7	49034	1.1	999		
	2	41673	1.3	849		
	2.4	34649	1.6	706	★	
	2.5	34109	1.6	695	★	
	2.8	30433	1.8	620		
	2.3	35925	0.84	732	★	**FD.108B-Z38-M90S4**
	2.3	36022	0.84	734	★	
	2.6	32098	0.94	654		
	2.9	29494	1	601	★	
	3.2	26554	1.1	541		
	3.7	22869	1.3	466	★	
	4	23029	1.3	424.49	★	**FD.108B-M90S4**
	4.5	20770	1.5	382.79		
	5	18724	1.6	345.19	★	
	5.7	16377	1.8	301.88		
	6.3	14703	2	271.01	★	
	4.8	19441	0.87	358.33	★	**FD.88B-M90S4**
	5.3	17670	0.95	325.76		
	5.9	15881	1.1	292.64	★	
	6.8	13604	1.2	250.83		
	7.6	12311	1.4	226.94	★	
	8.2	11363	1.5	209.49		
	9.4	9884	1.7	182.15	★	
	10.4	8972	1.9	165.38		
	11.4	8193	2.1	151.01	★	
	12.4	7519	2.2	138.56		
	9.1	10185	0.87	187.76	★	**FD.68B-M90S4**
	10.4	8919	0.99	164.44		
	11.8	7891	1.1	145.44	★	
	13	7147	1.2	131.82		
	14.7	6315	1.4	116.36	★	
	16.3	5695	1.6	104.96		
	18	5163	1.7	95.2	★	
	19.8	4703	1.9	86.74		
	22	4304	2.1	79.33	★	
	24	3844	2.3	70.93		
	28	3321	2.3	61.17	★	**FZ.68B-M90S4**
	17	5464	0.87	100.8	★	**FD.48B-M90S4**
	18.9	4915	0.97	90.53		
	21	4437	1.1	81.73	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1.5 (60 Hz)	23	4021	1.2	74.1		**FD.48B-M90S4**
	25	3658	1.3	67.43	★	
	29	3232	1.5	59.62		
	31	2984	1.6	55.06	★	
	36	2568	1.9	47.4		
	40	2338	2	43.09	★	
	28	3294	1.1	60.71	★	**FZ.48B-M90S4**
	31	2993	1.5	55.19		
	35	2692	1.8	49.58	★	
	40	2302	2.1	42.5		
	45	2090	2.3	38.45	★	
	48	1922	2.5	35.49		
	56	1674	2.9	30.86	★	
	30	3055	0.84	56.28		**FD.38B-M90S4**
	39	2373	0.93	43.75	★	**FZ.38B-M90S4**
	42	2214	1.1	40.88		
	48	1948	1.3	35.96	★	
	54	1709	1.5	31.49		
	62	1514	1.7	27.85	★	
	68	1372	1.9	25.24		
	77	1204	2.1	22.28	★	
	85	1089	2.4	20.1		
	94	992	2.6	18.23	★	
	103	903	2.9	16.61		
	113	823	3.1	15.19	★	
	126	735	3.5	13.58		
	138	673	3.8	12.47	★	
	63	1479	0.9	27.25		**FZ.28-M90S4**
	72	1302	1	23.96	★	
	79	1178	1.1	21.64		
	91	1027	1.3	18.86	★	
	101	921	1.4	16.94		
	112	832	1.6	15.29	★	
	124	752	1.8	13.87		
	136	682	1.9	12.62	★	
	154	602	2.1	11.16		
	167	558	2.2	10.3	★	
	193	478	2.4	8.87		
	213	434	2.6	8.06	★	
	238	389	2.9	7.2	★	
	263	354	3.1	6.53		
	289	318	3.2	5.94	★	
	327	283	3.5	5.25		
	354	265	3.7	4.85	★	
	410	230	3.9	4.18		
	451	203	4.1	3.8	★	
2 (60 Hz)	0.6	191087	0.93	2834		**FD.188B-Z48-M90L4**
	0.73	159059	1.1	2359	★	
	0.74	156570	1.1	2322	★	
	0.83	139715	1.3	2072		
	0.97	118670	1.5	1760		
	1.2	98785	1.8	1465	★	
	1.2	97705	1.8	1449		**FD.188B-Z68-M90L4**
	0.8	145171	0.85	2153	★	**FD.168B-Z48-M90L4**
	0.81	142877	0.87	2119	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
2 (60 Hz)	0.91	127509	0.97	1891	**FD.168B-Z48-M90L4**
	1.1	108289	1.1	1606	
	1.3	90149	1.4	1337 ★	
	1.3	87519	1.4	1298	**FD.168B-Z68-M90L4**
	1.5	74711	1.7	1108 ★	
	1.3	91974	0.87	1364	**FD.148B-Z48-M90L4**
	1.4	82063	0.97	1217 ★	
	1.6	73223	1.1	1086	
	1.9	62169	1.3	922	
	2.2	51788	1.5	768 ★	
	2.5	45446	1.8	674	
	1.7	67359	0.8	999	**FD.128B-Z48-M90L4**
	2	57244	0.94	849	
	2.4	47608	1.1	706 ★	
	2.5	46864	1.2	695 ★	
	2.8	41806	1.3	620	
	3.3	35535	1.5	527	
	3.9	29601	1.8	439 ★	
	3.8	33144	1.6	447.96	**FD.128B-M90L4**
	4.2	29999	1.8	405.47 ★	
	3.2	36474	0.83	541	**FD.108B-Z38-M90L4**
	3.7	31425	0.96	466 ★	
	4	31408	0.96	424.49 ★	**FD.108B-M90L4**
	4.5	28316	1.1	382.79	
	5	25535	1.2	345.19 ★	
	5.7	22338	1.3	301.88	
	6.3	20052	1.5	271.01 ★	
	6.9	18316	1.6	247.53	
	7.8	16253	1.9	219.66 ★	
	8.5	15004	2	202.77	
	6.8	18556	0.91	250.83	**FD.88B-M90L4**
	7.6	16793	1	226.94 ★	
	8.2	15500	1.1	209.49	
	9.4	13471	1.2	182.15 ★	
	10.4	12231	1.4	165.38	
	11.4	11169	1.5	151.01 ★	
	12.4	10247	1.6	138.56	
	13.4	9441	1.8	127.66 ★	
	14.8	8573	2	115.93	
	16.2	7812	2.2	105.61 ★	
	11.8	10761	0.82	145.44 ★	**FD.68B-M90L4**
	13	9751	0.91	131.82	
	14.7	8609	1	116.36 ★	
	16.3	7767	1.1	104.96	
	18	7041	1.3	95.2 ★	
	19.8	6421	1.4	86.74	
	22	5872	1.5	79.33 ★	
	24	5243	1.7	70.93	
	26	4818	1.8	65.14 ★	
	29	4340	2	58.71	
	34	3737	2.4	50.48 ★	
	28	4526	1.7	61.17 ★	**FZ.68B-M90L4**
	32	3959	2.2	53.5	
	36	3551	2.5	48.03 ★	
	39	3241	2.7	43.87	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
2 (60 Hz)	23	5482	0.87	74.1		**FD.48B-M90L4**
	25	4986	0.96	67.43	★	
	29	4410	1.1	59.62		
	31	4074	1.2	55.06	★	
	36	3507	1.4	47.4		
	40	3188	1.5	43.09	★	
	31	4083	1.1	55.19		**FZ.48B-M90L4**
	35	3666	1.3	49.58	★	
	40	3144	1.5	42.5		
	45	2843	1.7	38.45	★	
	48	2621	1.8	35.49		
	56	2285	2.1	30.86	★	
	61	2072	2.3	28.02		
	67	1895	2.5	25.59	★	
	73	1736	2.8	23.48		
	79	1603	3	21.63	★	
	87	1452	3.3	19.64		
	42	3020	0.81	40.88		**FZ.38B-M90L4**
	48	2657	0.97	35.96	★	
	54	2329	1.1	31.49		
	62	2063	1.2	27.85	★	
	68	1868	1.4	25.24		
	77	1647	1.6	22.28	★	
	85	1488	1.7	20.1		
	94	1346	1.9	18.23	★	
	103	1231	2.1	16.61		
	113	1124	2.3	15.19	★	
	126	1000	2.6	13.58		
	138	921	2.8	12.47	★	
	153	832	3.1	11.24		
	177	717	3.6	9.67	★	
	201	628	4.1	8.52	★	
	221	575	4.5	7.76		
	79	1603	0.83	21.64		**FZ.28-M90L4**
	91	1399	0.95	18.86	★	
	101	1248	1.1	16.94		
	112	1133	1.2	15.29	★	
	124	1027	1.3	13.87		
	136	930	1.4	12.62	★	
	154	823	1.5	11.16		
	167	761	1.6	10.3	★	
	193	655	1.8	8.87		
	213	593	1.9	8.06	★	
	238	531	2.1	7.2	★	
	263	478	2.2	6.53		
	289	442	2.4	5.94	★	
	327	389	2.5	5.25		
	354	354	2.7	4.85	★	
	410	310	2.8	4.18		
	451	283	3	3.8	★	
3 (60 Hz)	0.83	205640	0.86	2072		**FD.188B-Z48-M100L4**
	0.98	174675	1	1760		
	1.2	145401	1.2	1465	★	
	1.2	143807	1.2	1449		**FD.188B-Z68-M100L4**
	1.4	122673	1.4	1236	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
3 (60 Hz)	1.7	102222	1.7	1030		**FD.188B-Z68-M100L4**
	1.3	132691	0.93	1337	★	**FD.168B-Z48-M100L4**
	1.3	128820	0.96	1298		**FD.168B-Z68-M100L4**
	1.6	109963	1.1	1108	★	
	1.9	91602	1.4	923		
	2.2	75924	1.6	765	★	
	2.5	66987	1.9	675		
	1.9	91504	0.87	922		**FD.148B-Z48-M100L4**
	2.2	76226	1	768	★	
	2.6	66890	1.2	674		
	3	56872	1.4	573		
	3.6	47342	1.7	477	★	
	3.8	48600	1.6	449.21	★	**FD.148B-M100L4**
	4.2	44570	1.8	411.98		
	4.7	39822	2	368.06	★	
	2.8	61531	0.88	620		**FD.128B-Z48-M100L4**
	3.3	52302	1	527		
	3.9	43569	1.2	439	★	
	4.8	38405	1.4	354.99		**FD.128B-M100L4**
	5.4	34649	1.6	320.24	★	
	5.9	31726	1.7	293.22		
	6.6	28219	1.9	260.84	★	
	7.2	25792	2.1	238.39		
	5.7	32656	0.92	301.88		**FD.108B-M100L4**
	6.3	29317	1	271.01	★	
	6.9	26784	1.1	247.53		
	7.8	23764	1.3	219.66	★	
	8.5	21939	1.4	202.77		
	9.4	19840	1.5	183.39	★	
	10.2	18272	1.6	168.88		
	11	16899	1.8	156.19	★	
	11.9	15686	1.9	144.99		
	13.4	13843	2.2	127.92	★	
	9.4	19707	0.85	182.15	★	**FD.88B-M100L4**
	10.4	17891	0.94	165.38		
	11.4	16341	1	151.01	★	
	12.4	14995	1.1	138.56		
	13.5	13808	1.2	127.66	★	
	14.8	12541	1.3	115.93		
	16.3	11425	1.5	105.61	★	
	17.8	10469	1.6	96.75		
	19.9	9344	1.8	86.33	★	
	22	8334	2	77.04		
	26	7076	2.4	65.43		
	27	6988	2.4	64.58	★	**FZ.88B-M100L4**
	18.1	10301	0.86	95.2	★	**FD.68B-M100L4**
	19.8	9388	0.94	86.74		
	22	8582	1	79.33	★	
	24	7670	1.2	70.93		
	26	7050	1.3	65.14	★	
	29	6350	1.4	58.71		
	34	5464	1.6	50.48	★	
	32	5792	1.5	53.5		**FZ.68B-M100L4**
	36	5199	1.7	48.03	★	
	39	4747	1.9	43.87		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
3 (60 Hz)	44	4216	2.1	38.93	★	**FZ.68B-M100L4**
	48	3888	2.3	35.93		
	53	3516	2.5	32.5	★	
	58	3241	2.7	29.93		
	62	2993	3	27.68	★	
	31	5960	0.8	55.06	★	**FD.48B-M100L4**
	36	5128	0.93	47.4		
	40	4658	1	43.09	★	
	40	4596	1	42.5		**FZ.48B-M100L4**
	45	4162	1.1	38.45	★	
	48	3844	1.2	35.49		
	56	3339	1.4	30.86	★	
	61	3029	1.6	28.02		
	67	2772	1.7	25.59	★	
	73	2542	1.9	23.48		
	80	2338	2	21.63	★	
	88	2125	2.3	19.64		
	96	1939	2.5	17.89	★	
	105	1771	2.7	16.39		
	118	1585	3	14.63	★	
	132	1408	3.4	13.05		
	155	1195	3.9	11.09		
	62	3011	0.85	27.85	★	**FZ.38B-M100L4**
	68	2728	0.94	25.24		
	77	2409	1.1	22.28	★	
	86	2178	1.2	20.1		
	94	1975	1.3	18.23	★	
	104	1798	1.4	16.61		
	113	1647	1.6	15.19	★	
	127	1470	1.7	13.58		
	138	1346	1.9	12.47	★	
	153	1213	2.1	11.24		
	178	1045	2.5	9.67	★	
	202	921	2.8	8.52	★	
	222	841	3.1	7.76		
	242	770	3.3	7.1	★	
	271	690	3.5	6.35		
	295	628	3.9	5.83	★	
	328	566	3.9	5.25		
	381	487	4.1	4.52	★	
	112	1656	0.8	15.29	★	**FZ.28-M90LB4**
	124	1505	0.88	13.87		
	136	1372	0.96	12.62	★	
	154	1213	1	11.16		
	167	1116	1.1	10.3	★	
	193	965	1.2	8.87		
	213	876	1.3	8.06	★	
	238	779	1.4	7.2	★	
	263	708	1.5	6.53		
	289	646	1.6	5.94	★	
	327	566	1.7	5.25		
	354	522	1.9	4.85	★	
	410	451	1.9	4.18		
	451	416	2.1	3.8	★	
4 (60 Hz)	1.2	195693	0.91	1449		**FD.188B-Z68-M100LB4**

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
4 (60 Hz)	1.4	166925	1.1	1236	★	**FD.188B-Z68-M100LB4**
	1.7	139104	1.3	1030		
	2	115331	1.5	854	★	
	2.3	101832	1.7	754		
	2.7	86837	2	643	★	
	1.2	197845	0.9	1465	★	**FD.188B-Z48-M100LB4**
	1.6	149635	0.83	1108	★	**FD.168B-Z68-M100LB4**
	1.9	124649	0.99	923		
	2.3	103311	1.2	765	★	
	2.6	91159	1.4	675		
	3	77793	1.6	576	★	
	3.6	64826	1.9	480		
	2.6	91026	0.88	674		**FD.148B-Z48-M100LB4**
	3	77386	1	573		
	3.6	64419	1.2	477	★	
	3.9	65889	1.2	449.21	★	**FD.148B-M100LB4**
	4.2	60433	1.3	411.98		
	4.7	53985	1.5	368.06	★	
	5.1	49441	1.6	337.07		
	5.6	45544	1.8	310.51	★	
	6	42169	1.9	287.49		
	6.5	39220	2	267.35	★	
	3.9	59290	0.91	439	★	**FD.128B-Z48-M100LB4**
	4.9	52072	1	354.99		**FD.128B-M100LB4**
	5.4	46970	1.2	320.24	★	
	5.9	43011	1.3	293.22		
	6.6	38263	1.4	260.84	★	
	7.3	34968	1.5	238.39		
	7.9	32143	1.7	219.15	★	
	8.5	29698	1.8	202.48		
	9.2	27555	2	187.88	★	
	9.9	25668	2.1	175.01		
	7	36306	0.83	247.53		**FD.108B-M100LB4**
	7.9	32222	0.93	219.66	★	
	8.5	29742	1	202.77		
	9.4	26899	1.1	183.39	★	
	10.2	24773	1.2	168.88		
	11.1	22913	1.3	156.19	★	
	11.9	21266	1.4	144.99		
	13.5	18759	1.6	127.92	★	
	14.6	17324	1.7	118.11		
	16.4	15518	1.9	105.81	★	
	17.7	14313	2.1	97.57		
	12.5	20327	0.83	138.56		**FD.88B-M100LB4**
	13.6	18724	0.9	127.66	★	
	14.9	17006	0.99	115.93		
	16.4	15491	1.1	105.61	★	
	17.9	14189	1.2	96.75		
	20	12665	1.3	86.33	★	
	22	11301	1.5	77.04		
	26	9601	1.8	65.43		
	32	7989	2.1	54.47	★	
	27	9468	1.8	64.58	★	**FZ.88B-M100LB4**
	29	8671	1.9	59.13		
	33	7714	2.2	52.6	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
4 (60 Hz)	36	7041	2.4	48.03		**FZ.88B-M100LB4**
	39	6483	2.6	44.2	★	
	24	10407	0.85	70.93		**FD.68B-M100LB4**
	27	9557	0.93	65.14	★	
	30	8609	1	58.71		
	34	7404	1.2	50.48	★	
	32	7847	1.1	53.5		**FZ.68B-M100LB4**
	36	7041	1.3	48.03	★	
	39	6439	1.4	43.87		
	44	5712	1.6	38.93	★	
	48	5270	1.7	35.93		
	53	4765	1.9	32.5	★	
	58	4393	2	29.93		
	62	4056	2.2	27.68	★	
	67	3764	2.4	25.69		
	76	3321	2.7	22.67	★	
	83	3073	2.9	20.93		
	92	2754	3.2	18.75	★	
	100	2533	3.5	17.29		
	45	5642	0.85	38.45	★	**FZ.48B-M100LB4**
	49	5208	0.92	35.49		
	56	4526	1.1	30.86	★	
	62	4109	1.2	28.02		
	68	3755	1.3	25.59	★	
	74	3445	1.4	23.48		
	80	3170	1.5	21.63	★	
	88	2878	1.7	19.64		
	97	2621	1.8	17.89	★	
	106	2400	2	16.39		
	118	2143	2.2	14.63	★	
	133	1913	2.5	13.05		
	156	1629	2.9	11.09		
	187	1355	3.4	9.23	★	
	206	1231	3.7	8.39	★	
	225	1124	3.7	7.68		
	252	1009	3.9	6.86	★	
	283	894	4	6.12		
	333	761	4.4	5.2		
	400	637	4.5	4.33	★	
	86	2949	0.87	20.1		**FZ.38B-M100LB4**
	95	2674	0.96	18.23	★	
	104	2435	1.1	16.61		
	114	2232	1.2	15.19	★	
	127	1992	1.3	13.58		
	139	1833	1.4	12.47	★	
	154	1647	1.6	11.24		
	179	1417	1.8	9.67	★	
	203	1248	2.1	8.52	★	
	223	1142	2.3	7.76		
	244	1045	2.5	7.1	★	
	272	930	2.6	6.35		
	297	850	2.8	5.83	★	
	330	770	2.9	5.25		
	383	664	3	4.52	★	
	168	1514	0.81	10.3	★	**FZ.28-M100LB4**

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
4 (60 Hz)	195	1302	0.89	8.87		**FZ.28-M100LB4**
	215	1178	0.95	8.06	★	
	240	1054	1.1	7.2	★	
	265	956	1.1	6.53		
	291	868	1.2	5.94	★	
	330	770	1.3	5.25		
	357	708	1.4	4.85	★	
	414	611	1.4	4.18		
	455	558	1.5	3.8	★	
5.5 (60 Hz)	1.4	221211	0.8	1236	★	**FD.188B-Z68-M112MB4**
	1.7	184338	0.96	1030		
	2	152841	1.2	854	★	
	2.3	134941	1.3	754		
	2.7	115074	1.5	643	★	
	3.3	95924	1.8	536		
	2.3	136916	0.91	765	★	**FD.168B-Z68-M112MB4**
	2.6	120804	1	675		
	3	103090	1.2	576	★	
	3.6	85907	1.4	480		
	4.4	71230	1.7	398	★	
	3.7	85366	0.93	477	★	**FD.148B-Z48-M112MB4**
	3.9	87102	0.92	449.21	★	**FD.148B-M112MB4**
	4.2	79884	1	411.98		
	4.7	71363	1.1	368.06	★	
	5.2	65358	1.2	337.07		
	5.6	60203	1.3	310.51	★	
	6.1	55739	1.4	287.49		
	6.5	51841	1.5	267.35	★	
	7	48396	1.6	249.58		
	7.8	43303	1.8	223.31	★	
	8.4	40123	2	206.93		
	5.4	62089	0.87	320.24	★	**FD.128B-M112MB4**
	6	56855	0.95	293.22		
	6.7	50575	1.1	260.84	★	
	7.3	46226	1.2	238.39		
	8	42488	1.3	219.15	★	
	8.6	39264	1.4	202.48		
	9.3	36430	1.5	187.88	★	
	10	33932	1.6	175.01		
	11	30681	1.8	158.22	★	
	12	28245	1.9	145.66		
	13.3	25402	2.1	131.01	★	
	9.5	35562	0.85	183.39	★	**FD.108B-M112MB4**
	10.3	32745	0.92	168.88		
	11.2	30283	0.99	156.19	★	
	12	28113	1.1	144.99		
	13.6	24800	1.2	127.92	★	
	14.8	22905	1.3	118.11		
	16.5	20513	1.5	105.81	★	
	17.9	18919	1.6	97.57		
	21	15872	1.9	81.86		
	25	13542	2.2	69.84	★	
	27	12453	2.1	64.21	★	**FZ.108B-M112MB4**
	30	11399	2.3	58.8		
	16.5	20478	0.82	105.61	★	**FD.88B-M112MB4**

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
5.5 (60 Hz)	18	18759	0.9	96.75		**FD.88B-M112MB4**
	20	16740	1	86.33	★	
	23	14933	1.1	77.04		
	27	12683	1.3	65.43		
	32	10557	1.6	54.47	★	
	27	12524	1.3	64.58	★	**FZ.88B-M112MB4**
	30	11461	1.5	59.13		
	33	10194	1.7	52.6	★	
	36	9309	1.8	48.03		
	40	8573	2	44.2	★	
	43	7918	2.1	40.83		
	46	7342	2.3	37.89	★	
	49	6846	2.5	35.29		
	55	6191	2.7	31.91	★	
	59	5695	3	29.38		
	36	9309	0.95	48.03	★	**FZ.68B-M112MB4**
	40	8503	1	43.87		
	45	7546	1.2	38.93	★	
	49	6970	1.3	35.93		
	54	6297	1.4	32.5	★	
	58	5801	1.5	29.93		
	63	5367	1.7	27.68	★	
	68	4977	1.8	25.69		
	77	4393	2	22.67	★	
	83	4056	2.2	20.93		
	93	3631	2.4	18.75	★	
	101	3348	2.6	17.29		
	120	2816	3.1	14.51		
	141	2400	3.7	12.38	★	
	56	5987	0.8	30.86	★	**FZ.48B-M112MB4**
	62	5429	0.88	28.02		
	68	4960	0.96	25.59	★	
	74	4552	1.1	23.48		
	81	4198	1.1	21.63	★	
	89	3808	1.3	19.64		
	98	3472	1.4	17.89	★	
	106	3179	1.5	16.39		
	119	2834	1.7	14.63	★	
	134	2533	1.9	13.05		
	157	2152	2.2	11.09		
	189	1789	2.6	9.23	★	
	208	1629	2.8	8.39	★	
	227	1488	2.8	7.68		
	254	1328	2.9	6.86	★	
	285	1186	3	6.12		
	336	1009	3.3	5.2		
	403	841	3.4	4.33	★	
7.5 (60 Hz)	2	210591	0.84	854	★	**FD.188B-Z68-M132SB4**
	2.3	185932	0.95	754		
	2.7	158554	1.1	643	★	
	3.3	132177	1.3	536		
	3.9	109485	1.6	444	★	
	4.3	107669	1.6	403.86	★	**FD.188B-M132SB4**
	4.7	98785	1.8	370.52		
	5.1	91159	1.9	341.94	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
7.5 (60 Hz)	5.5	84560	2.1	317.18		**FD.188B-M132SB4**
	3	142035	0.87	576	★	**FD.168B-Z68-M132SB4**
	3.6	118360	1	480		
	4.4	98147	1.3	398	★	
	4.7	98449	1.3	369.26	★	**FD.168B-M132SB4**
	5.2	90247	1.4	338.49		
	5.6	83214	1.5	312.12	★	
	6	77120	1.6	289.26		
	6.3	73320	1.7	275.03	★	
	6.8	68529	1.8	257.04		
	7.7	60451	2.1	226.74	★	
	4.7	98130	0.81	368.06	★	**FD.148B-M132SB4**
	5.2	89866	0.89	337.07		
	5.6	82780	0.96	310.51	★	
	6.1	76651	1	287.49		
	6.5	71274	1.1	267.35	★	
	7	66536	1.2	249.58		
	7.8	59538	1.3	223.31	★	
	8.4	55172	1.4	206.93		
	9.2	50575	1.6	189.69	★	
	10	46359	1.7	173.89		
	11.8	39503	2	148.18		
	7.3	63560	0.85	238.39		**FD.128B-M132SB4**
	8	58422	0.92	219.15	★	
	8.6	53985	1	202.48		
	9.3	50088	1.1	187.88	★	
	10	46660	1.2	175.01		
	11	42178	1.3	158.22	★	
	12	38830	1.4	145.66		
	13.3	34924	1.5	131.01	★	
	14.4	32222	1.7	120.87		
	17	27307	2	102.41		
	19.6	23790	2.3	89.25	★	
	31	15039	2.5	56.42	★	**FZ.128B-M132SB4**
	13.6	34100	0.88	127.92	★	**FD.108B-M132SB4**
	14.8	31487	0.96	118.11		
	16.5	28210	1.1	105.81	★	
	17.9	26013	1.2	97.57		
	21	21824	1.4	81.86		
	25	18618	1.6	69.84	★	
	30	15518	1.9	58.2		
	36	12860	2.3	48.24	★	
	27	17121	1.6	64.21	★	**FZ.108B-M132SB4**
	30	15677	1.7	58.8		
	32	14446	2.1	54.17	★	
	35	13374	2.3	50.15		
	37	12435	2.4	46.64	★	
	40	11611	2.6	43.54		
	23	20540	0.82	77.04		**FD.88B-M132SB4**
	27	17440	0.96	65.43		
	32	14526	1.2	54.47	★	
	33	14021	1.2	52.6	★	**FZ.88B-M132SB4**
	36	12807	1.3	48.03		
	40	11780	1.4	44.2	★	
	43	10885	1.5	40.83		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
7.5 (60 Hz)	46	10097	1.7	37.89	★	**FZ.88B-M132SB4**
	49	9406	1.8	35.29		
	55	8511	2	31.91	★	
	59	7829	2.1	29.38		
	66	7041	2.4	26.42	★	
	72	6501	2.6	24.38		
	84	5509	3.1	20.65		
	97	4800	3.5	18	★	
	45	10380	0.85	38.93	★	**FZ.68B-M132SB4**
	49	9583	0.92	35.93		
	54	8662	1	32.5	★	
	58	7980	1.1	29.93		
	63	7378	1.2	27.68	★	
	68	6846	1.3	25.69		
	77	6040	1.5	22.67	★	
	83	5580	1.6	20.93		
	93	4995	1.8	18.75	★	
	101	4605	1.9	17.29		
	120	3870	2.3	14.51		
	141	3303	2.7	12.38	★	
	169	2745	3.2	10.31		
	204	2276	3.9	8.55	★	
	217	2143	3.7	8.03		
	259	1798	4.1	6.74		
	303	1532	4.4	5.75	★	
	364	1275	4.7	4.79		
	440	1054	4.9	3.97	★	
10 (60 Hz)	2.7	216534	0.82	643	★	**FD.188B-Z68-M132M4**
	3.3	180503	0.98	536		
	3.9	149520	1.2	444	★	
	4.3	146827	1.2	403.86	★	**FD.188B-M132M4**
	4.7	134702	1.3	370.52		
	5.1	124312	1.4	341.94	★	
	5.5	115313	1.5	317.18		
	5.8	108776	1.6	299.2	★	
	6.2	101744	1.7	279.86		
	7	90468	2	248.85	★	
	7.4	85411	2.1	234.93		
	4.4	134028	0.93	398	★	**FD.168B-Z68-M132M4**
	4.7	134250	0.92	369.26	★	**FD.168B-M132M4**
	5.2	123063	1	338.49		
	5.6	113471	1.1	312.12	★	
	6	105162	1.2	289.26		
	6.3	99990	1.2	275.03	★	
	6.8	93444	1.3	257.04		
	7.7	82435	1.5	226.74	★	
	8.2	77749	1.6	213.87		
	9.1	69671	1.8	191.63	★	
	9.9	64330	1.9	176.94		
	6.5	97200	0.82	267.35	★	**FD.148B-M132M4**
	7	90734	0.88	249.58		
	7.8	81186	0.98	223.31	★	
	8.4	75234	1.1	206.93		
	9.2	68963	1.2	189.69	★	
	10	63214	1.3	173.89		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
10 (60 Hz)	11.8	53870	1.5	148.18	**FD.148B-M132M4**
	13.3	47537	1.7	130.76 ★	
	15.7	40460	2	111.29	
	18.1	35057	2.3	96.43 ★	
	26	24809	2	68.23	**FZ.148B-M132M4**
	27	23401	2.5	64.37 ★	
	10	63622	0.85	175.01	**FD.128B-M132M4**
	11	57519	0.94	158.22 ★	
	12	52957	1	145.66	
	13.3	47625	1.1	131.01 ★	
	14.4	43941	1.2	120.87	
	17	37236	1.5	102.41	
	19.6	32444	1.7	89.25 ★	
	23	27608	2	75.93	
	27	23560	2.3	64.8 ★	
	31	20513	1.9	56.42 ★	**FZ.128B-M132M4**
	33	19007	2.1	52.29	
	35	18068	2.4	49.71 ★	
	17.9	35473	0.85	97.57	**FD.108B-M132M4**
	21	29760	1	81.86	
	25	25393	1.2	69.84 ★	
	30	21160	1.4	58.2	
	36	17537	1.7	48.24 ★	
	27	23347	1.1	64.21 ★	**FZ.108B-M132M4**
	30	21372	1.2	58.8	
	32	19689	1.5	54.17 ★	
	35	18228	1.7	50.15	
	37	16952	1.8	46.64 ★	
	40	15828	1.9	43.54	
	45	14162	2.1	38.95 ★	
	48	13126	2.3	36.1	
	53	12028	2.5	33.09 ★	
	58	11027	2.7	30.33	
	32	19804	0.85	54.47 ★	**FD.88B-M132M4**
	33	19122	0.88	52.6 ★	**FZ.88B-M132M4**
	36	17457	0.96	48.03	
	40	16067	1	44.2 ★	
	43	14844	1.1	40.83	
	46	13773	1.2	37.89 ★	
	49	12834	1.3	35.29	
	55	11603	1.5	31.91 ★	
	59	10681	1.6	29.38	
	66	9601	1.8	26.42 ★	
	72	8866	1.9	24.38	
	84	7511	2.2	20.65	
	97	6545	2.6	18 ★	
	114	5562	3	15.31	
	134	4747	3.5	13.07 ★	
	58	10885	0.81	29.93	**FZ.68B-M132M4**
	63	10061	0.88	27.68 ★	
	68	9335	0.95	25.69	
	77	8246	1.1	22.67 ★	
	83	7608	1.2	20.93	
	93	6820	1.3	18.75 ★	
	101	6288	1.4	17.29	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
10 (60 Hz)	120	5278	1.7	14.51		**FZ.68B-M132M4**
	141	4499	2	12.38	★	
	169	3746	2.4	10.31		
	204	3108	2.8	8.55	★	
	217	2922	2.7	8.03		
	259	2453	3	6.74		
	303	2090	3.2	5.75	★	
	364	1744	3.5	4.79		
	440	1443	3.6	3.97	★	
12.3 (60 Hz)	3.3	221574	0.8	536		**FD.188B-Z68-M132MB4**
	3.9	183550	0.97	444	★	
	4.3	180104	0.98	403.86	★	**FD.188B-M132MB4**
	4.7	165242	1.1	370.52		
	5.1	152496	1.2	341.94	★	
	5.5	141451	1.3	317.18		
	5.8	133435	1.3	299.2	★	
	6.2	124808	1.4	279.86		
	7	110973	1.6	248.85	★	
	7.4	104773	1.7	234.93		
	8.3	94046	1.9	210.89	★	
	9	86323	2.1	193.56		
	5.2	150955	0.82	338.49		**FD.168B-M132MB4**
	5.6	139192	0.89	312.12	★	
	6	128997	0.96	289.26		
	6.3	122656	1	275.03	★	
	6.8	114631	1.1	257.04		
	7.7	101115	1.2	226.74	★	
	8.2	95375	1.3	213.87		
	9.1	85455	1.5	191.63	★	
	9.9	78909	1.6	176.94		
	11.5	67421	1.8	151.18		
	12.8	60929	2	136.63	★	
	13.3	58706	2.1	131.64		
	7.8	99591	0.8	223.31	★	**FD.148B-M132MB4**
	8.4	92284	0.86	206.93		
	9.2	84596	0.94	189.69	★	
	10	77545	1	173.89		
	11.8	66084	1.2	148.18		
	13.3	58316	1.4	130.76	★	
	15.7	49627	1.6	111.29		
	18.1	43002	1.9	96.43	★	
	22	36190	2.2	81.15	★	
	24	32656	2.4	73.22		
	26	30424	1.6	68.23		**FZ.148B-M132MB4**
	27	28706	2	64.37	★	
	29	26855	2.3	60.21		
	12	64959	0.83	145.66		**FD.128B-M132MB4**
	13.3	58422	0.92	131.01	★	
	14.4	53905	1	120.87		
	17	45668	1.2	102.41		
	19.6	39804	1.4	89.25	★	
	23	33861	1.6	75.93		
	27	28901	1.9	64.8	★	
	33	23693	2.3	53.13	★	
	31	25163	1.5	56.42	★	**FZ.128B-M132MB4**

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
12.3 (60 Hz)	33	23321	1.7	52.29		**FZ.128B-M132MB4**
	35	22169	2	49.71	★	
	38	20717	2.2	46.46		
	21	36509	0.82	81.86		**FD.108B-M132MB4**
	25	31142	0.97	69.84	★	
	30	25951	1.2	58.2		
	36	21514	1.4	48.24	★	
	27	28635	0.93	64.21	★	**FZ.108B-M132MB4**
	30	26226	1	58.8		
	32	24153	1.2	54.17	★	
	35	22364	1.3	50.15		
	37	20796	1.4	46.64	★	
	40	19415	1.6	43.54		
	45	17369	1.7	38.95	★	
	48	16102	1.9	36.1		
	53	14756	2	33.09	★	
	58	13525	2.2	30.33		
	68	11532	2.6	25.85		
	76	10168	3	22.81	★	
	40	19707	0.85	44.2	★	**FZ.88B-M132MB4**
	43	18210	0.92	40.83		
	46	16899	1	37.89	★	
	49	15739	1.1	35.29		
	55	14233	1.2	31.91	★	
	59	13099	1.3	29.38		
	66	11780	1.4	26.42	★	
	72	10876	1.5	24.38		
	84	9211	1.8	20.65		
	97	8024	2.1	18	★	
	114	6828	2.5	15.31		
	134	5828	2.9	13.07	★	
	163	4774	3.5	10.71	★	
	190	4100	3.6	9.19		
	218	3569	3.8	8.01	★	
	256	3038	4.2	6.82		
	300	2595	4.6	5.82	★	
	366	2125	5	4.77	★	
	77	10106	0.88	22.67	★	**FZ.68B-M132MB4**
	83	9335	0.95	20.93		
	93	8361	1.1	18.75	★	
	101	7714	1.1	17.29		
	120	6474	1.4	14.51		
	141	5518	1.6	12.38	★	
	169	4596	1.9	10.31		
	204	3808	2.3	8.55	★	
	217	3578	2.2	8.03		
	259	3002	2.5	6.74		
	303	2568	2.6	5.75	★	
	364	2134	2.8	4.79		
	440	1771	2.9	3.97	★	
15 (60 Hz)	3.9	220839	0.8	444	★	**FD.188B-Z68-M160MB4**
	5.8	160459	1.1	299.2	★	**FD.188B-M160MB4**
	6.2	150087	1.2	279.86		
	7	133453	1.3	248.85	★	
	7.4	125986	1.4	234.93		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
15 (60 Hz)	8.2	113099	1.6	210.89 ★	**FD.188B-M160MB4**
	9	103807	1.7	193.56	
	10.4	89574	2	167.03	
	6.3	147492	0.84	275.03 ★	**FD.168B-M160MB4**
	6.7	137846	0.9	257.04	
	7.7	121602	1	226.74 ★	
	8.1	114693	1.1	213.87	
	9.1	102771	1.2	191.63 ★	
	9.8	94888	1.3	176.94	
	11.5	81079	1.5	151.18	
	12.7	73276	1.7	136.63 ★	
	13.2	70592	1.8	131.64	
	15.2	61062	2	113.86	
	17.5	53259	2.3	99.31 ★	
	10	93258	0.85	173.89	**FD.148B-M160MB4**
	11.7	79467	1	148.18	
	13.3	70123	1.1	130.76 ★	
	15.6	59680	1.3	111.29	
	18	51717	1.5	96.43 ★	
	21	43516	1.8	81.15 ★	
	24	39264	2	73.22	
	28	33746	2.4	62.93 ★	
	27	34516	1.7	64.37 ★	**FZ.148B-M160MB4**
	29	32293	1.9	60.21	
	32	28706	2.5	53.53 ★	
	34	27103	2.6	50.54	
	14.4	64817	0.83	120.87	**FD.128B-M160MB4**
	16.9	54924	0.98	102.41	
	19.4	47864	1.1	89.25 ★	
	23	40717	1.3	75.93	
	27	34747	1.6	64.8 ★	
	33	28493	1.9	53.13 ★	
	35	26660	1.6	49.71 ★	**FZ.128B-M160MB4**
	37	24915	1.8	46.46	
	42	21983	2.3	40.99 ★	
	45	20734	2.6	38.66	
	25	37457	0.8	69.84 ★	**FD.108B-M160MB4**
	30	31213	0.96	58.2	
	36	25872	1.2	48.24 ★	
	37	25013	1.2	46.64 ★	**FZ.108B-M160MB4**
	40	23347	1.3	43.54	
	44	20885	1.4	38.95 ★	
	48	19362	1.6	36.1	
	52	17750	1.7	33.09 ★	
	57	16262	1.9	30.33	
	67	13861	2.2	25.85	
	76	12231	2.5	22.81 ★	
	89	10407	2.9	19.41	
	103	9016	3.3	16.82 ★	
	46	20318	0.83	37.89 ★	**FZ.88B-M160MB4**
	49	18928	0.89	35.29	
	54	17112	0.98	31.91 ★	
	59	15757	1.1	29.38	
	66	14171	1.2	26.42 ★	
	71	13073	1.3	24.38	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
15 (60 Hz)	84	11071	1.5	20.65		**FZ.88B-M160MB4**
	96	9654	1.7	18	★	
	113	8210	2	15.31		
	133	7006	2.4	13.07	★	
	162	5739	2.9	10.71	★	
	189	4924	3	9.19		
	217	4295	3.2	8.01	★	
	254	3658	3.5	6.82		
	298	3117	3.8	5.82	★	
	364	2559	4.2	4.77	★	
20 (60 Hz)	5.8	218802	0.81	299.2	★	**FD.188B-M160L4**
	6.2	204666	0.87	279.86		
	7	181982	0.97	248.85	★	
	7.4	171805	1	234.93		
	8.2	154223	1.1	210.89	★	
	9	141548	1.3	193.56		
	10.4	122151	1.5	167.03		
	11.9	106854	1.7	146.11		
	13.7	92930	1.9	127.07		
	15.6	81531	2.2	111.49	★	
	9.1	140140	0.88	191.63	★	**FD.168B-M160L4**
	9.8	129396	0.96	176.94		
	11.5	110557	1.1	151.18		
	12.7	99919	1.2	136.63	★	
	13.2	96270	1.3	131.64		
	15.2	83267	1.5	113.86		
	17.5	72630	1.7	99.31	★	
	20	62151	2	84.99	★	
	23	55668	2.2	76.12		
	32	39113	2	53.48		**FZ.168B-M160L4**
	36	35314	2.6	48.29		
	13.3	95623	0.83	130.76	★	**FD.148B-M160L4**
	15.6	81389	0.98	111.29		
	18	70521	1.1	96.43	★	
	21	59344	1.3	81.15	★	
	24	53542	1.5	73.22		
	28	46022	1.7	62.93	★	
	27	47076	1.2	64.37	★	**FZ.148B-M160L4**
	29	44029	1.4	60.21		
	32	39149	1.8	53.53	★	
	34	36961	1.9	50.54		
	38	33179	2.3	45.37	★	
	42	30451	2.6	41.64		
	19.4	65269	0.83	89.25	★	**FD.128B-M160L4**
	23	55526	0.97	75.93		
	27	47386	1.1	64.8	★	
	33	38857	1.4	53.13	★	
	35	36350	1.2	49.71	★	**FZ.128B-M160L4**
	37	33976	1.3	46.46		
	42	29973	1.7	40.99	★	
	45	28272	1.9	38.66		
	50	25331	2.1	34.64	★	
	54	23383	2.3	31.98		
	64	19982	2.7	27.33		
	70	18060	3	24.7	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
20 (60 Hz)	73	17404	3.1	23.8		**FZ.128B-M160L4**
	36	35278	0.85	48.24	★	**FD.108B-M160L4**
	37	34109	0.88	46.64	★	**FZ.108B-M160L4**
	40	31842	0.95	43.54		
	44	28485	1.1	38.95	★	
	48	26403	1.1	36.1		
	52	24198	1.2	33.09	★	
	57	22178	1.4	30.33		
	67	18901	1.6	25.85		
	76	16678	1.8	22.81	★	
	89	14198	2.1	19.41		
	103	12302	2.4	16.82	★	
	123	10354	2.8	14.16	★	
	136	9335	3.1	12.77		
	158	8033	3.5	10.98	★	
	173	7342	4.1	10.04		
	199	6359	4.3	8.7	★	
	66	19317	0.87	26.42	★	**FZ.88B-M160L4**
	71	17829	0.94	24.38		
	84	15101	1.1	20.65		
	96	13161	1.3	18	★	
	113	11195	1.5	15.31		
	133	9557	1.8	13.07	★	
	162	7829	2.1	10.71	★	
	189	6722	2.2	9.19		
	217	5854	2.3	8.01	★	
	254	4986	2.6	6.82		
	298	4260	2.8	5.82	★	
	364	3489	3	4.77	★	
25 (60 Hz)	7.4	212504	0.83	234.93		**FD.188B-M180MB4**
	8.2	190760	0.93	210.89	★	
	8.9	175082	1	193.56		
	10.4	151088	1.2	167.03		
	11.8	132160	1.3	146.11		
	13.6	114941	1.5	127.07		
	15.5	100849	1.8	111.49	★	
	18.3	85278	2.1	94.28	★	
	20	77377	2.3	85.54		
	11.4	136748	0.91	151.18		**FD.168B-M180MB4**
	12.7	123586	1	136.63	★	
	13.1	119077	1	131.64		
	15.2	102992	1.2	113.86		
	17.4	89830	1.4	99.31	★	
	20	76881	1.6	84.99	★	
	23	68856	1.8	76.12		
	27	58316	2.1	64.47	★	
	31	50362	2.5	55.68		
	32	48378	1.6	53.48		**FZ.168B-M180MB4**
	36	43684	2.1	48.29		
	38	40929	2.5	45.25		
	17.9	87226	0.91	96.43	★	**FD.148B-M180MB4**
	21	73400	1.1	81.15	★	
	24	66235	1.2	73.22		
	28	56925	1.4	62.93	★	
	32	48422	1.5	53.53	★	**FZ.148B-M180MB4**

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
25 (60 Hz)	34	45712	1.5	50.54		**FZ.148B-M180MB4**
	38	41035	1.9	45.37	★	
	42	37661	2.1	41.64		
	48	32497	2.5	35.93		
	55	28431	2.8	31.43		
	27	58617	0.92	64.8	★	**FD.128B-M180MB4**
	33	48059	1.1	53.13	★	
	42	37076	1.4	40.99	★	**FZ.128B-M180MB4**
	45	34968	1.5	38.66		
	50	31337	1.7	34.64	★	
	54	28927	1.9	31.98		
	63	24720	2.2	27.33		
	70	22338	2.4	24.7	★	
	73	21532	2.5	23.8		
	84	18618	2.9	20.58		
	96	16235	3.3	17.95	★	
	44	35234	0.85	38.95	★	**FZ.108B-M180MB4**
	48	32656	0.92	36.1		
	52	29928	1	33.09	★	
	57	27431	1.1	30.33		
	67	23383	1.3	25.85		
	76	20628	1.5	22.81	★	
	89	17555	1.7	19.41		
	103	15216	2	16.82	★	
	122	12807	2.3	14.16	★	
	135	11549	2.5	12.77		
	158	9929	2.8	10.98	★	
	172	9078	3.3	10.04		
	199	7865	3.5	8.7	★	
	236	6625	3.8	7.32	★	
	262	5969	3.9	6.6		
	305	5137	4.2	5.68	★	
30 (60 Hz)	9	206419	0.86	193.56		**FD.188B-M180LB4**
	10.4	178129	0.99	167.03		
	11.9	155817	1.1	146.11		
	13.7	135508	1.3	127.07		
	15.7	118900	1.5	111.49	★	
	18.5	100539	1.8	94.28	★	
	20	91221	1.9	85.54		
	23	79538	2.2	74.58	★	
	33	56128	2.6	52.63		**FZ.188B-M180LB4**
	12.8	145702	0.85	136.63	★	**FD.168B-M180LB4**
	13.3	140388	0.88	131.64		
	15.3	121424	1	113.86		
	17.6	105906	1.2	99.31	★	
	20	90636	1.4	84.99	★	
	23	81177	1.5	76.12		
	27	68750	1.8	64.47	★	
	31	59379	2.1	55.68		
	33	57032	1.4	53.48		**FZ.168B-M180LB4**
	36	51496	1.8	48.29		
	39	48254	2.1	45.25		
	45	41452	2.8	38.87	★	
	22	86544	0.92	81.15	★	**FD.148B-M180LB4**
	24	78086	1	73.22		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
30 (60 Hz)	28	67111	1.2	62.93	★	**FD.148B-M180LB4**
	33	57085	1.2	53.53	★	**FZ.148B-M180LB4**
	34	53896	1.3	50.54		
	38	48387	1.6	45.37	★	
	42	44410	1.8	41.64		
	49	38316	2.1	35.93		
	56	33516	2.4	31.43		
	64	29158	2.7	27.34		
	73	25571	3.1	23.98	★	
	33	56660	0.95	53.13	★	**FD.128B-M180LB4**
	43	43710	1.2	40.99	★	**FZ.128B-M180LB4**
	45	41230	1.3	38.66		
	50	36943	1.5	34.64	★	
	55	34100	1.6	31.98		
	64	29149	1.9	27.33		
	71	26341	2.1	24.7	★	
	73	25385	2.1	23.8		
	85	21948	2.5	20.58		
	97	19140	2.8	17.95	★	
	114	16377	3.2	15.36	★	
	127	14676	3.4	13.76		
	150	12426	3.8	11.65	★	
	173	10735	4.2	10.07		
	253	7369	4.3	6.91		
	298	6235	4.7	5.85	★	
	346	5385	5.2	5.05		
	53	35287	0.85	33.09	★	**FZ.108B-M180LB4**
	58	32346	0.93	30.33		
	68	27563	1.1	25.85		
	76	24322	1.2	22.81	★	
	90	20699	1.5	19.41		
	104	17936	1.7	16.82	★	
	123	15101	1.9	14.16	★	
	137	13622	2.1	12.77		
	159	11709	2.4	10.98	★	
	174	10708	2.8	10.04		
	201	9273	3	8.7	★	
	238	7803	3.2	7.32	★	
	264	7041	3.3	6.6		
	307	6058	3.5	5.68	★	
40 (60 Hz)	12.1	209475	0.85	146.11		**FD.188B-M200LB4**
	13.9	182177	0.97	127.07		
	15.9	159839	1.1	111.49	★	
	18.8	135171	1.3	94.28	★	
	21	122638	1.4	85.54		
	24	106925	1.7	74.58	★	
	28	90778	2	63.32		
	36	69476	2.5	48.46	★	
	34	75455	1.9	52.63		**FZ.188B-M200LB4**
	36	69494	2.2	48.47		
	42	60318	2.6	42.07	★	
	17.8	142381	0.87	99.31	★	**FD.168B-M200LB4**
	21	121850	1	84.99	★	
	23	109131	1.1	76.12		
	28	92426	1.3	64.47	★	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
40 (60 Hz)	32	79831	1.6	55.68		**FD.168B-M200LB4**
	42	59999	2.1	41.85	★	
	33	76677	1	53.48		**FZ.168B-M200LB4**
	37	69228	1.3	48.29		
	39	64870	1.6	45.25		
	46	55730	2.1	38.87	★	
	53	48139	2.4	33.58		
	60	42497	2.9	29.64		
	28	90220	0.88	62.93	★	**FD.148B-M200LB4**
	33	76748	0.92	53.53	★	**FZ.148B-M200LB4**
	35	72461	0.98	50.54		
	39	65048	1.2	45.37	★	
	42	59698	1.3	41.64		
	49	51514	1.5	35.93		
	56	45057	1.8	31.43		
	65	39193	2	27.34		
	74	34384	2.3	23.98	★	
	87	29078	2.7	20.28	★	
	96	26377	3	18.4		
	110	22993	3.5	16.04	★	
	186	13631	4.3	9.51		
	43	58768	0.86	40.99	★	**FZ.128B-M200LB4**
	46	55429	0.96	38.66		
	51	49662	1.1	34.64	★	
	55	45845	1.2	31.98		
	65	39184	1.4	27.33		
	72	35411	1.5	24.7	★	
	74	34118	1.6	23.8		
	86	29503	1.8	20.58		
	99	25730	2.1	17.95	★	
	115	22019	2.4	15.36	★	
	129	19725	2.5	13.76		
	152	16704	2.8	11.65	★	
	176	14437	3.1	10.07		
	234	10850	3.7	7.57	★	
	256	9902	3.2	6.91		
	303	8387	3.5	5.85	★	
	350	7236	3.8	5.05		
	466	5447	4.4	3.8	★	
50 (60 Hz)	14	222796	0.8	127.07		**FD.188B-M225S4E**
	16	195480	0.91	111.49	★	
	18.9	165304	1.1	94.28	★	
	21	149980	1.2	85.54		
	24	130760	1.4	74.58	★	
	28	111026	1.6	63.32		
	37	84968	2.1	48.46	★	
	34	92275	1.6	52.63		**FZ.188B-M225S4E**
	37	84985	1.8	48.47		
	42	73763	2.1	42.07	★	
	48	65012	2.4	37.08		
	55	57049	2.9	32.54		
	21	149015	0.83	84.99	★	**FD.168B-M225S4E**
	23	133462	0.93	76.12		
	28	113037	1.1	64.47	★	
	32	97625	1.3	55.68		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
50 (60 Hz)	43	73374	1.7	41.85 ★	**FD.168B-M225S4E**
	37	84667	1.1	48.29	**FZ.168B-M225S4E**
	39	79334	1.3	45.25	
	46	68157	1.7	38.87 ★	
	53	58874	2	33.58	
	60	51965	2.4	29.64	
	67	46775	2.7	26.68 ★	
	81	38821	3.2	22.14 ★	
	39	79547	0.97	45.37 ★	**FZ.148B-M225S4E**
	43	73010	1.1	41.64	
	50	63002	1.3	35.93	
	57	55110	1.4	31.43	
	65	47935	1.7	27.34	
	74	42045	1.9	23.98 ★	
	88	35562	2.2	20.28 ★	
	97	32258	2.5	18.4	
	111	28121	2.8	16.04 ★	
	131	23879	3.2	13.62	
	171	18290	3.8	10.43 ★	
	188	16678	3.5	9.51	
	215	14534	3.8	8.29 ★	
	254	12347	4.2	7.04	
	331	9450	4.8	5.39 ★	
	52	60734	0.89	34.64 ★	**FZ.128B-K4-MI225S4E**
	56	56075	0.96	31.98	
	65	47918	1.1	27.33	
	72	43303	1.2	24.7 ★	
	75	41726	1.3	23.8	
	87	36084	1.5	20.58	
	99	31470	1.7	17.95 ★	
	116	26935	1.9	15.36 ★	
	130	24127	2.1	13.76	
	153	20424	2.3	11.65 ★	
	177	17652	2.6	10.07	
	236	13277	3	7.57 ★	
	258	12116	2.6	6.91	
	305	10256	2.9	5.85 ★	
	353	8857	3.1	5.05	
	470	6660	3.6	3.8 ★	
60 (60 Hz)	18.9	201052	0.88	94.28 ★	**FD.188B-M225M4E**
	21	182407	0.97	85.54	
	24	159041	1.1	74.58 ★	
	28	135029	1.3	63.32	
	37	103338	1.7	48.46 ★	
	34	112231	1.3	52.63	**FZ.188B-M225M4E**
	37	103356	1.4	48.47	
	42	89715	1.7	42.07 ★	
	48	79069	2	37.08	
	55	69388	2.4	32.54	
	61	62541	2.8	29.33 ★	
	28	137483	0.9	64.47 ★	**FD.168B-M225M4E**
	32	118732	1	55.68	
	43	89246	1.4	41.85 ★	
	37	102975	0.9	48.29	**FZ.168B-M225M4E**
	39	96491	1.1	45.25	

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
60 (60 Hz)	46	82886	1.4	38.87	★	**FZ.168B-M225M4E**
	53	71611	1.6	33.58		
	60	63205	2	29.64		
	67	56890	2.2	26.68	★	
	81	47209	2.6	22.14	★	
	88	43055	2.9	20.19		
	101	37767	3.3	17.71	★	
	39	96748	0.8	45.37	★	**FZ.148B-M225M4E**
	43	88794	0.9	41.64		
	50	76615	1	35.93		
	57	67023	1.2	31.43		
	65	58298	1.4	27.34		
	74	51133	1.6	23.98	★	
	88	43250	1.8	20.28	★	
	97	39237	2	18.4		
	111	34206	2.3	16.04	★	
	131	29043	2.6	13.62		
	171	22240	3.1	10.43	★	
	188	20283	2.9	9.51		
	215	17679	3.1	8.29	★	
	254	15013	3.4	7.04		
	331	11496	3.9	5.39	★	
	65	58281	0.93	27.33		**FZ.128B-K4-MI225M4E**
	72	52674	1	24.7	★	
	75	50752	1.1	23.8		
	87	43888	1.2	20.58		
	99	38281	1.4	17.95	★	
	116	32754	1.6	15.36	★	
	130	29344	1.7	13.76		
	153	24844	1.9	11.65	★	
	177	21470	2.1	10.07		
	236	16146	2.5	7.57	★	
	258	14738	2.2	6.91		
	305	12471	2.3	5.85	★	
	353	10770	2.6	5.05		
	470	8104	3	3.8	★	
75 (60 Hz)	21	222318	0.8	85.54		**FD.188B-M250M4E**
	24	193833	0.91	74.58	★	
	28	164568	1.1	63.32		
	37	125951	1.4	48.46	★	
	37	125977	1.2	48.47		**FZ.188B-M250M4E**
	42	109343	1.4	42.07	★	
	48	96376	1.6	37.08		
	55	84569	1.9	32.54		
	61	76226	2.3	29.33	★	
	72	64720	2.7	24.9	★	
	77	60114	2.9	23.13		
	90	51647	3.4	19.87	★	
	32	144719	0.86	55.68		**FD.168B-M250M4E**
	43	108767	1.1	41.85	★	
	40	117607	0.87	45.25		**FZ.168B-M250M4E**
	46	101026	1.1	38.87	★	
	53	87280	1.3	33.58		
	60	77032	1.6	29.64		
	67	69343	1.8	26.68	★	

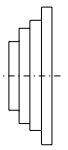
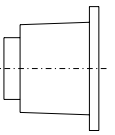
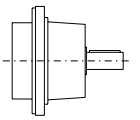
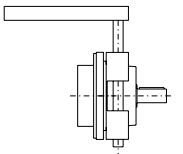
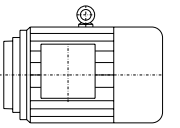
Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
75 (60 Hz)	81	57545	2.2	22.14	★	**FZ.168B-M250M4E**
	89	52470	2.4	20.19		
	101	46031	2.7	17.71	★	
	118	39556	3.1	15.22		
	151	30823	3.8	11.86	★	
	210	22196	4.5	8.54		
	50	93382	0.85	35.93		**FZ.148B-K4-MI250M4E**
	57	81691	0.98	31.43		
	66	71062	1.1	27.34		
	75	62328	1.3	23.98	★	
	88	52709	1.5	20.28	★	
	97	47820	1.7	18.4		
	112	41691	1.9	16.04	★	
	131	35402	2.1	13.62		
	172	27112	2.6	10.43	★	
	188	24720	2.4	9.51		
	216	21549	2.6	8.29	★	
	254	18299	2.8	7.04		
	332	14012	3.2	5.39	★	
100 (60 Hz)	37	171938	1	48.46	★	**FD.188B-K4-MI280S4E**
	48	131566	1.2	37.08		**FZ.188B-K4-MI280S4E**
	55	115455	1.4	32.54		
	61	104064	1.7	29.33	★	
	72	88351	2	24.9	★	
	77	82071	2.2	23.13		
	90	70504	2.5	19.87	★	
	105	60141	2.8	16.95		
	134	47368	3.3	13.35	★	
	166	38104	3.7	10.74	★	
	191	33135	4	9.34		
	214	29592	4.2	8.34		
	53	119148	0.97	33.58		**FZ.168B-K4-MI280S4E**
	60	105162	1.2	29.64		
	67	94667	1.3	26.68	★	
	81	78555	1.6	22.14	★	
	89	71637	1.7	20.19		
	101	62833	2	17.71	★	
	117	54003	2.3	15.22		
	151	42081	2.8	11.86	★	
	190	33427	3.2	9.42	★	
	209	30300	3.3	8.54		
	269	23595	3.8	6.65	★	
	339	18733	4.1	5.28	★	
125 (60 Hz)	37	206100	0.86	48.46	★	**FD.188B-K4-MI280M4E**
	48	157704	0.98	37.08		**FZ.188B-K4-MI280M4E**
	55	138395	1.2	32.54		
	61	124737	1.4	29.33	★	
	72	105898	1.7	24.9	★	
	77	98369	1.8	23.13		
	90	84507	2.1	19.87	★	
	106	72089	2.3	16.95		
	134	56775	2.7	13.35	★	
	167	45677	3.1	10.74	★	
	192	39725	3.3	9.34		
	215	35473	3.5	8.34		

Legend / explanations see page 5 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
125 (60 Hz)	53	142815	0.81	33.58		**FZ.168B-K4-MI280M4E**
	60	126057	0.98	29.64		
	67	113471	1.1	26.68	★	
	81	94162	1.3	22.14	★	
	89	85871	1.4	20.19		
	101	75322	1.6	17.71	★	
	118	64729	1.9	15.22		
	151	50442	2.3	11.86	★	
	190	40061	2.7	9.42	★	
	210	36323	2.7	8.54		
	269	28281	3.1	6.65	★	
	339	22453	3.4	5.28	★	

Possible types of input units

Frame-size		 NEMA-K5TC	IEC-K4 on request	 NEMA-KTC	IEC-K2 on request	 NEMA-A5	IEC-A on request	 NEMA-P5	IEC-P on request	 Motor
	63		•							•
56C	**71**	•	•	•		•	•	•		•
	80		•		•	•	•	•	•	•
140TC	**90**	•	•	•	•	•	•	•	•	•
180TC	**100**	•	•	•	•	•	•	•	•	•
	112		•		•	•	•	•	•	•
210TC	**132**	•	•	•	•	•	•	•	•	•
250TC	**160**	•	•	•	•	•	•	•	•	•
	180		•		•				•	•
280TC	**200**	•	•	•	•	•	•	•	•	•
320TC	**225**	•	•	•	•	•	•	•	•	•
360TC	**250**	•	•	•	•	•	•	•	•	•
	280		•				•		•	•
	315				•					

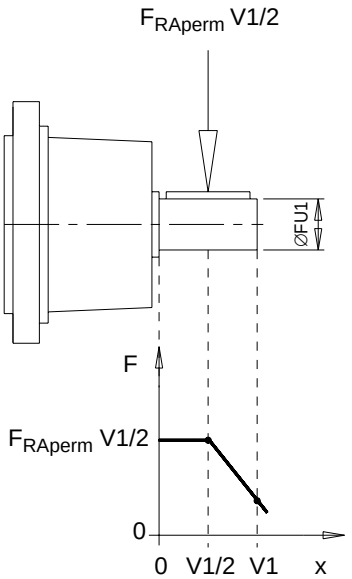
allowable combinations of input unit K., A., P. see chapter 7

5

Permissible overhung loads and torque

for type of input unit A., P.

Frame-size		T_1 1)		FU1		V1		F_{RAperm} V1/2	
		[lb in]	[Nm]	[in]	[*mm*]	[in]	[*mm*]	[lbf]	[N]
56C	**71**	26.5	3	5/8	*16*	1.575	*40*	54	240
	80	44.2	5	3/4	*19*	1.575	*40*	54	240
140TC	**90**	88.5	10	7/8	*24*	1.968	*50*	139	620
180TC	**100**	177	20	1 1/8	*28*	2.362	*60*	189	840
	112	230	26	1 1/4	*28*	2.362	*60*	225	1000
210TC	**132**	540	61	1 3/8	*38*	3.150	*80*	382	1700
250TC	**160**	867	98	1 5/8	*42*	4.331	*110*	405	1800
	180	1752	198	-	-	-	-	-	-
280TC	**200**	1752	198	2 1/8	*55*	4.331	*110*	674	3000
320TC	**225**	2575	291	2 1/8	*60*	5.512	*140*	776	3450
360TC	**250**	3150	356	2 3/8	*65*	5.512	*140*	877	3900
	280	5132	580	-	*70*	-	*140*	1158	5150
	315	11414	1290	-	-		-	-	-



1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Torque tables

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]									
					3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
	[-]	[rpm]	[lb in]	[Nm]	63	71	80	90	100	112	132	160	180	200
FD.28	**280.00**	6.2	1327	150		•								
	241.56 ★	7.2	1327	150		•	•							
1327 lb in	**207.53**	8.4	1327	150		•	•							
	191.06 ★	9.1	1327	150		•	•	•						
	173.69	10	1327	150		•	•	•						
	153.74 ★	11.3	1327	150		•	•	•						
	128.77	13.5	1327	150		•	•	•						
	109.79 ★	15.9	1327	150		•	•	•						
	93.32 ★	18.7	1327	150		•	•	•						
	81.10	21.5	1327	150		•	•	•						
	70.59 ★	25	1327	150		•	•	•						
	63.68	27	1327	150		•	•	•						
	56.20	31	1327	150		•	•	•						
FZ.28	**59.65**	29	1327	150		•								
	50.30 ★	35	1327	150		•	•							
1327 lb in	**44.66**	39	1327	150		•	•							
	39.15 ★	44	1327	150		•	•	•						
	35.04	50	1327	150		•	•	•						
	31.10 ★	56	1327	150		•	•	•						
	27.25	64	1327	150		•	•	•						
	23.96 ★	73	1327	150		•	•	•						
	21.64	80	1327	150		•	•	•	•					
	18.86 ★	92	1327	150		•	•	•						
	16.94	103	1327	150		•	•	•						
	15.29 ★	114	1327	150		•	•	•	•					
	13.87	125	1327	150		•	•	•	•					
	12.62 ★	138	1309	148		•	•	•	•					
	11.16	156	1256	142		•	•	•	•					
	10.30 ★	169	1221	138		•	•	•	•					
	8.87	196	1159	131		•	•	•	•					
	8.06 ★	216	1124	127		•	•	•	•					
	7.20 ★	242	1115	126		•	•	•	•					
	6.53	267	1079	122		•	•	•	•					
	5.94 ★	293	1044	118		•	•	•	•					
	5.25	331	982	111		•	•	•	•					
	4.85 ★	359	973	110		•	•	•	•					
	4.18	417	876	99		•	•	•	•					
	3.80 ★	458	849	96		•	•	•	•					

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]		n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
						Size						
							56C		140TC	180TC		210TC
						63	71	80	90	100	112	132
FZ.38B-D28	**7591**		0.22	2566	**290**		•					
	6548	★	0.26	2566	**290**		•	•				
2566 lb in	**5626**		0.3	2566	**290**		•	•				
	5179	★	0.32	2566	**290**		•	•	•			
	4709		0.38	2566	**290**		•	•	•			
	4168	★	0.4	2566	**290**		•	•	•			
	3491		0.48	2566	**290**		•	•	•			
	2976	★	0.56	2566	**290**		•	•	•			
	2530	★	0.66	2566	**290**		•	•	•			
	2199		0.76	2566	**290**		•	•	•			
	1914	★	0.88	2566	**290**		•	•	•			
	1726		0.97	2566	**290**		•	•	•			
FZ.38B-Z28	**1617**		1	2566	**290**		•					
	1364	★	1.2	2566	**290**		•	•				
2566 lb in	**1211**		1.4	2566	**290**		•	•				
	1061	★	1.6	2566	**290**		•	•	•			
	950		1.8	2566	**290**		•	•	•			
	843	★	2	2566	**290**		•	•	•			
	739		2.3	2566	**290**		•	•	•			
	650	★	2.6	2566	**290**		•	•	•			
	587		2.9	2566	**290**		•	•	•	•		
	511	★	3.3	2566	**290**		•	•	•			
	459		3.7	2566	**290**		•	•	•			
	415	★	4.1	2566	**290**		•	•	•	•		
	376		4.5	2566	**290**		•	•	•	•		
	342	★	4.9	2566	**290**		•	•	•	•		
	303		5.6	2566	**290**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
					63	71	80	90	100	112	132	160	180	200
FD.38B	**280.41**	6.2	2566	290	•	•								
	241.91 ★	7.2	2566	290	•	•	•							
2566 lb in	**207.83**	8.4	2566	290	•	•	•							
	191.34 ★	9.1	2566	290	•	•	•	•						
	173.94	10.1	2566	290	•	•	•	•						
	153.96 ★	11.4	2566	290	•	•	•	•						
	128.95	13.6	2566	290	•	•	•	•						
	109.95 ★	15.9	2566	290	•	•	•	•						
	93.46 ★	18.7	2566	290	•	•	•	•						
	81.22	22	2566	290	•	•	•	•						
	70.7 ★	25	2566	290	•	•	•	•						
	63.77	27	2566	290	•	•	•	•						
	56.28	31	2566	290	•	•	•	•						
FZ.38B	**56.72** ★	31	1858	210	•	•	•							
	50.44	35	2035	230	•	•	•							
2566 lb in	**43.75** ★	40	2212	250	•	•	•	•						
	40.88	43	2433	275	•	•	•	•						
	35.96 ★	49	2566	290	•	•	•	•						
	31.49	56	2566	290	•	•	•	•	•					
	27.85 ★	63	2566	290	•	•	•	•	•					
	25.24	69	2566	290	•	•	•	•	•					
	22.28 ★	79	2566	290	•	•	•	•	•					
	20.1	87	2566	290	•	•	•	•	•					
	18.23 ★	96	2566	290	•	•	•	•	•					
	16.61	105	2566	290	•	•	•	•	•					
	15.19 ★	115	2566	290	•	•	•	•	•					
	13.58	129	2566	290	•	•	•	•	•					
	12.47 ★	140	2566	290	•	•	•	•	•					
	11.24	156	2566	290	•	•	•	•	•					
	9.67 ★	181	2566	290	•	•	•	•	•					
	8.52 ★	205	2566	290	•	•	•	•	•					
	7.76	226	2566	290	•	•	•	•	•					
	7.1 ★	246	2566	290	•	•	•	•	•					
	6.35	276	2433	275	•	•	•	•	•					
	5.83 ★	300	2433	275	•	•	•	•	•					
	5.25	333	2238	253	•	•	•	•	•					
	4.52 ★	387	2017	228	•	•	•	•	•					

5

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]		n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
						Size						
						63	56C 71	80	140TC 90	180TC 100	112	210TC 132
FD.48B-D28	**19701**		0.09	4778	**540**		•					
4778 lb in	**16996**	★	0.1	4778	**540**		•	•				
	14602		0.12	4778	**540**		•	•				
	13443	★	0.13	4778	**540**		•	•	•			
	12221		0.14	4778	**540**		•	•	•			
	10817	★	0.16	4778	**540**		•	•	•			
	9060		0.19	4778	**540**		•	•	•			
	7725	★	0.22	4778	**540**		•	•	•			
	6566	★	0.26	4778	**540**		•	•	•			
	5706		0.29	4778	**540**		•	•	•			
	4967	★	0.34	4778	**540**		•	•	•			
	4480		0.38	4778	**540**		•	•	•			
FD.48B-Z28	**4197**		0.4	4778	**540**		•					
4778 lb in	**3539**	★	0.48	4778	**540**		•	•				
	3142		0.54	4778	**540**		•	•				
	2755	★	0.61	4778	**540**		•	•	•			
	2465		0.68	4778	**540**		•	•	•			
	2188	★	0.77	4778	**540**		•	•	•			
	1918		0.88	4778	**540**		•	•	•			
	1686	★	1	4778	**540**		•	•	•			
	1523		1.1	4778	**540**		•	•	•	•		
	1327	★	1.3	4778	**540**		•	•	•			
	1192		1.4	4778	**540**		•	•	•			
	1076	★	1.6	4778	**540**		•	•	•	•		
	976		1.7	4778	**540**		•	•	•	•		
	888	★	1.9	4778	**540**		•	•	•	•		
	785		2.1	4778	**540**		•	•	•	•		
	725	★	2.3	4778	**540**		•	•	•	•		
	624		2.7	4778	**540**		•	•	•	•		
	567	★	3	4778	**540**		•	•	•	•		
	516	★	3.3	4778	**540**		•	•	•	•		
	468		3.6	4778	**540**		•	•	•	•		
	426	★	3.9	4778	**540**		•	•	•	•		
	376		4.5	4778	**540**		•	•	•	•		
	347	★	4.8	4778	**540**		•	•	•	•		
	299		5.6	4778	**540**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160	180	280TC 200
FD.48B	**268.8** ★	6.5	4778	540	•	•	•							
	238.65	7.3	4778	540	•	•	•							
4778 lb in	**209.23** ★	8.4	4778	540	•	•	•	•						
	187.24	9.3	4778	540	•	•	•	•						
	166.19 ★	10.5	4778	540	•	•	•	•						
	145.63	12	4778	540	•	•	•	•						
	128.04 ★	13.7	4778	540	•	•	•	•						
	115.68	15.1	4778	540	•	•	•	•						
	100.8 ★	17.4	4778	540	•	•	•	•						
	90.53	19.3	4778	540	•	•	•	•						
	81.73 ★	21	4778	540	•	•	•	•	•					
	74.1	24	4778	540	•	•	•	•	•					
	67.43 ★	26	4778	540	•	•	•	•	•					
	59.62	29	4778	540	•	•	•	•	•					
	55.06 ★	32	4778	540	•	•	•	•	•					
	47.4	37	4778	540	•	•	•	•	•					
	43.09 ★	41	4778	540	•	•	•	•	•					
FZ.48B	**60.71** ★	29	3539	400	•	•	•	•						
	55.19	32	4424	500	•	•	•	•						
4778 lb in	**49.58** ★	35	4778	540	•	•	•	•						
	42.5	41	4778	540	•	•	•	•	•					
	38.45 ★	46	4778	540	•	•	•	•	•	•				
	35.49	49	4778	540	•	•	•	•	•	•				
	30.86 ★	57	4778	540	•	•	•	•	•	•				
	28.02	62	4778	540	•	•	•	•	•	•				
	25.59 ★	68	4778	540	•	•	•	•	•	•				
	23.48	75	4778	540	•	•	•	•	•	•				
	21.63 ★	81	4778	540	•	•	•	•	•	•				
	19.64	89	4778	540	•	•	•	•	•	•				
	17.89 ★	98	4778	540	•	•	•	•	•	•				
	16.39	107	4778	540	•	•	•	•	•	•				
	14.63 ★	120	4778	540	•	•	•	•	•	•				
	13.05	134	4778	540			•	•	•	•				
	11.09	158	4734	535			•	•	•	•				
	9.23 ★	190	4654	526			•	•	•	•				
	8.39 ★	209	4512	510	•	•	•	•	•	•				
	7.68	228	4132	467	•	•	•	•	•	•				
	6.86 ★	255	3920	443	•	•	•	•	•	•				
	6.12	286	3592	406			•	•	•	•				
	5.2	337	3344	378			•	•	•	•				
	4.33 ★	404	2876	325			•	•	•	•				

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
					Size						
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132
FD.68B-D28	**39638**	0.05	8848	**1000**		•					
8848 lb in	**34196** ★	0.05	8848	**1000**		•	•				
	29378	0.06	8848	**1000**		•	•				
	27047 ★	0.06	8848	**1000**		•	•	•			
	24588	0.07	8848	**1000**		•	•	•			
	21763 ★	0.07	8848	**1000**		•	•	•			
	20908	0.08	8848	**1000**		•					
	18038 ★	0.09	8848	**1000**		•	•				
	15497 ★	0.11	8848	**1000**		•	•				
	14267	0.12	8848	**1000**		•	•	•			
	12970 ★	0.13	8848	**1000**		•	•	•			
	11480	0.15	8848	**1000**		•	•	•			
	9615	0.18	8848	**1000**		•	•	•			
	8198	0.21	8848	**1000**		•	•	•			
	6969	0.24	8848	**1000**		•	•	•			
	6056	0.28	8848	**1000**		•	•	•			
	5271	0.32	8848	**1000**		•	•	•			
	4755	0.35	8848	**1000**		•	•	•			
FD.68B-Z28	**4454**	0.38	8848	**1000**		•					
8848 lb in	**3756** ★	0.45	8848	**1000**		•	•				
	3335	0.5	8848	**1000**		•	•				
	2924 ★	0.58	8848	**1000**		•	•	•			
	2916	0.64	8848	**1000**		•	•	•			
	2322 ★	0.72	8848	**1000**		•	•	•			
	2035	0.82	8848	**1000**		•	•	•			
	1789 ★	0.94	8848	**1000**		•	•	•			
	1616	1	8848	**1000**		•	•	•	•		
	1408 ★	1.2	8848	**1000**		•	•	•			
	1265	1.3	8848	**1000**		•	•	•			
	1142 ★	1.5	8848	**1000**		•	•	•	•		
	1036	1.6	8848	**1000**		•	•	•	•		
	942 ★	1.8	8848	**1000**		•	•	•	•		
	833	2	8848	**1000**		•	•	•	•		
	769 ★	2.2	8848	**1000**		•	•	•	•		
	662	2.5	8848	**1000**		•	•	•	•		
	602 ★	2.8	8848	**1000**		•	•	•	•		
	547 ★	3.1	8848	**1000**		•	•	•	•		
	496	3.4	8848	**1000**		•	•	•	•		
	452 ★	3.7	8848	**1000**		•	•	•	•		
	399	4.2	8848	**1000**		•	•	•	•		
	369 ★	4.6	8848	**1000**		•	•	•	•		
	317	5.3	8848	**1000**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
					63	71	80	90	100	112	132	160	180	200
FD.68B	**296.18** ★	5.9	8848	1000	•	•	•							
	263.39	6.6	8848	1000	•	•	•							
8848 lb in	**228.48** ★	7.7	8848	1000	•	•	•	•						
	213.48	8.2	8848	1000	•	•	•	•						
	187.76 ★	9.3	8848	1000	•	•	•	•						
	164.44	10.6	8848	1000	•	•	•	•	•					
	145.44 ★	12	8848	1000	•	•	•	•	•					
	131.82	13.3	8848	1000	•	•	•	•	•					
	116.36 ★	15	8848	1000	•	•	•	•	•					
	104.96	16.7	8848	1000	•	•	•	•	•					
	95.2 ★	18.4	8848	1000	•	•	•	•	•					
	86.74	20	8848	1000	•	•	•	•	•					
	79.33 ★	22	8848	1000	•	•	•	•	•					
	70.93	25	8848	1000	•	•	•	•	•					
	65.14 ★	27	8848	1000	•	•	•	•	•					
	58.71	30	8848	1000	•	•	•	•	•					
	50.48 ★	35	8848	1000	•	•	•	•	•					
FZ.68B	**61.17** ★	29	7521	850			•	•						
	53.5	33	8848	1000			•	•	•					
8848 lb in	**48.03** ★	36	8848	1000			•	•	•	•				
	43.87	40	8848	1000			•	•	•	•				
	38.93 ★	45	8848	1000			•	•	•	•	•			
	35.93	49	8848	1000			•	•	•	•	•			
	32.5 ★	54	8848	1000			•	•	•	•	•			
	29.93	58	8848	1000			•	•	•	•	•			
	27.68 ★	63	8848	1000			•	•	•	•	•			
	25.69	68	8848	1000			•	•	•	•	•			
	22.67 ★	77	8848	1000			•	•	•	•	•			
	20.93	84	8848	1000			•	•	•	•	•			
	18.75 ★	93	8848	1000			•	•	•	•	•			
	17.29	101	8848	1000			•	•	•	•	•			
	14.51	121	8848	1000			•	•	•	•	•			
	12.38 ★	141	8848	1000			•	•	•	•	•			
	10.31	170	8848	1000					•	•	•			
	8.55 ★	205	8848	1000					•	•	•			
	8.03	218	7936	897			•	•	•	•	•			
	6.74	260	7388	835			•	•	•	•	•			
	5.75 ★	304	6680	755			•	•	•	•	•			
	4.79	365	6034	682					•	•	•			
	3.97 ★	441	5211	589					•	•	•			

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540
					Size						
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132
FD.88B-D28	**54705**	0.04	16811	**1900**		•					
16811 lb in	**47195** ★	0.04	16811	**1900**		•	•				
	40546	0.04	16811	**1900**		•	•				
	37328 ★	0.05	16811	**1900**		•	•	•			
	33935	0.05	16811	**1900**		•	•	•			
	30036 ★	0.06	16811	**1900**		•	•	•			
	28814	0.06	16811	**1900**		•	•				
	24755 ★	0.07	16811	**1900**		•	•				
	22790 ★	0.07	16811	**1900**		•	•	•			
	20718	0.08	16811	**1900**		•	•	•			
	18338 ★	0.09	16811	**1900**		•	•	•			
	15360	0.11	16811	**1900**		•	•	•			
	13096 ★	0.13	16811	**1900**		•	•	•			
	11132 ★	0.15	16811	**1900**		•	•	•			
	9674	0.17	16811	**1900**		•	•	•			
	8420 ★	0.2	16811	**1900**		•	•	•			
	7595	0.22	16811	**1900**		•	•	•			
	6703	0.25	16811	**1900**		•	•	•			
FD.88B-Z28	**6000** ★	0.28	16811	**1900**		•	•				
16811 lb in	**5327**	0.32	16811	**1900**		•	•				
	4670 ★	0.36	16811	**1900**		•	•	•			
	4179	0.4	16811	**1900**		•	•	•			
	3709 ★	0.45	16811	**1900**		•	•	•			
	3251	0.52	16811	**1900**		•	•	•			
	2858 ★	0.59	16811	**1900**		•	•	•			
	2582	0.65	16811	**1900**		•	•	•	•		
	2250 ★	0.75	16811	**1900**		•	•	•			
	2021	0.83	16811	**1900**		•	•	•			
	1824 ★	0.92	16811	**1900**		•	•	•	•		
	1654	1	16811	**1900**		•	•	•	•		
	1505 ★	1.1	16811	**1900**		•	•	•	•		
	1331	1.3	16811	**1900**		•	•	•	•		
	1229 ★	1.4	16811	**1900**		•	•	•	•		
	1058	1.6	16811	**1900**		•	•	•	•		
	962 ★	1.7	16811	**1900**		•	•	•	•		
	874 ★	1.9	16811	**1900**		•	•	•	•		
	793	2.1	16811	**1900**		•	•	•	•		
	721 ★	2.3	16811	**1900**		•	•	•	•		
	638	2.6	16811	**1900**		•	•	•	•		
	589 ★	2.9	16811	**1900**		•	•	•	•		
	507	3.3	16811	**1900**		•	•	•	•		
	461 ★	3.6	16811	**1900**		•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
					63	71	80	90	100	112	132	160	180	200
FD.88B	**404.92**	4.3	16811	1900	•	•	•							
	358.33 ★	4.9	16811	1900	•	•	•	•						
16811 lb in	**325.76**	5.4	16811	1900	•	•	•	•						
	292.64 ★	6	16811	1900	•	•	•	•						
	250.83	7	16811	1900	•	•	•	•	•					
	226.94 ★	7.7	16811	1900	•	•	•	•	•	•				
	209.49	8.4	16811	1900	•	•	•	•	•	•				
	182.15 ★	9.6	16811	1900	•	•	•	•	•	•	•			
	165.38	10.6	16811	1900	•	•	•	•	•	•	•			
	151.01 ★	11.6	16811	1900	•	•	•	•	•	•	•			
	138.56	12.6	16811	1900	•	•	•	•	•	•	•			
	127.66 ★	13.7	16811	1900	•	•	•	•	•	•	•			
	115.93	15.1	16811	1900	•	•	•	•	•	•	•			
	105.61 ★	16.6	16811	1900	•	•	•	•	•	•	•			
	96.75	18.1	16811	1900	•	•	•	•	•	•	•			
	86.33 ★	20	16811	1900	•	•	•	•	•	•	•			
	77.04	23	16811	1900			•	•	•	•	•			
	65.43	27	16811	1900			•	•	•	•	•			
	54.47 ★	32	16811	1900			•	•	•	•	•			
FZ.88B	**64.58** ★	27	16811	1900			•	•	•	•				
	59.13	30	16811	1900			•	•	•	•				
16811 lb in	**52.6** ★	33	16811	1900			•	•	•	•	•			
	48.03	36	16811	1900			•	•	•	•	•			
	44.2 ★	40	16811	1900			•	•	•	•	•			
	40.83	43	16811	1900			•	•	•	•	•			
	37.89 ★	46	16811	1900			•	•	•	•	•	•		
	35.29	50	16811	1900			•	•	•	•	•	•		
	31.91 ★	55	16811	1900			•	•	•	•	•	•		
	29.38	60	16811	1900			•	•	•	•	•	•		
	26.42 ★	66	16811	1900			•	•	•	•	•	•		
	24.38	72	16811	1900			•	•	•	•	•	•		
	20.65	85	16811	1900			•	•	•	•	•	•		
	18 ★	97	16811	1900			•	•	•	•	•	•		
	15.31	114	16811	1900					•	•	•	•		
	13.07 ★	134	16811	1900					•	•	•	•		
	10.71 ★	163	16811	1900					•	•	•	•		
	9.19	190	14669	1658			•	•	•	•	•	•		
	8.01 ★	218	13696	1548			•	•	•	•	•	•		
	6.82	257	12865	1454					•	•	•	•		
	5.82 ★	301	11927	1348					•	•	•	•		
	4.77 ★	367	10608	1199					•	•	•	•		

5

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
					63	71	80	90	100	112	132	160	180	200
FD.108B-D38	**66190** ★	0.03	30082	3400	•	•	•							
	58766	0.03	30082	3400	•	•	•							
30082 lb in	**51521** ★	0.03	30082	3400	•	•	•	•						
	46105	0.04	30082	3400	•	•	•	•						
	40922 ★	0.04	30082	3400	•	•	•	•						
	35860	0.05	30082	3400	•	•	•	•						
	31530 ★	0.06	30082	3400	•	•	•	•						
	28485	0.06	30082	3400	•	•	•	•						
	24821 ★	0.07	30082	3400	•	•	•	•						
	22293	0.08	30082	3400	•	•	•	•						
	20125 ★	0.09	30082	3400	•	•	•	•						
	18247	0.1	30082	3400	•	•	•	•						
	16603 ★	0.11	30082	3400	•	•	•	•						
FD.108B-Z38	**15230** ★	0.11	30082	3400	•	•	•							
	13544	0.13	30082	3400	•	•	•							
30082 lb in	**11749** ★	0.15	30082	3400	•	•	•	•						
	10977	0.16	30082	3400	•	•	•	•						
	9655 ★	0.18	30082	3400	•	•	•	•						
	8456	0.21	30082	3400	•	•	•	•	•					
	7479 ★	0.23	30082	3400	•	•	•	•	•					
	6778	0.26	30082	3400	•	•	•	•	•					
	5983 ★	0.29	30082	3400	•	•	•	•	•					
	5397	0.32	30082	3400	•	•	•	•	•					
	4895 ★	0.36	30082	3400	•	•	•	•	•					
	4460	0.39	30082	3400	•	•	•	•	•					
	4079 ★	0.43	30082	3400	•	•	•	•	•					
	3648	0.48	30082	3400	•	•	•	•	•					
	3349 ★	0.52	30082	3400	•	•	•	•	•					
	3019	0.58	30082	3400	•	•	•	•	•					
	2596 ★	0.67	30082	3400	•	•	•	•	•					
	2315	0.76	30082	3400	•	•	•	•	•					
	2126 ★	0.82	30082	3400	•	•	•	•	•					
	1916	0.91	30082	3400	•	•	•	•	•					
	1647 ★	1.1	30082	3400	•	•	•	•	•					
	1526	1.1	30082	3400	•	•	•	•	•					
	1384 ★	1.3	30082	3400	•	•	•	•	•					
	1261	1.4	30082	3400	•	•	•	•	•					
	1153 ★	1.5	30082	3400	•	•	•	•	•					
	1031	1.7	30082	3400	•	•	•	•	•					
	947 ★	1.8	30082	3400	•	•	•	•	•					
	853	2.1	30082	3400	•	•	•	•	•					
	734 ★	2.4	30082	3400	•	•	•	•	•					
	732 ★	2.4	30082	3400	•	•	•	•	•					
	654	2.7	30082	3400	•	•	•	•	•					
	601 ★	2.9	30082	3400	•	•	•	•	•					
	541	3.2	30082	3400	•	•	•	•	•					
	466 ★	3.8	30082	3400	•	•	•	•	•					

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160	180	280TC 200
FD.108B	**424.49** ★	4.1	30082	3400			•	•						
	382.79	4.6	30082	3400			•	•						
30082 lb in	**345.19** ★	5.1	30082	3400			•	•						
	301.88	5.8	30082	3400			•	•	•					
	271.01 ★	6.5	30082	3400			•	•	•	•				
	247.53	7.1	30082	3400			•	•	•	•				
	219.66 ★	8	30082	3400			•	•	•	•	•			
	202.77	8.6	30082	3400			•	•	•	•	•			
	183.39 ★	9.5	30082	3400			•	•	•	•	•			
	168.88	10.4	30082	3400			•	•	•	•	•			
	156.19 ★	11.2	30082	3400			•	•	•	•	•	•		
	144.99	12.1	30082	3400			•	•	•	•	•	•		
	127.92 ★	13.7	30082	3400			•	•	•	•	•	•		
	118.11	14.8	30082	3400			•	•	•	•	•	•		
	105.81 ★	16.5	30082	3400			•	•	•	•	•	•		
	97.57	17.9	30082	3400			•	•	•	•	•	•		
	81.86	21	30082	3400			•	•	•	•	•	•		
	69.84 ★	25	30082	3400			•	•	•	•	•	•		
	58.2	30	30082	3400					•	•	•	•		
	48.24 ★	36	30082	3400					•	•	•	•		
FZ.108B	**64.21** ★	27	26543	3000					•	•	•			
	58.8	30	26543	3000					•	•	•			
30082 lb in	**54.17** ★	32	30082	3400					•	•	•			
	50.15	35	30082	3400					•	•	•			
	46.64 ★	38	30082	3400					•	•	•	•		
	43.54	40	30082	3400					•	•	•	•		
	38.95 ★	45	30082	3400					•	•	•	•	•	
	36.1	48	30082	3400					•	•	•	•	•	
	33.09 ★	53	30082	3400					•	•	•	•	•	
	30.33	58	30082	3400					•	•	•	•	•	
	25.85	68	30082	3400					•	•	•	•	•	
	22.81 ★	77	30082	3400					•	•	•	•	•	
	19.41	90	30082	3400					•	•	•	•	•	
	16.82 ★	104	30082	3400					•	•	•	•	•	
	14.16 ★	124	29233	3304					•	•	•	•	•	
	12.77	137	28746	3249							•	•	•	
	10.98 ★	159	27897	3153							•	•	•	
	10.04	174	29852	3374					•	•	•	•	•	
	8.7 ★	201	27446	3102					•	•	•	•	•	
	7.32 ★	239	25242	2853					•	•	•	•	•	
	6.6	265	23455	2651							•	•	•	
	5.68 ★	308	21429	2422							•	•	•	

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
					63	71	80	90	100	112	132	160	180	200
FD.128B-D38	**68070** ★	0.03	53971	6100	•	•	•							
	60435	0.03	53971	6100	•	•	•							
53971 lb in	**52984** ★	0.03	53971	6100	•	•	•	•						
	47415	0.04	53971	6100	•	•	•	•						
	42084 ★	0.04	53971	6100	•	•	•	•						
	36878	0.05	53971	6100	•	•	•	•						
	32425 ★	0.05	53971	6100	•	•	•	•						
	29294	0.06	53971	6100	•	•	•	•						
	25526 ★	0.07	53971	6100	•	•	•	•						
	22926	0.08	53971	6100	•	•	•	•						
	20697 ★	0.08	53971	6100	•	•	•	•						
	18765	0.09	53971	6100	•	•	•	•						
	17075 ★	0.1	53971	6100	•	•	•	•						
FD.128B-Z38	**15663** ★	0.11	53971	6100	•	•	•							
	13928	0.13	53971	6100	•	•	•							
53971 lb in	**12083** ★	0.14	53971	6100	•	•	•	•						
	11289	0.16	53971	6100	•	•	•	•						
	9929 ★	0.18	53971	6100	•	•	•	•						
	8696	0.2	53971	6100	•	•	•	•	•					
	7691 ★	0.23	53971	6100	•	•	•	•	•					
	6971	0.25	53971	6100	•	•	•	•	•					
	6153 ★	0.28	53971	6100	•	•	•	•	•					
	5551	0.32	53971	6100	•	•	•	•	•					
	5034 ★	0.35	53971	6100	•	•	•	•	•					
	4587	0.38	53971	6100	•	•	•	•	•					
	4195 ★	0.42	53971	6100	•	•	•	•	•					
	3751	0.47	53971	6100	•	•	•	•	•					
	3445 ★	0.51	53971	6100	•	•	•	•	•					
	3105	0.56	53971	6100	•	•	•	•	•					
	2670 ★	0.66	53971	6100	•	•	•	•	•					
	2381	0.73	53971	6100	•	•	•	•	•					
	2186 ★	0.8	53971	6100	•	•	•	•	•					
	1970	0.89	53971	6100	•	•	•	•	•					
	1694 ★	1	53971	6100	•	•	•	•	•					
FD.128B-Z48	**1504**	1.2	53971	6100	•	•	•	•	•	•				
	1370 ★	1.3	53971	6100	•	•	•	•	•	•				
53971 lb in	**1255**	1.4	53971	6100	•	•	•	•	•	•				
	1120 ★	1.6	53971	6100	•	•	•	•	•	•				
	999	1.8	53971	6100			•	•	•	•				
	849	2.1	53971	6100			•	•	•	•				
	706 ★	2.5	53971	6100			•	•	•	•				
	695 ★	2.5	53971	6100	•	•	•	•	•	•				
	620	2.8	53971	6100			•	•	•	•				
	527	3.3	53971	6100			•	•	•	•				
	439 ★	4	53971	6100			•	•	•	•				

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

					T_1 [1] [Nm / lb in]									
					10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752	291 / 2575	356 / 3150	580 / 5132
	Ratio	n_2 (60 Hz)	T_2	T_2	Size									
Gear Type		(4 pol.)	(SF=1)	(SF=1)	140TC	180TC		210TC	250TC		280TC	320TC	360TC	
	[-]	[rpm]	[lb in]	[Nm]	90	100	112	132	160	180	200	225	250	280
FD.128B	**447.96**	3.9	53971	6100	•									
	405.47 ★	4.3	53971	6100	•									
53971 lb in	**354.99**	4.9	53971	6100	•	•								
	320.24 ★	5.5	53971	6100	•	•	•							
	293.22	6	53971	6100	•	•	•							
	260.84 ★	6.7	53971	6100	•	•	•	•						
	238.39	7.3	53971	6100	•	•	•	•						
	219.15 ★	8	53971	6100	•	•	•	•						
	202.48	8.6	53971	6100	•	•	•	•						
	187.88 ★	9.3	53971	6100	•	•	•	•	•					
	175.01	10	53971	6100	•	•	•	•	•					
	158.22 ★	11.1	53971	6100	•	•	•	•	•	•	•			
	145.66	12	53971	6100	•	•	•	•	•	•	•			
	131.01 ★	13.4	53971	6100	•	•	•	•	•	•	•			
	120.87	14.5	53971	6100	•	•	•	•	•	•	•			
	102.41	17.1	53971	6100	•	•	•	•	•	•	•			
	89.25 ★	19.6	53971	6100	•	•	•	•	•	•	•			
	75.93	23	53971	6100		•	•	•	•	•	•			
	64.8 ★	27	53971	6100		•	•	•	•	•	•			
	53.13 ★	33	53971	6100		•	•	•	•	•	•			
FZ.128B	**56.42** ★	31	38045	4300			•	•						
	52.29	33	40699	4600			•	•						
53971 lb in	**49.71** ★	35	43354	4900			•	•	•					
	46.46	38	45566	5150			•	•	•					
	40.99 ★	43	50432	5700			•	•	•	•	•			
	38.66	45	53086	6000			•	•	•	•	•			
	34.64 ★	51	53971	6100			•	•	•	•	•	•		
	31.98	55	53971	6100			•	•	•	•	•	•		
	27.33	64	53971	6100			•	•	•	•	•	•		
	24.7 ★	71	53971	6100			•	•	•	•	•	•		
	23.8	74	53971	6100			•	•	•	•	•	•		
	20.58	85	53971	6100			•	•	•	•	•	•		
	17.95 ★	97	53971	6100			•	•	•	•	•	•		
	15.36 ★	114	51733	5847			•	•	•	•	•	•		
	13.76	127	49901	5640				•	•	•	•	•		
	11.65 ★	150	47309	5347				•	•	•	•	•		
	10.07	174	45238	5113					•	•	•	•		
	7.57 ★	231	40390	4565					•	•	•	•		
	6.91	253	31781	3592				•	•	•	•	•		
	5.85 ★	299	29206	3301				•	•	•	•	•		
	5.05	347	27755	3137					•	•	•	•		
	3.8 ★	461	23960	2708					•	•	•	•		

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio [-]	n_2 (60 Hz) (4 pol.) [rpm]	T_2 (SF=1) [lb in]	T_2 (SF=1) [Nm]	T_1 [1] [Nm / lb in] 3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
					63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160	180	280TC 200
FD.148B-D38	**70576** ★	0.02	79629	9000	•	•	•							
79629 lb in	**62660**	0.03	79629	9000	•	•	•							
	54935 ★	0.03	79629	9000	•	•	•	•						
	49161	0.04	79629	9000	•	•	•	•						
	43633 ★	0.04	79629	9000	•	•	•	•						
	38236	0.05	79629	9000	•	•	•	•						
	33619 ★	0.05	79629	9000	•	•	•	•						
	30373	0.06	79629	9000	•	•	•	•						
	26466 ★	0.07	79629	9000	•	•	•	•						
	23770	0.07	79629	9000	•	•	•	•						
	21459 ★	0.08	79629	9000	•	•	•	•						
	19456	0.09	79629	9000	•	•	•	•						
	17704 ★	0.1	79629	9000	•	•	•	•						
FD.148B-Z38	**16239** ★	0.11	79629	9000	•	•	•							
	14441	0.12	79629	9000	•	•	•							
79629 lb in	**12527** ★	0.14	79629	9000	•	•	•	•						
	11705	0.15	79629	9000	•	•	•	•						
	10295 ★	0.17	79629	9000	•	•	•	•						
	9016	0.19	79629	9000	•	•	•	•	•					
	7975 ★	0.22	79629	9000	•	•	•	•	•					
	7227	0.24	79629	9000	•	•	•	•	•					
	6380 ★	0.27	79629	9000	•	•	•	•	•					
	5755	0.3	79629	9000	•	•	•	•	•					
	5220 ★	0.34	79629	9000	•	•	•	•	•					
	4756	0.37	79629	9000	•	•	•	•	•					
	4350 ★	0.4	79629	9000	•	•	•	•	•					
	3889	0.45	79629	9000	•	•	•	•	•					
	3571 ★	0.49	79629	9000	•	•	•	•	•					
	3219	0.54	79629	9000	•	•	•	•	•					
	2768 ★	0.63	79629	9000	•	•	•	•	•					
	2468	0.71	79629	9000	•	•	•	•	•					
	2266 ★	0.77	79629	9000	•	•	•	•	•					
	2043	0.86	79629	9000	•	•	•	•	•					
	1757 ★	1	79629	9000	•	•	•	•	•					
FD.148B-Z48	**1634**	1.1	79629	9000	•	•	•	•	•	•				
	1489 ★	1.2	79629	9000	•	•	•	•	•	•				
79629 lb in	**1364**	1.3	79629	9000	•	•	•	•	•	•				
	1217 ★	1.4	79629	9000	•	•	•	•	•	•				
	1086	1.6	79629	9000			•	•	•	•				
	922	1.9	79629	9000			•	•	•	•				
	768 ★	2.3	79629	9000	•	•	•	•	•	•				
	674	2.6	79629	9000			•	•	•	•				
	573	3.1	79629	9000			•	•	•	•				
	477 ★	3.7	79629	9000			•	•	•	•				

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]									
					10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752	291 / 2575	356 / 3150	580 / 5132
					Size									
					140TC	180TC		210TC	250TC		280TC	320TC	360TC	
	[-]	[rpm]	[lb in]	[Nm]	90	100	112	132	160	180	200	225	250	280
FD.148B	**449.21** ★	3.9	79629	9000		•	•							
	411.98	4.2	79629	9000		•	•							
79629 lb in	**368.06** ★	4.8	79629	9000		•	•	•						
	337.07	5.2	79629	9000		•	•	•						
	310.51 ★	5.6	79629	9000		•	•	•						
	287.49	6.1	79629	9000		•	•	•						
	267.35 ★	6.5	79629	9000		•	•	•	•					
	249.58	7	79629	9000		•	•	•	•					
	223.31 ★	7.8	79629	9000		•	•	•	•	•	•			
	206.93	8.5	79629	9000		•	•	•	•	•	•			
	189.69 ★	9.2	79629	9000		•	•	•	•	•	•	•		
	173.89	10.1	79629	9000		•	•	•	•	•	•	•		
	148.18	11.8	79629	9000		•	•	•	•	•	•	•		
	130.76 ★	13.4	79629	9000		•	•	•	•	•	•	•		
	111.29	15.7	79629	9000		•	•	•	•	•	•	•		
	96.43 ★	18.1	79629	9000		•	•	•	•	•	•	•		
	81.15 ★	22	79629	9000		•	•	•	•	•	•	•		
	73.22	24	79629	9000				•	•	•	•	•		
	62.93 ★	28	79629	9000				•	•	•	•	•		
FZ.148B	**68.23**	26	49547	5600				•						
	64.37 ★	27	57510	6500				•	•					
79629 lb in	**60.21**	29	61934	7000				•	•					
	53.53 ★	33	70782	8000				•	•	•	•			
	50.54	35	70782	8000				•	•	•	•			
	45.37 ★	39	76975	8700				•	•	•	•	•		
	41.64	42	79629	9000				•	•	•	•	•		
	35.93	49	79629	9000				•	•	•	•	•	•	
	31.43	56	79629	9000				•	•	•	•	•	•	
	27.34	64	79629	9000				•	•	•	•	•	•	
	23.98 ★	73	79629	9000				•	•	•	•	•	•	
	20.28 ★	86	79629	9000				•	•	•	•	•	•	
	18.4	95	79629	9000				•	•	•	•	•	•	
	16.04 ★	109	79629	9000				•	•	•	•	•	•	
	13.62	128	75374	8519					•	•	•	•	•	
	10.43 ★	168	69207	7822					•	•	•	•	•	
	9.51	184	58227	6581				•	•	•	•	•	•	
	8.29 ★	211	54891	6204				•	•	•	•	•	•	
	7.04	249	51494	5820					•	•	•	•	•	
	5.39 ★	325	45336	5124					•	•	•	•	•	

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]									
					3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
	[-]	[rpm]	[lb in]	[Nm]	63	71	80	90	100	112	132	160	180	200
FD.168B-D48	**65160** ★	0.03	123868	14000	•	•	•							
	57946	0.03	123868	14000	•	•	•							
123868 lb in	**50267** ★	0.03	123868	14000	•	•	•	•						
	46966	0.04	123868	14000	•	•	•	•						
	41307 ★	0.04	123868	14000	•	•	•	•						
	36177	0.05	123868	14000	•	•	•	•	•					
	31998 ★	0.05	123868	14000	•	•	•	•	•					
	29000	0.06	123868	14000	•	•	•	•	•					
	25599 ★	0.07	123868	14000	•	•	•	•	•					
	23093	0.08	123868	14000	•	•	•	•	•					
	20944 ★	0.08	123868	14000	•	•	•	•	•					
	19083	0.09	123868	14000	•	•	•	•	•					
	17454 ★	0.1	123868	14000	•	•	•	•	•					
FD.168B-Z48	**16007**	0.11	123868	14000	•	•	•							
	14165 ★	0.12	123868	14000	•	•	•	•						
123868 lb in	**12878**	0.14	123868	14000	•	•	•	•						
	11568 ★	0.15	123868	14000	•	•	•	•						
	9916	0.18	123868	14000	•	•	•	•	•					
	8971 ★	0.2	123868	14000	•	•	•	•	•	•				
	8281	0.21	123868	14000	•	•	•	•	•	•				
	7201 ★	0.24	123868	14000	•	•	•	•	•	•				
	6538	0.27	123868	14000	•	•	•	•	•	•				
	5970 ★	0.29	123868	14000	•	•	•	•	•	•				
	5477	0.32	123868	14000	•	•	•	•	•	•				
	5046 ★	0.35	123868	14000	•	•	•	•	•	•				
	4583	0.38	123868	14000	•	•	•	•	•	•				
	4175 ★	0.42	123868	14000	•	•	•	•	•	•				
	3825	0.46	123868	14000	•	•	•	•	•	•				
	3413 ★	0.51	123868	14000	•	•	•	•	•	•				
	3046	0.57	123868	14000			•	•	•	•				
	2587	0.68	123868	14000			•	•	•	•				
	2153 ★	0.81	123868	14000			•	•	•	•				
	2119 ★	0.83	123868	14000	•	•	•	•	•	•				
	1891	0.93	123868	14000			•	•	•	•				
	1606	1.1	123868	14000			•	•	•	•				
	1337 ★	1.3	123868	14000			•	•	•	•				
FD.168B-Z68	**1298**	1.3	123868	14000			•	•	•	•	•			
	1108 ★	1.6	123868	14000			•	•	•	•	•			
123868 lb in	**923**	1.9	123868	14000					•	•	•			
	765 ★	2.3	123868	14000					•	•	•			
	675	2.6	123868	14000			•	•	•	•	•			
	576 ★	3	123868	14000			•	•	•	•	•			
	480	3.6	123868	14000					•	•	•			
	398 ★	4.4	123868	14000					•	•	•			

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]									
					20/177	26/230	61/540	98/867	198/1752	198/1752	291/2575	356/3150	580/5132	1290/11414
					Size									
					180TC		210TC	250TC		280TC	320TC	360TC		
	[-]	[rpm]	[lb in]	[Nm]	100	112	132	160	180	200	225	250	280	315
FD.168B	**369.26** ★	4.7	123868	14000			•							
	338.49	5.2	123868	14000			•							
123868 lb in	**312.12** ★	5.6	123868	14000			•							
	289.26	6	123868	14000			•							
	275.03 ★	6.4	123868	14000			•	•						
	257.04	6.8	123868	14000			•	•						
	226.74 ★	7.7	123868	14000			•	•	•	•				
	213.87	8.2	123868	14000			•	•	•	•				
	191.63 ★	9.1	123868	14000			•	•	•	•	•			
	176.94	9.9	123868	14000			•	•	•	•	•			
	151.18	11.6	123868	14000			•	•	•	•	•			
	136.63 ★	12.8	123868	14000			•	•	•	•	•			
	131.64	13.3	123868	14000			•	•	•	•	•	•		
	113.86	15.4	123868	14000			•	•	•	•	•	•		
	99.31 ★	17.6	123868	14000			•	•	•	•	•	•		
	84.99 ★	21	123868	14000			•	•	•	•	•	•		
	76.12	23	123868	14000			•	•	•	•	•	•		
	64.47 ★	27	123868	14000			•	•	•	•	•	•		
	55.68	31	123868	14000				•	•	•	•	•		
	41.85 ★	42	123868	14000				•	•	•	•	•		
FZ.168B	**53.48**	33	79629	9000			•	•	•	•				
	48.29	36	92901	10500			•	•	•	•	•			
123868 lb in	**45.25**	39	101749	11500			•	•	•	•	•	•		
	38.87 ★	45	115020	13000			•	•	•	•	•	•		
	33.58	52	115020	13000			•	•	•	•	•	•	•	
	29.64	59	123868	14000			•	•	•	•	•	•	•	
	26.68 ★	66	123868	14000			•	•	•	•	•	•	•	
	22.14 ★	79	123868	14000			•	•	•	•	•	•	•	
	20.19	87	123868	14000			•	•	•	•	•	•	•	
	17.71 ★	99	123868	14000			•	•	•	•	•	•	•	
	15.22	115	123868	14000				•	•	•	•	•	•	
	11.86 ★	148	115693	13076				•	•	•	•	•	•	
	9.42 ★	186	107473	12147					•	•	•	•	•	
	8.54	205	99599	11257				•	•	•	•	•	•	
	6.65 ★	263	88574	10011				•	•	•	•	•	•	
	5.28 ★	331	76816	8682					•	•	•	•	•	

5

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in]									
					3 / 27	3 / 27	5 / 44	10 / 88	20 / 177	26 / 230	61 / 540	98 / 867	198 / 1752	198 / 1752
					Size									
						56C		140TC	180TC		210TC	250TC		280TC
	[-]	[rpm]	[lb in]	[Nm]	63	71	80	90	100	112	132	160	180	200
FD.188B-D48	**71388** ★	0.02	176954	20000	•	•	•							
	63484	0.03	176954	20000	•	•	•							
176954 lb in	**55070** ★	0.03	176954	20000	•	•	•	•						
	51455	0.03	176954	20000	•	•	•	•						
	45255 ★	0.04	176954	20000	•	•	•	•						
	39634	0.04	176954	20000	•	•	•	•	•					
	35056 ★	0.05	176954	20000	•	•	•	•	•					
	31771	0.06	176954	20000	•	•	•	•	•					
	28045 ★	0.06	176954	20000	•	•	•	•	•					
	25299	0.07	176954	20000	•	•	•	•	•					
	22946 ★	0.08	176954	20000	•	•	•	•	•					
	20906	0.08	176954	20000	•	•	•	•	•					
	19122 ★	0.09	176954	20000	•	•	•	•	•					
FD.188B-Z48	**17537**	0.1	176954	20000	•	•	•							
	15519 ★	0.11	176954	20000	•	•	•	•						
176954 lb in	**14108**	0.12	176954	20000	•	•	•	•						
	12674 ★	0.14	176954	20000	•	•	•	•						
	10863	0.16	176954	20000	•	•	•	•	•					
	9829 ★	0.18	176954	20000	•	•	•	•	•	•				
	9073	0.19	176954	20000	•	•	•	•	•	•				
	7889 ★	0.22	176954	20000	•	•	•	•	•	•				
	7163	0.24	176954	20000	•	•	•	•	•	•				
	6540 ★	0.27	176954	20000	•	•	•	•	•	•				
	6001	0.29	176954	20000	•	•	•	•	•	•				
	5529 ★	0.32	176954	20000	•	•	•	•	•	•				
	5021	0.35	176954	20000	•	•	•	•	•	•				
	4574 ★	0.38	176954	20000	•	•	•	•	•	•				
	4190	0.42	176954	20000	•	•	•	•	•	•				
	3739 ★	0.47	176954	20000	•	•	•	•	•	•				
	3337	0.52	176954	20000			•	•	•	•				
	2834	0.62	176954	20000			•	•	•	•				
	2359 ★	0.74	176954	20000			•	•	•	•				
	2322 ★	0.75	176954	20000	•	•	•	•	•	•				
	2072	0.84	176954	20000			•	•	•	•				
	1760	0.99	176954	20000			•	•	•	•				
	1465 ★	1.2	176954	20000			•	•	•	•				
FD.188B-Z68	**1449**	1.2	176954	20000			•	•	•	•	•			
	1236 ★	1.4	176954	20000			•	•	•	•	•			
176954 lb in	**1030**	1.7	176954	20000					•	•	•			
	854 ★	2	176954	20000					•	•	•			
	754	2.3	176954	20000			•	•	•	•	•			
	643 ★	2.7	176954	20000			•	•	•	•	•			
	536	3.3	176954	20000					•	•	•			
	444 ★	3.9	176954	20000					•	•	•			

1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Legend / explanations see page 5 - 10
Input Units see chapter 7

Gear Type	Ratio	n_2 (60 Hz) (4 pol.)	T_2 (SF=1)	T_2 (SF=1)	T_1 [1] [Nm / lb in] 20/177	26/230	61/540	98/867	198/1752	198/1752	291/2575	356/3150	580/5132	1290/11414
					Size									
					180TC		210TC	250TC		280TC	320TC	360TC		
	[-]	[rpm]	[lb in]	[Nm]	100	112	132	160	180	200	225	250	280	315
FD.188B	**403.86** ★	4.3	176954	20000			•							
	370.52	4.7	176954	20000			•							
176954 lb in	**341.94** ★	5.1	176954	20000			•							
	317.18	5.5	176954	20000			•							
	299.2 ★	5.8	176954	20000			•	•						
	279.86	6.3	176954	20000			•	•						
	248.85 ★	7	176954	20000			•	•	•	•				
	234.93	7.4	176954	20000			•	•	•	•				
	210.89 ★	8.3	176954	20000			•	•	•	•	•			
	193.56	9	176954	20000			•	•	•	•	•			
	167.03	10.5	176954	20000			•	•	•	•	•	•		
	146.11	12	176954	20000			•	•	•	•	•	•		
	127.07	13.8	176954	20000			•	•	•	•	•	•	•	
	111.49 ★	15.7	176954	20000			•	•	•	•	•	•	•	
	94.28 ★	18.6	176954	20000			•	•	•	•	•	•	•	
	85.54	20	176954	20000			•	•	•	•	•	•	•	
	74.58 ★	23	176954	20000			•	•	•	•	•	•	•	
	63.32	28	176954	20000				•	•	•	•	•	•	
	48.46 ★	36	176954	20000				•	•	•	•	•	•	
FZ.188B	**52.63**	33	146695	16580				•	•	•	•			
	48.47	36	149261	16870				•	•	•	•	•		
176954 lb in	**42.07** ★	42	154835	17500				•	•	•	•	•		
	37.08	47	154923	17510				•	•	•	•	•	•	
	32.54	54	164125	18550				•	•	•	•	•	•	
	29.33 ★	60	176954	20000				•	•	•	•	•	•	
	24.9 ★	70	176954	20000				•	•	•	•	•	•	
	23.13	76	176954	20000				•	•	•	•	•	•	
	19.87 ★	88	175096	19790				•	•	•	•	•	•	
	16.95	103	165452	18700				•	•	•	•	•	•	
	16.95	103	166956	18870				•	•	•	•	•	•	•
	13.35 ★	131	155366	17560				•	•	•	•	•	•	•
	10.74 ★	163	142183	16070					•	•	•	•	•	•
	9.34	187	132627	14990							•	•	•	•
	8.34	210	125549	14190								•	•	•

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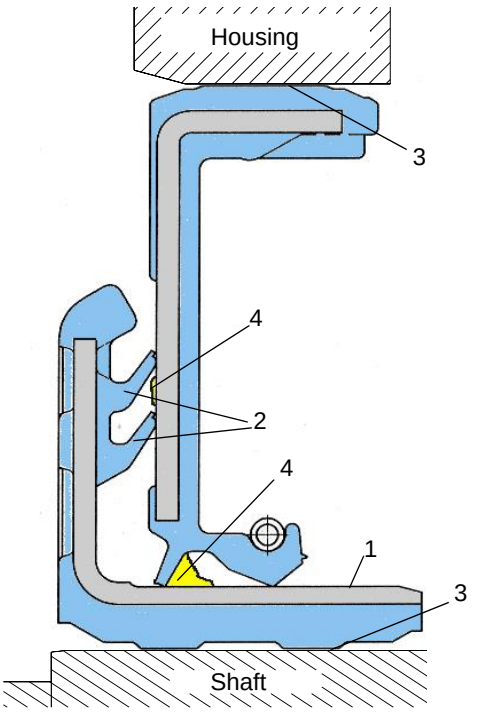
1) permissible short time value is 2,5 times (for e.g. starting torque of motor)

Quadrilip seals (optional)

Improvement of Sealing Quality F.38B-168B



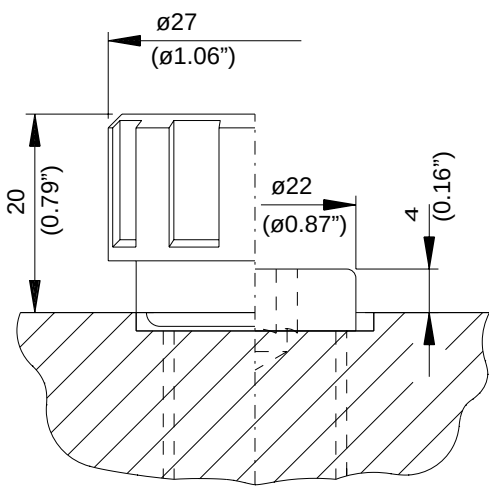
- Protected running surface for shaft seal **1**
- No risk of damage during assembly
- Additional seal-lips against dust **2**
- Separate sealing system prevents damage to the shaft through corrosion and dust
- Rubber coated inner ring and outer ring **3**
- Grease prevents dry run of lips of seals **4**

F.28 and 188B double sealing optional.

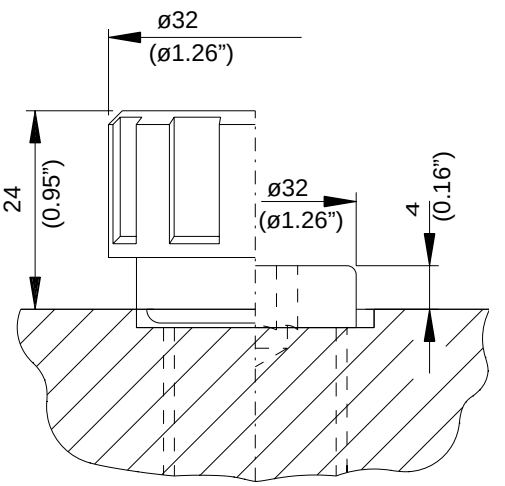
Breather Element

The position of the plug screw is shown in the dimension sheets for the horizontal mounting position (B3, B5). When running the gear box, in sizes FD./FZ.48B ... FD./FZ.188B a breather must replace the plug screw. The breather dimensions are as follows.
Please note that the breather plug must be inserted at other locations for other mounting positions.

FD./FZ. 48B ... 128B



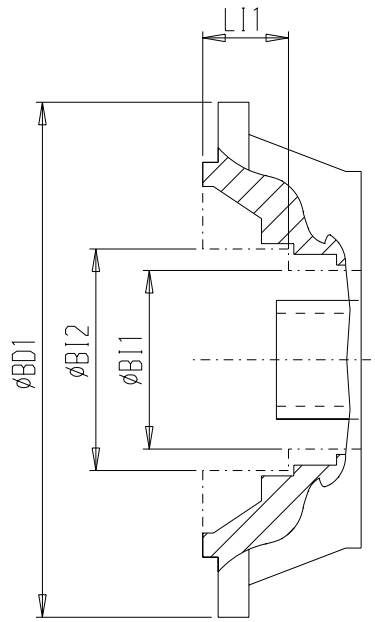
FD./FZ. 148B ... 188B



Flange mounted (A-Type)

Detail inner outline

Design reference for the appearance of the customer side e.g. for plug-in shaft at hollow shaft configuration.

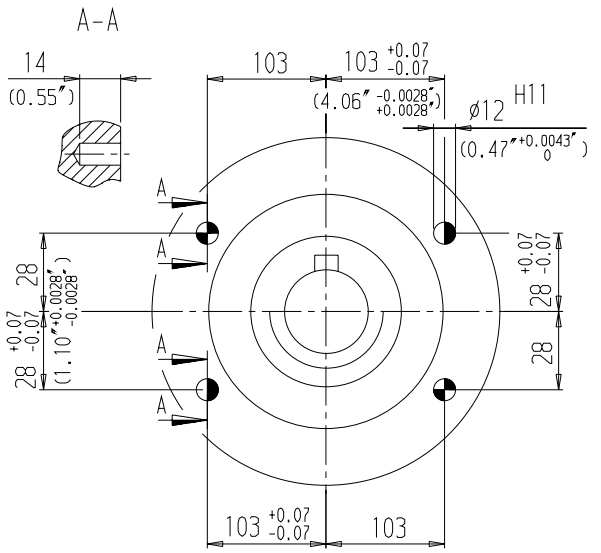


Types	øBD1		øBI1		øBI2		LI1	
	[*mm*]	[inch]	[*mm*]	[inch]	[*mm*]	[inch]	[*mm*]	[inch]
F.F28	*120*	4.72	*70*	2.76	*72*	2.84	*24*	0.95
F.F28	*160*	6.30	*70*	2.76	*103*	4.06	*8.5*	0.34
F.F38B	*160*	6.30	*70*	2.76	*77*	3.03	*20*	0.79
F.F48B	*200*	7.87	*84*	3.31	*90*	3.54	*22.5*	0.89
F.F68B	*250*	9.84	*96*	3.78	*96*	3.78	-	-
F.F88B	*300*	11.81	*126*	4.96	*138*	5.43	*31*	1.22
F.F108B	*350*	13.78	*176*	6.93	*185*	7.28	*32*	1.26
F.F128B	*450*	17.72	*226*	8.90	*234*	9.21	*38.5*	1.52
F.F148B	*450*	17.72	*246*	9.69	*262*	10.31	*34*	1.34
F.F168B	*550*	21.65	*296*	11.65	*313*	12.32	*39*	1.54
F.F188B	*660*	25.98	*296*	11.65	*296*	11.65	-	-

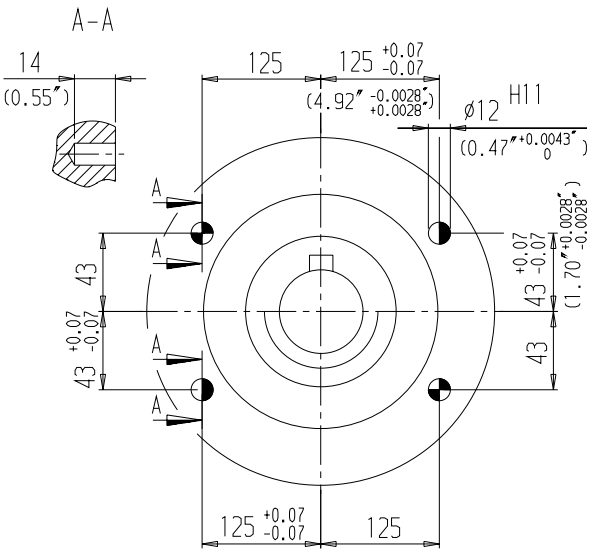
Pin holes

With housing flange (C-Type) for sizes F.Z.108B-188B, the output side can be pinned.
The output flanges are designed in a manner, that the permissible torques and radial loads can be transmitted safely by screw connection.
When there is need for additional safety, e.g. operation with heavy shock load, the existing pin holes can be used.
The gear box can also be bored and pinned together with the machine. In this case the given dimensions should be observed.

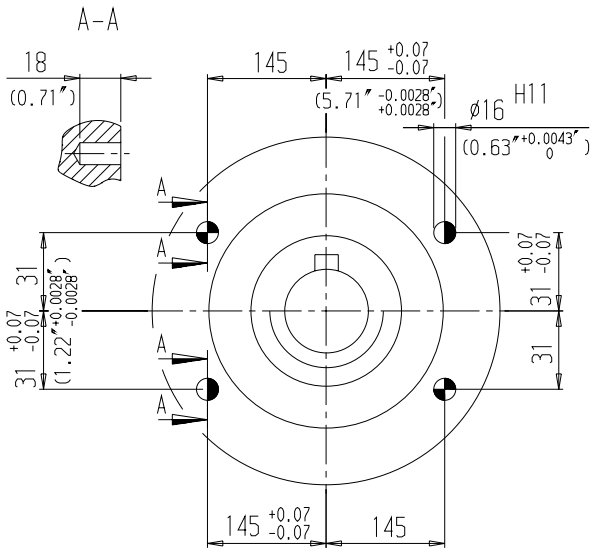
F.Z.108B



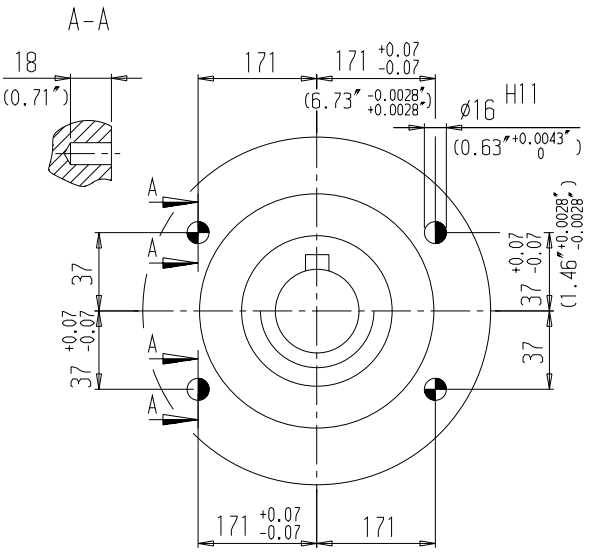
F.Z.128B



F.Z.148B



F.Z.168B, F.Z.188B

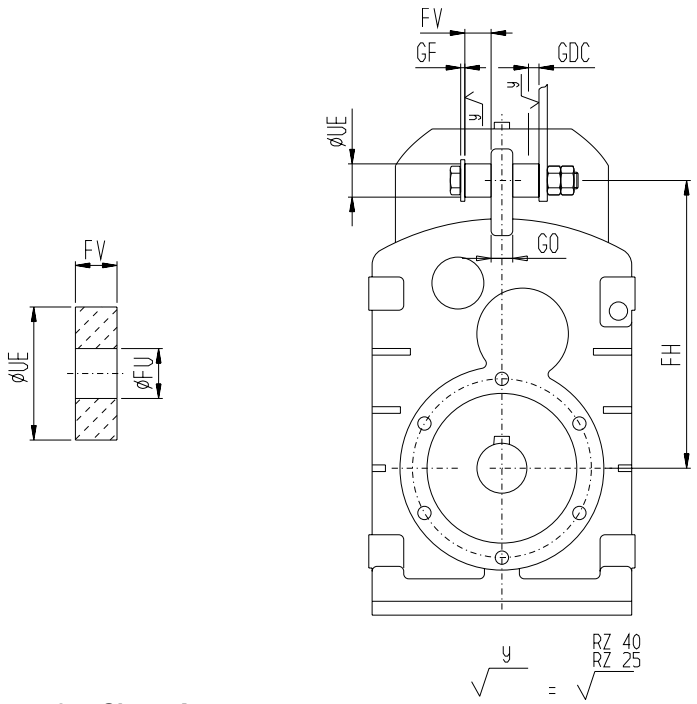


◑ With heavy straight pins to DIN 1481: Use existing pinholes in the housing flange.

◒ With dowel pins to DIN EN 28740 / ISO 8740:

Note: Bore the mating part together with the housing.

Torque Arm for Parallel Shaft Gear Units



Dimensions in **inch**
mm

Material: Natural Rubber Hardness 70±5 Shore A

*Compression at max. torque

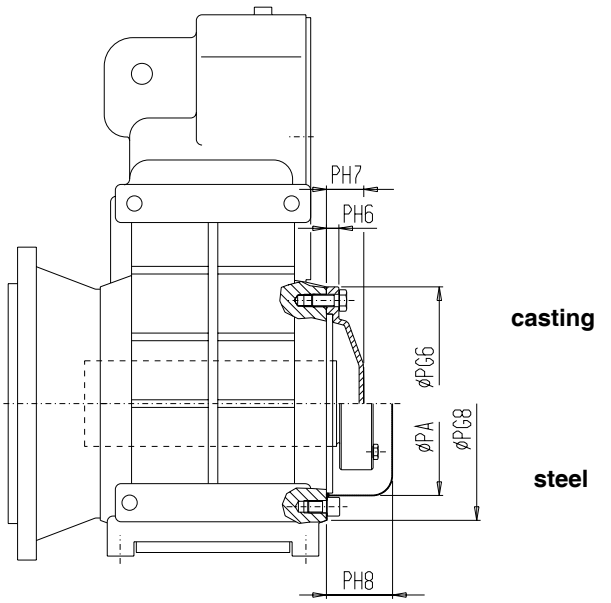
Gear Units	FH	FV	FU	UE	GF	GO	GDC *	Bushing Module Number
F.28	5.51	0.59	0.41 + 0.02	1.18	0.08	0.39	0.07	086043
	140	*15*	*10.5 + 0.50*	*30*	*2*	*10*	*1.80*	
F.38B	5.51	0.59	0.41 + 0.02	1.18	0.10	0.47	0.15	086043
	140	*15*	*10.5 + 0.50*	*30*	*2.50*	*12*	*3.80*	
F.48B	7.28	0.79	0.49 + 0.02	1.57	0.12	0.47	0.15	086050
	185	*20*	*12.5 + 0.50*	*40*	*3*	*12*	*3.70*	
F.68B	8.58	0.79	0.49 + 0.02	1.57	0.12	0.63	0.22	086072
	218	*20*	*12.5 + 0.50*	*40*	*3*	*16*	*5.60*	
F.88B	10.94	1.18	0.83 + 0.02	2.36	0.16	0.79	0.20	086078
	278	*30*	*21.0 + 0.50*	*60*	*4*	*20*	*5.00*	
F.108B	13.62	1.18	0.83 + 0.02	2.36	0.16	1.02	0.29	086084
	346	*30*	*21 + 0.50*	*60*	*4*	*26*	*7.30*	
F.128B	15.55	1.57	0.98 + 0.02	3.14	0.24	1.18	0.31	086090
	395	*40*	*25 + 0.50*	*80*	*6*	*30*	*8.00*	
F.148B	19.09	1.57	0.98 + 0.02	3.14	0.24	1.42	0.37	086096
	485	*40*	*25 + 0.50*	*80*	*6*	*36*	*9.40*	
F.168B	21.65	1.97	1.22 + 0.02	4.72	0.31	1.97	0.24	086102
	550	*50*	*31 + 0.50*	*120*	*8*	*50*	*6.20*	
F.188B	24.41	1.97	1.22 + 0.02	4.72	0.31	1.97	0.33	086102
	620	*50*	*31 + 0.50*	*120*	*8*	*50*	*8.30*	

The additional available rubber buffers are used to give elastic support between the gearboxes and the housing web. Torque arm will be delivered extra.
The rubber buffers are suitable for all types of construction and are temperature resistant from -40°C to +80°C (-104°F to 176°F).

Parallel Shaft Gear Units
Cover B-Side (optional)

F.A, F.AF, F.AZ, F. AS[1)], F.AFS[1)], F.AZS[1)], F.AT, F.AFT, F.AZT

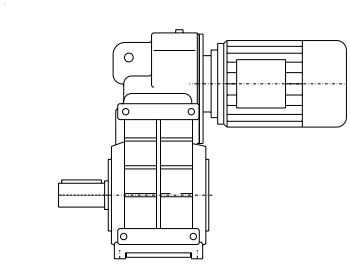
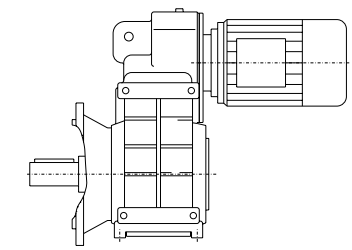
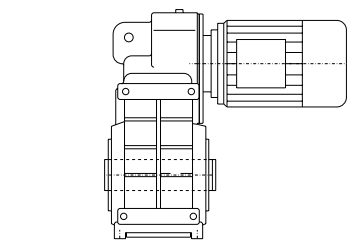
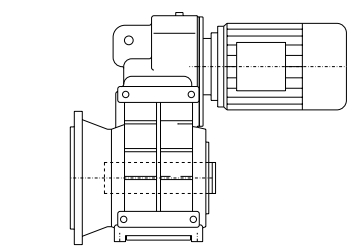
Dimensions in **Inch**
mm



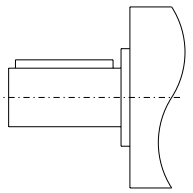
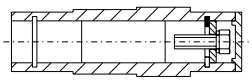
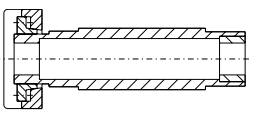
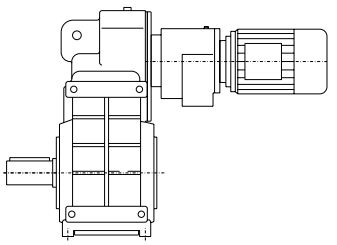
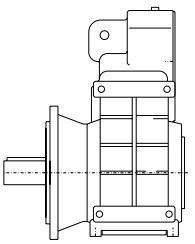
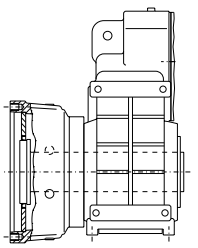
Model	Steel cover			Casting cover		
	PA	PG8	PH8	PG6	PH6	PH7
F. 28	2.28 *58*	4.02 *102*	1.32 *33.5*	-	-	-
F. 38B	3.24 *82.2*	4.53 *115*	1.57 *40*	4.72 *120*	0.39 *10*	1.30 *33*
F. 48B	3.90 *99*	5.12 *130*	1.73 *44*	5.20 *132*	0.39 *10*	1.30 *33*
F. 68B	4.53 *115*	5.91 *150*	2.46 *62.5*	5.91 *150*	0.39 *10*	1.46 *37*
F. 88B	5.39 *137*	7.48 *190*	2.76 *70*	7.48 *190*	0.51 *13*	1.97 *50*
F.108B	7.36 *187*	9.45 *240*	3.15 *80*	9.65 *245*	0.51 *13*	2.17 *55*
F.128B	9.17 *233*	11.50 *292*	3.35 *85*	11.61 *295*	0.63 *16*	1.89 *48*
F.148B	10.14 *257.5*	13.15 *334*	3.94 *100*	13.19 *335*	0.51 *13*	1.97 *50*
F.168B	12.19 *309.5*	15.35 *390*	5.10 *129.5*	15.75 *400*	0.51 *13*	1.97 *50*
F. 188B	12.19 *309.5*	15.35 *390*	5.10 *129.5*	15.75 *400*	0.51 *13*	1.97 *50*

1) For F.AS, F.ADS, F.AFS and F.AZS only steel protection cover is possible. For size 28 protection cover is standard.

Dimension Sheets-Overview

	Typ(e)	Dimension sheet see page
	F.Z28	5 - 74
	F.Z38B	5 - 82
	F.Z48B	5 - 90
	F.Z68B	5 - 98
	F.Z88B	5 - 106
	F.Z108B	5 - 114
	F.Z128B	5 - 122
	F.Z148B	5 - 130
	F.Z168B	5 - 138
	F.Z188B	5 - 146
	F.F28	5 - 76
	F.F38B	5 - 84
	F.F48B	5 - 92
	F.F68B	5 - 100
	F.F88B	5 - 108
	F.F108B	5 - 116
	F.F128B	5 - 124
	F.F148B	5 - 132
	F.F168B	5 - 140
	F.F188B	5 - 148
	F.A28 / F.AZ28	5 - 78
	F.A38B / F.AZ38B	5 - 86
	F.A48B / F.AZ48B	5 - 94
	F.A68B / F.AZ68B	5 - 102
	F.A88B / F.AZ88B	5 - 110
	F.A108B / F.AZ108B	5 - 118
	F.A128B / F.AZ128B	5 - 126
	F.A148B / F.AZ148B	5 - 134
	F.A168B / F.AZ168B	5 - 142
	F.A168B / F.AZ188B	5 - 150
	F.AF28	5 - 80
	F.AF38B	5 - 88
	F.AF48B	5 - 96
	F.AF68B	5 - 104
	F.AF88B	5 - 112
	F.AF108B	5 - 120
	F.AF128B	5 - 128
	F.AF148B	5 - 136
	F.AF168B	5 - 144
	F.AF188B	5 - 152

Dimension Sheets-Overview

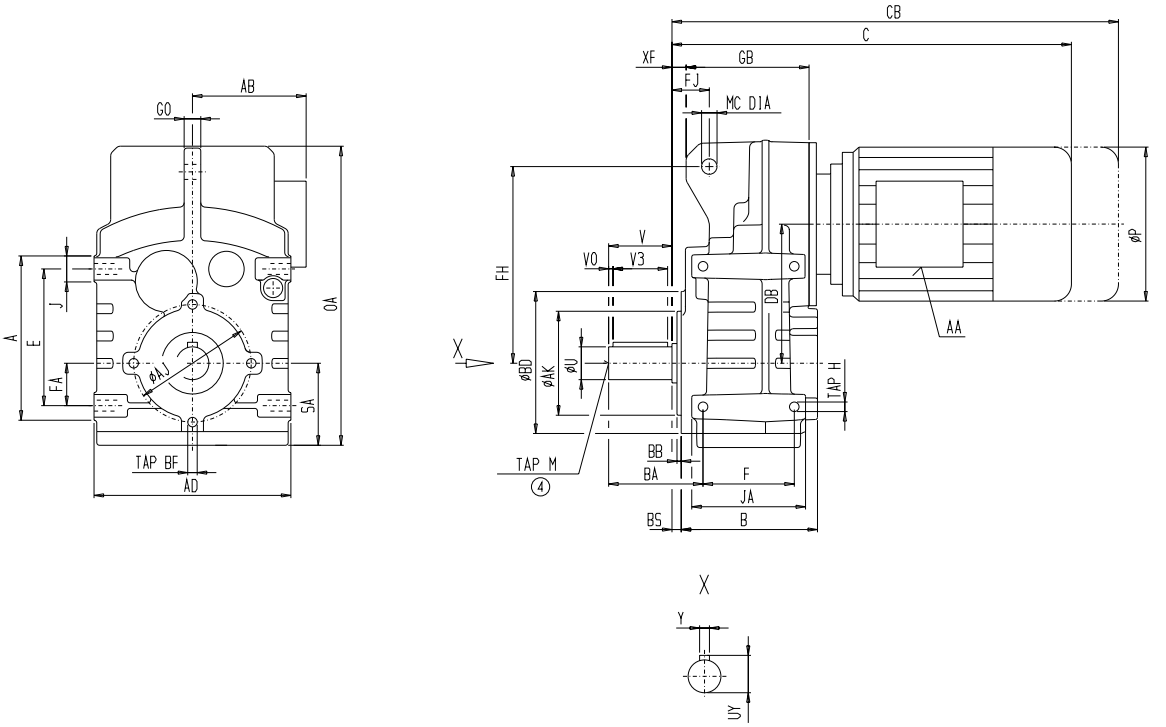
	Typ(e)	Dimension sheet see page
	Available Output solid shaft	5 - 154
	Available Output hollow shaft	5 - 155
	F.A.S38B ... F.A.S188B	5 - 157
	F.38B-Z28 ... F.188B-Z68	5 - 158
	F.M88B ... F.M168B	5 - 162
	F.E88B ... F.E168B	5 - 165

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ28

FZ 510

[inch]



5

Mounting

BD	AK	AJ	BB	TAP BF
4.02	2.91	3.39	0.12	M8x16

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
1	1.97	1.5	0.252	3/8-16UNC	1.11	0.25	2.81

Gearcase

F	E	JA	A	GB	SA	FA	DB	J	B	BS	AD	OA	TAP H	XF	FJ	FH	MC DIA	GO
2.56	3.94	3.19	4.69	3.44	2.36	1.22	3.9	0.75	3.82	0.24	5.59	8.61	M8x16	0.37	1.02	5.51	0.43	0.39

Motor

	F.Z28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	11.87	13.6	5.43	4.67	2x1/2“	28
M71MP	12.46	14.63	5.43	4.67	2x1/2“	32
M90S	15.2	17.8	6.93	5.91	2x3/4“	43
M90L	15.2	17.8	6.93	5.91	2x3/4“	51
M100L	18.42	21.26	7.64	6.3	2x3/4“	66

Tolerances see page 1 - 4

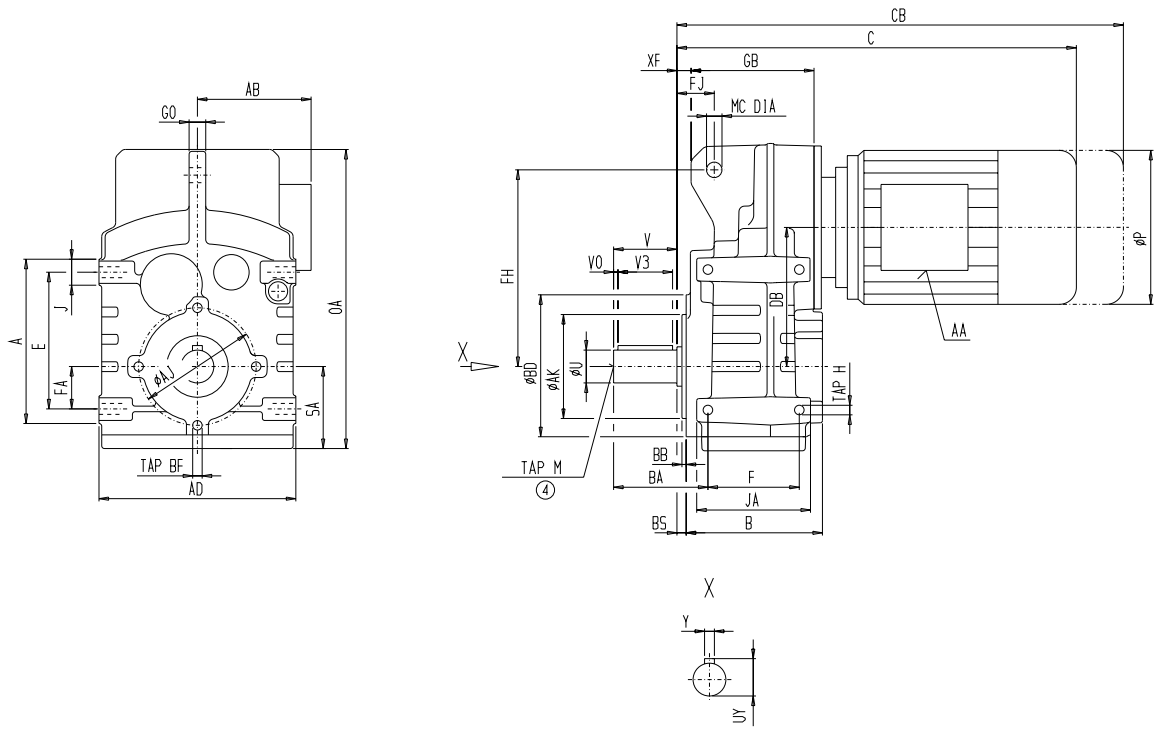
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ28

FZ 510

[mm]



Mounting

BD	AK	AJ	BB	TAP BF
102	*74*	*86*	*3*	*M8x16*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
25,4	*50*	*38,1*	*6,401*	*3/8"-16UNC*	*28,19*	*6,35*	*71,5*

Gearcase

F	E	JA	A	GB	SA	FA	DB	J	B	BS	AD	OA	TAP H	XF	FJ	FH	MC DIA	GO
65	*100*	*81*	*119*	*87,5*	*60*	*31*	*99*	*19*	*97*	*6*	*142*	218,8	M8x16	9,5	26	140	11	10

Motor

	F.Z28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*302,5*	*346,5*	*138*	*118,5*	*2x1/2"*	*13*
M71MP	*317,5*	*372,5*	*138*	*118,5*	*2x1/2"*	*14*
M90S	*387*	*453*	*176*	*150*	*2x3/4"*	*19*
M90L	*387*	*453*	*176*	*150*	*2x3/4"*	*23*
M100L	*468*	*540*	*194*	*160*	*2x3/4"*	*30*

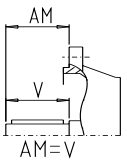
Tolerances see page 1 - 4

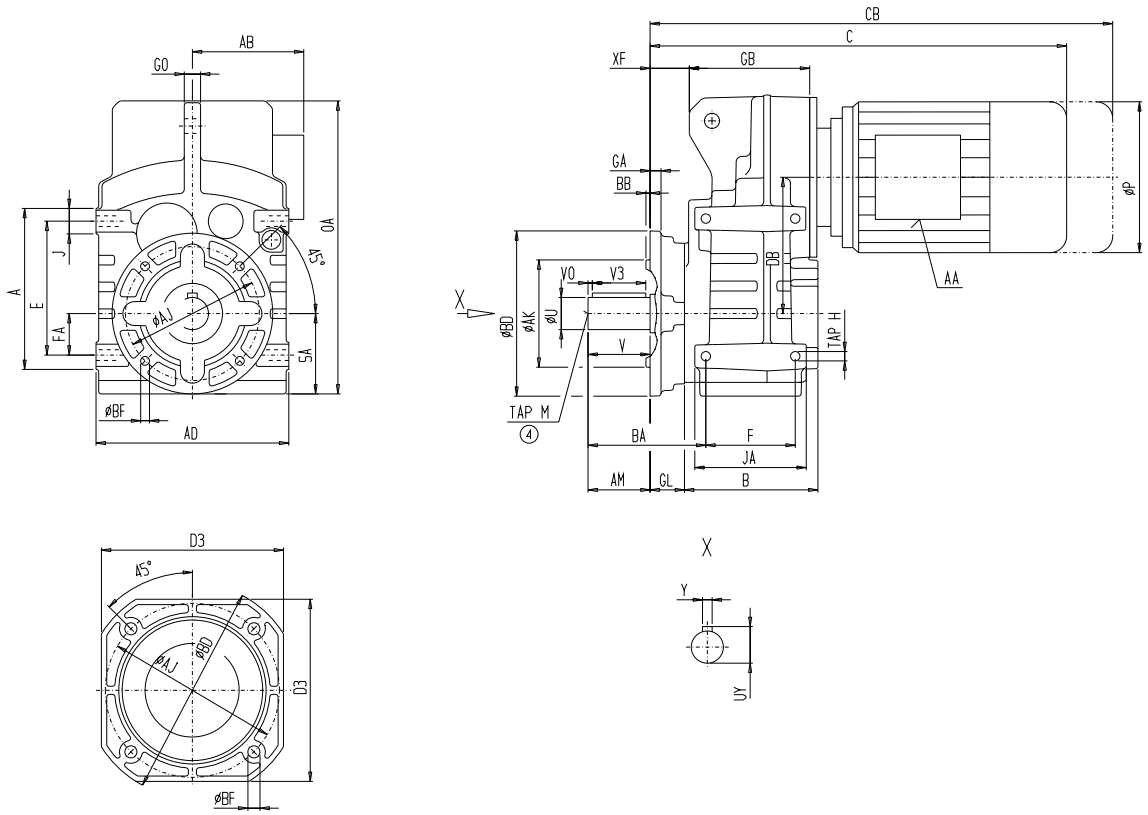
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF28

FF 510
[inch]





5

Flange

BD	AK	GA	AJ	D3	BB	BA	BF
4.72	3.15	0.31	3.94	-	0.12	3.56	0.26
6.3	4.3	0.35	5.12	5.35	0.14	3.56	0.35

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
1	1.97	1.5	0.252	3/8-16UNC	1.11	0.25	1.97

Gearcase

F	E	JA	A	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	XF	GO
2.56	3.94	3.19	4.69	3.44	2.36	1.22	3.9	0.75	3.82	0.98	5.59	8.61	M8x16	1.12	0.39

Motor

	F.F28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	12.62	14.35	5.43	4.67	2x1/2“	29
M71MP	13.21	15.38	5.43	4.67	2x1/2“	31
M90S	15.95	18.55	6.93	5.91	2x3/4“	42
M90L	15.95	18.55	6.93	5.91	2x3/4“	46
M100L	19.17	22	7.64	6.3	2x3/4“	66

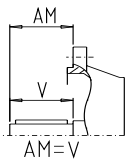
Tolerances see page 1 - 4

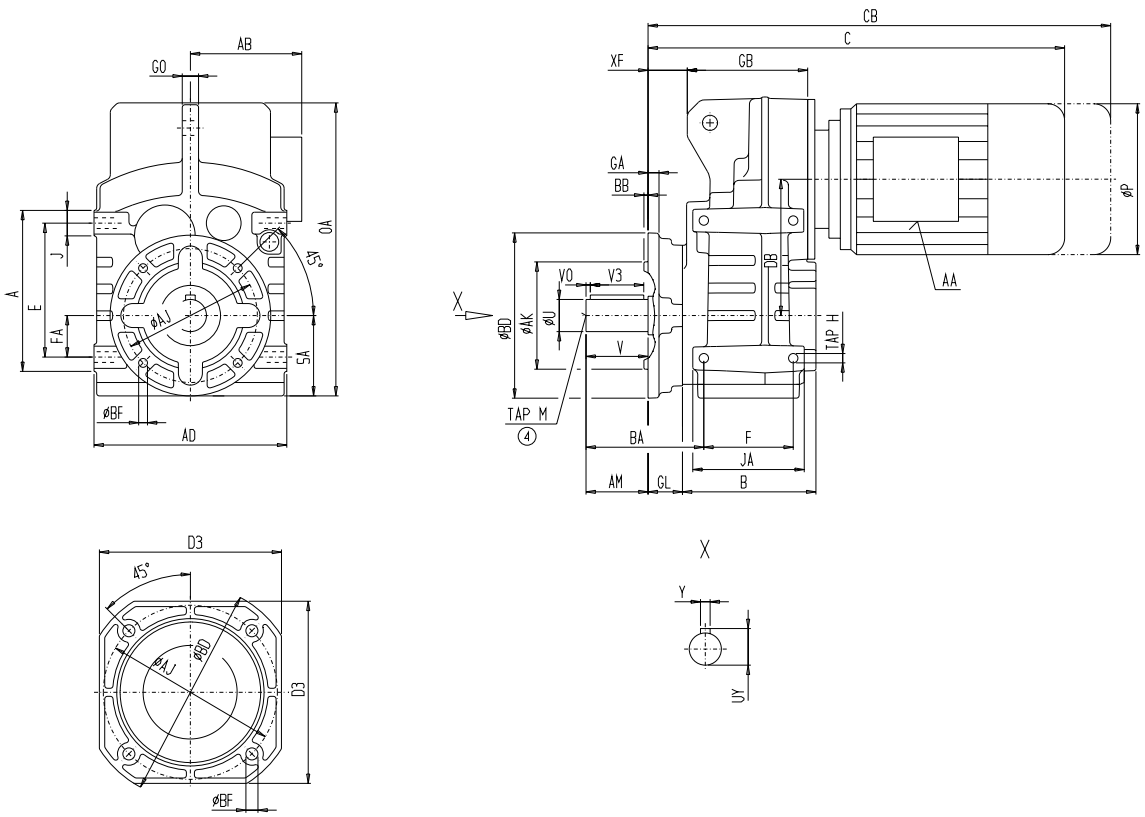
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF28

FF 510
[mm]





5

Flange

BD	AK	GA	AJ	D3	BB	BA	BF
120	*80*	*8*	*100*	*-*	*3*	*90,5*	*6,6*
160	*110*	*9*	*130*	*136*	*3,5*	*90,5*	*9*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
25,4	*50*	*38,1*	*6,401*	*3/8"-16UNC*	*28,19*	*6,35*	*50*

Gearcase

F	E	JA	A	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	XF	GO
65	*100*	*81*	*119*	*87,5*	*60*	*31*	*99*	*19*	*97*	*25*	*142*	*218,8*	*M8x16*	*28,5*	*10*

Motor

	F.F28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*321,5*	*365,5*	*138*	*118,5*	*2x1/2"*	*13*
M71MP	*336,5*	*391,5*	*138*	*118,5*	*2x1/2"*	*14*
M90S	*406*	*472*	*176*	*150*	*2x3/4"*	*19*
M90L	*406*	*472*	*176*	*150*	*2x3/4"*	*21*
M100L	*487*	*559*	*194*	*160*	*2x3/4"*	*30*

Tolerances see page 1 - 4

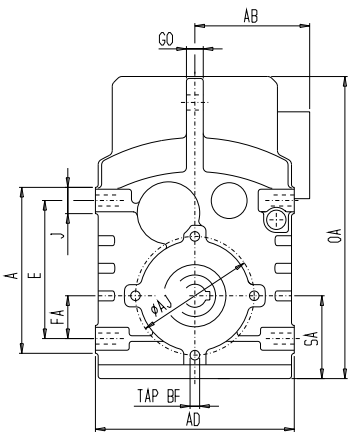
④ Tap specification see page 1 - 7

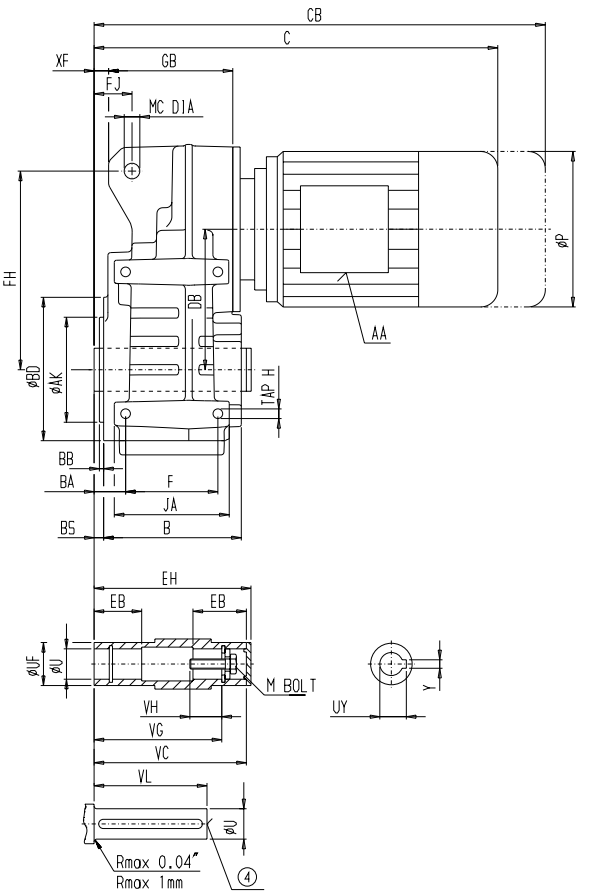
Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA28
FDAZ/FZAZ28

FA 510
FAZ 510

[inch]





5

Mounting

AK	BD	AJ	BB	TAP BF
4.02	2.91	3.39	0.12	M8x16

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
1	1.575	4.094	3.504	1.547	2.76	3/8-1 3/4UNC	1.124	0.25	1.575	4.21

Gearcase

F	E	JA	A	GB	SA	FA	DB	J	B	BS	BA	AD	OA	TAP H	XF	FJ	FH	MC DIA	GO
2.56	3.94	3.19	4.69	3.44	2.36	1.22	3.9	0.75	3.82	0.2	0.81	5.59	8.61	M8x16	0.33	0.98	5.51	0.43	0.39

Motor

	F.A.28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	11.83	13.56	5.43	4.67	2x1/2“	26
M71MP	12.42	14.59	5.43	4.67	2x1/2“	29
M90S	15.16	17.76	6.93	5.91	2x3/4“	40
M90L	15.16	17.76	6.93	5.91	2x3/4“	48
M100L	18.38	21.2	7.64	6.3	2x3/4“	64

Tolerances see page 1 - 4

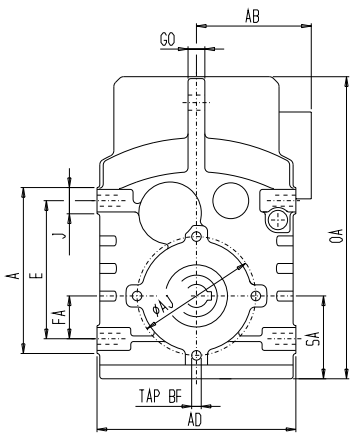
④ Tap specification see page 1 - 7

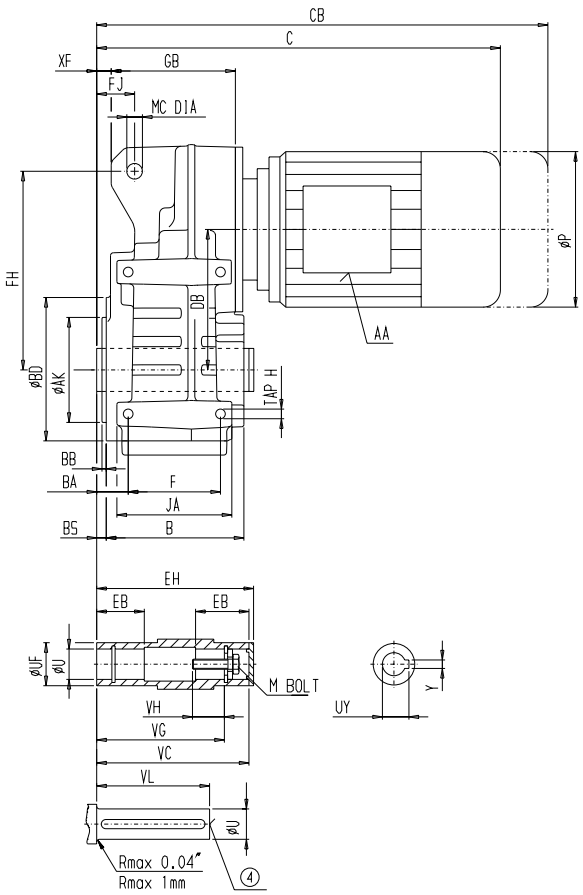
Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA28
FDAZ/FZAZ28

FA 510
FAZ 510

[mm]





5

Mounting

BD	AK	AJ	BB	TAP BF
102	*74*	*86*	*3*	*M8x16*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
25,4	*40*	*104*	*89*	*39*	*70*	*3/8"-1 3/4"UNC*	*28,55*	*6,35*	*40*	*107*

Gearcase

F	E	JA	A	GB	SA	FA	DB	J	B	BS	BA	AD	OA	TAP H	XF	FJ	FH	MC DIA	GO
65	*100*	*81*	*119*	*87,5*	*60*	*31*	*99*	*19*	*97*	*5*	*20,5*	*142*	*218,8*	*M8x16*	*8,5*	*25*	*140*	*11*	*10*

Motor

	F.A.28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*301,5*	*345,5*	*138*	*118,5*	*2x1/2"*	*12*
M71MP	*316,5*	*371,5*	*138*	*118,5*	*2x1/2"*	*13*
M90S	*386*	*452*	*176*	*150*	*2x3/4"*	*18*
M90L	*386*	*452*	*176*	*150*	*2x3/4"*	*22*
M100L	*467*	*539*	*194*	*160*	*2x3/4"*	*29*

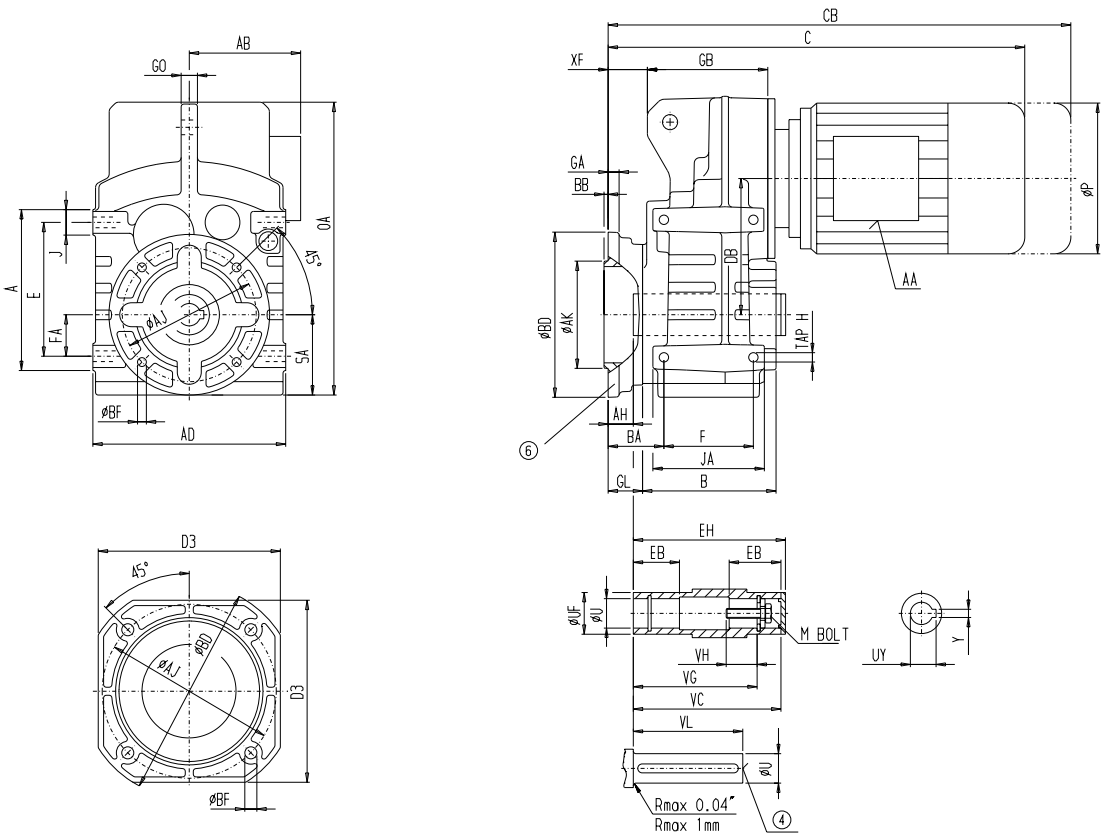
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF28

FAF 510
[inch]



5

Flange

BD	AK	GA	AJ	D3	BB	AH	BA	BF
4.72	3.15	0.31	3.94	0	0.12	0.79	0.26	1.59
6.3	4.3	0.35	5.12	5.35	0.14	0.79	0.35	1.59

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
1	1.575	4.094	3.504	1.547	2.76	3/8-1 3/4UNC	1.124	0.25	1.575	4.21

Gearcase

F	E	JA	A	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	XF	GO
2.56	3.94	3.19	4.69	3.44	2.36	1.22	3.9	0.75	3.82	0.98	5.59	8.61	M8x16	1.12	0.39

Motor

	F.AF28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	12.62	14.35	5.43	4.67	2x1/2“	29
M71MP	13.21	15.38	5.43	4.67	2x1/2“	31
M90S	15.95	18.55	6.93	5.91	2x3/4“	42
M90L	15.95	18.55	6.93	5.91	2x3/4“	46
M100L	19.17	22	7.6	6.3	2x3/4“	66

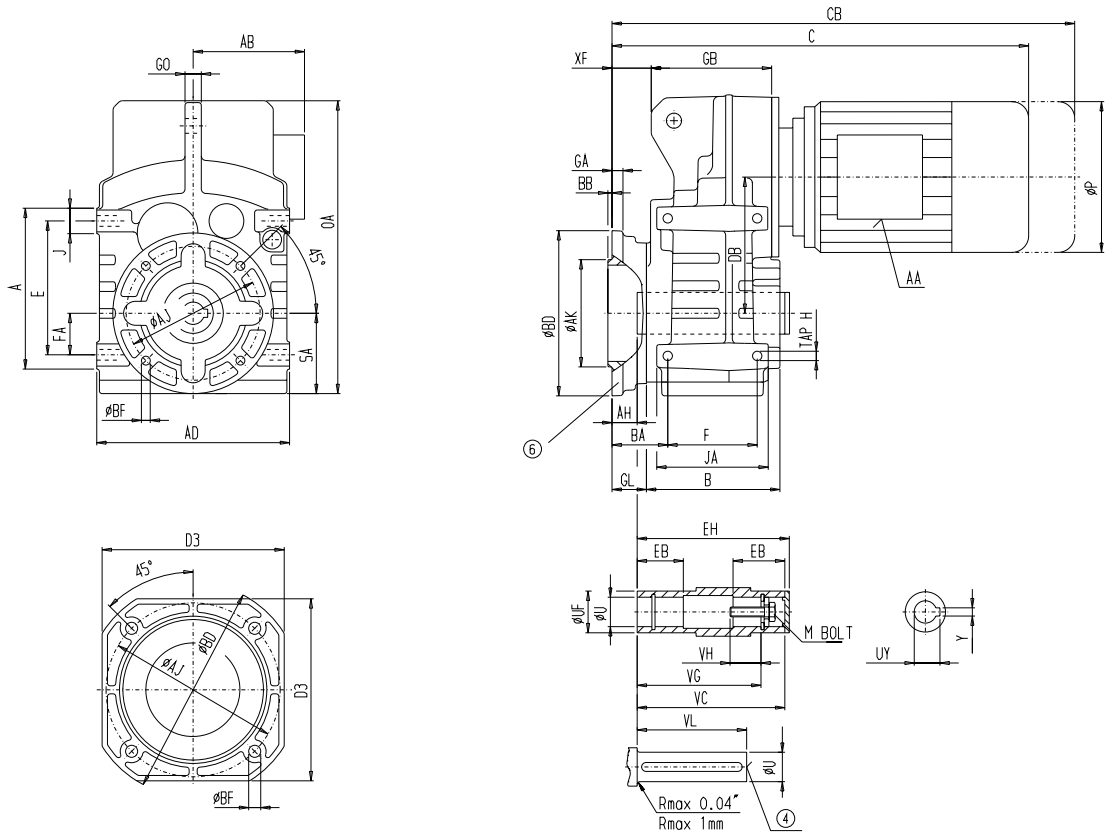
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF28

FAF 510

[mm]



5

Flange

BD	AK	GA	AJ	D3	BB	AH	BA	BF
120	*80*	*8*	*100*	*-*	*3*	*20*	*40,5*	*6,6*
160	*110*	*9*	*130*	*136*	*3,5*	*20*	*40,5*	*9*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
25,4	*40*	*104*	*89*	*40*	*70*	*3/8"-1 3/4"UNC*	*28,55*	*6,35*	*40*	*107*

Gearcase

F	E	JA	A	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	XF	GO
65	*100*	*81*	*119*	*87,5*	*60*	*31*	*99*	*19*	*97*	*25*	*142*	*218,8*	*M8x16*	*28,5*	*10*

Motor

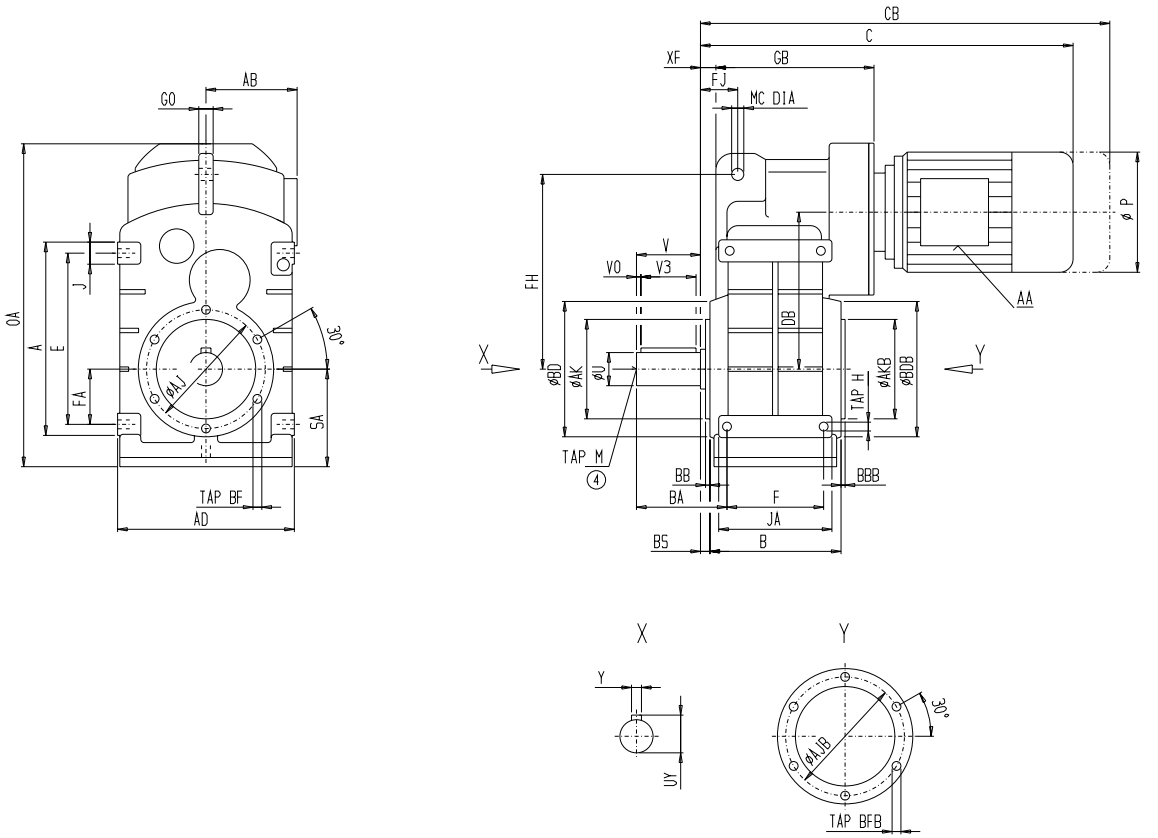
	F.AF28					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*321,5*	*365,5*	*138*	*118,5*	*2x1/2"*	*13*
M71MP	*336,5*	*391,5*	*138*	*118,5*	*2x1/2"*	*14*
M90S	*406*	*472*	*176*	*150*	*2x3/4"*	*19*
M90L	*406*	*472*	*176*	*150*	*2x3/4"*	*21*
M100L	*487*	*559*	*194*	*160*	*2x3/4"*	*30*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ38B

FZ 510
[inch]



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Mounting

BD	AK	AJ	BB	TAP BF
4.72	3.15	3.94	0.12	M8x11

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
1	1.97	1.5	0.252	3/8-16UNC	1.11	0.25	2.81

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB
3.03	4.72	4.53	3.15	3.74	3.94	5.31	0.12	5.24	2.95	1.22	4.53

J	B	BS	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
0.79	4.25	0.24	5.91	9.59	M8x11	M8x11	0.41	1.24	5.51	0.43	0.47

Motor

	F.Z38B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	14.65	16.38	5.43	4.67	2x1/2“	48
M80	15.49	17.66	6.22	4.98	2x1/2“	54
M90S	17.11	19.7	6.93	5.91	2x3/4“	61
M90L	17.11	19.7	6.93	5.91	2x3/4“	65
M100L	18.88	21.71	7.64	6.3	2x3/4“	80

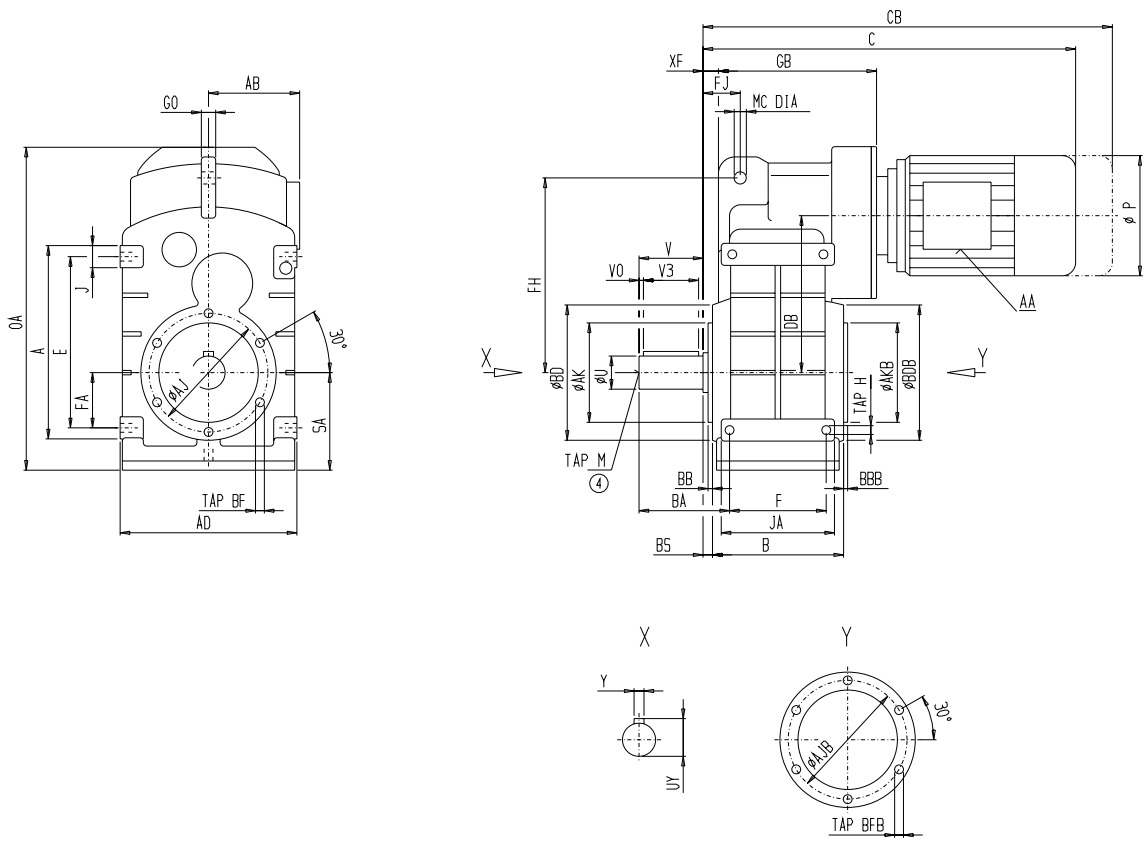
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ38B

FZ 510
[mm]



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Mounting

BD	AK	AJ	BB	TAP BF
120	*80*	*100*	*3*	*M8x11*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
25,4	*50*	*38,1*	*6,401*	*3/8“-16UNC*	*28,19*	*6,35*	*71,5*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB
77	*120*	*115*	*80*	*95*	*100*	*135*	*3*	*133*	*75*	*31*	*115*

J	B	BS	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
20	*108*	*6*	*150*	*243,5*	*M8x11*	*M8x11*	*10,5*	*31,5*	*140*	*11*	*12*

Motor

	F.Z38B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*373,5*	*417,5*	*138*	*118,5*	*2x1/2“*	*22*
M80	*395*	*450*	*158*	*126,5*	*2x1/2“*	*25*
M90S	*436*	*502*	*176*	*150*	*2x3/4“*	*28*
M90L	*436*	*502*	*176*	*150*	*2x3/4“*	*30*
M100L	*481*	*553*	*194*	*160*	*2x3/4“*	*36*

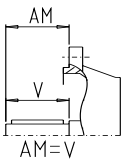
Tolerances see page 1 - 4

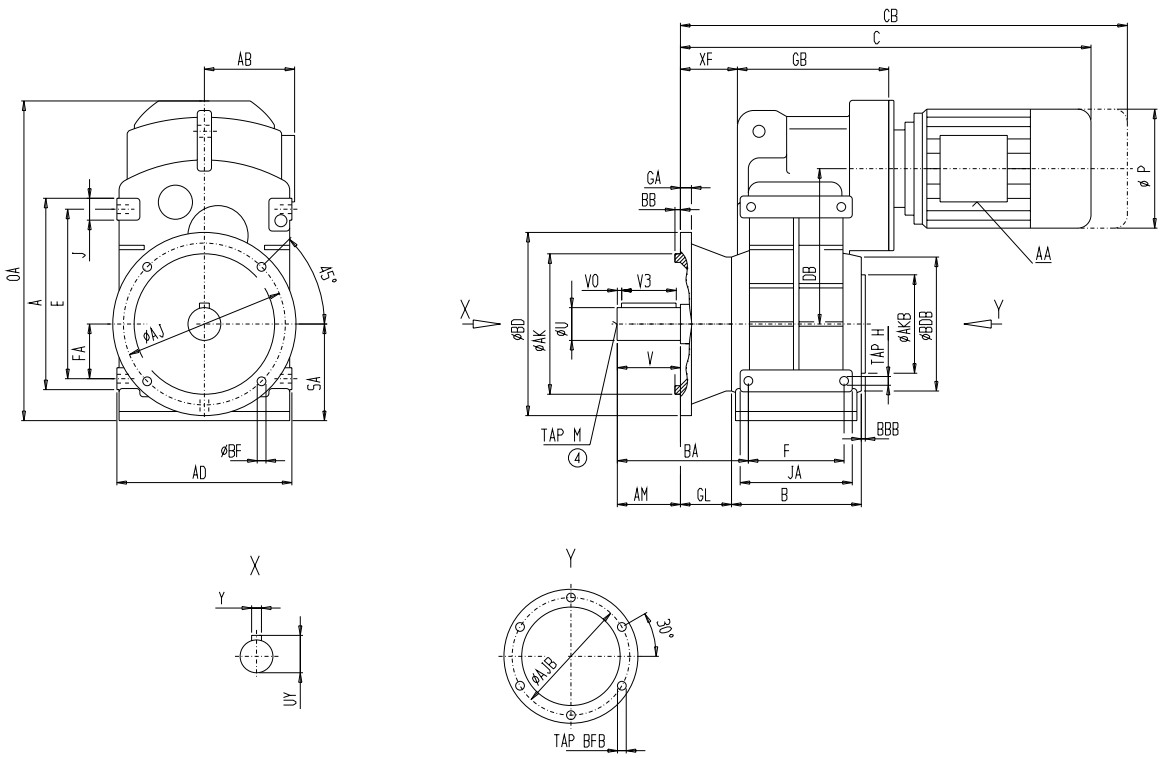
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF38B

FF 510
[inch]





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Flange

BD	AK	GA	AJ	BB	BA	BF
6.3	4.33	0.39	5.12	0.14	3.76	0.35

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
1	1.97	1.5	0.252	3/8-16UNC	1.11	0.25	1.97

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA
3.03	4.72	4.53	3.15	3.74	3.94	5.31	0.12	5.24	2.95

FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
1.22	4.53	0.79	4.25	1.18	5.91	9.59	M8x11	M8x11	1.36

Motor

	F.F38B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.59	17.32	5.43	4.67	2x1/2“	52
M80	16.43	18.6	6.22	4.98	2x1/2“	59
M90S	18.05	20.64	6.93	5.91	2x3/4“	65
M90L	18.05	20.64	6.93	5.91	2x3/4“	70
M100L	19.82	22.65	7.64	6.3	2x3/4“	84

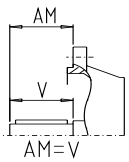
Tolerances see page 1 - 4

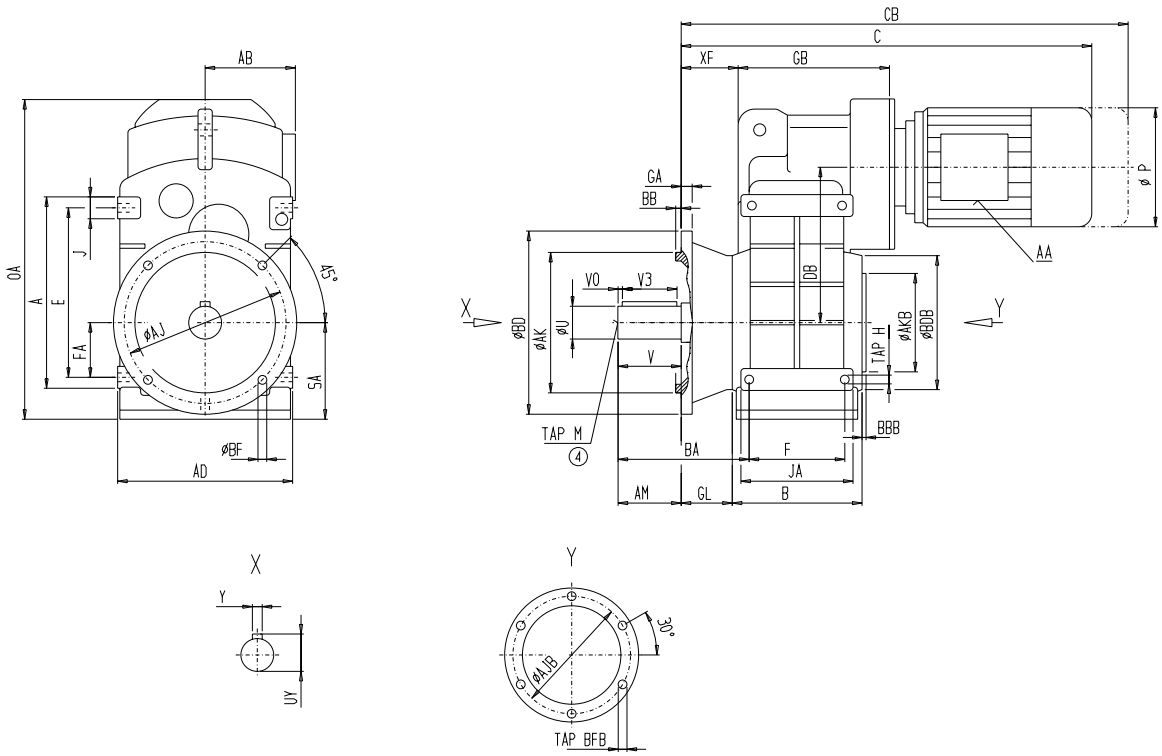
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF38B

FF 510
[mm]





Flange

BD	AK	GA	AJ	BB	BA	BF
160	*110*	*10*	*130*	*3,5*	*95,5*	*9*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
25,4	*50*	*38,1*	*6,401*	*3/8"-16UNC*	*28,19*	*6,35*	*50*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA
77	*120*	*115*	*80*	*95*	*100*	*135*	*3*	*133*	*75*

FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
31	*115*	*20*	*108*	*30*	*150*	*243,5*	*M8x11*	*M8x11*	*34,5*

Motor

	F.F38B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*397,5*	*441,5*	*138*	*118,5*	*2x1/2"*	*24*
M80	*419*	*474*	*158*	*126,5*	*2x1/2"*	*27*
M90S	*460*	*526*	*176*	*150*	*2x3/4"*	*30*
M90L	*460*	*526*	*176*	*150*	*2x3/4"*	*32*
M100L	*505*	*577*	*194*	*160*	*2x3/4"*	*38*

Tolerances see page 1 - 4

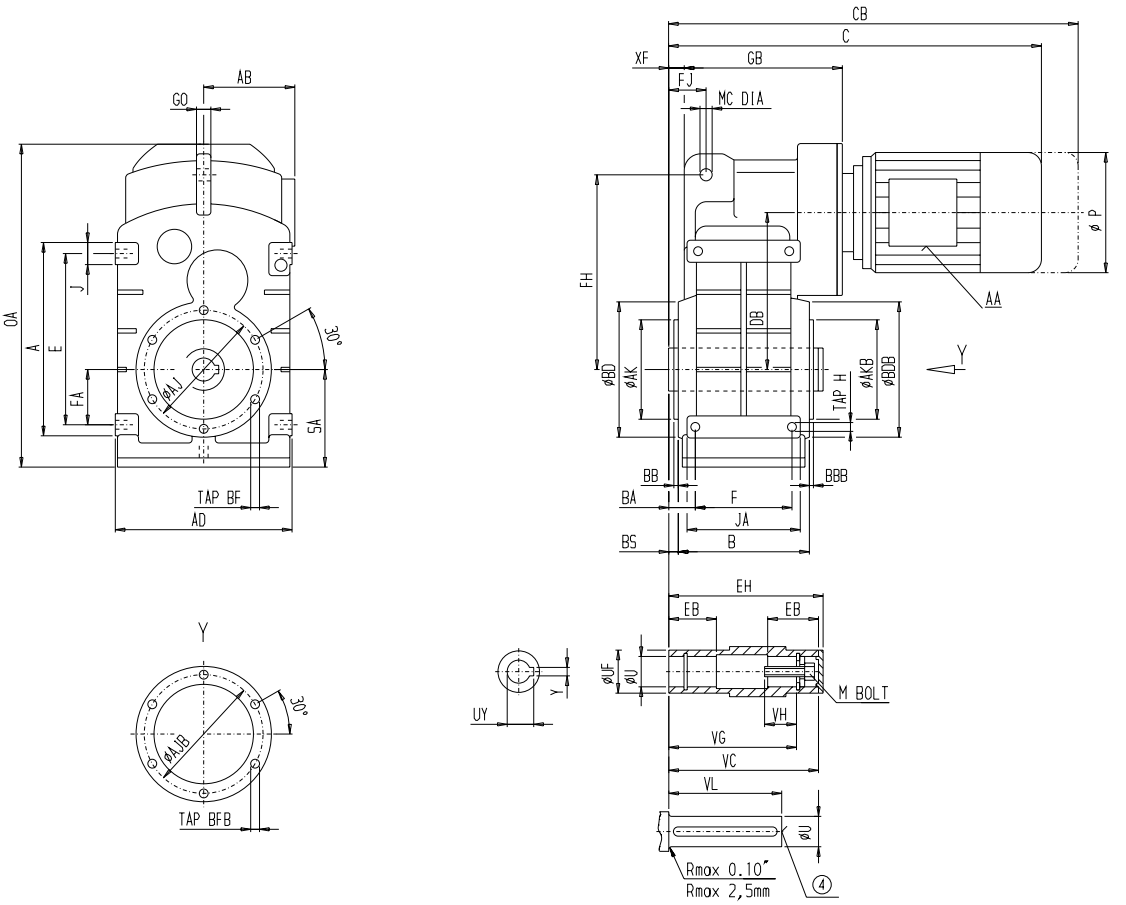
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA38B
FDAZ/FZAZ38B

FA 510
FAZ 510

[inch]



5

Mounting

AK	BD	AJ	BB	TAP BF
4.72	3.15	3.94	0.12	M8x11

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
1.25	1.772	4.72	4.016	1.38	3.54	3/8-16UNC	1.38	0.25	1.732	4.84

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB
3.03	4.72	4.53	3.15	3.74	3.94	5.31	0.12	5.24	2.95	1.22	4.53

J	B	BS	BA	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
0.79	4.25	0.24	0.85	5.91	9.59	M8x11	M8x11	0.41	1.24	5.51	0.43	0.47

Motor

	F.A.38B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	14.65	16.38	5.43	4.67	2x1/2“	45
M80	15.49	17.66	6.22	4.98	2x1/2“	49
M90S	17.11	19.7	6.93	5.91	2x3/4“	58
M90L	17.11	19.7	6.93	5.91	2x3/4“	63
M100L	18.88	21.71	7.64	6.3	2x3/4“	77

Tolerances see page 1 - 4

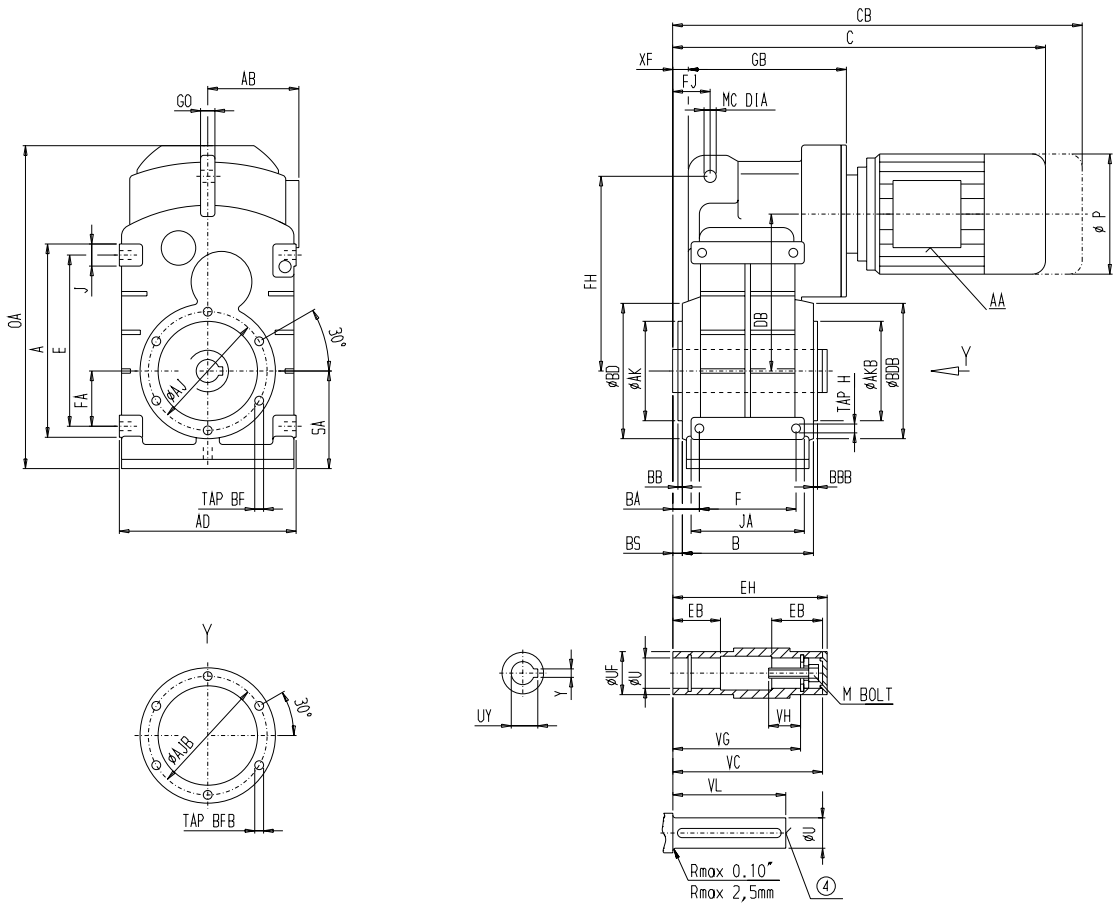
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA38B
FDAZ/FZAZ38B

FA 510
FAZ 510

[mm]



5

Mounting

BD	AK	AJ	BB	TAP BF
120	*80*	*100*	*3*	*M8x11*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
31,75	*45*	*120*	*102*	*35*	*90*	*3/8"-16UNC*	*35,05*	*6,35*	*44*	*123*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB
77	*120*	*115*	*80*	*95*	*100*	*135*	*3*	*133*	*75*	*31*	*115*

J	B	BS	BA	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
20	*108*	*6*	*21,5*	*150*	*243,5*	*M8x11*	*M8x11*	*10,5*	*31,5*	*140*	*11*	*12*

Motor

	F.A.38B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*373,5*	*417,5*	*138*	*118,5*	*2x1/2"*	*20*
M80	*395*	*450*	*158*	*126,5*	*2x1/2"*	*22*
M90S	*436*	*502*	*176*	*150*	*2x3/4"*	*26*
M90L	*436*	*502*	*176*	*150*	*2x3/4"*	*28*
M100L	*481*	*553*	*194*	*160*	*2x3/4"*	*35*

Tolerances see page 1 - 4

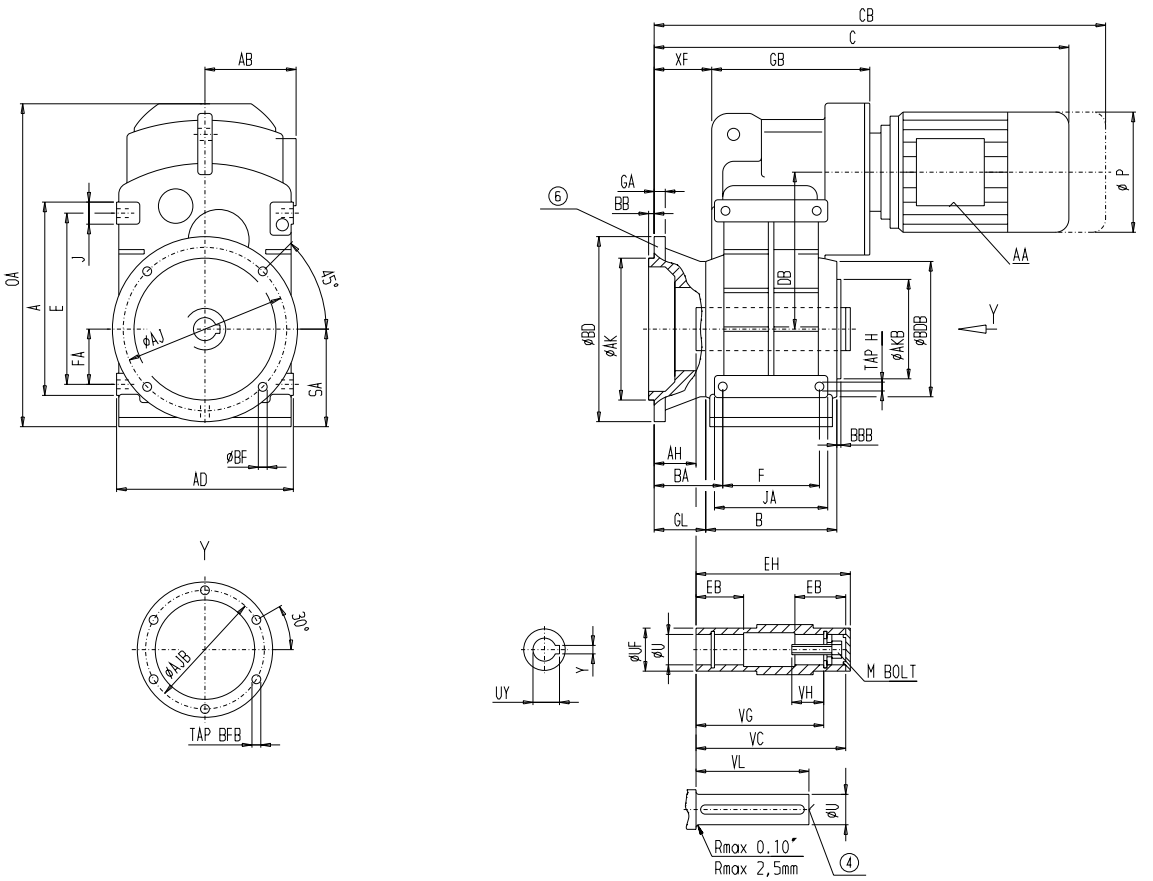
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF38B

FAF 510

[inch]



5

Flange

BD	AK	GA	AJ	BB	AH	BF	BA
6.3	4.33	0.39	5.12	0.14	0.94	0.35	1.79

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
1.25	1.772	4.72	4.016	1.38	3.54	3/8-16UNC	1.38	0.25	1.732	4.84

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
3.03	4.72	4.53	3.15	3.74	3.94	5.31	0.12	5.24	2.95	1.22	4.53	0.79	4.25	1.18	5.91	9.59	M8x11	M8x11	1.36

Motor

	F.AF38B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.59	17.32	5.43	4.67	2x1/2“	49
M80	16.43	18.6	6.22	4.98	2x1/2“	54
M90S	18.05	20.64	6.93	5.91	2x3/4“	63
M90L	18.05	20.64	6.93	5.91	2x3/4“	67
M100L	19.82	22.65	7.64	6.3	2x3/4“	82

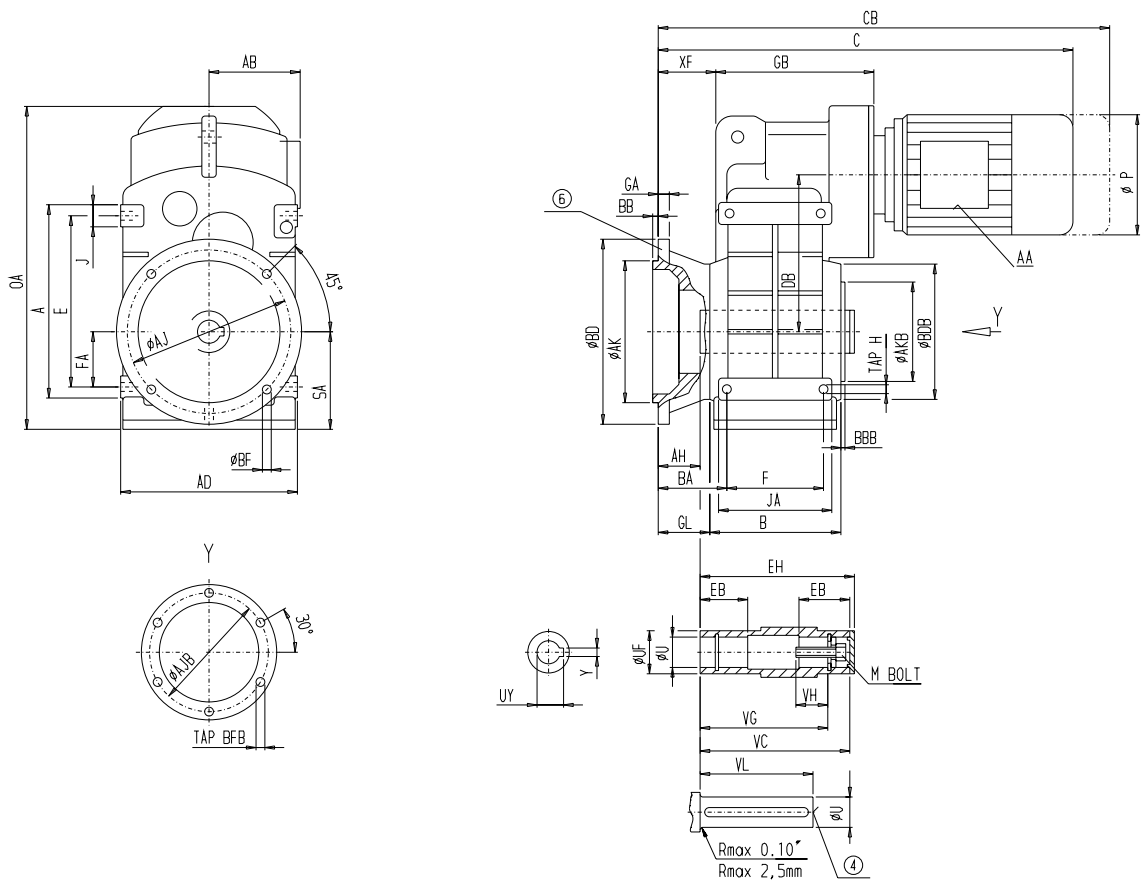
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF38B

FAF 510

[mm]



Flange

BD	AK	GA	AJ	BB	AH	BA	BF
160	*110*	*10*	*130*	*3,5*	*24*	*45,5*	*9*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
31,75	*45*	*120*	*102*	*35*	*90*	*3/8"-16UNC*	*35,05*	*6,35*	*44*	*123*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
77	*120*	*115*	*80*	*95*	*100*	*135*	*3*	*133*	*75*	*31*	*115*	*20*	*108*	*30*	*150*	*243,5*	*M8x11*	*M8x11*	*34,5*

Motor

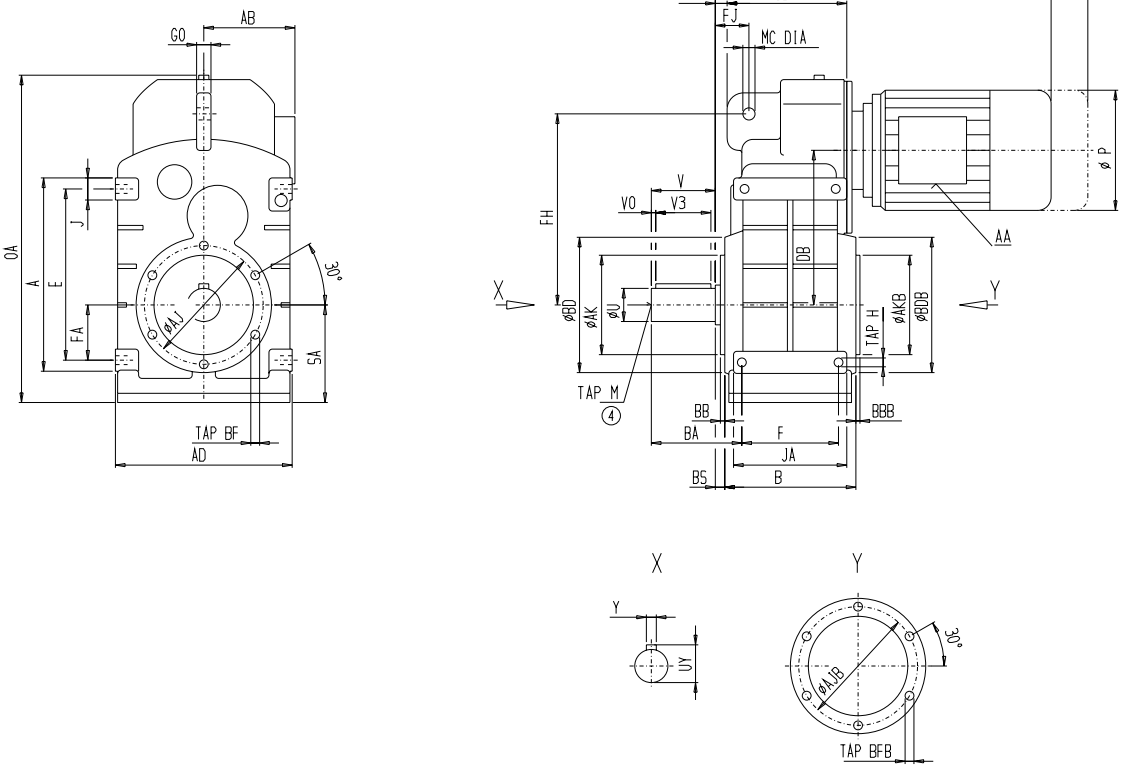
	F.AF38B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*397,5*	*441,5*	*138*	*118,5*	*2x1/2"*	*22*
M80	*419*	*474*	*158*	*126,5*	*2x1/2"*	*24*
M90S	*460*	*526*	*176*	*150*	*2x3/4"*	*28*
M90L	*460*	*526*	*176*	*150*	*2x3/4"*	*30*
M100L	*505*	*577*	*194*	*160*	*2x3/4"*	*37*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ48B

FZ 510
[inch]



5

Mounting

BD	AK	AJ	BB	TAP BF
5.24	3.74	4.53	0.12	M10x17

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
1.25	2.36	1.875	0.133	3/8-16UNC	1.36	0.25	3.48

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB
3.66	5.24	5.71	3.74	4.49	4.53	6.65	0.12	4.82	3.58	1.69	5.91

J	B	BS	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
0.94	5.35	0.28	7.09	12.22	M10x13	M10x17	0.43	1.26	7.28	0.55	0.47

Motor

	F.Z48B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.24	16.97	5.43	4.67	2x1/2“	65
M80	16.08	18.25	6.22	4.98	2x1/2“	72
M90S	17.7	20.29	6.93	5.91	2x3/4“	78
M90L	17.7	20.29	6.93	5.91	2x3/4“	83
M100L	19.47	22.3	7.64	6.3	2x3/4“	98
M112M	21.52	24.71	8.58	6.59	2x3/4“	115

Tolerances see page 1 - 4

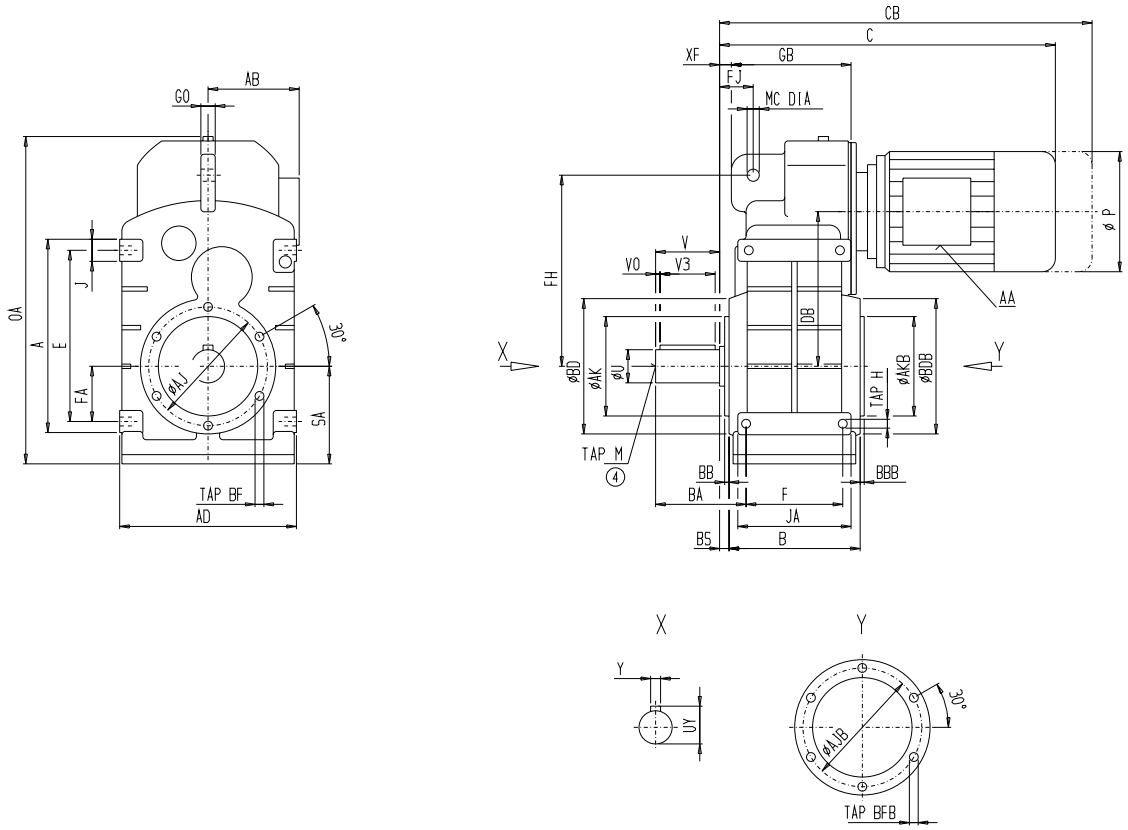
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ48B

FZ 510

[mm]



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Mounting

BD	AK	AJ	BB	BF
133	*95*	*115*	*3*	*M10x17*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
31,75	*60*	*47,625*	*3,378*	*3/8"-16UNC*	*34,54*	*6,35*	*88,5*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB
93	*133*	*145*	*95*	*114*	*115*	*169*	*3*	*122,5*	*91*	*43*	*150*

J	B	BS	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
24	*136*	*7*	*180*	*310,5*	*M10x13*	*M10x17*	*11*	*32*	*185*	*14*	*12*

Motor

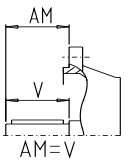
	F.Z48B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*388*	*432*	*138*	*118,5*	*2x1/2"*	*29*
M80	*409,5*	*464,5*	*158*	*126,5*	*2x1/2"*	*32*
M90S	*450,5*	*516,5*	*176*	*150*	*2x3/4"*	*35*
M90L	*450,5*	*516,5*	*176*	*150*	*2x3/4"*	*37*
M100L	*495,5*	*567,5*	*194*	*160*	*2x3/4"*	*44*
M112M	*547,5*	*628,5*	*218*	*167,5*	*2x3/4"*	*52*

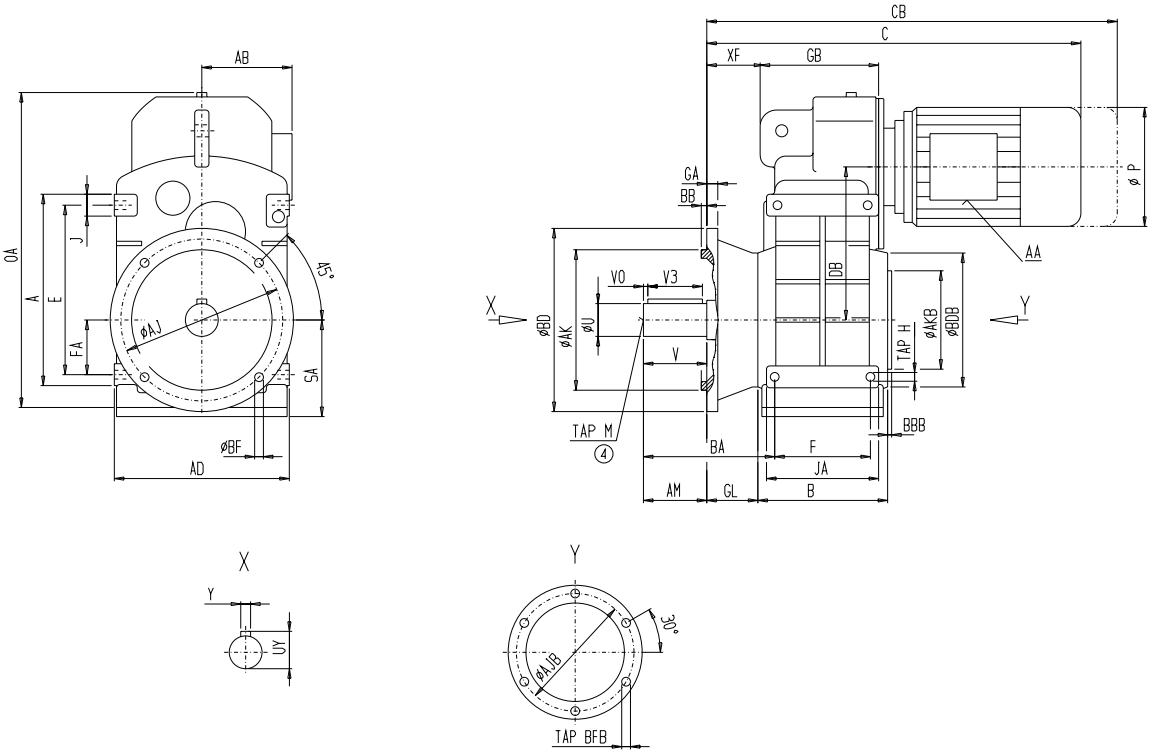
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF48B

FF 510
[inch]





5

Flange

BD	AK	GA	AJ	BB	BA	BF
7.87	5.12	0.47	6.5	0.14	4.47	0.43

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
1.25	2.36	1.875	0.133	3/8-16UNC	1.36	0.25	2.36

GearcaseMotor

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
3.66	5.24	5.71	3.74	4.49	4.53	6.65	0.12	4.82	3.58	1.69	5.91	0.94	5.35	1.26	7.09	12.22	M10x13	M10x17	1.42

	F.F48B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	16.22	17.95	5.43	4.67	2x1/2“	72
M80	17.06	19.23	6.22	4.98	2x1/2“	78
M90S	18.68	21.27	6.93	5.91	2x3/4“	85
M90L	18.68	21.27	6.93	5.91	2x3/4“	89
M100L	20.45	23.28	7.64	6.3	2x3/4“	105
M112M	22.5	25.69	8.58	6.59	2x3/4“	122

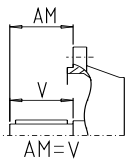
Tolerances see page 1 - 4

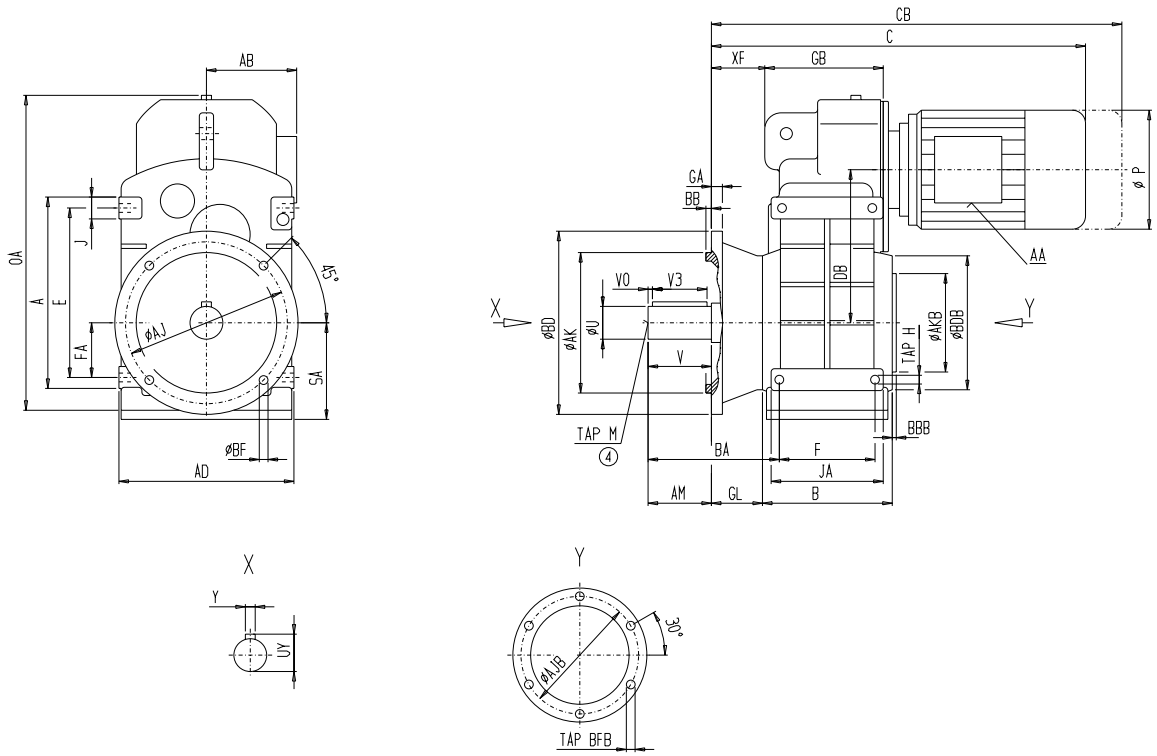
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF48B

FF 510
[mm]





Flange

BD	AK	GA	AJ	BB	BA	BF
200	*130*	*12*	*165*	*3,5*	*113,5*	*11*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
31,75	*60*	*47,625*	*3,378*	*3/8"-16UNC*	*34,54*	*6,35*	*60*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
93	*133*	*145*	*95*	*114*	*115*	*169*	*3*	*122,5*	*91*	*43*	*150*	*24*	*136*	*32*	*180*	*310,5*	*M10x13*	*M10x17*	*36*

Motor

	F.F48B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*413*	*457*	*138*	*118,5*	*2x1/2"*	*32*
M80	*434,5*	*489,5*	*158*	*126,5*	*2x1/2"*	*35*
M90S	*475,5*	*541,5*	*176*	*150*	*2x3/4"*	*38*
M90L	*475,5*	*541,5*	*176*	*150*	*2x3/4"*	*40*
M100L	*520,5*	*592,5*	*194*	*160*	*2x3/4"*	*47*
M112M	*572,5*	*653,5*	*218*	*167,5*	*2x3/4"*	*55*

Tolerances see page 1 - 4

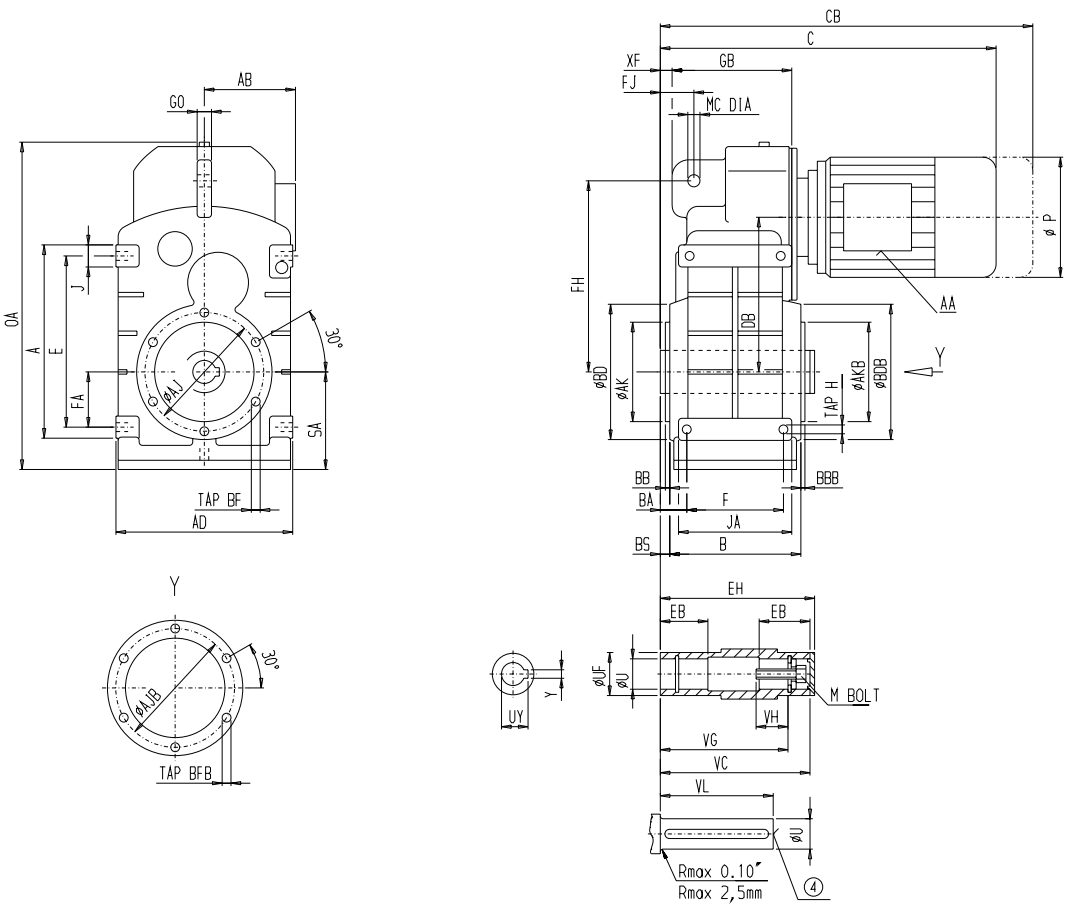
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA48B
FDAZ/FZAZ48B

FA 510
FAZ 510

[inch]



5

Mounting

AK	BD	AJ	BB	TAP BF
5.24	3.74	4.53	0.12	M10x17

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
1.375	2.165	5.91	5.039	1.37	4.53	3/8-16UNC	1.53	0.31	2.283	6.02

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J
3.66	5.24	5.71	3.74	4.49	4.53	6.65	0.12	4.82	3.58	1.69	5.91	0.94

B	BS	BA	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
5.35	0.28	1.12	7.09	12.22	M10x13	M10x17	0.43	1.26	7.28	0.55	0.47

Motor

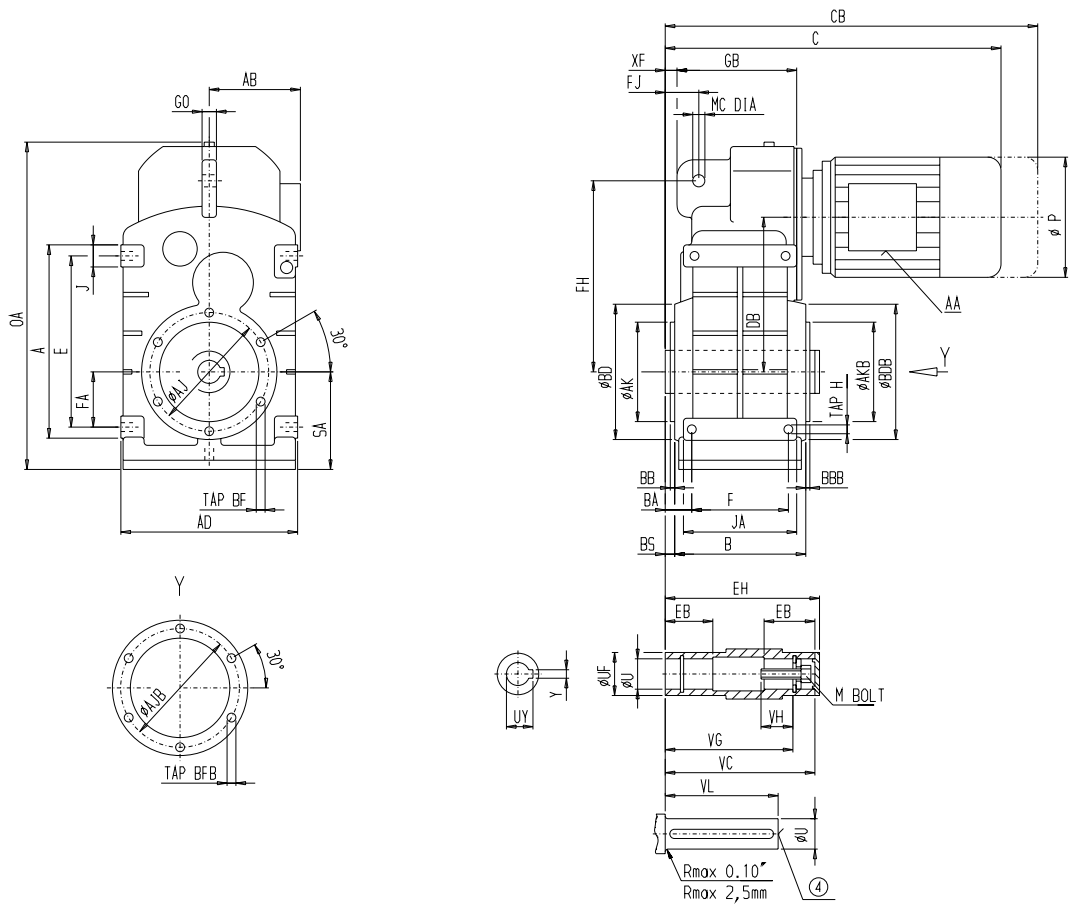
	F.A.48B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.24	16.97	5.43	4.67	2x1/2“	62
M80	16.08	18.25	6.22	4.98	2x1/2“	69
M90S	17.7	20.29	6.93	5.91	2x3/4“	75
M90L	17.7	20.29	6.93	5.91	2x3/4“	80
M100L	19.47	22.3	7.64	6.3	2x3/4“	95
M112M	21.52	24.71	8.58	6.59	2x3/4“	112

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA48B
FDAZ/FZAZ48B

FA 510
FAZ 510
[mm]



5

Mounting

BD	AK	AJ	BB	TAP BF
133	*95*	*115*	*3*	*M10x17*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
34,925	*55*	*150*	*128*	*35*	*115*	*3/8"-16UNC*	*38,86*	*7,874*	*58*	*153*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J
93	*133*	*145*	*95*	*114*	*115*	*169*	*3*	*122,5*	*91*	*43*	*150*	*24*

B	BS	BA	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
136	*7*	*28,5*	*180*	*310,5*	*M10x13*	*M10x17*	*11*	*32*	*185*	*14*	*12*

Motor

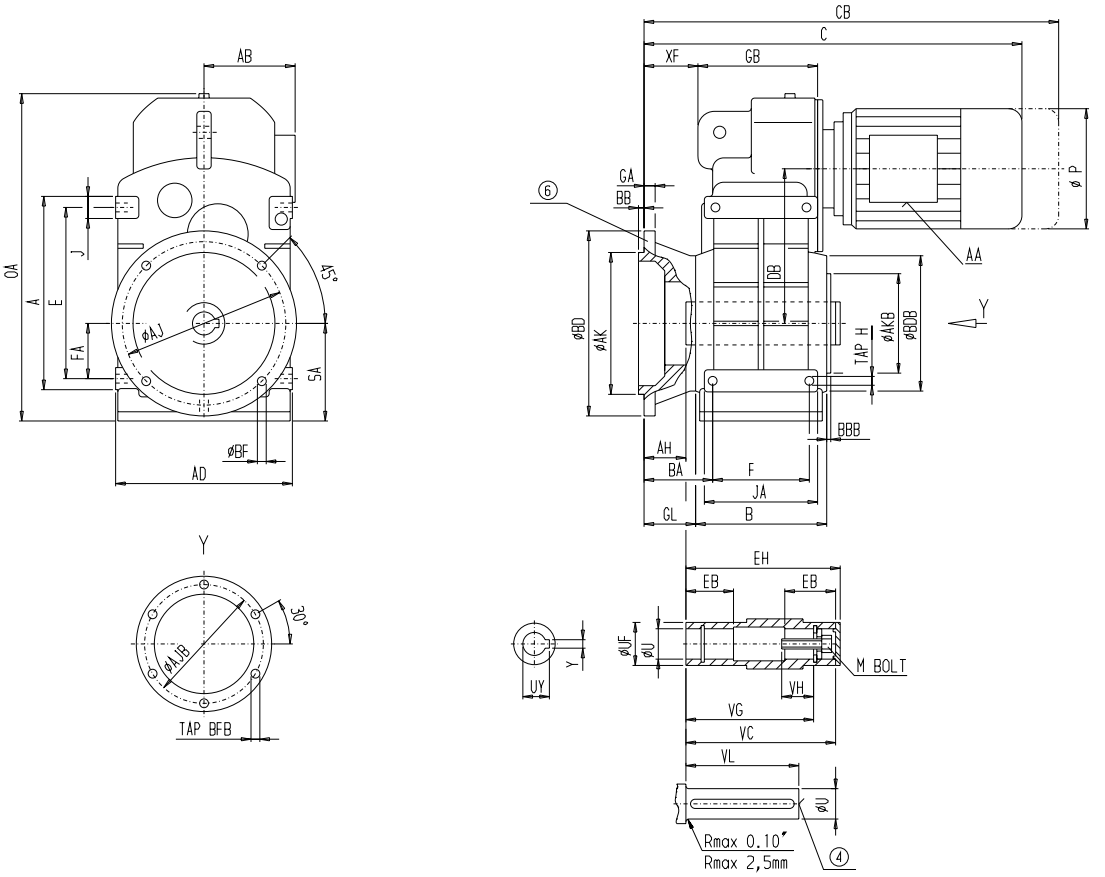
	F.A.48B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*388*	*432*	*138*	*118,5*	*2x1/2"*	*28*
M80	*409,5*	*464,5*	*158*	*126,5*	*2x1/2"*	*31*
M90S	*450,5*	*516,5*	*176*	*150*	*2x3/4"*	*34*
M90L	*450,5*	*516,5*	*176*	*150*	*2x3/4"*	*36*
M100L	*495,5*	*567,5*	*194*	*160*	*2x3/4"*	*43*
M112M	*547,5*	*628,5*	*218*	*167,5*	*2x3/4"*	*51*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF48B

FAF 510
[inch]



5

Flange

BD	AK	GA	AJ	BB	AH	BF	BA
7.87	5.12	0.47	6.5	0.14	0.98	0.43	2.11

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
1.375	2.165	5.91	5.039	1.37	4.53	3/8-16UNC	1.53	0.31	2.283	6.02

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
3.66	5.24	5.71	3.74	4.49	4.53	6.65	0.12	4.82	3.58	1.69	5.91	0.94	5.35	1.26	7.09	12.22	M10x13	M10x17	1.42

Motor

	F.AF48B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	16.22	17.95	5.43	4.67	2x1/2“	69
M80	17.06	19.23	6.22	4.98	2x1/2“	75
M90S	18.68	21.27	6.93	5.91	2x3/4“	82
M90L	18.68	21.27	6.93	5.91	2x3/4“	86
M100L	20.45	23.28	7.64	6.3	2x3/4“	102
M112M	22.5	25.69	8.58	6.59	2x3/4“	119

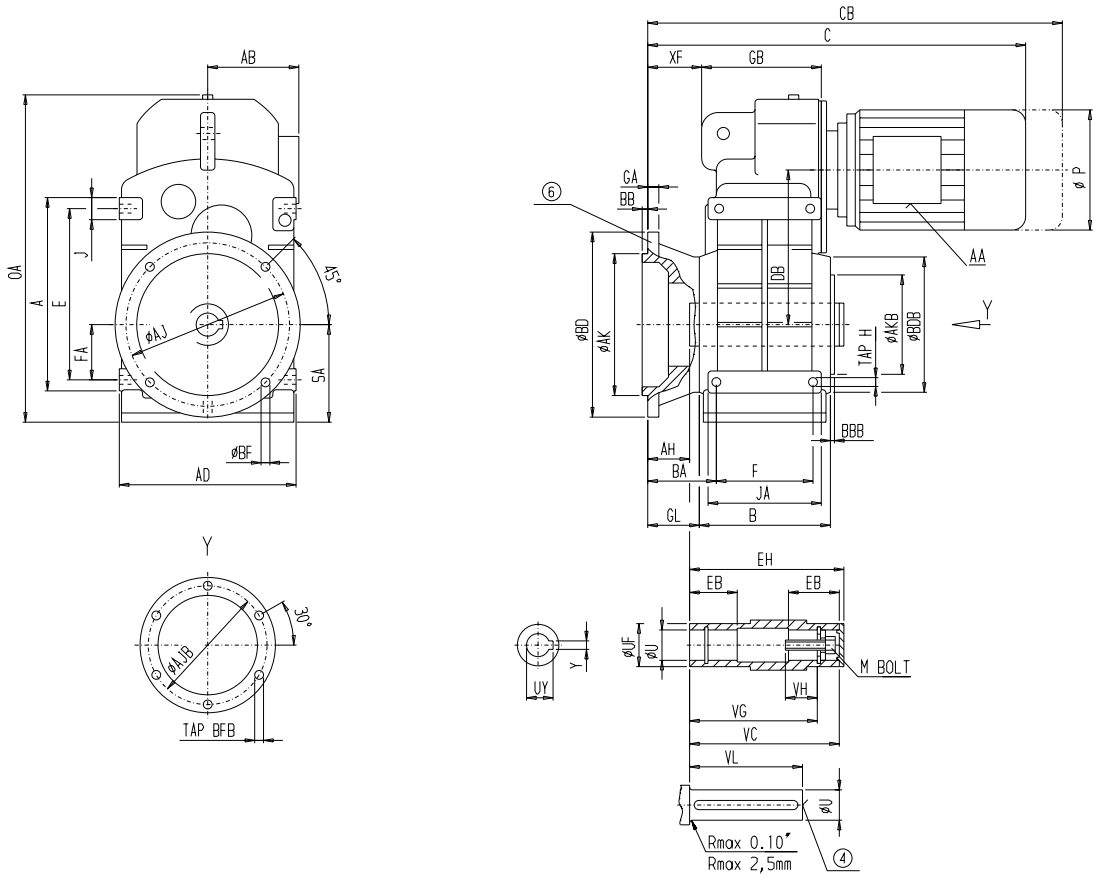
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF48B

FAF 510

[mm]



5

Flange

BD	AK	GA	AJ	BB	AH	BA	BF
200	*130*	*12*	*165*	*3,5*	*25*	*53,5*	*11*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
34,925	*55*	*150*	*128*	*35*	*115*	*3/8"-16UNC*	*38,86*	*7,874*	*58*	*153*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
93	*133*	*145*	*95*	*114*	*115*	*169*	*3*	*122,5*	*91*	*43*	*150*	*24*	*136*	*32*	*180*	*310,5*	*M10x13*	*M10x17*	*36*

Motor

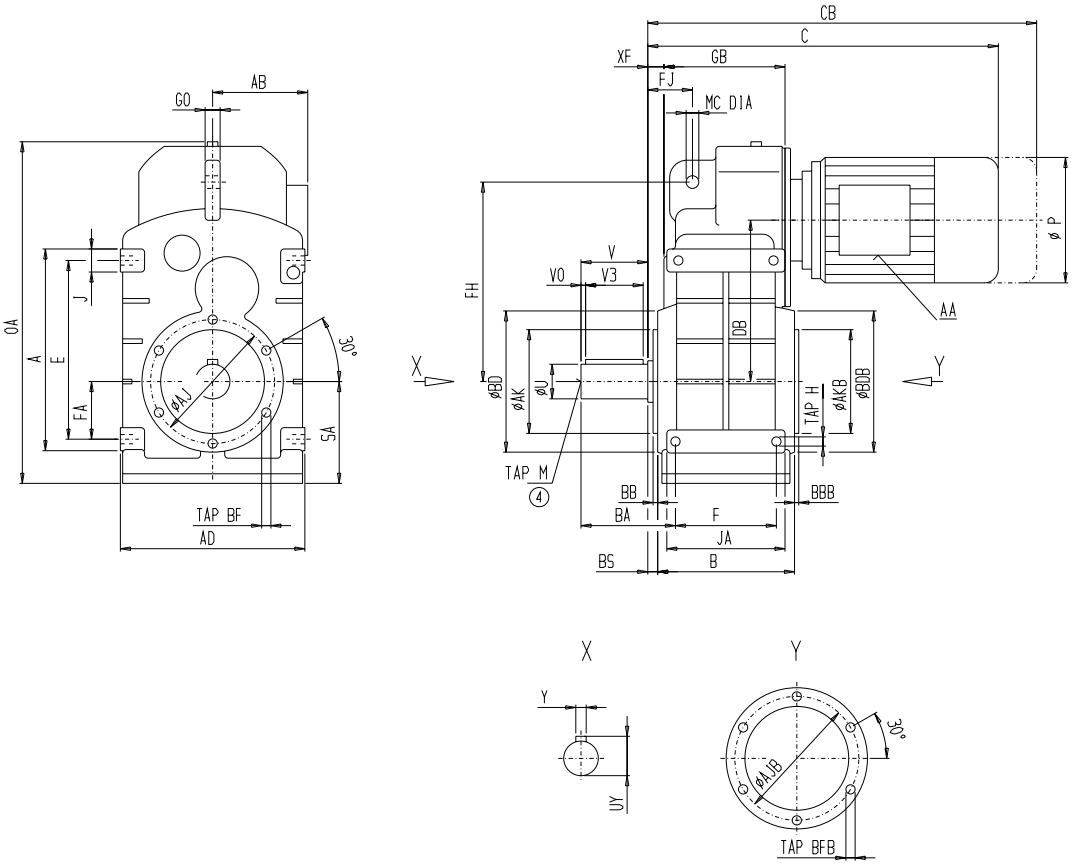
	F.AF48B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*413*	*457*	*138*	*118,5*	*2x1/2"*	*31*
M80	*434,5*	*489,5*	*158*	*126,5*	*2x1/2"*	*33*
M90S	*475,5*	*541,5*	*176*	*150*	*2x3/4"*	*37*
M90L	*475,5*	*541,5*	*176*	*150*	*2x3/4"*	*39*
M100L	*520,5*	*592,5*	*194*	*160*	*2x3/4"*	*46*
M112M	*572,5*	*653,5*	*218*	*167,5*	*2x3/4"*	*54*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ68B

FZ 510
[inch]



5

Mounting

BD	AK	AJ	BB	TAP BF
6.06	4.33	5.12	0.14	M12x21

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
1.625	3.15	2.75	0.065	5/8-11UNC	1.79	0.375	4.49

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB
4.41	6.06	7.48	4.33	5.35	5.12	8.5	0.14	5.45	4.33	2.36	7.09

J	B	BS	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
1.02	6.5	0.3	8.82	14.84	M12x17	M12x21	0.63	1.61	8.58	0.55	0.63

Motor

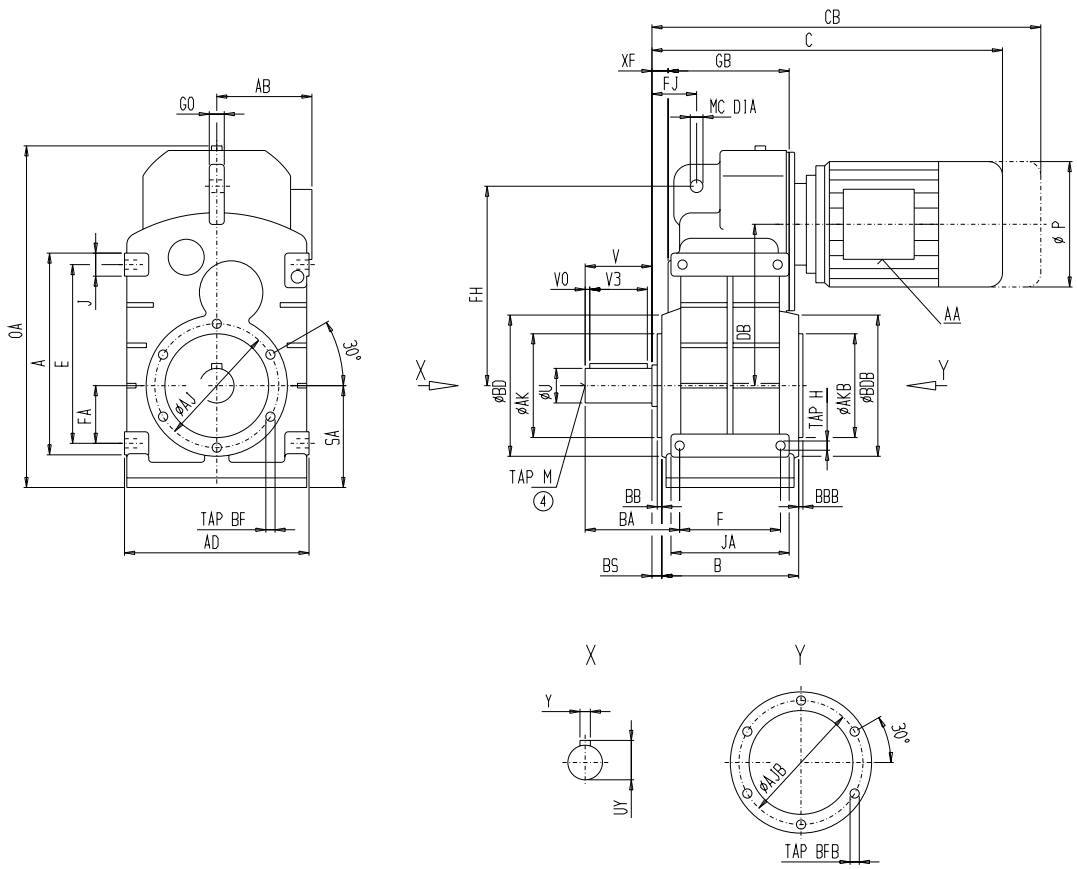
	F.Z68B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.85	17.58	5.43	4.67	2x1/2“	97
M80	16.69	18.86	6.22	4.98	2x1/2“	101
M90S	18.31	20.9	6.93	5.91	2x3/4“	110
M90L	18.31	20.9	6.93	5.91	2x3/4“	115
M100L	20.08	22.91	7.64	6.3	2x3/4“	130
M112M	22.11	25.3	8.58	6.59	2x3/4“	147
M132S	25.75	29.68	10.16	7.13	1“+3/4“	170
M132M	25.75	29.68	10.16	7.13	1“+3/4“	217

Tolerances see page 1 - 4
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ68B

FZ 510
[mm]



5

Mounting

BD	AK	AJ	BB	TAP BF
154	*110*	*130*	*3,5*	*M12x21*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
41,275	*80*	*69,85*	*1,651*	*5/8“-11UNC*	*45,47*	*9,525*	*114*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB
112	*154*	*190*	*110*	*136*	*130*	*216*	*3,5*	*138,5*	*110*	*60*	*180*

J	B	BS	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
26	*165*	*7,5*	*224*	*377*	*M12x17*	*M12x21*	*16*	*41*	*218*	*14*	*16*

Motor

	F.Z68B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*403,5*	*447,5*	*138*	*118,5*	*2x1/2“*	*44*
M80	*425*	*480*	*158*	*126,5*	*2x1/2“*	*47*
M90S	*466*	*532*	*176*	*150*	*2x3/4“*	*50*
M90L	*466*	*532*	*176*	*150*	*2x3/4“*	*52*
M100L	*511*	*583*	*194*	*160*	*2x3/4“*	*59*
M112M	*562,5*	*643,5*	*218*	*167,5*	*2x3/4“*	*67*
M132S	*655*	*755*	*258*	*181*	*1“+3/4“*	*77*
M132M	*655*	*755*	*258*	*181*	*1“+3/4“*	*98*

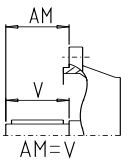
Tolerances see page 1 - 4

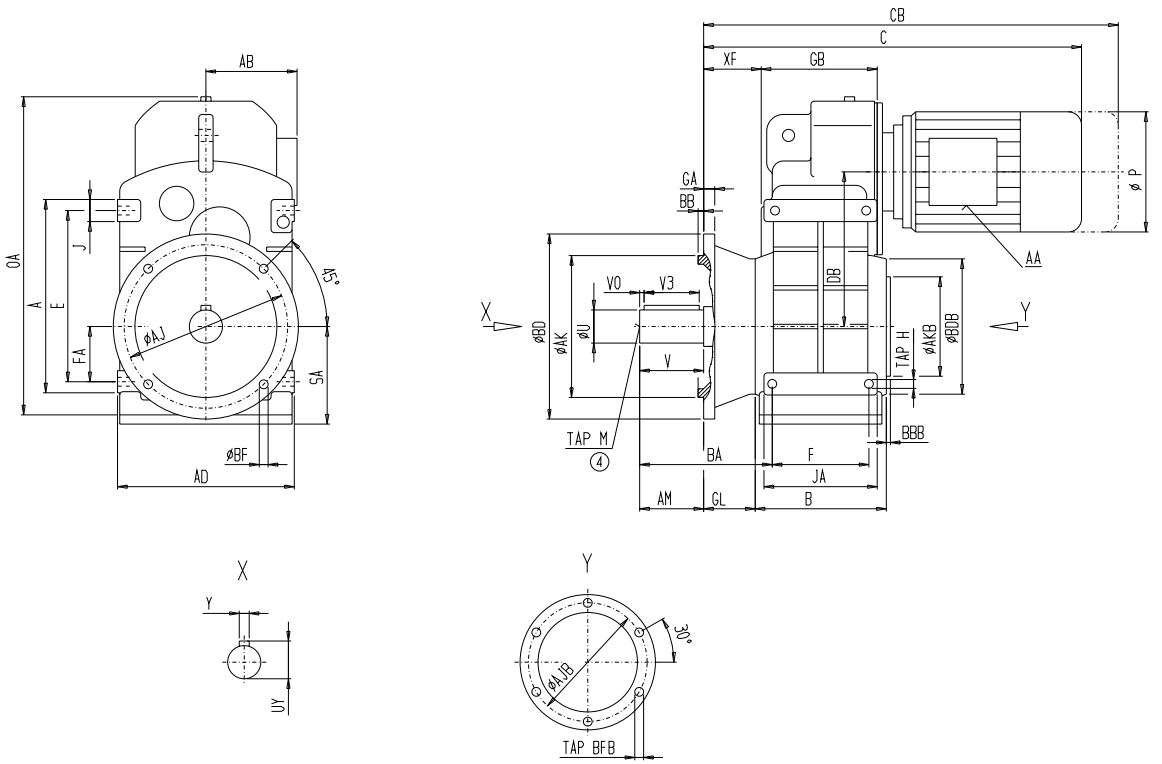
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF68B

FF 510
[inch]





5

Flange

BD	AK	GA	AJ	BB	BA	BF
9.84	7.09	0.59	8.46	0.16	5.39	0.53

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
1.625	3.15	2.76	0.065	5/8-11UNC	1.79	0.38	3.15

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
4.41	6.06	7.48	4.33	5.35	5.12	8.5	0.14	5.45	4.33	2.36	7.09	1.02	6.5	1.2	8.82	14.84	M12x17	M12x21	1.54

Motor

	F.F68B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	16.76	18.49	5.43	4.67	2x1/2“	114
M80	17.51	19.68	6.22	4.98	2x1/2“	121
M90S	19.22	21.81	6.93	5.91	2x3/4“	128
M90L	19.22	21.81	6.93	5.91	2x3/4“	132
M100L	20.99	23.82	7.64	6.3	2x3/4“	148
M112M	23.01	26.2	8.58	6.59	2x3/4“	165
M132S	26.66	30.59	10.16	7.13	1“+3/4“	188
M132M	26.66	30.59	10.16	7.13	1“+3/4“	234

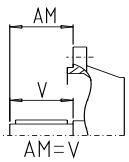
Tolerances see page 1 - 4

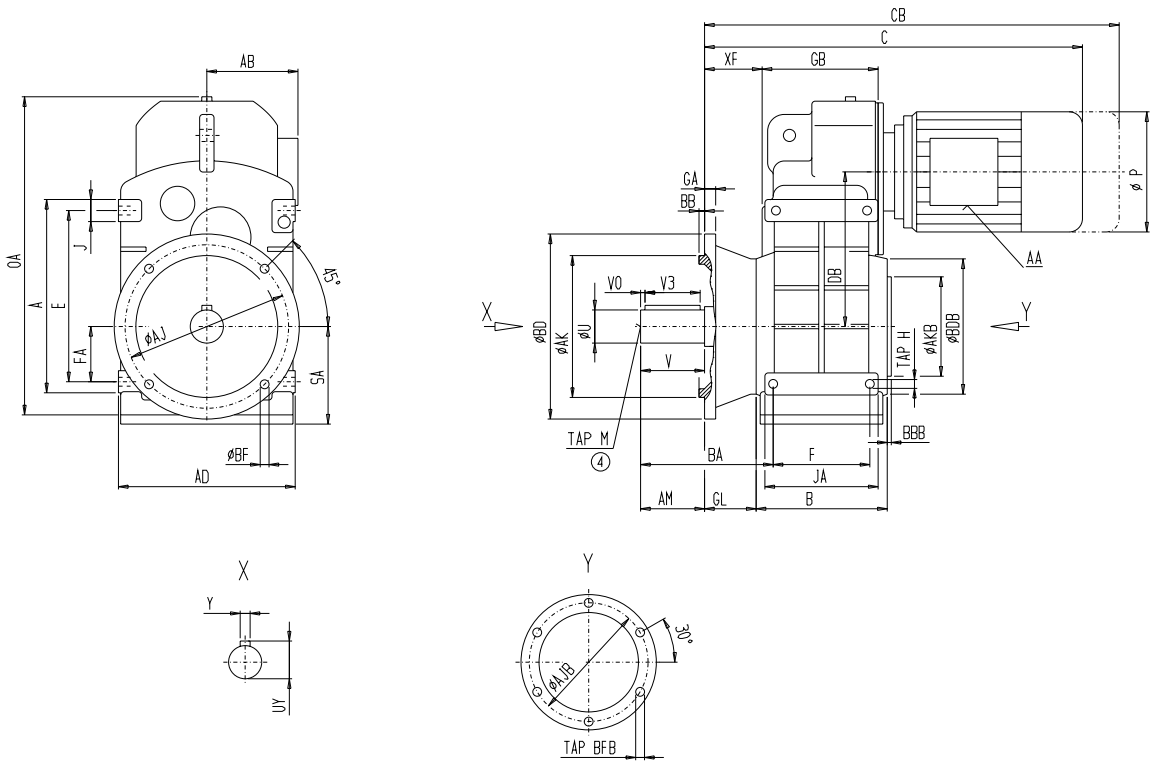
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF68B

FF 510
[mm]





5

Flange

BD	AK	GA	AJ	BB	BA	BF
250	*180*	*15*	*215*	*4*	*137*	*13,5*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
41,275	*80*	*70,104*	*1,65*	*5/8"-11UNC*	*45,47*	*9,652*	*80*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
112	*154*	*190*	*110*	*136*	*130*	*216*	*3,5*	*138,5*	*110*	*60*	*180*	*26*	*165*	*30,5*	*224*	*377*	*M12x17*	*M12x21*	*39*

Motor

	F.F68B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*426,5*	*470,5*	*138*	*118,5*	*2x1/2"*	*52*
M80	*445*	*500*	*158*	*126,5*	*2x1/2"*	*54*
M90S	*489*	*555*	*176*	*150*	*2x3/4"*	*58*
M90L	*489*	*555*	*176*	*150*	*2x3/4"*	*60*
M100L	*534*	*606*	*194*	*160*	*2x3/4"*	*67*
M112M	*585,5*	*666,5*	*218*	*167,5*	*2x3/4"*	*75*
M132S	*678*	*778*	*258*	*181*	*1"+3/4"*	*85*
M132M	*678*	*778*	*258*	*181*	*1"+3/4"*	*106*

Tolerances see page 1 - 4

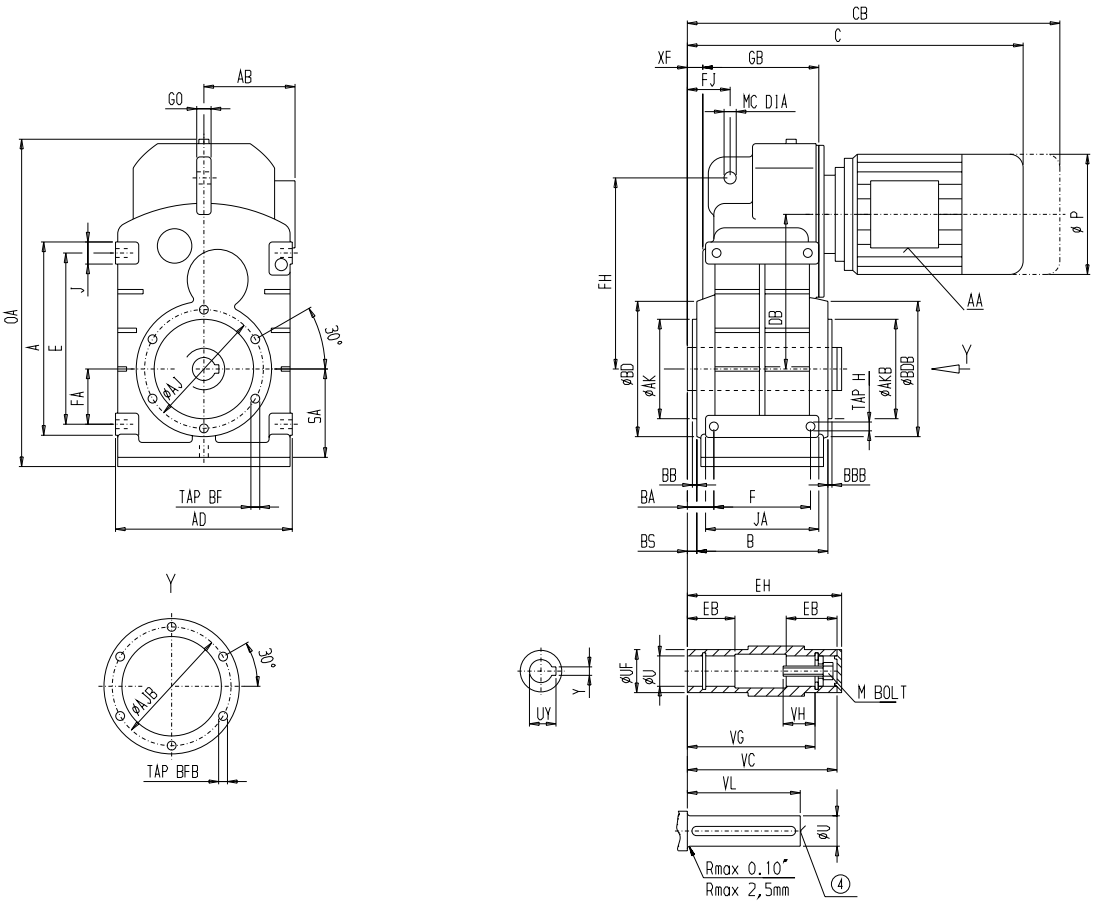
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA68B
FDAZ/FZAZ68B

FA 510
FAZ 510

[inch]



5

Mounting

AK	BD	AJ	BB	TAP BF
6.06	4.33	5.12	0.14	M12x21

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
1.5	2.559	7.09	5.906	1.93	5.31	3/8-16UNC	1.68	0.38	2.717	7.2

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J
4.41	6.06	7.48	4.33	5.35	5.12	8.5	0.14	5.45	4.33	2.36	7.09	1.02

B	BS	BA	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
6.5	0.3	1.34	8.82	14.84	M12x17	M12x21	0.63	1.61	8.58	0.55	0.63

Motor

	F.A.68B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	15.85	17.58	5.43	4.67	2x1/2“	90
M80	16.61	18.77	6.22	4.98	2x1/2“	96
M90S	18.31	20.9	6.93	5.91	2x3/4“	103
M90L	18.31	20.9	6.93	5.91	2x3/4“	107
M100L	20.08	22.91	7.64	6.3	2x3/4“	123
M112M	22.11	25.3	8.58	6.59	2x3/4“	140
M132S	25.75	29.68	10.16	7.13	1“+3/4“	163
M132M	25.75	29.68	10.16	7.13	1“+3/4“	210

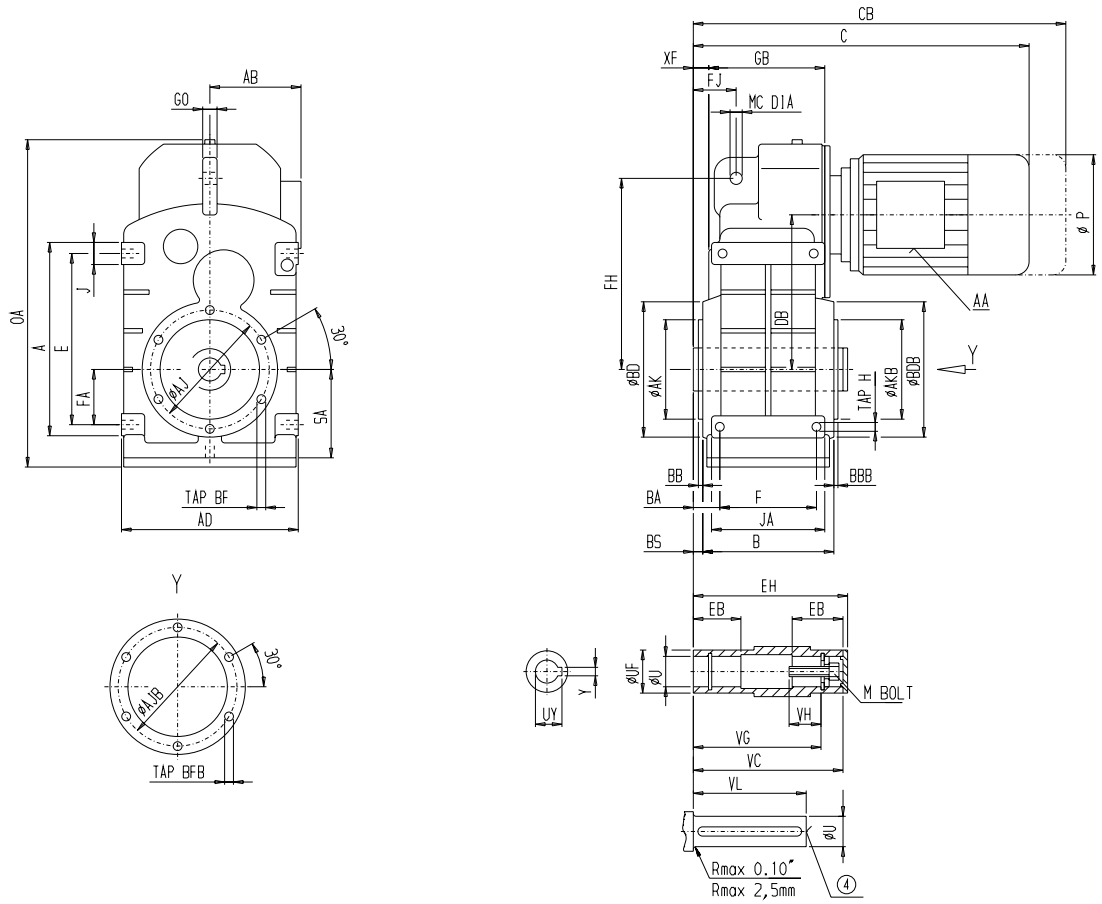
Tolerances see page 1 - 4
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA68B
FDAZ/FZAZ68B

FA 510
FAZ 510

[mm]



5

Mounting

BD	AK	AJ	BB	BF
154	*110*	*130*	*3,5*	*M12x21*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
38,1	*65*	*180*	*150*	*49*	*135*	*3/8"-16UNC*	*42,67*	*9,652*	*69*	*183*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J
112	*154*	*190*	*110*	*136*	*130*	*216*	*3,5*	*138,5*	*110*	*60*	*180*	*26*

B	BS	BA	AD	OA	TAP H	TAP BFB	XF	FJ	FH	MC DIA	GO
165	*7,5*	*34*	*224*	*377*	*M12x17*	*M12x21*	*16*	*41*	*218*	*14*	*16*

Motor

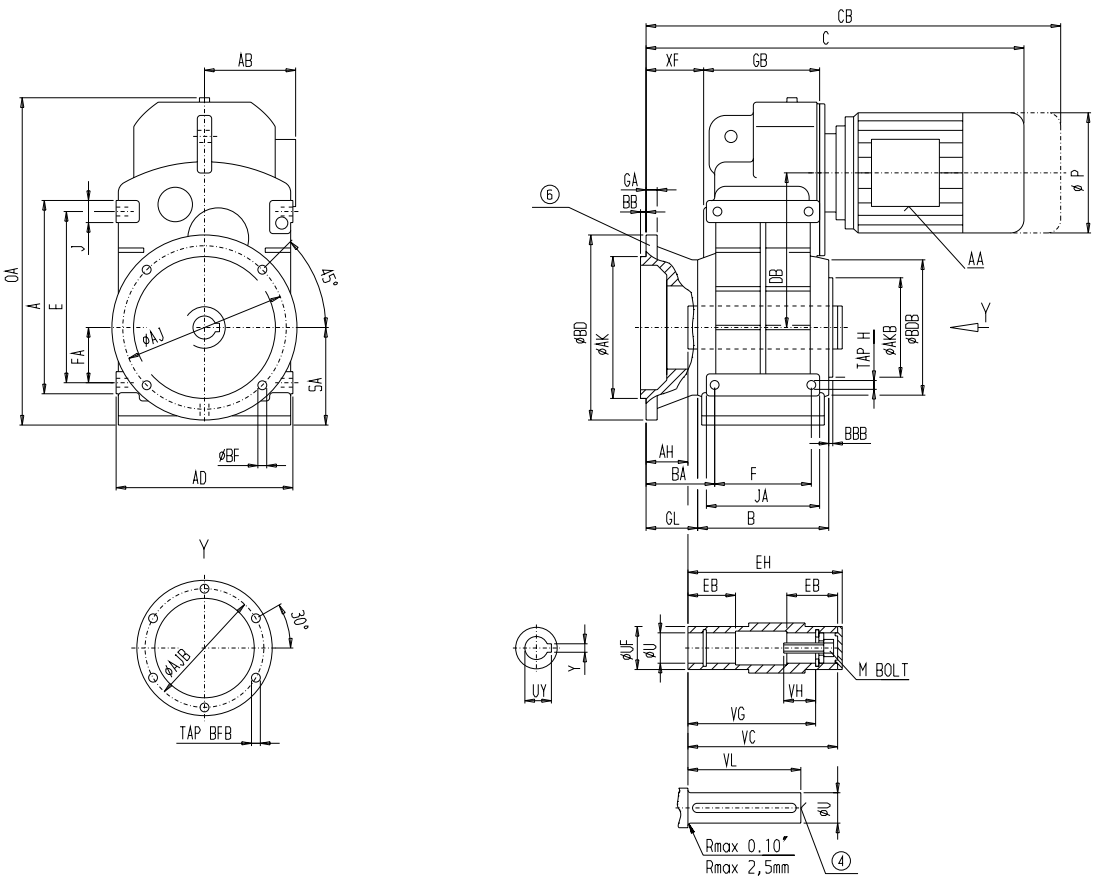
	F.A.68B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*403,5*	*447,5*	*138*	*118,5*	*2x1/2"*	*41*
M80	*422*	*477*	*158*	*126,5*	*2x1/2"*	*44*
M90S	*466*	*532*	*176*	*150*	*2x3/4"*	*47*
M90L	*466*	*532*	*176*	*150*	*2x3/4"*	*49*
M100L	*511*	*583*	*194*	*160*	*2x3/4"*	*56*
M112M	*562,5*	*643,5*	*218*	*167,5*	*2x3/4"*	*64*
M132S	*655*	*755*	*258*	*181*	*1"+3/4"*	*74*
M132M	*655*	*755*	*258*	*181*	*1"+3/4"*	*95*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF68B

FAF 510
[inch]



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Flange

BD	AK	GA	AJ	BB	AH	BF	BA
9.84	7.09	0.59	8.46	0.16	0.91	0.53	2.24

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
1.5	2.559	7.09	5.906	1.93	5.31	3/8-16UNC	1.68	0.38	2.717	7.2

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
4.41	6.06	7.48	4.33	5.35	5.12	8.5	0.14	5.45	4.33	2.36	7.09	1.02	6.5	1.2	8.82	14.84	M12x17	M12x21	1.54

Motor

	F.AF68B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	16.76	18.49	5.43	4.67	2x1/2“	107
M80	17.51	19.68	6.22	4.98	2x1/2“	114
M90S	19.22	21.81	6.93	5.91	2x3/4“	120
M90L	19.22	21.81	6.93	5.91	2x3/4“	125
M100L	20.99	23.82	7.64	6.3	2x3/4“	140
M112M	23.01	26.2	8.58	6.59	2x3/4“	158
M132S	26.66	30.59	10.16	7.13	1“+3/4“	181
M132M	26.66	30.59	10.16	7.13	1“+3/4“	227

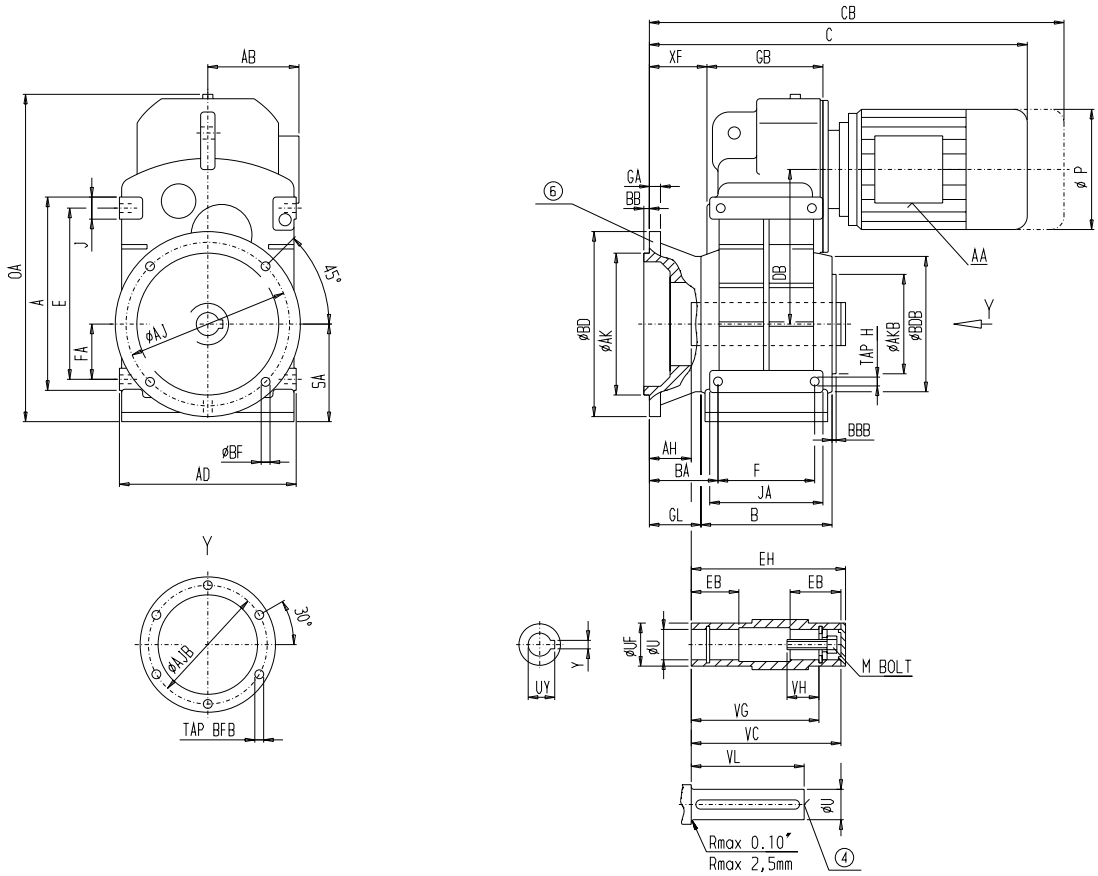
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF68B

FAF 510

[mm]



Flange

BD	AK	GA	AJ	BB	AH	BA	BF
250	*180*	*15*	*215*	*4*	*23*	*57*	*13,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
38,1	*65*	*180*	*150*	*49*	*135*	*3/8"-16UNC*	*42,67*	*9,652*	*69*	*183*

Gearcase

F	BDB	E	AKB	JA	AJB	A	BBB	GB	SA	FA	DB	J	B	GL	AD	OA	TAP H	TAP BFB	XF
112	*154*	*190*	*110*	*136*	*130*	*216*	*3,5*	*138,5*	*110*	*60*	*180*	*26*	*165*	*30,5*	*224*	*377*	*M12x17*	*M12x21*	*39*

Motor

	F.AF68B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*426,5*	*470,5*	*138*	*118,5*	*2x1/2"*	*49*
M80	*445*	*500*	*158*	*126,5*	*2x1/2"*	*52*
M90S	*489*	*555*	*176*	*150*	*2x3/4"*	*55*
M90L	*489*	*555*	*176*	*150*	*2x3/4"*	*57*
M100L	*534*	*606*	*194*	*160*	*2x3/4"*	*64*
M112M	*585,5*	*666,5*	*218*	*167,5*	*2x3/4"*	*71*
M132S	*678*	*778*	*258*	*181*	*1"+3/4"*	*82*
M132M	*678*	*778*	*258*	*181*	*1"+3/4"*	*103*

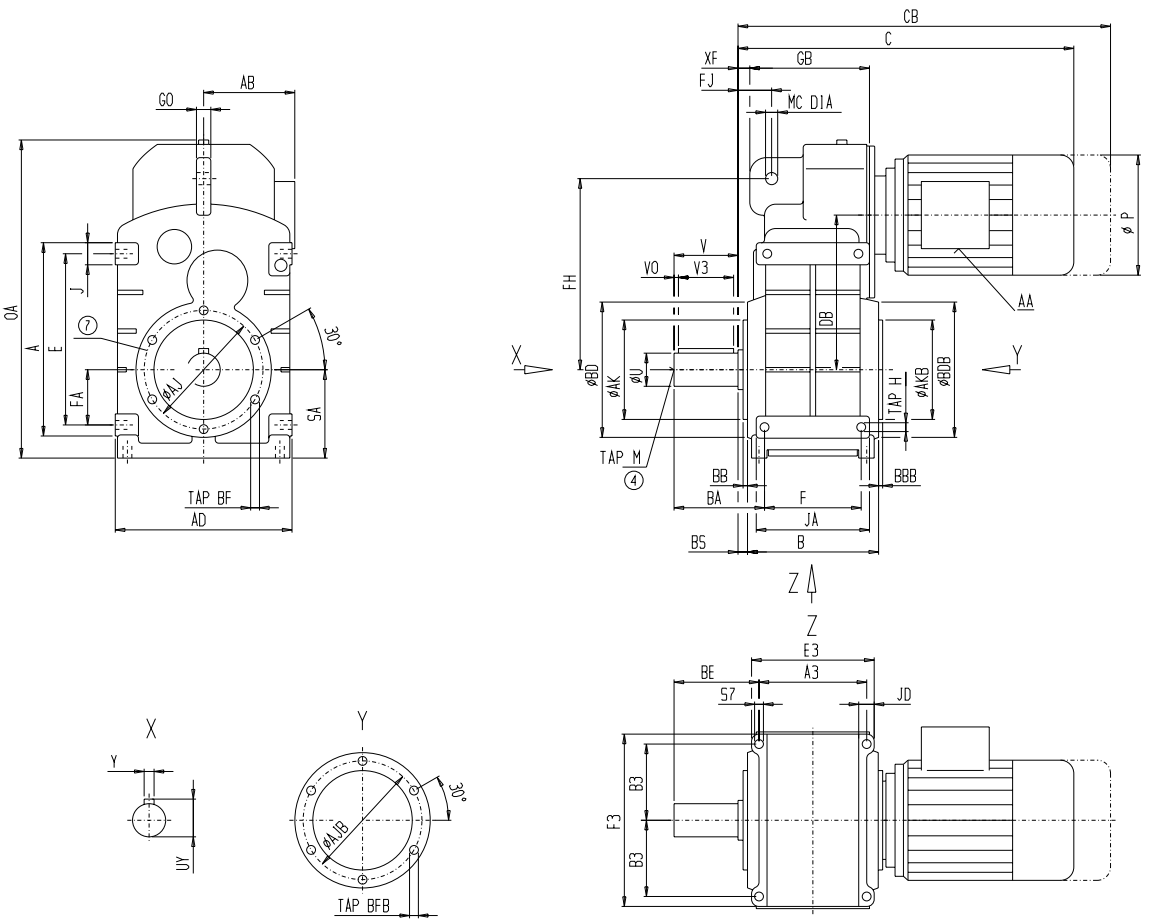
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ88B

FZ 510

[inch]



Mounting

BD	AK	AJ	BB	TAP BF
7.48	5.12	6.5	0.14	M12x21

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
2	3.94	3.5	0.004	3/4-10UNC	2.22	0.5	5.31

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
5.51	7.48	5.91	10.63	5.12	4.33	6.61	6.5	7.05	12.11	0.14	10.16	6.89	5.2	3.94

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
9.06	5.12	1.38	1.2	7.6	0.33	10.39	18.52	M16x22	M12x21	M16x22	0.57	1.97	10.94	0.87	0.79

Motor

	F.Z88B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	16.99	18.72	5.43	4.67	2x1/2“	163
M80	17.75	19.92	6.22	4.98	2x1/2“	168
M90S	19.45	22.04	6.93	5.91	2x3/4“	177
M90L	19.45	22.04	6.93	5.91	2x3/4“	181
M100L	21.22	24.05	7.64	6.3	2x3/4“	196
M112M	23.17	26.36	8.58	6.59	2x3/4“	214
M132S	26.74	30.71	10.16	7.13	1“+3/4“	264
M132M	26.74	30.71	10.16	7.13	1“+3/4“	288
M160L	30.02	34.63	12.2	7.83	1“+3/4“	322
M160M	30.02	34.63	12.2	7.83	1“+3/4“	353

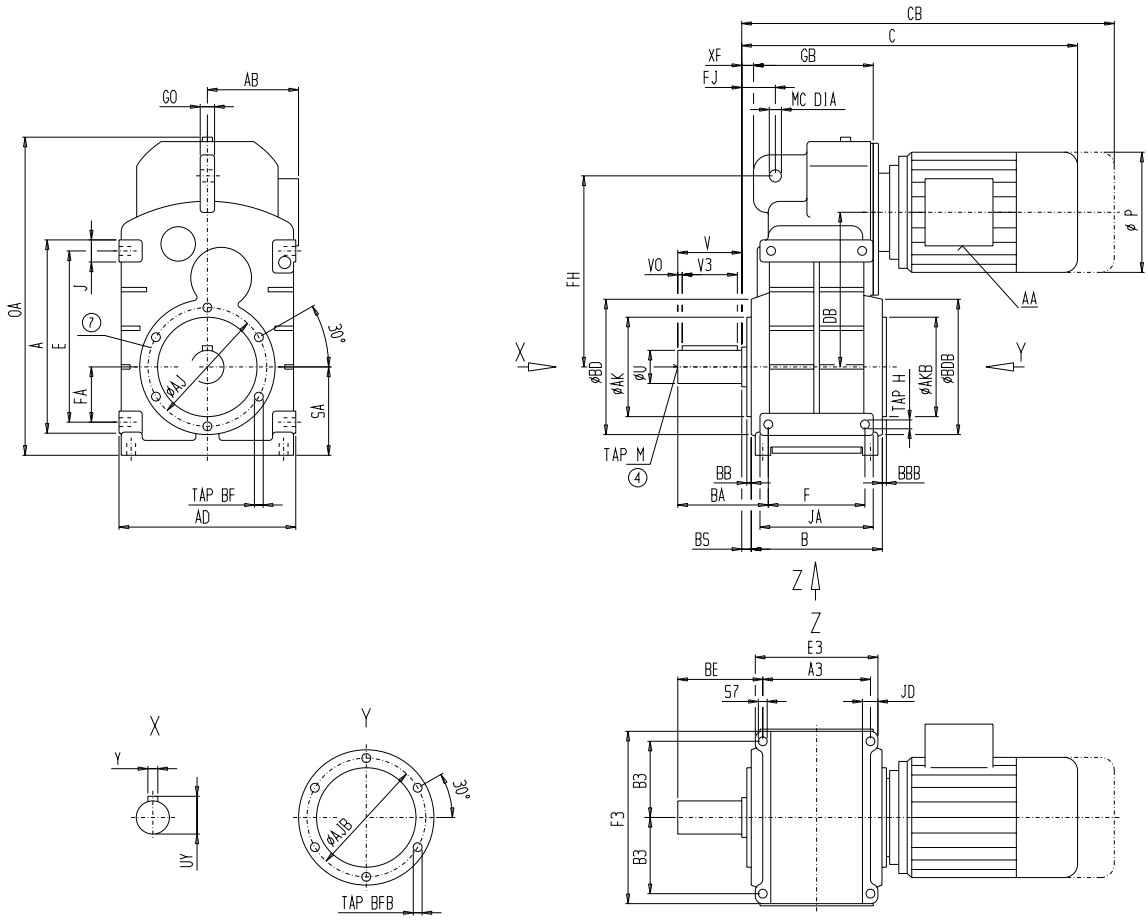
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ88B

FZ 510

[mm]



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Mounting

BD	AK	AJ	BB	TAP BF
190	*130*	*165*	*3,5*	*M12x21*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
50,8	*100*	*88,9*	*0,102*	*3/4"-10UNC*	*56,39*	*12,7*	*135*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
140	*190*	*150*	*270*	*130*	*110*	*168*	*165*	*179*	*307,5*	*3,5*	*258*	*175*	*132*	*100*

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
230	*130*	*35*	*30,5*	*193*	*8,5*	*264*	*470,5*	*M16x22*	*M12x21*	*M16x22*	*14,5*	*50*	*278*	*22*	*20*

Motor

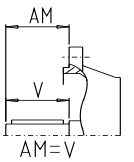
	F.Z88B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*432,5*	*476,5*	*138*	*118,5*	*2x1/2"*	*74*
M80	*451*	*506*	*158*	*126,5*	*2x1/2"*	*77*
M90S	*495*	*561*	*176*	*150*	*2x3/4"*	*80*
M90L	*495*	*561*	*176*	*150*	*2x3/4"*	*82*
M100L	*540*	*612*	*194*	*160*	*2x3/4"*	*89*
M112M	*589,5*	*670,5*	*218*	*167,5*	*2x3/4"*	*97*
M132S	*680*	*781*	*258*	*181*	*1"+3/4"*	*120*
M132M	*680*	*781*	*258*	*181*	*1"+3/4"*	*131*
M160M	*763,5*	*880,5*	*310*	*199*	*1"+3/4"*	*146*
M160L	*763,5*	*880,5*	*310*	*199*	*1"+3/4"*	*160*

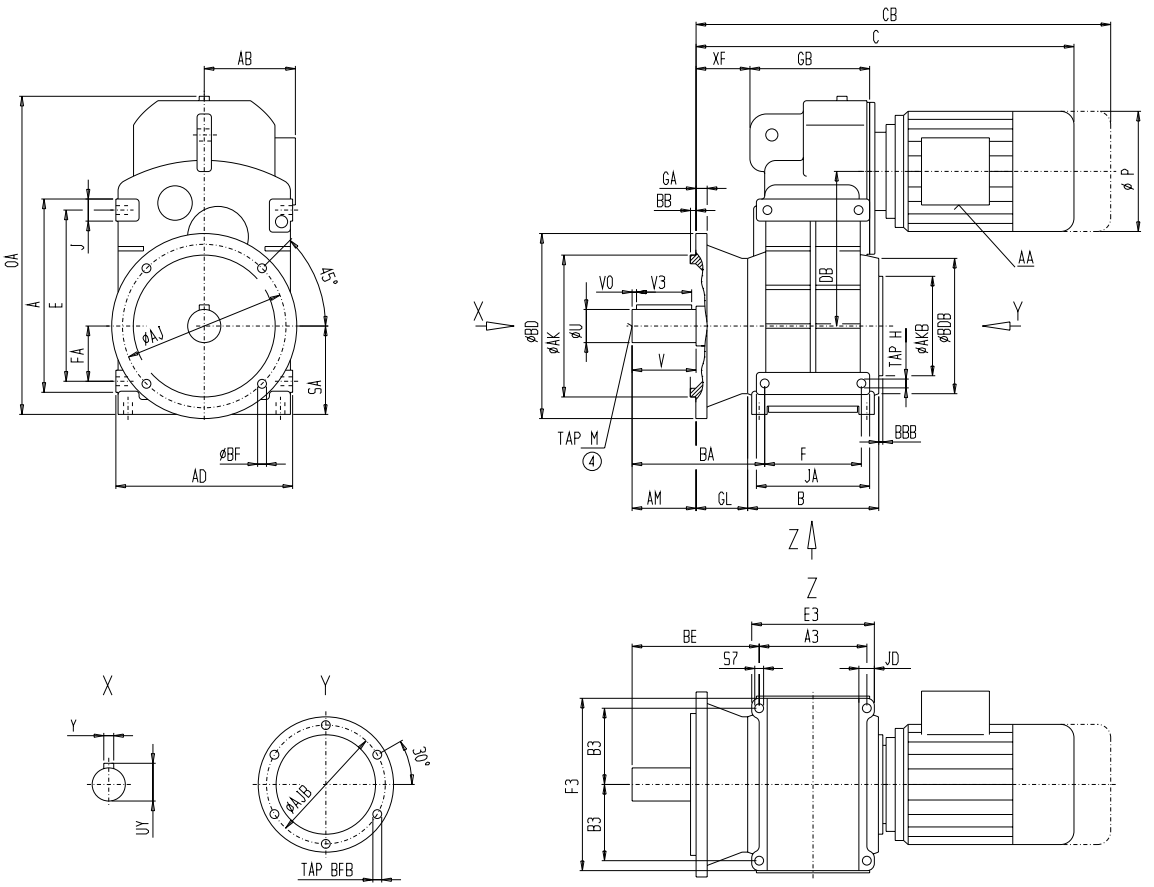
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF88B

FF 510
[inch]





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Flange

BD	AK	GA	AJ	BB	BA	BF
11.81	9.06	0.63	10.43	0.16	6.77	0.53

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
2	3.94	3.5	0.004	3/4-10UNC	2.22	0.5	3.94

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
5.51	7.48	5.91	10.63	5.12	4.33	6.61	6.5	12.11	0.14	10.16	6.89	5.2

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
3.94	9.06	6.57	1.38	1.2	7.6	1.79	10.39	18.52	M16x22	M12x21	M16x22	2.03

Motor

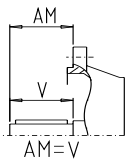
	F.F88B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	18.45	20.18	5.43	4.67	2x1/2“	188
M80	19.21	21.37	6.22	4.98	2x1/2“	194
M90S	20.91	23.5	6.93	5.91	2x3/4“	201
M90L	20.91	23.5	6.93	5.91	2x3/4“	205
M100L	22.68	25.51	7.64	6.3	2x3/4“	221
M112M	24.63	27.82	8.58	6.59	2x3/4“	239
M132S	28.19	32.16	10.16	7.13	1“+3/4“	288
M132M	28.19	32.16	10.16	7.13	1“+3/4“	312
M160M	31.48	36.09	12.2	7.83	1“+3/4“	346
M160L	31.48	36.09	12.2	7.83	1“+3/4“	377

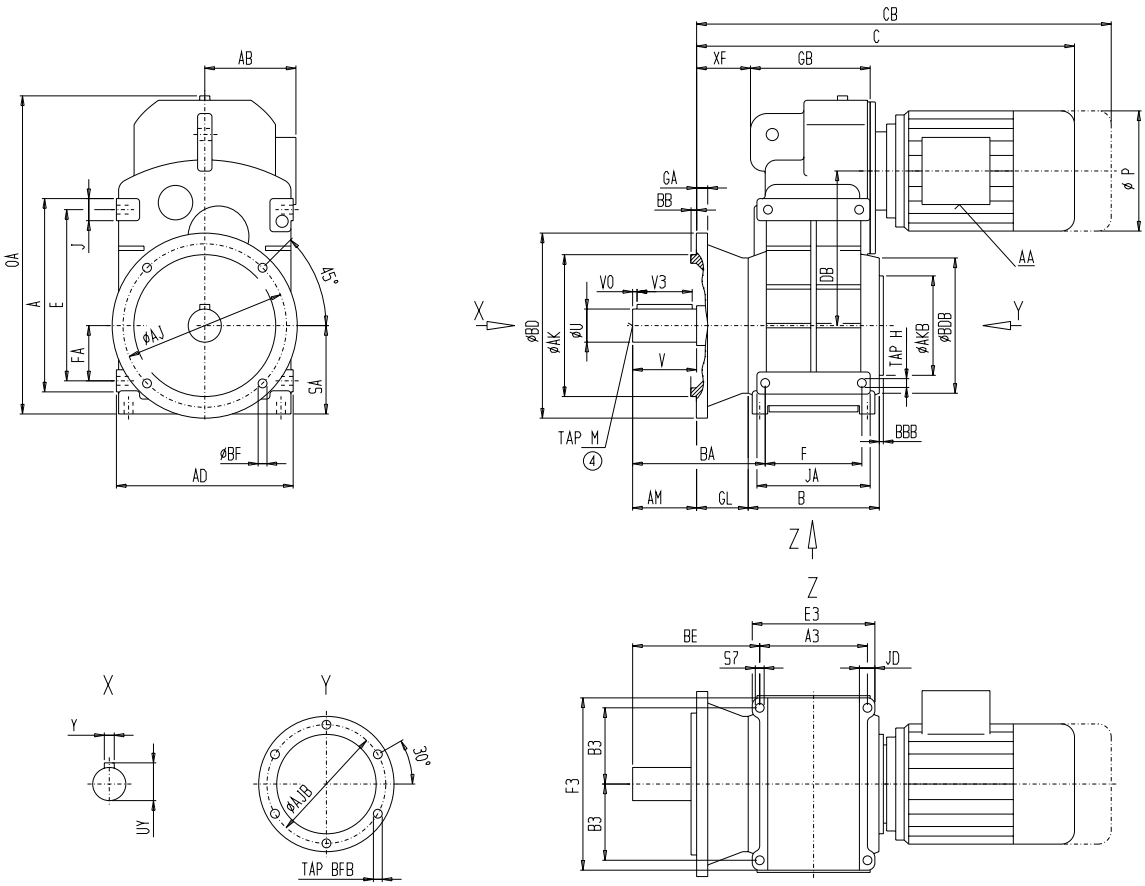
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF88B

FF 510
[mm]





Flange

BD	AK	GA	AJ	BB	BA	BF
300	*230*	*16*	*265*	*4*	*172*	*13,5*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
50,8	*100*	*88,9*	*0,102*	*3/4"-10UNC*	*56,39*	*12,7*	*100*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
140	*190*	*150*	*270*	*130*	*110*	*168*	*165*	*307,5*	*3,5*	*258*	*175*	*132*

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
100	*230*	*167*	*35*	*30,5*	*193*	*45,5*	*264*	*470,5*	*M16x22*	*M12x21*	*M16x22*	*51,5*

Motor

	F.F88B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*469,5*	*513,5*	*138*	*118,5*	*2x1/2"*	*85*
M80	*488*	*543*	*158*	*126,5*	*2x1/2"*	*87*
M90S	*532*	*598*	*176*	*150*	*2x3/4"*	*91*
M90L	*532*	*598*	*176*	*150*	*2x3/4"*	*93*
M100L	*577*	*649*	*194*	*160*	*2x3/4"*	*100*
M112M	*626,5*	*707,5*	*218*	*167,5*	*2x3/4"*	*108*
M132S	*717*	*818*	*258*	*181*	*1"+3/4"*	*131*
M132M	*717*	*818*	*258*	*181*	*1"+3/4"*	*142*
M160M	*800,5*	*917,5*	*310*	*199*	*1"+3/4"*	*157*
M160L	*800,5*	*917,5*	*310*	*199*	*1"+3/4"*	*171*

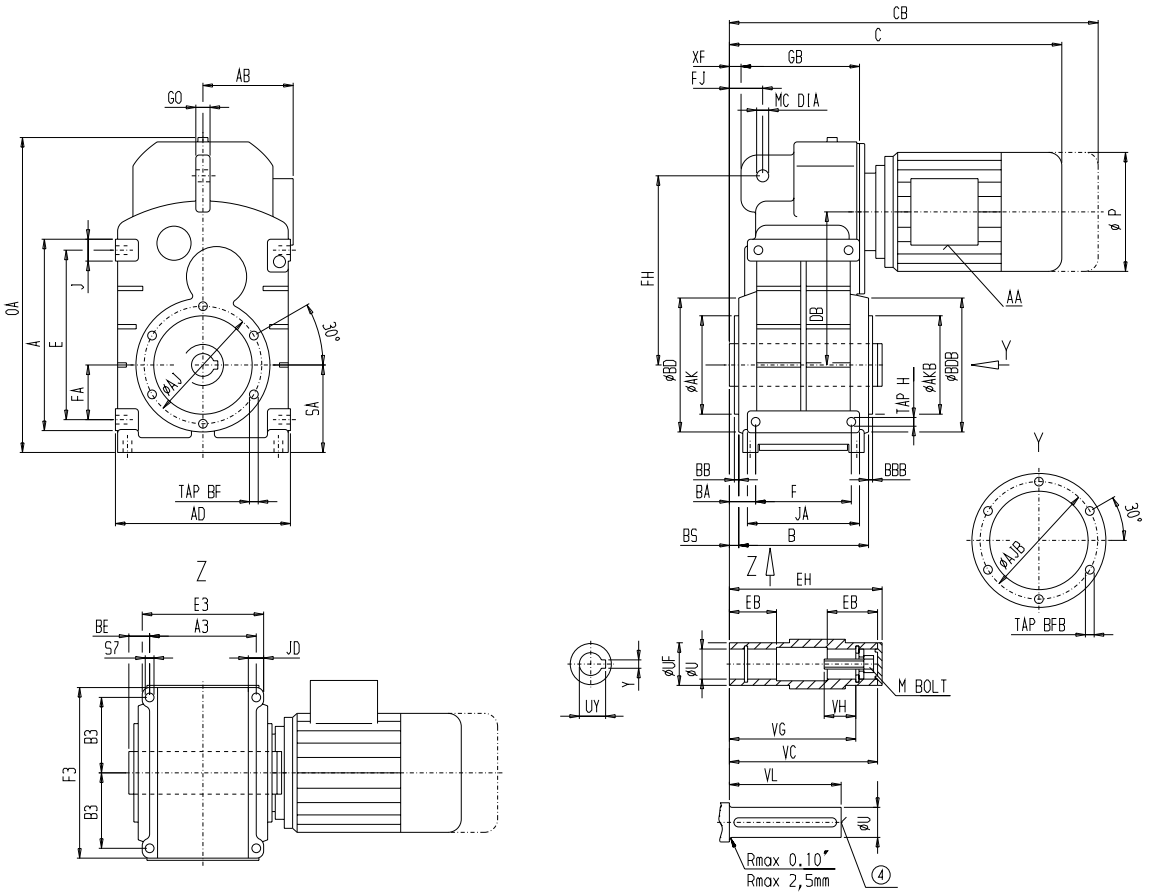
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA88B
FDAZ/FZAZ88B

FA 510
FAZ 510
[inch]



5

Mounting

AK	BD	AJ	BB	TAP BF
7.48	5.12	6.5	0.14	M12x21

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
2	3.15	8.27	7.087	1.62	6.5	3/4-10UNC	2.23	0.5	3.071	8.39

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
5.51	7.48	5.91	10.63	5.12	4.33	6.61	6.5	7.05	12.11	0.14	10.16	6.89	5.2	3.94	9.06

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
1.18	1.38	1.2	7.6	0.33	1.38	10.39	18.52	M16x22	M12x21	M16x22	0.57	1.97	10.94	0.87	0.79

Motor

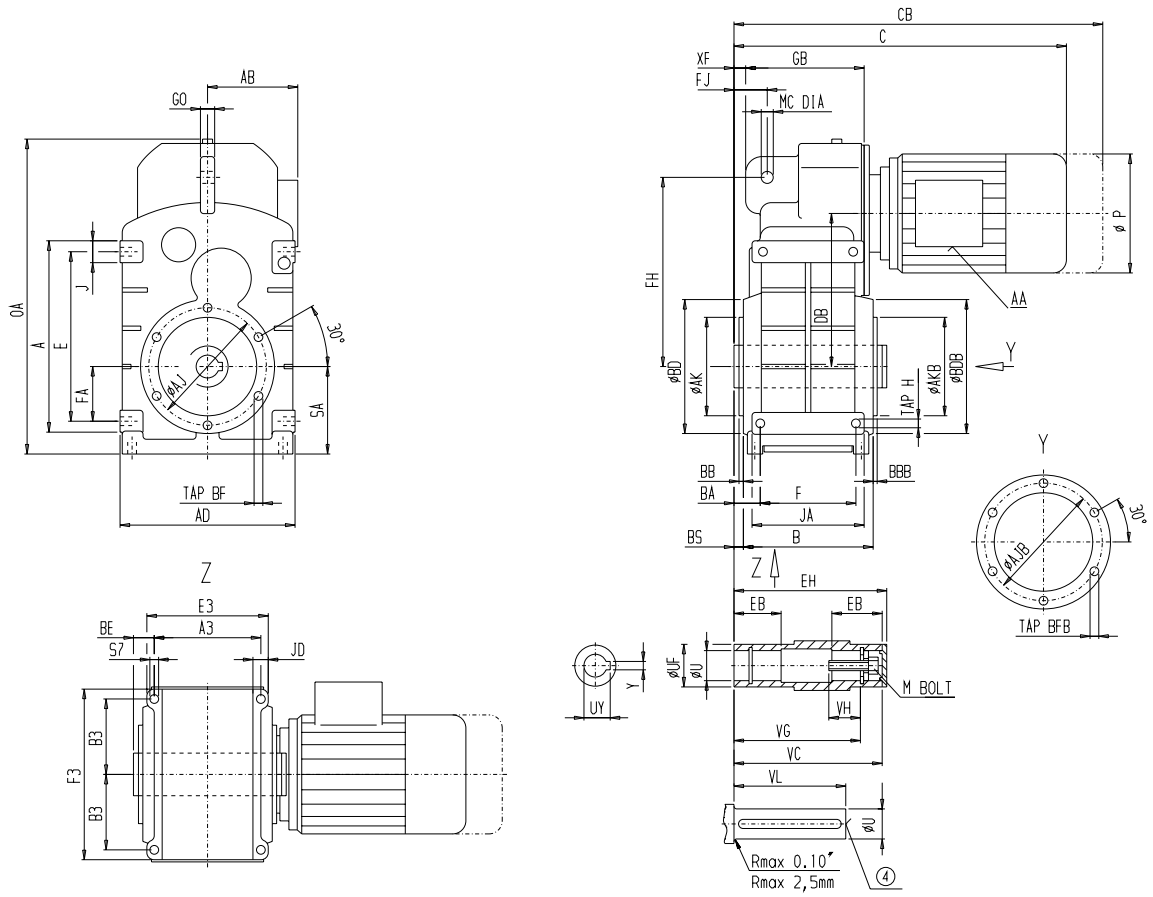
	F.A.88B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	16.99	18.72	5.43	4.67	2x1/2“	145
M80	17.75	19.92	6.22	4.98	2x1/2“	152
M90S	19.45	22.04	6.93	5.91	2x3/4“	159
M90L	19.45	22.04	6.93	5.91	2x3/4“	163
M100L	21.22	24.05	7.64	6.3	2x3/4“	178
M112M	23.17	26.36	8.58	6.59	2x3/4“	196
M132S	26.74	30.71	10.16	7.13	1“+3/4“	246
M132M	26.74	30.71	10.16	7.13	1“+3/4“	270
M160M	30.02	34.63	12.2	7.83	1“+3/4“	304
M160L	30.02	34.63	12.2	7.83	1“+3/4“	335

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA88B
FDAZ/FZAZ88B

FA 510
FAZ 510
[mm]



Mounting

BD	AK	AJ	BB	TAP BF
190	*130*	*165*	*3,5*	*M12x21*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
50,8	*80*	*210*	*180*	*41*	*165*	*3/4"-10UNC*	*56,64*	*12,7*	*78*	*213*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
140	*190*	*150*	*270*	*130*	*110*	*168*	*165*	*179*	*307,5*	*3,5*	*258*	*175*	*132*	*100*	*230*

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
30	*35*	*30,5*	*193*	*8,5*	*35*	*264*	*470,5*	*M16x22*	*M12x21*	*M16x22*	*14,5*	*50*	*278*	*22*	*20*

Motor

	F.A.88B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*432,5*	*476,5*	*138*	*118,5*	*2x1/2"*	*66*
M80	*451*	*506*	*158*	*126,5*	*2x1/2"*	*69*
M90S	*495*	*561*	*176*	*150*	*2x3/4"*	*72*
M90L	*495*	*561*	*176*	*150*	*2x3/4"*	*74*
M100L	*540*	*612*	*194*	*160*	*2x3/4"*	*81*
M112M	*589,5*	*670,5*	*218*	*167,5*	*2x3/4"*	*89*
M132S	*680*	*781*	*258*	*181*	*1"+3/4"*	*112*
M132M	*680*	*781*	*258*	*181*	*1"+3/4"*	*123*
M160M	*763,5*	*880,5*	*310*	*199*	*1"+3/4"*	*138*
M160L	*763,5*	*880,5*	*310*	*199*	*1"+3/4"*	*152*

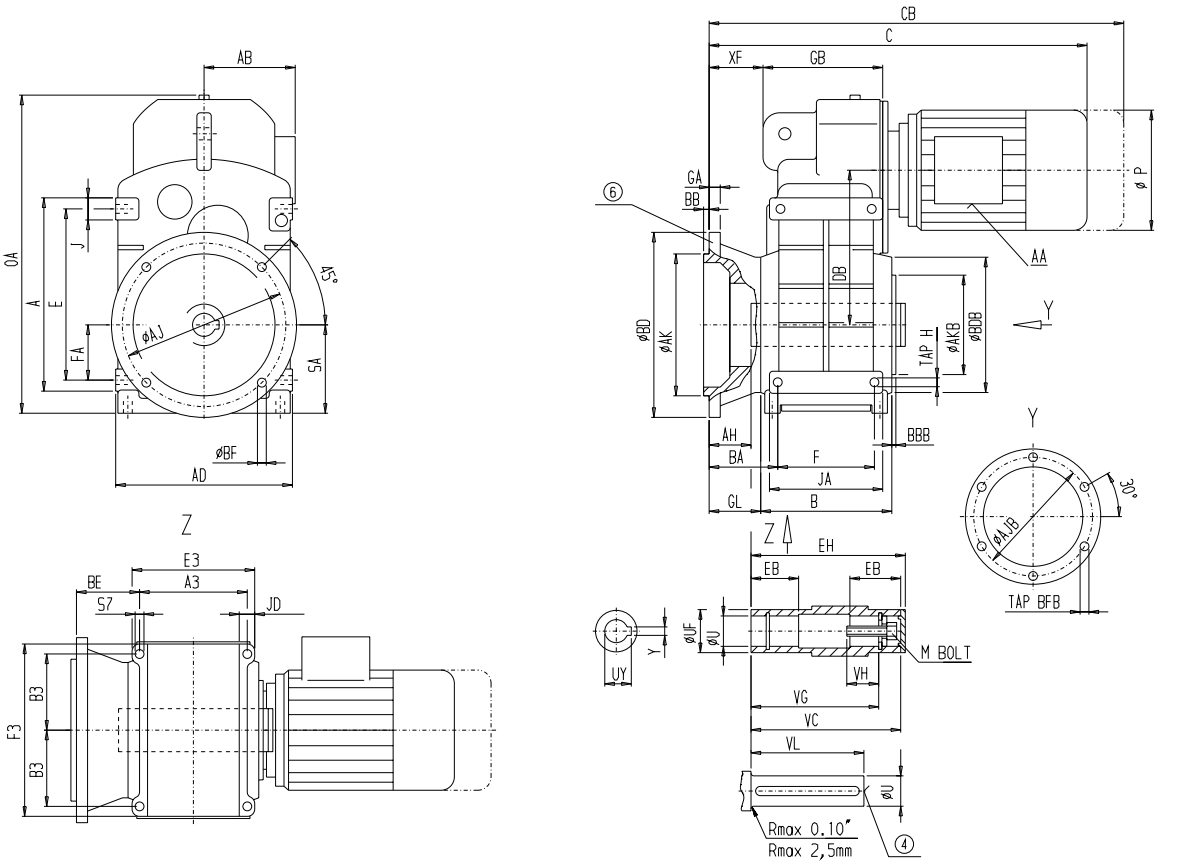
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF88B

FAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	AH	BF	BA
11.81	9.06	0.63	10.43	0.16	1.46	0.53	2.83

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
2	3.15	8.27	7.087	1.62	6.5	3/4-10UNC	2.23	0.5	3.071	8.39

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
5.51	7.48	5.91	10.63	5.12	4.33	6.61	6.5	7.05	12.11	0.14	10.16	6.89

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
5.2	3.94	9.06	2.64	1.38	1.2	7.6	1.79	10.39	18.52	M16x22	M12x21	M16x22	2.03

Motor

	F.AF88B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M71	18.45	20.18	5.43	4.67	2x1/2“	170
M80	19.21	21.37	6.22	4.98	2x1/2“	176
M90S	20.91	23.5	6.93	5.91	2x3/4“	183
M90L	20.91	23.5	6.93	5.91	2x3/4“	187
M100L	22.68	25.51	7.64	6.3	2x3/4“	203
M112M	24.63	27.82	8.58	6.59	2x3/4“	221
M132S	28.19	32.16	10.16	7.13	1“+3/4“	270
M132M	28.19	32.16	10.16	7.13	1“+3/4“	294
M160M	31.48	36.09	12.2	7.83	1“+3/4“	329
M160L	31.48	36.09	12.2	7.83	1“+3/4“	359

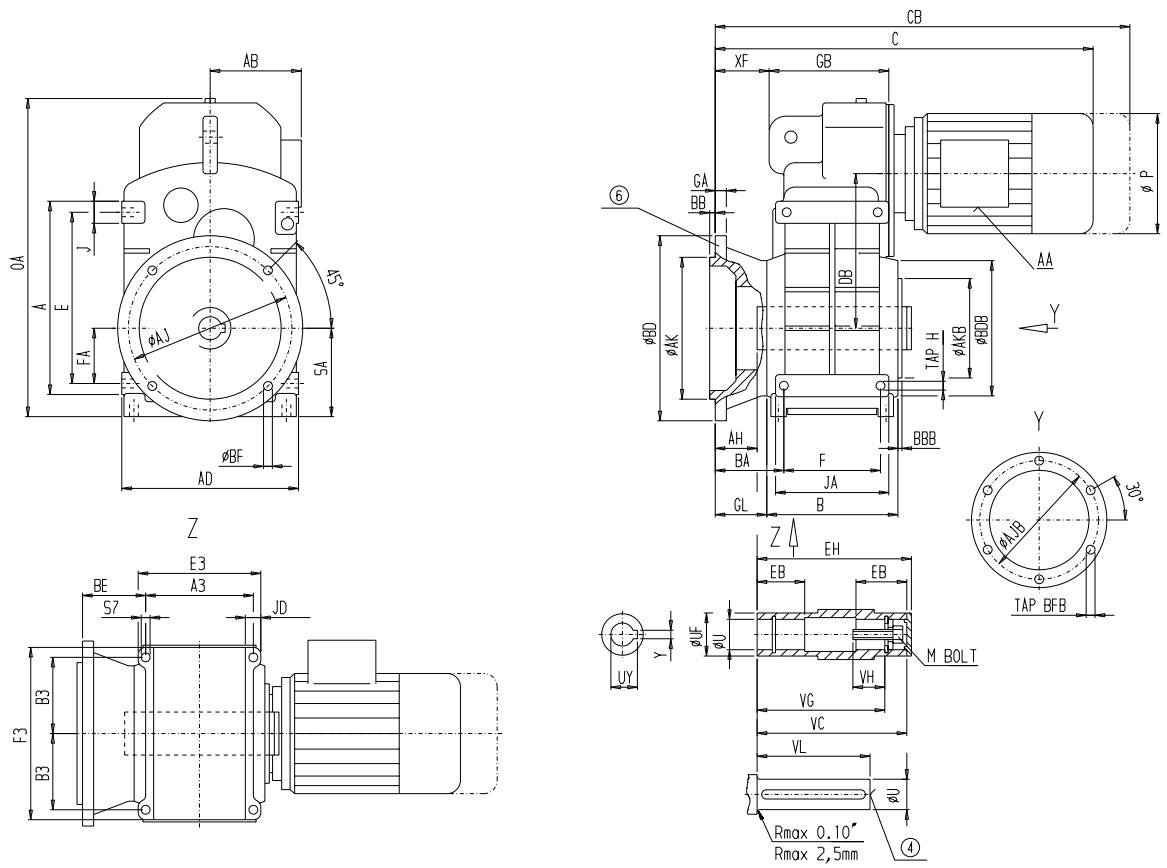
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF88B

FAF 510

[mm]



Flange

BD	AK	GA	AJ	BB	AH	BA	BF
300	*230*	*16*	*265*	*4*	*37*	*72*	*13,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
50,8	*80*	*210*	*180*	*41*	*165*	*3/4"-10UNC*	*56,64*	*12,7*	*78*	*213*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
140	*190*	*150*	*270*	*130*	*110*	*168*	*165*	*179*	*307,5*	*3,5*	*258*	*175*

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
132	*100*	*230*	*67*	*35*	*30,5*	*193*	*45,5*	*264*	*470,5*	*M16x22*	*M12x21*	*M16x22*	*51,5*

Motor

	F.AF88B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M71	*469,5*	*513,5*	*138*	*118,5*	*2x1/2"*	*77*
M80	*488*	*543*	*158*	*126,5*	*2x1/2"*	*79*
M90S	*532*	*598*	*176*	*150*	*2x3/4"*	*83*
M90L	*532*	*598*	*176*	*150*	*2x3/4"*	*85*
M100L	*577*	*649*	*194*	*160*	*2x3/4"*	*92*
M112M	*626,5*	*707,5*	*218*	*167,5*	*2x3/4"*	*100*
M132S	*717*	*818*	*258*	*181*	*1"+3/4"*	*123*
M132M	*717*	*818*	*258*	*181*	*1"+3/4"*	*134*
M160M	*800,5*	*917,5*	*310*	*199*	*1"+3/4"*	*149*
M160L	*800,5*	*917,5*	*310*	*199*	*1"+3/4"*	*163*

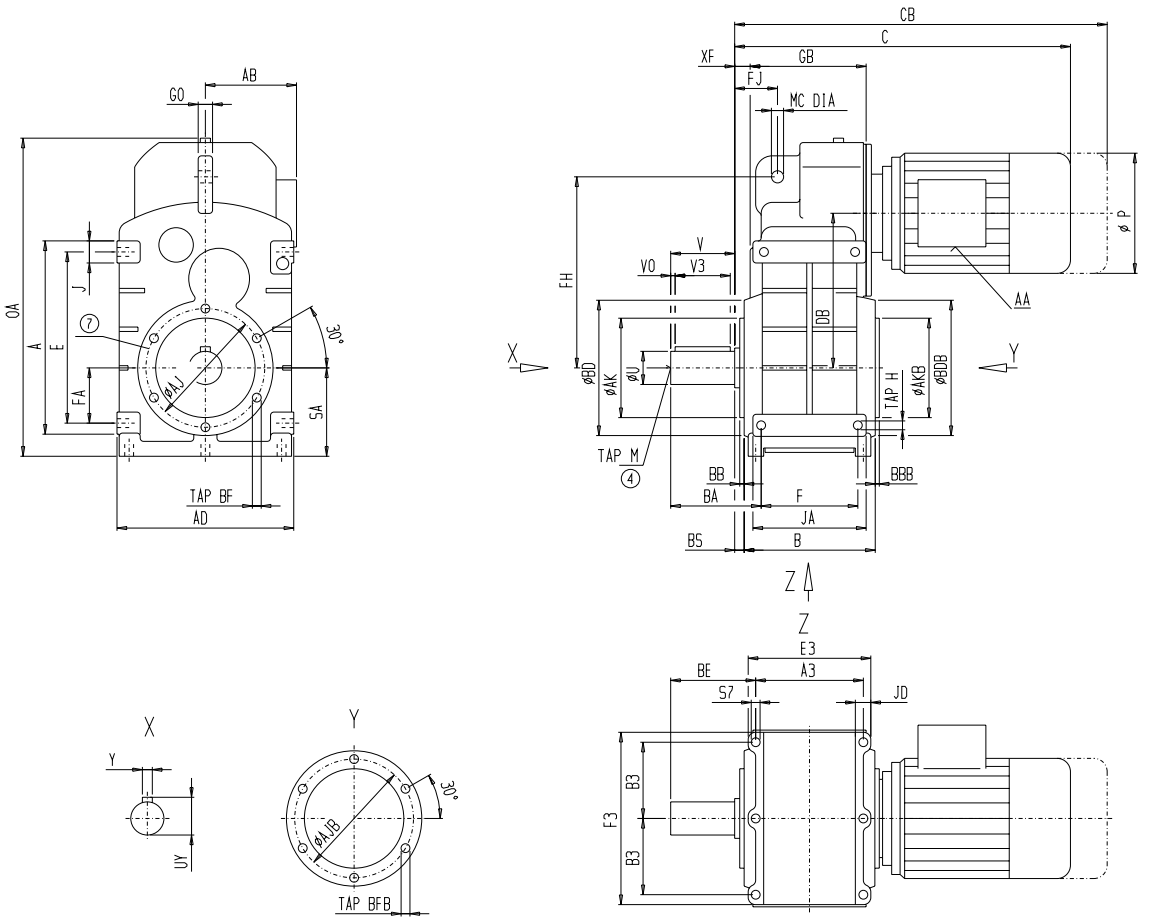
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ108B

FZ 510

[inch]



5

Mounting

BD	AK	AJ	BB	TAP BF
9.65	7.09	8.46	0.16	M16x28

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
2.375	4.72	4.25	0.002	3/4-10UNC	2.65	0.625	6.2

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
6.5	9.65	7.64	12.2	7.09	5.43	7.68	8.46	8.74	13.78	0.16	12.28	8.07	6.3	3.94

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
11.02	5.63	1.57	1.12	8.74	0.35	12.6	22.54	M16x22	M16x28	M16x22	0.57	2.44	13.62	0.87	1.02

Motor

	F.Z108B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M80	18.42	20.59	6.22	4.98	2x1/2“	269
M90S	20.04	22.63	6.93	5.91	2x3/4“	278
M90L	20.04	22.63	6.93	5.91	2x3/4“	282
M100L	21.71	24.54	7.64	6.3	2x3/4“	295
M112M	23.62	26.81	8.58	6.59	2x3/4“	315
M132S	27.19	31.16	10.16	7.13	1“+3/4“	361
M132M	27.19	31.16	10.16	7.13	1“+3/4“	385
M160M	30.55	35.16	12.2	7.83	1“+3/4“	440
M160L	30.55	35.16	12.2	7.83	1“+3/4“	471
M180M	32.56	37.2	13.7	9.69	1 1/4“+3/4“	507
M180L	32.56	37.2	13.7	9.69	1 1/4“+3/4“	523

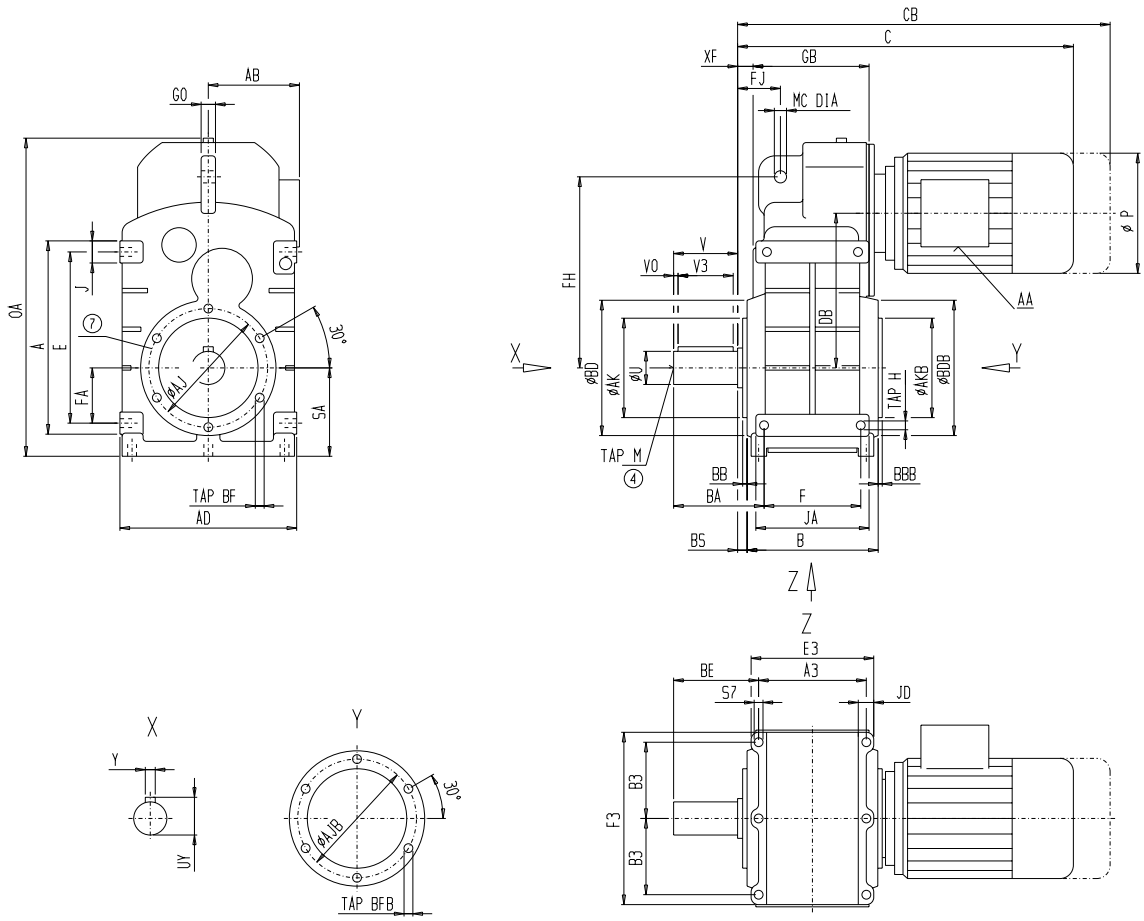
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ108B

FZ 510

[mm]



5

Mounting

BD	AK	AJ	BB	TAP BF
245	*180*	*215*	*4*	*M16x28*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
60,325	*120*	*107,95*	*0,051*	*3/4"-10UNC*	*67,31*	*15,875*	*157,5*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
165	*245*	*194*	*310*	*180*	*138*	*195*	*215*	*222*	*350*	*4*	*312*	*205*	*160*	*100*

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
280	*143*	*40*	*28,5*	*222*	*9*	*320*	*572,5*	*M16x22*	*M16x28*	*M16x22*	*14,5*	*62*	*346*	*22*	*26*

Motor

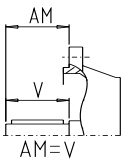
	F.Z108B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M80	*469*	*524*	*158*	*126,5*	*2x1/2"*	*122*
M90S	*510*	*576*	*176*	*150*	*2x3/4"*	*126*
M90L	*510*	*576*	*176*	*150*	*2x3/4"*	*128*
M100L	*552,5*	*624,5*	*194*	*160*	*2x3/4"*	*134*
M112M	*601*	*682*	*218*	*167,5*	*2x3/4"*	*143*
M132S	*691,5*	*792,5*	*258*	*181*	*1"+3/4"*	*164*
M132M	*691,5*	*792,5*	*258*	*181*	*1"+3/4"*	*175*
M160M	*777*	*894*	*310*	*199*	*1"+3/4"*	*200*
M160L	*777*	*894*	*310*	*199*	*1"+3/4"*	*214*
M180M	*828*	*946*	*348*	*246*	*1 1/4"+3/4"*	*230*
M180L	*828*	*946*	*348*	*246*	*1 1/4"+3/4"*	*237*

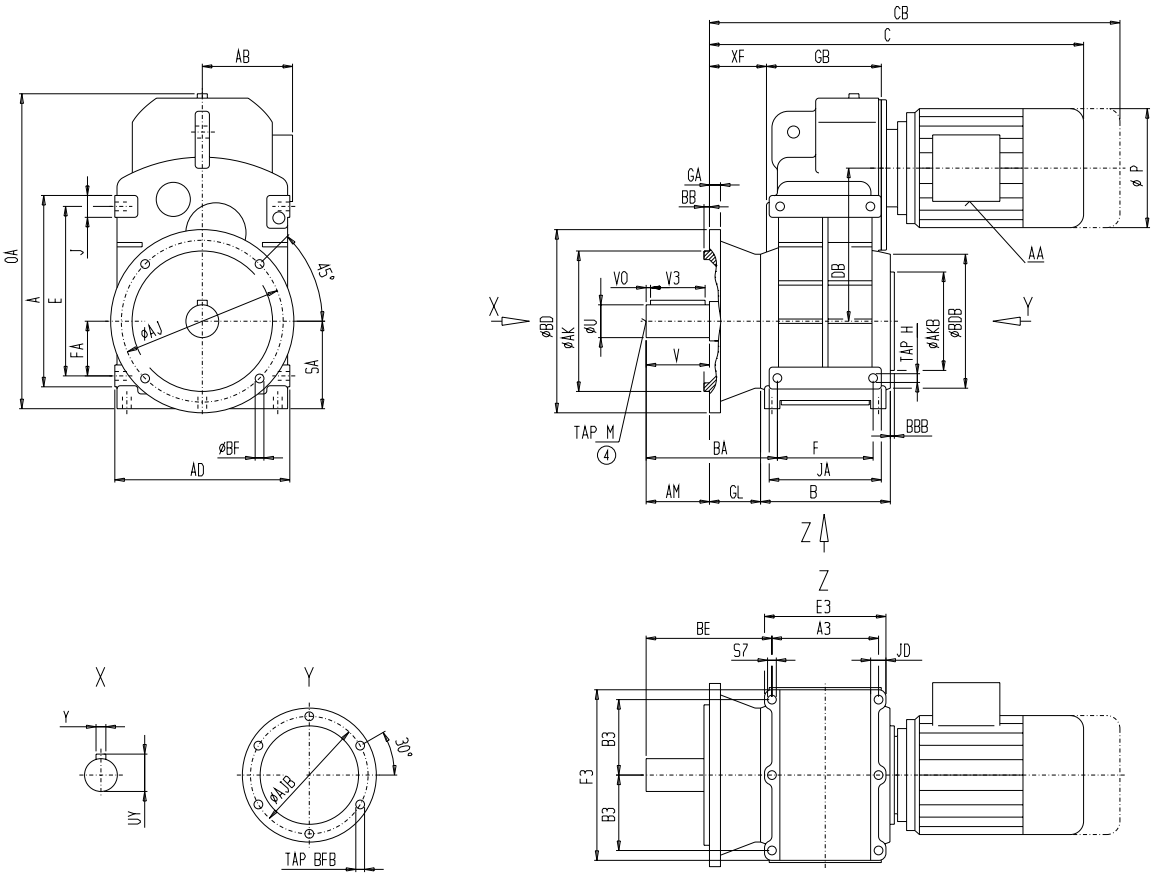
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF108B

FF 510
[inch]





Flange

BD	AK	GA	AJ	BB	BA	BF
13.78	9.84	0.71	11.81	0.2	7.62	0.69

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
2.375	4.72	4.25	0.002	3/4-10UNC	2.65	0.625	4.72

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
6.5	9.65	7.64	12.2	7.09	5.43	7.68	8.46	13.78	0.16	12.28	8.07	6.3

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
3.94	11.02	7.05	1.57	1.12	8.74	1.77	12.6	22.54	M16x22	M16x28	M16x22	1.99

Motor

	F.F108B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M80	19.84	22.01	6.22	4.98	2x1/2“	298
M90S	21.46	24.05	6.93	5.91	2x3/4“	307
M90L	21.46	24.05	6.93	5.91	2x3/4“	311
M100L	23.13	25.96	7.64	6.3	2x3/4“	324
M112M	25.04	28.23	8.58	6.59	2x3/4“	343
M132S	28.61	32.58	10.16	7.13	1“+3/4“	389
M132M	28.61	32.58	10.16	7.13	1“+3/4“	414
M160M	31.96	36.57	12.2	7.83	1“+3/4“	469
M160L	31.96	36.57	12.2	7.83	1“+3/4“	500
M180M	34.01	38.66	13.7	9.69	1 1/4“+3/4“	479
M180L	34.01	38.66	13.7	9.69	1 1/4“+3/4“	494

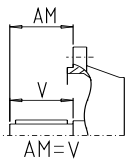
Tolerances see page 1 - 4

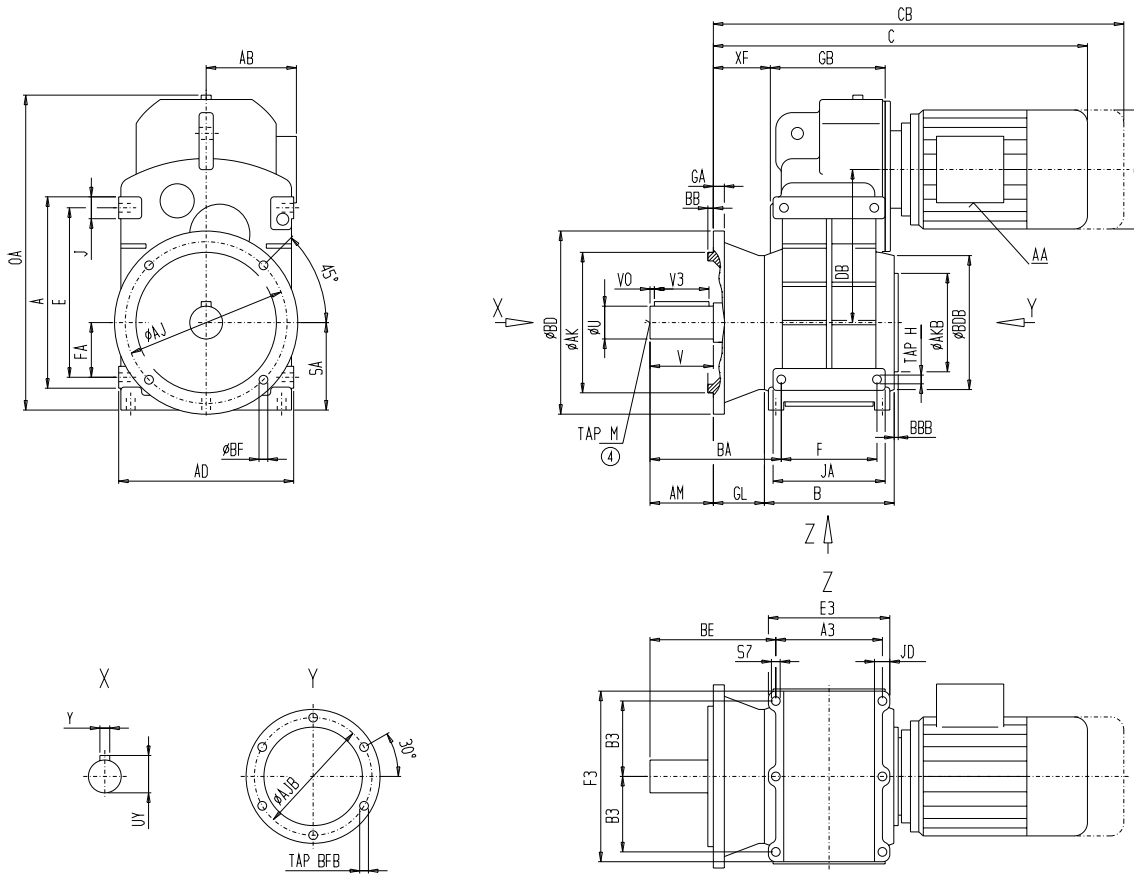
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF108B

FF 510
[mm]





Flange

BD	AK	GA	AJ	BB	BA	BF
350	*250*	*18*	*300*	*5*	*193,5*	*17,5*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
60,325	*120*	*107,95*	*0,051*	*3/4"-10UNC*	*67,31*	*15,875*	*120*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
165	*245*	*194*	*310*	*180*	*138*	*195*	*215*	*350*	*4*	*312*	*205*	*160*

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
100	*280*	*179*	*40*	*28,5*	*222*	*45*	*320*	*572,5*	*M16x22*	*M16x28*	*M16x22*	*50,5*

Motor

	F.F108B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M80	*505*	*560*	*158*	*126,5*	*2x1/2"*	*135*
M90S	*546*	*612*	*176*	*150*	*2x3/4"*	*139*
M90L	*546*	*612*	*176*	*150*	*2x3/4"*	*141*
M100L	*588,5*	*660,5*	*194*	*160*	*2x3/4"*	*147*
M112M	*637*	*718*	*218*	*167,5*	*2x3/4"*	*156*
M132S	*727,5*	*828,5*	*258*	*181*	*1"+3/4"*	*177*
M132M	*727,5*	*828,5*	*258*	*181*	*1"+3/4"*	*188*
M160M	*813*	*930*	*310*	*199*	*1"+3/4"*	*213*
M160L	*813*	*930*	*310*	*199*	*1"+3/4"*	*227*
M180M	*864*	*982*	*348*	*246*	*1 1/4"+3/4"*	*217*
M180L	*864*	*982*	*348*	*246*	*1 1/4"+3/4"*	*224*

Tolerances see page 1 - 4

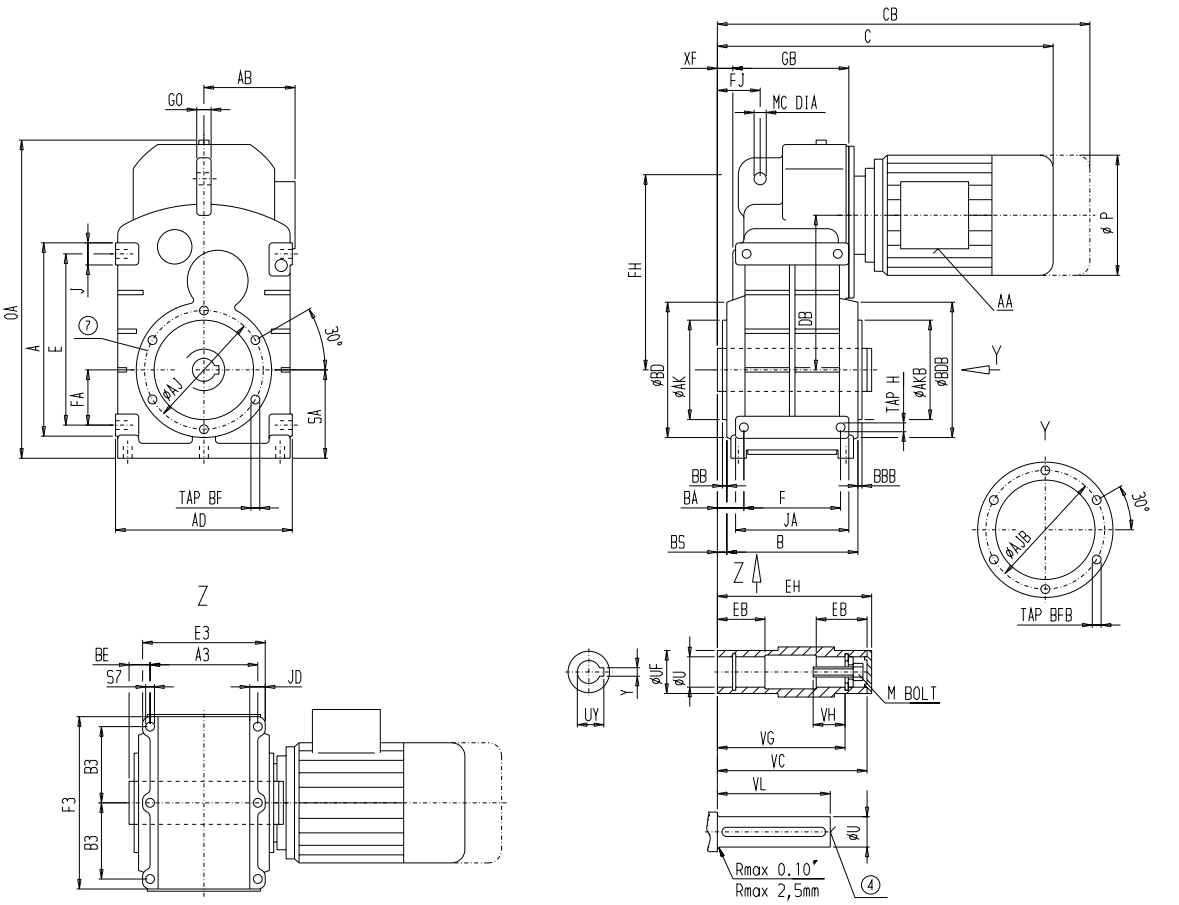
④ Tap specification see page 1 - 7

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA108B
FDAZ/FZAZ108B

FA 510
FAZ 510

[inch]



5

Mounting

AK	BD	AJ	BB	TAP BF
9.65	7.09	8.46	0.16	M16x28

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
2.375	3.74	9.45	8.189	2.37	7.28	3/4-10UNC	2.66	0.63	3.661	9.61

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
6.5	9.65	7.64	12.2	7.09	5.43	7.68	8.46	8.74	13.78	0.16	12.28	8.07	6.3	3.94	11.02

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
0.91	1.57	1.12	8.74	0.35	1.48	12.6	22.54	M16x22	M16x28	M16x22	0.57	2.44	13.62	0.87	1.02

Motor

	F.A.108B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M80	18.42	20.59	6.22	4.98	2x1/2“	243
M90S	20.04	22.63	6.93	5.91	2x3/4“	250
M90L	20.04	22.63	6.93	5.91	2x3/4“	254
M100L	21.71	24.54	7.64	6.3	2x3/4“	267
M112M	23.62	26.81	8.58	6.59	2x3/4“	286
M132S	27.19	31.16	10.16	7.13	1“+3/4“	333
M132M	27.19	31.16	10.16	7.13	1“+3/4“	357
M160M	30.55	35.16	12.2	7.83	1“+3/4“	412
M160L	30.55	35.16	12.2	7.83	1“+3/4“	443
M180M	32.56	37.2	13.7	9.69	1 1/4“+3/4“	479
M180L	32.56	37.2	13.7	9.69	1 1/4“+3/4“	494

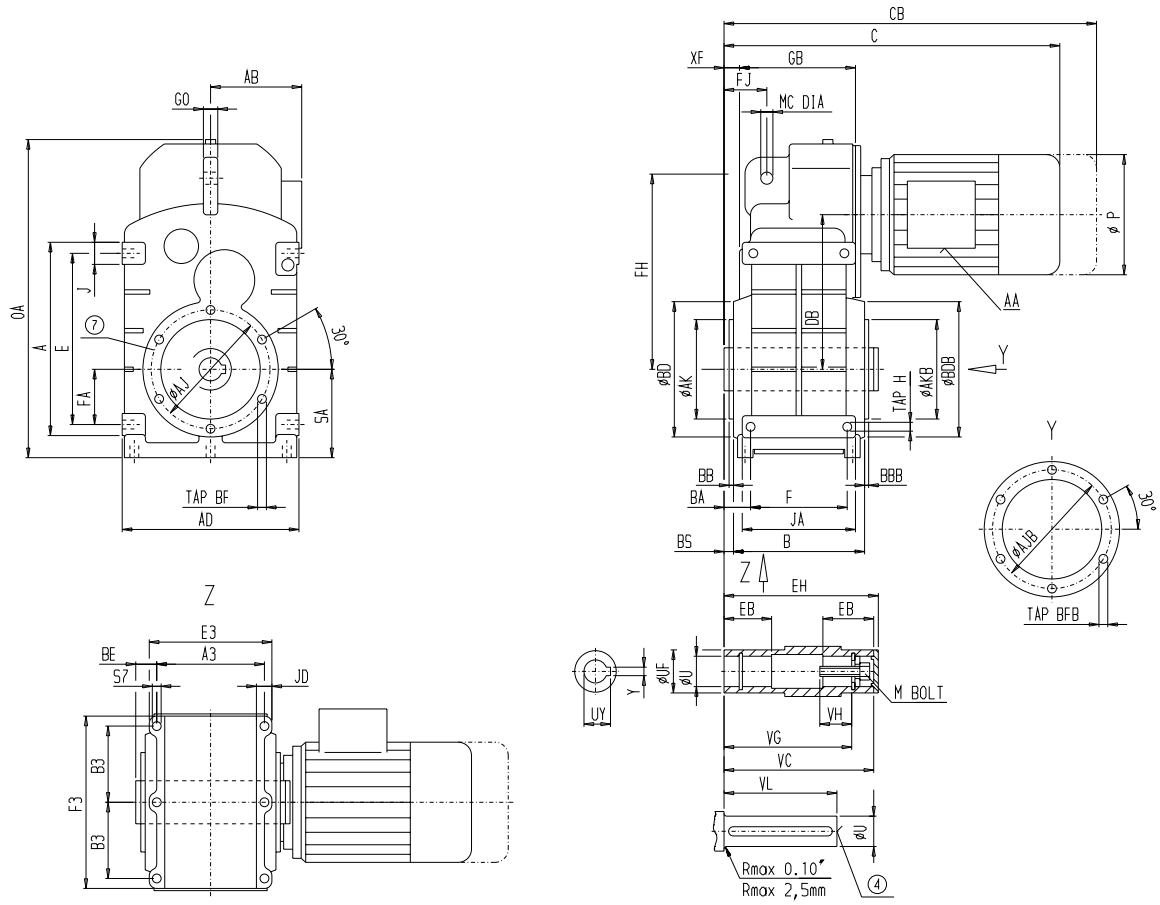
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA108B
FDAZ/FZAZ108B

FA 510
FAZ 510

[mm]



5

Mounting

BD	AK	AJ	BB	TAP BF
245	*180*	*215*	*4*	*M16x28*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
60,325	*95*	*240*	*208*	*60*	*185*	*3/4"-10UNC*	*67,56*	*16,002*	*93*	*244*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
165	*245*	*194*	*310*	*180*	*138*	*195*	*215*	*222*	*350*	*4*	*312*	*205*	*160*	*100*	*280*

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
23	*40*	*28,5*	*222*	*9*	*37,5*	*320*	*572,5*	*M16x22*	*M16x28*	*M16x22*	*14,5*	*62*	*346*	*22*	*26*

Motor

	F.A.108B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M80	*469*	*524*	*158*	*126,5*	*2x1/2"*	*109*
M90S	*510*	*576*	*176*	*150*	*2x3/4"*	*113*
M90L	*510*	*576*	*176*	*150*	*2x3/4"*	*115*
M100L	*552,5*	*624,5*	*194*	*160*	*2x3/4"*	*121*
M112M	*601*	*682*	*218*	*167,5*	*2x3/4"*	*130*
M132S	*691,5*	*792,5*	*258*	*181*	*1"+3/4"*	*151*
M132M	*691,5*	*792,5*	*258*	*181*	*1"+3/4"*	*162*
M160M	*777*	*894*	*310*	*199*	*1"+3/4"*	*187*
M160L	*777*	*894*	*310*	*199*	*1"+3/4"*	*201*
M180M	*828*	*946*	*348*	*246*	*1 1/4"+3/4"*	*217*
M180L	*828*	*946*	*348*	*246*	*1 1/4"+3/4"*	*224*

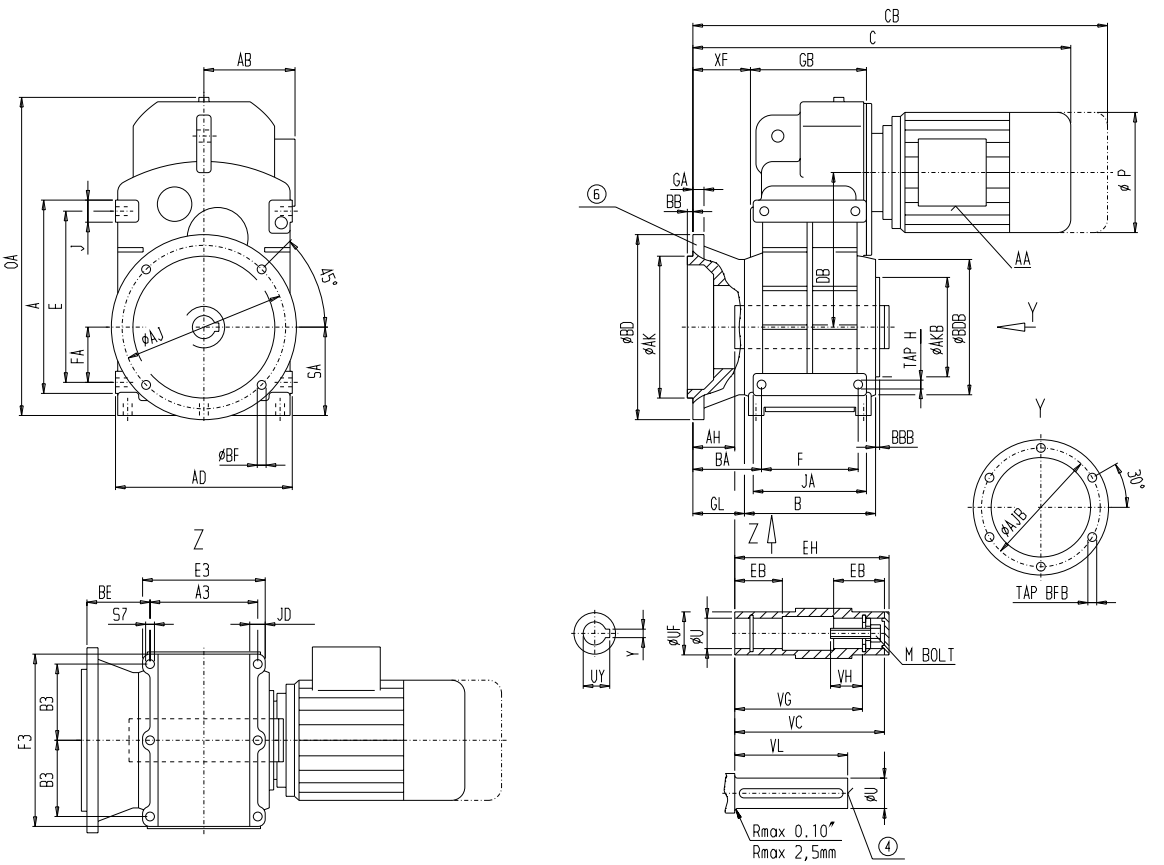
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF108B

FAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	AH	BF	BA
13.78	9.84	0.71	11.81	0.2	1.42	0.69	2.89

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
2.375	3.74	9.45	8.189	2.37	7.28	3/4-10UNC	2.66	0.63	3.661	9.61

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
6.5	9.65	7.64	12.2	7.09	5.43	7.68	8.46	8.74	13.78	0.16	12.28	8.07

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
6.3	3.94	11.02	2.32	1.57	1.12	8.74	1.77	12.6	22.54	M16x22	M16x28	M16x22	1.99

Motor

	F.AF108B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [lb]
M80	19.84	22.01	6.22	4.98	2x1/2“	270
M90S	21.46	24.05	6.93	5.91	2x3/4“	279
M90L	21.46	24.05	6.93	5.91	2x3/4“	283
M100L	23.13	25.96	7.64	6.3	2x3/4“	296
M112M	25.04	28.23	8.58	6.59	2x3/4“	315
M132S	28.61	32.58	10.16	7.13	1“+3/4“	361
M132M	28.61	32.58	10.16	7.13	1“+3/4“	385
M160M	31.96	36.57	12.2	7.83	1“+3/4“	441
M160L	31.96	36.57	12.2	7.83	1“+3/4“	471
M180M	33.98	38.62	13.7	9.69	1 1/4“+3/4“	508
M180L	33.98	38.62	13.7	9.69	1 1/4“+3/4“	523

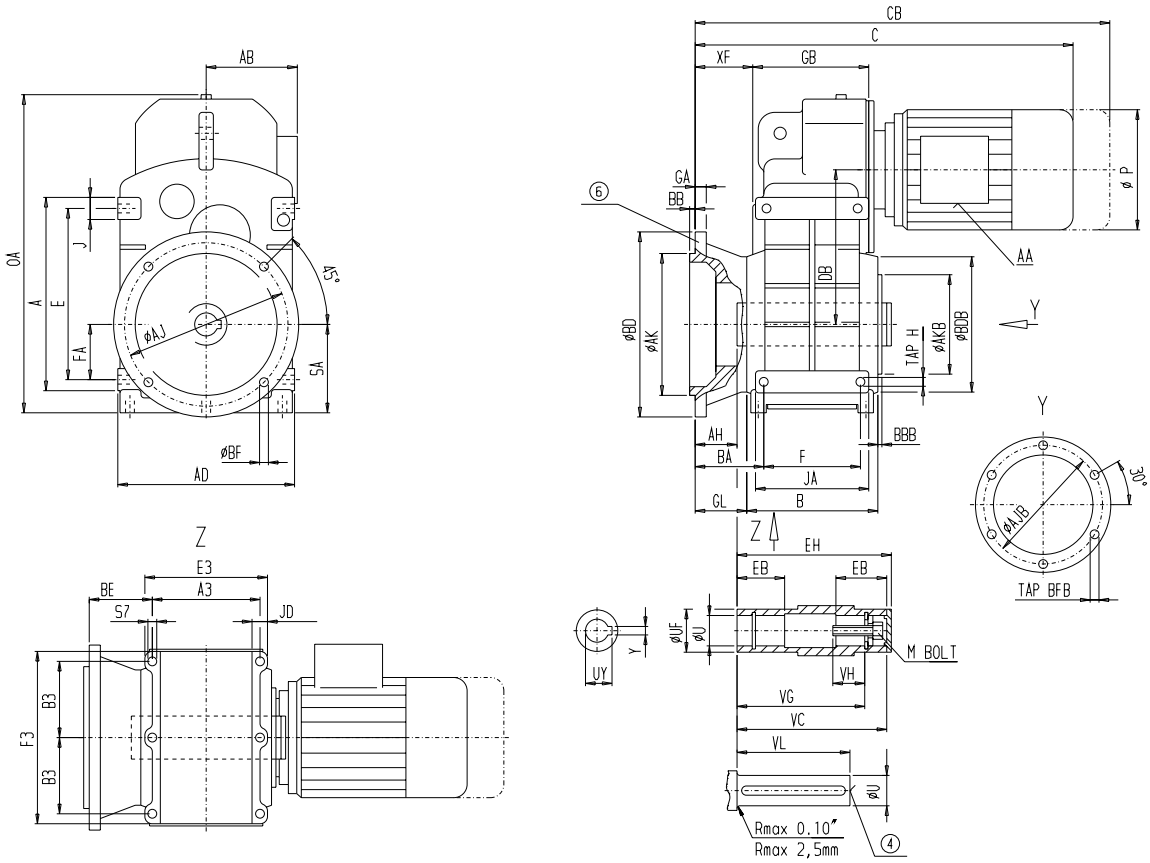
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF108B

FAF 510

[mm]



Flange

BD	AK	GA	AJ	BB	AH	BA	BF
350	*250*	*18*	*300*	*5*	*36*	*73,5*	*17,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
60,325	*95*	*240*	*208*	*60*	*185*	*3/4"-10UNC*	*67,56*	*16,002*	*93*	*244*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
165	*245*	*194*	*310*	*180*	*138*	*195*	*215*	*222*	*350*	*4*	*312*	*205*

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
160	*100*	*280*	*59*	*40*	*28,5*	*222*	*45*	*320*	*572,5*	*M16x22*	*M16x28*	*M16x22*	*50,5*

Motor

	F.AF108B					
Motor	**C**	**CB**	**P**	**AB**	**AA**	**Weight** [*kg*]
M80	*505*	*560*	*158*	*126,5*	*2x1/2"*	*122*
M90S	*546*	*612*	*176*	*150*	*2x3/4"*	*126*
M90L	*546*	*612*	*176*	*150*	*2x3/4"*	*128*
M100L	*588,5*	*660,5*	*194*	*160*	*2x3/4"*	*134*
M112M	*637*	*718*	*218*	*167,5*	*2x3/4"*	*143*
M132S	*727,5*	*828,5*	*258*	*181*	*1"+3/4"*	*164*
M132M	*727,5*	*828,5*	*258*	*181*	*1"+3/4"*	*175*
M160M	*813*	*930*	*310*	*199*	*1"+3/4"*	*200*
M160L	*813*	*930*	*310*	*199*	*1"+3/4"*	*214*
M180M	*864*	*982*	*348*	*246*	*1 1/4"+3/4"*	*230*
M180L	*864*	*982*	*348*	*246*	*1 1/4"+3/4"*	*237*

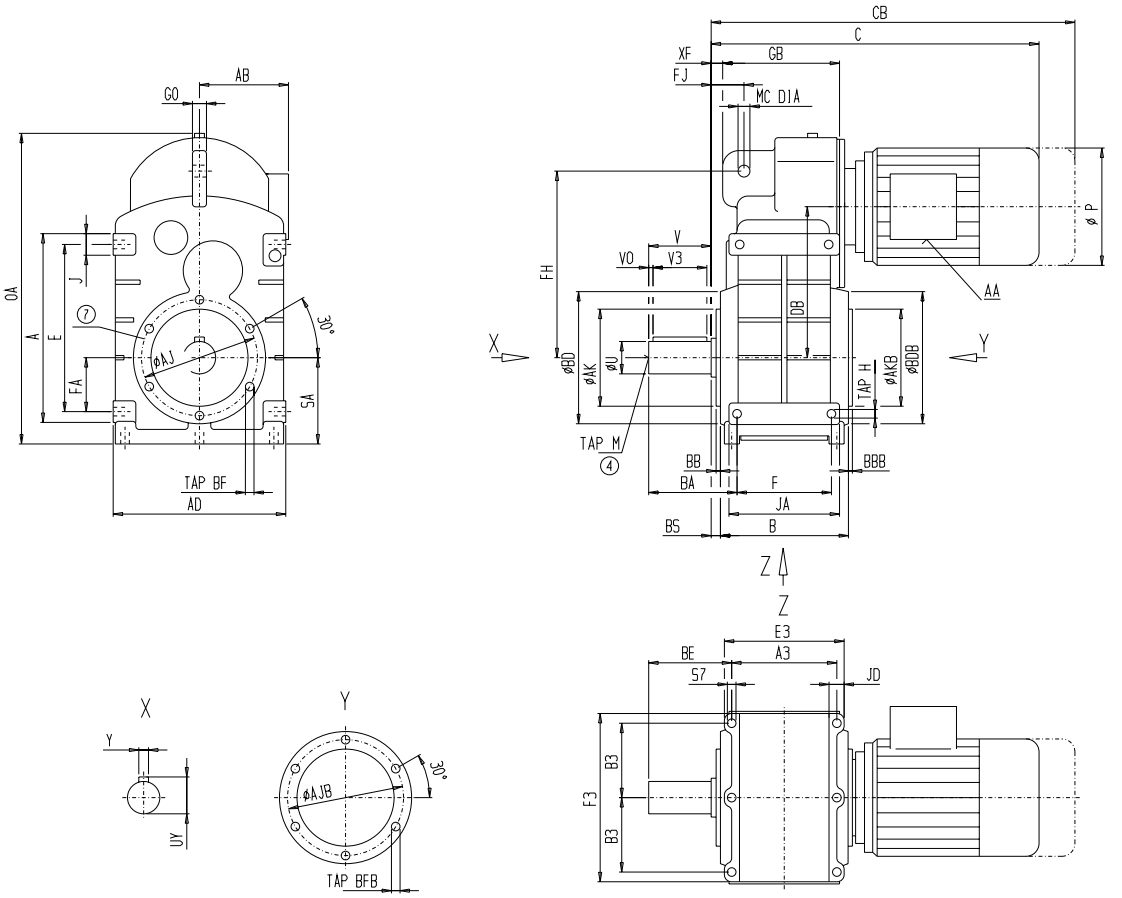
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ128B

FZ 510

[inch]



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Mounting

BD	AK	AJ	BB	TAP BF
11.81	9.06	10.43	0.16	M16x28

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
2.875	5.51	4.875	0.046	3/4-10UNC	3.2	0.75	7.38

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
8.07	11.81	8.86	13.78	9.06	6.5	9.65	10.43	10.43	15.75	0.16	15.35	10.67	7.09	4.72

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
11.85	6.99	1.97	1.56	11.1	0.35	15.75	26.44	M20x27	M16x28	M20x27	0.63	2.76	15.55	1.02	1.18

Motor

	F.Z128B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M90S	22.25	24.84	6.93	5.91	5.91	2x3/4“	455
M90L	22.25	24.84	6.93	5.91	5.91	2x3/4“	460
M100L	23.9	26.73	7.64	6.3	6.3	2x3/4“	473
M112M	25.83	29.02	8.58	6.59	6.59	2x3/4“	491
M132S	29.36	33.33	10.16	7.13	7.13	1“+3/4“	535
M132M	29.36	33.33	10.16	7.13	7.13	1“+3/4“	559
M160M	32.75	37.36	12.2	7.83	7.83	1“+3/4“	614
M160L	32.75	37.36	12.2	7.83	7.83	1“+3/4“	645
M180M	34.72	39.37	13.7	9.69	9.69	1 1/4“+3/4“	690
M180L	34.72	39.37	13.7	9.69	9.69	1 1/4“+3/4“	706
M200L	35.71	40.83	15.16	10.24	10.24	1 1/4“+3/4“	814
LG225S incl. adapter	46.52	on request	17.4	12.8	on request	2x1 1/2“	1230
LG225ZM incl. adapter	47.7	on request	17.4	12.8	on request	2x1 1/2“	1318

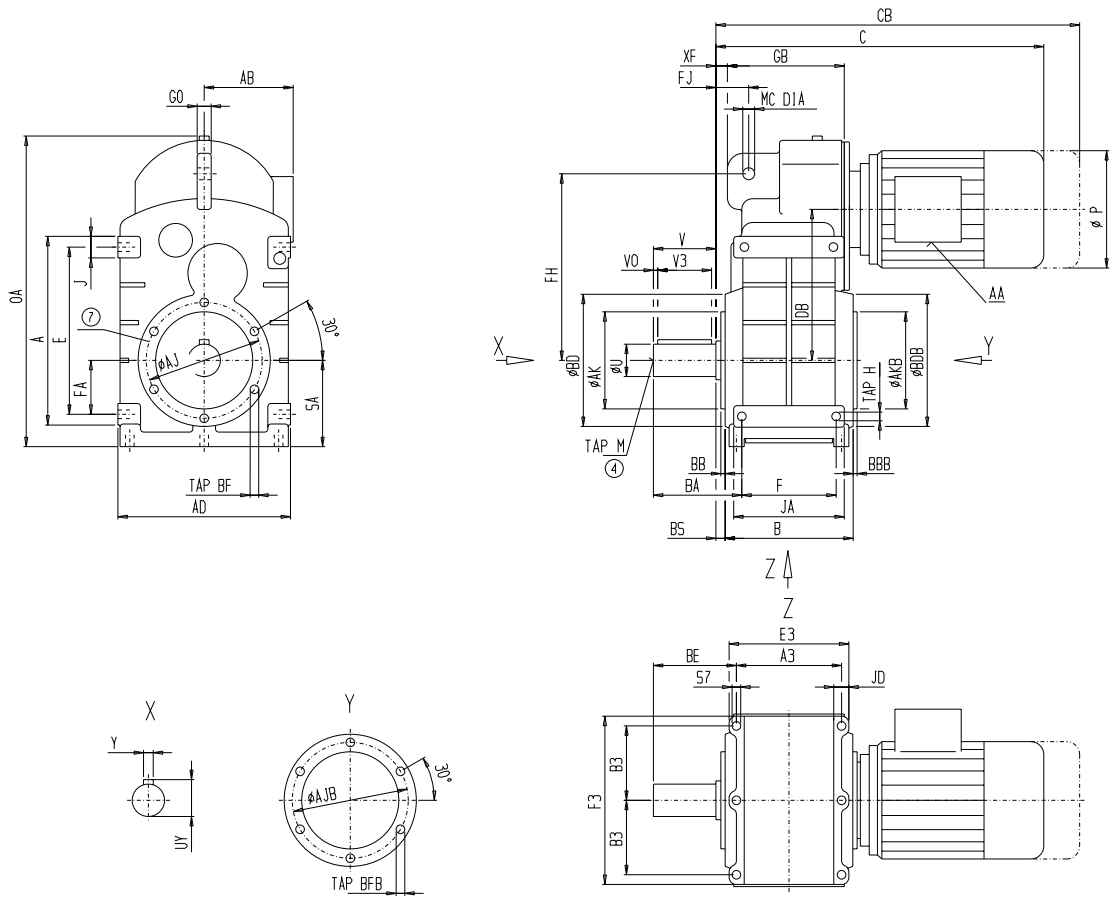
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ128B

FZ 510

[mm]



Mounting

BD	AK	AJ	BB	TAP BF
300	*230*	*265*	*4*	*M16x28*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
73,025	*140*	*123,825*	*1,168*	*3/4"-10UNC*	*81,28*	*19,05*	*187,5*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
205	*300*	*225*	*350*	*230*	*165*	*245*	*265*	*265*	*400*	*4*	*390*	*271*	*180*	*120*

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
301	*177,5*	*50*	*39,5*	*282*	*9*	*400*	*671,5*	*M20x27*	*M16x28*	*M20x27*	*16*	*70*	*395*	*26*	*30*

Motor

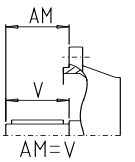
	F.Z128B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M90S	*566*	*632*	*176*	*150*	*150*	*2x3/4"*	*206*
M90L	*566*	*632*	*176*	*150*	*150*	*2x3/4"*	*208*
M100L	*608*	*680*	*194*	*160*	*160*	*2x3/4"*	*214*
M112M	*657*	*738*	*218*	*167,5*	*167,5*	*2x3/4"*	*223*
M132S	*746,5*	*847,5*	*258*	*181*	*181*	*1"+3/4"*	*243*
M132M	*746,5*	*847,5*	*258*	*181*	*181*	*1"+3/4"*	*254*
M160M	*833*	*950*	*310*	*199*	*199*	*1"+3/4"*	*278*
M160L	*833*	*950*	*310*	*199*	*199*	*1"+3/4"*	*292*
M180M	*883*	*1001*	*348*	*246*	*246*	*1 1/4"+3/4"*	*313*
M180L	*883*	*1001*	*348*	*246*	*246*	*1 1/4"+3/4"*	*320*
M200L	*908*	*1038*	*385*	*260*	*260*	*1 1/4"+3/4"*	*369*
LG225S incl. adapter	*1181,5*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*558*
LG225ZM incl. adapter	*1211,5*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*599*

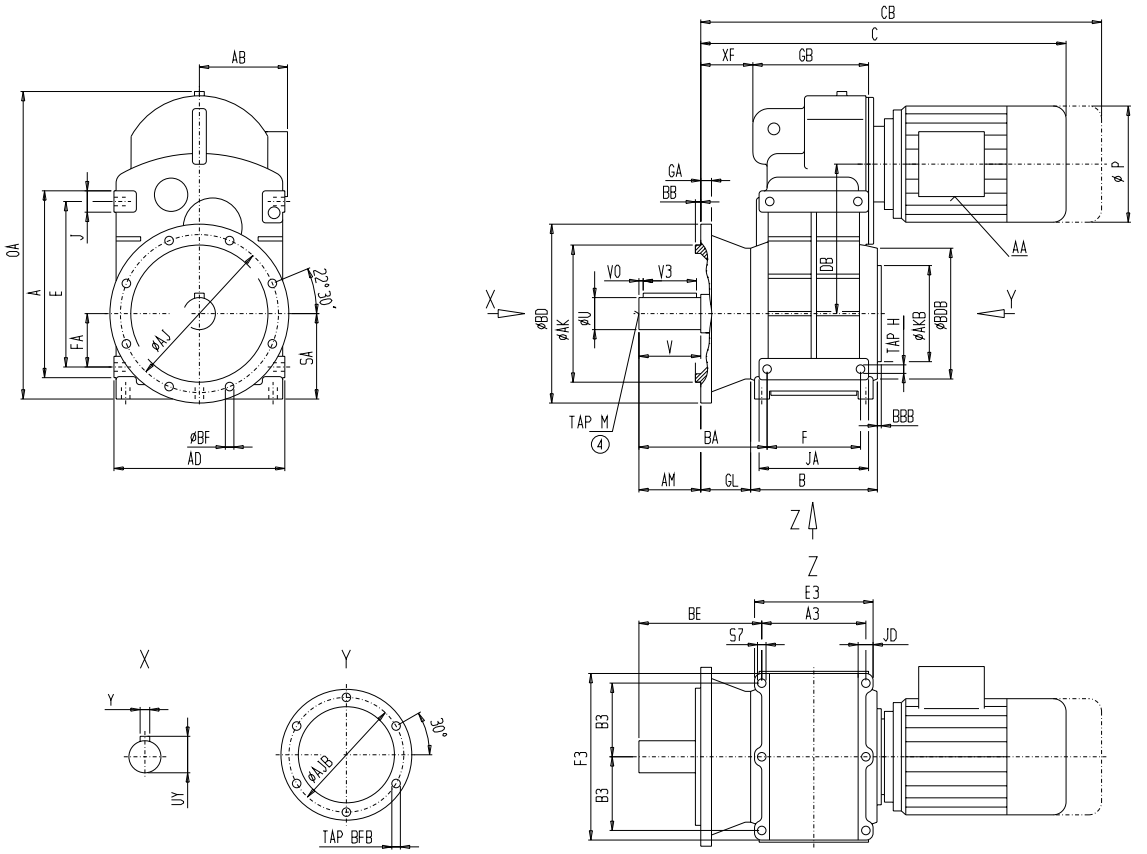
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF128B

FF 510
[inch]





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Flange

BD	AK	GA	AJ	BB	BA	BF
17.72	13.78	0.87	15.75	0.2	9.02	0.69

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
2.875	5.51	4.875	0.046	3/4-10UNC	3.2	0.75	5.51

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
8.07	11.81	8.86	13.78	9.06	6.5	9.65	10.43	15.75	0.16	15.35	10.67	7.09

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
4.72	11.85	8.62	1.97	1.56	11.1	1.99	15.75	26.44	M20x27	M16x28	M20x27	2.26

Motor

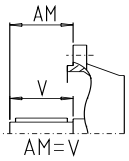
	F.F128B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M90S	23.88	26.47	6.93	5.91	5.91	2x3/4“	499
M90L	23.88	26.47	6.93	5.91	5.91	2x3/4“	504
M100L	25.53	28.36	7.64	6.3	6.3	2x3/4“	517
M112M	27.46	30.65	8.58	6.59	6.59	2x3/4“	535
M132S	30.99	34.96	10.16	7.13	7.13	1“+3/4“	579
M132M	30.99	34.96	10.16	7.13	7.13	1“+3/4“	603
M160M	34.38	38.99	12.2	7.83	7.83	1“+3/4“	658
M160L	34.38	38.99	12.2	7.83	7.83	1“+3/4“	689
M180M	36.35	41	13.7	9.69	9.69	1 1/4“+3/4“	734
M180L	36.35	41	13.7	9.69	9.69	1 1/4“+3/4“	750
M200L	37.34	42.46	15.16	10.24	10.24	1 1/4“+3/4“	858
LG225S incl. adapter	48.15	on request	17.4	12.8	on request	2x1 1/2“	1230
LG225ZM incl. adapter	49.33	on request	17.4	12.8	on request	2x1 1/2“	1318

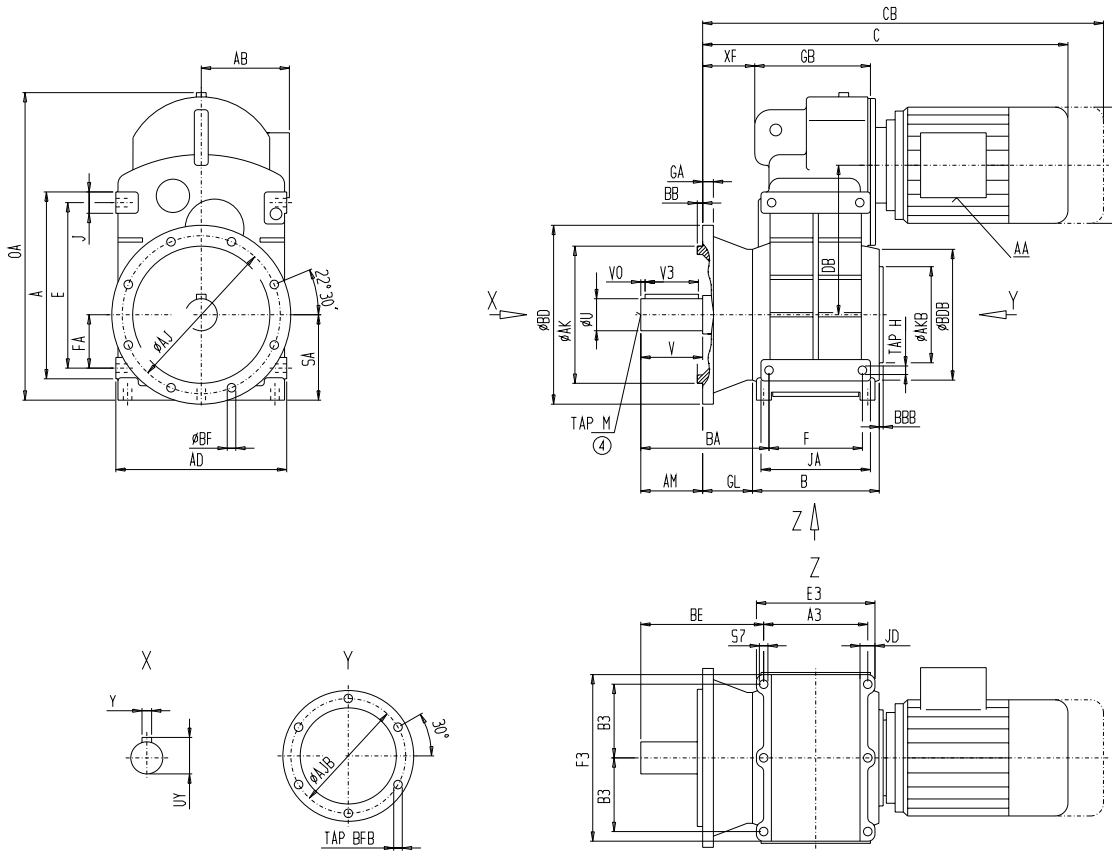
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF128B

FF 510
[mm]





Flange

BD	AK	GA	AJ	BB	BA	BF
450	*350*	*22*	*400*	*5*	*229*	*17,5*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
73,025	*140*	*123,825*	*1,168*	*3/4"-10UNC*	*81,28*	*19,05*	*140*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
205	*300*	*225*	*350*	*230*	*165*	*245*	*265*	*400*	*4*	*390*	*271*	*180*

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
120	*301*	*219*	*50*	*39,5*	*282*	*50,5*	*400*	*671,5*	*M20x27*	*M16x28*	*M20x27*	*57,5*

Motor

	F.F128B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M90S	*607,5*	*673,5*	*176*	*150*	*150*	*2x3/4"*	*226*
M90L	*607,5*	*673,5*	*176*	*150*	*150*	*2x3/4"*	*228*
M100L	*649,5*	*721,5*	*194*	*160*	*160*	*2x3/4"*	*234*
M112M	*698,5*	*779,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*243*
M132S	*788*	*889*	*258*	*181*	*181*	*1"+3/4"*	*263*
M132M	*788*	*889*	*258*	*181*	*181*	*1"+3/4"*	*274*
M160M	*874,5*	*991,5*	*310*	*199*	*199*	*1"+3/4"*	*298*
M160L	*874,5*	*991,5*	*310*	*199*	*199*	*1"+3/4"*	*312*
M180M	*924,5*	*1042,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*333*
M180L	*924,5*	*1042,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*340*
M200L	*949,5*	*1079,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*389*
LG225S incl. adapter	*1223*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*558*
LG225ZM incl. adapter	*1253*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*599*

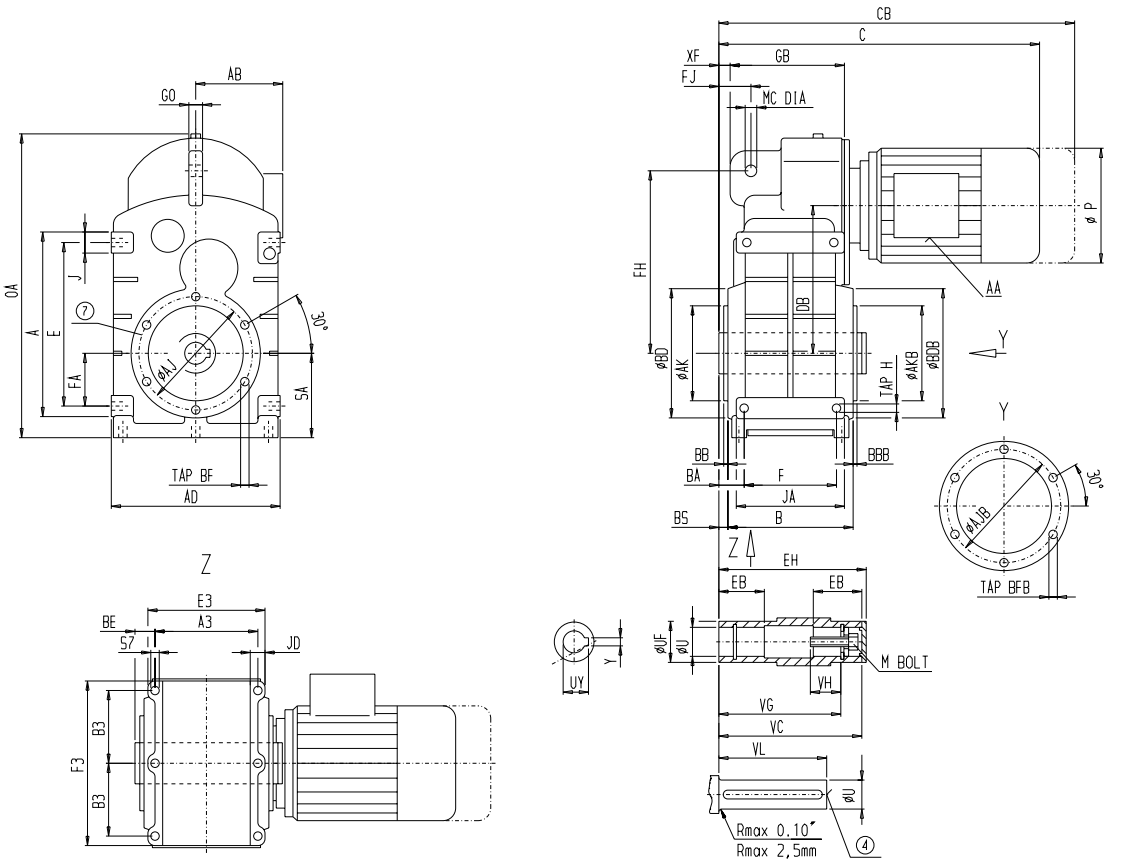
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA128B
FDAZ/FZAZ128B

FA 510
FAZ 510

[inch]



5

Mounting

AK	BD	AJ	BB	TAP BF
11.81	9.06	10.43	0.16	M16x28

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
2.75	4.331	11.81	10.354	2.35	9.45	3/4-10UNC	3.04	0.63	4.843	11.97

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
8.07	11.81	8.86	13.78	9.06	6.5	9.65	10.43	10.43	15.75	0.16	15.35	10.67	7.09	4.72	11.85

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
1.48	1.97	1.56	11.1	0.35	1.87	15.75	26.44	M20x27	M16x28	M20x27	0.63	2.76	15.55	1.02	1.18

Motor

	F.A.128B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M90S	22.25	24.84	6.93	5.91	5.91	2x3/4“	412
M90L	22.25	24.84	6.93	5.91	5.91	2x3/4“	416
M100L	23.9	26.73	7.64	6.3	6.3	2x3/4“	429
M112M	25.83	29.02	8.58	6.59	6.59	2x3/4“	447
M132S	29.36	33.33	10.16	7.13	7.13	1“+3/4“	492
M132M	29.36	33.33	10.16	7.13	7.13	1“+3/4“	516
M160M	32.75	37.36	12.2	7.83	7.83	1“+3/4“	571
M160L	32.75	37.36	12.2	7.83	7.83	1“+3/4“	601
M180M	34.72	39.37	13.7	9.69	9.69	1 1/4“+3/4“	647
M180L	34.72	39.37	13.7	9.69	9.69	1 1/4“+3/4“	662
M200L	35.71	40.83	15.16	10.24	10.24	1 1/4“+3/4“	770
LG225S incl. adapter	46.52	on request	17.4	12.8	on request	2x1 1/2“	1230
LG225ZM incl. adapter	47.7	on request	17.4	12.8	on request	2x1 1/2“	1318

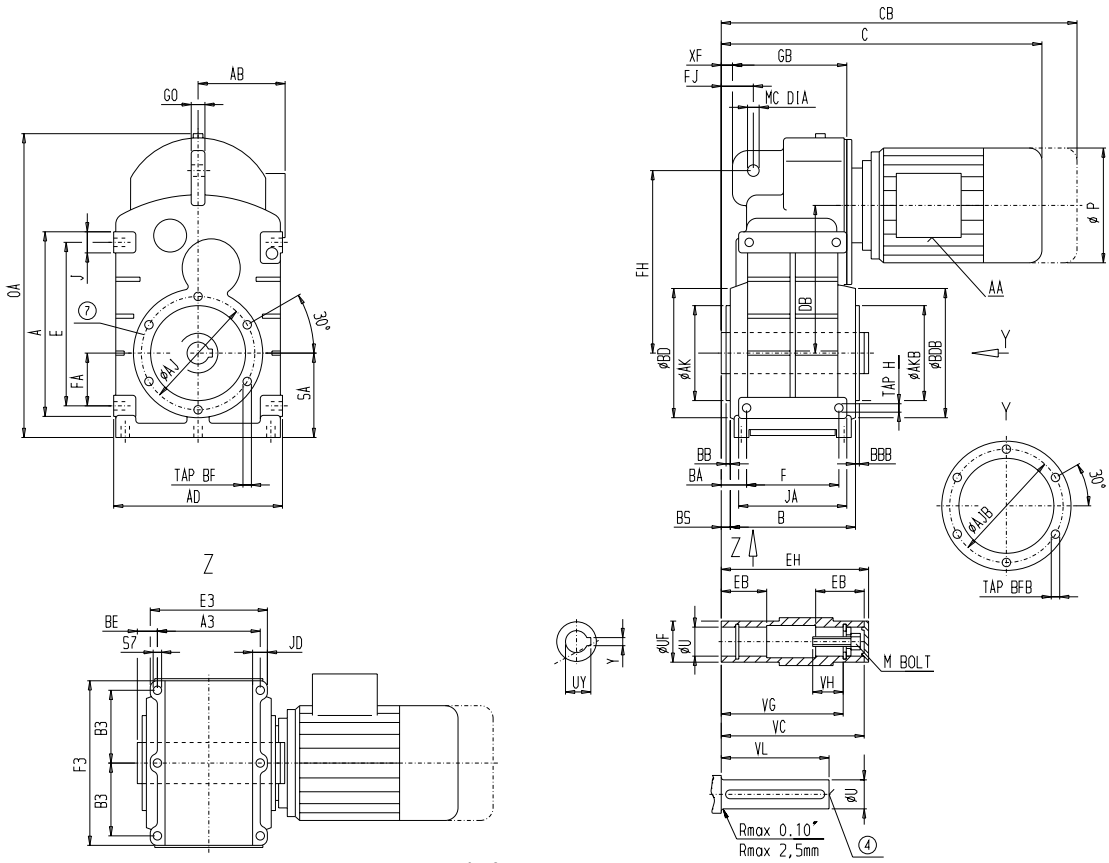
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA128B
FDAZ/FZAZ128B

FA 510
FAZ 510

[mm]



Mounting

BD	AK	AJ	BB	TAP BF
300	*230*	*265*	*4*	*M16x28*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
69,85	*110*	*300*	*263*	*60*	*240*	*3/4"-10UNC*	*77,22*	*16,002*	*123*	*304*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
205	*300*	*225*	*350*	*230*	*165*	*245*	*265*	*265*	*400*	*4*	*390*	*271*	*180*	*120*	*301*

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
37,5	*50*	*39,5*	*282*	*9*	*47,5*	*400*	*671,5*	*M20x27*	*M16x28*	*M20x27*	*16*	*70*	*395*	*26*	*30*

Motor

	F.A.128B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M90S	*566*	*632*	*176*	*150*	*150*	*2x3/4"*	*187*
M90L	*566*	*632*	*176*	*150*	*150*	*2x3/4"*	*189*
M100L	*608*	*680*	*194*	*160*	*160*	*2x3/4"*	*195*
M112M	*657*	*738*	*218*	*167,5*	*167,5*	*2x3/4"*	*203*
M132S	*746,5*	*847,5*	*258*	*181*	*181*	*1"+3/4"*	*223*
M132M	*746,5*	*847,5*	*258*	*181*	*181*	*1"+3/4"*	*234*
M160M	*833*	*950*	*310*	*199*	*199*	*1"+3/4"*	*259*
M160L	*833*	*950*	*310*	*199*	*199*	*1"+3/4"*	*273*
M180M	*883*	*1001*	*348*	*246*	*246*	*1 1/4"+3/4"*	*293*
M180L	*883*	*1001*	*348*	*246*	*246*	*1 1/4"+3/4"*	*300*
M200L	*908*	*1038*	*385*	*260*	*260*	*1 1/4"+3/4"*	*349*
LG225S incl. adapter	*1181,5*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*558*
LG225ZM incl. adapter	*1211,5*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*599*

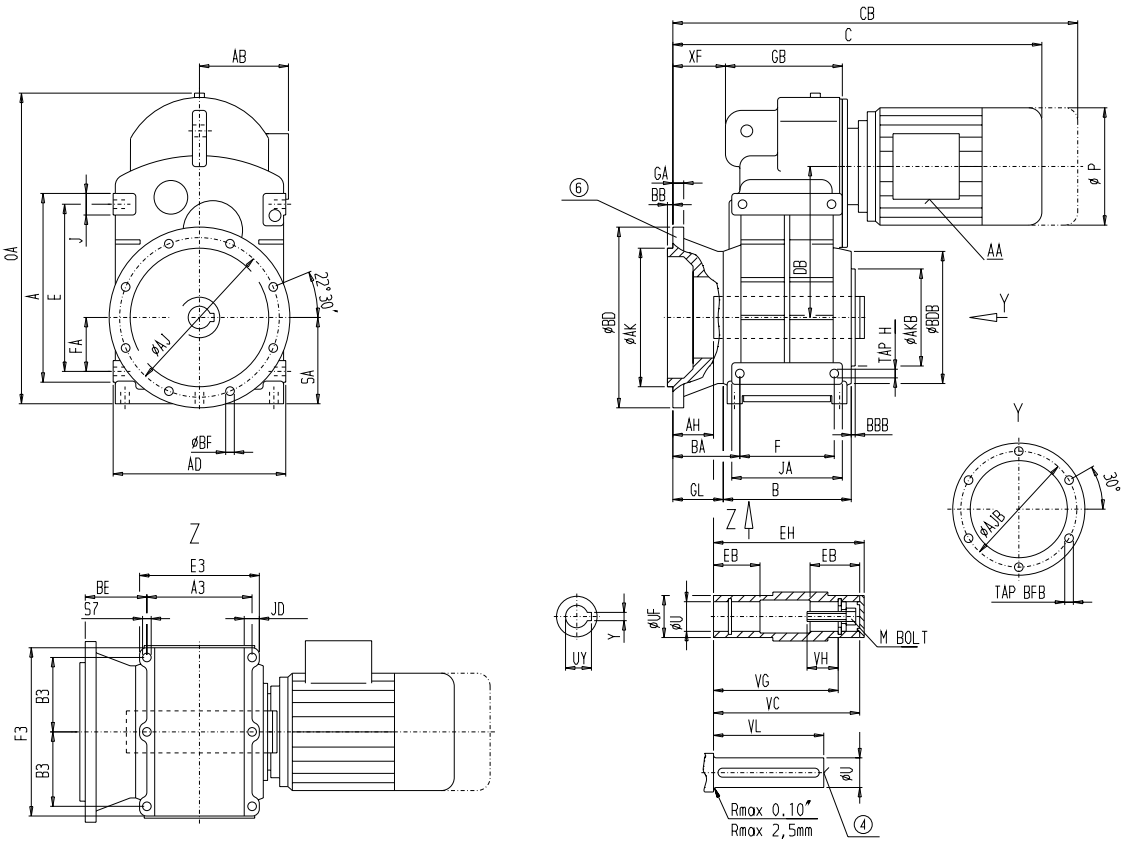
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF128B

FAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	AH	BF	BA
17.72	13.78	0.87	15.75	0.2	1.63	0.69	3.5

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
2.75	4.331	11.81	10.354	2.35	9.45	3/4-10UNC	3.04	0.63	4.843	11.97

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
8.07	11.81	8.86	13.78	9.06	6.5	9.65	10.43	10.43	15.75	0.16	15.35	10.67

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
7.09	4.72	11.85	3.11	1.97	1.56	11.1	1.99	15.75	26.44	M20x27	M16x28	M20x27	2.26

Motor

	F.AF128B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M90S	23.88	26.47	6.93	5.91	5.91	2x3/4“	456
M90L	23.88	26.47	6.93	5.91	5.91	2x3/4“	460
M100L	25.53	28.36	7.64	6.3	6.3	2x3/4“	473
M112M	27.46	30.65	8.58	6.59	6.59	2x3/4“	491
M132S	30.99	34.96	10.16	7.13	7.13	1“+3/4“	536
M132M	30.99	34.96	10.16	7.13	7.13	1“+3/4“	560
M160M	34.38	38.99	12.2	7.83	7.83	1“+3/4“	615
M160L	34.38	38.99	12.2	7.83	7.83	1“+3/4“	646
M180M	36.35	41	13.7	9.69	9.69	1 1/4“+3/4“	691
M180L	36.35	41	13.7	9.69	9.69	1 1/4“+3/4“	706
M200L	37.34	42.46	15.16	10.24	10.24	1 1/4“+3/4“	814
LG225S incl. adapter	48.15	on request	17.4	12.8	on request	2x1 1/2“	1230
LG225ZM incl. adapter	49.33	on request	17.4	12.8	on request	2x1 1/2“	1318

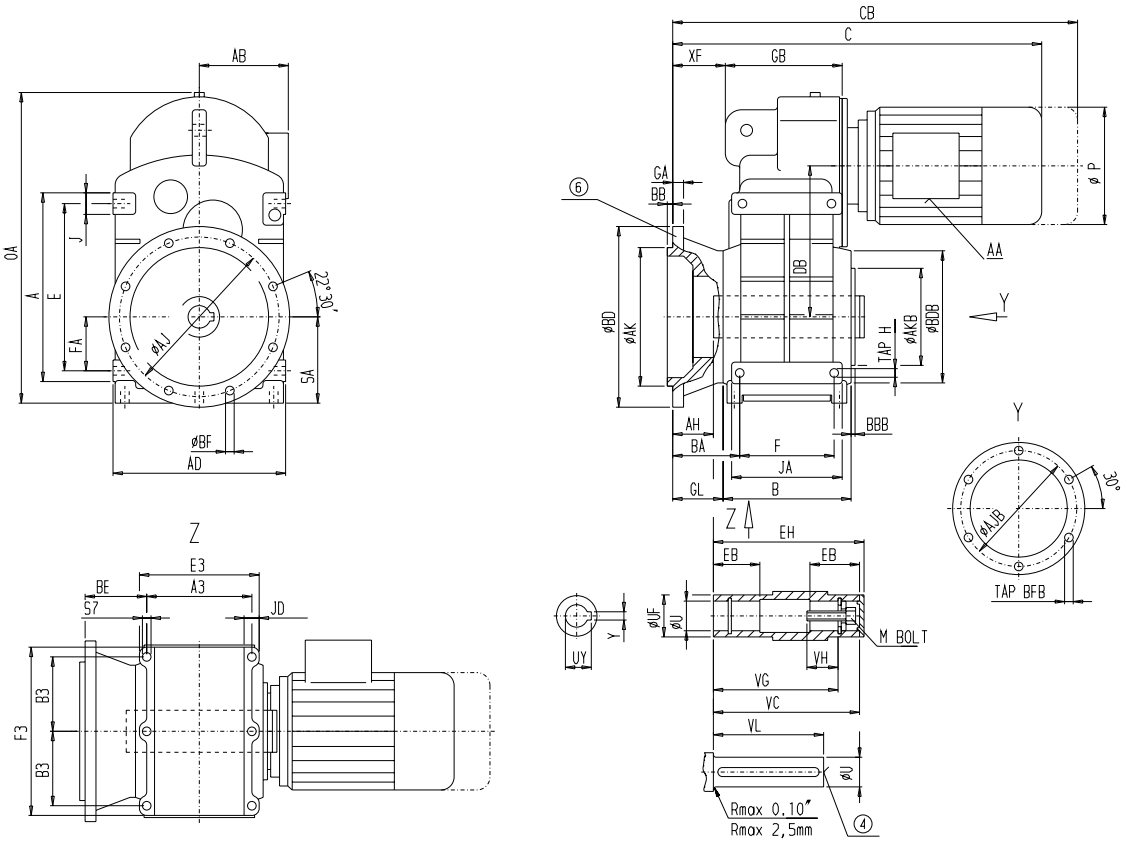
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF128B

FAF 510

[mm]



Flange

BD	AK	GA	AJ	BB	AH	BA	BF
450	*350*	*22*	*400*	*5*	*41,5*	*89*	*17,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
69,85	*110*	*300*	*263*	*60*	*240*	*3/4"-10UNC*	*77,22*	*16,002*	*123*	*304*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
205	*300*	*225*	*350*	*230*	*165*	*245*	*265*	*265*	*400*	*4*	*390*	*271*

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
180	*120*	*301*	*79*	*50*	*39,5*	*282*	*50,5*	*400*	*671,5*	*M20x27*	*M16x28*	*M20x27*	*57,5*

Motor

	F.AF128B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M90S	*607,5*	*673,5*	*176*	*150*	*150*	*2x3/4"*	*207*
M90L	*607,5*	*673,5*	*176*	*150*	*150*	*2x3/4"*	*209*
M100L	*649,5*	*721,5*	*194*	*160*	*160*	*2x3/4"*	*215*
M112M	*698,5*	*779,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*223*
M132S	*788*	*889*	*258*	*181*	*181*	*1"+3/4"*	*243*
M132M	*788*	*889*	*258*	*181*	*181*	*1"+3/4"*	*254*
M160M	*874,5*	*991,5*	*310*	*199*	*199*	*1"+3/4"*	*279*
M160L	*874,5*	*991,5*	*310*	*199*	*199*	*1"+3/4"*	*293*
M180M	*924,5*	*1042,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*313*
M180L	*924,5*	*1042,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*320*
M200L	*949,5*	*1079,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*369*
LG225S incl. adapter	*1223*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*558*
LG225ZM incl. adapter	*1253*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*599*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67 ** for voltage ratio 1:2

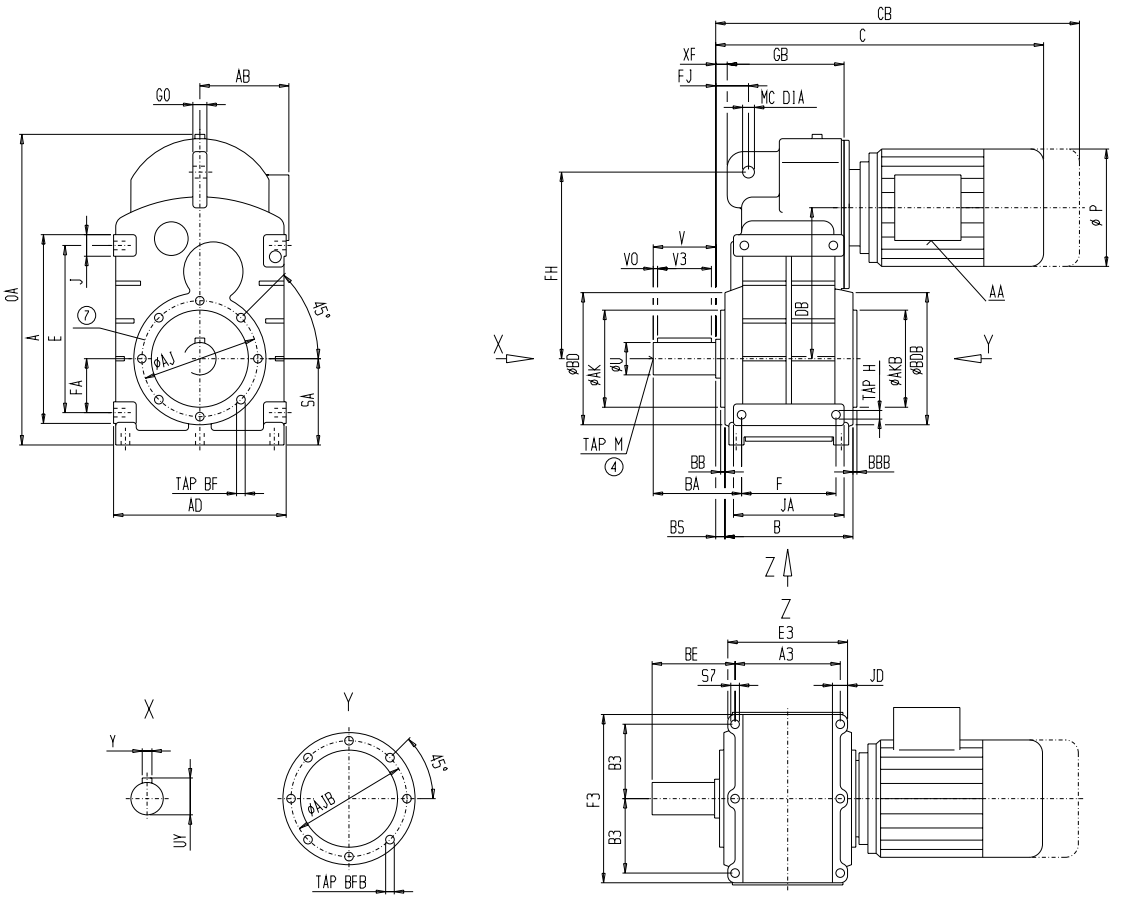
5

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ148B

FZ 510

[inch]



5

Mounting

BD	AK	AJ	BB	TAP BF
13.19	9.84	11.81	0.2	M20x34

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
3.625	6.69	5.5	0.602	1-8UNC	4.01	0.875	9.25

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
8.66	13.19	10.31	15.75	9.84	7.48	10.24	11.81	11.89	18.11	0.2	16.93	11.73	8.35	4.92

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
13.82	8.43	2.36	1.57	12.91	0.43	17.72	30.73	M24x32	M20x34	M24x32	1.46	3.46	19.09	1.02	1.42

Motor

	F.Z148B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M100L	25.42	28.25	7.64	6.3	6.3	2x3/4“	686
M112M	27.3	30.49	8.58	6.59	6.59	2x3/4“	703
M132S	30.83	34.8	10.16	7.13	7.13	1“+3/4“	744
M132M	30.83	34.8	10.16	7.13	7.13	1“+3/4“	769
M160M	33.99	38.6	12.2	7.83	7.83	1“+3/4“	834
M160L	33.99	38.6	12.2	7.83	7.83	1“+3/4“	865
M180M	36.08	40.73	13.7	9.69	9.69	1 1/4“+3/4“	898
M180L	36.08	40.73	13.7	9.69	9.69	1 1/4“+3/4“	913
M200L	37.07	42.19	15.16	10.24	10.24	1 1/4“+3/4“	1021
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl. adapter	51.71	on request	19.49	15.43	on request	2x2“	2111

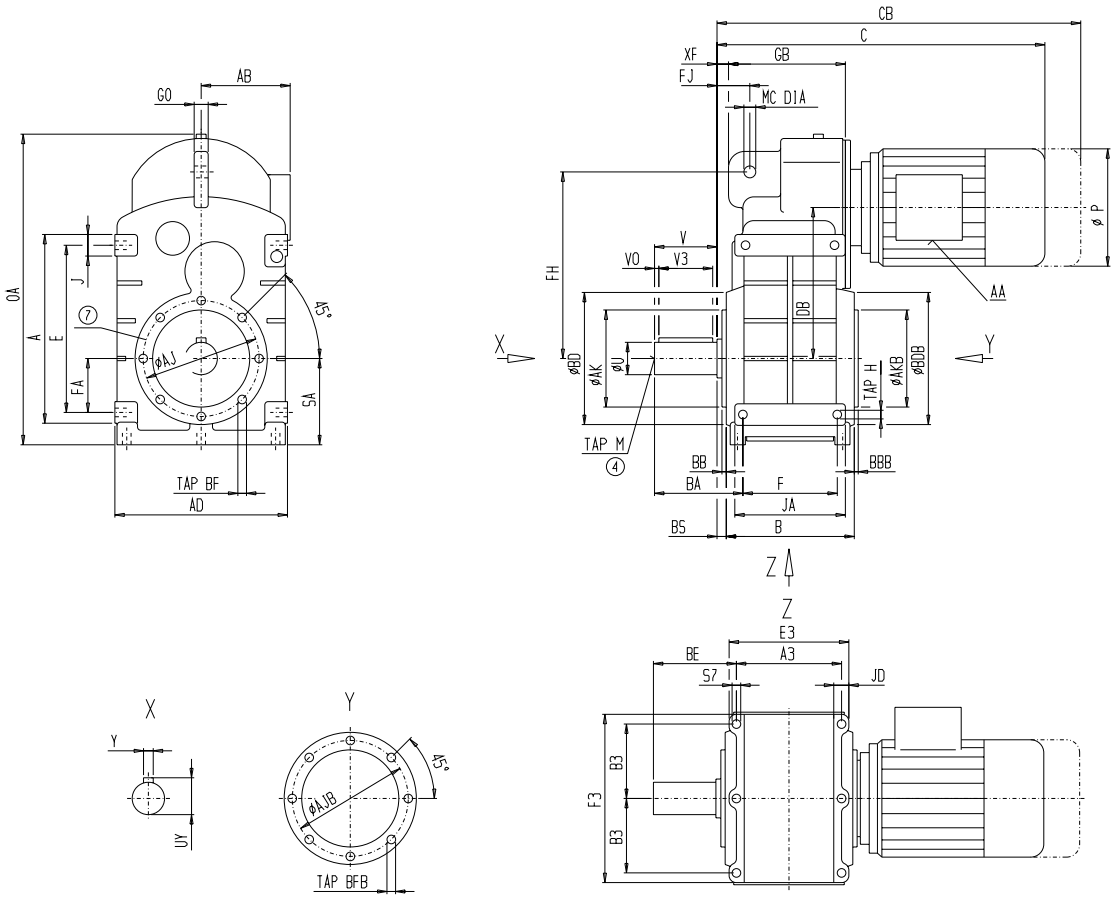
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ148B

FZ 510

[mm]



Mounting

BD	AK	AJ	BB	TAP BF
335	*250*	*300*	*5*	*M20x34*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
92,075	*170*	*139,7*	*15,291*	*1"-8UNC*	*101,85*	*22,225*	*235*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
220	*335*	*262*	*400*	*250*	*190*	*260*	*300*	*302*	*460*	*5*	*430*	*298*	*212*	*125*

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
351	*214*	*60*	*40*	*328*	*11*	*450*	*780,5*	*M24x32*	*M20x34*	*M24x32*	*37*	*88*	*485*	*26*	*36*

Motor

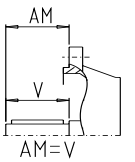
	F.Z148B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M100L	*646,5*	*718,5*	*194*	*160*	*160*	*2x3/4"*	*311*
M112M	*694,5*	*775,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*319*
M132S	*784*	*885*	*258*	*181*	*181*	*1"+3/4"*	*338*
M132M	*784*	*885*	*258*	*181*	*181*	*1"+3/4"*	*349*
M160M	*864,5*	*981,5*	*310*	*199*	*199*	*1"+3/4"*	*378*
M160L	*864,5*	*981,5*	*310*	*199*	*199*	*1"+3/4"*	*392*
M180M	*917,5*	*1035,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*407*
M180L	*917,5*	*1035,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*414*
M200L	*942,5*	*1072,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*463*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl. adapter	*1313,5*	*on request*	*495*	*392*	*on request*	*2x2"*	*958*

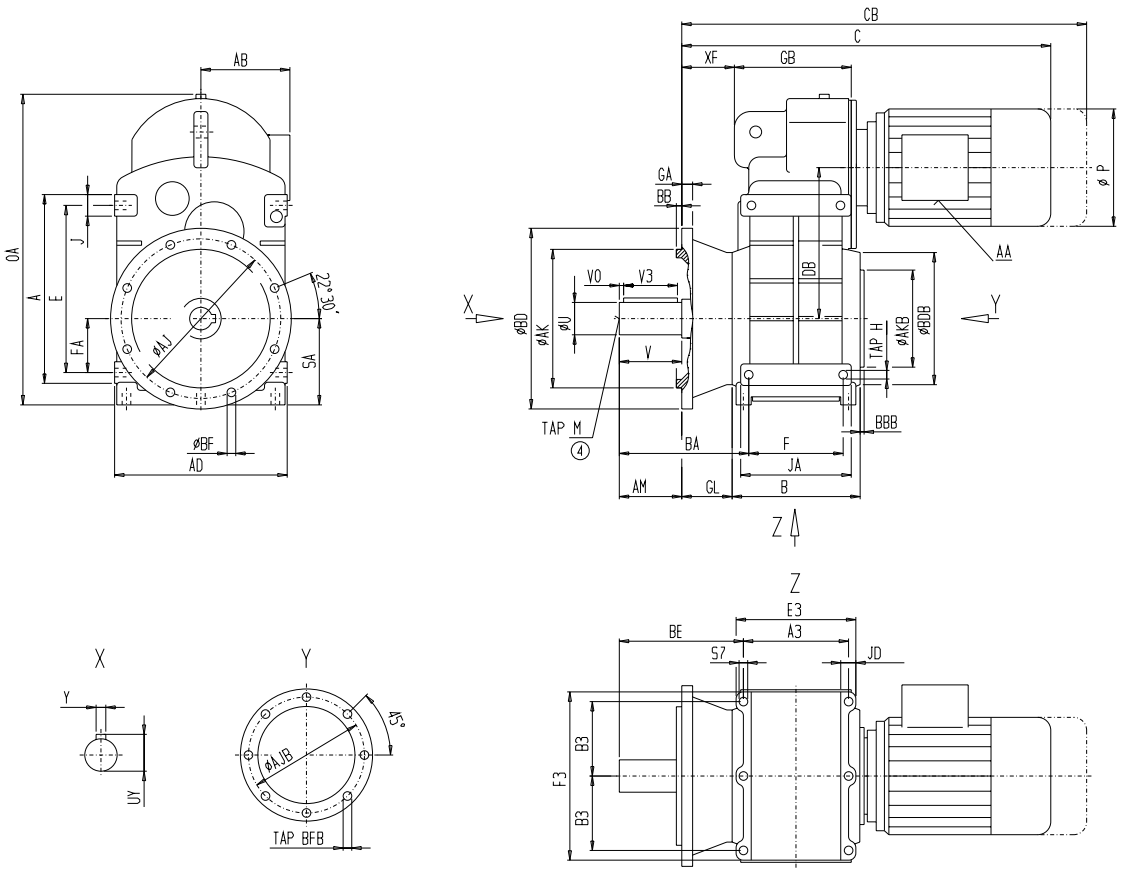
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF148B

FF 510
[inch]





5

Flange

BD	AK	GA	AJ	BB	BA	BF
17.72	13.78	0.87	15.75	0.2	10.87	0.69

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
3.625	6.69	5.5	0.602	1-8UNC	4.01	0.875	6.69

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
8.66	13.19	10.31	15.75	9.84	7.48	10.24	11.81	18.11	0.2	16.93	11.73	8.35

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
4.92	13.82	10.04	2.36	1.57	12.91	2.05	17.72	30.73	M24x32	M20x34	M24x32	3.07

Motor

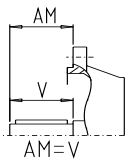
	F.F148B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M100L	27.03	29.86	7.64	6.3	6.3	2x3/4“	736
M112M	28.92	32.11	8.58	6.59	6.59	2x3/4“	753
M132S	32.45	36.42	10.16	7.13	7.13	1“+3/4“	794
M132M	32.45	36.42	10.16	7.13	7.13	1“+3/4“	819
M160M	35.61	40.22	12.2	7.83	7.83	1“+3/4“	884
M160L	35.61	40.22	12.2	7.83	7.83	1“+3/4“	915
M180M	37.69	42.34	13.7	9.69	9.69	1 1/4“+3/4“	948
M180L	37.69	42.34	13.7	9.69	9.69	1 1/4“+3/4“	963
M200L	38.68	43.8	15.16	10.24	10.24	1 1/4“+3/4“	1071
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl. adapter	53.32	on request	19.49	15.43	on request	2x2“	2111

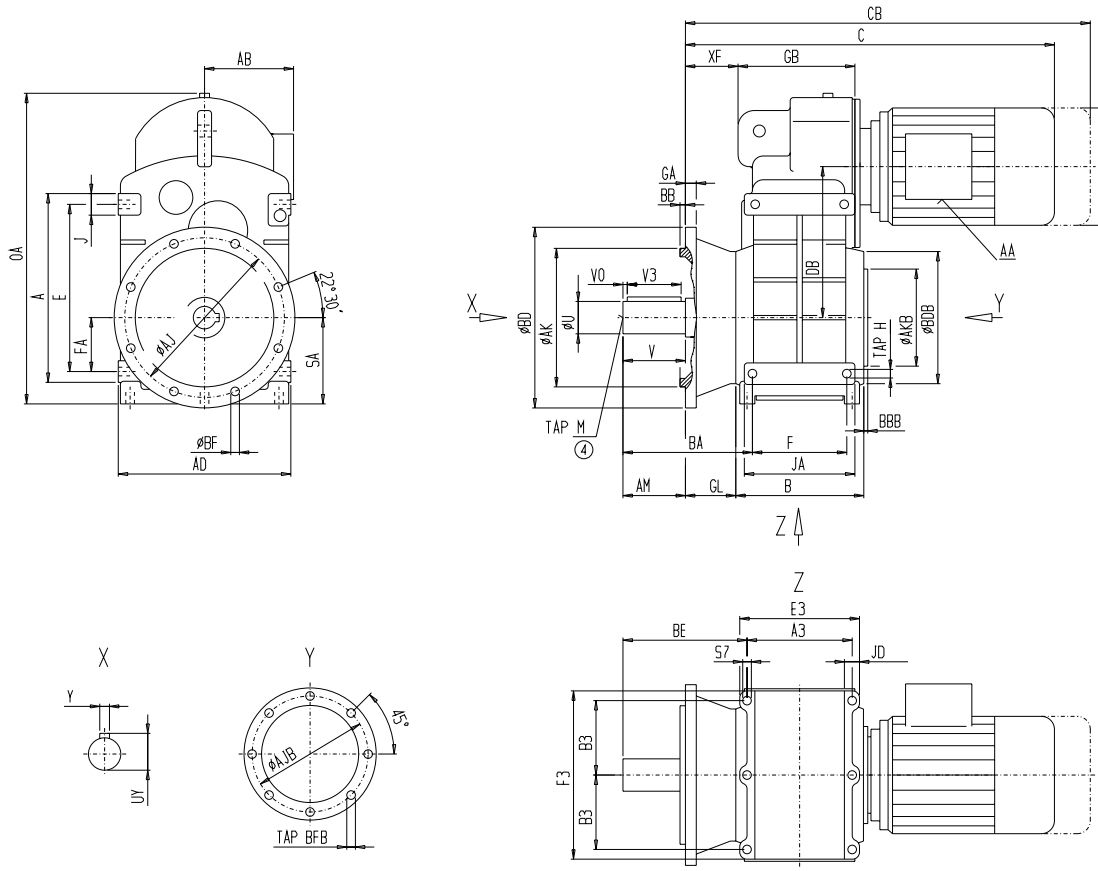
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF148B

FF 510
[mm]





Flange

BD	AK	GA	AJ	BB	BA	BF
450	*350*	*22*	*400*	*5*	*276*	*17,5*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
92,075	*170*	*139,7*	*15,291*	*1"-8UNC*	*101,85*	*22,225*	*170*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
220	*335*	*262*	*400*	*250*	*190*	*260*	*300*	*460*	*5*	*430*	*298*	*212*

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
125	*351*	*255*	*60*	*40*	*328*	*52*	*450*	*780,5*	*M24x32*	*M20x34*	*M24x32*	*78*

Motor

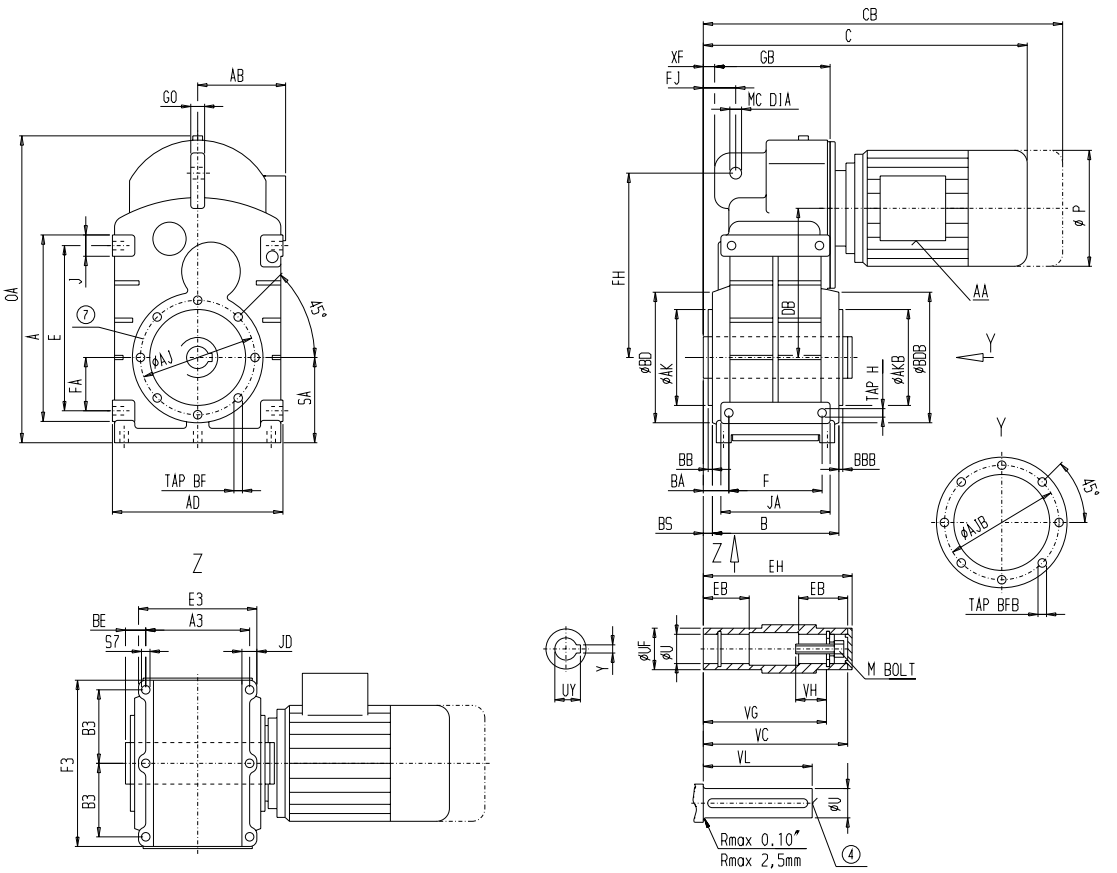
	F.F148B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M100L	*687,5*	*759,5*	*194*	*160*	*160*	*2x3/4"*	*334*
M112M	*735,5*	*816,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*342*
M132S	*825*	*926*	*258*	*181*	*181*	*1"+3/4"*	*360*
M132M	*825*	*926*	*258*	*181*	*181*	*1"+3/4"*	*371*
M160M	*905,5*	*1022,5*	*310*	*199*	*199*	*1"+3/4"*	*401*
M160L	*905,5*	*1022,5*	*310*	*199*	*199*	*1"+3/4"*	*415*
M180M	*958,5*	*1076,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*430*
M180L	*958,5*	*1076,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*437*
M200L	*983,5*	*1113,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*486*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl. adapter	*1354*	*on request*	*495*	*392*	*on request*	*2x2"*	*958*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA148B
FDAZ/FZAZ148B

FA 510
FAZ 510
[inch]



Mounting

AK	BD	AJ	BB	TAP BF
13.19	9.84	11.81	0.2	M20x34

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
3.625	4.724	13.78	12.205	2.1	11.22	1-8UNC	3.84	0.88	5.827	13.94

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
8.66	13.19	10.31	15.75	9.84	7.48	10.24	11.81	11.89	18.11	0.2	16.93	11.73	8.35	4.92	13.82

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
1.73	2.36	1.57	12.91	0.43	2.56	17.72	30.73	M24x32	M20x34	M24x32	1.46	3.46	19.09	1.02	1.42

Motor

	F.A.148B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M100L	25.42	28.25	7.64	6.3	6.3	2x3/4“	624
M112M	27.3	30.49	8.58	6.59	6.59	2x3/4“	642
M132S	30.83	34.8	10.16	7.13	7.13	1“+3/4“	683
M132M	30.83	34.8	10.16	7.13	7.13	1“+3/4“	707
M160M	33.99	38.6	12.2	7.83	7.83	1“+3/4“	772
M160L	33.99	38.6	12.2	7.83	7.83	1“+3/4“	803
M180M	36.08	40.73	13.7	9.69	9.69	1 1/4“+3/4“	836
M180L	36.08	40.73	13.7	9.69	9.69	1 1/4“+3/4“	851
M200L	37.07	42.19	15.16	10.24	10.24	1 1/4“+3/4“	960
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl. adapter	51.71	on request	19.49	15.43	on request	2x2“	2111

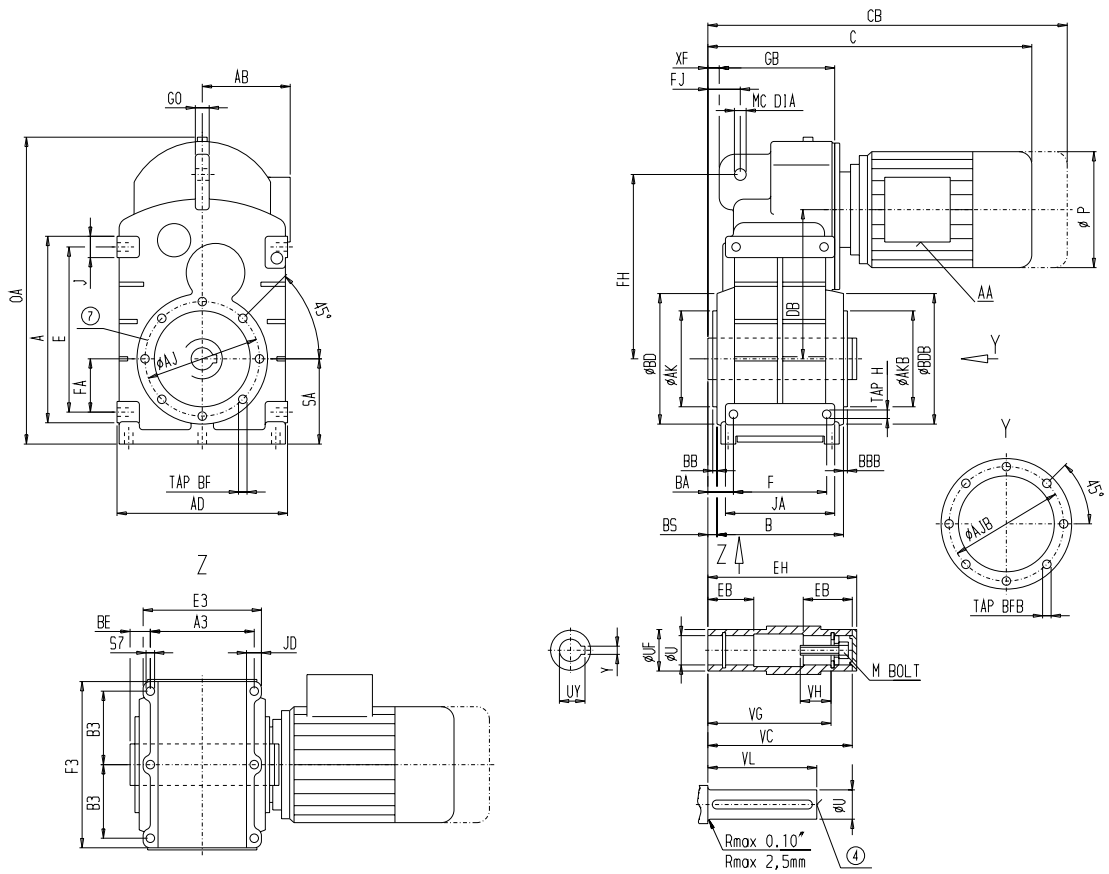
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA148B
FDAZ/FZAZ148B

FA 510
FAZ 510

[mm]



Mounting

BD	AK	AJ	BB	TAP BF
335	*250*	*300*	*5*	*M20x34*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
92,075	*120*	*350*	*310*	*53*	*285*	*1"-8UNC*	*97,54*	*22,352*	*148*	*354*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
220	*335*	*262*	*400*	*250*	*190*	*260*	*300*	*302*	*460*	*5*	*430*	*298*	*212*	*125*	*351*

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
44	*60*	*40*	*328*	*11*	*65*	*450*	*780,5*	*M24x32*	*M20x34*	*M24x32*	*37*	*88*	*485*	*26*	*36*

Motor

	F.A.148B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M100L	*646,5*	*718,5*	*194*	*160*	*160*	*2x3/4"*	*283*
M112M	*694,5*	*775,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*291*
M132S	*784*	*885*	*258*	*181*	*181*	*1"+3/4"*	*310*
M132M	*784*	*885*	*258*	*181*	*181*	*1"+3/4"*	*321*
M160M	*864,5*	*981,5*	*310*	*199*	*199*	*1"+3/4"*	*350*
M160L	*864,5*	*981,5*	*310*	*199*	*199*	*1"+3/4"*	*364*
M180M	*917,5*	*1035,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*379*
M180L	*917,5*	*1035,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*386*
M200L	*942,5*	*1072,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*435*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl. adapter	*1313,5*	*on request*	*495*	*392*	*on request*	*2x2"*	*958*

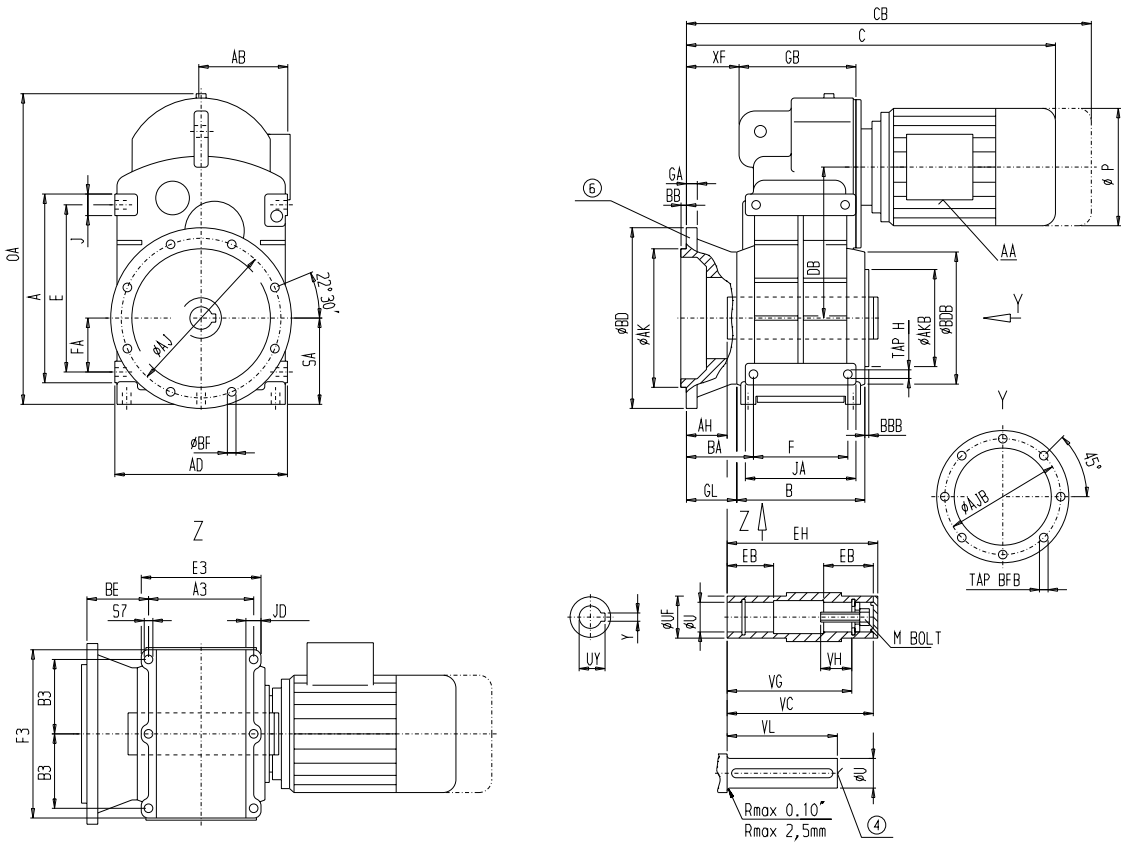
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF148B

FAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	AH	BF	BA
17.72	13.78	0.87	15.75	0.2	1.61	0.69	4.17

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
3.625	4.724	13.78	12.205	2.1	11.22	1-8UNC	3.84	0.88	5.827	13.94

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
8.66	13.19	10.31	15.75	9.84	7.48	10.24	11.81	11.89	18.11	0.2	16.93	11.73

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
8.35	4.92	13.82	3.35	2.36	1.57	12.91	2.05	17.72	30.73	M24x32	M20x34	M24x32	3.07

Motor

	F.AF148B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M100L	27.03	29.86	7.64	6.3	6.3	2x3/4“	674
M112M	28.92	32.11	8.58	6.59	6.59	2x3/4“	692
M132S	32.45	36.42	10.16	7.13	7.13	1“+3/4“	733
M132M	32.45	36.42	10.16	7.13	7.13	1“+3/4“	757
M160M	35.61	40.22	12.2	7.83	7.83	1“+3/4“	822
M160L	35.61	40.22	12.2	7.83	7.83	1“+3/4“	853
M180M	37.69	42.34	13.7	9.69	9.69	1 1/4“+3/4“	886
M180L	37.69	42.34	13.7	9.69	9.69	1 1/4“+3/4“	902
M200L	38.68	43.8	15.16	10.24	10.24	1 1/4“+3/4“	1010
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM incl. adapter	53.32	on request	19.49	15.43	on request	2x2“	2110

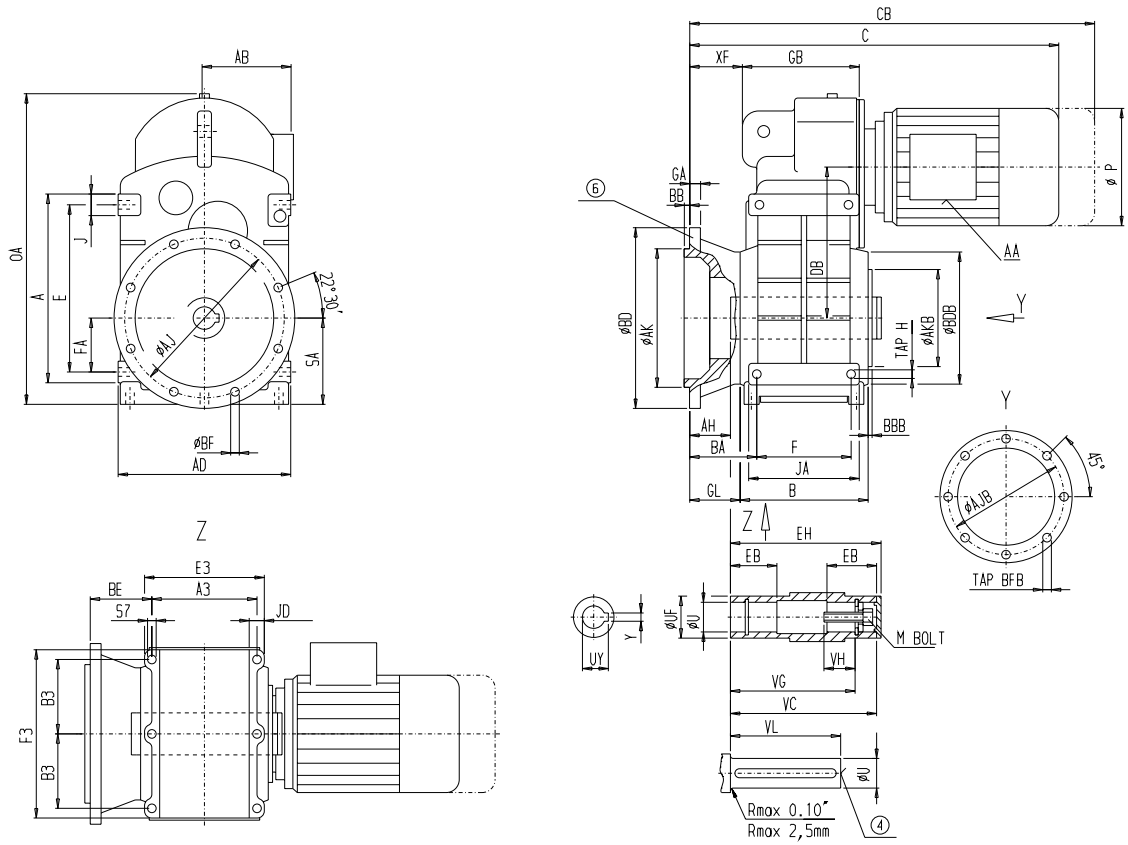
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF148B

FAF 510

[mm]



Flange

BD	AK	GA	AJ	BB	AH	BA	BF
450	*350*	*22*	*400*	*5*	*41*	*106*	*17,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
92,075	*120*	*350*	*310*	*53*	*285*	*1"-8UNC*	*97,54*	*22,352*	*148*	*354*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
220	*335*	*262*	*400*	*250*	*190*	*260*	*300*	*302*	*460*	*5*	*430*	*298*

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
212	*125*	*351*	*85*	*60*	*40*	*328*	*52*	*450*	*780,5*	*M24x32*	*M20x34*	*M24x32*	*78*

Motor

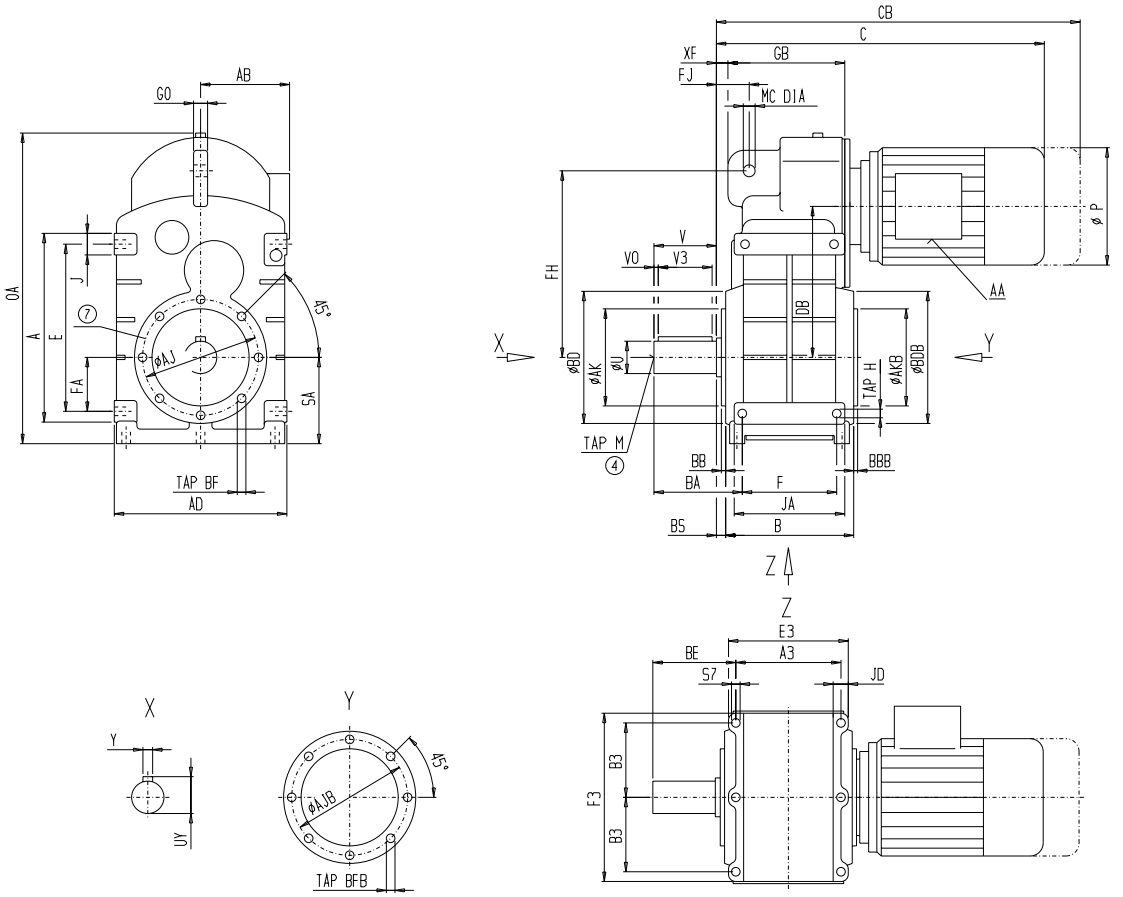
	F.AF148B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M100L	*687,5*	*759,5*	*194*	*160*	*160*	*2x3/4"*	*306*
M112M	*735,5*	*816,5*	*218*	*167,5*	*167,5*	*2x3/4"*	*314*
M132S	*825*	*926*	*258*	*181*	*181*	*1"+3/4"*	*332*
M132M	*825*	*926*	*258*	*181*	*181*	*1"+3/4"*	*343*
M160M	*905,5*	*1022,5*	*310*	*199*	*199*	*1"+3/4"*	*373*
M160L	*905,5*	*1022,5*	*310*	*199*	*199*	*1"+3/4"*	*387*
M180M	*958,5*	*1076,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*402*
M180L	*958,5*	*1076,5*	*348*	*246*	*246*	*1 1/4"+3/4"*	*409*
M200L	*983,5*	*1113,5*	*385*	*260*	*260*	*1 1/4"+3/4"*	*458*
LG225S	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*325*	*on request*	*2x1 1/2"*	*on request*
LG250ZM incl. adapter	*1354,5*	*on request*	*495*	*392*	*on request*	*2x2"*	*953*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ168B

FZ 510
[inch]



5

Mounting

BD	AK	AJ	BB	TAP BF
15.75	11.81	13.78	0.2	M20x34

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
4.375	8.27	7	0.677	1-8UNC	4.82	1	11.02

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
10.63	15.75	12.4	17.72	11.81	8.07	12.99	13.78	14.45	20.47	0.2	19.37	13.39	9.84	5.59

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
16.22	9.92	2.76	2.01	15.28	0.43	19.69	35.81	M30x40	M20x34	M30x40	1.34	4.33	21.65	1.3	1.97

Motor

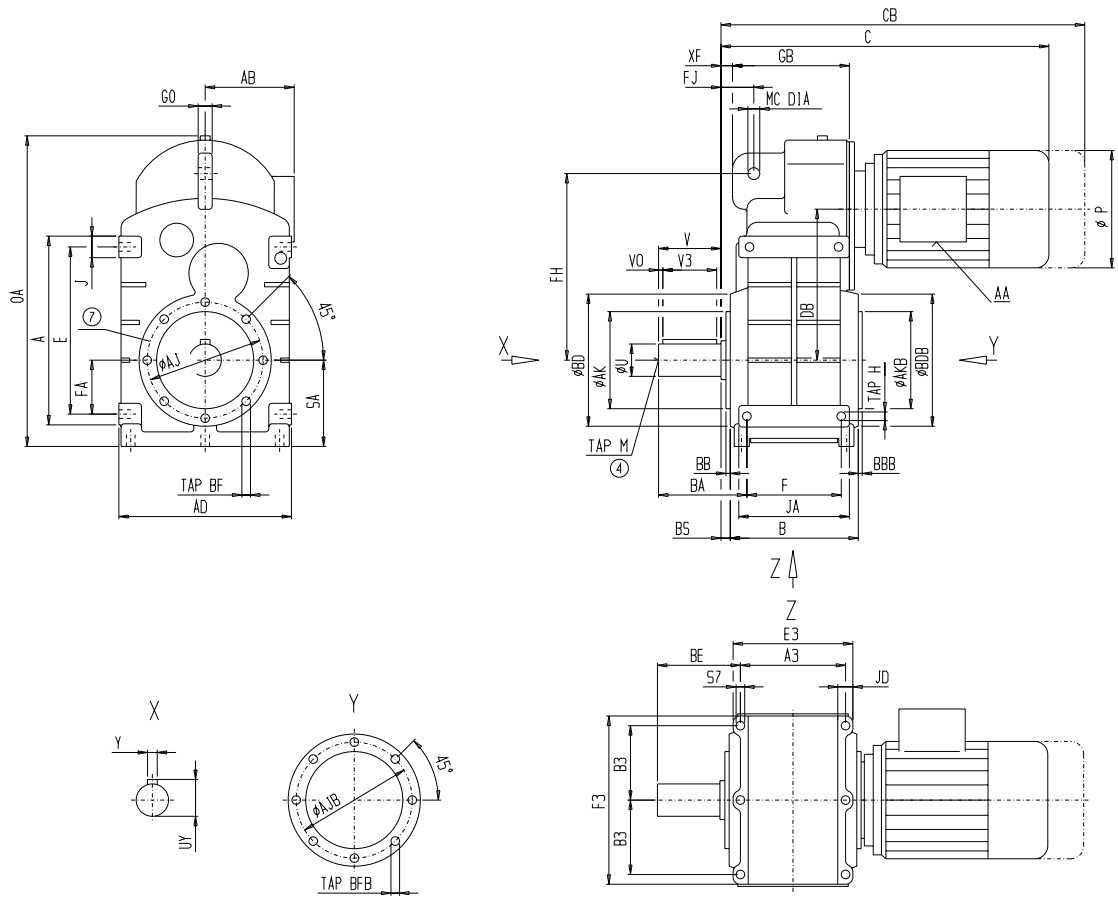
	F.Z168B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	32.05	36.02	10.16	7.13	7.13	1“+3/4“	1108
M132M	32.05	36.02	10.16	7.13	7.13	1“+3/4“	1132
M160M	35.23	39.84	12.2	7.83	7.83	1“+3/4“	1186
M160L	35.23	39.84	12.2	7.83	7.83	1“+3/4“	1217
M180M	37.32	41.97	13.7	9.69	9.69	1 1/4“+3/4“	1260
M180L	37.32	41.97	13.7	9.69	9.69	1 1/4“+3/4“	1275
M200L	38.31	43.43	15.16	10.24	10.24	1 1/4“+3/4“	1383
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	on request	on request	21.85	17.01	on request	2x2“	on request
LG280ZM incl. adapter	46.98	on request	21.85	17.01	on request	2x2“	2707

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ168B

FZ 510
[mm]



Mounting

BD	AK	AJ	BB	TAP BF
400	*300*	*350*	*5*	*M20x34*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
111,125	*210*	*177,8*	*17,196*	*1"-8UNC*	*122,43*	*25,4*	*280*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
270	*400*	*315*	*450*	*300*	*205*	*330*	*350*	*367*	*520*	*5*	*492*	*340*	*250*	*142*

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
412	*252*	*70*	*51*	*388*	*11*	*500*	*909,5*	*M30x40*	*M20x34*	*M30x40*	*34*	*110*	*550*	*33*	*50*

Motor

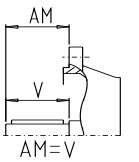
	F.Z168B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*815*	*916*	*258*	*181*	*181*	*1"+3/4"*	*503*
M132M	*815*	*916*	*258*	*181*	*181*	*1"+3/4"*	*514*
M160M	*896*	*1013*	*310*	*199*	*199*	*1"+3/4"*	*538*
M160L	*896*	*1013*	*310*	*199*	*199*	*1"+3/4"*	*552*
M180M	*949*	*1067*	*348*	*246*	*246*	*1 1/4"+3/4"*	*571*
M180L	*949*	*1067*	*348*	*246*	*246*	*1 1/4"+3/4"*	*578*
M200L	*974*	*1104*	*385*	*260*	*260*	*1 1/4"+3/4"*	*627*
LG225S	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*on request*	*on request*	*555*	*432*	*on request*	*2x2"*	*on request*
LG280ZM incl. adapter	*1193,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1228*

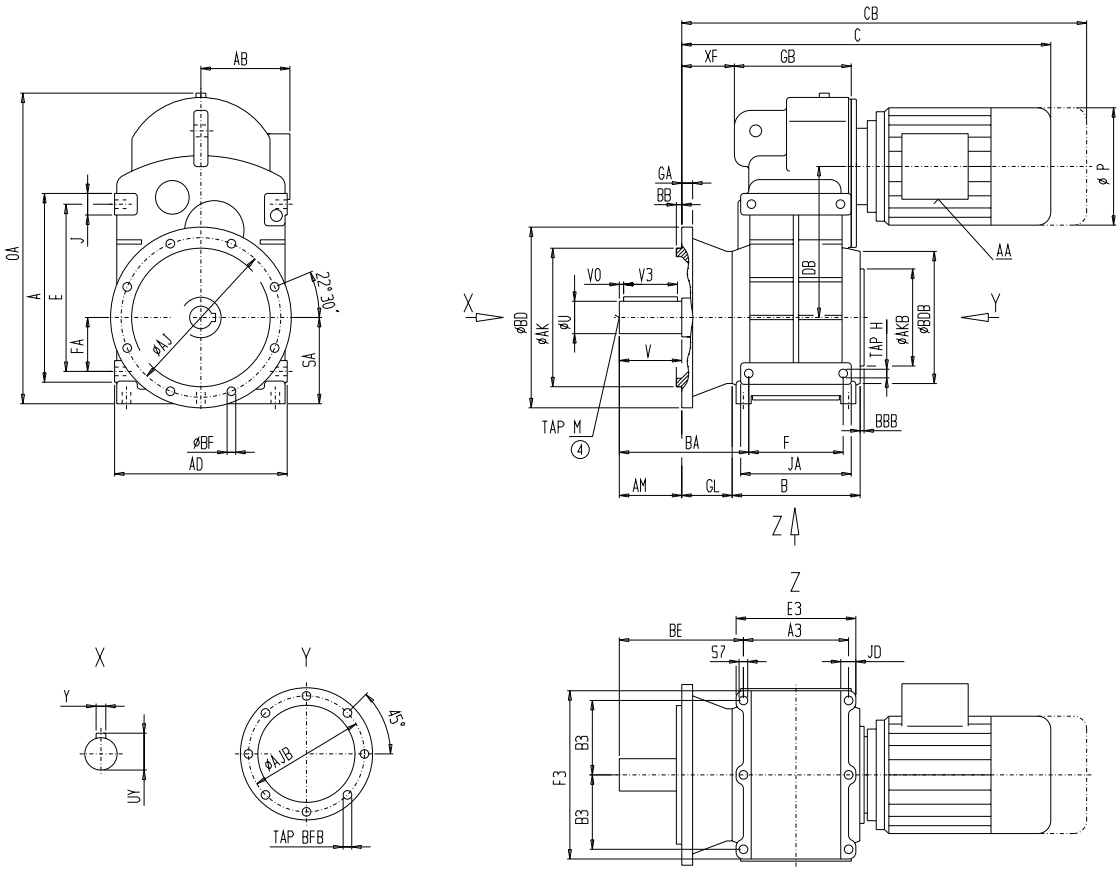
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF168B

FF 510
[inch]





5

Flange

BD	AK	GA	AJ	BB	BA	BF
21.65	17.72	0.98	19.69	0.2	13.03	0.69

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
4.375	8.27	7	0.677	1-8UNC	4.82	1	8.27

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
10.63	15.75	12.4	17.72	11.81	8.07	12.99	13.78	20.47	0.2	19.37	13.39	9.84

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
5.59	16.22	11.93	2.76	2.01	15.28	2.44	19.69	35.81	M30x40	M20x34	M30x40	3.35

Motor

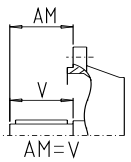
	F.F168B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	34.06	38.03	10.16	7.13	7.13	1“+3/4“	1190
M132M	34.06	38.03	10.16	7.13	7.13	1“+3/4“	1214
M160M	37.24	41.85	12.2	7.83	7.83	1“+3/4“	1267
M160L	37.24	41.85	12.2	7.83	7.83	1“+3/4“	1298
M180M	39.33	43.98	13.7	9.69	9.69	1 1/4“+3/4“	1341
M180L	39.33	43.98	13.7	9.69	9.69	1 1/4“+3/4“	1357
M200L	40.32	45.44	15.16	10.24	10.24	1 1/4“+3/4“	1465
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	on request	on request	21.85	17.01	on request	2x2“	on request
LG280ZM incl. adapter	48.99	on request	21.85	17.01	on request	2x2“	2707

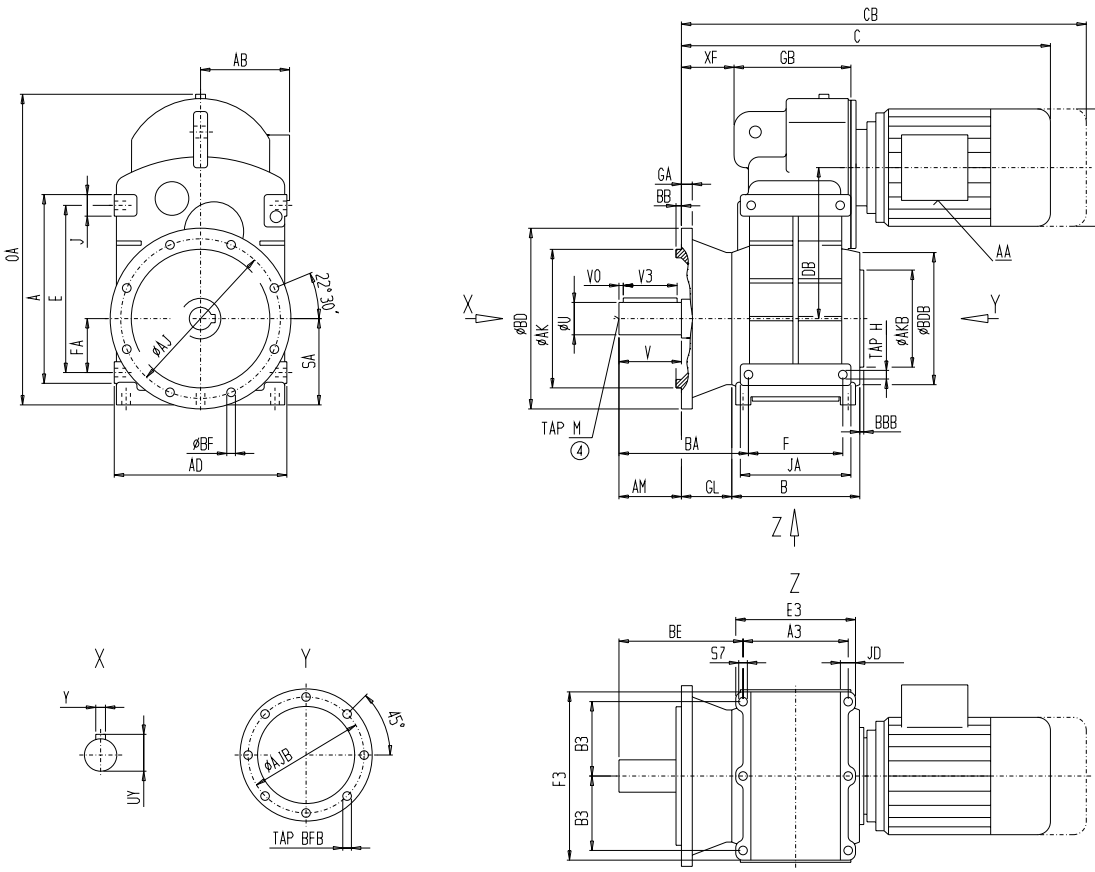
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF168B

FF 510
[mm]





5

Flange

BD	AK	GA	AJ	BB	BA	BF
550	*450*	*25*	*500*	*5*	*331*	*17,5*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
111,125	*210*	*177,8*	*17,196*	*1"-8UNC*	*122,43*	*25,4*	*210*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
270	*400*	*315*	*450*	*300*	*205*	*330*	*350*	*520*	*5*	*492*	*340*	*250*

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
142	*412*	*303*	*70*	*51*	*388*	*62*	*500*	*909,5*	*M30x40*	*M20x34*	*M30x40*	*85*

Motor

	F.F168B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*866*	*967*	*258*	*181*	*181*	*1"„+3/4"*	*540*
M132M	*866*	*967*	*258*	*181*	*181*	*1"„+3/4"*	*551*
M160M	*947*	*1064*	*310*	*199*	*199*	*1"„+3/4"*	*575*
M160L	*947*	*1064*	*310*	*199*	*199*	*1"„+3/4"*	*589*
M180M	*1000*	*1118*	*348*	*246*	*246*	*1 1/4"„+3/4"*	*608*
M180L	*1000*	*1118*	*348*	*246*	*246*	*1 1/4"„+3/4"*	*615*
M200L	*1025*	*1155*	*385*	*260*	*260*	*1 1/4"„+3/4"*	*664*
LG225S	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*on request*	*on request*	*555*	*432*	*on request*	*2x2"*	*on request*
LG280ZM incl. adapter	*1244,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1228*

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

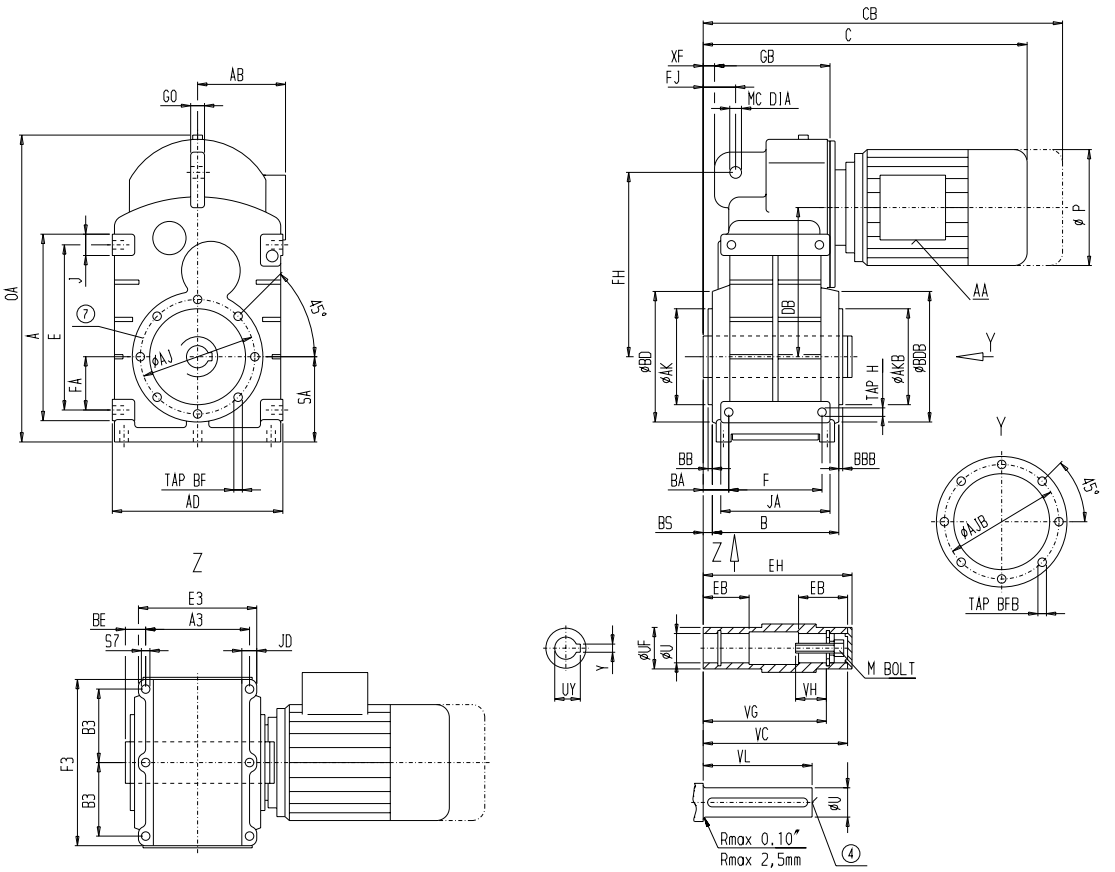
** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA168B
FDAZ/FZAZ168B

FA 510
FAZ 510

[inch]



Mounting

AK	BD	AJ	BB	TAP BF
15.75	11.81	13.78	0.2	M20x34

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
4	5.906	16.14	14.409	2.09	13.39	1-8UNC	4.45	1	6.89	16.3

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
10.63	15.75	12.4	17.72	11.81	8.07	12.99	13.78	14.45	20.47	0.2	19.37	13.39	9.84	5.59	16.22

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
1.65	2.76	2.01	15.28	0.43	2.76	19.69	35.81	M30x40	M20x34	M30x40	1.34	4.33	21.65	1.3	1.97

Motor

	F.A.168B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	32.05	36.02	10.16	7.13	7.13	1“+3/4“	1009
M132M	32.05	36.02	10.16	7.13	7.13	1“+3/4“	1033
M160M	35.23	39.84	12.2	7.83	7.83	1“+3/4“	1086
M160L	35.23	39.84	12.2	7.83	7.83	1“+3/4“	1117
M180M	37.32	41.97	13.7	9.69	9.69	1 1/4“+3/4“	1160
M180L	37.32	41.97	13.7	9.69	9.69	1 1/4“+3/4“	1176
M200L	38.31	43.43	15.16	10.24	10.24	1 1/4“+3/4“	1284
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	on request	on request	21.85	17.01	on request	2x2“	on request
LG280ZM incl. adapter	46.98	on request	21.85	17.01	on request	2x2“	2707

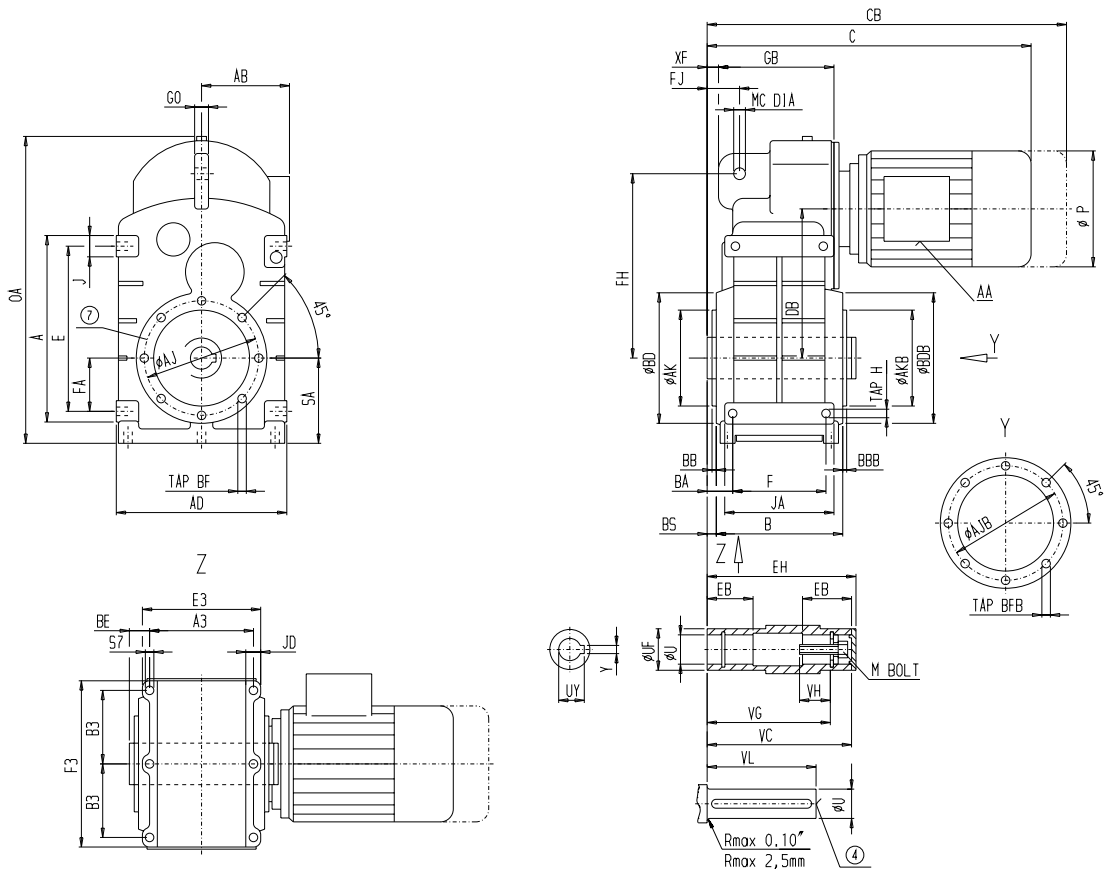
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA168B
FDAZ/FZAZ168B

FA 510
FAZ 510

[mm]



5

Mounting

BD	AK	AJ	BB	TAP BF
400	*300*	*350*	*5*	*M20x34*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
101,6	*150*	*410*	*366*	*53*	*340*	*1"-8UNC*	*113,03*	*25,4*	*175*	*414*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
270	*400*	*315*	*450*	*300*	*205*	*330*	*350*	*367*	*520*	*5*	*492*	*340*	*250*	*142*	*412*

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
42	*70*	*51*	*388*	*11*	*70*	*500*	*909,5*	*M30x40*	*M20x34*	*M30x40*	*34*	*110*	*550*	*33*	*50*

Motor

	F.A.168B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*815*	*916*	*258*	*181*	*181*	*1"+3/4"*	*457*
M132M	*815*	*916*	*258*	*181*	*181*	*1"+3/4"*	*468*
M160M	*896*	*1013*	*310*	*199*	*199*	*1"+3/4"*	*493*
M160L	*896*	*1013*	*310*	*199*	*199*	*1"+3/4"*	*507*
M180M	*949*	*1067*	*348*	*246*	*246*	*1 1/4"+3/4"*	*526*
M180L	*949*	*1067*	*348*	*246*	*246*	*1 1/4"+3/4"*	*533*
M200L	*974*	*1104*	*385*	*260*	*260*	*1 1/4"+3/4"*	*582*
LG225S	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*on request*	*on request*	*555*	*432*	*on request*	*2x2"*	*on request*
LG280ZM incl. adapter	*1193,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1228*

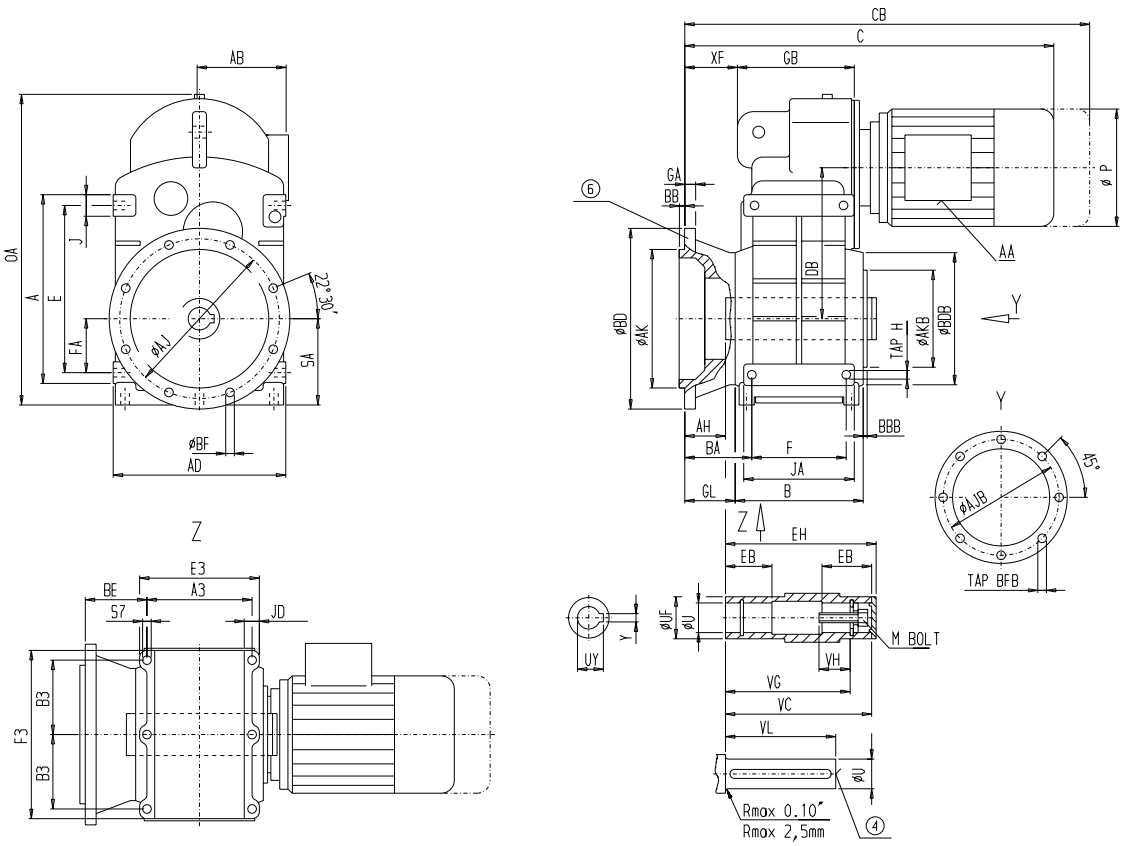
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF168B

FAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	AH	BA	BF
21.65	17.72	0.98	19.69	0.2	2.01	0.69	4.76

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
4	5.906	16.14	14.409	2.09	13.39	1-8UNC	4.45	1	6.89	16.3

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
10.63	15.75	12.4	17.72	11.81	8.07	12.99	13.78	14.45	20.47	0.2	19.37	13.39

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
9.84	5.59	16.22	3.66	2.76	2.01	15.28	2.44	19.69	35.81	M30x40	M20x34	M30x40	3.35

Motor

	F.AF168B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	34.06	38.03	10.16	7.13	7.13	1"+3/4"	1090
M132M	34.06	38.03	10.16	7.13	7.13	1"+3/4"	1115
M160M	37.24	41.85	12.2	7.83	7.83	1"+3/4"	1168
M160L	37.24	41.85	12.2	7.83	7.83	1"+3/4"	1199
M180M	39.33	43.98	13.7	9.69	9.69	1 1/4"+3/4"	1242
M180L	39.33	43.98	13.7	9.69	9.69	1 1/4"+3/4"	1257
M200L	40.32	45.44	15.16	10.24	10.24	1 1/4"+3/4"	1366
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2"	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2"	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2"	on request
LG280S incl. adapter	on request	on request	21.85	17.01	on request	2x2"	on request
LG280ZM incl. adapter	48.99	on request	21.85	17.01	on request	2x2"	2707

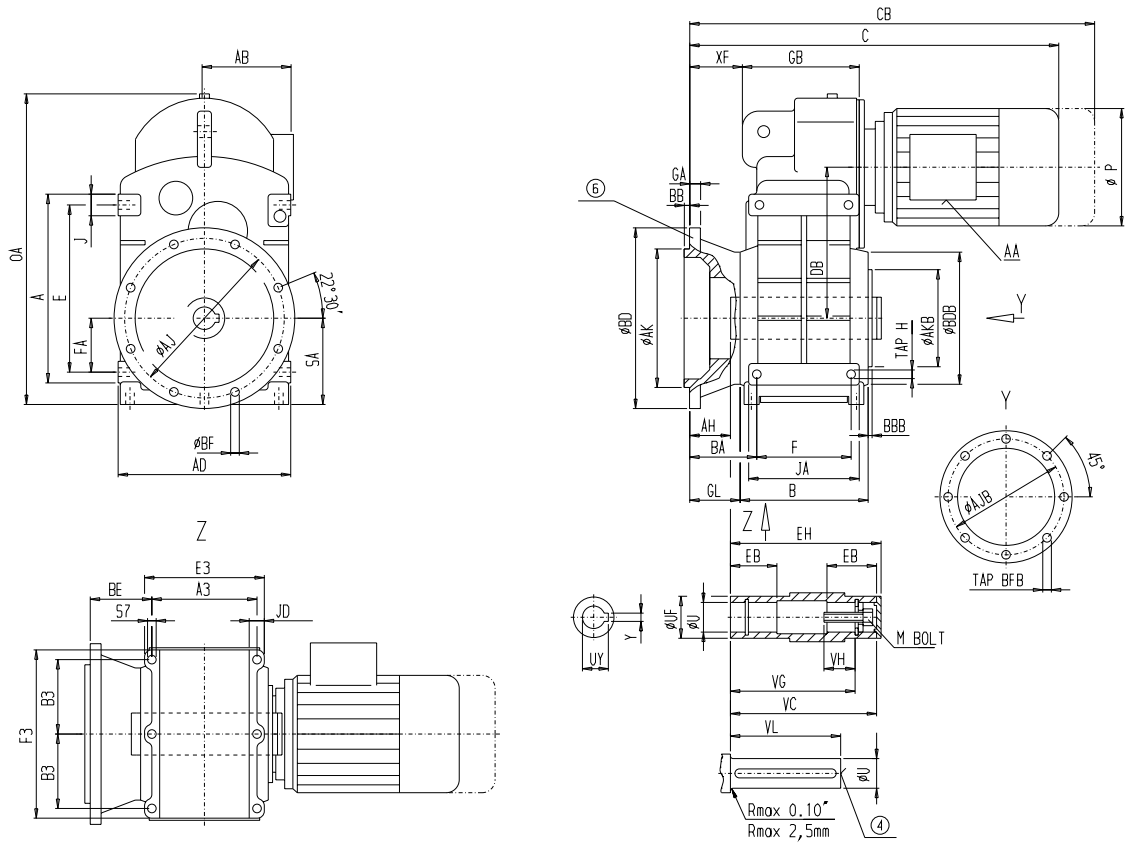
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF168B

FAF 510

[mm]



Flange

BD	AK	GA	AJ	BB	AH	BA	BF
550	*450*	*25*	*500*	*5*	*51*	*121*	*17,5*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
101,6	*150*	*410*	*366*	*53*	*340*	*1"-8UNC*	*113,03*	*25,4*	*175*	*414*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
270	*400*	*315*	*450*	*300*	*205*	*330*	*350*	*367*	*520*	*5*	*492*	*340*

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
250	*142*	*412*	*93*	*70*	*51*	*388*	*62*	*500*	*909,5*	*M30x40*	*M20x34*	*M30x40*	*85*

Motor

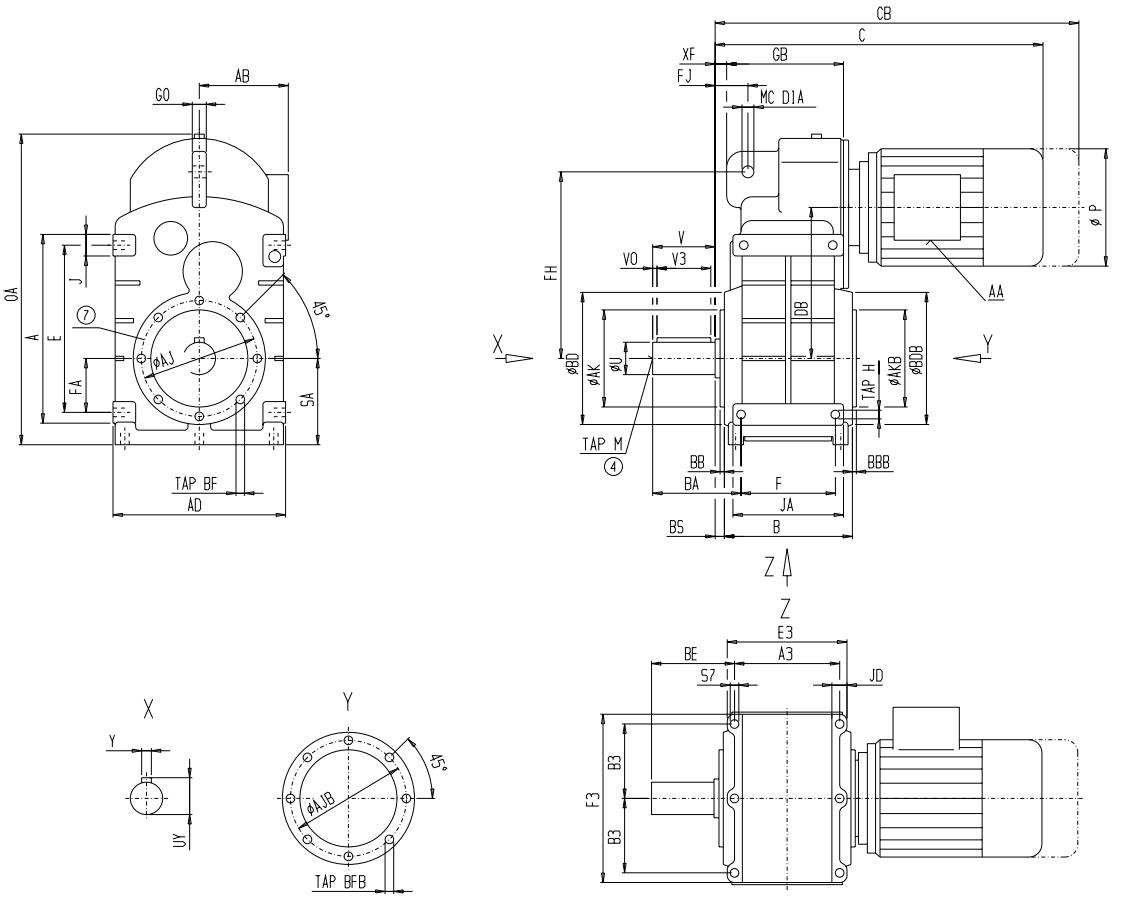
	F.AF168B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*866*	*967*	*258*	*181*	*181*	*1"„+3/4"*	*494*
M132M	*866*	*967*	*258*	*181*	*181*	*1"„+3/4"*	*505*
M160M	*947*	*1064*	*310*	*199*	*199*	*1"„+3/4"*	*530*
M160L	*947*	*1064*	*310*	*199*	*199*	*1"„+3/4"*	*544*
M180M	*1000*	*1118*	*348*	*246*	*246*	*1 1/4"„+3/4"*	*563*
M180L	*1000*	*1118*	*348*	*246*	*246*	*1 1/4"„+3/4"*	*570*
M200L	*1025*	*1155*	*385*	*260*	*260*	*1 1/4"„+3/4"*	*619*
LG225S	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*on request*	*on request*	*555*	*432*	*on request*	*2x2"*	*on request*
LG280ZM incl. adapter	*1244,5*	*on request*	*555*	*432*	*on request*	*2x2"*	*1228*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ188B

FZ 510
[inch]



Mounting

BD	AK	AJ	BB	TAP BF
15.75	11.81	13.78	0.2	M24x32

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
4.75	8.27	7	0.677	1-8UNC	5.29	1.25	12.01

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
12.2	15.75	13.39	21.26	11.81	9.25	14.37	13.78	15.75	24.41	0.2	21.26	16.3	10.43	6.69

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
17.32	11.42	3.15	2.46	18.58	0.55	22.05	38.41	M36x50	M24x32	M36x50	1.56	4.33	24.41	1.3	1.97

Motor

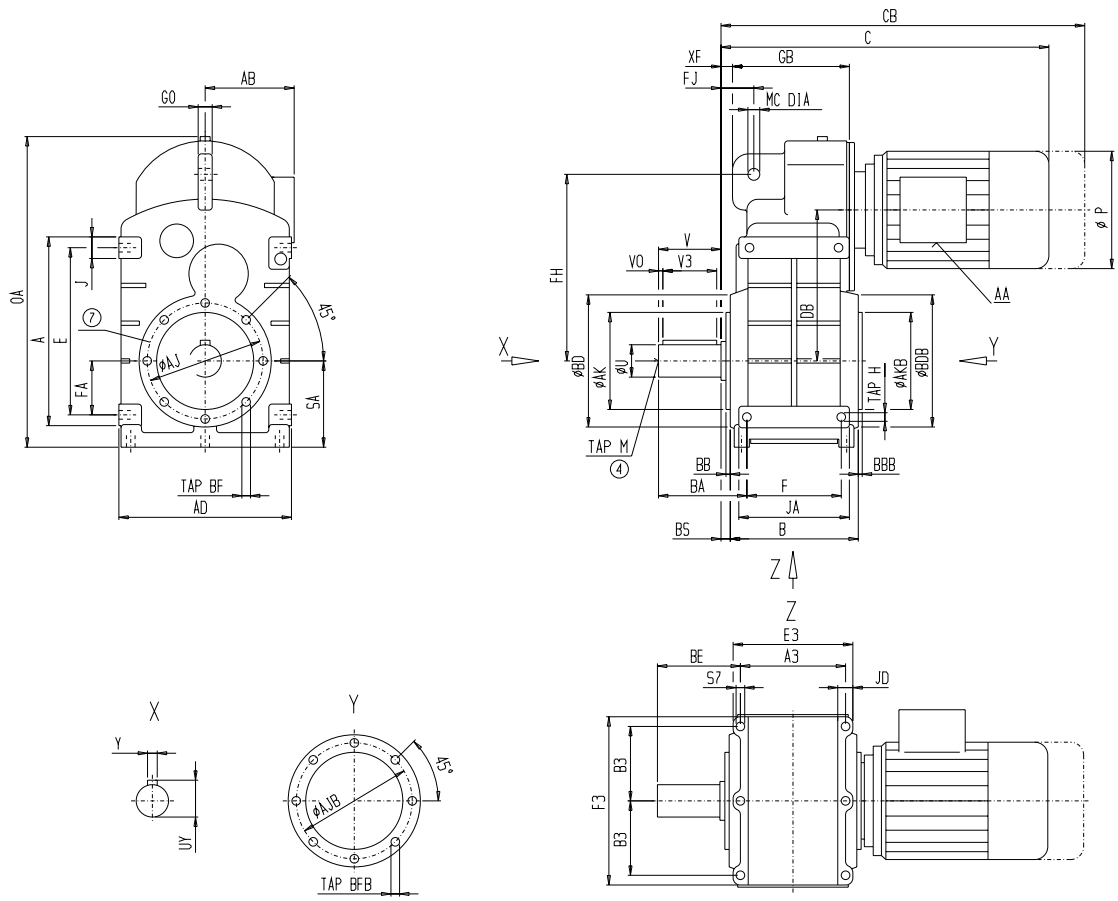
	F.Z188B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	34.61	38.58	10.16	7.13	7.13	1“+3/4“	1524
M132M	34.61	38.58	10.16	7.13	7.13	1“+3/4“	1548
M160M	37.79	42.4	12.2	7.83	7.83	1“+3/4“	1601
M160L	37.79	42.4	12.2	7.83	7.83	1“+3/4“	1632
M180M	39.88	44.53	13.7	9.69	9.69	1 1/4“+3/4“	1675
M180L	39.88	44.53	13.7	9.69	9.69	1 1/4“+3/4“	1690
M200L	40.87	45.99	15.16	10.24	10.24	1 1/4“+3/4“	1798
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	on request	on request	21.85	17.01	on request	2x2“	on request
LG280ZM incl. adapter	50.11	on request	21.85	17.01	on request	2x2“	3074

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
with housing flange (C-type)

FDZ/FZZ188B

FZ 510
[mm]



Mounting

BD	AK	AJ	BB	TAP BF
400	*300*	*350*	*5*	*M24x32*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	BA
120,65	*210*	*177,8*	*17,196*	*1"-8UNC*	*134,37*	*31,75*	*305*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA
310	*400*	*340*	*540*	*300*	*235*	*365*	*350*	*400*	*620*	*5*	*540*	*414*	*265*	*170*

DB	BE	J	JD	B	BS	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
440	*290*	*80*	*62,5*	*472*	*14*	*560*	*975,5*	*M36x50*	*M24x32*	*M36x50*	*39,5*	*110*	*620*	*33*	*50*

Motor

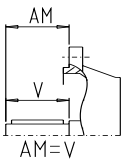
	F.Z188B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*880*	*981*	*258*	*181*	*181*	*1"+3/4"*	*691*
M132M	*880*	*981*	*258*	*181*	*181*	*1"+3/4"*	*702*
M160M	*961*	*1078*	*310*	*199*	*199*	*1"+3/4"*	*726*
M160L	*961*	*1078*	*310*	*199*	*199*	*1"+3/4"*	*740*
M180M	*1014*	*1132*	*348*	*246*	*246*	*1 1/4"+3/4"*	*759*
M180L	*1014*	*1132*	*348*	*246*	*246*	*1 1/4"+3/4"*	*766*
M200L	*1039*	*1169*	*385*	*260*	*260*	*1 1/4"+3/4"*	*815*
LG225S	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*on request*	*on request*	*555*	*432*	*on request*	*2x2"*	*on request*
LG280ZM incl. adapter	*1273*	*on request*	*555*	*432*	*on request*	*2x2"*	*1394*

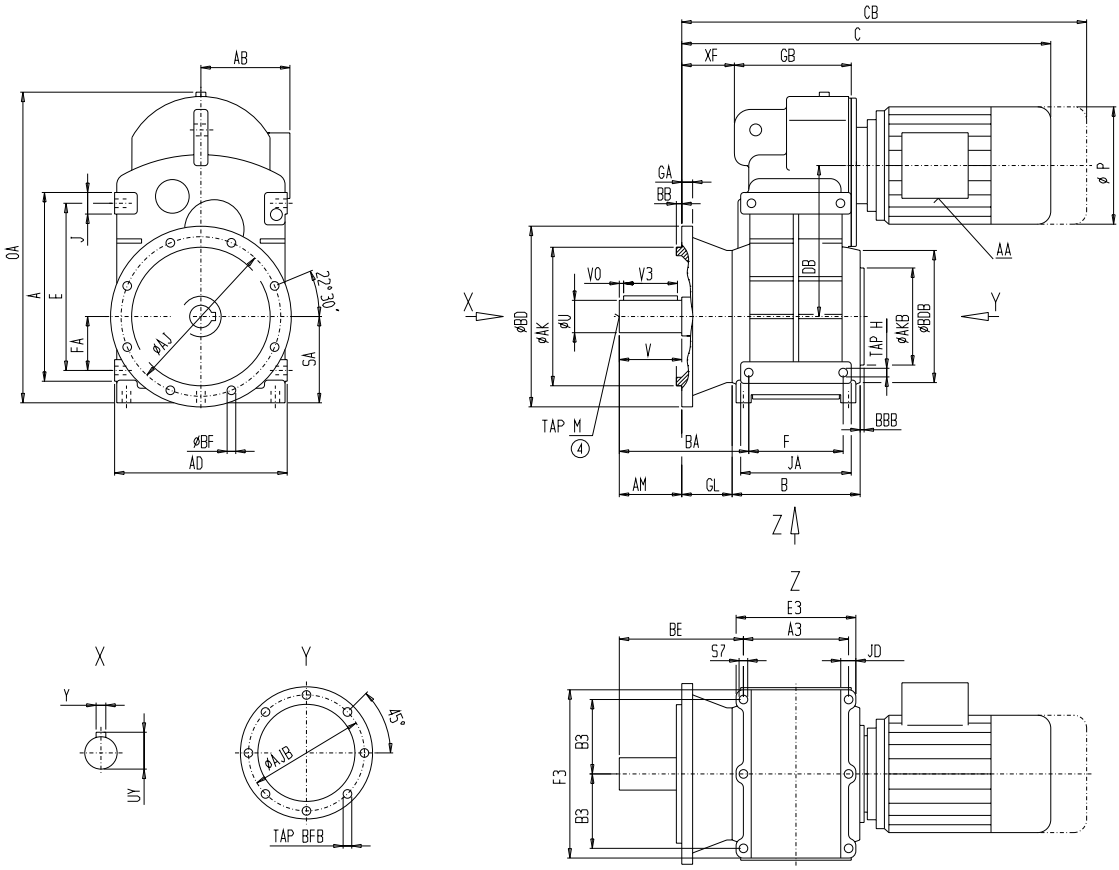
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF188B

FF 510
[inch]





5

Flange

BD	AK	GA	AJ	BB	BA	BF
25.98	21.65	1.1	23.62	0.24	14.37	0.87

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
4.75	8.27	7	0.677	1-8UNC	5.29	1.25	8.27

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
12.2	15.75	13.39	21.26	11.81	9.25	14.37	13.78	24.41	0.2	21.26	16.3	10.43

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
6.69	17.32	13.78	3.15	2.46	18.58	2.91	22.05	38.41	M36x50	M24x32	M36x50	3.92

Motor

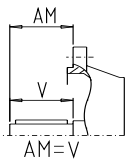
	F.F188B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	36.97	40.94	10.16	7.13	7.13	1“+3/4“	1645
M132M	36.97	40.94	10.16	7.13	7.13	1“+3/4“	1670
M160M	40.15	44.76	12.2	7.83	7.83	1“+3/4“	1722
M160L	40.15	44.76	12.2	7.83	7.83	1“+3/4“	1753
M180M	42.24	46.89	13.7	9.69	9.69	1 1/4“+3/4“	1796
M180L	42.24	46.89	13.7	9.69	9.69	1 1/4“+3/4“	1811
M200L	43.23	48.35	15.16	10.24	10.24	1 1/4“+3/4“	1919
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	on request	on request	21.85	17.01	on request	2x2“	on request
LG280ZM incl. adapter	52.48	on request	21.85	17.01	on request	2x2“	3074

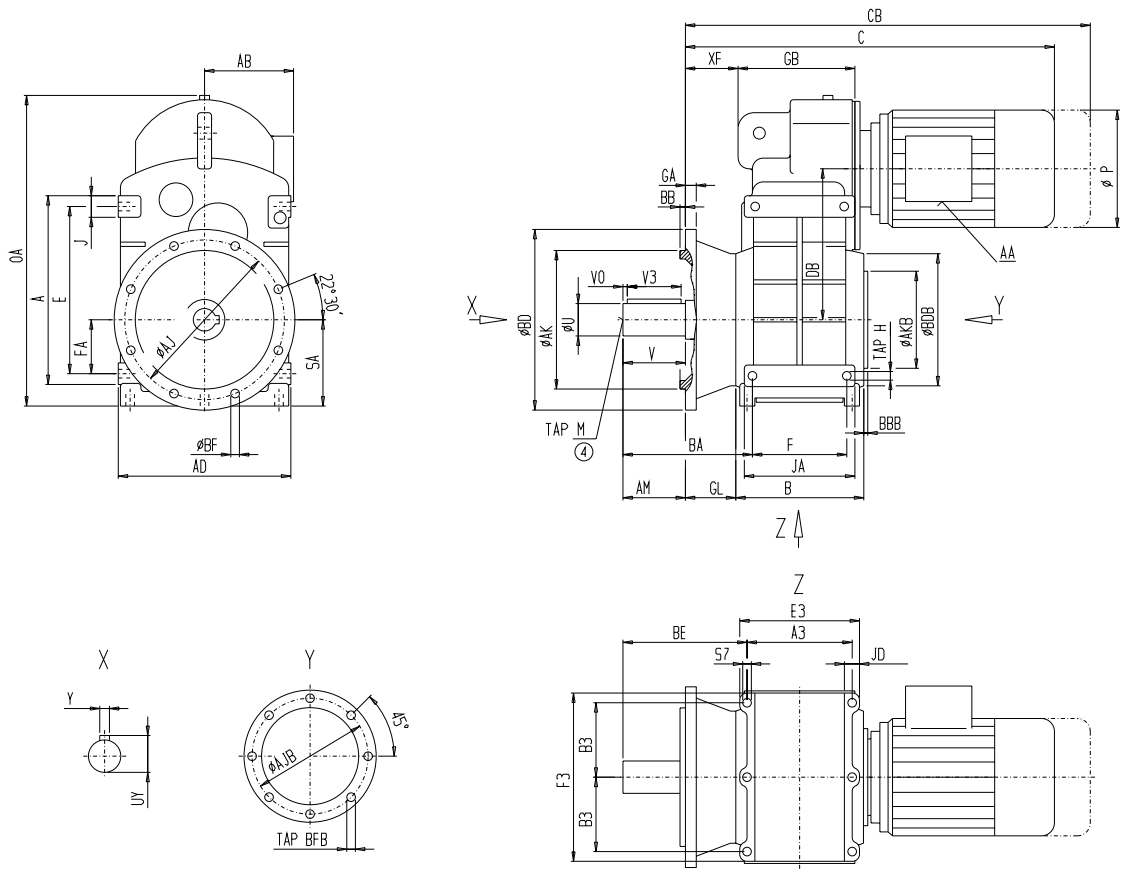
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Flange mounted

FDF/FZF188B

FF 510
[mm]





5

Flange

BD	AK	GA	AJ	BB	BA	BF
660	*550*	*28*	*600*	*6*	*365*	*22*

Output Shaft

U	V	V3	V0	TAP M	UY	Y	AM
120,65	*210*	*177,8*	*17,196*	*1"-8UNC*	*134,37*	*31,75*	*210*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	A	BBB	F3	GB	SA
310	*400*	*340*	*540*	*300*	*235*	*365*	*350*	*620*	*5*	*540*	*414*	*265*

FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
170	*440*	*350*	*80*	*62,5*	*472*	*74*	*560*	*975,5*	*M36x50*	*M24x32*	*M36x50*	*99,5*

Motor

	F.F188B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*940*	*1041*	*258*	*181*	*181*	*1"+3/4"*	*746*
M132M	*940*	*1041*	*258*	*181*	*181*	*1"+3/4"*	*757*
M160M	*1021*	*1138*	*310*	*199*	*199*	*1"+3/4"*	*781*
M160L	*1021*	*1138*	*310*	*199*	*199*	*1"+3/4"*	*795*
M180M	*1074*	*1192*	*348*	*246*	*246*	*1 1/4"+3/4"*	*814*
M180L	*1074*	*1192*	*348*	*246*	*246*	*1 1/4"+3/4"*	*821*
M200L	*1099*	*1229*	*385*	*260*	*260*	*1 1/4"+3/4"*	*870*
M225S	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
M225M	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
M250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
M280S incl. adapter	*on request*	*on request*	*555*	*432*	*on request*	*2x2"*	*on request*
M280M incl. adapter	*1333*	*on request*	*555*	*432*	*on request*	*2x2"*	*1394*

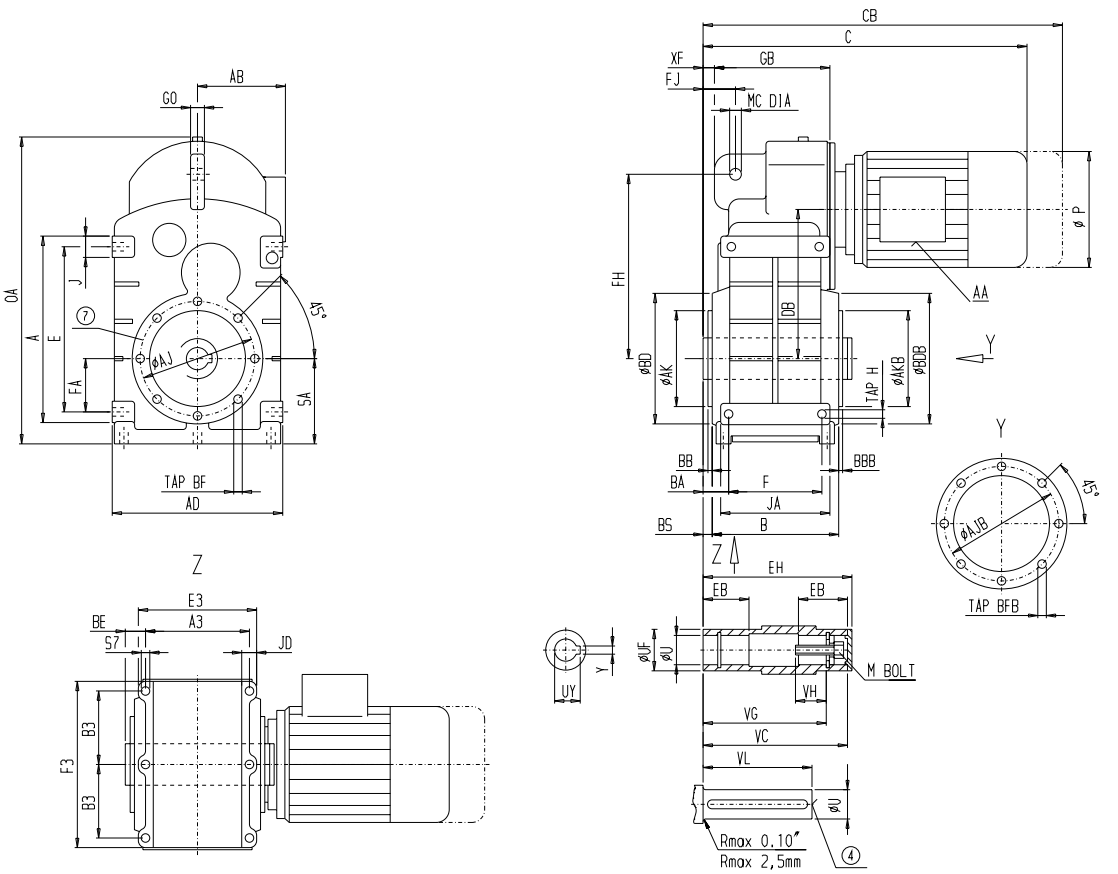
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA188B
FDAZ/FZAZ188B

FA 510
FAZ 510

[inch]



5

Mounting

AK	BD	AJ	BB	TAP BF
15.75	11.81	13.78	0.2	M24x32

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
4.5	6.299	19.685	18.11	2.94	16.93	1-8UNC	4.959	1	8.661	20.04

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
12.2	15.75	13.39	21.26	11.81	9.25	14.37	13.78	15.75	24.41	0.2	21.26	16.3	10.43	6.69	17.32

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
3.15	3.15	2.46	18.58	0.55	3.74	22.05	38.41	M36x50	M24x32	M36x50	1.56	4.33	24.41	1.3	1.97

Motor

	F.A.188B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	34.61	38.58	10.16	7.13	7.13	1“+3/4“	1385
M132M	34.61	38.58	10.16	7.13	7.13	1“+3/4“	1409
M160M	37.79	42.4	12.2	7.83	7.83	1“+3/4“	1462
M160L	37.79	42.4	12.2	7.83	7.83	1“+3/4“	1493
M180M	39.88	44.53	13.7	9.69	9.69	1 1/4“+3/4“	1536
M180L	39.88	44.53	13.7	9.69	9.69	1 1/4“+3/4“	1551
M200L	40.87	45.99	15.16	10.24	10.24	1 1/4“+3/4“	1659
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2“	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2“	on request
LG280S incl. adapter	on request	on request	21.85	17.01	on request	2x2“	on request
LG280ZM incl. adapter	50.11	on request	21.85	17.01	on request	2x2“	3074

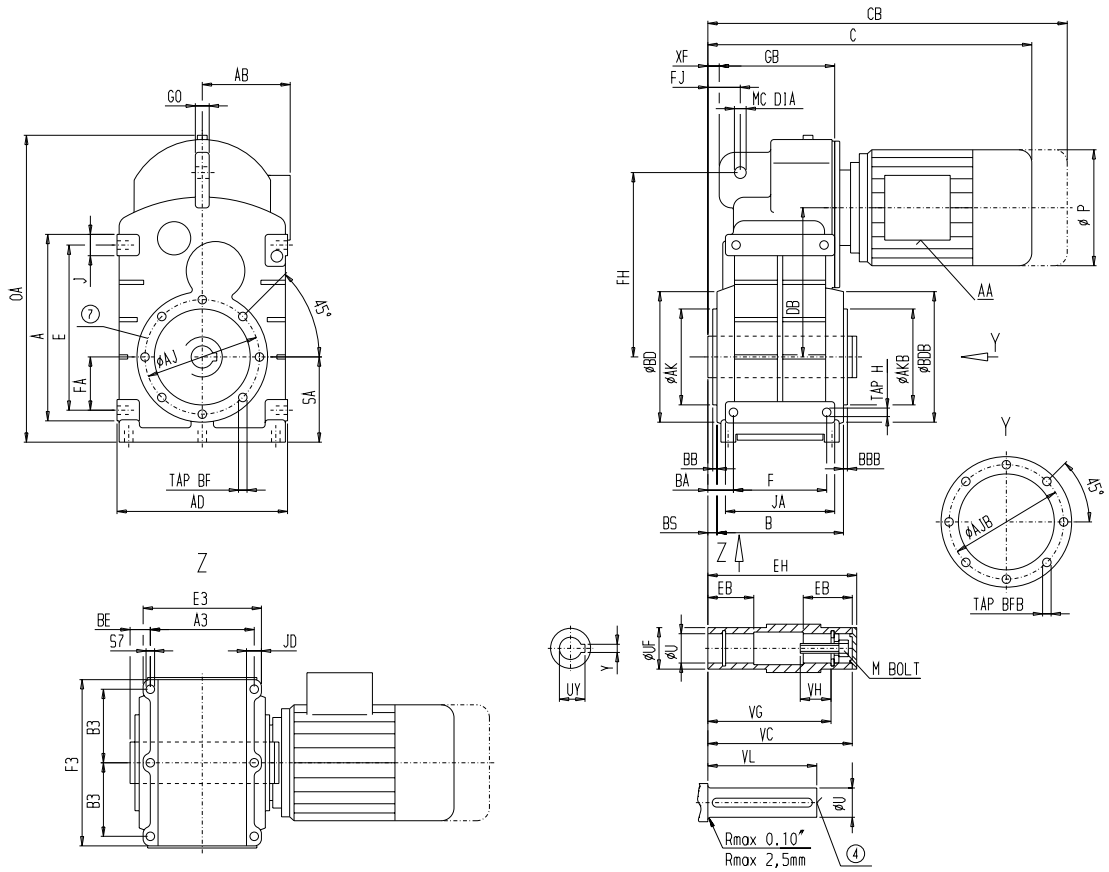
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

FDA/FZA188B
FDAZ/FZAZ188B

FA 510
FAZ 510

[mm]



Mounting

BD	AK	AJ	BB	TAP BF
400	*300*	*350*	*5*	*M24x32*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
114,3	*160*	*500*	*460*	*75*	*430*	*1"-8UNC*	*125,96*	*25,4*	*220*	*509*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB	SA	FA	DB
310	*400*	*340*	*540*	*300*	*235*	*365*	*350*	*400*	*620*	*5*	*540*	*414*	*265*	*170*	*440*

BE	J	JD	B	BS	BA	AD	OA	TAP H	TAP BFB	S7	XF	FJ	FH	MC DIA	GO
80	*80*	*62,5*	*472*	*14*	*95*	*560*	*975,5*	*M36x50*	*M24x32*	*M36x50*	*39,5*	*110*	*620*	*33*	*50*

Motor

	F.A.188B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*880*	*981*	*258*	*181*	*181*	*1"+3/4"*	*628*
M132M	*880*	*981*	*258*	*181*	*181*	*1"+3/4"*	*639*
M160M	*961*	*1078*	*310*	*199*	*199*	*1"+3/4"*	*663*
M160L	*961*	*1078*	*310*	*199*	*199*	*1"+3/4"*	*677*
M180M	*1014*	*1132*	*348*	*246*	*246*	*1 1/4"+3/4"*	*696*
M180L	*1014*	*1132*	*348*	*246*	*246*	*1 1/4"+3/4"*	*703*
M200L	*1039*	*1169*	*385*	*260*	*260*	*1 1/4"+3/4"*	*752*
LG225S	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*on request*	*on request*	*555*	*432*	*on request*	*2x2"*	*on request*
LG280ZM incl. adapter	*1273*	*on request*	*555*	*432*	*on request*	*2x2"*	*1394*

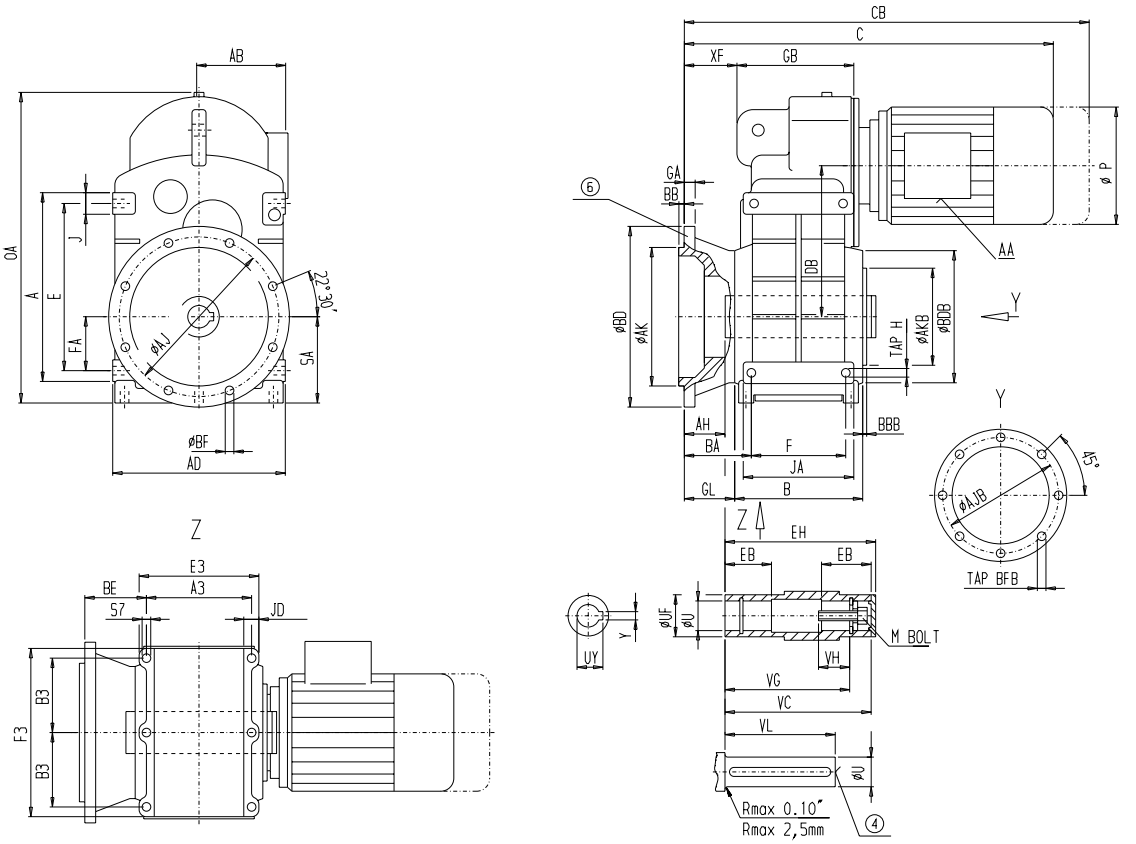
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑦ Note see page 5 - 68 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF188B

FAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	AH	BF	BA
25.98	21.65	1.1	23.62	0.24	2.36	0.87	6.1

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
4.5	6.299	19.685	18.11	2.94	16.93	1-8UNC	4.959	1	8.661	20.04

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
12.2	15.75	13.39	21.26	11.81	9.25	14.37	13.78	15.75	24.41	0.2	21.26	16.3

SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
10.43	6.69	17.32	5.51	3.15	2.46	18.58	2.91	22.05	38.41	M36x50	M24x32	M36x50	3.92

Motor

	F.AF188B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [lb]
M132S	36.97	40.94	10.16	7.13	7.13	1"+3/4"	1506
M132M	36.97	40.94	10.16	7.13	7.13	1"+3/4"	1531
M160M	40.15	44.76	12.2	7.83	7.83	1"+3/4"	1583
M160L	40.15	44.76	12.2	7.83	7.83	1"+3/4"	1614
M180M	42.24	46.89	13.7	9.69	9.69	1 1/4"+3/4"	1657
M180L	42.24	46.89	13.7	9.69	9.69	1 1/4"+3/4"	1672
M200L	43.23	48.35	15.16	10.24	10.24	1 1/4"+3/4"	1781
LG225S	on request	on request	17.4	12.8	on request	2x1 1/2"	on request
LG225ZM	on request	on request	17.4	12.8	on request	2x1 1/2"	on request
LG250ZM	on request	on request	19.49	15.43	on request	2x2"	on request
LG280S incl. adapter	on request	on request	21.85	17.01	on request	2x2"	on request
LG280ZM incl. adapter	52.48	on request	21.85	17.01	on request	2x2"	3074

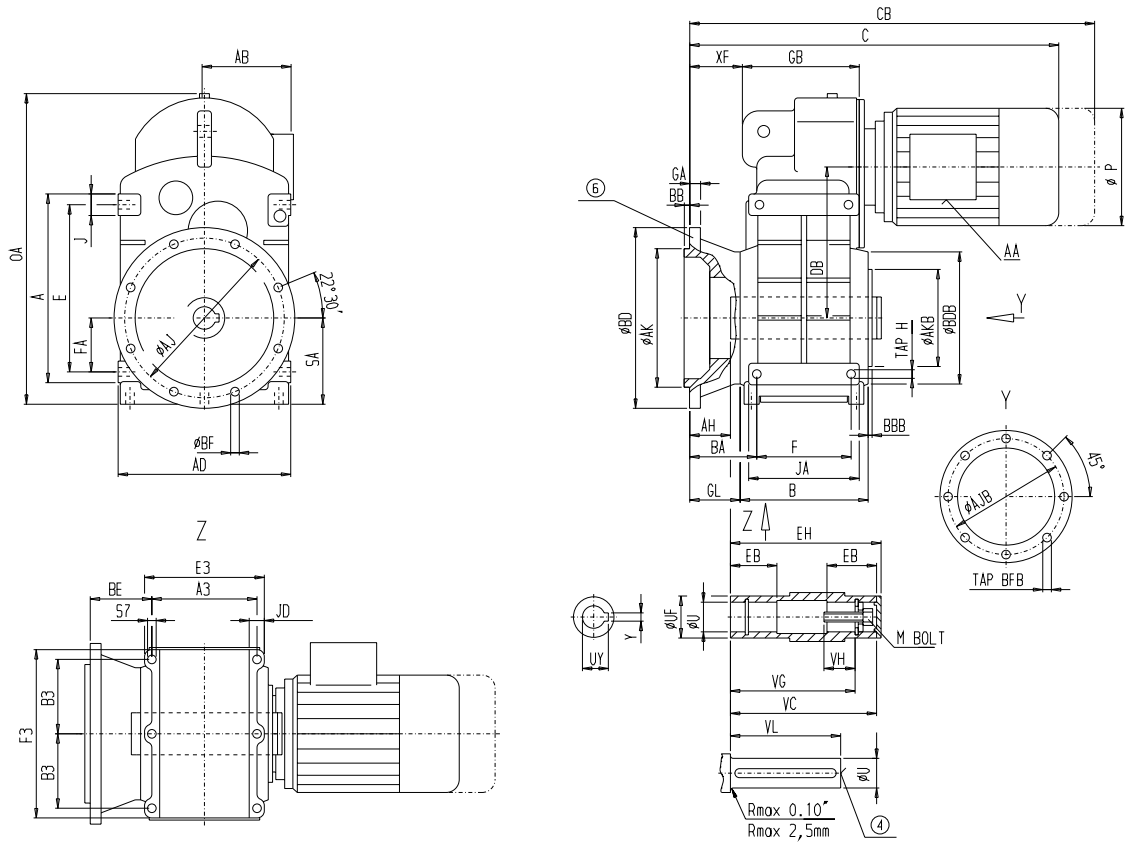
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67 ** for voltage ratio 1:2

Parallel Shaft Gear Motors
Shaft mounted with flange

FDAF/FZAF188B

FAF 510

[mm]



Flange

BD	AK	GA	AJ	BB	AH	BA	BF
660	*550*	*28*	*600*	*6*	*60*	*155*	*22*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EB	EH
114,3	*160*	*500*	*460*	*75*	*430*	*1"-8UNC*	*125,96*	*25,4*	*220*	*509*

Gearcase

F	BDB	A3	E	AKB	B3	JA	AJB	E3	A	BBB	F3	GB
310	*400*	*340*	*540*	*300*	*235*	*365*	*350*	*400*	*620*	*5*	*540*	*414*

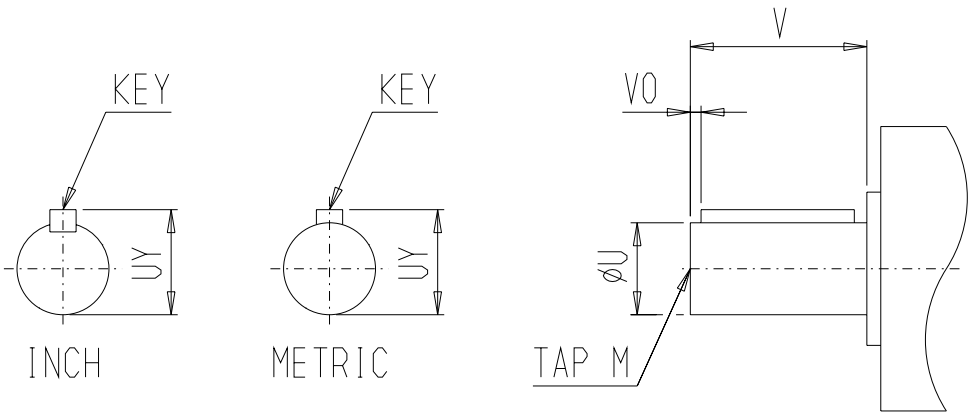
SA	FA	DB	BE	J	JD	B	GL	AD	OA	TAP H	TAP BFB	S7	XF
265	*170*	*440*	*140*	*80*	*62,5*	*472*	*74*	*560*	*975,5*	*M36x50*	*M24x32*	*M36x50*	*99,5*

Motor

	F.AF188B						
Motor	**C**	**CB**	**P**	**AB**	**AB****	**AA**	**Weight** [*kg*]
M132S	*940*	*1041*	*258*	*181*	*181*	*1"+3/4"*	*683*
M132M	*940*	*1041*	*258*	*181*	*181*	*1"+3/4"*	*694*
M160M	*1021*	*1138*	*310*	*199*	*199*	*1"+3/4"*	*718*
M160L	*1021*	*1138*	*310*	*199*	*199*	*1"+3/4"*	*732*
M180M	*1074*	*1192*	*348*	*246*	*246*	*1 1/4"+3/4"*	*751*
M180L	*1074*	*1192*	*348*	*246*	*246*	*1 1/4"+3/4"*	*758*
M200L	*1099*	*1229*	*385*	*260*	*260*	*1 1/4"+3/4"*	*807*
LG225S	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG225ZM	*on request*	*on request*	*442*	*395*	*on request*	*2x1 1/2"*	*on request*
LG250ZM	*on request*	*on request*	*495*	*392*	*on request*	*2x2"*	*on request*
LG280S incl. adapter	*on request*	*on request*	*555*	*432*	*on request*	*2x2"*	*on request*
LG280ZM incl. adapter	*1333*	*on request*	*555*	*432*	*on request*	*2x2"*	*1394*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 5 - 67 ** for voltage ratio 1:2

Available Output Solid Shafts



INCH

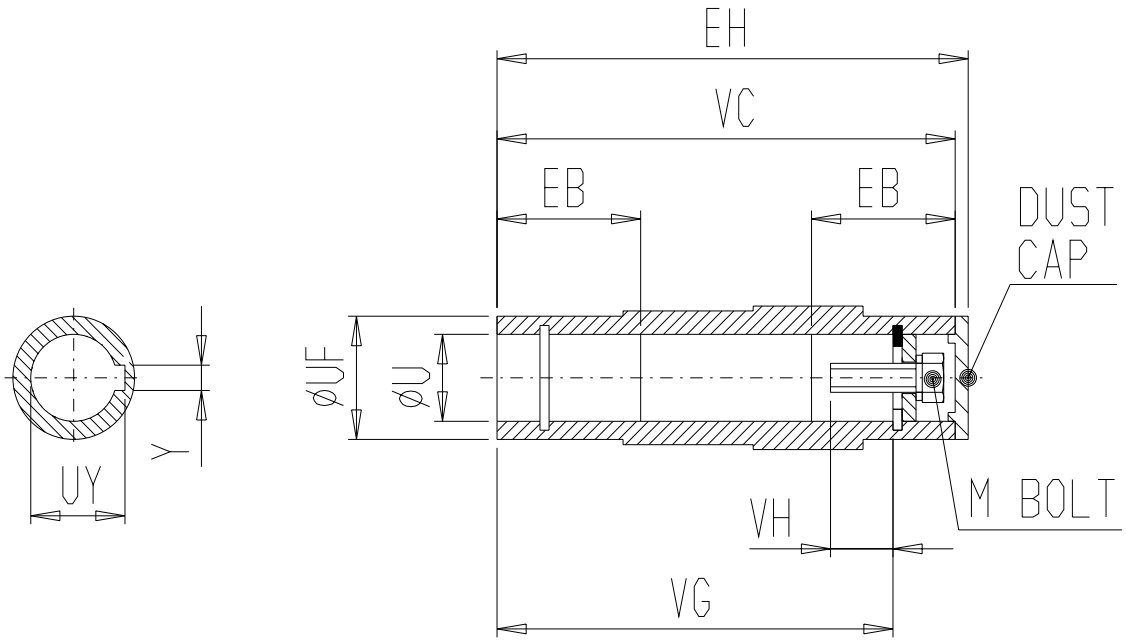
Size	U [inch]	UY [inch]	V [inch]	VO [inch]	KEY [inch]	TAP M [inch]
F./F.F 28	1	1.11	1.97	0.252	1/4 x 1/4 x 1 1/2	3/8 - 16 x 0.87
F./F.F 38B						
F./F.F 48B	1 1/4	1.36	2.36	0.133	1/4 x 1/4 x 1 7/8	3/8 - 16 x 0.87
F. 38B	1 3/8	1.51	2.76	0.027	5/16 x 5/16 x 2 3/8	3/8 - 16 x 0.87
F. 48B	1 5/8	1.79	3.15	0.065	3/8 x 3/8 x 2 3/4	5/8 - 11 x 1.42
F./F.F 68B						
F. 68B	2	2.22	3.94	0.004	1/2 x 1/2 x 3 1/2	3/4 - 10 x 1.65
F./F.F 88B						
F./F.F 108B	2 3/8	2.65	4.72	0.002	5/8 x 5/8 x 4 1/4	3/4 - 10 x 1.65
F. 88B	2 3/4	3.03	5.51	0.671	5/8 x 5/8 x 4 1/4	3/4 - 10 x 1.65
F./F.F 128B	2 7/8	3.20	5.51	0.046	3/4 x 3/4 x 4 7/8	3/4 - 10 x 1.65
F. 108B	3 3/16	3.52	6.69	0.834	3/4 x 3/4 x 4 7/8	3/4 - 10 x 1.65
F. 128B	3 5/8	4.01	6.69	0.602	7/8 x 7/8 x 5 1/2	1 - 8 x 1.97
F./F.F 148B						
F. 148B	4	4.44	8.27	0.677	1 x 1 x 7	1 - 8 x 1.97
F./F.F 168B	4 3/8	4.82	8.27	0.677	1 x 1 x 7	1 - 8 x 1.97
F. 168B	4 3/4	5.29	8.27	0.677	1 1/4 x 1 1/4 x 7	1 - 8 x 1.97
F./F.F 188B						

METRIC

Size	U [*mm*]	UY [*mm*]	V [*mm*]	VO [*mm*]	KEY [*mm*]	TAP M [*mm*]
F./F.F 28	*25*	*28*	*50*	*5*	*8 x 7 x 40*	*M10 x 22*
F./F.F 38B						
F./F.F 48B	*30*	*33*	*60*	*3.5*	*8 x 7 x 50*	*M10 x 22*
F./F.F 68B	*40*	*43*	*80*	*5*	*12 x 8 x 70*	*M16 x 36*
F./F.F 88B	*50*	*53.5*	*100*	*10*	*14 x 9 x 80*	*M16 x 36*
F./F.F 108B	*60*	*64*	*120*	*5*	*18 x 11 x 110*	*M20 x 42*
F./F.F 128B	*70*	*74.5*	*140*	*7.5*	*20 x 12 x 125*	*M20 x 42*
F./F.F 148B	*90*	*95*	*170*	*15*	*25 x 14 x 140*	*M24 x 50*
F./F.F 168B	*110*	*116*	*210*	*15*	*28 x 16 x 180*	*M24 x 50*
F./F.F 188B	*120*	*127*	*210*	*15*	*32 x 18 x 180*	*M24 x 50*

Tolerances see page 1 - 4. Tap specification see page 1 - 7.

Available Output Hollow Shafts Inch



INCH

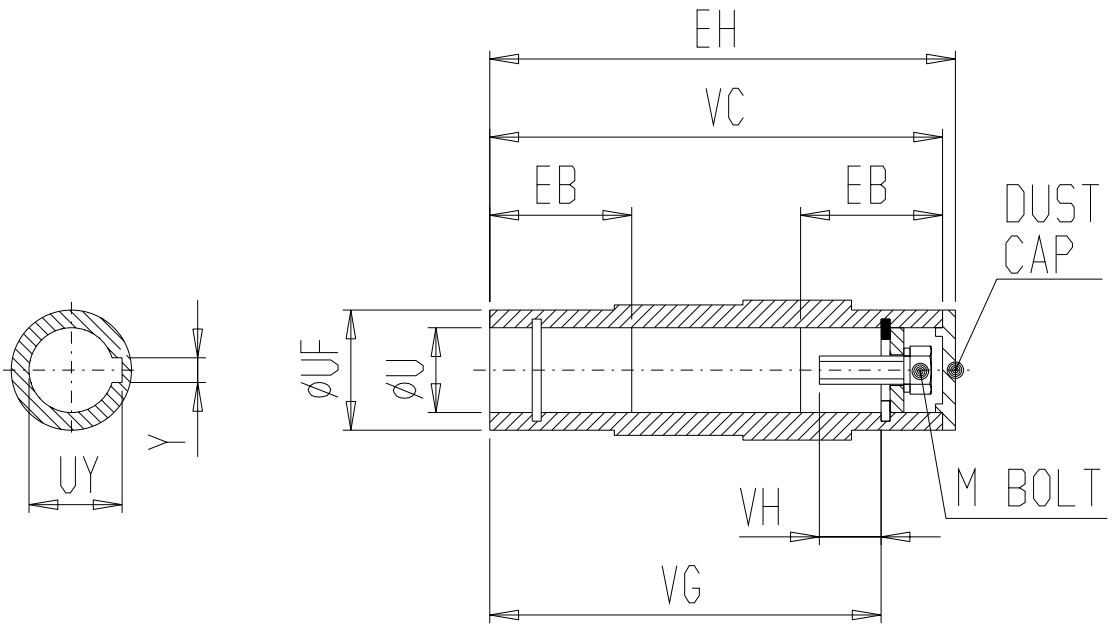
5

Size	VC [inch]	EH [inch]	EB [inch]	U [inch]	UF [inch]	UY [inch]	Y [inch]	VG [inch]	VH [inch]	M BOLT [inch]
FA. 28	4.09	4.21	1.58	1	1.58	1.12	1/4	3.5	1.547	3/8 - 16 UNC
FA. 38B	4.72	4.84	1.73	1	1.77	1.12	1/4	4.13	1.38	3/8 - 16 UNC
				1 1/4		1.38		4.02		
FA. 48B	5.91	6.02	2.28	1 3/8	2.17	1.53	5/16	5.04	1.37	3/8 - 16 UNC
				1 1/2		1.68	3/8		1.93	
FA. 68B	7.09	7.20	2.72	1 1/2	2.56	1.68	3/8	5.91	1.93	5/8 - 11 UNC
				1 3/4		1.87 *				5/8 - 11 UNC
FA. 88B	8.27	8.39	3.07	2	3.15	2.23	1/2	7.09	1.62	3/4 - 10 UNC
				2 3/8		2.47 *	5/8			
FA. 108B	9.45	9.61	3.66	2 3/8	3.74	2.66	5/8	8.19	2.37	3/4 - 10 UNC
				2 7/16		2.72				
				2 3/4		2.92 *			2.35	
FA. 128B	11.81	11.97	4.84	2 3/4	4.33	3.04	5/8	10.35	2.35	3/4 - 10 UNC
				2 15/16		3.28	3/4		2.27	
				3 1/4		3.41 *			2.15	
FA. 148B	13.78	13.94	5.83	3 7/16	4.72	3.70 *	7/8	12.2	2.10	1 - 8 UNC
				3 5/8		3.84 *				
FA. 168B	16.14	16.30	6.89	4	5.91	4.45	1	14.41	2.09	1 - 8 UNC
				4 1/2		4.83 *			1.94	
FA. 188B	19.69	20.04	8.66	4 1/2	6.30	4.95	1	18.11	2.94	1 - 8 UNC

Tolerances see page 1 - 4.

* rectangular key have to be used

Available Output Hollow Shafts Metric



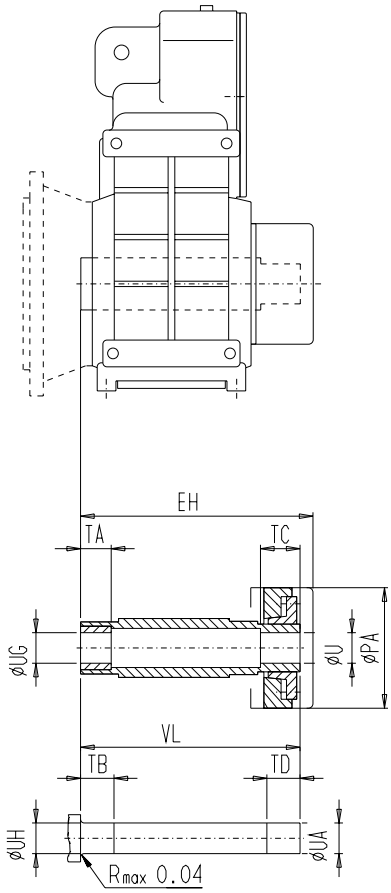
METRIC

5

Size	VC [mm]	EH [mm]	EB [mm]	U [mm]	UF [mm]	UY [mm]	Y [mm]	VG [mm]	VH [mm]	M BOLT [mm]
FA. 28	104	106	40	25	40	28.3	8	89	27.6	M10 x 30
FA. 38B	120	123	44	30	45	33.3	8	102	31	M10 x 40
FA. 48B	150	153	58	40	55	43.3	12	128	48	M16 x 60
				35		38.3	10		40	M12 x 50
FA. 68B	180	183	69	45	65	48.8	14	150	47	M16 x 60
				40		43.3	12		48	
FA. 88B	210	213	78	60	80	64.4	18	180	54	M20 x 70
				50		53.8	14		44.5	M16 x 60
FA. 108B	240	244	93	70	95	74.9	20	208	63.5	M20 x 80
				60		64.4	18			
FA. 128B	300	304	123	80	110	85.4	22	263	63.5	M20 x 85
				70		74.9	20			M20 x 80
FA. 148B	350	354	148	90	120	95.4	25	310	72	M24 x 95
				80		85.4	22		63.5	M20 x 85
FA. 168B	410	414	175	110	150	116.4	28	366	73	M24 x 100
				100		106.4			72	M24 x 95
FA. 188B	500	510	220	120	160	127.4	32	460	71	M24 x 100

Tolerances see page 1 - 4.

Parallel shaft gear motors shaft mounted with shrink disk



Model	U UA [inch] [*mm*]	UG UH [inch] [*mm*]	VL [inch] [*mm*]	TA [inch] [*mm*]	TB [inch] [*mm*]	TC [inch] [*mm*]	TD [inch] [*mm*]	PA [inch] [*mm*]	EH [inch] [*mm*]	1) Motor size
F.A.S28	-	-	4.96	0.79	0.98	0.98	1.18	2.28	5.33	
	25	*25*	*126*	*20*	*25*	*25*	*30*	*58*	*135.5*	*100 **
F.A.S38B	-	-	5.75	0.79	0.98	0.87	1.06	3.03	6.06	
	30	*30*	*146*	*20*	*25*	*22*	*27*	*77*	*154*	*100*
F.A.S48B	-	-	6.97	0.79	0.98	0.98	1.18	3.66	7.24	
	40	*40*	*177*	*20*	*25*	*25*	*30*	*93*	*184*	*112*
F.A.S68B	-	-	8.23	0.79	0.98	1.06	1.26	4.41	8.50	
	50	*50*	*209*	*20*	*25*	*27*	*32*	*112*	*216*	*132*
F.A.S88B	-	-	9.49	1.18	1.38	1.14	1.34	5.20	9.80	
	60	*60*	*241*	*30*	*35*	*29*	*34*	*132*	*249*	*160*
F.A.S108B	-	-	11.02	1.57	1.77	1.18	1.38	5.67	11.34	
	70	*70*	*280*	*40*	*45*	*30*	*35*	*144*	*288*	*200*
F.A.S128B	-	-	13.58	1.97	2.17	1.57	1.77	7.09	14.06	
	80	*80*	*345*	*50*	*55*	*40*	*45*	*180*	*357*	*225*
F.A.S148B	-	-	15.91	2.36	2.56	1.93	2.13	8.27	16.46	
	95	*95*	*404*	*60*	*65*	*49*	*54*	*210*	*418*	*250*
F.A.S168B	-	-	19.02	2.76	2.95	2.13	2.32	9.33	19.53	
	105	*105*	*483*	*70*	*75*	*54*	*59*	*237*	*496*	*280*
F.A.S188B	-	-	22.83	3.15	3.35	2.44	2.64	10.35	23.31	
	125	*125*	*580*	*80*	*85*	*62*	*67*	*263*	*592*	*315*

1) Largest mountable motor size

*) F.A.S 28-90 not possible

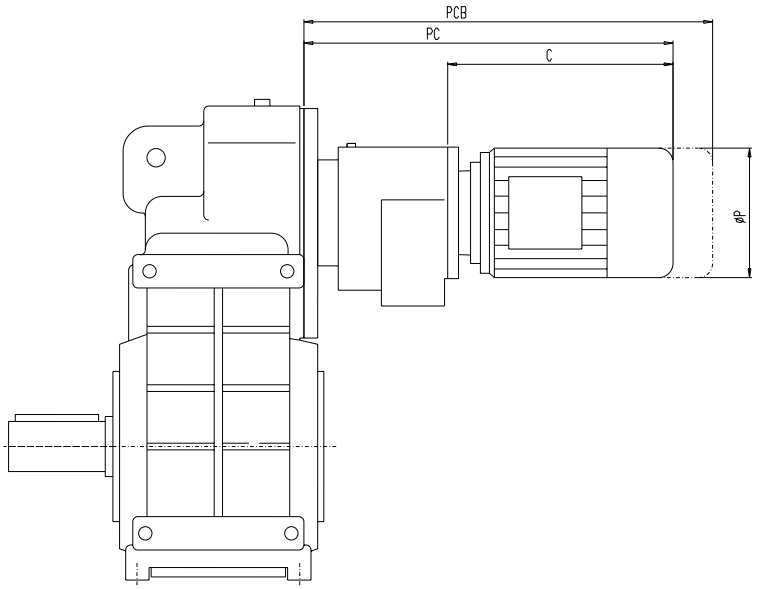
Tolerances see page1 - 4

Minimum strength of machines drive shaft 50000psi (360N/mm^2)

Tandem-Parallel Shaft Gear Motors

FDZ 710

[inch]



Gear Units		P	PC	PCB	C
FZ.38B-Z28	M71	5.43	13.37	15.1	8.09
	M71MP	5.43	13.96	16.13	8.68
	M90S	6.93	16.7	19.3	11.42
	M90L	6.93	16.7	19.3	11.42
	M100L	7.64	19.89	22.72	14.57
FZ.38B-D28	M71	5.43	13.37	15.1	8.09
	M71MP	5.43	13.96	16.13	8.68
	M90S	6.93	16.7	19.3	11.42
	M90L	6.93	16.7	19.3	11.42
FD.48B-Z28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
	M100L	7.64	20.87	23.7	14.57
FD.48B-D28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
FD.68B-Z28	M71	5.43	14.14	15.87	8.09
	M71MP	5.43	14.73	16.9	8.68
	M90S	6.93	17.47	20.07	11.42
	M90L	6.93	17.47	20.07	11.42
	M100L	7.64	20.66	23.49	14.57
FD.68B-D28	M71	5.43	14.14	15.87	8.09
	M71MP	5.43	14.73	16.9	8.68
	M90S	6.93	17.47	20.07	11.42
	M90L	6.93	17.47	20.07	11.42
FD.88B-Z28	M71	5.43	13.9	15.63	8.09
	M71MP	5.43	14.49	16.66	8.68
	M90S	6.93	17.23	19.83	11.42
	M90L	6.93	17.23	19.83	11.42
	M100L	7.64	20.42	23.25	14.57
FD.88B-D28	M71	5.43	13.9	15.63	8.09
	M71MP	5.43	14.49	16.66	8.68
	M90S	6.93	17.23	19.83	11.42
	M90L	6.93	17.23	19.83	11.42

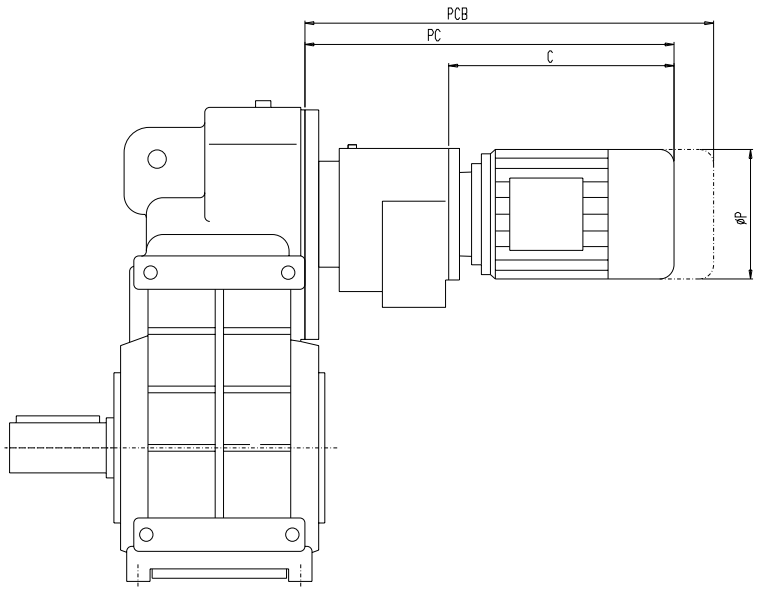
1) $i_{ges} \geq 1647$ 2) $i_{ges} < 1647$

Gear Units		P	PC	PCB	C
FD.108B-Z38	M71 1)	5.43	18.11	19.84	10.02
	M80 1)	6.22	18.95	21.12	10.87
	M90S 1)	6.93	20.57	23.16	12.48
	M90L 1)	6.93	20.57	23.16	12.48
	M100L 1)	7.64	22.34	25.17	14.25
	M112M 1)	8.58	24.39	27.58	16.3
	M71 2)	5.43	18.52	20.25	10.02
	M80 2)	6.22	19.36	21.53	10.87
	M90S 2)	6.93	20.98	23.57	12.48
	M90L 2)	6.93	20.98	23.57	12.48
	M100L 2)	7.64	22.75	25.58	14.25
	M112M 2)	8.58	24.8	27.99	16.3
FD.108B-D38	M71	5.43	18.71	20.44	10.61
	M80	6.22	19.55	21.72	11.46
	M90S	6.93	21.17	23.76	13.07
	M90L	6.93	21.17	23.76	13.07
FD.128B-Z38	M71	5.43	17.83	19.56	10.02
	M80	6.22	18.67	20.84	10.87
	M90S	6.93	20.29	22.88	12.48
	M90L	6.93	20.29	22.88	12.48
	M100L	7.64	22.06	24.89	14.25
	M112M	8.58	24.11	27.3	16.3
FD.128B-D38	M71	5.43	18.43	20.16	10.61
	M80	6.22	19.27	21.44	11.46
	M90S	6.93	20.89	23.48	13.07
	M90L	6.93	20.89	23.48	13.07
FD.128B-Z48	M71	5.43	20.74	22.47	9.8
	M80	6.22	21.58	23.75	10.65
	M90S	6.93	23.2	25.79	12.26
	M90L	6.93	23.2	25.79	12.26
	M100L	7.64	24.97	27.8	14.04
	M112M	8.58	26.99	30.18	16.06
	M132S	10.16	30.64	34.57	19.7
	M132M	10.16	30.64	34.57	19.7

Tandem-Parallel Shaft Gear Motors

FDZ 710

[inch]



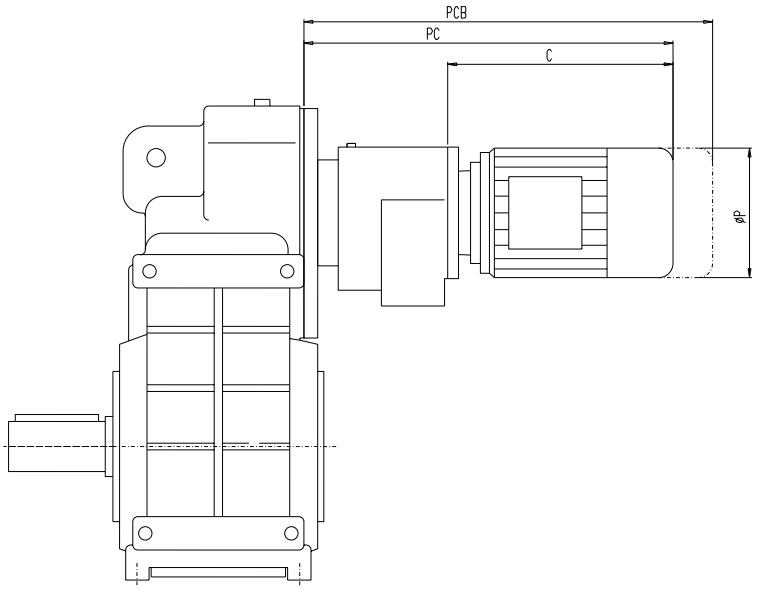
Gear Units		P	PC	PCB	C
FD.148B-Z38	M71	5.43	17.65	19.38	
	M80	6.22	18.49	20.66	
	M90S	6.93	20.11	22.7	
	M90L	6.93	20.11	22.7	
	M100L	7.64	21.88	24.71	
	M112M	8.58	23.93	27.12	
FD.148B-D38	M71	5.43	18.25	19.98	
	M80	6.22	19.09	21.26	
	M90S	6.93	20.71	23.3	
	M90L	6.93	20.71	23.3	
FD.148B-Z48	M71	5.43	20.32	22.05	
	M80	6.22	21.16	23.33	
	M90S	6.93	22.78	25.37	
	M90L	6.93	22.78	25.37	
	M100L	7.64	24.55	27.38	
	M112M	8.58	26.57	29.76	
	M132S	10.16	30.22	34.15	
	M132M	10.16	30.22	34.15	
FD.168B-Z48	M71	5.43	20.01	21.74	
	M80	6.22	20.85	23.02	
	M90S	6.93	22.47	25.06	
	M90L	6.93	22.47	25.06	
	M100L	7.64	24.24	27.07	
	M112M	8.58	26.26	29.45	
	M132S	10.16	29.91	33.84	
	M132M	10.16	29.91	33.84	
FD.168B-D48	M71	5.43	20.68	22.41	10.47
	M80	6.22	21.52	23.69	11.32
	M90S	6.93	23.14	25.73	12.93
	M90L	6.93	23.14	25.73	12.93
	M100L	7.64	24.91	27.74	14.7

Gear Units		P	PC	PCB	C
FD.168B-Z68	M71	5.43	22.74	24.47	9.57
	M80	6.22	23.58	25.75	10.41
	M90S	6.93	25.2	27.79	12.03
	M90L	6.93	25.2	27.79	12.03
	M100L	7.64	26.97	29.8	13.8
	M112M	8.58	28.92	32.11	15.75
	M132S	10.16	32.49	36.42	19.31
	M132M	10.16	32.49	36.42	19.31
	M160M	12.2	35.77	40.38	22.6
	M160L	12.2	35.77	40.38	22.6
FD.188B-Z48	M71	5.43	19.44	21.17	9.8
	M80	6.22	20.28	22.45	10.65
	M90S	6.93	21.9	24.49	12.26
	M90L	6.93	21.9	24.49	12.26
	M100L	7.64	23.67	26.5	14.04
	M112M	8.58	25.69	28.88	16.06
	M132S	10.16	29.34	33.27	19.7
	M132M	10.16	29.34	33.27	19.7
FD.188B-D48	M71	5.43	20.11	21.84	10.47
	M80	6.22	20.95	23.12	11.32
	M90S	6.93	22.57	25.16	12.93
	M90L	6.93	22.57	25.16	12.93
	M100L	7.64	24.34	27.17	14.7
FD.188B-Z68	M71	5.43	22.82	24.55	9.57
	M80	6.22	23.66	25.83	10.41
	M90S	6.93	25.28	27.87	12.03
	M90L	6.93	25.28	27.87	12.03
	M100L	7.64	27.05	29.88	13.8
	M112M	8.58	29	32.19	15.75
	M132S	10.16	32.57	36.5	19.31
	M132M	10.16	32.57	36.5	19.31
	M160M	12.2	35.85	40.46	22.6
	M160L	12.2	35.85	40.46	22.6

Tandem-Parallel Shaft Gear Motors

FDZ 710

[*mm*]



Gear Units		P	PC	PCB	C
FZ.38B-Z28	M71	138	341	385	205,5
	M71MP	138	356	411	220,5
	M90S	176	425,5	491,5	290
	M90L	176	425,5	491,5	290
	M100L	194	506,5	578,5	370
FZ.38B-D28	M71	138	341	385	205,5
	M71MP	138	356	411	220,5
	M90S	176	425,5	491,5	290
	M90L	176	425,5	491,5	290
FD.48B-Z28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
	M100L	194	531,5	603,5	370
FD.48B-D28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
FD.68B-Z28	M71	138	360,5	404,5	205,5
	M71MP	138	375,5	430,5	220,5
	M90S	176	445	511	290
	M90L	176	445	511	290
	M100L	194	526	598	370
FD.68B-D28	M71	138	360,5	404,5	205,5
	M71MP	138	375,5	430,5	220,5
	M90S	176	445	511	290
	M90L	176	445	511	290
FD.88B-Z28	M71	138	354,5	398,5	205,5
	M71MP	138	369,5	424,5	220,5
	M90S	176	439	505	290
	M90L	176	439	505	290
	M100L	194	520	592	370
FD.88B-D28	M71	138	354,5	398,5	205,5
	M71MP	138	369,5	424,5	220,5
	M90S	176	439	505	290
	M90L	176	439	505	290

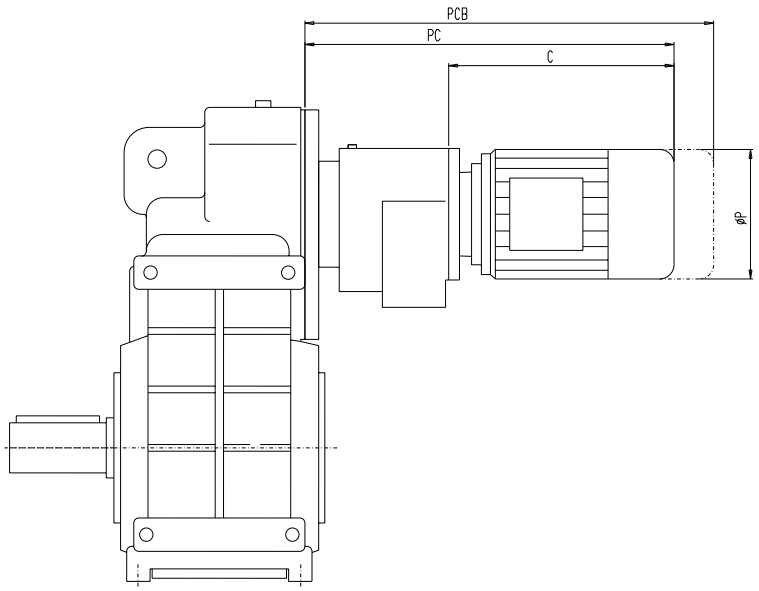
1) $i_{ges} \geq 1647$ 2) $i_{ges} < 1647$

Gear Units		P	PC	PCB	C
FD.108B-Z38	M71 1)	138	461,5	505,5	254,5
	M80 1)	158	483	538	276
	M90S 1)	176	524	590	317
	M90L 1)	176	524	590	317
	M100L 1)	194	569	641	362
	M112M 1)	218	621	702	414
	M71 2)	138	472	516	254,5
	M80 2)	158	493,5	548,5	276
	M90S 2)	176	534,5	600,5	317
	M90L 2)	176	534,5	600,5	317
	M100L 2)	194	579,5	651,5	362
	M112M 2)	218	631,5	712,5	414
FD.108B-D38	M71	138	476,5	520,5	269,5
	M80	158	498	553	291
	M90S	176	539	605	332
	M90L	176	539	605	332
FD.128B-Z38	M71	138	454,5	498,5	254,5
	M80	158	476	531	276
	M90S	176	517	583	317
	M90L	176	517	583	317
	M100L	194	562	634	362
	M112M	218	614	695	414
FD.128B-D38	M71	138	469,5	513,5	269,5
	M80	158	491	546	291
	M90S	176	532	598	332
	M90L	176	532	598	332
FD.128B-Z48	M71	138	528	572	249
	M80	158	549,5	604,5	270,5
	M90S	176	590,5	656,5	311,5
	M90L	176	590,5	656,5	311,5
	M100L	194	635,5	707,5	356,5
	M112M	218	687	768	408
	M132S	258	779,5	879,5	500,5
	M132M	258	779,5	879,5	500,5

Tandem-Parallel Shaft Gear Motors

FDZ 710

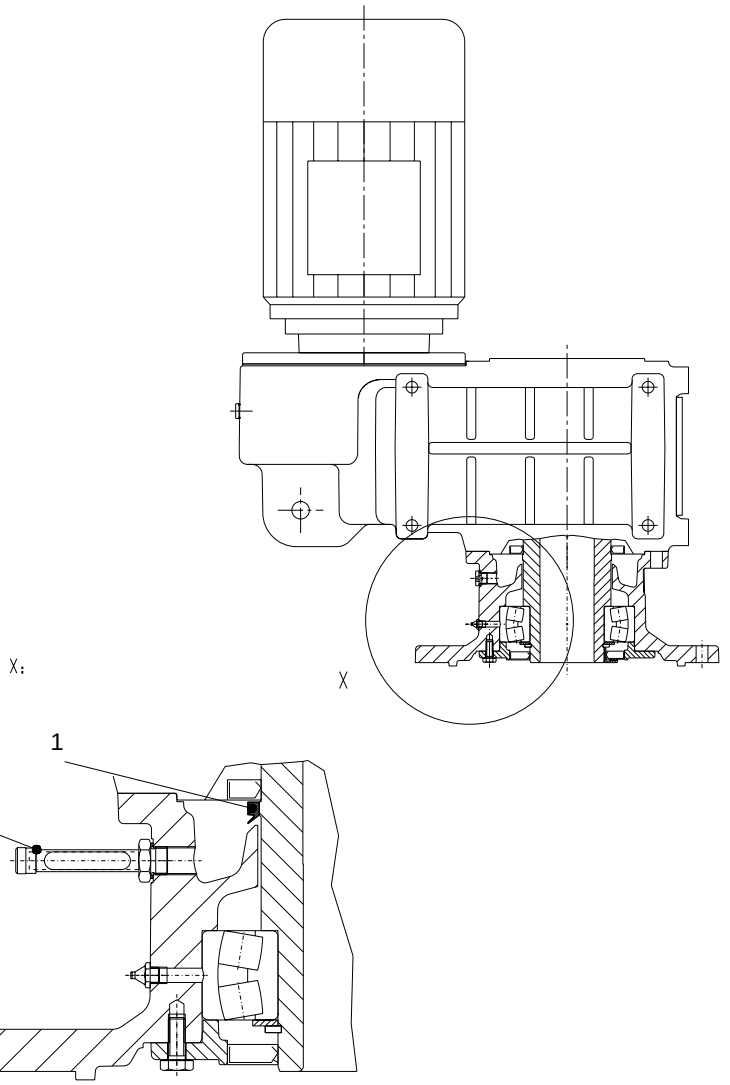
[*mm*]



Gear Units		P	PC	PCB	C
FD.148B-Z38	M71	138	450	494	254,5
	M80	158	471,5	526,5	276
	M90S	176	512,5	578,5	317
	M90L	176	512,5	578,5	317
	M100L	194	557,5	629,5	362
	M112M	218	609,5	690,5	414
FD.148B-D38	M71	138	465	509	269,5
	M80	158	486,5	541,5	291
	M90S	176	527,5	593,5	332
	M90L	176	527,5	593,5	332
FD.148B-Z48	M71	138	517,5	561,5	249
	M80	158	539	594	270,5
	M90S	176	580	646	311,5
	M90L	176	580	646	311,5
	M100L	194	625	697	356,5
	M112M	218	676,5	757,5	408
	M132S	258	769	869	500,5
	M132M	258	769	869	500,5
FD.168B-Z48	M71	138	509,5	553,5	249
	M80	158	531	586	270,5
	M90S	176	572	638	311,5
	M90L	176	572	638	311,5
	M100L	194	617	689	356,5
	M112M	218	668,5	749,5	408
	M132S	258	761	861	500,5
	M132M	258	761	861	500,5
FD.168B-D48	M71	138	526,5	570,5	266
	M80	158	548	603	287,5
	M90S	176	589	655	328,5
	M90L	176	589	655	328,5
	M100L	194	634	706	373,5

Gear Units		P	PC	PCB	C
FD.168B-Z68	M71	138	579	623	243
	M80	158	600,5	655,5	264,5
	M90S	176	641,5	707,5	305,5
	M90L	176	641,5	707,5	305,5
	M100L	194	686,5	758,5	350,5
	M112M	218	736	817	400
	M132S	258	826,5	926,5	490,5
	M132M	258	826,5	926,5	490,5
	M160M	310	910	1027	574
	M160L	310	910	1027	574
FD.188B-Z48	M71	138	495	539	249
	M80	158	516,5	571,5	270,5
	M90S	176	557,5	623,5	311,5
	M90L	176	557,5	623,5	311,5
	M100L	194	602,5	674,5	356,5
	M112M	218	654	735	408
	M132S	258	746,5	846,5	500,5
	M132M	258	746,5	846,5	500,5
FD.188B-D48	M71	138	512	556	266
	M80	158	533,5	588,5	287,5
	M90S	176	574,5	640,5	328,5
	M90L	176	574,5	640,5	328,5
	M100L	194	619,5	691,5	373,5
FD.188B-Z68	M71	138	581	625	243
	M80	158	602,5	657,5	264,5
	M90S	176	643,5	709,5	305,5
	M90L	176	643,5	709,5	305,5
	M100L	194	688,5	760,5	350,5
	M112M	218	738	819	400
	M132S	258	828,5	928,5	490,5
	M132M	258	828,5	928,5	490,5
	M160M	310	912	1029	574
	M160L	310	912	1029	574

Parallel Shaft Gear Units flange mounted for Mixer/Agitator



Mixer-Design FAM/FM

Heavy-Duty Design

Large fixed bearing with long distance between bearings on the output shaft to carry heavy radial and axial loads, especially for long shafts of mixer or agitator.

Optimized design resulting in no axial force transmission through the gear-housing.

Optional Dry-Well Design

For mounting position V1-00, safety against possible oil-leakage is made possible by diverting any leaked oil to a safety chamber with an additional „V"-Ring (1) and detecting the leakage either through a sight glass or electronic sensor (2).

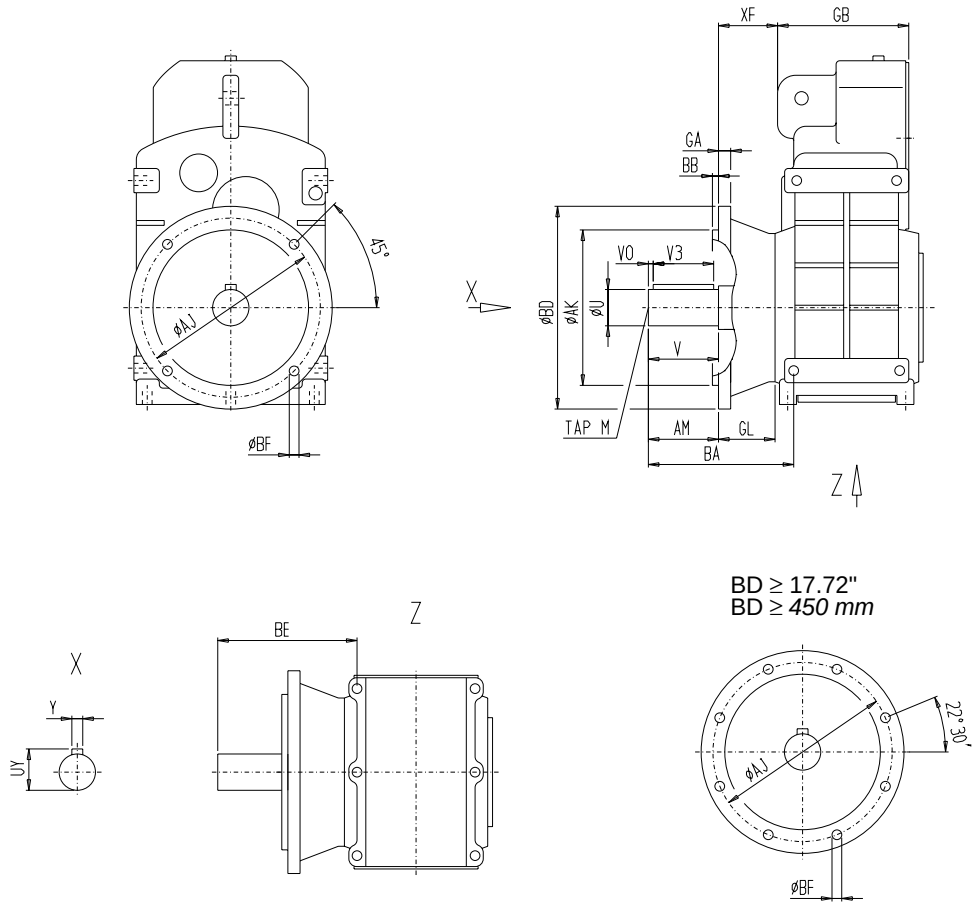
Optional Re-Greasing System

Various Output Shaft Sealing System Possible.

Bearing Life Time Calculation

on request or in electronic cataloque.

Parallel Shaft Gear Units Flange mounted for Mixer / Agitator



Dimensions in Inch / mm

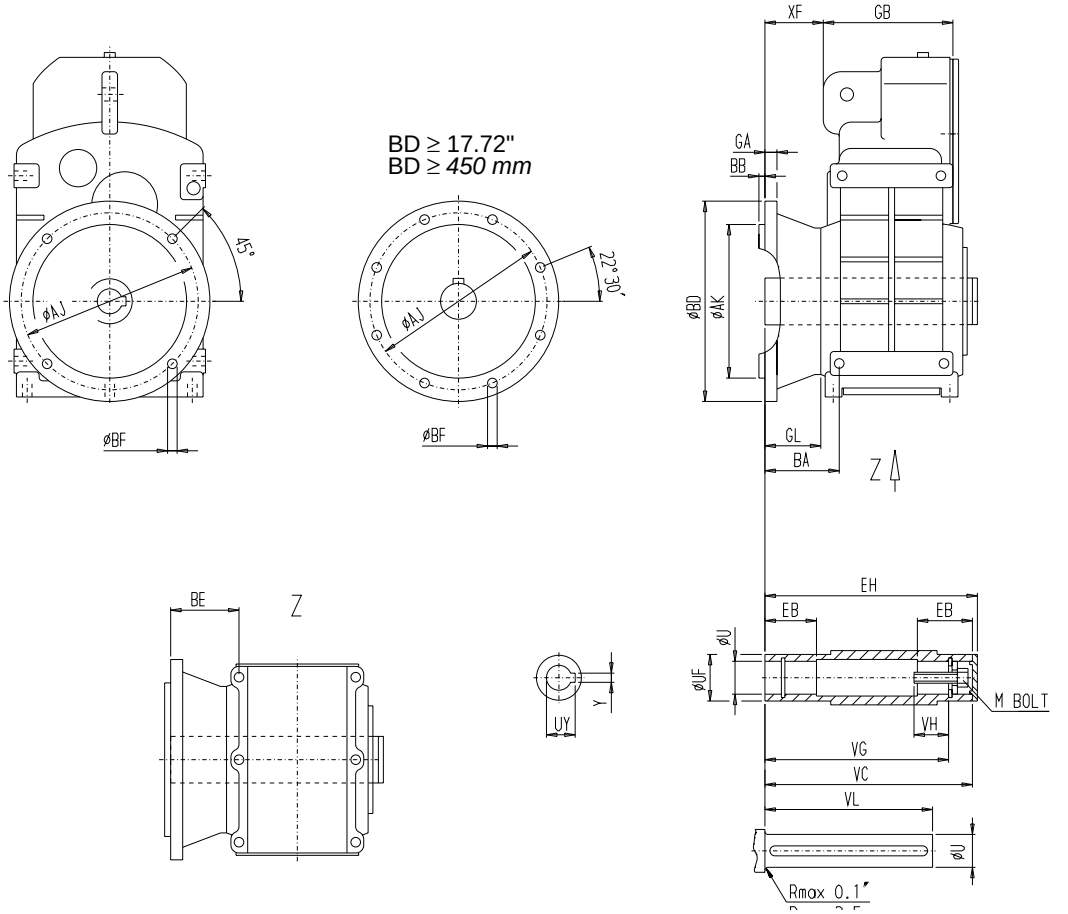
Model	BD	AK	GA	AJ	BB	BF	GL	BA	AM	BE	XF	GB	U / V	V3	VO	Y / UY	TAP M	Add. Weight*
FDM/FZM88B	11.81	9.06	0.79	10.43	0.16	0.53	4.72	11.28	5.51	11.08	4.96	6.89	*70* / 5.51	4.33	0.59	*20* / 2.93	*M20 x 42*	64 / *29*
	300	*230*	*20*	*265*	*4*	*13.5*	*120*	*286.5*	*140*	*281.5*	*126*	*175*	*140*	*110*	*15*	*74.5*		
FDM/FZM108B	13.78	9.84	0.79	11.81	0.20	0.69	5.31	13.13	6.69	12.56	5.53	8.07	*80* / 6.69	4.92	0.79	*22* / 3.35	*M20 x 42*	105 / *48*
	350	*250*	*20*	*300*	*5*	*17.5*	*135*	*333.5*	*170*	*319*	*140.5*	*205*	*170*	*125*	*20*	*85*		
FDM/FZM128B	17.72	13.78	0.98	15.75	0.20	0.69	6.50	14.70	6.69	14.31	6.77	10.67	*90* / 6.69	5.51	0.59	*25* / 3.74	*M24 x 50*	182 / *82*
	450	*350*	*25*	*400*	*5*	*17.5*	*165*	*373.5*	*170*	*363.5*	*172*	*271*	*170*	*140*	*15*	*95*		
FDM/FZM148B	17.72	13.78	0.98	15.75	0.20	0.69	7.28	17.68	8.27	16.85	8.31	11.73	*100* / 8.27	7.09	0.59	*28* / 4.17	*M24 x 50*	234 / *106*
	450	*350*	*25*	*400*	*5*	*17.5*	*185*	*449*	*210*	*428*	*211*	*298*	*210*	*180*	*15*	*106*		
FDM/FZM168B	21.65	17.72	1.10	19.69	0.20	0.69	8.27	18.86	8.27	17.76	9.33	13.23	*120* / 8.27	7.09	0.59	*32* / 5.00	*M24 x 50*	389 / *177*
	550	*450*	*28*	*500*	*5*	*17.5*	*210*	*479*	*210*	*451*	*237*	*336*	*210*	*180*	*15*	*127*		

Tolerances see page 1 - 4.

Tap specification see page 1 - 7.

* To get the weight of the complete drive, the additional weight must be added to the weight of the gear unit in flange design FDA.B/FZA.B
Eg:- Weight FZA88B-M112M (198 lb / 90 kg) + additional weight FM88B (64 lb / 29 kg) = total weight FM88B-M112M (262 lb / 119 kg)

Parallel Shaft Gear Units Shaft mounted with flange for Mixer / Agitator



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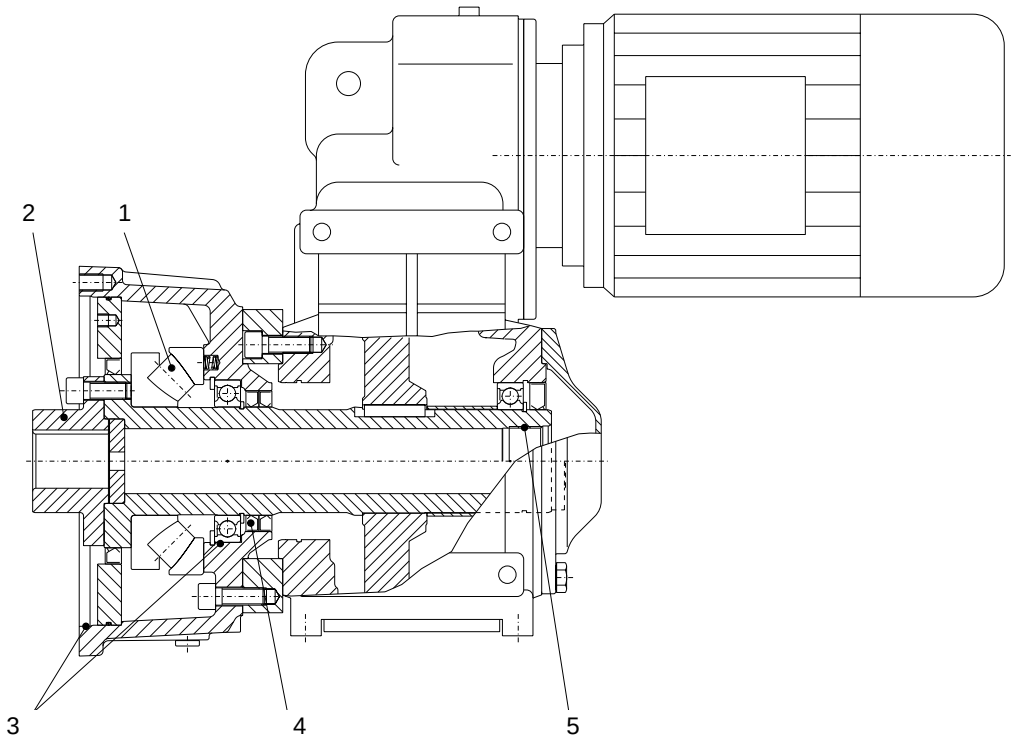
Inch
Dimensions in
mm

Model	BD	AK	GA	AJ / BF	BB	GL	BA	BE	GB / XF	EH / VC	U	UF	EB	VG	VH	VL	Y / UY	M BOLT	Add.Weight*
FDAM/FZAM88B	11.81	9.06	0.79	10.43	0.16	4.72	5.77	5.57	6.89	12.76		3.15	3.07	11.46	2.13	10.83	*18*		39
	300	*230*	*20*	*265*	*4*	*120*	*146.5*	*141.5*	*175*	*324*	*60*	*80*	*78*	*291*	*54*	*275*	2.54	*M20*	*18*
				0.53					4.96	12.64							*64.4*		
				13.5					*126*	*321*									
FDAM/FZAM108B	13.78	9.84	0.79	11.81	0.20	5.31	6.44	5.87	8.07	14.55		3.74	3.66	13.15	2.50	12.20	*20*		66
	350	*250*	*20*	*300*	*5*	*135*	*163.5*	*149*	*205*	*369.5*	*70*	*95*	*93*	*334*	*63.5*	*310*	2.95	*M20*	*30*
				0.69					5.53	14.41							*74.9*		
				17.5					*140.5*	*366*									
FDAM/FZAM128B	17.72	13.78	0.98	15.75	0.20	6.50	8.01	7.62	10.67	18.03		4.33	4.84	16.50	2.50	15.55	*22*		123
	450	*350*	*25*	*400*	*5*	*165*	*203.5*	*193.5*	*271*	*458*	*80*	*110*	*123*	*419*	*63.5*	*395*	3.36	*M20*	*56*
				0.69					6.77	17.95							*85.4*		
				17.5					*172*	*456*									
FDAM/FZAM148B	17.72	13.78	0.98	15.75	0.20	7.28	9.41	8.58	11.73	20.71		4.72	5.83	19.06	2.83	18.11	*25*		148
	450	*350*	*25*	*400*	*5*	*185*	*239*	*218*	*298*	*526*	*90*	*120*	*148*	*484*	*72*	*460*	3.76	*M24*	*67*
				0.69					8.31	20.63							*95.4*		
				17.5					*211*	*524*									
FDAM/FZAM168B	21.65	17.72	1.10	19.69	0.20	8.27	10.59	9.49	13.23	24.06		5.91	6.89	22.24	2.87	21.26	*28*		248
	550	*450*	*28*	*500*	*5*	*210*	*269*	*241*	*336*	*611*	*110*	*150*	*175*	*565*	*73*	*540*	4.58	*M24*	*113*
				0.69					9.33	23.98							*116.4*		
				17.5					*237*	*609*									

Tolerances see page 1 - 4.
Tap specification see page 1 - 7.

***** To get the weight of the complete drive, the additional weight must be added to the weight of the gear unit in flange design FDA.B / FZA.B
Eg:- Weight FZA88B-M112M (198 lb / 90 kg) + additional weight FAM88B (40 lb / 18 kg) = total weight FAM88B-M112M (237 lb / 108 kg)

Parallel Shaft Gear Units
Flange mounted for Extruder Drives **FAE**



1. Large Spherical Roller Bearing - 294... Series of Spherical Roller Bearings to carry heavy Axial Loads.

2. Simple, Cost-effective Design - Customer Connecting Hub without any Grinding Process.Standard Shaft-Hub Connection by Key acc. DIN 6885/1.

3. High Accuracy - Customer-side Centering and Radial Bearing Bore machined in One Setting and from One Direction.

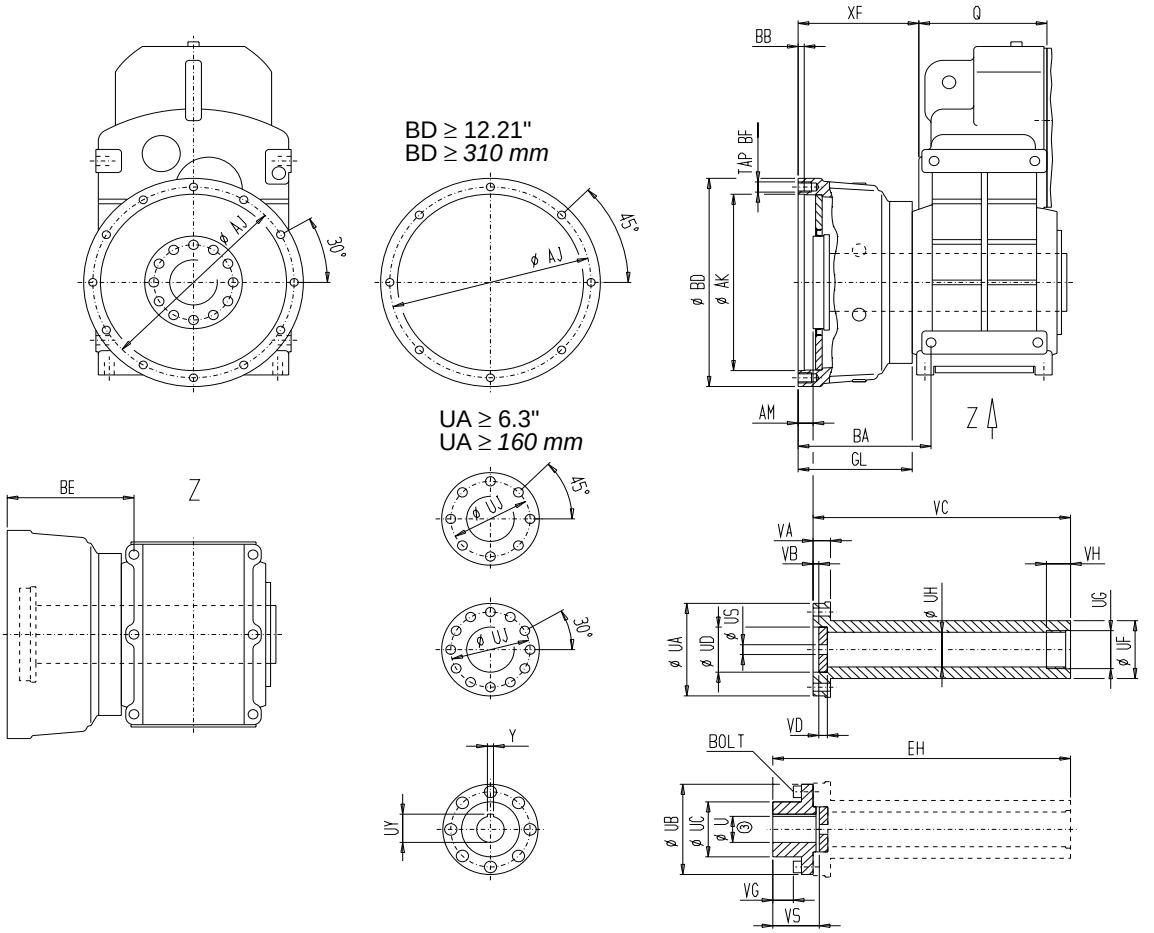
4. Optimized Lubrication - Extruder Flange Lubrication isolated from Gearbox Lubrication.

5. Standard Connections - Metric thread for support of extruder screw (disassembly of extruder screw to the back end).

	Parallel Shaft Gear Unit		F.AE 68B	F.AE 88B	F.AE 108B	F.AE 128B	F.AE 148B	F.AE 168B
	Maximum Power	[hp]	12.5	20	30	60	75	120
	Min / Max Ratio	[2-stage]	3.97 / 61.17	4.77 / 64.58	5.68 / 64.21	3.8 / 56.42	5.39 / 68.23	5.28 / 53.48
	Maximum Torque	[lb-in]	8800	16800	30000	54000	79600	124000
	Thrust Bearing	[.]	29414E	29417E	29420E	29424E	29426E	29432E
Scope of Application	**Screw-ø [mm]**							
	20		**X**					
	25		**X**					
	30		**X**	**X**				
	35		**O**	**X**				
	38			**X**				
	40			**X**	**X**			
	45			**O**	**X**	**X**		
	50			**O**	**X**	**X**		
	60				**O**	**X**	**X**	
	70					**O**	**X**	**X**
	75						**X**	**X**
	80						**O**	**X**
	90							**X**
	100							**O**

X Extruder Screw Extraction towards the front / back end **O** Extruder Screw Extraction only towards the front end

Parallel Shaft Helical Gear Motors with Extruder Flange



5

Dimensions in Inch / *mm*

Flange

Model	BD	AK		AJ	BB	TAP BF	GL	BA	BE	AM	XF	Q
FD/ZAE 68B	10.24 *260*	8.66 *220*	+0.0018 / 0 *+0.046 / 0*	9.29 *236*	0.39 *10*	*M12x17*	5.81 *147.5*	6.85 *174*	-	0.59 *15*	6.14 *156*	5.45 *138.5*
FD/ZAE 88B	12.21 *310*	10.04 *255*	+0.0021 / 0 *+0.052 / 0*	11.02 *280*	0.39 *10*	*M16x22*	6.73 *171*	7.78 *197.5*	7.58 *192.5*	0.61 *15.5*	6.97 *177*	6.89 *175*
FD/ZAE 108B	14.17 *360*	12.01 *305*	+0.0021 / 0 *+0.052 / 0*	12.99 *330*	0.39 *10*	*M16x22*	7.40 *188*	8.52 *216.5*	7.95 *202*	0.91 *23*	7.62 *193.5*	8.07 *205*
FD/ZAE 128B	16.54 *420*	13.58 *345*	+0.0023 / 0 *+0.057 / 0*	14.96 *380*	0.39 *10*	*M20x27*	8.11 *206*	9.63 *244.5*	9.23 *234.5*	0.98 *25*	8.39 *213*	10.67 *271*
FD/ZAE 148B	17.72 *450*	14.17 *360*	+0.0023 / 0 *+0.057 / 0*	15.75 *400*	0.39 *10*	*M24x32*	8.86 *225*	10.99 *279*	10.16 *258*	1.06 *27*	9.88 *251*	11.73 *298*
FD/ZAE 168B	20.08 *510*	16.54 *420*	+0.0025 / 0 *+0.063 / 0*	18.11 *460*	0.59 *15*	*M24x32*	10.32 *262*	12.64 *321*	11.54 *293*	1.50 *38*	11.22 *285*	13.39 *340*

3) Refer Page 1 - 4

Shaft **Dimensions in** Inch / mm

Model	U	VS	UF	UH	VH	UG	EH / VC	UA / UB	VA	UJ	UD	US	VD	UC	VB	VG	BOLT	UY	Y
FD/ZAE 68B	-						13.74	4.13										0.90	0.24
	20	1.89	2.56	1.50	1.18				0.55	3.47	1.89 +0.001 / 0	0.43	0.43	2.56	0.16	0.79		*22.8*	*6*
	-						*349*	*105*										1.11	0.32
	25						12.01	4.09										*28.3*	*8*
	-	*48*	*65*	*38*	*30*	*M42x2*			*14*	*88*	*48 +0.025 / 0*	*11*	*11*	*65*	*4*	*20*	*M10x25*	1.31	0.32
	30						*305*	*104*										*33.3*	*8*
FD/ZAE 88B	-						16.16	5.12										1.31	0.32
	30	2.28	3.15	1.93	1.54				0.91	4.33	2.48 +0.0012 / 0	0.67	0.47	3.15	0.18	0.93		*33.3*	*8*
	-						*410.5*	*130*										1.51	0.39
	35						14.06	5.08										*38.3*	*10*
	-	*58*	*80*	*49*	*39*	*M56x2*			*23*	*110*	*63 +0.030 / 0*	*17*	*12*	*80*	*4.5*	*23.5*	*M12x35*	1.71	0.47
	40						*357*	*129*										*43.3*	*12*
FD/ZAE 108B	-						18.19	6.30										1.71	0.47
	40	2.80	3.74	2.36	1.54				0.98	5.12	3.07 +0.0012 / 0	0.67	0.55	3.74	0.20	1.22		*43.3*	*12*
	-						*462*	*160*										1.92	0.55
	45						15.59	6.14										*48.8*	*14*
	-	*71*	*95*	*60*	*39*	*M64x2*			*25*	*130*	*78 +0.030 / 0*	*17*	*14*	*95*	*5*	*31*	*M16x45*	2.12	0.55
	50						396	*156*										*53.8*	*14*
FD/ZAE 128B	-						21.81	6.89										1.92	0.55
	45	3.43	4.33	2.80	1.93				1.22	5.91	3.46 +0.0014 / 0	0.87	0.67	4.33	0.20	1.65		*48.8*	*14*
	-						*554*	*175*										2.12	0.55
	50						18.58	6.85										*53.8*	*14*
	-	*87*	*110*	*71*	*49*	*M80x3*			*31*	*150*	*88 +0.035 / 0*	*22*	*17*	*110*	*5*	*42*	*M16x45*	2.54	0.71
	60						*472*	*174*										*64.4*	*18*
FD/ZAE 148B	-						24.65	7.48										2.54	0.71
	60	3.74	4.72	3.47	2.05				1.30	6.30	4.13 +0.0014 / 0	0.87	0.79	4.72	0.24	1.77		*64.4*	*18*
	-						*626*	*190*										2.95	0.79
	70						21.14	7.44										*74.9*	*20*
	-	*95*	*120*	*88*	*52*	*M95x3*			*33*	*160*	*105 +0.035 / 0*	*22*	*20*	*120*	*6*	*45*	*M16x55*	3.15	0.79
	75						*537*	*189*										*79.9*	*20*
FD/ZAE 168B	-						28.43	9.06										2.95	0.79
	70	4.13	5.91	4.09	2.24				1.65	7.68	4.92 +0.0016 / 0	0.98	0.87	5.91	0.24	1.93		*74.9*	*20*
	-						*722*	*230*										3.36	0.87
	80						24.53	9.02										*85.4*	*22*
	-	*105*	*150*	*104*	*57*	*M110x3*			*42*	*195*	*125 +0.040 / 0*	*25*	*22*	*150*	*6*	*49*	*M20x55*	3.76	0.98
	90						*623*	229										*95.4*	*25*

5

Parallel Shaft Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

Frame size 28:

These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.

Frame size 38B:

V Oil fitter inlet / Oil drain

From frame size 48B:

Oil level Ventilation Oil drain - - - - - alternative

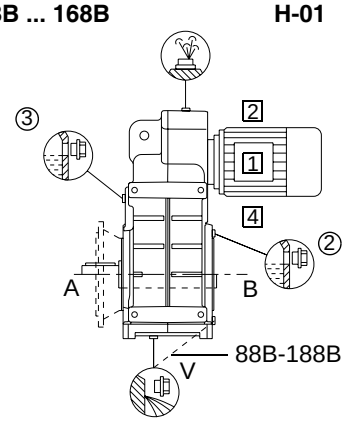
* on opposite side

② 2-stage Gear Units

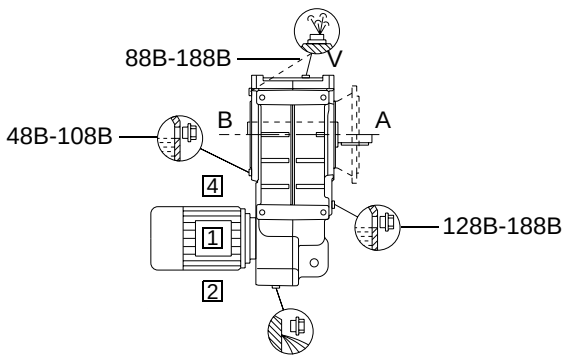
③ 3-stage Gear Units

A, B position of solid shaft or assembly shaft of customer

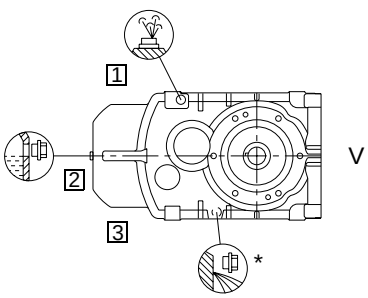
F.Z, F.F, F.M68B .. 168B
F.A., F.AM68B ... 168B
B5-01 (IM B5-01**)**
H-01



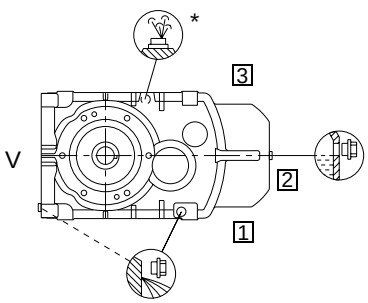
F.Z, F.F, F.M68B ... 168B
F.A., F.AM68B ... 168B
B5-03 (IM B5-03**)**
H-02



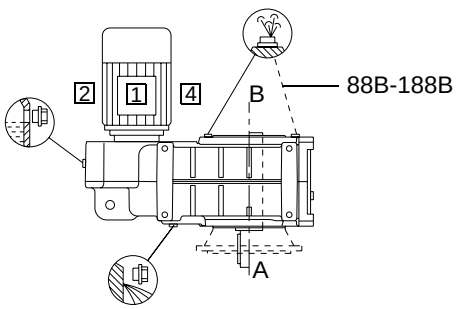
F.Z, F.F, F.M68B ... 168B
F.A., F.AM68B ... 168B
B5-02 (IM B5-02**)**
H-03



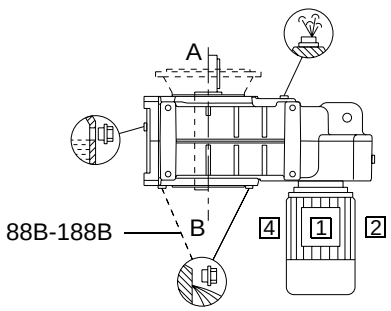
F.Z, F.F, F.M68B ... 168B
F.A., F.AM68B ... 168B
B5-00 (IM B5-00**)**
H-04



F.Z, F.F, F.M68B ... 168B
F.A., F.AM68B ... 168B
V1-00 (IM V1-00**)**
H-05



F.Z, F.F, F.M68B ... 168B
F.A., F.AM68B ... 168B
V3-00 (IM V3-00**)**
H-06



5

Tandem-Parallel Shaft Gear Motors and Tandem-Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

Note:
In a horizontal mounting position the smaller gear unit generally is turned to the bottom.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

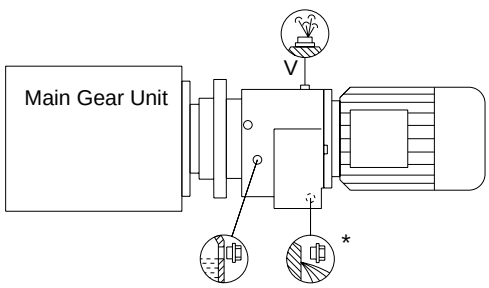
Frame size 28/38 (smaller gear unit):

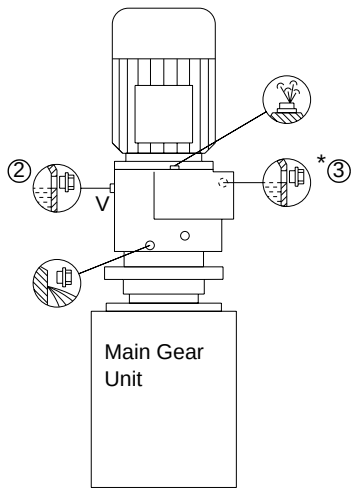
These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.

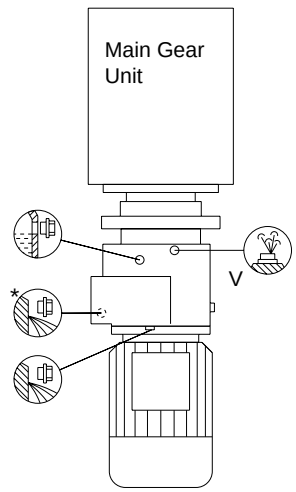
From frame size 48:

Oil level Ventilation Oil drain

* on opposite side
② 2-stage Gear Units
③ 3-stage Gear Units







5

Lubrication

MOTOX-N-Parallel Shaft Gear Units of sizes 48B...188B are supplied with filler, oil level and drain plug. Before starting operations the separately supplied breather plug has to replace the filler plug.
The size 28 have no venting, oil level and oil drain plug. Because of the low thermal load, no lubricant-change is necessary.
FD../FZ.. 38B gear units have one oil plug, ventilation of this gear units is not necessary.
Speed reducers are shipped with their lubricant, ready for operation. In order to fill the housings with adequate **amount of lubricant, working conditions have to be specified in the order.** Only blended, age-resistant and non-foaming EP oils (FZG test DIN 51354 load stage > 12) are used.
Do not mix oils of different manufacturers. We recommend the oils listed. This is, of course, no exclusive recommendation and equivalent lubricants of other manufacturers can be used.
During an oil change, only oils of the same type (for example CLP) and with the same viscosity class (for example VG 220) may be mixed. **Do not mix differing types of oil (e.g. CLP and PGLP) under any circumstances.**
Biologically decomposable, environment-friendly oils based on synthetic or native ester with water hazard class 1 or 2 respectively or oils with USDA -H1/-H2 acceptance can be supplied on request.

Maintenance

of the parallel shaft gear units has to be carried out in accordance with the Operating Instructions manual supplied with the units.

Lubricant selection table

Ambient temperature °C	Marking according to DIN 51502	Examples of Lubricants									
		ADDINOL	ARAL	bp	Castrol	DEA	Esso	FUCHS	KLÜBER LUBRICATION	Mobil	Shell
-10 ... + 40	CLP ISO VG 220	CLP 220S	Degol BG 220	Energol GR-XP 220	Alpha SP 220 Optigear BM220 Tribol 1100/220	Falcon CLP220	Spartan EP220	Renolin CLP 220	Klüberoil GEM 1-220	Mobilgear XMP 220	Omala 220
-20* ... + 50	CLP PG ISO VG 220	-	Degol GS 220	Enersyn SG-XP 220	Optiflex A220 Tribol 800/220	Polydea PGLP 220	Glycolube 220	Renolin PG 220	Syntheso D 220 EP	-	Tivela S 220
0* ... + 60*	CLP PG ISO VG 460	-	Degol GS 450	Enersyn SG-XP 460	Optiflex A460 Tribol 800/460	Polydea PGLP 460	Glycolube 460	Renolin PG 460	Syntheso D 460 EP	-	Tivela S 460

Other brands on request or see operating instruction BA7300.

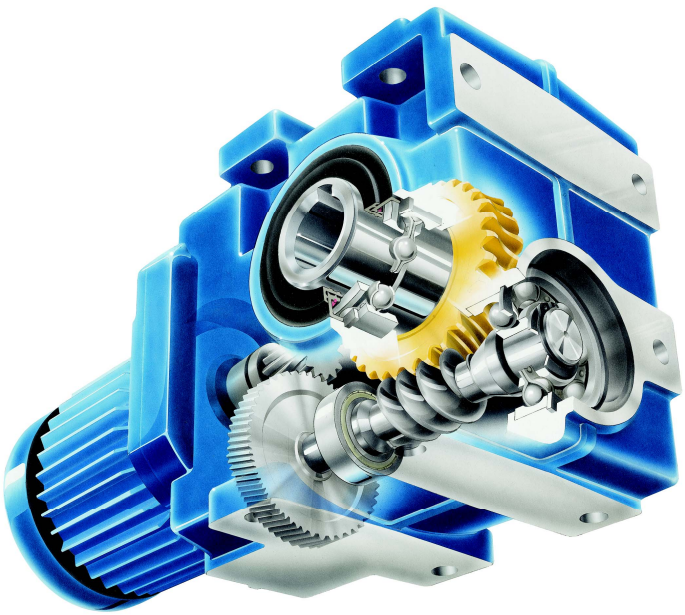
* **Note:**
Ambient temperatures for motors according to EN 60034-1; see “Greasing of the bearings” in electrical section of this catalogue.

Oil quantities (*litre* / US gallon)

The quantities listed in the following tables are reference values.
The exact oil quantities are specified on the rating plates of the drives.

Important:
The value on the left (*italic*) is in litres; the value on the right is in U.S. gallons.

Type	Mounting position					
	B3-67 **B5-01** **H-01**	**B8-67** **B5-03** **H-02**	**B7-38** **B5-02** **H-03**	**B6-38** **B5-00** **H-04**	**V5-67** **V1-00** **H-05**	**V6-67** **V3-00** **H-06**
FZ.28	*0.60* / 0.16	*0.45* / 0.119	*0.50* / 0.132	*0.50* / 0.132	*0.65* / 0.172	*0.85* / 0.225
FZ.38B	*0.70* / 0.185	*0.60* / 0.159	*0.70* / 0.185	*0.60* / 0.159	*1.00* / 0.264	*1.1* / 0.29
FZ.48B	*1.6* / 0.42	*1.00* / 0.264	*1.3* / 0.34	*1.3* / 0.34	*1.8* / 0.48	*2.1* / 0.55
FZ.68B	*2.5* / 0.66	*2.3* / 0.61	*2.4* / 0.63	*2.3* / 0.61	*3.3* / 0.87	*3.8* / 1
FZ.88B	*4.5* / 1.19	*5.0* / 1.32	*4.8* / 1.27	*4.6* / 1.22	*7.0* / 1.85	*6.6* / 1.74
FZ.108B	*7.4* / 1.95	*9.2* / 2.43	*8.4* / 2.22	*8.1* / 2.14	*11.1* / 2.93	*13.1* / 3.46
FZ.128B	*13.8* / 3.65	*13.7* / 3.62	*15.5* / 4.09	*14.8* / 3.91	*22.1* / 5.84	*22.7* / 6
FZ.148B	*19.5* / 5.15	*20.8* / 5.49	*22.7* / 6	*22.3* / 5.89	*34.5* / 9.11	*33.5* / 8.85
FZ.168B	*32.8* / 8.67	*30.0* / 7.93	*37.0* / 9.77	*35.8* / 9.46	*53.8* / 14.21	*53.0* / 14
FZ.188B	*41.4* / 10.94	*40.7* / 10.75	*44.2* / 11.68	*46.5* / 12.28	*68.0* / 17.96	*66.4* / 17.54
FD.28	*0.60* / 0.159	*0.45* / 0.119	*0.50* / 0.132	*0.50* / 0.132	*0.65* / 0.172	*0.75* / 0.2
FD.38B	*0.90* / 0.238	*0.60* / 0.159	*0.70* / 0.185	*0.70* / 0.185	*0.90* / 0.238	*1.1* / 0.29
FD.48B	*2.0* / 0.53	*0.90* / 0.238	*1.3* / 0.34	*1.3* / 0.34	*1.8* / 0.48	*2.0* / 0.53
FD.68B	*3.3* / 0.87	*2.3* / 0.61	*2.4* / 0.63	*2.3* / 0.61	*3.2* / 0.85	*3.8* / 1
FD.88B	*6.3* / 1.66	*5.0* / 1.32	*4.7* / 1.24	*4.7* / 1.24	*6.8* / 1.8	*6.7* / 1.77
FD.108B	*10.6* / 2.8	*9.1* / 2.4	*8.2* / 2.17	*8.2* / 2.17	*11.1* / 2.93	*13.0* / 3.43
FD.128B	*16.8* / 4.44	*13.5* / 3.57	*15.2* / 4.02	*14.8* / 3.91	*21.6* / 5.71	*22.5* / 5.94
FD.148B	*24.7* / 6.53	*20.3* / 5.36	*21.8* / 5.76	*22.3* / 5.89	*33.6* / 8.88	*32.6* / 8.61
FD.168B	*44.0* / 11.62	*28.8* / 7.61	*36.0* / 9.51	*35.8* / 9.46	*52.4* / 13.84	*51.9* / 13.71
FD.188B	*52.0* / 13.74	*38.4* / 10.14	*44.5* / 11.76	*54.1* / 14.29	*66.0* / 17.44	*65.2* / 17.22



Helical Worm Gear Motors and Gear Units

6

Table of Contents **Page**

Helical Worm Gear Motors and Gear Units

Helical Worm Gear Units

Technical description

MOTOX-N Helical Worm Gear Units are part of the MOTOX-N modular system which essentially comprises helical, helical bevel, parallel shaft and worm gear units or mechanical variable speed drives. With three or single phase AC motors with or without brake, all imaginable drive combinations up to electronic variable speed drives are possible.

MOTOX-N Helical Worm Gear Units are designed for continuous operation.

The housings made of grey cast iron or aluminium are developed in 3D-CAD and optimized for rigid and anti-vibration structure. An additional cover is not necessary to assemble the gear parts in the housing. For this reason these gear boxes have a special high stiffness.

Lubricant loss and entry of dust and water are effectively prevented by high quality radial shaft seals.

The gears of the helical stages are hobbed, case hardened and profile ground or honed. Additionally, gear teeth are profile corrected and crowned for optimum performance.

Helical gears are in compliance with ASME / AGMA Standard 2001-B88.
Helical gears have a hardness of 58-62 R_C.

The worm wheels are made out of centrifugally cast bronze. This manufacturing process gives a higher density to the material.
All worm shafts are case-hardened and have a low friction coefficient for increased efficiency.

From size 38 up CAVEX hollow-flank worm and wheel sets are used.

The concave-profile cylindrical worm with its enveloping wormwheel is substantially different to conventional designs.

The worm threads have a concave profile instead of an involute or convex one. The illustrations and explanations in the following show in a very simplified form the operating advantages this profile provides.

The concave-profile teeth are subject to only low specific tooth pressure (Hertzian pressure) and the maintenance of an oil film between the tooth flanks is particularly assisted, because the concave threads are in contact with convex gear teeth. The profile contact is therefore much more favourable than in conventional gear teeth systems in which convex teeth are in contact with convex mating tooth flanks.

Fig. 1 shows an example of a shaft running in journal bearings to indicate that improved profile contact must also have a very favourable effect on the concave-profile teeth.

The concave-profile teeth provide a particularly favourable position of the instantaneous axes which extend mainly at right angles to the sliding direction. Thus, the build-up of lubricating pressure, i.e. the generation of an oil film between the tooth flanks is assisted, while in conventional gear teeth systems the lubricating pressure build-up is lower since the sliding direction is mainly parallel to the instantaneous axes. Fig. 2 shows the corresponding conditions (in this case shown in exaggerated form) obtained with journal bearings. It is clearly visible that the best lubricating pressure exists when the shaft rotates - sliding direction precisely at right angles to the instantaneous axes - while no lubricating pressure is generated by movement of the shaft in the axial direction - sliding direction parallel to the instantaneous axes.

Owing to the worm thread shape and the position of the pitch circle in concave-profile gear teeth systems a particularly large tooth root thickness S_2 on the wormwheel is obtained (Fig. 3) without, however weakening the worm thread.

Fig. 1

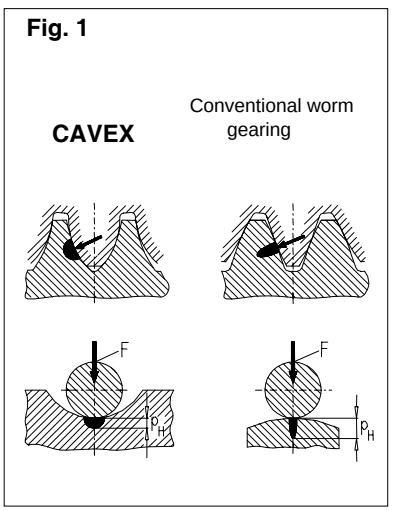


Fig. 2

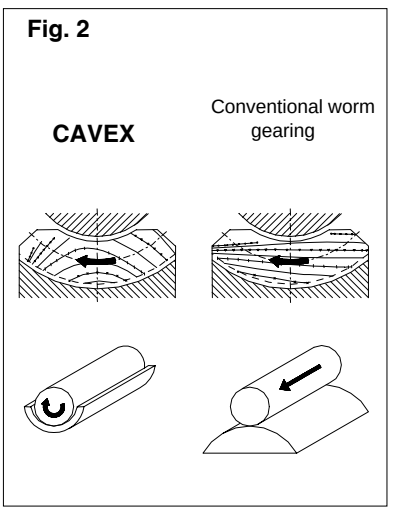
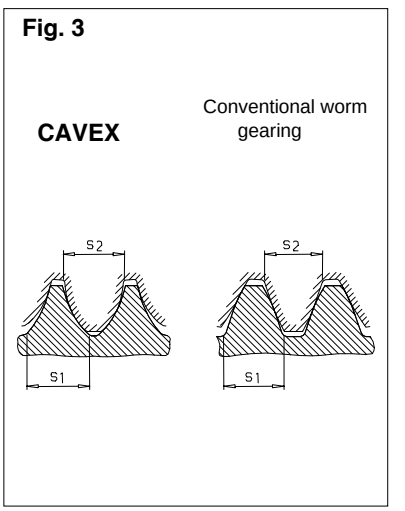


Fig. 3



The rated efficiencies shown in the data sheet lists for helical-worm gear units can only be achieved if:
- the gear unit is run-in-correctly
- the gear unit has achieved its normal operating temperature
- the gear unit has the recommended lubricant
- the gear unit is working within the indicated torque range.

All new gear units should be run in for a period of approximately 24-30 hours at full load. From experience we have found that the initial efficiency reduction can be as high as those indicated in the following table. This varies considerably with the gear ratio shown since a multi-start worm, having a high lead angle is substantially more efficient than a single start worm under the same conditions. Starting efficiency is always smaller than efficiency at operating speeds. This fact should be taken into account for machine starting against full load, depending on starting characteristics of the motor. A check will be necessary in case of singlephase motors with operating capacitors.

Note: In respect to torque driving back from the output shaft, please take into account the reduced gear tooth efficiency $\eta' = 2 - 1/\eta$ particularly with large ratio relationships of the worm gear stage. (η=efficiency of the driving worm)

automatic locking arises only with high ratios, which are not used with the size 28 to 88.

The output and input shafts are in right angle position.

The maximum permissible radial and axial loads are to be observed.

Design Variations

The standard unit is available in foot, face, flange or shaft mounted versions for use in all mounting positions. The gear units are manufactured with a solid shaft or with a hollow shaft (fitted key or shrink disc).

Integrally mounted C-Face adapters, either in the clamp collar style (K5TC) or the elastic coupling style (KTC), are available for NEMA motors.

Electro-magnetic brakes, backstops, speed monitors and numerous integral options are available.

Standards

The important dimensions correspond to the DIN standards, namely:

Shaft heights	DIN 747
Cylindrical shaft ends	DIN 748/1
Mounting flanges	DIN 42948
Coaxial concentricity and runout of shaft ends and of flange surface	DIN 42955
Parallel keys	DIN 6885/1
Second motor shaft extension	DIN 748/3
Centre holes in shaft ends	DIN 332/2

Direction of rotation

Three-phase a.c. motors are arranged so that the motor shaft turns to the right (IEC 60034-8).
The direction of rotation of the gear unit output shaft may be reversed by swapping over two external wires at the motor. For single-phase a.c. geared motors and for geared motors fitted with backstop, the required direction of rotation must be stated when the order is placed.

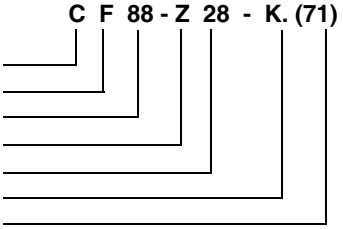
The weights [lbs/kg] shown in the dimension sheets are average values and do not include oil.

For Oil quantities according to the operational mounting positions see chapter “Lubrication, Oil Quantities”.
Specific weights of oils:
Mineral oil (CLP) = 0.9 kg/l (2 lbs/l)
Synthetic oil (PGLP) = 1.05 kg/l (2.3 lbs/l)

Type Designations

Gear Units

Example: **C F 88 - Z 28 - K. (71)**



Type of gear unit

C Helical Worm Gear Unit

Stages

(-) without determination

Design

Shaft

(-) Solid shaft
A Hollow shaft

Fixing

(-) Foot-mounted
F Flange-mounted (A-type)
Z Housing flange (C-type)
D Torque arm
G Flange (A-type) on opposite side of output shaft

Connection

(-) Parallel key
S Shrink Disc
T Splined hollow shaft

Type of ancillary gear unit

(-) Helical Gear Unit

Stages

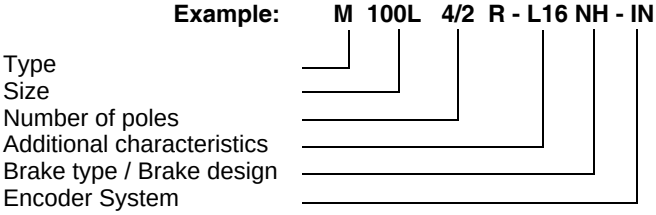
Z 2-stages
D 3-stages

Type of input unit

K4 Extended housing with shank assembly for IEC flange mounted motors
K2 Extended housing with elastic coupling for IEC flange mounted motor
A Input flange with free input shaft (metric)
P Design piggy back for IEC motors
K5TC Adapter with clamp collar for NEMA C-face motors
KTC Adapter 3 Piece Coupled for NEMA C-face mounted motors
A5 Input flange with free input shaft (imperial)
P5 Design piggy back for NEMA motors

Motors

Example: **M 100L 4/2 R - L16 NH - IN**



Types of motors

AM., M., MI.
Three phase motor

MB
Single phase motor with running capacitor

MK
Single phase motor with running and starting capacitor and starting relais

1MA, 1LA, 1LG
Three phase motors, explosion-proof EExe II

DNG., DVG., DBG.
Three phase motors, explosion-proof EExde II or EExd II

Additional characteristics

E Efficiency level class: eff1
R Resistance rotor
F Forced cooling
U Non ventilated
I High inertia fan
W Rain cover
H Reduced noise level
M MOTOX-Master (Integral Frequency Inverters)
X Backstop

Brake type / Brake design

L, KFB
Spring loaded-single disk brake, DC-excitation

16 Size = Nominal torque of brake
16/.. Adjusted braking torque

M Microswitch
N Normal design
G Encapsulated design

H Manual release
A Locking for manual release

Encoder system

IN Incremental encoder

Existing overhung loads

For the calculation of the existing radial load the type of drive element has to be taken into consideration.
For different drive elements the following factor C have to be considered.

Drive element	Factor C	Remarks
Gears	1.15	< 17 teeth
Chain sprockets	1.40	< 13 teeth
Chain sprockets	1.25	< 20 teeth
V-Belt	2.0	Pretension
Flat belt	2.50	Pretension
Toothed belt	1.50	Pretension
Agitator / Mixer	2.0	rotating radial force

$$F_{exist} = \frac{T_2 \cdot 2}{d_0}$$

F_{exist} = existing radial load [lbf]

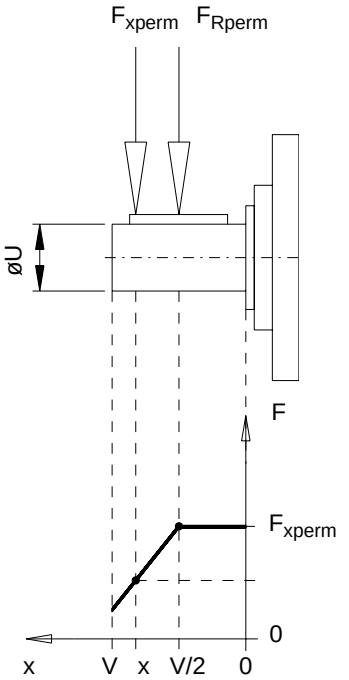
T_2 = existing torque [lb-in]

d_0 = average diameter of the drive element [in]

C = Factor for the drive element type [-]

$$F_{exist} \cdot C \leq F_{xperm}$$

Permissible overhung loads for helical worm gear units at Service Factor 1.0



Calculation based on bearing life

$$F_{xperm1} = F_{RPerm} \cdot \frac{y}{z + x} \qquad [lbf]$$

6

Calculation based on mechanical strength

$$F_{xperm2} = \frac{a \cdot 1000}{x} \qquad [lbf]$$

valid for x ≧ V/2
for x < V/2: $F_{xperm} = F_{RPerm}$

The dimension x is the distance from the shaft shoulder to the point where the load (F_{xperm}) is applied.
The lower value F_{xperm} of both calculation results is the permissible overhung load. Higher overhung loads are permitted under certain load conditions. If values on tables are not sufficient for the requirement, please consult FLENDER, stating the following criteria on overhung load:
- value
- direction / angle of force
- location (x) on shaft
- direction of rotation of shaft

Note:
The listed radial forces refer to worst case setup (CF). All setups can be calculated with Flender software (electronic catalog).
For high or rotating radial load mixer- and agitator drives have to be used.

Standard Bearings

							F_{Rperm} in lbf for x = V/2 for output speeds n_2 in rpm					
Typ(e)	**y** [in.]	**z** [in.]	**a** [lb in]	**U** [in.]	**V** [in.]	*	≤ **16** [rpm]	≤ **25** [rpm]	≤ **40** [rpm]	≤ **63** [rpm]	≤ **100** [rpm]	≤ **160** [rpm]
CF28	5.43	4.65	0.48	3/4	1.57	ccw	608	608	608	608	608	-
						cw	608	608	608	608	608	-
CF38	5.75	4.76	1.22	1	1.97	ccw	1244	1244	961	794	632	572
						cw	1244	1244	1060	882	720	644
CF48	6.93	5.75	2.20	1 1/4	2.36	ccw	1864	1864	1586	1283	1026	925
						cw	1864	1864	1683	1382	1127	1008
CF68	8.39	6.81	3.45	1 5/8	3.15	ccw	2190	2070	1582	1334	1154	1051
						cw	2190	2189	1717	1449	1274	1141
CF88	10.31	8.35	6.48	2	3.94	ccw	3291	2876	2480	2106	1719	1532
						cw	3291	3033	2615	2223	1890	1665

Heavy Duty Bearings

							F_{Rperm} in lbf for x = V/2 for output speeds n_2 in rpm					
Typ(e)	**y** [in.]	**z** [in.]	**a** [lb in]	**U** [in.]	**V** [in.]	*	≤ **16** [rpm]	≤ **25** [rpm]	≤ **40** [rpm]	≤ **63** [rpm]	≤ **100** [rpm]	≤ **160** [rpm]
CF68	8.39	6.81	4.97	1 5/8	3.15	ccw	3156	3156	3156	3156	3156	3056
						cw	3156	3156	3156	3156	3156	3152
CF88	10.31	8.35	9.53	2	3.94	ccw	4838	4838	4838	4838	4838	4804
						cw	4838	4838	4838	4838	4838	4838

* Direction of rotation with view on output shaft
cw = clockwise
ccw = counter clockwise

Legend / Explanations

Performance Data / Torque tables

P_{Motor} = Rated power of motor
(60Hz) = at mains frequency 60Hz

Ratio = Total ratio of the gear unit

★ = Ratio belonging to preferred list of MOTOX-N

P_{Mot} = Input power

n_{Mot} = Input speed

η = Efficiency

n_2 = Output speed of gear unit
(60Hz) at mains frequency 60Hz (4pol.) and 4 pole motor

T_2 = Output torque of gear unit (SF=1) at Service Factor SF =1

T_1 = permisssible continuous input torque of input unit K., A., P.

SF = Service Factor of the drive

FU1 x V1 = Dimension of solid shaft of type if input unit A., P.

F_{RAperm} V1/2 = Permissible overhung load at type of input unit A., P. at 0.5 x V1

Prefered list

The preferred list offers short delivery through higher availability.

Performance Data

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.25 (60 Hz)	0.36	16970	0.83	4683	★	**C.88-Z28-M71C4**
	0.4	15323	0.92	4191		
	0.46	13746	1	3719	★	
	0.52	12205	1.2	3260		
	0.59	10876	1.3	2866	★	
	0.66	9937	1.4	2589		
	0.75	8813	1.6	2256	★	
	0.84	8033	1.8	2026		
	0.93	7360	1.9	1829	★	
	0.89	7466	0.8	1900	★	**C.68-Z28-M71C4**
	0.99	6775	0.88	1706		
	1.1	6191	0.97	1541	★	
	1.2	5677	1.1	1397		
	1.3	5225	1.1	1271	★	
	1.5	4694	1.3	1124		
	1.6	4384	1.4	1038	★	
	1.9	3852	1.6	893		
	2.1	3551	1.7	812	★	
	2.3	3622	1.7	738	★	
	2.5	3020	2	669		
	1.8	3702	0.87	937		**C.48-Z28-M71C4**
	2	3454	0.94	865	★	
	2.3	3038	1.1	745		
	2.5	2798	1.2	677	★	
	2.8	2586	1.3	615	★	
	3	2382	1.4	558		
	3.3	2196	1.5	508	★	
	3.8	1984	1.6	449		
	4.1	1851	1.8	414	★	
	4.7	1638	2	357		
	5.3	1851	1.8	320.67	★	**C.48-M71C4**
	6	1674	2	284.7		
	2.8	2453	0.81	615	★	**C.38-Z28-M71C4**
	3	2258	0.88	558		
	3.3	2090	0.95	508	★	
	3.8	1886	1.1	449		
	4.1	1762	1.1	414	★	
	4.7	1550	1.3	357		
	5.2	1434	1.4	324	★	
	5.3	1753	1.1	320.67	★	**C.38-M71C4**
	6	1585	1.3	284.7		
	6.8	1417	1.4	249.6	★	
	7.6	1284	1.6	223.36		
	8.5	1160	1.7	198.25	★	
	9.8	1027	2	173.73		
	11.1	912	2.2	152.75	★	
	10.9	1036	1	155		**C.28-M71C4**
	13.4	841	1	126.4		
	18.2	690	1.5	93		
	22	566	1.5	75.84		
	27	487	2.1	62		
	34	389	2.1	50.56		

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.25 (60 Hz)	36	372	2.6	46.5		**C.28-M71C4**
	45	310	2.6	37.92		
	55.0	256	3.50	31		
	67.0	212	3.40	25.28		
0.33 (60 Hz)	0.59	16031	0.88	2866	★	**C.88-Z28-M71S4**
	0.65	14658	0.96	2589		
	0.75	12993	1.1	2256	★	
	0.83	11842	1.2	2026		
	0.92	10850	1.3	1829	★	
	1	9991	1.4	1659		
	1.1	9229	1.5	1510	★	
	1.3	8325	1.7	1335		
	1.4	7794	1.8	1232	★	
	1.6	6890	2	1061		
	1.5	6917	0.87	1124		**C.68-Z28-M71S4**
	1.6	6456	0.93	1038	★	
	1.90	5677	1.1	893		
	2.1	5234	1.1	812	★	
	2.3	5340	1.1	738	★	
	2.5	4446	1.4	669		
	2.8	4109	1.5	609	★	
	3.1	3711	1.6	539		
	3.4	3463	1.7	497	★	
	3.9	3055	2	428		
	4.6	3108	1.9	364	★	**C.68-M71S4**
	5.2	2807	2.1	323.7		
	2.7	3808	0.85	615	★	**C.48-Z28-M71S4**
	3	3507	0.93	558		
	3.3	3241	1	508	★	
	3.8	2922	1.1	449		
	4.1	2736	1.2	414	★	
	4.7	2418	1.4	357		
	5.2	2223	1.5	324	★	
	5.3	2586	1.3	320.67	★	**C.48-M71S4**
	5.9	2338	1.4	284.7		
	6.8	2081	1.6	249.6	★	
	7.5	1886	1.7	223.36		
	8.5	1700	1.9	198.25	★	
	4.7	2294	0.87	357		**C.38-Z28-M71S4**
	5.2	2108	0.95	324	★	
	5.3	2453	0.81	320.67	★	**C.38-M71S4**
	5.9	2214	0.9	284.7		
	6.8	1975	1	249.6	★	
	7.5	1798	1.1	223.36		
	8.5	1612	1.2	198.25	★	
	9.7	1434	1.4	173.73		
	11	1275	1.6	152.75	★	
	12.2	1160	1.8	138		
	14	1009	2	120.25	★	
	15.6	912	2.2	108		
	17.3	823	2.3	97.5	★	
	18.1	965	1.1	93		**C.28-M71S4**
	22	788	1.1	75.84		
	27	673	1.5	62		
	33	549	1.5	50.56		

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.33 (60 Hz)	36	522	1.9	46.5		**C.28-M71S4**
	44	425	1.9	37.92		
	54	354	2.5	31		
	67	292	2.5	25.28		
0.5 (60 Hz)	0.92	16766	0.84	1829	★	**C.88-Z28-M71M4**
	1	15438	0.91	1659		
	1.1	14260	0.99	1510	★	
	1.3	12869	1.1	1335		
	1.4	12045	1.2	1232	★	
	1.6	10655	1.3	1061		
	1.7	9849	1.4	964	★	
	1.9	10115	1.4	877	★	
	2.1	8414	1.7	795		
	2.3	7776	1.8	723	★	
	2.6	7032	2	640		
	2.5	6873	0.87	669		**C.68-Z28-M71M4**
	2.8	6350	0.95	609	★	
	3.1	5739	1	539		
	3.4	5358	1.1	497	★	
	3.9	4720	1.3	428		
	4.3	4348	1.4	389	★	
	4.6	4605	1.3	364	★	**C.68-M71M4**
	5.2	4162	1.5	323.7		
	6	3666	1.7	280.8	★	
	6.4	3445	1.8	262.36		
	7.3	3064	2	230.75	★	
	8.3	2710	2.1	202.09		
	4.7	3728	0.88	357		**C.48-Z28-M71M4**
	5.2	3436	0.95	324	★	
	5.3	3826	0.86	320.67	★	**C.48-M71M4**
	5.9	3454	0.95	284.7		
	6.8	3082	1.1	249.6	★	
	7.5	2798	1.2	223.36		
	8.5	2515	1.3	198.25	★	
	9.7	2232	1.5	173.73		
	11	1975	1.7	152.75	★	
	12.2	1798	1.9	138		
	14	1576	2.1	120.25	★	
	15.6	1417	2.2	108		
	8.5	2391	0.84	198.25	★	**C.38-M71M4**
	9.7	2125	0.95	173.73		
	11	1886	1.1	152.75	★	
	12.2	1709	1.2	138		
	14	1496	1.4	120.25	★	
	15.6	1355	1.5	108		
	17.3	1222	1.6	97.5	★	
	19.1	1107	1.7	88.4		
	21	1009	1.8	80.44	★	
	24	894	1.9	71.12		
	26	823	2.1	65.68	★	
	28	965	1.8	60.3	★	
	32	859	2.5	53.53		
	27	1000	1	62		**C.28-M71M4**
	33	814	1	50.56		
	36	779	1.3	46.5		

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.5 (60 Hz)	44	637	1.3	37.92		**C.28-M71M4**
	54	531	1.7	31		
	67	434	1.7	25.28		
0.75 (60 Hz)	1.6	16297	0.86	1061		**C.88-Z28-M71MB4**
	1.7	15066	0.93	964	★	
	1.9	15464	0.91	877	★	
	2.1	12869	1.1	795		
	2.3	11895	1.2	723	★	
	2.6	10761	1.3	640		
	2.9	10044	1.4	590	★	
	3.3	8839	1.6	508		
	3.6	8139	1.7	462	★	
	3.8	8520	1.7	440.7		**C.88-M71MB4**
	4.3	7635	1.8	390	★	
	4.8	6997	2	354.55		
	5.3	6332	2.1	318.5	★	
	3.9	7218	0.83	428		**C.68-Z28-M71MB4**
	4.3	6651	0.91	389	★	
	4.6	6846	0.88	364	★	**C.68-M71MB4**
	5.2	6182	0.98	323.7		
	6	5447	1.1	280.8	★	
	6.4	5128	1.2	262.36		
	7.3	4552	1.3	230.75	★	
	8.3	4021	1.4	202.09		
	9.4	3578	1.5	178.75	★	
	10.4	3250	1.6	162		
	11.8	2878	1.8	143	★	
	13.1	2604	1.9	129		
	14.4	2364	2	117	★	
	15.8	2152	2.2	106.6		
	17.3	1975	2.3	97.5	★	
	8.5	3737	0.88	198.25	★	**C.48-M71MB4**
	9.7	3312	1	173.73		
	11	2940	1.1	152.75	★	
	12.2	2666	1.2	138		
	14	2338	1.4	120.25	★	
	15.6	2108	1.5	108		
	17.3	1904	1.6	97.5	★	
	19.1	1727	1.7	88.4		
	21	1576	1.8	80.44	★	
	24	1390	2	71.12		
	26	1284	2.1	65.68	★	
	30	1107	2.3	56.55		
	33	1009	2.5	51.41	★	
	36	1142	2.2	46.93	★	
	40	1018	2.7	42		
	45	912	2.6	37.28	★	
	52	797	2.9	32.67		
	12.2	2542	0.8	138		**C.38-M71MB4**
	14	2232	0.91	120.25	★	
	15.6	2010	0.99	108		
	17.3	1815	1.1	97.5	★	
	19.1	1647	1.1	88.4		
	21	1505	1.2	80.44	★	
	24	1328	1.3	71.12		

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
0.75 (60 Hz)	26	1231	1.4	65.68	★	**C.38-M71MB4**
	28	1434	1.2	60.3	★	
	32	1275	1.7	53.53		
	36	1124	1.8	46.93	★	
	40	1009	1.9	42		
	45	903	2.2	37.28	★	
	52	788	2.1	32.67		
	59	699	2.6	28.72	★	
	65	628	2.9	25.95		
	36	1151	0.85	46.5		**C.28-M71MB4**
	44	938	0.85	37.92		
	54	788	1.1	31		
	67	637	1.1	25.28		
1 (60 Hz)	2.3	16518	0.85	723	★	**C.88-Z28-M71MP4**
	2.6	14933	0.94	640		
	2.8	13941	1	590	★	
	3.3	12276	1.1	508		
	3.6	11301	1.2	462	★	
	3.9	11523	1.2	440.7		**C.88-M80M4**
	4.4	10327	1.4	390	★	
	4.8	9468	1.5	354.55		
	5.3	8565	1.6	318.5	★	
	6.2	7395	1.7	273		
	6.9	6713	1.8	247	★	
	7.5	6217	1.9	228		
	8.6	5411	2	198.25	★	
	6.1	7369	0.82	280.8	★	**C.68-M80M4**
	6.5	6935	0.87	262.36		
	7.4	6155	0.98	230.75	★	
	8.4	5438	1.1	202.09		
	9.5	4836	1.1	178.75	★	
	10.5	4402	1.2	162		
	11.9	3897	1.3	143	★	
	13.2	3516	1.4	129		
	14.5	3197	1.5	117	★	
	15.9	2914	1.6	106.6		
	17.4	2666	1.7	97.5	★	
	18.9	2896	1.9	90	★	
	20	2710	2	84.09		
	23	2391	2.2	73.96	★	
	11.1	3976	0.84	152.75	★	**C.48-M80M4**
	12.3	3604	0.92	138		
	14.1	3162	1	120.25	★	
	15.7	2843	1.1	108		
	17.4	2577	1.2	97.5	★	
	19.2	2338	1.3	88.4		
	21	2125	1.3	80.44	★	
	24	1877	1.5	71.12		
	26	1736	1.5	65.68	★	
	30	1496	1.7	56.55		
	33	1364	1.8	51.41	★	
	36	1541	1.7	46.93	★	
	40	1381	2	42		
	46	1231	1.9	37.28	★	
	52	1080	2.2	32.67		

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1 (60 Hz)	59	947	2.7	28.72	★	**C.48-M80M4**
	66	859	2.8	25.95		
	75	744	3.2	22.61	★	
	19.2	2232	0.83	88.4		**C.38-M80M4**
	21	2037	0.88	80.44	★	
	24	1798	0.96	71.12		
	26	1665	1	65.68	★	
	28	1939	0.92	60.3	★	
	32	1727	1.2	53.53		
	36	1523	1.3	46.93	★	
	40	1364	1.4	42		
	46	1222	1.7	37.28	★	
	52	1071	1.6	32.67		
	59	938	1.9	28.72	★	
	66	850	2.1	25.95		
	75	744	2.4	22.61	★	
	84	664	2.6	20.31		
	93	602	2.9	18.33	★	
	102	549	3.1	16.62		
	112	496	3.2	15.13	★	
	127	442	3.3	13.37		
	138	407	3.7	12.35	★	
	160	354	4.1	10.63		
	54	1071	0.82	31		**C.28-M71MP4**
	66	876	0.82	25.28		
1.5 (60 Hz)	3.7	16492	0.85	462	★	**C.88-Z28-M90S4**
	4.4	15022	0.94	390	★	**C.88-M90S4**
	4.8	13773	1	354.55		
	5.4	12462	1.1	318.5	★	
	6.3	10761	1.2	273		
	6.9	9769	1.2	247	★	
	7.5	9034	1.3	228		
	8.7	7874	1.4	198.25	★	
	9.5	7156	1.5	180		
	10.4	6536	1.6	164.36	★	
	11.4	5996	1.7	150.8		
	12.3	5526	1.8	138.94	★	
	13.6	5022	1.9	126.18		
	14.9	4570	2	114.95	★	
	10.6	6394	0.83	162		**C.68-M90S4**
	12	5659	0.9	143	★	
	13.3	5119	0.96	129		
	14.7	4641	1	117	★	
	16.1	4233	1.1	106.6		
	17.6	3870	1.2	97.5	★	
	19.1	4207	1.3	90	★	
	20	3941	1.4	84.09		
	23	3480	1.5	73.96	★	
	26	3055	1.8	64.77		
	30	2701	2	57.29	★	
	33	2453	2.1	51.92		
	37	2170	2.3	45.83	★	
	42	1957	2.5	41.35		
	45	1824	2.1	38		
	46	1771	2.7	37.5	★	

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
1.5 (60 Hz)	51	1612	2.4	33.61	★	**C.68-M90S4**
	56	1461	2.4	30.46		
	64	1293	2.7	26.89	★	
	71	1169	3	24.26		
	17.6	3737	0.8	97.5	★	**C.48-M90S4**
	19.4	3392	0.86	88.4		
	21	3091	0.92	80.44	★	
	24	2736	1	71.12		
	26	2524	1.1	65.68	★	
	30	2178	1.2	56.55		
	33	1975	1.2	51.41	★	
	36	2240	1.1	46.93	★	
	41	2010	1.4	42		
	46	1789	1.3	37.28	★	
	52	1567	1.5	32.67		
	60	1381	1.8	28.72	★	
	66	1248	1.9	25.95		
	76	1089	2.2	22.61	★	
	84	974	2.5	20.31		
	94	876	3	18.33	★	
	103	797	3.2	16.62		
	113	726	3.2	15.13	★	
	128	637	3.2	13.37		
	139	593	3.7	12.35	★	
	36	2214	0.91	46.93	★	**C.38-M90S4**
	41	1992	0.97	42		
	46	1771	1.1	37.28	★	
	52	1558	1.1	32.67		
	60	1372	1.3	28.72	★	
	66	1240	1.5	25.95		
	76	1080	1.7	22.61	★	
	84	974	1.8	20.31		
	94	876	2	18.33	★	
	103	797	2.1	16.62		
	113	726	2.2	15.13	★	
	128	637	2.3	13.37		
	139	593	2.5	12.35	★	
	161	504	2.8	10.63		
	177	460	3	9.67	★	
2 (60 Hz)	6.3	14676	0.85	273		**C.88-M90L4**
	6.9	13321	0.9	247	★	
	7.5	12320	0.94	228		
	8.7	10735	1	198.25	★	
	9.5	9760	1.1	180		
	10.4	8910	1.2	164.36	★	
	11.4	8184	1.2	150.8		
	12.3	7537	1.3	138.94	★	
	13.6	6846	1.4	126.18		
	14.9	6235	1.5	114.95	★	
	15.8	6846	1.7	108.5		
	17.5	6200	1.9	98.17	★	
	18.9	5730	1.9	90.62		
	22	4986	2.2	78.79	★	
	24	4526	2.3	71.54		
	16.1	5774	0.8	106.6		**C.68-M90L4**

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
2 (60 Hz)	17.6	5278	0.85	97.5	★	**C.68-M90L4**
	19.1	5739	0.95	90	★	
	20	5376	1	84.09		
	23	4738	1.1	73.96	★	
	26	4162	1.3	64.77		
	30	3684	1.5	57.29	★	
	33	3348	1.6	51.92		
	37	2958	1.7	45.83	★	
	42	2666	1.8	41.35		
	45	2488	1.5	38		
	46	2418	2	37.5	★	
	50	2205	2.1	34.17		
	51	2196	1.7	33.61	★	
	55	2019	2.2	31.25	★	
	56	1992	1.7	30.46		
	61	1806	2.4	27.94		
	64	1762	2	26.89	★	
	67	1656	2.5	25.66	★	
	71	1585	2.2	24.26		
	74	1488	2.7	23.13		
	78	1443	2.6	22	★	
	86	1310	2.9	20.04		
	86	1284	3	19.89	★	
	94	1204	3.1	18.33	★	
	105	1071	3.3	16.39		
	114	983	3.5	15.05	★	
	30	2967	0.85	56.55		**C.48-M90L4**
	33	2692	0.91	51.41	★	
	36	3055	0.84	46.93	★	
	41	2736	1	42		
	46	2435	0.96	37.28	★	
	52	2134	1.1	32.67		
	60	1877	1.3	28.72	★	
	66	1700	1.4	25.95		
	76	1479	1.6	22.61	★	
	84	1328	1.8	20.31		
	94	1204	2.2	18.33	★	
	103	1089	2.3	16.62		
	113	992	2.3	15.13	★	
	128	876	2.3	13.37		
	139	806	2.7	12.35	★	
	161	699	3.1	10.63		
	177	637	3.3	9.67	★	
	46	2418	0.84	37.28	★	**C.38-M90L4**
	60	1868	0.97	28.72	★	
	66	1691	1.1	25.95		
	76	1470	1.2	22.61	★	
	84	1319	1.3	20.31		
	94	1195	1.5	18.33	★	
	103	1080	1.5	16.62		
	113	983	1.6	15.13	★	
	128	868	1.7	13.37		
	139	806	1.8	12.35	★	
	161	690	2.1	10.63		
	177	628	2.2	9.67	★	

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
3 (60 Hz)	11.4	11966	0.84	150.8		**C.88-M100L4**
	12.4	11027	0.89	138.94	★	
	13.6	10008	0.94	126.18		
	15	9123	1	114.95	★	
	15.9	10008	1.2	108.5		
	17.5	9069	1.3	98.17	★	
	19	8379	1.3	90.62		
	22	7289	1.5	78.79	★	
	24	6625	1.6	71.54		
	26	6049	1.7	65.32	★	
	29	5544	1.8	59.93		
	31	5110	1.9	55.22	★	
	34	4641	2	50.15		
	38	4224	2.1	45.68	★	
	41	3870	2.3	41.85		
	46	3454	2.4	37.34	★	
	51	3312	2.2	33.85		
	52	3082	2.7	33.33		
	56	3029	2.4	30.9	★	
	61	2772	2.6	28.36		
	61	2621	3	28.3		
	66	2559	2.8	26.13	★	
	72	2320	2.9	23.73		
	27	6093	0.92	64.77		**C.68-M100L4**
	30	5394	1	57.29	★	
	33	4889	1.1	51.92		
	38	4322	1.2	45.83	★	
	42	3897	1.3	41.35		
	45	3640	1	38		
	46	3534	1.3	37.5	★	
	50	3224	1.4	34.17		
	51	3215	1.2	33.61	★	
	55	2949	1.5	31.25	★	
	56	2914	1.2	30.46		
	62	2639	1.6	27.94		
	64	2577	1.4	26.89	★	
	67	2418	1.7	25.66	★	
	71	2320	1.5	24.26		
	74	2178	1.9	23.13		
	78	2108	1.8	22	★	
	86	1922	2	20.04		
	86	1877	2.1	19.89	★	
	94	1753	2.1	18.33	★	
	105	1567	2.2	16.39		
	114	1443	2.4	15.05	★	
	127	1302	2.7	13.57		
	147	1116	2.9	11.67	★	
	94	1753	1.5	18.33	★	**C.48-M100L4**
	103	1594	1.6	16.62		
	114	1452	1.6	15.13	★	
	129	1284	1.6	13.37		
	139	1186	1.8	12.35	★	
	162	1018	2.1	10.63		
	178	930	2.3	9.67	★	
	94	1744	1	18.33	★	**C.38-M100L4**

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
3 (60 Hz)	103	1585	1.1	16.62		**C.38-M100L4**
	114	1443	1.1	15.13	★	
	129	1275	1.1	13.37		
	139	1178	1.3	12.35	★	
	162	1009	1.4	10.63		
	178	921	1.5	9.67	★	
4 (60 Hz)	15.9	13569	0.87	108.5		**C.88-M100LB4**
	17.6	12293	0.95	98.17	★	
	19.1	11355	0.97	90.62		
	22	9884	1.1	78.79	★	
	24	8972	1.2	71.54		
	26	8193	1.2	65.32	★	
	29	7519	1.3	59.93		
	31	6926	1.4	55.22	★	
	34	6297	1.5	50.15		
	38	5730	1.6	45.68	★	
	41	5252	1.7	41.85		
	46	4685	1.8	37.34	★	
	51	4490	1.6	33.85		
	52	4180	2	33.33		
	56	4100	1.7	30.9	★	
	61	3764	1.9	28.36		
	61	3551	2.2	28.3		
	66	3472	2	26.13	★	
	73	3153	2.1	23.73		
	73	2958	2.4	23.56	★	
	80	2869	2.5	21.61	★	
	87	2630	2.7	19.8		
	98	2347	3	17.67	★	
	110	2090	3.2	15.77		
	129	1780	3.6	13.39		
	155	1479	3.9	11.15	★	
	38	5854	0.86	45.83	★	**C.68-M100LB4**
	42	5287	0.92	41.35		
	46	4791	0.99	37.5	★	
	51	4366	1.1	34.17		
	52	4366	0.87	33.61	★	
	55	3994	1.1	31.25	★	
	57	3959	0.87	30.46		
	62	3569	1.2	27.94		
	64	3489	1	26.89	★	
	67	3286	1.3	25.66	★	
	71	3153	1.1	24.26		
	75	2958	1.4	23.13		
	79	2860	1.3	22	★	
	86	2604	1.4	20.04		
	87	2542	1.5	19.89	★	
	94	2382	1.5	18.33	★	
	106	2125	1.6	16.39		
	115	1957	1.8	15.05	★	
	127	1762	2	13.57		
	148	1514	2.2	11.67	★	
	94	2382	1.1	18.33	★	**C.48-M100LB4**
	104	2161	1.2	16.62		
	114	1966	1.2	15.13	★	

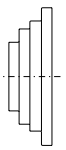
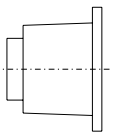
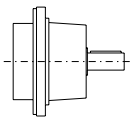
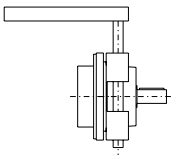
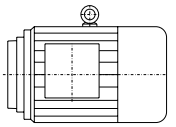
Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]		Gear Motor
4 (60 Hz)	129	1736	1.2	13.37		**C.48-M100LB4**
	140	1603	1.4	12.35	★	
	163	1381	1.6	10.63		
	179	1257	1.7	9.67	★	
	114	1957	0.82	15.13	★	**C.38-M100LB4**
	129	1727	0.83	13.37		
	140	1594	0.93	12.35	★	
	163	1372	1	10.63		
	179	1248	1.1	9.67	★	
5.5 (60 Hz)	22	13064	0.83	78.79	★	**C.88-M112MB4**
	24	11868	0.88	71.54		
	27	10832	0.94	65.32	★	
	29	9946	0.99	59.93		
	32	9158	1	55.22	★	
	35	8317	1.1	50.15		
	38	7581	1.2	45.68	★	
	42	6944	1.3	41.85		
	47	6191	1.4	37.34	★	
	52	5526	1.5	33.33		
	52	5943	1.2	33.85		
	56	5420	1.3	30.9	★	
	62	4694	1.6	28.3		
	62	4977	1.4	28.36		
	67	4588	1.6	26.13	★	
	74	4162	1.6	23.73		
	74	3906	1.8	23.56	★	
	81	3790	1.9	21.61	★	
	88	3472	2	19.8		
	99	3100	2.2	17.67	★	
	111	2763	2.4	15.77		
	130	2347	2.7	13.39		
	157	1957	2.9	11.15	★	
	56	5287	0.84	31.25	★	**C.68-M112MB4**
	62	4720	0.91	27.94		
	68	4340	0.96	25.66	★	
	72	4162	0.84	24.26		
	75	3914	1	23.13		
	79	3773	0.99	22	★	
	87	3436	1.1	20.04		
	88	3365	1.2	19.89	★	
	95	3144	1.2	18.33	★	
	106	2816	1.2	16.39		
	116	2586	1.4	15.05	★	
	129	2329	1.5	13.57		
	150	2001	1.6	11.67	★	
	95	3144	0.83	18.33	★	**C.48-M112MB4**
	105	2852	0.9	16.62		
	115	2595	0.9	15.13	★	
	131	2294	0.9	13.37		
	141	2116	1	12.35	★	
	164	1824	1.2	10.63		
	180	1656	1.3	9.67	★	
7.5 (60 Hz)	35	11443	0.81	50.15		**C.88-M132SB4**
	38	10425	0.86	45.68	★	
	42	9548	0.92	41.85		

Legend / explanations see page 6 - 10

P_{Motor} [hp]	n_2 (60 Hz) [rpm]	T_2 [lb in]	SF [-]	Ratio [-]	Gear Motor
7.5 (60 Hz)	47	8520	0.99	37.34 ★	**C.88-M132SB4**
	52	8166	0.87	33.85	
	52	7599	1.1	33.33	
	56	7457	0.96	30.9 ★	
	62	6456	1.2	28.3	
	62	6837	1	28.36	
	67	6306	1.1	26.13 ★	
	74	5721	1.2	23.73	
	74	5376	1.3	23.56 ★	
	81	5216	1.4	21.61 ★	
	88	4774	1.5	19.8	
	99	4260	1.6	17.67 ★	
	111	3808	1.8	15.77	
	130	3232	2	13.39	
	157	2692	2.1	11.15 ★	
	88	4623	0.84	19.89 ★	**C.68-M132SB4**
	116	3551	0.98	15.05 ★	
	129	3206	1.1	13.57	
	150	2754	1.2	11.67 ★	
10 (60 Hz)	62	8804	0.88	28.3	**C.88-M132M4**
	67	8600	0.83	26.13 ★	
	74	7333	0.98	23.56 ★	
	74	7803	0.85	23.73	
	81	7112	1	21.61 ★	
	88	6510	1.1	19.8	
	99	5810	1.2	17.67 ★	
	111	5190	1.3	15.77	
	130	4402	1.4	13.39	
	157	3666	1.6	11.15 ★	
	129	4366	0.81	13.57	**C.68-M132M4**
	150	3755	0.87	11.67 ★	
12.3 (60 Hz)	74	8990	0.8	23.56 ★	**C.88-M132MB4**
	81	8724	0.81	21.61 ★	
	88	7989	0.88	19.8	
	99	7130	0.97	17.67 ★	
	111	6368	1.1	15.77	
	130	5402	1.2	13.39	
	157	4499	1.3	11.15 ★	
15 (60 Hz)	130	6501	0.98	13.39	**C.88-M160MB4**
	156	5411	1.1	11.15 ★	

Possible types of input units

Frame-size		 NEMA-K5TC	IEC-K4 on request	 NEMA-KTC	IEC-K2 on request	 NEMA-A5	IEC-A on request	 NEMA-P5	IEC-P on request	 Motor
	63		•							•
56C	**71**	•	•	•		•	•	•		•
	80		•		•	•	•	•	•	•
140TC	**90**	•	•	•	•	•	•	•	•	•
180TC	**100**	•	•	•	•	•	•	•	•	•
	112		•		•	•	•	•	•	•
210TC	**132**	•	•	•	•	•	•	•	•	•
250TC	**160**	•	•	•	•	•	•	•	•	•

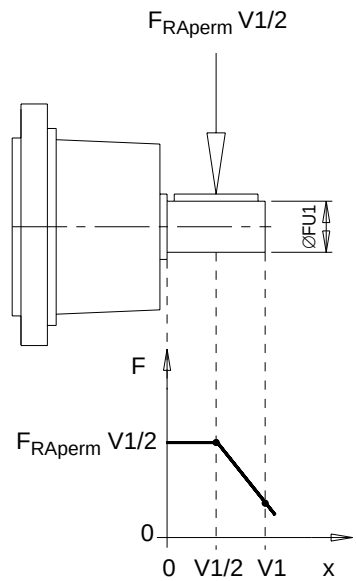
allowable combinations of input unit K., A., P. see chapter 7

6

Permissible overhung loads and torque

for type of input unit A., P.

Frame-size		T_1 1)		FU1		V1		F_{RAperm} V1/2	
		[lb in]	[Nm]	[in]	[*mm*]	[in]	[*mm*]	[lbf]	[N]
56C	**71**	26.5	3	5/8	*16*	1.575	*40*	54	240
	80	44.2	5	3/4	*19*	1.575	*40*	54	240
140TC	**90**	88.5	10	7/8	*24*	1.968	*50*	139	620
180TC	**100**	177	20	1 1/8	*28*	2.362	*60*	189	840
	112	230	26	1 1/4	*28*	2.362	*60*	225	1000
210TC	**132**	540	61	1 3/8	*38*	3.150	*80*	382	1700
250TC	**160**	867	98	1 5/8	*42*	4.331	*110*	405	1800



1)permissible short time value is 2,5 times (for e.g. starting torque of motor)

Worm Helical Gear Units

List of Efficiency C.28

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]	n_{Mot}= 2500 rpm				n_{Mot}= 1450 rpm				n_{Mot}= 950 rpm				n_{Mot}= 700 rpm				Size for motor
	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	56C 71
372.00	6.7	1053	0.20	56%	3.9	1044	0.12	56%	2.6	1026	0.08	55%	1.9	1009	<0.07	54%	•
303.36	8.2	964	0.23	56%	4.8	956	0.13	56%	3.1	947	0.08	55%	2.3	920	<0.07	54%	•
248.00	10.1	1044	0.25	66%	5.8	1044	0.15	66%	3.8	1035	0.09	65%	2.8	1026	0.07	65%	•
202.24	12.4	885	0.27	66%	7.2	885	0.15	66%	4.7	876	0.09	65%	3.5	858	0.08	65%	•
155.00	16.1	1026	0.35	74%	9.4	1026	0.20	74%	6.1	1026	0.13	74%	4.5	1017	0.09	73%	•
126.40	19.8	832	0.35	74%	11.5	841	0.20	74%	7.5	832	0.13	74%	5.5	823	0.09	73%	•
93.00	27	1044	0.54	83%	15.6	1044	0.31	83%	10.2	1044	0.20	82%	7.5	1035	0.15	82%	•
75.84	33	849	0.54	83%	19.1	849	0.31	83%	12.5	841	0.20	82%	9.2	841	0.15	82%	•
62.00	40	1035	0.76	87%	23	1035	0.43	87%	15.3	1035	0.30	87%	11.3	1035	0.21	86%	•
50.56	49	832	0.75	87%	29	841	0.44	87%	18.8	832	0.28	87%	13.8	832	0.21	86%	•
46.50	54	973	0.94	90%	31	973	0.54	90%	20	973	0.35	89%	15.1	973	0.25	89%	•
37.92	66	796	0.93	90%	38	796	0.54	90%	25	787	0.35	89%	18.5	787	0.25	89%	•
31.00	81	876	1.23	92%	47	876	0.71	92%	31	876	0.47	92%	23	876	0.35	91%	•
25.28	99	717	1.22	92%	57	717	0.71	92%	38	717	0.47	92%	28	708	0.35	91%	•

Ratio [-]	n_{Mot}= 1750 rpm				n_{Mot}= 1150 rpm				n_{Mot}= 850 rpm				Size for motor
	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	56C 71
372.00	4.7	1053	0.13	56%	3.1	1035	0.09	55%	2.3	1026	0.07	54%	•
303.36	5.8	964	0.16	56%	3.8	956	0.11	55%	2.8	938	0.08	54%	•
248.00	7.1	1044	0.17	66%	4.6	1044	0.12	66%	3.4	1035	0.08	65%	•
202.24	8.7	885	0.19	66%	5.7	876	0.12	66%	4.2	867	0.09	65%	•
155.00	11.3	1026	0.25	74%	7.4	1026	0.16	74%	5.5	1017	0.12	73%	•
126.40	13.8	841	0.24	74%	9.1	832	0.16	74%	6.7	832	0.12	73%	•
93.00	18.8	1044	0.38	83%	12.4	1044	0.25	83%	9.1	1044	0.19	82%	•
75.84	23	849	0.38	83%	15.2	841	0.24	83%	11.2	841	0.19	82%	•
62.00	28	1035	0.54	87%	18.5	1035	0.35	87%	13.7	1035	0.25	87%	•
50.56	35	841	0.54	87%	23	832	0.35	87%	16.8	832	0.25	87%	•
46.50	38	973	0.66	90%	25	973	0.43	90%	18.3	973	0.32	89%	•
37.92	46	796	0.64	90%	30	796	0.42	90%	22	787	0.31	89%	•
31.00	56	885	0.86	92%	37	876	0.56	92%	27	876	0.42	91%	•
25.28	69	717	0.86	92%	45	717	0.56	92%	34	717	0.42	91%	•

Helical Worm Gear Units

List of Efficiency C.38-D/Z28

Legend/explanations see page 6 - 28

Input Units see chapter 7

	n_{Mot}= 1750 rpm				n_{Mot}= 1450 rpm				Size for motor
Ratio [-]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	56C 71
23503	0.07	1964	<0.08	45%	0.06	1964	<0.08	45%	•
20276	0.09	1964	<0.08	45%	0.07	1964	<0.08	45%	•
17420	0.10	1964	<0.08	45%	0.08	1964	<0.08	45%	•
16037	0.11	1964	<0.08	45%	0.09	1964	<0.08	45%	•
14579	0.12	1964	<0.08	45%	0.10	1964	<0.08	45%	•
12904	0.14	1964	<0.08	45%	0.11	1964	<0.08	45%	•
10808	0.16	1964	<0.08	45%	0.13	1964	<0.08	45%	•
9216	0.19	1964	<0.08	46%	0.16	1964	<0.08	45%	•
7833	0.22	1964	<0.08	46%	0.19	1964	<0.08	46%	•
6807	0.26	1964	<0.08	46%	0.21	1964	<0.08	46%	•
5925	0.30	1964	<0.08	46%	0.24	1964	<0.08	46%	•
5345	0.33	1964	<0.08	46%	0.27	1964	<0.08	46%	•
4717	0.37	1964	<0.08	46%	0.31	1964	<0.08	46%	•
4222	0.41	1964	<0.08	47%	0.34	1964	<0.08	46%	•
3749	0.47	1964	<0.08	47%	0.39	1964	<0.08	46%	•
3286	0.53	1964	<0.08	47%	0.44	1964	<0.08	47%	•
2941	0.60	1964	<0.08	47%	0.49	1964	<0.08	47%	•
2610	0.67	1964	<0.08	48%	0.56	1964	<0.08	47%	•
2288	0.76	1973	<0.08	48%	0.63	1964	<0.08	47%	•
2011	0.87	1973	<0.08	48%	0.72	1964	<0.08	48%	•
1817	0.96	1973	<0.08	49%	0.80	1973	<0.08	48%	•
1583	1.11	1973	<0.08	49%	0.92	1973	<0.08	49%	•
1422	1.23	1973	<0.08	50%	1.02	1973	<0.08	49%	•
1284	1.36	1973	0.08	50%	1.13	1973	<0.08	49%	•
1164	1.50	1973	0.09	51%	1.25	1973	<0.08	50%	•
1059	1.65	1973	0.11	51%	1.37	1973	0.08	50%	•
937	1.87	1973	0.11	52%	1.55	1973	0.09	51%	•
865	2.02	1973	0.12	53%	1.68	1973	0.11	51%	•
745	2.35	1973	0.13	54%	1.95	1973	0.12	52%	•
677	2.59	1982	0.15	54%	2.14	1973	0.12	53%	•
615	2.84	1982	0.16	55%	2.36	1973	0.13	54%	•
558	3.14	1982	0.17	56%	2.60	1982	0.15	55%	•
508	3.45	1982	0.19	57%	2.86	1982	0.16	55%	•
449	3.90	1982	0.21	58%	3.23	1982	0.17	56%	•
414	4.22	1991	0.23	59%	3.50	1982	0.19	57%	•
357	4.90	1991	0.25	60%	4.06	1991	0.21	58%	•
324	5.40	1991	0.28	61%	4.47	1991	0.24	59%	•

Helical Worm Gear Units

List of Efficiency C.38

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 1750 rpm				n_{Mot}= 1450 rpm				n_{Mot}= 1150 rpm				Size for motor and input unit							
		n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
320.67	★	5.5	1991	0.28	62%	4.5	1991	0.24	60%	3.6	1982	0.20	58%	•	•	•					
284.70		6.1	2000	0.31	63%	5.1	1991	0.27	62%	4.0	1982	0.21	59%	•	•	•					
249.60	★	7.0	2000	0.35	64%	5.8	2000	0.30	63%	4.6	1991	0.24	61%	•	•	•	•				
223.36		7.8	2008	0.38	65%	6.5	2000	0.32	64%	5.1	1991	0.27	62%	•	•	•	•				
198.25	★	8.8	2008	0.43	66%	7.3	2000	0.36	65%	5.8	1991	0.30	63%	•	•	•	•				
173.73		10.1	2017	0.48	67%	8.3	2008	0.40	66%	6.6	2000	0.32	64%	•	•	•	•				
152.75	★	11.5	2017	0.55	68%	9.5	2008	0.46	67%	7.5	2000	0.36	65%	•	•	•	•				
138.00		12.7	2026	0.60	68%	10.5	2017	0.50	67%	8.3	2008	0.40	66%	•	•	•	•				
120.25	★	14.6	2035	0.68	68%	12.1	2026	0.58	68%	9.6	2017	0.46	67%	•	•	•	•				
108.00		16.2	2000	0.75	69%	13.4	2026	0.63	68%	10.6	2017	0.51	67%	•	•	•	•				
97.50	★	17.9	1938	0.80	69%	14.9	2035	0.71	68%	11.8	2026	0.56	68%	•	•	•	•	•			
88.40		19.8	1867	0.86	69%	16.4	1982	0.75	69%	13.0	2026	0.62	68%	•	•	•	•	•			
80.44	★	22	1796	0.91	69%	18.0	1920	0.80	69%	14.3	2035	0.67	68%	•	•	•	•	•			
71.12		25	1725	0.99	69%	20	1858	0.86	69%	16.2	1991	0.75	69%	•	•	•	•	•			
65.68	★	27	1690	1.05	69%	22	1805	0.91	69%	17.5	1946	0.79	69%	•	•	•	•	•			
60.30	★	29	1805	0.95	87%	24	1787	0.79	87%	19.1	1761	0.63	85%	•	•	•					
53.53		33	2168	1.29	88%	27	2150	1.06	87%	21	2115	0.82	86%	•	•	•					
46.93	★	37	2053	1.37	88%	31	2044	1.14	88%	25	2017	0.93	87%	•	•	•	•				
42.00		42	1964	1.48	89%	35	1946	1.23	88%	27	1929	0.95	87%	•	•	•	•				
37.28	★	47	2053	1.72	89%	39	2044	1.43	89%	31	2026	1.14	88%	•	•	•	•				
32.67		54	1699	1.64	89%	44	1699	1.33	89%	35	1681	1.06	88%	•	•	•	•				
28.72	★	61	1840	2.00	89%	50	1831	1.64	89%	40	1823	1.30	89%	•	•	•	•				
25.95		67	1849	2.20	89%	56	1840	1.84	89%	44	1831	1.45	89%	•	•	•	•				
22.61	★	77	1823	2.49	89%	64	1823	2.08	89%	51	1814	1.65	89%	•	•	•	•				
20.31		86	1734	2.66	89%	71	1734	2.19	89%	57	1734	1.76	89%	•	•	•	•				
18.33	★	95	1761	2.96	89%	79	1823	2.56	89%	63	1823	2.04	89%	•	•	•	•	•			
16.62		105	1690	3.14	89%	87	1734	2.68	89%	69	1734	2.13	89%	•	•	•	•	•			
15.13	★	116	1619	3.34	89%	96	1655	2.82	89%	76	1655	2.23	89%	•	•	•	•	•			
13.37		131	1460	3.39	89%	108	1460	2.80	89%	86	1460	2.23	89%	•	•	•	•	•			
12.35	★	142	1495	3.77	89%	117	1522	3.16	89%	93	1522	2.52	89%	•	•	•	•	•			
10.63		165	1371	4.02	89%	136	1531	3.70	89%	108	1619	3.10	89%	•	•	•	•	•			
9.67	★	181	1248	4.02	89%	150	1504	4.02	89%	119	1557	3.30	89%	•	•	•	•	•			

Helical Worm Gear Units

List of Efficiency C.38

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 950 rpm				n_{Mot}= 850 rpm				n_{Mot}= 700 rpm				Size for motor and input unit							
		n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
320.67	★	3.0	1982	0.16	56%	2.7	1982	0.15	56%	2.2	1973	0.13	54%	•	•	•					
284.70		3.3	1982	0.17	58%	3.0	1982	0.16	57%	2.5	1982	0.15	55%	•	•	•					
249.60	★	3.8	1982	0.20	59%	3.4	1982	0.19	58%	2.8	1982	0.16	56%	•	•	•	•				
223.36		4.3	1991	0.23	60%	3.8	1982	0.20	59%	3.1	1982	0.17	57%	•	•	•	•				
198.25	★	4.8	1991	0.25	61%	4.3	1991	0.23	60%	3.5	1982	0.19	58%	•	•	•	•				
173.73		5.5	1991	0.28	62%	4.9	1991	0.25	61%	4.0	1982	0.21	59%	•	•	•	•				
152.75	★	6.2	2000	0.31	63%	5.6	1991	0.28	62%	4.6	1991	0.24	61%	•	•	•	•				
138.00		6.9	2000	0.34	64%	6.2	2000	0.31	63%	5.1	1991	0.27	62%	•	•	•	•				
120.25	★	7.9	2008	0.39	65%	7.1	2000	0.35	65%	5.8	2000	0.30	63%	•	•	•	•				
108.00		8.8	2008	0.43	66%	7.9	2008	0.39	65%	6.5	2000	0.32	64%	•	•	•	•				
97.50	★	9.7	2017	0.47	67%	8.7	2008	0.42	66%	7.2	2000	0.35	65%	•	•	•	•	•			
88.40		10.7	2017	0.51	67%	9.6	2017	0.46	67%	7.9	2008	0.39	65%	•	•	•	•	•			
80.44	★	11.8	2026	0.56	68%	10.6	2017	0.51	67%	8.7	2008	0.42	66%	•	•	•	•	•			
71.12		13.4	2026	0.63	68%	12.0	2026	0.56	68%	9.8	2017	0.47	67%	•	•	•	•	•			
65.68	★	14.5	2035	0.68	68%	12.9	2026	0.62	68%	10.7	2017	0.51	67%	•	•	•	•	•			
60.30	★	15.8	1734	0.52	84%	14.1	1725	0.46	84%	11.6	1699	0.38	82%	•	•	•					
53.53		17.7	2088	0.70	85%	15.9	2070	0.62	84%	13.1	2044	0.51	83%	•	•	•					
46.93	★	20	1991	0.74	86%	18.1	1973	0.67	85%	14.9	1946	0.55	84%	•	•	•	•				
42.00		23	1911	0.80	86%	20	1893	0.70	86%	16.7	1867	0.59	85%	•	•	•	•				
37.28	★	25	2008	0.91	87%	23	1991	0.84	86%	18.8	1964	0.68	85%	•	•	•	•				
32.67		29	1672	0.87	87%	26	1663	0.79	87%	21	1637	0.63	86%	•	•	•	•				
28.72	★	33	1814	1.07	88%	30	1805	0.98	88%	24	1787	0.78	87%	•	•	•	•				
25.95		37	1823	1.21	88%	33	1814	1.09	88%	27	1805	0.89	87%	•	•	•	•				
22.61	★	42	1814	1.35	89%	38	1805	1.23	88%	31	1787	1.01	88%	•	•	•	•				
20.31		47	1725	1.45	89%	42	1725	1.29	89%	34	1708	1.05	88%	•	•	•	•				
18.33	★	52	1823	1.69	89%	46	1814	1.49	89%	38	1805	1.23	88%	•	•	•	•	•			
16.62		57	1734	1.76	89%	51	1725	1.57	89%	42	1725	1.29	89%	•	•	•	•	•			
15.13	★	63	1646	1.85	89%	56	1646	1.64	89%	46	1646	1.35	89%	•	•	•	•	•			
13.37		71	1460	1.84	89%	64	1460	1.66	89%	52	1451	1.34	89%	•	•	•	•	•			
12.35	★	77	1522	2.08	89%	69	1522	1.86	89%	57	1522	1.54	89%	•	•	•	•	•			
10.63		89	1619	2.55	89%	80	1619	2.29	89%	66	1610	1.89	89%	•	•	•	•	•			
9.67	★	98	1557	2.71	89%	88	1557	2.44	89%	72	1557	2.00	89%	•	•	•	•	•			

Helical Worm Gear Units

List of Efficiency C.38

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 500 rpm				n_{Mot}= 250 rpm				n_{Mot}= 10 rpm				Size for motor and input unit							
		n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
320.67	★	1.6	1973	0.09	52%	0.78	1973	<0.07	49%	0.031	1964	<0.07	46%	•	•	•					
284.70		1.8	1973	0.11	53%	0.88	1973	<0.07	49%	0.035	1964	<0.07	46%	•	•	•					
249.60	★	2.0	1973	0.12	53%	1.0	1973	<0.07	50%	0.04	1964	<0.07	46%	•	•	•	•				
223.36		2.2	1973	0.12	54%	1.1	1973	0.07	50%	0.045	1964	<0.07	46%	•	•	•	•				
198.25	★	2.5	1982	0.15	55%	1.3	1973	0.08	51%	0.050	1964	<0.07	46%	•	•	•	•				
173.73		2.9	1982	0.16	56%	1.4	1973	0.08	51%	0.058	1964	<0.07	46%	•	•	•	•				
152.75	★	3.3	1982	0.17	57%	1.6	1973	0.09	52%	0.065	1964	<0.07	46%	•	•	•	•				
138.00		3.6	1982	0.20	58%	1.8	1973	0.11	53%	0.072	1964	<0.07	46%	•	•	•	•				
120.25	★	4.2	1991	0.23	60%	2.1	1973	0.12	54%	0.083	1964	<0.07	46%	•	•	•	•				
108.00		4.6	1991	0.24	61%	2.3	1973	0.13	54%	0.093	1964	<0.07	46%	•	•	•	•				
97.50	★	5.1	1991	0.27	62%	2.6	1982	0.15	55%	0.10	1964	<0.07	46%	•	•	•	•	•			
88.40		5.7	1991	0.30	63%	2.8	1982	0.16	56%	0.11	1964	<0.07	46%	•	•	•	•	•			
80.44	★	6.2	2000	0.31	63%	3.1	1982	0.17	57%	0.12	1964	<0.07	46%	•	•	•	•	•			
71.12		7.0	2000	0.35	64%	3.5	1982	0.19	58%	0.14	1964	<0.07	46%	•	•	•	•	•			
65.68	★	7.6	2000	0.38	65%	3.8	1982	0.20	59%	0.15	1964	<0.07	46%	•	•	•	•	•			
60.30	★	8.3	1663	0.27	80%	4.1	1601	0.13	78%	0.17	1531	<0.07	74%	•	•	•					
53.53		9.3	2000	0.36	81%	4.7	1920	0.19	78%	0.19	1823	<0.07	74%	•	•	•					
46.93	★	10.7	1902	0.39	82%	5.3	1823	0.20	78%	0.21	1716	<0.07	74%	•	•	•	•				
42.00		11.9	1823	0.42	82%	6.0	1743	0.21	79%	0.24	1637	<0.07	74%	•	•	•	•				
37.28	★	13.4	1920	0.50	83%	6.7	1831	0.24	79%	0.27	1708	<0.07	74%	•	•	•	•				
32.67		15.3	1601	0.47	84%	7.7	1531	0.23	80%	0.31	1416	<0.07	74%	•	•	•	•				
28.72	★	17.4	1743	0.56	85%	8.7	1663	0.28	81%	0.35	1522	<0.07	74%	•	•	•	•				
25.95		19.3	1761	0.63	85%	9.6	1681	0.31	81%	0.39	1531	<0.07	74%	•	•	•	•				
22.61	★	22	1761	0.71	86%	11.1	1672	0.36	82%	0.44	1513	<0.07	74%	•	•	•	•				
20.31		25	1681	0.76	87%	12.3	1601	0.38	83%	0.49	1442	<0.07	74%	•	•	•	•				
18.33	★	27	1778	0.87	87%	13.6	1699	0.44	83%	0.55	1522	<0.07	74%	•	•	•	•	•			
16.62		30	1699	0.93	88%	15.0	1628	0.46	84%	0.60	1442	<0.07	74%	•	•	•	•	•			
15.13	★	33	1628	0.97	88%	16.5	1557	0.48	84%	0.66	1371	<0.07	74%	•	•	•	•	•			
13.37		37	1442	0.95	88%	18.7	1389	0.48	85%	0.75	1221	<0.07	75%	•	•	•	•	•			
12.35	★	40	1513	1.09	89%	20	1460	0.54	86%	0.81	1274	<0.07	75%	•	•	•	•	•			
10.63		47	1610	1.34	89%	24	1566	0.68	86%	0.94	1354	<0.07	75%	•	•	•	•	•			
9.67	★	52	1557	1.43	89%	26	1513	0.72	87%	1	1301	<0.07	75%	•	•	•	•	•			

Helical Worm Gear Units

List of Efficiency C.48-D/Z28

Legend/explanations see page 6 - 28

Input Units see chapter 7

	n_{Mot}= 1750 rpm				n_{Mot}= 1450 rpm				Size for motor
Ratio [-]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	56C 71
23503	0.07	3221	<0.08	47%	0.06	3221	<0.08	47%	•
20276	0.09	3221	<0.08	47%	0.07	3221	<0.08	47%	•
17420	0.10	3221	<0.08	47%	0.08	3221	<0.08	47%	•
16037	0.11	3221	<0.08	47%	0.09	3221	<0.08	47%	•
14579	0.12	3221	<0.08	47%	0.10	3221	<0.08	47%	•
12904	0.14	3221	<0.08	47%	0.11	3221	<0.08	47%	•
10808	0.16	3221	<0.08	47%	0.13	3221	<0.08	47%	•
9216	0.19	3221	<0.08	47%	0.16	3221	<0.08	47%	•
7833	0.22	3221	<0.08	48%	0.19	3221	<0.08	47%	•
6807	0.26	3221	<0.08	48%	0.21	3221	<0.08	47%	•
5925	0.30	3221	<0.08	48%	0.24	3221	<0.08	48%	•
5345	0.33	3221	<0.08	48%	0.27	3221	<0.08	48%	•
4717	0.37	3221	<0.08	48%	0.31	3221	<0.08	48%	•
4222	0.41	3221	<0.08	48%	0.34	3221	<0.08	48%	•
3749	0.47	3221	<0.08	49%	0.39	3221	<0.08	48%	•
3286	0.53	3221	<0.08	49%	0.44	3221	<0.08	49%	•
2941	0.60	3221	<0.08	49%	0.49	3221	<0.08	49%	•
2610	0.67	3221	<0.08	50%	0.56	3221	<0.08	49%	•
2288	0.76	3229	<0.08	50%	0.63	3221	<0.08	49%	•
2011	0.87	3229	0.09	51%	0.72	3221	<0.08	50%	•
1817	0.96	3229	0.09	51%	0.80	3229	0.08	50%	•
1583	1.11	3229	0.11	52%	0.92	3229	0.09	51%	•
1422	1.23	3229	0.12	52%	1.02	3229	0.11	51%	•
1284	1.36	3229	0.13	53%	1.13	3229	0.11	52%	•
1164	1.50	3229	0.15	53%	1.25	3229	0.12	52%	•
1059	1.65	3238	0.16	54%	1.37	3229	0.13	53%	•
937	1.87	3238	0.17	55%	1.55	3229	0.15	53%	•
865	2.02	3238	0.19	55%	1.68	3238	0.16	54%	•
745	2.35	3238	0.21	56%	1.95	3238	0.19	55%	•
677	2.59	3247	0.23	57%	2.14	3238	0.20	56%	•
615	2.84	3247	0.25	58%	2.36	3238	0.21	57%	•
558	3.14	3247	0.27	59%	2.60	3247	0.23	57%	•
508	3.45	3256	0.30	60%	2.86	3247	0.25	58%	•
449	3.90	3256	0.34	61%	3.23	3247	0.28	59%	•
414	4.22	3256	0.35	62%	3.50	3256	0.30	60%	•
357	4.90	3265	0.40	64%	4.06	3256	0.34	62%	•
324	5.40	3274	0.43	64%	4.47	3265	0.38	63%	•

Helical Worm Gear Units

List of Efficiency C.48

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 1750 rpm				n_{Mot}= 1450 rpm				n_{Mot}= 1150 rpm				Size for motor and input unit							
		n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
320.67	★	5.5	3274	0.43	66%	4.5	3265	0.36	64%	3.6	3256	0.31	61%	•	•	•					
284.70		6.1	3274	0.47	67%	5.1	3265	0.40	65%	4.0	3256	0.34	63%	•	•	•					
249.60	★	7.0	3282	0.54	68%	5.8	3274	0.46	66%	4.6	3265	0.38	64%	•	•	•	•				
223.36		7.8	3291	0.59	69%	6.5	3282	0.51	67%	5.1	3265	0.40	65%	•	•	•	•				
198.25	★	8.8	3300	0.66	70%	7.3	3291	0.56	68%	5.8	3274	0.46	66%	•	•	•	•				
173.73		10.1	3309	0.75	70%	8.3	3300	0.63	69%	6.6	3282	0.51	67%	•	•	•	•				
152.75	★	11.5	3318	0.86	71%	9.5	3309	0.71	70%	7.5	3291	0.58	68%	•	•	•	•				
138.00		12.7	3336	0.94	71%	10.5	3318	0.78	71%	8.3	3300	0.63	69%	•	•	•	•				
120.25	★	14.6	3212	1.05	72%	12.1	3327	0.90	71%	9.6	3309	0.72	70%	•	•	•	•				
108.00		16.2	3097	1.11	72%	13.4	3336	0.99	71%	10.6	3318	0.79	71%	•	•	•	•				
97.50	★	17.9	2999	1.18	72%	14.9	3344	1.10	72%	11.8	3327	0.87	71%	•	•	•	•	•			
88.40		19.8	2911	1.27	72%	16.4	3362	1.22	72%	13.0	3318	0.97	71%	•	•	•	•	•			
80.44	★	22	2814	1.37	72%	18	3371	1.34	72%	14.3	3229	1.02	72%	•	•	•	•	•			
71.12		25	2699	1.49	72%	20	3380	1.49	72%	16.2	3114	1.11	72%	•	•	•	•	•			
65.68	★	27	2628	1.57	72%	22	3398	1.65	72%	17.5	3035	1.17	72%	•	•	•	•	•			
56.55		31	2522	1.72	72%	26	3415	1.96	72%	20	2911	1.29	72%	•	•	•	•	•			
51.41	★	34	2442	1.84	72%	28	3424	2.12	72%	22	2822	1.37	72%	•	•	•	•	•			
46.93	★	37	2592	1.70	89%	31	2584	1.43	89%	25	2557	1.15	88%	•	•	•	•				
42.00		42	2831	2.11	90%	35	2814	1.76	89%	27	2796	1.35	88%	•	•	•	•				
37.28	★	47	2362	1.97	90%	39	2362	1.64	89%	31	2345	1.30	89%	•	•	•	•				
32.67		54	2362	2.25	90%	44	2353	1.84	90%	35	2345	1.46	89%	•	•	•	•				
28.72	★	61	2557	2.75	90%	50	2557	2.25	90%	40	2548	1.81	89%	•	•	•	•				
25.95		67	2451	2.91	90%	56	2451	2.43	90%	44	2451	1.90	90%	•	•	•	•				
22.61	★	77	2389	3.25	90%	64	2389	2.71	90%	51	2389	2.16	90%	•	•	•	•				
20.31		86	2486	3.78	90%	71	2486	3.12	90%	57	2486	2.51	90%	•	•	•	•				
18.33	★	95	2654	4.45	90%	79	2654	3.70	90%	63	2654	2.95	90%	•	•	•	•	•			
16.62		105	2575	4.77	90%	87	2592	3.98	90%	69	2592	3.15	90%	•	•	•	•	•			
15.13	★	116	2353	4.83	90%	96	2353	4.00	90%	76	2353	3.16	90%	•	•	•	•	•			
13.37		131	2088	4.83	90%	108	2088	3.97	90%	86	2088	3.16	90%	•	•	•	•	•			
12.35	★	142	2141	5.36	90%	117	2203	4.55	90%	93	2203	3.61	90%	•	•	•	•	•			
10.63		165	1840	5.36	90%	136	2230	5.36	90%	108	2247	4.29	90%	•	•	•	•	•			
9.67	★	181	1672	5.36	90%	150	2026	5.36	90%	119	2150	4.52	90%	•	•	•	•	•			

Helical Worm Gear Units

List of Efficiency C.48

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 950 rpm				n_{Mot}= 850 rpm				n_{Mot}= 700 rpm				Size for motor and input unit							
		n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
320.67	★	3.0	3247	0.25	59%	2.7	3247	0.24	58%	2.2	3238	0.20	57%	•	•	•					
284.70		3.3	3247	0.28	61%	3.0	3247	0.25	59%	2.5	3238	0.23	58%	•	•	•					
249.60	★	3.8	3256	0.32	62%	3.4	3256	0.30	61%	2.8	3247	0.24	59%	•	•	•	•				
223.36		4.3	3256	0.35	63%	3.8	3256	0.32	62%	3.1	3247	0.27	60%	•	•	•	•				
198.25	★	4.8	3265	0.39	64%	4.3	3256	0.35	63%	3.5	3256	0.30	61%	•	•	•	•				
173.73		5.5	3274	0.43	66%	4.9	3265	0.39	64%	4.0	3256	0.34	62%	•	•	•	•				
152.75	★	6.2	3274	0.48	67%	5.6	3274	0.44	66%	4.6	3265	0.38	64%	•	•	•	•				
138.00		6.9	3282	0.54	68%	6.2	3274	0.48	67%	5.1	3265	0.40	65%	•	•	•	•				
120.25	★	7.9	3291	0.60	69%	7.1	3282	0.55	68%	5.8	3274	0.46	66%	•	•	•	•				
108.00		8.8	3300	0.66	70%	7.9	3291	0.60	69%	6.5	3282	0.51	67%	•	•	•	•				
97.50	★	9.7	3309	0.72	70%	8.7	3300	0.66	69%	7.2	3282	0.55	68%	•	•	•	•	•			
88.40		10.7	3318	0.79	71%	9.6	3309	0.72	70%	7.9	3291	0.60	69%	•	•	•	•	•			
80.44	★	11.8	3327	0.87	71%	10.6	3318	0.79	71%	8.7	3300	0.66	69%	•	•	•	•	•			
71.12		13.4	3300	0.98	71%	12.0	3327	0.89	71%	9.8	3309	0.74	70%	•	•	•	•	•			
65.68	★	14.5	3212	1.03	72%	12.9	3336	0.95	71%	10.7	3318	0.79	71%	•	•	•	•	•			
56.55		16.8	3079	1.14	72%	15.0	3194	1.06	72%	12.4	3327	0.93	71%	•	•	•	•	•			
51.41	★	18.5	2991	1.22	72%	16.5	3097	1.13	72%	13.6	3291	0.99	71%	•	•	•	•	•			
46.93	★	20	2530	0.93	87%	18.1	2513	0.83	86%	14.9	2477	0.68	85%	•	•	•	•				
42.00		23	2769	1.15	88%	20	2752	1.01	87%	16.7	2707	0.83	86%	•	•	•	•				
37.28	★	25	2327	1.05	88%	23	2309	0.97	90%	18.8	2283	0.79	87%	•	•	•	•				
32.67		29	2327	1.21	89%	26	2318	1.09	88%	21	2292	0.87	87%	•	•	•	•				
28.72	★	33	2530	1.49	89%	30	2522	1.35	89%	24	2504	1.09	88%	•	•	•	•				
25.95		37	2442	1.61	89%	33	2433	1.43	89%	27	2415	1.17	88%	•	•	•	•				
22.61	★	42	2380	1.77	90%	38	2380	1.61	89%	31	2362	1.31	89%	•	•	•	•				
20.31		47	2477	2.07	90%	42	2477	1.85	90%	34	2469	1.49	89%	•	•	•	•				
18.33	★	52	2645	2.44	90%	46	2645	2.16	90%	38	2637	1.78	89%	•	•	•	•	•			
16.62		57	2592	2.60	90%	51	2584	2.33	90%	42	2584	1.92	90%	•	•	•	•	•			
15.13	★	63	2353	2.63	90%	56	2353	2.33	90%	46	2353	1.92	90%	•	•	•	•	•			
13.37		71	2079	2.61	90%	64	2079	2.36	90%	52	2079	1.92	90%	•	•	•	•	•			
12.35	★	77	2203	2.99	90%	69	2203	2.68	90%	57	2194	2.21	90%	•	•	•	•	•			
10.63		89	2247	3.54	90%	80	2247	3.18	90%	66	2247	2.61	90%	•	•	•	•	•			
9.67	★	98	2150	3.73	90%	88	2150	3.34	90%	72	2150	2.74	90%	•	•	•	•	•			

Helical Worm Gear Units

List of Efficiency C.48

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 500 rpm n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_{Mot}= 250 rpm n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_{Mot}= 10 rpm n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	Size for motor and input unit 63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
320.67	★	1.6	3229	0.15	54%	0.78	3229	0.08	51%	0.031	3221	<0.07	47%	•	•	•					
284.70		1.8	3238	0.17	55%	0.88	3229	0.09	51%	0.035	3221	<0.07	47%	•	•	•					
249.60	★	2.0	3238	0.19	56%	1.0	3229	0.09	52%	0.040	3221	<0.07	47%	•	•	•	•				
223.36		2.2	3238	0.20	57%	1.1	3229	0.11	52%	0.045	3221	<0.07	47%	•	•	•	•				
198.25	★	2.5	3247	0.23	58%	1.3	3229	0.12	53%	0.050	3221	<0.07	47%	•	•	•	•				
173.73		2.9	3247	0.25	59%	1.4	3229	0.13	54%	0.058	3221	<0.07	47%	•	•	•	•				
152.75	★	3.3	3247	0.28	60%	1.6	3238	0.15	55%	0.065	3221	<0.07	47%	•	•	•	•				
138.00		3.6	3256	0.31	61%	1.8	3238	0.16	55%	0.072	3221	<0.07	47%	•	•	•	•				
120.25	★	4.2	3256	0.35	63%	2.1	3238	0.19	56%	0.083	3221	<0.07	48%	•	•	•	•				
108.00		4.6	3265	0.38	64%	2.3	3238	0.20	57%	0.093	3221	<0.07	48%	•	•	•	•				
97.50	★	5.1	3265	0.40	65%	2.6	3247	0.23	58%	0.10	3221	<0.07	48%	•	•	•	•	•			
88.40		5.7	3274	0.44	66%	2.8	3247	0.24	59%	0.11	3221	<0.07	48%	•	•	•	•	•			
80.44	★	6.2	3274	0.48	67%	3.1	3247	0.27	60%	0.12	3221	<0.07	48%	•	•	•	•	•			
71.12		7.0	3282	0.54	68%	3.5	3256	0.30	61%	0.14	3221	<0.07	48%	•	•	•	•	•			
65.68	★	7.6	3291	0.58	69%	3.8	3256	0.32	62%	0.15	3221	<0.07	48%	•	•	•	•	•			
56.55		8.8	3300	0.66	70%	4.4	3265	0.36	63%	0.18	3221	<0.07	48%	•	•	•	•	•			
51.41	★	9.7	3309	0.72	70%	4.9	3265	0.39	64%	0.19	3221	<0.07	48%	•	•	•	•	•			
46.93	★	10.7	2407	0.50	83%	5.3	2283	0.24	78%	0.21	2106	<0.07	72%	•	•	•	•				
42.00		11.9	2637	0.59	84%	6.0	2495	0.30	79%	0.24	2292	<0.07	72%	•	•	•	•				
37.28	★	13.4	2230	0.56	84%	6.7	2106	0.28	80%	0.27	1911	<0.07	72%	•	•	•	•				
32.67		15.3	2238	0.64	85%	7.7	2123	0.32	81%	0.31	1911	<0.07	73%	•	•	•	•				
28.72	★	17.4	2451	0.79	86%	8.7	2318	0.39	81%	0.35	2070	<0.07	73%	•	•	•	•				
25.95		19.3	2371	0.83	87%	9.6	2238	0.42	82%	0.39	1982	<0.07	73%	•	•	•	•				
22.61	★	22	2327	0.93	87%	11.1	2212	0.47	83%	0.44	1938	<0.07	73%	•	•	•	•				
20.31		25	2433	1.10	88%	12.3	2318	0.54	84%	0.49	2017	<0.07	73%	•	•	•	•				
18.33	★	27	2610	1.26	88%	13.6	2495	0.64	84%	0.55	2150	<0.07	73%	•	•	•	•	•			
16.62		30	2557	1.37	89%	15.0	2451	0.68	85%	0.60	2106	<0.07	73%	•	•	•	•	•			
15.13	★	33	2336	1.37	89%	16.5	2247	0.68	86%	0.66	1920	<0.07	73%	•	•	•	•	•			
13.37		37	2070	1.37	89%	18.7	2008	0.68	87%	0.75	1699	<0.07	73%	•	•	•	•	•			
12.35	★	40	2185	1.56	89%	20	2132	0.78	87%	0.81	1796	<0.07	73%	•	•	•	•	•			
10.63		47	2247	1.86	90%	24	2194	0.95	88%	0.94	1840	<0.07	73%	•	•	•	•	•			
9.67	★	52	2150	1.97	90%	26	2115	0.99	88%	1	1761	<0.07	74%	•	•	•	•	•			

Helical Worm Gear Units

List of Efficiency C.68-D/Z28

Legend/explanations see page 6 - 28

Input Units see chapter 7

	n_{Mot}= 1750 rpm				n_{Mot}= 1450 rpm				Size for motor
Ratio [-]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	56C 71
28203	0.06	5972	<0.08	49%	0.05	5972	<0.08	49%	•
24331	0.07	5972	<0.08	49%	0.06	5972	<0.08	49%	•
20903	0.08	5972	<0.08	49%	0.07	5972	<0.08	49%	•
19244	0.09	5972	<0.08	49%	0.08	5972	<0.08	49%	•
17495	0.10	5972	<0.08	49%	0.08	5972	<0.08	49%	•
15485	0.11	5972	<0.08	49%	0.09	5972	<0.08	49%	•
12970	0.13	5972	<0.08	49%	0.11	5972	<0.08	49%	•
11059	0.16	5972	<0.08	49%	0.13	5972	<0.08	49%	•
9400	0.19	5972	<0.08	50%	0.15	5972	<0.08	49%	•
8169	0.21	5972	<0.08	50%	0.18	5972	<0.08	50%	•
7110	0.25	5972	<0.08	50%	0.20	5972	<0.08	50%	•
6414	0.27	5972	<0.08	50%	0.23	5972	<0.08	50%	•
5661	0.31	5972	<0.08	50%	0.26	5972	<0.08	50%	•
5066	0.35	5972	<0.08	51%	0.29	5972	<0.08	50%	•
4498	0.39	5972	<0.08	51%	0.32	5972	<0.08	51%	•
3944	0.44	5972	0.08	51%	0.37	5972	<0.08	51%	•
3529	0.50	5972	0.09	52%	0.41	5972	<0.08	51%	•
3132	0.56	5972	0.11	52%	0.46	5972	0.08	51%	•
2745	0.64	5972	0.12	53%	0.53	5972	0.09	52%	•
2414	0.73	5981	0.13	53%	0.60	5972	0.11	52%	•
2180	0.80	5981	0.15	54%	0.67	5972	0.12	53%	•
1900	0.92	5981	0.16	54%	0.76	5981	0.13	53%	•
1706	1.03	5981	0.17	55%	0.85	5981	0.15	54%	•
1541	1.14	5981	0.19	56%	0.94	5981	0.16	54%	•
1397	1.25	5981	0.21	56%	1.04	5981	0.17	55%	•
1271	1.38	5990	0.23	57%	1.14	5981	0.20	56%	•
1124	1.56	5990	0.25	58%	1.29	5981	0.21	56%	•
1038	1.69	5990	0.27	58%	1.40	5990	0.23	57%	•
893	1.96	5990	0.31	60%	1.62	5990	0.27	58%	•
812	2.15	5999	0.34	61%	1.79	5990	0.30	59%	•
738	2.37	5999	0.36	61%	1.96	5990	0.31	60%	•
669	2.61	5999	0.40	62%	2.17	5999	0.34	61%	•
609	2.87	6008	0.43	63%	2.38	5999	0.36	62%	•
539	3.25	6008	0.48	65%	2.69	6008	0.40	63%	•
497	3.52	6016	0.51	65%	2.92	6008	0.44	64%	•
428	4.09	6025	0.58	67%	3.39	6016	0.50	65%	•
389	4.50	6025	0.63	68%	3.73	6016	0.54	66%	•

Helical Worm Gear Units

List of Efficiency C.68

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 1750 rpm				n_{Mot}= 1450 rpm				n_{Mot}= 1150 rpm				Size for motor and input unit							
		n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
364.00	★	4.8	6034	0.66	70%	4.0	6016	0.56	68%	3.2	6008	0.47	65%	•	•						
323.70		5.4	6034	0.74	71%	4.5	6025	0.63	69%	3.6	6016	0.51	67%	•	•	•					
280.80	★	6.2	6052	0.83	72%	5.2	6034	0.71	70%	4.1	6025	0.58	68%	•	•	•	•				
262.36		6.7	6052	0.90	72%	5.5	6043	0.75	71%	4.4	6025	0.62	69%	•	•	•	•				
230.75	★	7.6	6061	1.01	73%	6.3	6052	0.84	72%	5.0	6034	0.68	70%	•	•	•	•				
202.09		8.7	5786	1.09	73%	7.2	6061	0.95	72%	5.7	6043	0.76	71%	•	•	•	•	•			
178.75	★	9.8	5548	1.17	74%	8.1	5857	1.03	73%	6.4	6052	0.86	72%	•	•	•	•	•	•		
162.00		10.8	5362	1.25	74%	9.0	6078	1.18	73%	7.1	6043	0.94	72%	•	•	•	•	•	•		
143.00	★	12.2	5141	1.34	74%	10.1	5450	1.18	74%	8.0	5831	1.02	73%	•	•	•	•	•	•		
129.00		13.6	4955	1.43	74%	11.2	5264	1.26	74%	8.9	5645	1.09	73%	•	•	•	•	•	•		
117.00	★	15	4795	1.54	74%	12.4	6114	1.62	74%	9.8	5477	1.15	74%	•	•	•	•	•	•		
106.60		16.4	4654	1.62	74%	13.6	4946	1.43	74%	10.8	5317	1.23	74%	•	•	•	•	•	•		
97.50	★	17.9	4521	1.73	74%	14.9	6140	1.96	74%	11.8	5176	1.31	74%	•	•	•	•	•	•		
90.00	★	19.4	3070	1.07	88%	16.1	3044	0.90	87%	12.8	2999	0.71	86%	•	•	•	•				
84.09		21	4698	1.78	88%	17.2	4672	1.46	87%	13.7	4610	1.17	86%	•	•	•	•				
73.96	★	24	4840	2.09	88%	19.6	4813	1.72	88%	15.5	4769	1.35	87%	•	•	•	•				
64.77		27	5663	2.75	88%	22	5645	2.24	88%	17.8	5601	1.81	87%	•	•	•	•	•			
57.29	★	31	5459	3.04	88%	25	5848	2.63	88%	20	6273	2.27	88%	•	•	•	•	•	•		
51.92		34	5300	3.23	88%	28	5839	2.94	88%	22	5813	2.31	88%	•	•	•	•	•	•		
45.83	★	38	5114	3.49	88%	32	6025	3.46	88%	25	5848	2.63	88%	•	•	•	•	•	•		
41.35		42	4946	3.73	89%	35	5256	3.30	88%	28	5654	2.84	88%	•	•	•	•	•	•		
37.50	★	47	4778	4.02	89%	39	5707	4.00	88%	31	5477	3.04	88%	•	•	•	•	•	•		
34.17		51	4654	4.25	89%	42	4964	3.74	89%	34	5317	3.25	88%	•	•	•	•	•	•		
31.25	★	56	4521	4.53	89%	46	4822	3.98	89%	37	5185	3.45	88%	•	•	•	•	•	•		
27.94		63	4362	4.92	89%	52	5247	4.89	89%	41	5034	3.70	89%	•	•	•	•	•	•		
25.66	★	68	4247	5.18	89%	57	5052	5.16	89%	45	4866	3.93	89%	•	•	•	•	•	•		
23.13		76	4105	5.59	89%	63	4928	5.57	89%	50	4725	4.24	89%	•	•	•	•	•	•		
19.89	★	88	3928	6.21	89%	73	4725	6.18	89%	58	4521	4.69	89%	•	•	•	•	•	•		
38.00		46	3866	3.14	90%	38	3858	2.60	90%	30	3849	2.05	89%	•	•	•	•	•			
33.61	★	52	3849	3.54	90%	43	3849	2.92	90%	34	3840	2.31	90%	•	•	•	•	•	•		
30.46		57	3486	3.51	90%	48	3486	2.95	90%	38	3477	2.35	90%	•	•	•	•	•	•		
26.89	★	65	3592	4.12	90%	54	3592	3.42	90%	43	3592	2.72	90%	•	•	•	•	•	•		
24.26		72	3548	4.51	90%	60	3548	3.75	90%	47	3548	2.95	90%	•	•	•	•	•	•		
22.00	★	80	3778	5.34	90%	66	3778	4.40	90%	52	3778	3.47	90%	•	•	•	•	•	•		
20.04		87	3822	5.87	90%	72	3822	4.87	90%	57	3822	3.85	90%	•	•	•	•	•	•		
18.33	★	95	3734	6.26	90%	79	3734	5.20	90%	63	3734	4.16	90%	•	•	•	•	•	•		
16.39		107	3548	6.71	90%	88	3548	5.51	90%	70	3548	4.39	90%	•	•	•	•	•	•		
15.05	★	116	3548	7.25	90%	96	3548	6.01	90%	76	3548	4.76	90%	•	•	•	•	•	•		
13.57		129	3238	7.38	90%	107	3716	7.01	90%	85	3716	5.57	90%	•	•	•	•	•	•		
11.67	★	150	2787	7.38	90%	124	3344	7.31	90%	99	3344	5.83	90%	•	•	•	•	•	•		

Helical Worm Gear Units

List of Efficiency C.68

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 950 rpm				n_{Mot}= 850 rpm				n_{Mot}= 700 rpm				Size for motor and input unit							
		n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
364.00	★	2.6	5999	0.39	63%	2.3	5999	0.35	62%	1.9	5990	0.30	60%	•	•						
323.70		2.9	6008	0.43	65%	2.6	5999	0.39	63%	2.2	5999	0.34	62%	•	•	•					
280.80	★	3.4	6016	0.50	66%	3.0	6008	0.44	65%	2.5	5999	0.38	63%	•	•	•	•				
262.36		3.6	6016	0.51	67%	3.2	6008	0.47	66%	2.7	5999	0.40	64%	•	•	•	•				
230.75	★	4.1	6025	0.58	68%	3.7	6016	0.52	67%	3.0	6008	0.44	65%	•	•	•	•				
202.09		4.7	6025	0.64	69%	4.2	6025	0.59	68%	3.5	6016	0.51	66%	•	•	•	•	•			
178.75	★	5.3	6034	0.72	70%	4.8	6025	0.66	69%	3.9	6016	0.55	68%	•	•	•	•	•	•		
162.00		5.9	6043	0.79	71%	5.2	6034	0.71	70%	4.3	6025	0.60	69%	•	•	•	•	•	•		
143.00	★	6.6	6052	0.89	72%	5.9	6043	0.79	71%	4.9	6034	0.67	70%	•	•	•	•	•	•		
129.00		7.4	5937	0.97	73%	6.6	6052	0.89	72%	5.4	6034	0.74	71%	•	•	•	•	•	•		
117.00	★	8.1	5786	1.02	73%	7.3	5946	0.95	73%	6.0	6043	0.80	71%	•	•	•	•	•	•		
106.60		8.9	5636	1.09	73%	8.0	5804	1.01	73%	6.6	6052	0.89	72%	•	•	•	•	•	•		
97.50	★	9.7	5494	1.15	74%	8.7	5671	1.07	73%	7.2	5972	0.94	72%	•	•	•	•	•	•		
90.00	★	10.6	2964	0.59	85%	9.4	2937	0.52	84%	7.8	2884	0.43	82%	•	•	•	•				
84.09		11.3	4557	0.97	85%	10.1	4512	0.86	84%	8.3	4442	0.71	83%	•	•	•	•				
73.96	★	12.8	4716	1.11	86%	11.5	4680	1.01	85%	9.5	4610	0.83	84%	•	•	•	•				
64.77		14.7	5548	1.50	86%	13.1	5512	1.34	86%	10.8	5432	1.10	85%	•	•	•	•	•			
57.29	★	16.6	6353	1.92	87%	14.8	6317	1.72	86%	12.2	6238	1.41	85%	•	•	•	•	•	•		
51.92		18.3	5778	1.92	87%	16.4	5751	1.72	87%	13.5	5689	1.42	86%	•	•	•	•	•	•		
45.83	★	21	5981	2.27	88%	18.5	5955	2.00	87%	15.3	5901	1.65	87%	•	•	•	•	•	•		
41.35		23	5919	2.45	88%	21	5901	2.24	88%	16.9	5857	1.81	87%	•	•	•	•	•	•		
37.50	★	25	5866	2.64	88%	23	6016	2.49	88%	18.7	6264	2.13	87%	•	•	•	•	•	•		
34.17		28	5671	2.86	88%	25	5875	2.64	88%	20	6300	2.28	88%	•	•	•	•	•	•		
31.25	★	30	5556	2.99	88%	27	5742	2.79	88%	22	6131	2.43	88%	•	•	•	•	•	•		
27.94		34	5353	3.27	88%	30	5574	3.00	88%	25	5910	2.66	88%	•	•	•	•	•	•		
25.66	★	37	5194	3.45	88%	33	5397	3.19	88%	27	5760	2.79	88%	•	•	•	•	•	•		
23.13		41	5043	3.71	89%	37	5220	3.46	88%	30	5592	3.02	88%	•	•	•	•	•	•		
19.89	★	48	4813	4.14	89%	43	4990	3.85	89%	35	5344	3.35	88%	•	•	•	•	•	•		
38.00		25	3831	1.70	89%	22	3813	1.50	89%	18.4	3778	1.26	88%	•	•	•	•	•			
33.61	★	28	3822	1.90	89%	25	3813	1.70	89%	21	3787	1.42	88%	•	•	•	•	•	•		
30.46		31	3468	1.90	89%	28	3459	1.73	89%	23	3442	1.42	89%	•	•	•	•	•	•		
26.89	★	35	3583	2.23	90%	32	3574	2.02	89%	26	3557	1.65	89%	•	•	•	•	•	•		
24.26		39	3539	2.44	90%	35	3539	2.20	90%	29	3530	1.82	89%	•	•	•	•	•	•		
22.00	★	43	3778	2.87	90%	39	3769	2.60	90%	32	3760	2.13	89%	•	•	•	•	•	•		
20.04		47	3822	3.18	90%	42	3822	2.84	90%	35	3813	2.36	90%	•	•	•	•	•	•		
18.33	★	52	3734	3.43	90%	46	3734	3.03	90%	38	3725	2.51	90%	•	•	•	•	•	•		
16.39		58	3548	3.63	90%	52	3548	3.26	90%	43	3539	2.70	90%	•	•	•	•	•	•		
15.05	★	63	3539	3.94	90%	56	3539	3.50	90%	47	3539	2.94	90%	•	•	•	•	•	•		
13.57		70	3707	4.59	90%	63	3707	4.13	90%	52	3707	3.41	90%	•	•	•	•	•	•		
11.67	★	81	3344	4.77	90%	73	3344	4.30	90%	60	3336	3.54	90%	•	•	•	•	•	•		

Helical Worm Gear Units

List of Efficiency C.68

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 500 rpm				n_{Mot}= 250 rpm				n_{Mot}= 10 rpm				Size for motor and input unit							
		n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
364.00	★	1.4	5990	0.23	58%	0.69	5981	0.12	54%	0.027	5963	<0.07	49%	•	•						
323.70		1.5	5990	0.24	59%	0.77	5981	0.13	54%	0.031	5963	<0.07	49%	•	•	•					
280.80	★	1.8	5990	0.28	60%	0.89	5981	0.15	55%	0.036	5397	<0.07	49%	•	•	•	•				
262.36		1.9	5990	0.30	60%	0.95	5981	0.16	55%	0.038	5963	<0.07	49%	•	•	•	•				
230.75	★	2.2	5999	0.34	62%	1.1	5981	0.19	56%	0.043	5972	<0.07	49%	•	•	•	•				
202.09		2.5	5999	0.38	63%	1.2	5981	0.20	57%	0.049	5972	<0.07	49%	•	•	•	•	•			
178.75	★	2.8	6008	0.42	64%	1.4	5990	0.23	58%	0.056	5972	<0.07	50%	•	•	•	•	•	•		
162.00		3.1	6008	0.46	65%	1.5	5990	0.24	59%	0.062	5972	<0.07	50%	•	•	•	•	•	•		
143.00	★	3.5	6016	0.51	66%	1.7	5990	0.27	60%	0.070	5972	<0.07	50%	•	•	•	•	•	•		
129.00		3.9	6016	0.55	67%	1.9	5990	0.30	61%	0.078	5972	<0.07	50%	•	•	•	•	•	•		
117.00	★	4.3	6025	0.60	68%	2.1	5999	0.32	61%	0.085	5972	<0.07	50%	•	•	•	•	•	•		
106.60		4.7	6025	0.64	69%	2.3	5999	0.35	62%	0.094	5972	<0.07	50%	•	•	•	•	•	•		
97.50	★	5.1	6034	0.70	70%	2.6	5999	0.39	63%	0.10	5972	<0.07	50%	•	•	•	•	•	•		
90.00	★	5.6	2805	0.31	80%	2.8	2654	0.16	76%	0.11	2469	<0.07	70%	•	•	•	•				
84.09		5.9	4309	0.50	80%	3.0	4079	0.25	76%	0.12	3769	<0.07	70%	•	•	•	•				
73.96	★	6.8	4477	0.59	81%	3.4	4229	0.30	77%	0.14	3875	<0.07	70%	•	•	•	•				
64.77		7.7	5291	0.78	82%	3.9	4981	0.40	78%	0.15	4521	<0.07	70%	•	•	•	•	•			
57.29	★	8.7	6078	1.01	83%	4.4	5724	0.51	78%	0.17	5149	<0.07	71%	•	•	•	•	•	•		
51.92		9.6	5556	1.01	84%	4.8	5229	0.51	79%	0.19	4672	<0.07	71%	•	•	•	•	•	•		
45.83	★	10.9	5778	1.18	85%	5.5	5441	0.59	80%	0.22	4813	<0.07	71%	•	•	•	•	•	•		
41.35		12.1	5751	1.29	85%	6.0	5424	0.64	81%	0.24	4760	<0.07	71%	•	•	•	•	•	•		
37.50	★	13.3	6158	1.52	86%	6.7	5831	0.76	81%	0.27	5070	<0.07	71%	•	•	•	•	•	•		
34.17		14.6	6273	1.68	86%	7.3	5946	0.84	82%	0.29	5141	<0.07	71%	•	•	•	•	•	•		
31.25	★	16.0	6149	1.80	87%	8.0	5848	0.90	83%	0.32	5017	<0.07	71%	•	•	•	•	•	•		
27.94		17.9	5866	1.90	87%	8.9	5609	0.95	83%	0.36	4769	<0.07	71%	•	•	•	•	•	•		
25.66	★	19.5	5884	2.08	88%	9.7	5645	1.03	84%	0.39	4769	<0.07	71%	•	•	•	•	•	•		
23.13		22	6158	2.45	88%	10.8	5963	1.21	85%	0.43	5008	<0.07	71%	•	•	•	•	•	•		
19.89	★	25	5583	2.51	88%	12.6	5424	1.26	86%	0.5	4512	<0.07	71%	•	•	•	•	•	•		
38.00		13.2	3707	0.90	86%	6.6	3530	0.46	82%	0.26	3203	<0.07	75%	•	•	•	•	•			
33.61	★	14.9	3716	1.02	87%	7.4	3539	0.51	83%	0.30	3194	<0.07	75%	•	•	•	•	•	•		
30.46		16.4	3389	1.01	87%	8.2	3229	0.51	83%	0.33	2893	<0.07	75%	•	•	•	•	•	•		
26.89	★	18.6	3513	1.18	88%	9.3	3362	0.59	84%	0.37	2982	<0.07	75%	•	•	•	•	•	•		
24.26		21	3486	1.31	88%	10.3	3344	0.64	85%	0.41	2955	<0.07	75%	•	•	•	•	•	•		
22.00	★	23	3725	1.53	89%	11.4	3583	0.76	85%	0.45	3141	<0.07	75%	•	•	•	•	•	•		
20.04		25	3787	1.69	89%	12.5	3654	0.84	86%	0.50	3185	<0.07	75%	•	•	•	•	•	•		
18.33	★	27	3707	1.78	89%	13.6	3583	0.90	86%	0.55	3114	<0.07	75%	•	•	•	•	•	•		
16.39		31	3530	1.94	89%	15.3	3433	0.95	87%	0.61	2964	<0.07	75%	•	•	•	•	•	•		
15.05	★	33	3530	2.07	90%	16.6	3442	1.03	87%	0.66	2964	<0.07	75%	•	•	•	•	•	•		
13.57		37	3698	2.43	90%	18.4	3628	1.21	88%	0.74	3106	<0.07	75%	•	•	•	•	•	•		
11.67	★	43	3336	2.53	90%	21	3291	1.23	88%	0.86	2805	<0.07	75%	•	•	•	•	•	•		

Helical Worm Gear Units

List of Efficiency C.88-D/Z28

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]	n_{Mot}= 1750 rpm n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_{Mot}= 1450 rpm n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	Size for motor 56C 71
33491	0.05	14068	<0.08	47%	0.04	14068	<0.08	46%	•
28893	0.06	14068	<0.08	47%	0.05	14068	<0.08	47%	•
24823	0.07	14068	<0.08	47%	0.06	14068	<0.08	47%	•
22853	0.08	14068	<0.08	47%	0.06	14068	<0.08	47%	•
20775	0.08	14068	<0.08	47%	0.07	14068	<0.08	47%	•
18389	0.10	14068	<0.08	47%	0.08	14068	<0.08	47%	•
15402	0.11	14068	<0.08	47%	0.09	14068	<0.08	47%	•
13132	0.13	14068	<0.08	47%	0.11	14068	<0.08	47%	•
11162	0.16	14068	<0.08	48%	0.13	14068	<0.08	47%	•
9701	0.18	14068	0.08	48%	0.15	14068	<0.08	48%	•
8444	0.21	14068	0.09	48%	0.17	14068	<0.08	48%	•
7616	0.23	14068	0.11	49%	0.19	14068	0.09	48%	•
6722	0.26	14068	0.12	49%	0.22	14068	0.09	48%	•
6016	0.29	14068	0.13	49%	0.24	14068	0.11	49%	•
5342	0.33	14068	0.15	50%	0.27	14068	0.12	49%	•
4683	0.37	14068	0.16	50%	0.31	14068	0.13	49%	•
4191	0.42	14068	0.19	51%	0.35	14068	0.16	50%	•
3719	0.47	14068	0.20	51%	0.39	14068	0.17	50%	•
3260	0.54	14068	0.23	52%	0.44	14068	0.20	51%	•
2866	0.61	14068	0.25	52%	0.51	14068	0.21	51%	•
2589	0.68	14068	0.28	53%	0.56	14068	0.24	52%	•
2256	0.78	14068	0.32	54%	0.64	14068	0.27	53%	•
2026	0.86	14068	0.35	55%	0.72	14068	0.30	53%	•
1829	0.96	14068	0.39	56%	0.79	14068	0.32	54%	•
1659	1.05	14068	0.42	57%	0.87	14068	0.35	55%	•
1510	1.16	14068	0.46	57%	0.96	14068	0.39	56%	•
1335	1.31	14068	0.50	59%	1.09	14068	0.43	57%	•
1232	1.42	14068	0.54	59%	1.18	14068	0.46	58%	•
1061	1.65	14068	0.60	61%	1.37	14068	0.52	59%	•
964	1.81	14068	0.66	62%	1.50	14068	0.56	60%	•
877	2.00	14068	0.71	63%	1.65	14068	0.60	61%	•
795	2.20	14068	0.76	64%	1.82	14068	0.66	62%	•
723	2.42	14068	0.83	65%	2.00	14068	0.71	63%	•
640	2.74	14068	0.91	67%	2.27	14068	0.78	65%	•
590	2.96	14068	0.98	68%	2.46	14068	0.83	66%	•
508	3.44	14068	1.11	69%	2.85	14068	0.95	67%	•
462	3.79	14068	1.21	70%	3.14	14068	1.03	68%	•

Helical Worm Gear Units

List of Efficiency C.88

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 1750 rpm				n_{Mot}= 1450 rpm				n_{Mot}= 1150 rpm				Size for motor and input unit							
		n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
440.70		4	14072	1.25	71%	3.3	14071	1.06	70%	2.6	14068	0.86	67%	•	•	•					
390.00	★	4.5	14073	1.39	72%	3.7	14071	1.17	71%	2.9	14068	0.94	69%	•	•	•	•				
354.55		4.9	13993	1.49	73%	4.1	14072	1.27	72%	3.2	14068	1.03	70%	•	•	•	•				
318.50	★	5.5	13418	1.60	73%	4.6	14052	1.42	72%	3.6	14068	1.14	71%	•	•	•	•				
273.00		6.4	12629	1.74	74%	5.3	13326	1.53	73%	4.2	14077	1.30	72%	•	•	•	•	•			
247.00	★	7.1	12086	1.84	74%	5.9	12768	1.80	74%	4.7	13572	1.39	72%	•	•	•	•	•	•		
228.00		7.7	11654	1.92	74%	6.4	12331	1.93	74%	5	13227	1.43	73%	•	•	•	•	•	•		
198.25	★	8.8	11145	2.09	74%	7.3	11826	1.85	74%	5.8	12661	1.58	74%	•	•	•	•	•	•	•	
180.00		9.7	10785	2.23	74%	8.1	11430	2.44	74%	6.4	12289	1.69	74%	•	•	•	•	•	•	•	
164.36	★	10.6	10462	2.36	74%	8.8	11117	2.09	74%	7	11953	1.80	74%	•	•	•	•	•	•	•	
150.80		11.6	10141	2.51	74%	9.6	10793	2.21	74%	7.6	11635	1.89	74%	•	•	•	•	•	•	•	
138.94	★	12.6	9854	2.64	74%	10.4	10500	2.33	74%	8.3	11299	2.00	74%	•	•	•	•	•	•	•	
126.18		13.9	9525	2.82	74%	11.5	10143	3.34	74%	9.1	10953	2.13	74%	•	•	•	•	•	•	•	
114.95	★	15.2	9217	2.99	74%	12.6	9811	2.64	74%	10	10591	2.25	74%	•	•	•	•	•	•	•	
108.50		16.1	11968	3.53	87%	13.4	11920	2.94	86%	10.6	11821	2.32	85%	•	•	•	•	•			
98.17	★	17.8	11845	3.86	87%	14.8	12560	3.43	86%	11.7	12528	2.71	86%	•	•	•	•	•	•		
90.62		19.3	11128	3.93	87%	16	11105	3.26	87%	12.7	11042	2.59	86%	•	•	•	•	•	•		
78.79	★	22	11000	4.43	87%	18.4	11661	3.93	87%	14.6	12051	3.23	86%	•	•	•	•	•	•	•	
71.54		24	10683	4.68	87%	20	11344	4.14	87%	16.1	11511	3.39	87%	•	•	•	•	•	•	•	
65.32	★	27	10268	5.07	87%	22	10989	4.43	87%	17.6	11821	3.81	87%	•	•	•	•	•	•	•	
59.93		29	10022	5.31	87%	24	10672	4.68	87%	19.2	11484	4.04	87%	•	•	•	•	•	•	•	
55.22	★	32	9694	5.67	87%	26	10387	4.93	87%	21	11148	4.28	87%	•	•	•	•	•	•	•	
50.15		35	9410	6.02	87%	29	10018	6.10	87%	23	10821	4.55	87%	•	•	•	•	•	•	•	
45.68	★	38	9126	6.33	87%	32	9664	6.46	87%	25	10493	4.79	87%	•	•	•	•	•	•	•	
41.85		42	8843	6.79	87%	35	9397	6.87	87%	27	10246	5.06	87%	•	•	•	•	•	•	•	
37.34	★	47	8528	7.32	87%	39	9075	7.42	87%	31	9794	5.55	87%	•	•	•	•	•	•	•	
33.33		53	8223	7.97	87%	44	8749	8.03	87%	35	9440	6.03	87%	•		•	•	•	•	•	
28.30		62	7816	8.85	87%	51	8342	7.78	87%	41	8972	6.72	87%	•		•	•	•	•	•	
23.56	★	74	7285	9.84	87%	62	7728	10.03	87%	49	8361	7.48	87%	•		•	•	•	•	•	
33.85		52	7227	6.49	92%	43	7226	5.36	92%	34	7220	4.25	92%	•	•	•	•	•	•	•	
30.90	★	57	7227	7.12	92%	47	7227	5.87	92%	37	7229	4.61	92%	•	•	•	•	•	•	•	
28.36		62	7209	7.72	92%	51	7208	6.36	92%	41	7211	5.11	92%	•	•	•	•	•	•	•	
26.13	★	67	7209	8.34	92%	56	7209	6.97	92%	44	7211	5.48	92%	•	•	•	•	•	•	•	
23.73		74	6750	8.62	92%	61	6750	7.11	92%	48	6751	5.59	92%	•	•	•	•	•	•	•	
21.61	★	81	7199	10.07	92%	67	7199	8.33	92%	53	7202	6.60	92%	•	•	•	•	•	•	•	
19.80		88	7097	10.80	92%	73	7097	8.94	92%	58	7096	7.11	92%	•	•	•	•	•	•	•	
17.67	★	99	7036	12.03	92%	82	7036	9.96	92%	65	7034	7.90	92%	•	•	•	•	•	•	•	
15.77		111	6862	13.16	92%	92	6908	10.98	92%	73	6910	8.72	92%	•		•	•	•	•	•	
13.39		131	6434	14.56	92%	108	6862	12.81	92%	86	7131	10.59	92%	•		•	•	•	•	•	
11.15	★	157	5807	14.75	92%	130	6025	13.53	92%	103	6025	10.71	92%	•		•	•	•	•	•	

Helical Worm Gear Units

List of Efficiency C.88

Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 950 rpm				n_{Mot}= 850 rpm				n_{Mot}= 700 rpm				Size for motor and input unit							
		n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
440.70		2.2	13758	0.74	65%	1.9	13484	0.64	64%	1.6	13015	0.54	62%	•	•	•					
390.00	★	2.4	14068	0.80	67%	2.2	14068	0.75	65%	1.8	14068	0.64	63%	•	•	•	•				
354.55		2.7	14068	0.90	68%	2.4	14068	0.80	66%	2	14068	0.70	64%	•	•	•	•				
318.50	★	3	14068	0.98	69%	2.7	14068	0.90	68%	2.2	14068	0.75	65%	•	•	•	•				
273.00		3.5	14068	1.11	70%	3.1	14068	1.01	69%	2.6	14068	0.87	67%	•	•	•	•	•			
247.00	★	3.8	14068	1.19	71%	3.4	14068	1.09	70%	2.8	14068	0.91	68%	•	•	•	•	•	•		
228.00		4.2	13794	1.29	72%	3.7	14068	1.17	71%	3.1	14068	1.01	69%	•	•	•	•	•	•		
198.25	★	4.8	13325	1.39	73%	4.3	13687	1.30	72%	3.5	14068	1.11	70%	•	•	•	•	•	•	•	
180.00		5.3	12971	1.49	73%	4.7	13387	1.38	73%	3.9	13988	1.22	71%	•	•	•	•	•	•	•	
164.36	★	5.8	12635	1.58	73%	5.2	13015	1.48	73%	4.3	13652	1.30	72%	•	•	•	•	•	•	•	
150.80		6.3	12316	1.66	74%	5.6	12750	1.54	73%	4.6	13431	1.35	72%	•	•	•	•	•	•	•	
138.94	★	6.8	12024	1.76	74%	6.1	12422	1.64	74%	5	13130	1.43	73%	•	•	•	•	•	•	•	
126.18		7.5	11652	1.86	74%	6.7	12059	1.73	74%	5.5	12776	1.52	73%	•	•	•	•	•	•	•	
114.95	★	8.3	11245	2.00	74%	7.4	11661	1.85	74%	6.1	12360	1.62	74%	•	•	•	•	•	•	•	
108.50		8.8	11688	1.93	85%	7.8	11599	1.72	84%	6.5	11414	1.42	83%	•	•	•	•	•			
98.17	★	9.7	12413	2.25	85%	8.7	12334	2.01	85%	7.1	12148	1.65	83%	•	•	•	•	•	•		
90.62		10.5	10962	2.13	85%	9.4	10892	1.92	85%	7.7	10750	1.57	84%	•	•	•	•	•	•		
78.79	★	12.1	11980	2.68	86%	10.8	11927	2.39	86%	8.9	11803	1.97	85%	•	•	•	•	•	•	•	
71.54		13.3	11458	2.80	86%	11.9	11414	2.51	86%	9.8	11316	2.07	85%	•	•	•	•	•	•	•	
65.32	★	14.5	12564	3.35	86%	13	12997	3.11	86%	10.7	13767	2.74	86%	•	•	•	•	•	•	•	
59.93		15.9	12201	3.55	87%	14.2	12643	3.30	86%	11.7	13404	2.90	86%	•	•	•	•	•	•	•	
55.22	★	17.2	11891	3.74	87%	15.4	12316	3.49	87%	12.7	12661	2.96	86%	•	•	•	•	•	•	•	
50.15		18.9	11537	4.00	87%	17	11936	3.71	87%	14	12688	3.27	86%	•	•	•	•	•	•	•	
45.68	★	21	11113	4.26	87%	18.6	11564	3.93	87%	15.3	12307	3.46	87%	•	•	•	•	•	•	•	
41.85		23	10803	4.55	87%	20	11316	4.14	87%	16.7	11989	3.67	87%	•	•	•	•	•	•	•	
37.34	★	25	10520	4.80	87%	23	10812	4.55	87%	18.7	11573	3.96	87%	•	•	•	•	•	•	•	
33.33		29	10051	5.32	87%	26	10423	4.95	87%	21	11183	4.29	87%	•		•	•	•	•	•	
28.30		34	9547	5.93	87%	30	9954	5.46	87%	25	10573	4.83	87%	•		•	•	•	•	•	
23.56	★	40	8945	6.53	87%	36	9264	6.09	87%	30	9839	5.39	87%	•		•	•	•	•	•	
33.85		28	7211	3.50	92%	25	7202	3.12	92%	21	7184	2.63	91%	•	•	•	•	•	•	•	
30.90	★	31	7220	3.88	92%	28	7211	3.50	92%	23	7193	2.87	91%	•	•	•	•	•	•	•	
28.36		34	7202	4.24	92%	30	7202	3.74	92%	25	7184	3.11	92%	•	•	•	•	•	•	•	
26.13	★	36	7202	4.48	92%	33	7202	4.10	92%	27	7193	3.37	92%	•	•	•	•	•	•	•	
23.73		40	6751	4.67	92%	36	6742	4.20	92%	30	6742	3.50	92%	•	•	•	•	•	•	•	
21.61	★	44	7202	5.47	92%	39	7193	4.85	92%	32	7193	3.98	92%	•	•	•	•	•	•	•	
19.80		48	7096	5.89	92%	43	7096	5.27	92%	35	7096	4.29	92%	•	•	•	•	•	•	•	
17.67	★	54	7034	6.56	92%	48	7034	5.83	92%	40	7034	4.87	92%	•	•	•	•	•	•	•	
15.77		60	6910	7.16	92%	54	6910	6.45	92%	44	6910	5.26	92%	•		•	•	•	•	•	
13.39		71	7131	8.76	92%	63	7131	7.76	92%	52	7131	6.41	92%	•		•	•	•	•	•	
11.15	★	85	6025	8.85	92%	76	6025	7.91	92%	63	6025	6.56	92%	•		•	•	•	•	•	

Helical Worm Gear Units

List of Efficiency C.88

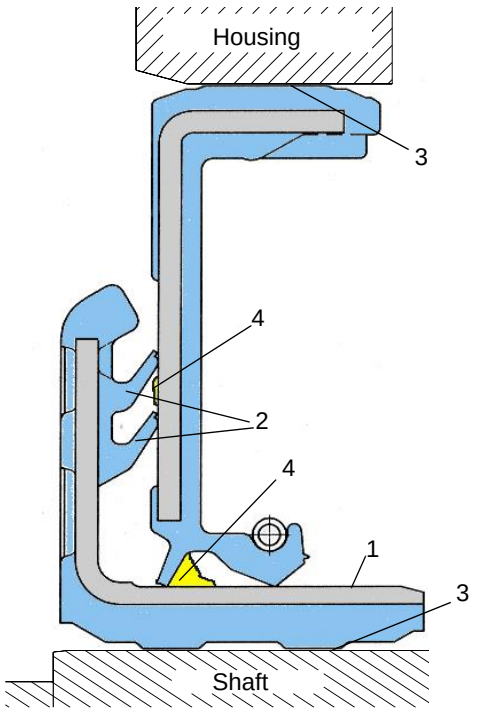
Legend/explanations see page 6 - 28

Input Units see chapter 7

Ratio [-]		n_{Mot}= 500 rpm n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_{Mot}= 250 rpm n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	n_{Mot}= 10 rpm n_2 [rpm]	T_2 [lb in]	P_{Mot} [hp]	η [%]	Size for motor and input unit 63	56C 71	80	140TC 90	180TC 100	112	210TC 132	250TC 160
440.70		1.1	12272	0.38	58%	0.57	11166	0.19	53%	0.023	9918	<0.07	47%	•	•	•					
390.00	★	1.3	14068	0.50	59%	0.64	14068	0.27	54%	0.026	12829	<0.07	47%	•	•	•	•				
354.55		1.4	14068	0.52	60%	0.71	14068	0.30	54%	0.028	14068	<0.07	47%	•	•	•	•				
318.50	★	1.6	14068	0.58	61%	0.78	14068	0.32	55%	0.031	12909	<0.07	47%	•	•	•	•				
273.00		1.8	14068	0.63	63%	0.92	14068	0.36	56%	0.037	12741	<0.07	47%	•	•	•	•	•			
247.00	★	2	14068	0.70	64%	1	14068	0.39	57%	0.04	14068	<0.07	47%	•	•	•	•	•	•		
228.00		2.2	14068	0.75	65%	1.1	14068	0.43	58%	0.044	13325	<0.07	47%	•	•	•	•	•	•		
198.25	★	2.5	14068	0.83	67%	1.3	14068	0.50	59%	0.05	14068	<0.07	47%	•	•	•	•	•	•	•	
180.00		2.8	14068	0.93	68%	1.4	14068	0.52	60%	0.056	14068	<0.07	47%	•	•	•	•	•	•	•	
164.36	★	3	14068	0.97	69%	1.5	14068	0.55	61%	0.061	14068	<0.07	47%	•	•	•	•	•	•	•	
150.80		3.3	14068	1.06	70%	1.7	14068	0.62	62%	0.066	14068	<0.07	47%	•	•	•	•	•	•	•	
138.94	★	3.6	14068	1.14	71%	1.8	14068	0.64	63%	0.072	14068	<0.07	47%	•	•	•	•	•	•	•	
126.18		4	13820	1.23	71%	2	14068	0.70	64%	0.079	14068	<0.07	48%	•	•	•	•	•	•	•	
114.95	★	4.3	13581	1.29	72%	2.2	14068	0.75	65%	0.087	14068	<0.07	48%	•	•	•	•	•	•	•	
108.50		4.6	11042	1.01	80%	2.3	10281	0.51	74%	0.092	9149	<0.07	66%	•	•	•	•	•			
98.17	★	5.1	11776	1.18	81%	2.5	10962	0.58	75%	0.1	9662	<0.07	66%	•	•	•	•	•	•		
90.62		5.5	10431	1.11	81%	2.8	9706	0.58	76%	0.11	8503	<0.07	66%	•	•	•	•	•	•		
78.79	★	6.3	11493	1.39	82%	3.2	10706	0.71	77%	0.13	9246	<0.07	66%	•	•	•	•	•	•	•	
71.54		7	11051	1.48	83%	3.5	10308	0.74	78%	0.14	8821	<0.07	66%	•	•	•	•	•	•	•	
65.32	★	7.7	13555	1.97	84%	3.8	12670	0.98	78%	0.15	10750	<0.07	66%	•	•	•	•	•	•	•	
59.93		8.3	13979	2.19	84%	4.2	13103	1.10	79%	0.17	11033	<0.07	67%	•	•	•	•	•	•	•	
55.22	★	9.1	12466	2.12	85%	4.5	11723	1.05	80%	0.18	9786	<0.07	67%	•	•	•	•	•	•	•	
50.15		10	13236	2.47	85%	5	12502	1.23	81%	0.2	10352	<0.07	67%	•	•	•	•	•	•	•	
45.68	★	10.9	13634	2.75	86%	5.5	13466	1.45	81%	0.22	11051	<0.07	67%	•	•	•	•	•	•	•	
41.85		11.9	13316	2.92	86%	6	13387	1.56	82%	0.24	10909	<0.07	67%	•	•	•	•	•	•	•	
37.34	★	13.4	12865	3.18	86%	6.7	13413	1.72	83%	0.27	10838	0.07	67%	•	•	•	•	•	•	•	
33.33		15	12466	3.43	86%	7.5	13289	1.89	84%	0.3	10661	0.08	67%	•		•	•	•	•	•	
28.30		17.7	11847	3.84	87%	8.8	13891	2.29	85%	0.35	11051	0.09	67%	•		•	•	•	•	•	
23.56	★	21	11077	4.25	87%	10.6	11847	2.33	85%	0.42	9370	0.09	68%	•		•	•	•	•	•	
33.85		14.8	7105	1.85	90%	7.4	6830	0.93	87%	0.3	6087	<0.07	77%	•	•	•	•	•	•	•	
30.90	★	16.2	7131	2.02	91%	8.1	6875	1.01	87%	0.32	6087	<0.07	77%	•	•	•	•	•	•	•	
28.36		17.6	7131	2.19	91%	8.8	6892	1.10	88%	0.35	6078	<0.07	77%	•	•	•	•	•	•	•	
26.13	★	19.1	7149	2.37	91%	9.6	6928	1.19	88%	0.38	6087	<0.07	78%	•	•	•	•	•	•	•	
23.73		21	6707	2.45	91%	10.5	6530	1.22	89%	0.42	5698	<0.07	78%	•	•	•	•	•	•	•	
21.61	★	23	7167	2.86	91%	11.6	6999	1.45	89%	0.46	6087	<0.07	78%	•	•	•	•	•	•	•	
19.80		25	7078	3.07	92%	12.6	6928	1.54	90%	0.51	6008	<0.07	78%	•	•	•	•	•	•	•	
17.67	★	28	7025	3.41	92%	14.2	6910	1.73	90%	0.57	5963	0.07	78%	•	•	•	•	•	•	•	
15.77		32	6901	3.82	92%	15.9	6813	1.89	91%	0.63	5866	0.08	78%	•		•	•	•	•	•	
13.39		37	7131	4.56	92%	18.7	7069	2.31	91%	0.75	6078	0.09	78%	•		•	•	•	•	•	
11.15	★	45	6025	4.68	92%	22	5999	2.29	91%	0.9	5149	0.09	79%	•		•	•	•	•	•	

Quadrilip seals (optional)

Improvement of Sealing Quality C.38-88



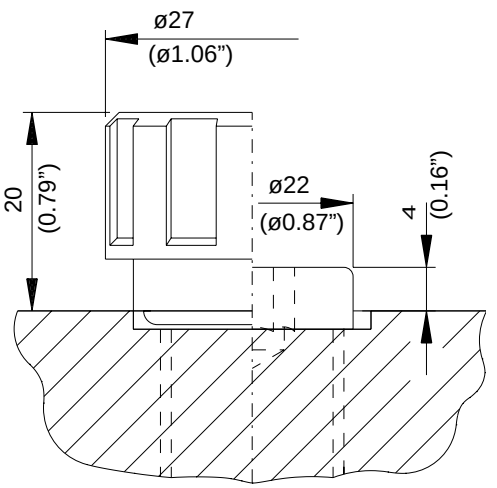
- Protected running surface for shaft seal **1**
- No risk of damage during assembly
- Additional seal-lips against dust **2**
- Separate sealing system prevents damage to the shaft through corrosion and dust
- Rubber coated inner ring and outer ring **3**
- Grease prevents dry run of lips of seals **4**

C.28 double sealing optional.

6 Breather Element

The position of the plug screw is shown in the dimension sheets for the horizontal mounting position (B3, B5). When running the gear box, in sizes C. 38 ... C. 88 a breather must replace the plug screw. The breather dimensions are as follows.
Please note that the breather plug must be inserted at other locations for other mounting positions.

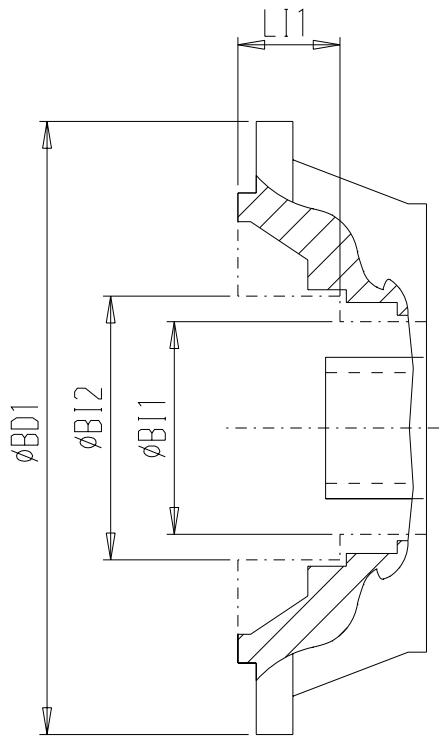
C.38 ... 88



Flange mounted (A-Type)

Detail inner outline

Design reference for the appearance of the customer side e.g. for plug-in shaft at hollow shaft configuration.

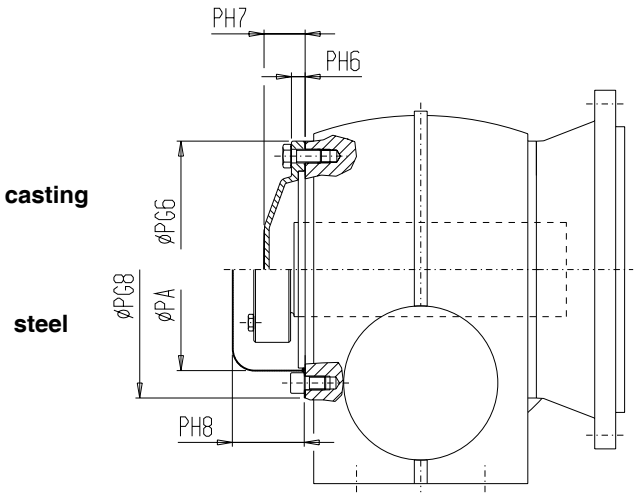


Types	øBD1		øBI1		øBI2		LI1	
	[*mm*]	[inch]	[*mm*]	[inch]	[*mm*]	[inch]	[*mm*]	[inch]
CAF. 28	*120*	4.72	*70*	2.76	*72*	2.84	*24*	0.95
CAF. 28	*160*	6.30	*70*	2.76	*103*	4.06	*8.5*	0.34
CAF. 38	*160*	6.30	*70*	2.76	*77*	3.03	*20*	0.79
CAF. 48	*200*	7.87	*84*	3.31	*90*	3.54	*22.5*	0.89
CAF. 68	*200*	7.87	*100*	3.94	*100*	3.94	-	-
CAF. 68	*250*	9.84	*96*	3.80	*96*	3.78	-	-
CAF. 88	*250*	9.84	*124*	4.88	*124*	4.88	-	-
CAF. 88	*300*	11.81	*126*	4.96	*138*	5.43	*31*	1.22

Helical Worm Gear Units
Cover B-Side (optional)

CAF, CAZ, CAD, CAFS[1)], CAZS[1)], CADS[1)], CAFT, CAZT, CADT

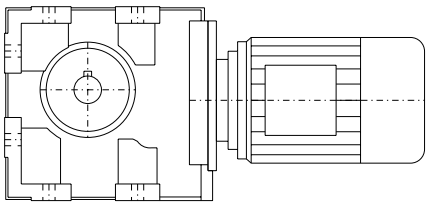
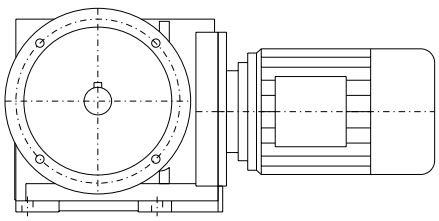
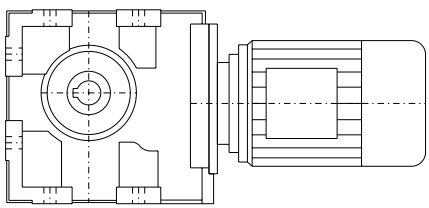
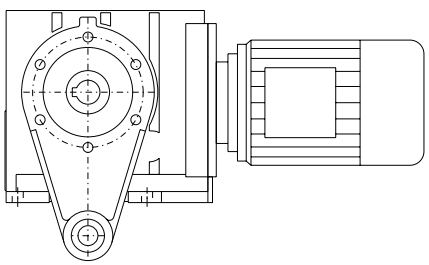
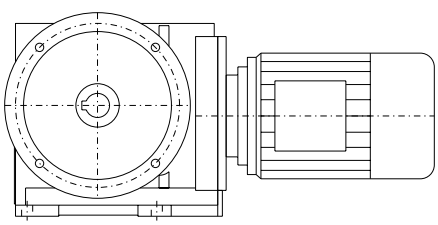
Dimensions in **inch**
mm



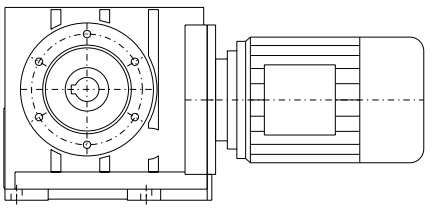
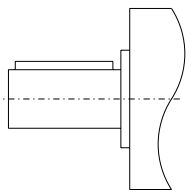
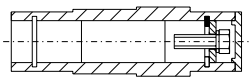
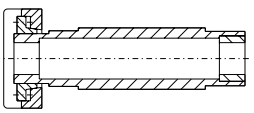
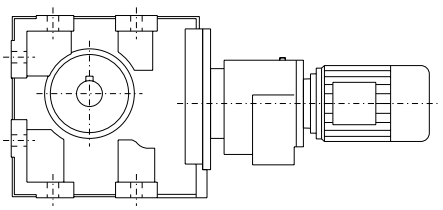
Model	Steel cover			Casting cover		
	PA	PG8	PH8	PG6	PH6	PH7
C. 28	2.28 *58*	4.02 *102*	1.42 *36*	-	-	-
C. 38	3.24 *82.2*	4.53 *115*	1.57 *40*	4.72 *120*	0.39 *10*	1.30 *33*
C. 48	3.90 *99*	5.12 *130*	1.73 *44*	5.20 *132*	0.39 *10*	1.30 *33*
C. 68	4.53 *115*	5.91 *150*	2.46 *62.5*	5.91 *150*	0.39 *10*	1.46 *37*
C. 88	5.39 *137*	7.48 *190*	2.76 *70*	7.48 *190*	0.51 *13*	1.97 *50*

1) For CAFS, CAZS and CADS only steel protection cover is possible.

Dimension Sheets-Overview

	Typ(e)	Dimension sheet see page
	C28 / CZ28	6 - 48
	C38	6 - 58
	C48	6 - 70
	C68	6 - 82
	C88	6 - 94
	CF28	6 - 50
	CF38	6 - 60
	CF48	6 - 72
	CF68	6 - 84
	CF88	6 - 96
	CA28 / CAZ28	6 - 52
	CA38	6 - 62
	CA48	6 - 74
	CA68	6 - 86
	CA88	6 - 98
	CAD28	6 - 54
	CAD38	6 - 64
	CAD48	6 - 76
	CAD68	6 - 88
	CAD88	6 - 100
	CAF28	6 - 56
	CAF38	6 - 66
	CAF48	6 - 78
	CAF68	6 - 90
	CAF88	6 - 102

Dimension Sheets-Overview

	Typ(e)	Dimension sheet see page
	CAZ38	6 - 68
	CAZ48	6 - 80
	CAZ68	6 - 92
	CAZ88	6 - 104
	Available Output solid shaft	6 - 106
	Available Output hollow shaft	6 - 107
	CA.S38 ... CA.S88	6 - 108
	C.38-Z28 ...C.88-D/Z38	6 - 109

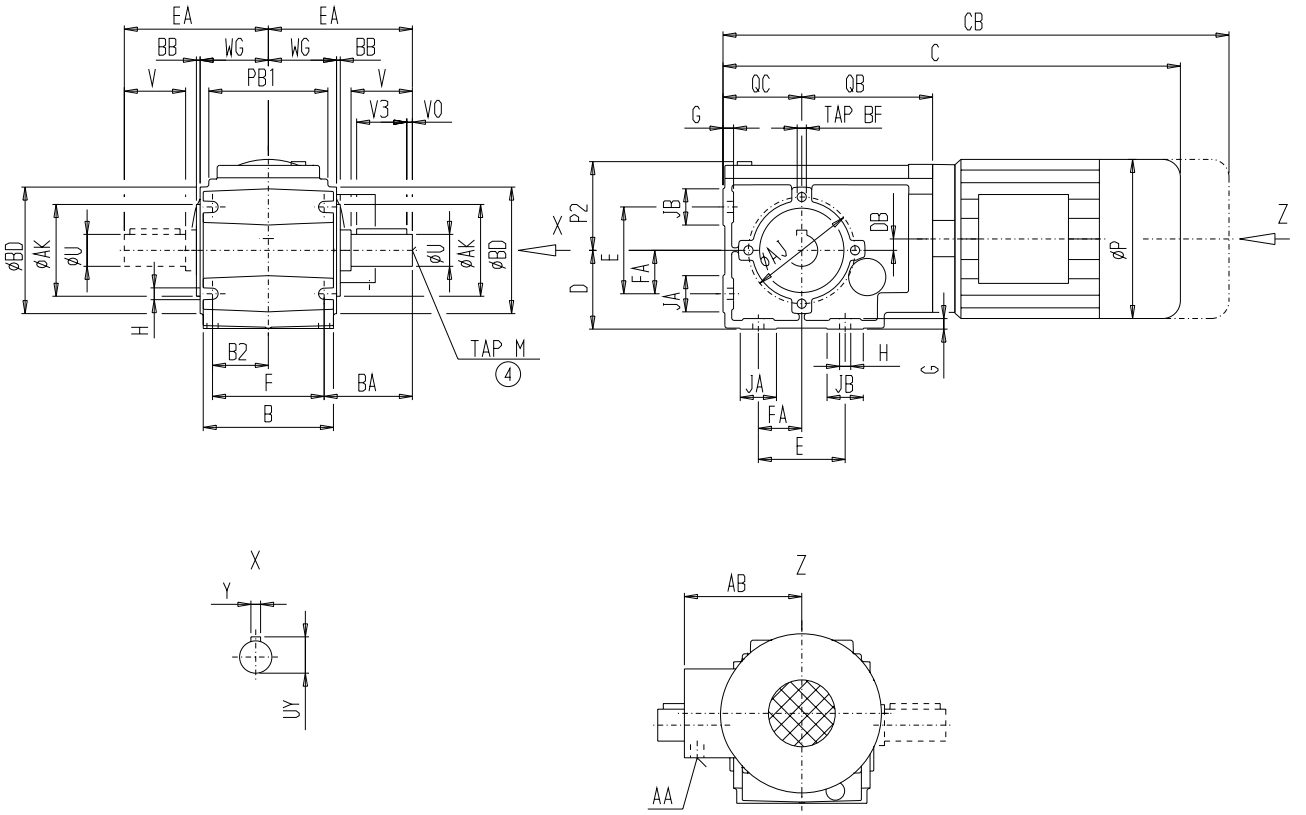
6

Worm Helical Gear Motors
Foot mounted
Housing flange (C-type)

C28
CZ28

C 510
CZ 510

[inch]



Mounting

E	F	G	H
2.76	3.54	0.31	0.35

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
0.75	1.57	1.25	0.01	0.83	0.1875	2.17	1/4-20UNC

Gearcase

BD	AK	B2	AJ	B	BB	JA	JB	FA	D	DB	PB1	QC	QB	WG	P2	EA	TAP BF
4.02	2.91	1.77	3.39	4.13	0.12	0.98	0.98	1.38	2.48	0.37	3.78	2.48	4.15	2.17	2.78	3.94	M8x16

Motor

	C28					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**C28**
M71	13.99	15.72	5.43	4.67	2x1/2"	24
M71MP	14.58	16.75	5.43	4.67	2x1/2"	29

Tolerances see page 1 - 4

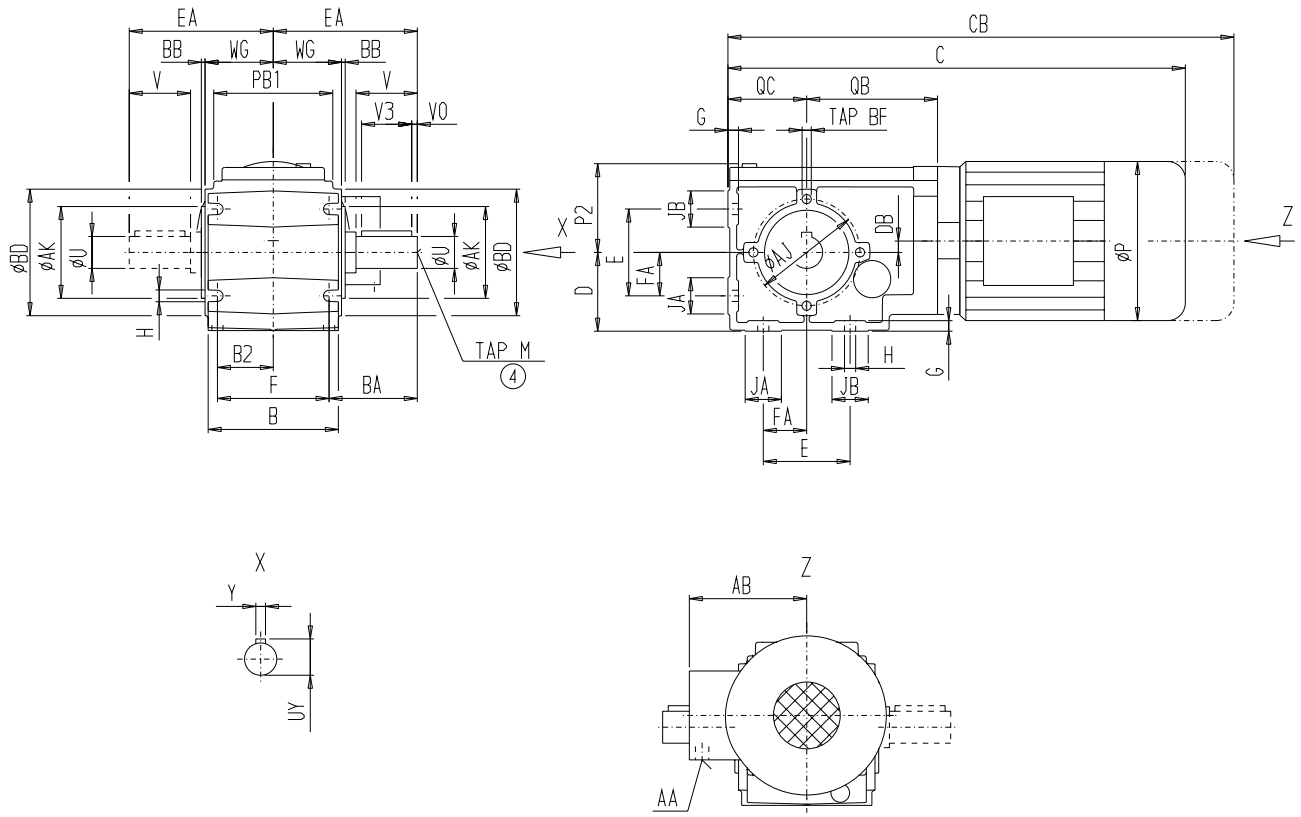
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Foot mounted
Housing flange (C-type)

C28
CZ28

C 510
CZ 510

[mm]



Mounting

E	F	G	H
70	*90*	*8*	*9*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
19,05	*40*	*31,75*	*0,254*	*21,08*	*4,763*	*55*	*1/4"-20UNC*

Gearcase

BD	AK	B2	AJ	B	BB	JA	JB	FA	D	DB	PB1	QC	QB	WG	P2	EA	TAP BF
102	*74*	*45*	*86*	*105*	*3*	*25*	*25*	*35*	*63*	*9,5*	*96*	*63*	*105,5*	*55*	*70,5*	*100*	*M8x16*

Motor

	C.28					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**C.28**
M71	*356*	*400*	*138*	*118,5*	*2x1/2"*	*11*
M71MP	*371*	*426*	*138*	*118,5*	*2x1/2"*	*13*

Tolerances see page 1 - 4

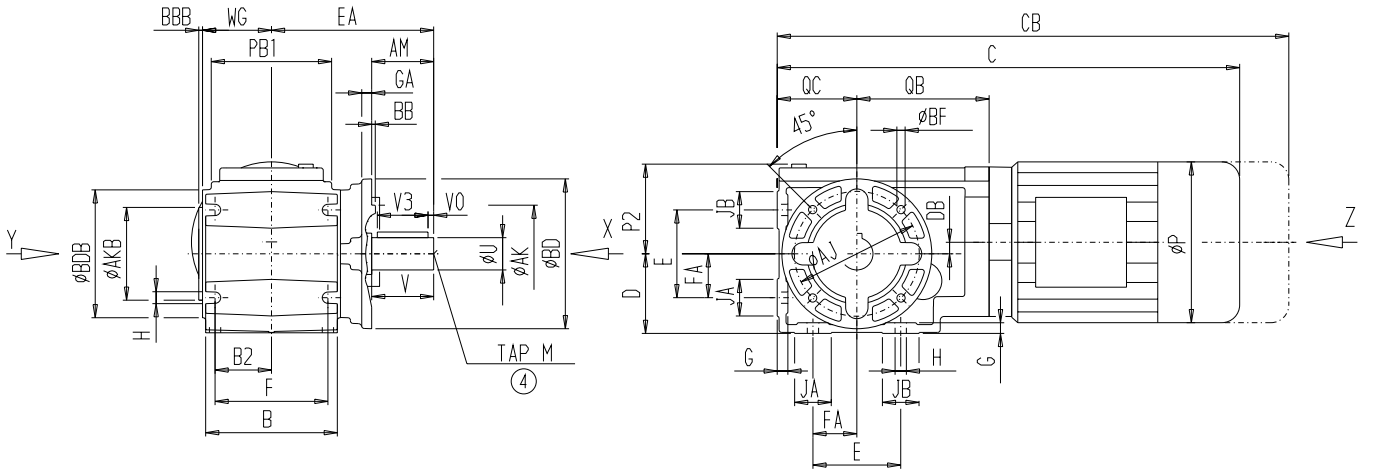
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Flange mounted

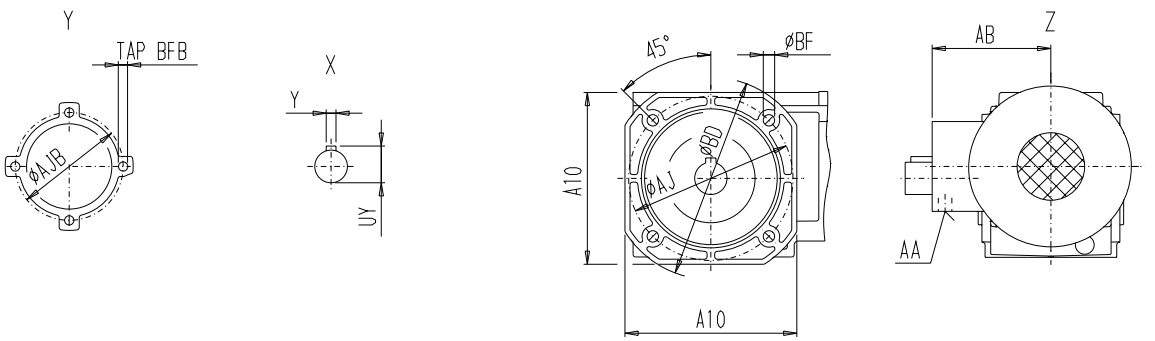
CF28

CF 510

[inch]



BD = 6.3"



6

Flange

BD	AK	GA	AJ	BB	BF	A10
4.72	3.15	0.31	3.94	0.12	0.26	-
6.3	4.33	0.35	5.12	0.14	0.35	5.35

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
0.75	1.57	1.25	0.01	0.83	0.1875	1.57	1/4-20UNC

Gearcase

E	BDB	FA	F	AKB	BBB	B2	G	AJB	B	D	DB	JB	JA	PB1	QC	QB	WG	P2	EA	H	TAP BFB
2.76	4.02	1.38	3.54	2.91	0.12	1.77	0.31	3.39	4.13	2.48	0.37	0.98	0.98	3.78	2.48	4.15	2.17	2.78	4.72	0.354	M8X16

Motor

	CF28					Weight [lb]
Motor	C	CB	P	AB	AA	CF28
M71	13.99	15.72	5.43	4.67	2x1/2"	26
M71MP	14.58	16.75	5.43	4.67	2x1/2"	30

Tolerances see page 1 - 4

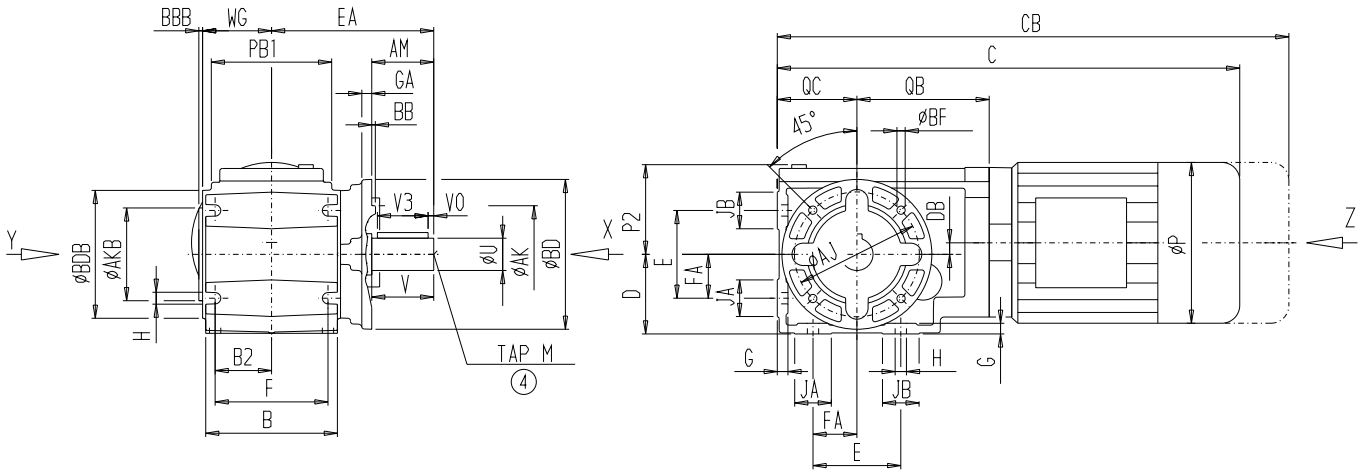
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Flange mounted

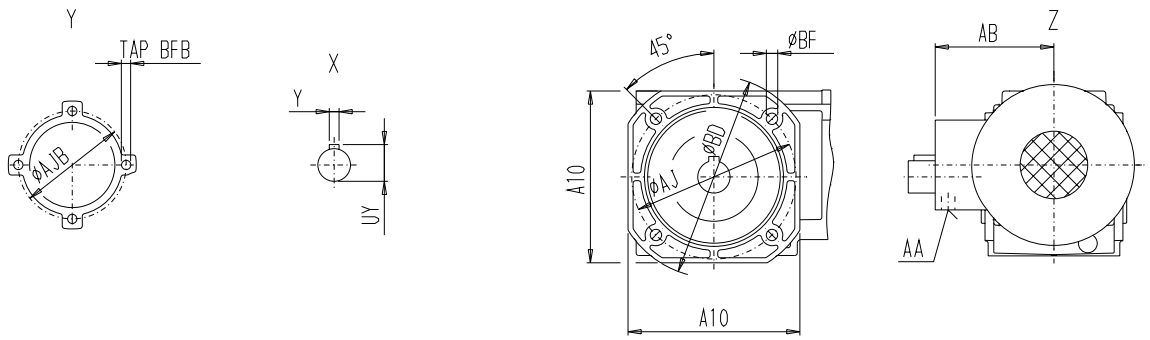
CF28

CF 510

[mm]



BD = *160mm*



Mounting

BD	AK	GA	AJ	BB	BF	A10
120	*80*	*8*	*100*	*3*	*6,6*	-
160	*110*	*9*	*130*	*3.5*	*9*	*136*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
19,05	*40*	*31,75*	*0,254*	*21,08*	*4,763*	*40*	*1/4"-20UNC*

Gearcase

E	BDB	FA	F	AKB	BBB	B2	G	AJB	B	D	DB	JB	JA	PB1	QC	QB	WG	P2	EA	H	TAP BFB
70	*102*	*35*	*90*	*74*	*3*	*45*	*8*	*86*	*105*	*63*	*9,5*	*25*	*25*	*96*	*63*	*105,5*	*55*	*70,5*	*120*	*9*	*M8X16*

Motor

	CF28					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CF28**
M71	*356*	*400*	*138*	*118,5*	*2x1/2"*	*12*
M71MP	*371*	*426*	*138*	*118,5*	*2x1/2"*	*13*

Tolerances see page 1 - 4

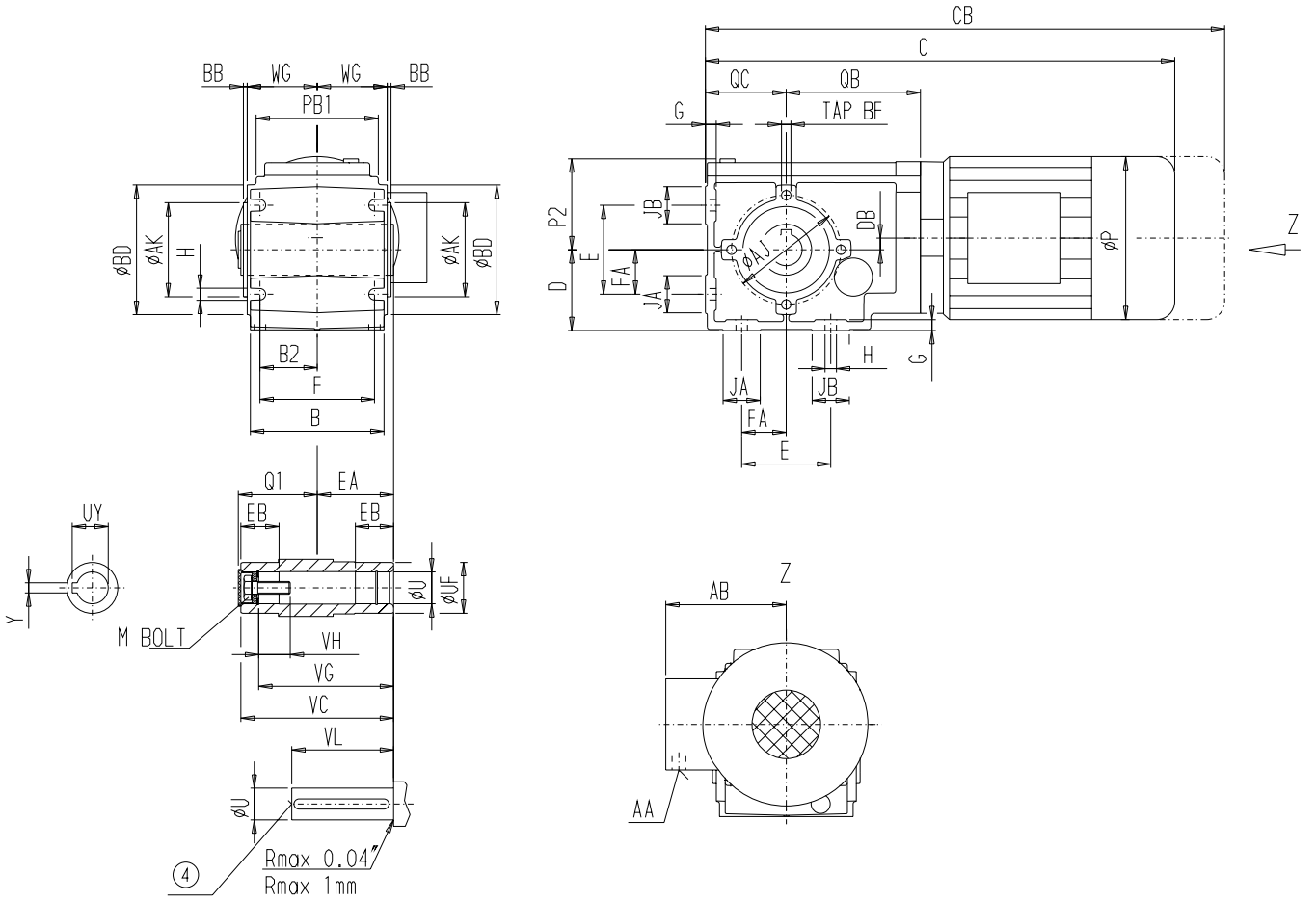
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

CA28
CAZ28

CA 510
CAZ 510

[inch]



Mounting

E	F	FA	G	H
2.76	3.54	1.38	0.31	0.35

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
0.75	1.575	4.724	4.173	3.74	1.047	1/2-13UNC	0.847	0.188	2.36	1.575	2.44

Gearcase

BD	AK	B2	AJ	B	BB	D	DB	JB	JA	PB1	QC	QB	WG	P2	TAP BF
4.02	2.91	1.77	3.39	4.13	0.12	2.48	0.37	0.98	0.98	3.78	2.48	4.15	2.17	2.78	M8x16

Motor

	CA.28					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CA.28**
M71	13.99	15.72	5.43	4.67	2x1/2"	24
M71MP	14.58	16.75	5.43	4.67	2x1/2"	26

Tolerances see page 1 - 4

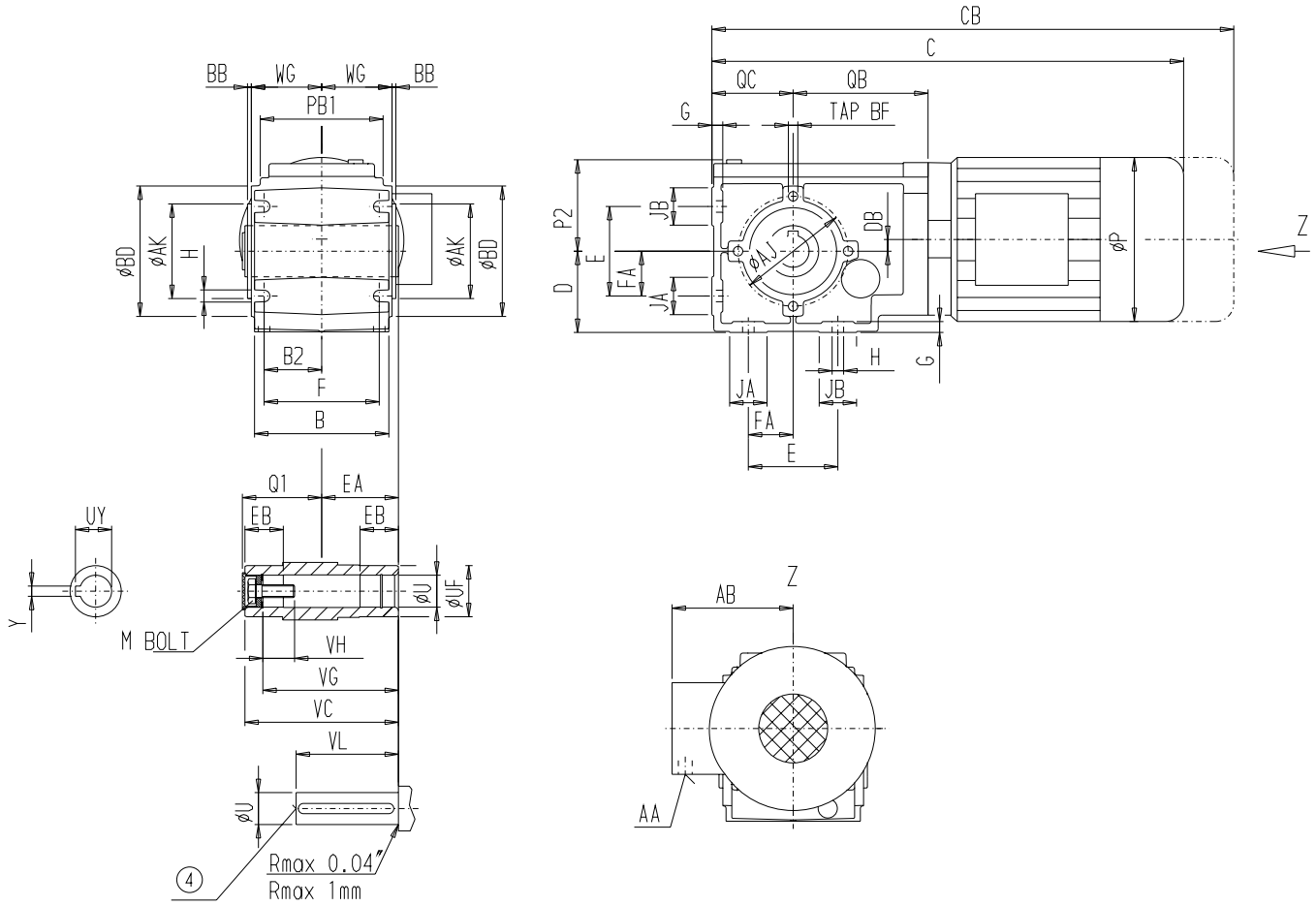
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted
Shaft mounted with housing flange (C-type)

CA28
CAZ28

CA 510
CAZ 510

[mm]



Mounting

E	F	FA	G	H
70	*90*	*35*	*8*	*9*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
19,05	*40*	*120*	*106*	*95*	*27*	*1/2"-13UNC*	*21,59*	*4,826*	*60*	*40*	*62*

Gearcase

BD	AK	B2	AJ	B	D	DB	JB	JA	PB1	QC	QB	WG	P2	TAP BF
102	*74*	*45*	*86*	*105*	*63*	*9,5*	*25*	*25*	*96*	*63*	*105,5*	*55*	*70,5*	*M8x16*

Motor

	CA.28					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CA.28**
M71	*356*	*400*	*138*	*118,5*	*2x1/2"*	*11*
M71MP	*371*	*426*	*138*	*118,5*	*2x1/2"*	*12*

Tolerances see page 1 - 4

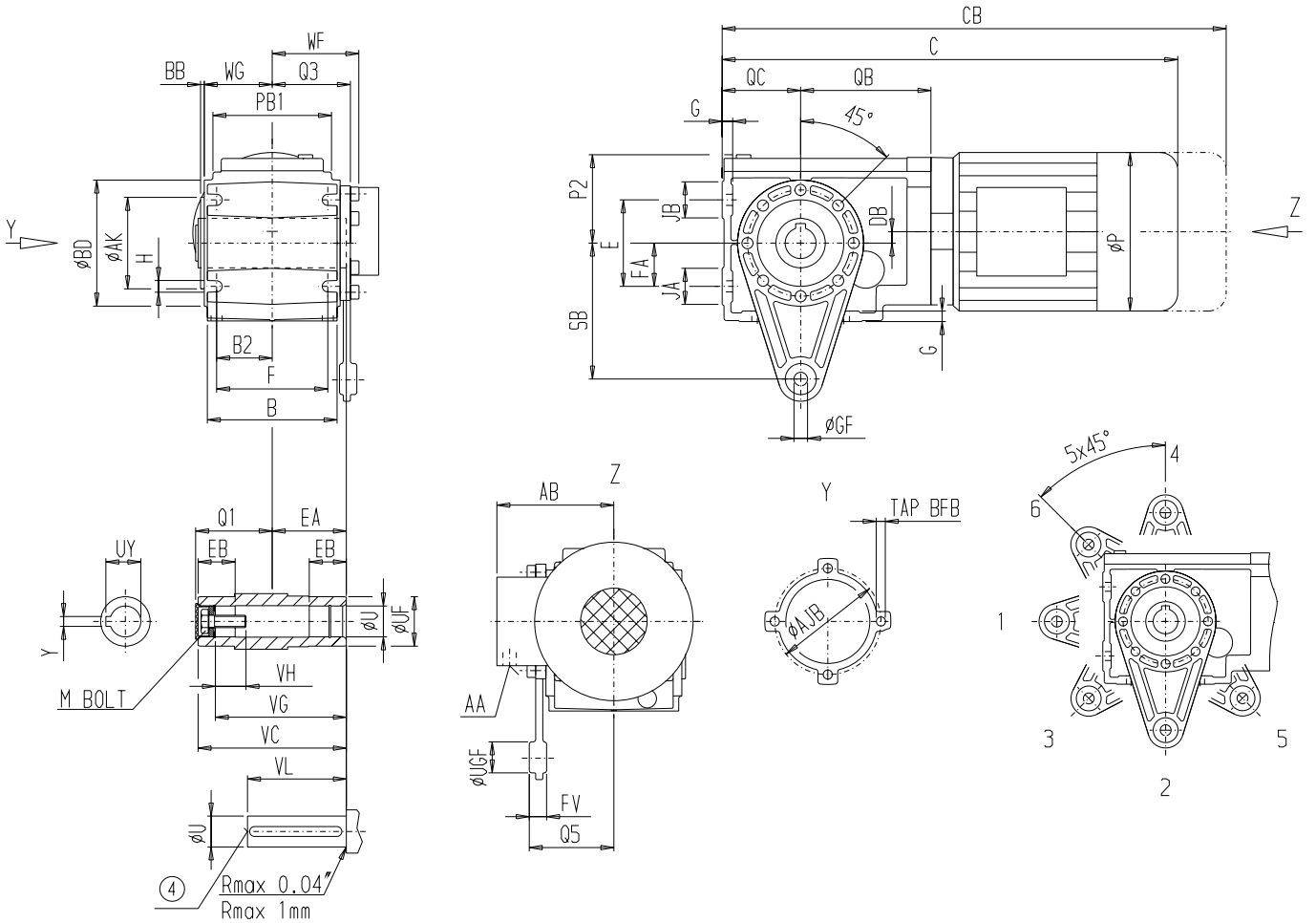
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with torque arm

CAD28

CAD 510

[inch]



Mounting

BD	AK	BB	AJB	TAP BFB	G
4.02	2.91	0.12	3.39	M8x16	0.31

Torque Arm

FV	GF	UGF	SB	WF	Q3	Q5
0.51	0.43	0.98	4.33	2.62	2.4	2.52

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
0.75	1.575	4.72	4.173	3.74	1.05	1/2-13UNC	0.85	0.19	2.36	1.575	2.44

Gearcase

E	FA	B2	B	D	DB	PB1	JA	JB	QC	QB	WG	P2
2.76	1.38	1.77	4.13	2.48	0.37	3.78	0.98	0.98	2.48	4.15	2.05	2.78

Motor

	CAD28					Weight [lb]
Motor	C	CB	P	AB	AA	CAD28
M71	13.99	15.72	5.43	4.67	2x1/2"	24
M71MP	14.58	16.75	5.43	4.67	2x1/2"	26

Tolerances see page 1 - 4

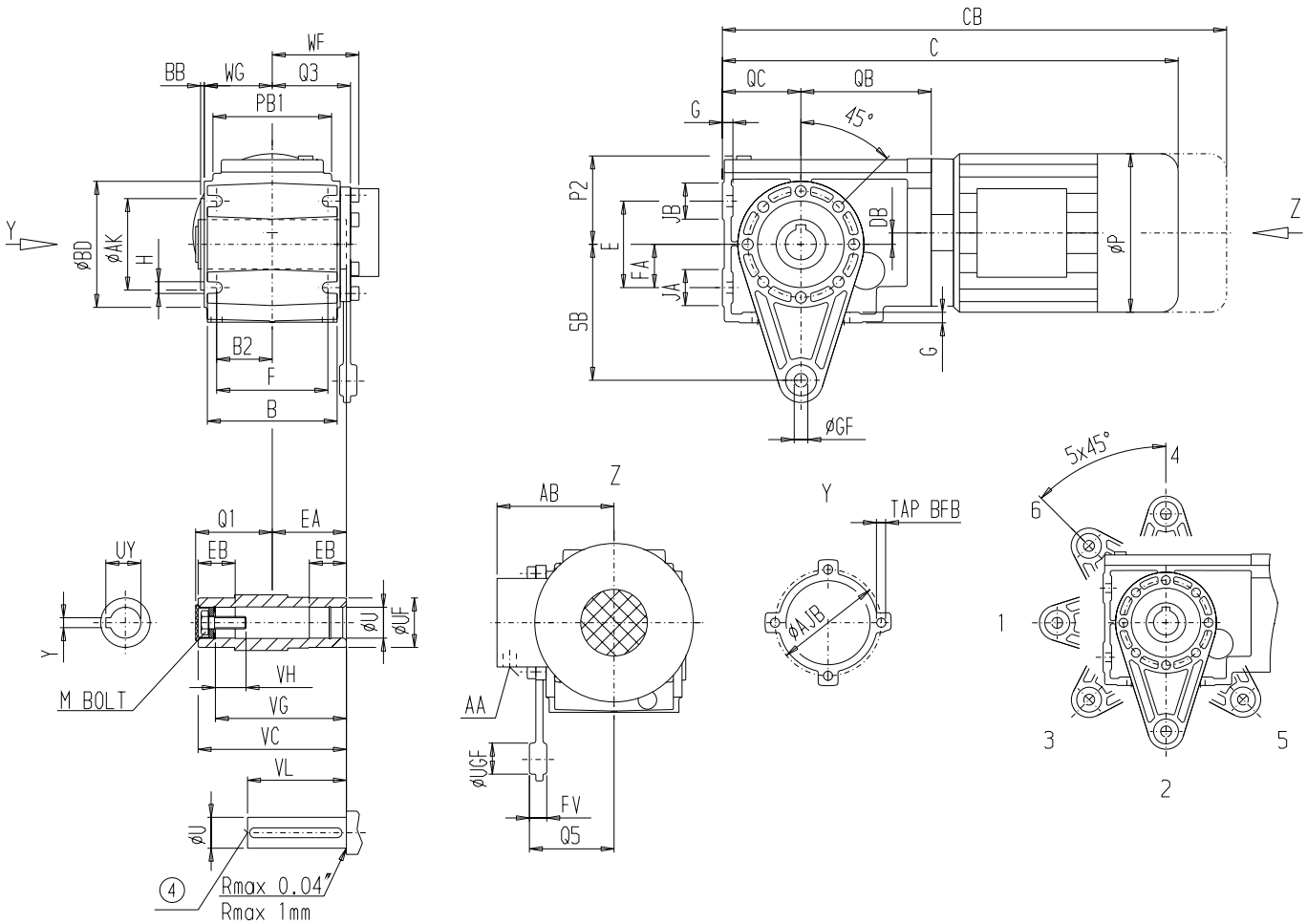
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with torque arm

CAD28

CAD 510

[mm]



Mounting

AK	BB	BD	AJB	TAP BFB	G
74	*3*	*102*	*86*	*M8x16*	*8*

Torque Arm

FV	GF	UGF	SB	WF	Q3	Q5
13	*11*	*25*	*110*	*66,5*	*61*	*64*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
19,05	*40*	*120*	*106*	*95*	*27*	*1/2"-13UNC*	*21,59*	*4,826*	*60*	*40*	*62*

Gearcase

E	FA	B2	B	JA	JB	DB	PB1	QC	QB	WG	P2
70	*35*	*45*	*105*	*25*	*25*	*9,5*	*96*	*63*	*105,5*	*55*	*70,5*

Motor

	CAD28					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAD28**
M71	*356*	*400*	*138*	*118,5*	*2x1/2"*	*11*
M71MP	*371*	*426*	*138*	*118,5*	*2x1/2"*	*12*

Tolerances see page 1 - 4

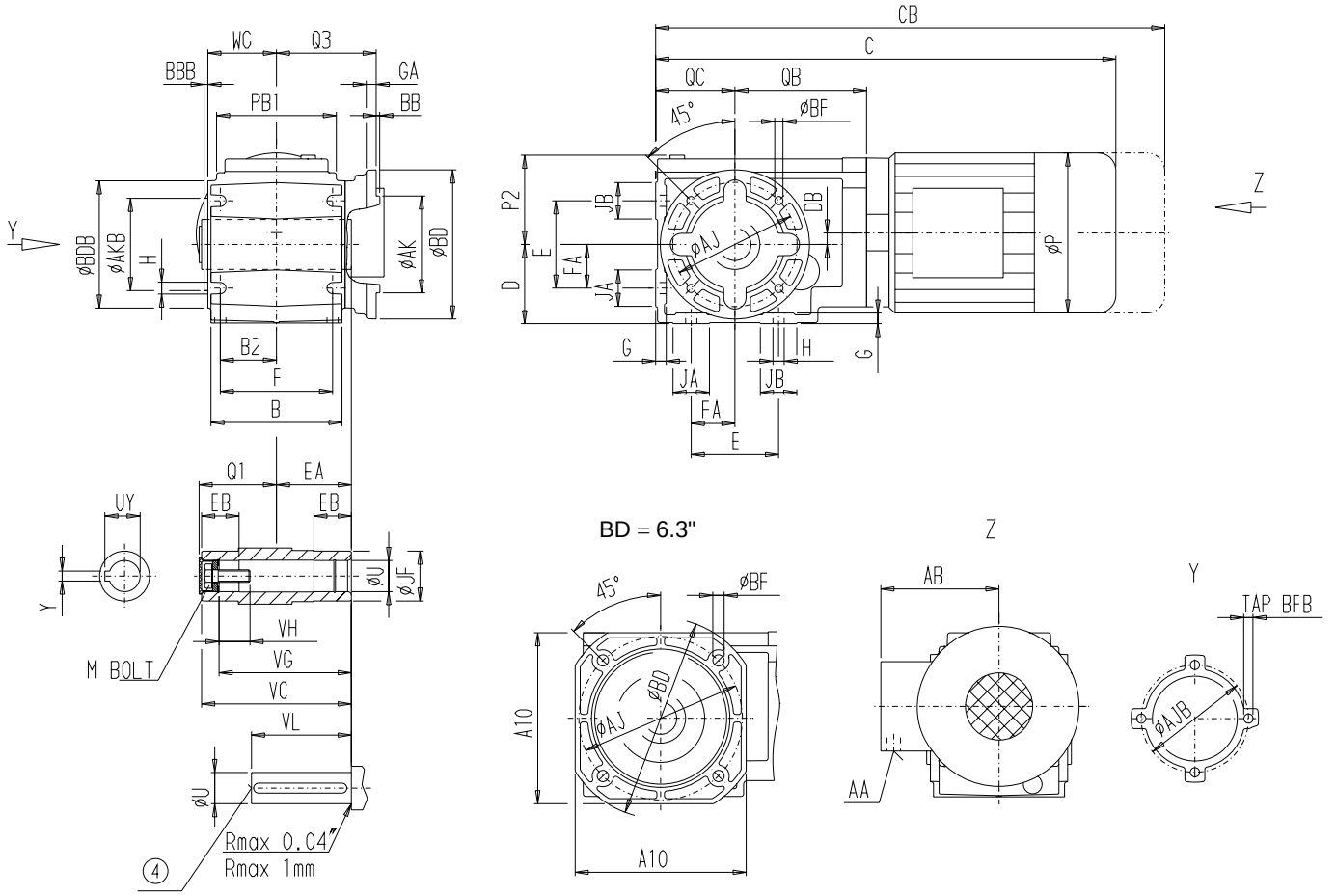
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with flange

CAF28

CAF 510

[inch]



Mounting

BD	AK	GA	AJ	BB	Q3	BF	A10
4.72	3.15	0.31	3.94	0.12	3.15	0.26	-
6.3	4.33	0.35	5.12	0.14	3.15	0.35	5.35

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
0.75	1.575	4.72	4.173	3.74	1.05	1/2-13UNC	0.85	0.19	2.36	1.575	2.44

Gearcase

E	BDB	FA	F	AKB	BBB	B2	G	AJB	B	D	DB	JB	JA	PB1	QC	QB	WG	P2	H	TAP BFB
2.76	4.02	1.38	3.54	2.91	0.12	1.77	0.31	3.39	4.13	2.48	0.37	0.98	0.98	3.78	2.48	4.15	2.17	2.78	0.35	M8X16

Motor

	CAF28					Weight [lb]
Motor	C	CB	P	AB	AA	CAF28
M71	13.99	15.72	5.43	4.67	2x1/2"	24
M71MP	14.58	16.75	5.43	4.67	2x1/2"	29

Tolerances see page 1 - 4

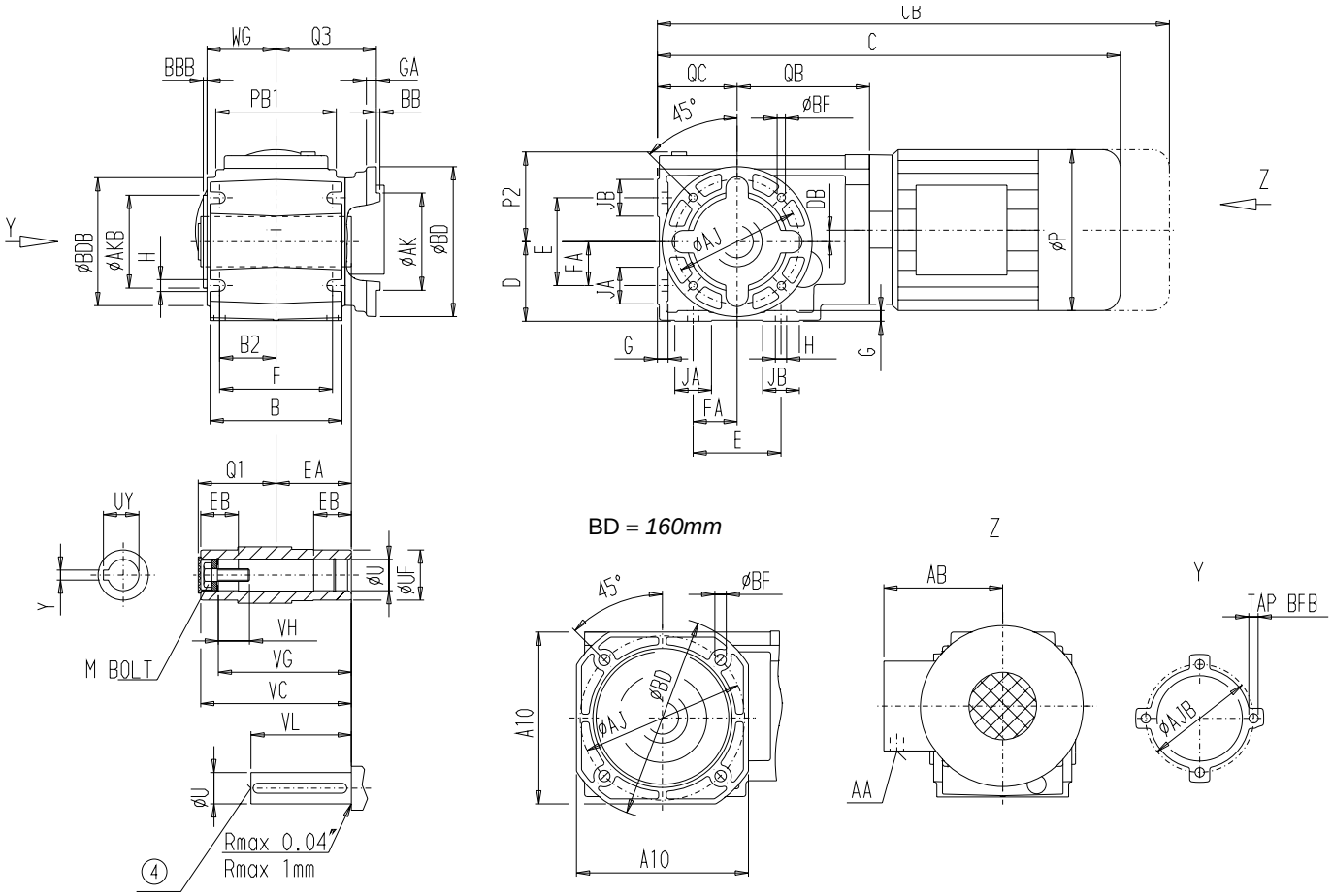
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with flange

CAF28

CAF 510

[mm]



Mounting

BD	AK	GA	AJ	BB	Q3	BF	A10
120	*80*	*8*	*100*	*3*	*80*	*6,6*	-
160	*110*	*9*	*130*	*3,5*	*80*	*9*	*136*

Output Shaft

U	UF	VC	VG	VH	VL	M BOLT	UY	Y	EA	EB	Q1
19,05	*40*	*120*	*106*	*27*	*95*	*1/2"-13UNC*	*21,59*	*4,826*	*60*	*40*	*62*

Gearcase

E	BDB	FA	F	AKB	B2	G	AJB	BBB	B	D	DB	JB	JA	PB1	QC	QB	WG	P2	H	TAP BFB
70	*102*	*35*	*90*	*74*	*45*	*8*	*86*	*3*	*105*	*63*	*9,5*	*25*	*25*	*96*	*63*	*105,5*	*55*	*70,5*	*9*	*M8X16*

Motor

	CAF28					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAF28**
M71	*356*	*400*	*138*	*118,5*	*2x1/2"*	*11*
M71MP	*371*	*426*	*138*	*118,5*	*2x1/2"*	*13*

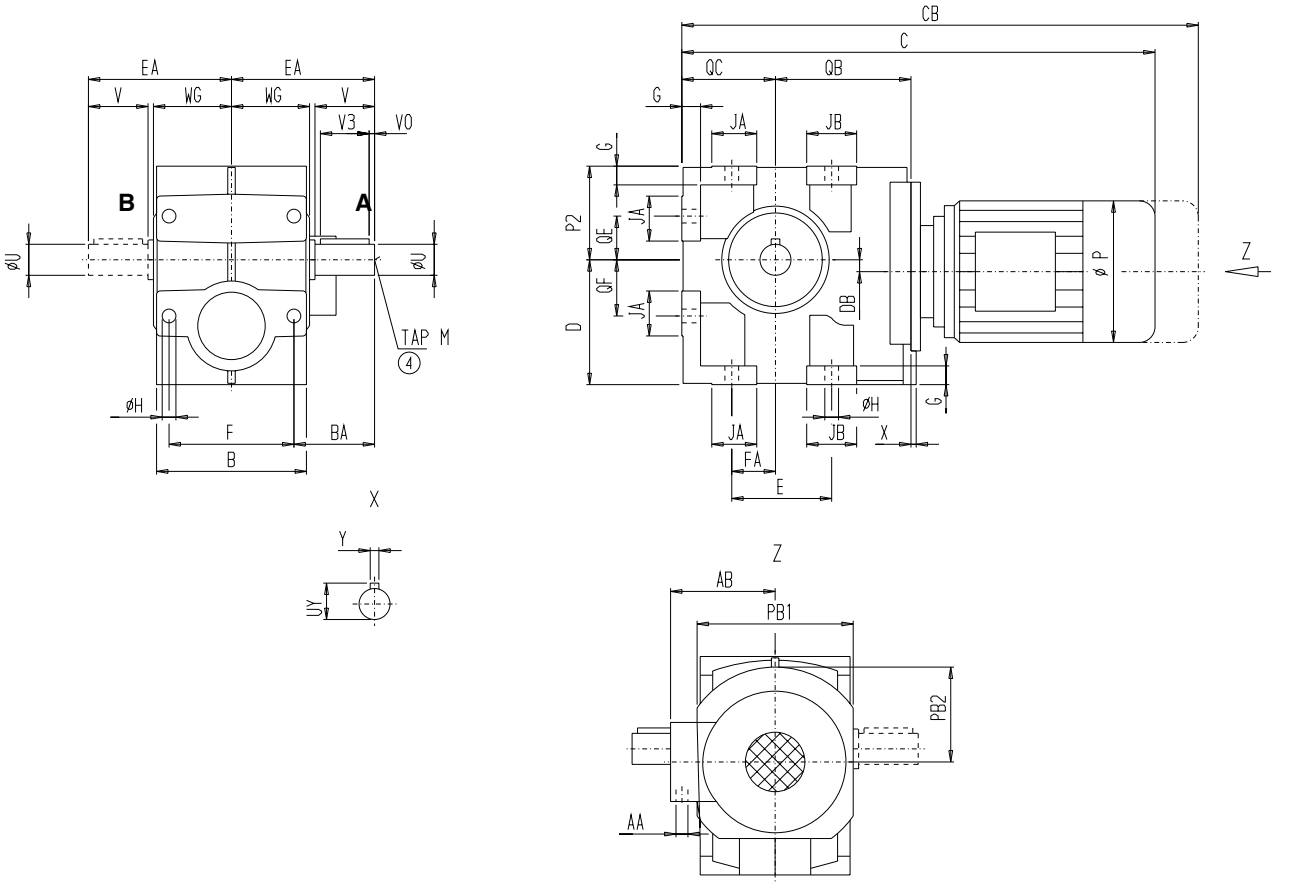
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Foot mounted

C38

C 510
[inch]



Mounting

E	F	FA	G	H
3.15	3.94	1.38	0.59	0.43

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1	1.97	1.5	0.252	1.11	0.25	2.36	3/8-16UNC

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	EA
4.72	3.94	1.77	1.38	2.99	0.37	1.57	1.42	4.92	0.16	2.95	4.27	2.24	2.95	4.33

Motor

	C38					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**C38**
M71	17.21	18.94	5.43	4.67	2x1/2"	55
M80	18.05	20.22	6.22	4.98	2x1/2"	60
M90S	19.67	22.26	6.93	5.91	2x3/4"	64
M90L	19.67	22.26	6.93	5.91	2x3/4"	68
M100L	21.44	24.27	7.64	6.3	2x3/4"	88
M112M	23.5	26.69	8.58	6.59	2x3/4"	106

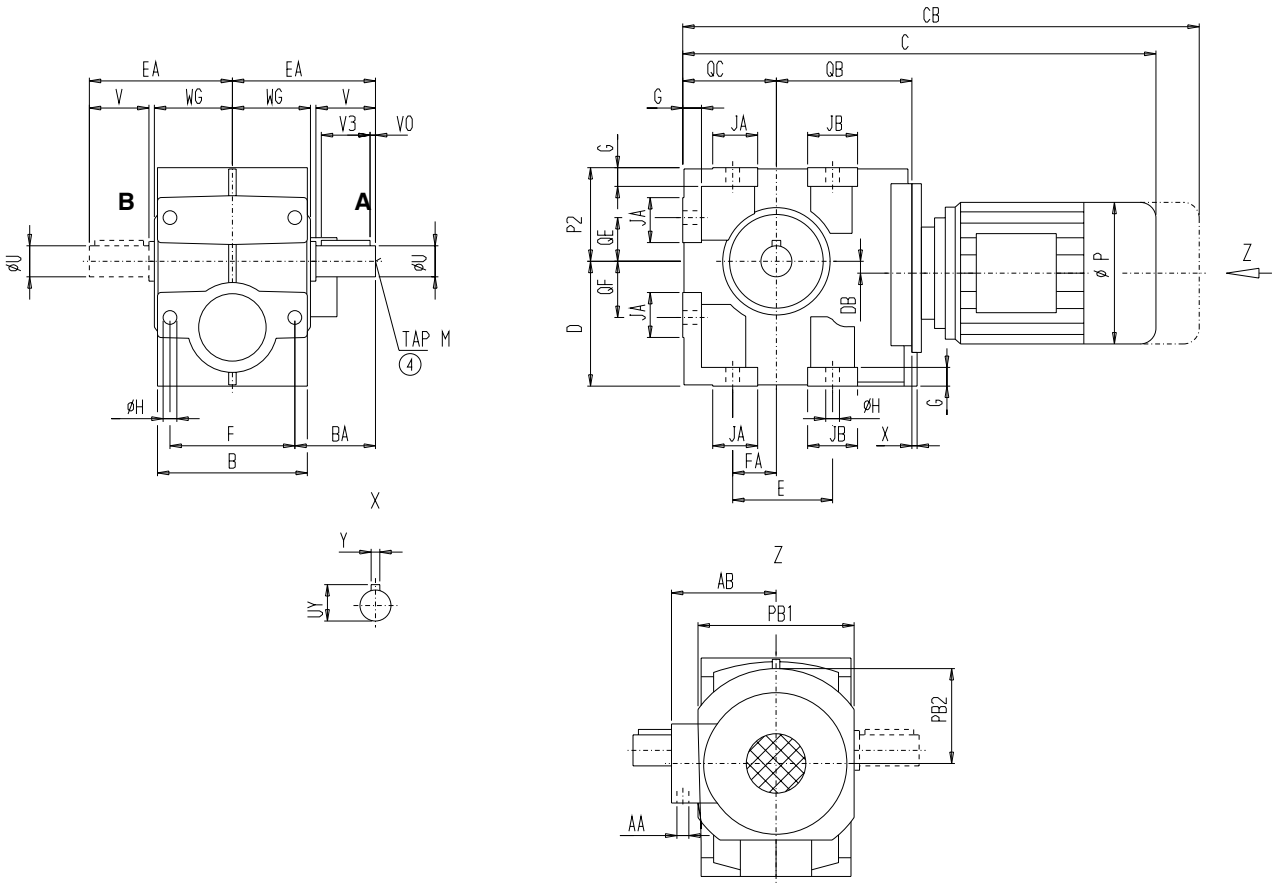
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Foot mounted

C38

C 510
[mm]



Mounting

E	F	FA	G	H
80	*100*	*35*	*15*	*11*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
25,4	*50*	*38,1*	*6,401*	*28,19*	*6,35*	*60*	*3/8"-16UNC*

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	EA
120	*100*	*45*	*35*	*76*	*9,5*	*40*	*36*	*125*	*4*	*75*	*108,5*	*57*	*75*	*110*

Motor

	C38					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**C38**
M71	*438*	*482*	*138*	*118,5*	*2x1/2"*	*25*
M80	*459,5*	*514,5*	*158*	*126,5*	*2x1/2"*	*27*
M90S	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*29*
M90L	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*31*
M100L	*545,5*	*617,5*	*194*	*160*	*2x3/4"*	*40*
M112M	*597,5*	*678,5*	*218*	*167,5*	*2x3/4"*	*48*

Tolerances see page 1 - 4

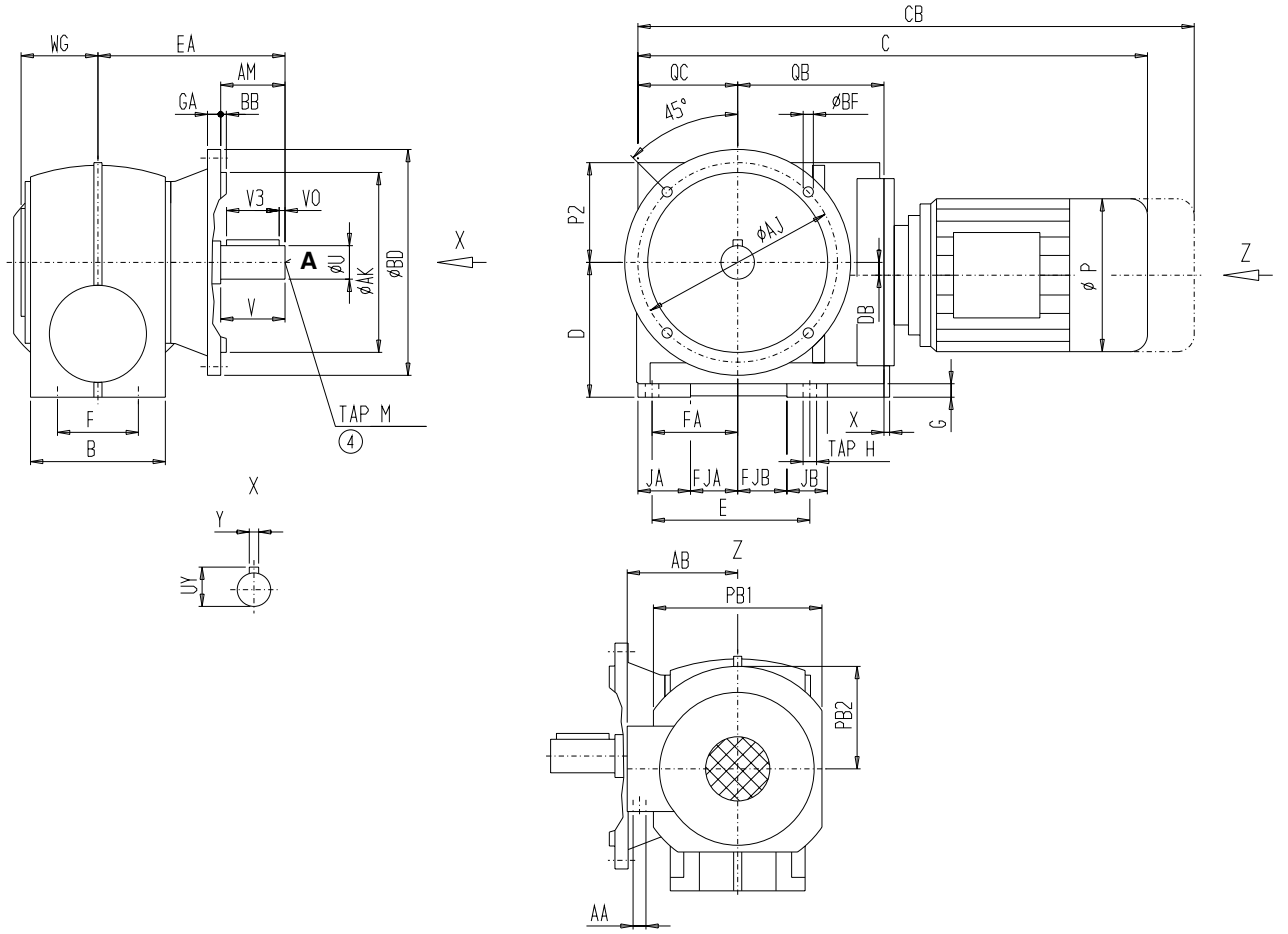
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Flange mounted

CF38

CF 510

[inch]



Flange

BD	AK	GA	AJ	BB	BF
6.3	4.33	0.39	5.12	0.14	0.35

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1	1.97	1.5	0.252	1.11	0.25	1.97	3/8-16UNC

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	EA	TAP H
4.61	2.5	1.38	1.52	2.36	0.39	3.94	3.94	2.99	0.37	1.18	1.46	4.92	0.16	2.95	4.27	2.24	2.91	5.28	M10x17

Motor

	CF38					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CF38**
M71	17.21	18.94	5.43	4.67	2x1/2"	64
M80	18.05	20.22	6.22	4.98	2x1/2"	68
M90S	19.67	22.26	6.93	5.91	2x3/4"	73
M90L	19.67	22.26	6.93	5.91	2x3/4"	77
M100L	21.44	24.27	7.64	6.3	2x3/4"	97
M112M	23.5	26.69	8.58	6.59	2x3/4"	115

Tolerances see page 1 - 4

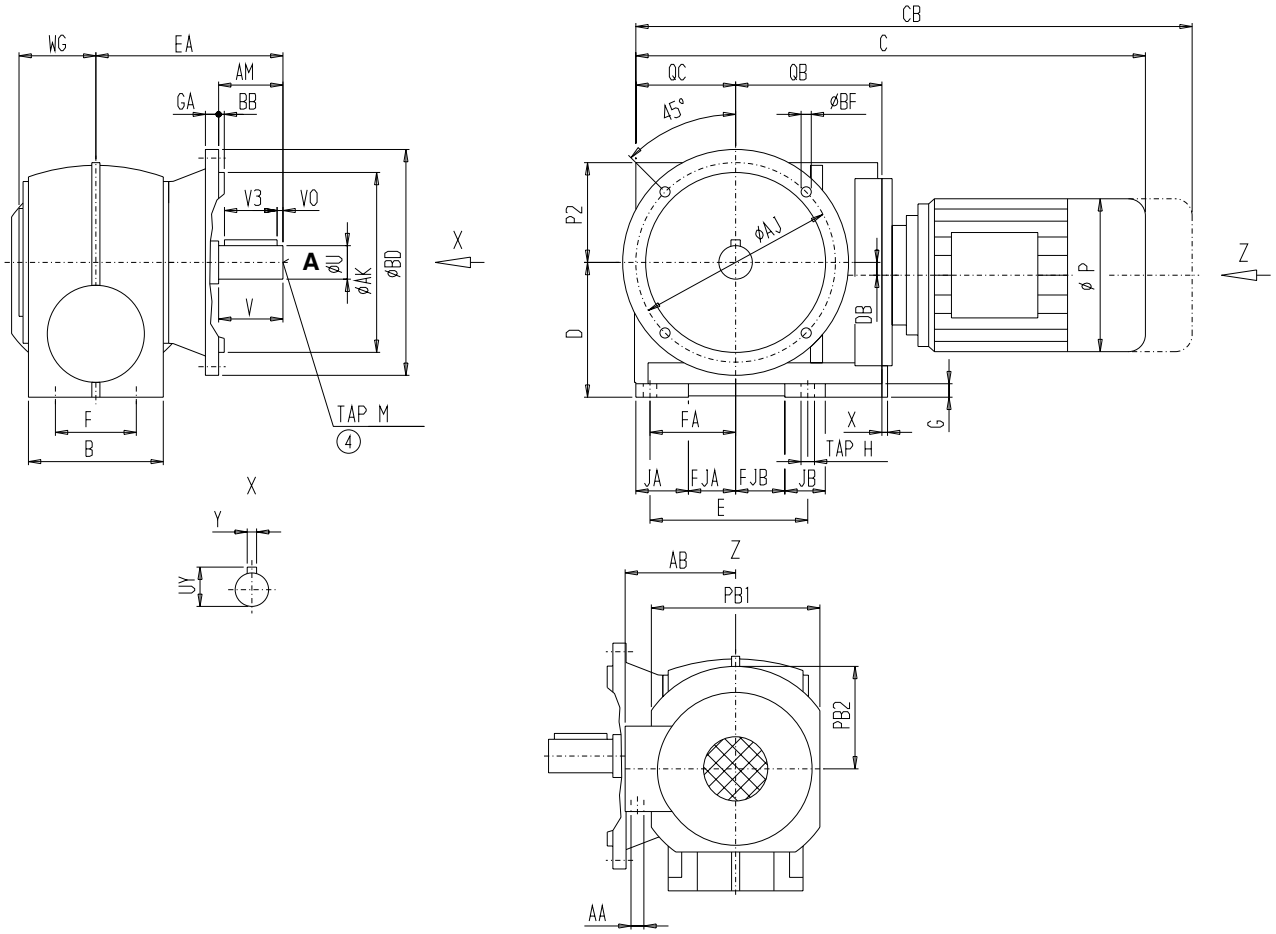
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Flange mounted

CF38

CF 510

[mm]



Flange

BD	AK	GA	AJ	BB	BF
160	*110*	*10*	*130*	*3,5*	*9*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
25,4	*50*	*38,1*	*6,401*	*28,19*	*6,35*	*50*	*3/8"-16UNC*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	EA	TAP H
117	*63,5*	*35*	*38,5*	*60*	*10*	*100*	*100*	*76*	*9,5*	*30*	*37*	*125*	*4*	*75*	*108,5*	*57*	*74*	*134*	*M10x17*

Motor

	CF38					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CF38**
M71	*438*	*482*	*138*	*118,5*	*2x1/2"*	*29*
M80	*459,5*	*514,5*	*158*	*126,5*	*2x1/2"*	*31*
M90S	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*33*
M90L	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*35*
M100L	*545,5*	*617,5*	*194*	*160*	*2x3/4"*	*44*
M112M	*597,5*	*678,5*	*218*	*167,5*	*2x3/4"*	*52*

Tolerances see page 1 - 4

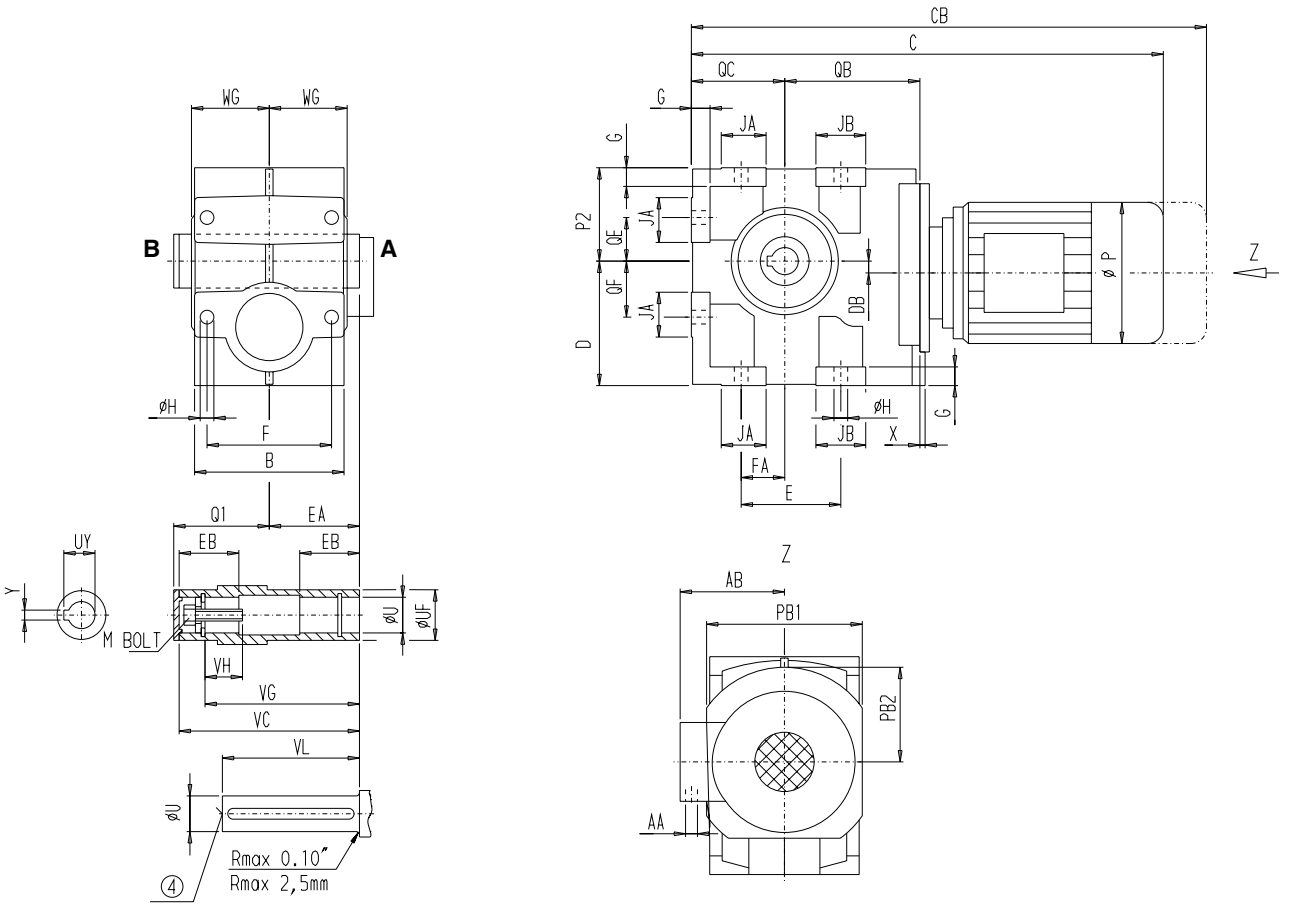
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted

CA38

CA 510

[inch]



Mounting

E	F	FA	G	H
3.15	3.94	1.38	0.59	0.43

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.25	1.772	4.72	4.016	3.54	1.38	3/8-16UNC	1.38	0.25	2.36	1.732	2.48

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2
4.72	3.94	1.77	1.38	2.99	0.37	1.57	1.42	4.92	0.16	2.95	4.27	2.24	2.95

Motor

	CA38					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CA38**
M71	17.21	18.94	5.43	4.67	2x1/2"	53
M80	18.05	20.22	6.22	4.98	2x1/2"	57
M90S	19.67	22.26	6.93	5.91	2x3/4"	62
M90L	19.67	22.26	6.93	5.91	2x3/4"	66
M100L	21.44	24.27	7.64	6.3	2x3/4"	86
M112M	23.5	26.69	8.58	6.59	2x3/4"	104

Tolerances see page 1 - 4

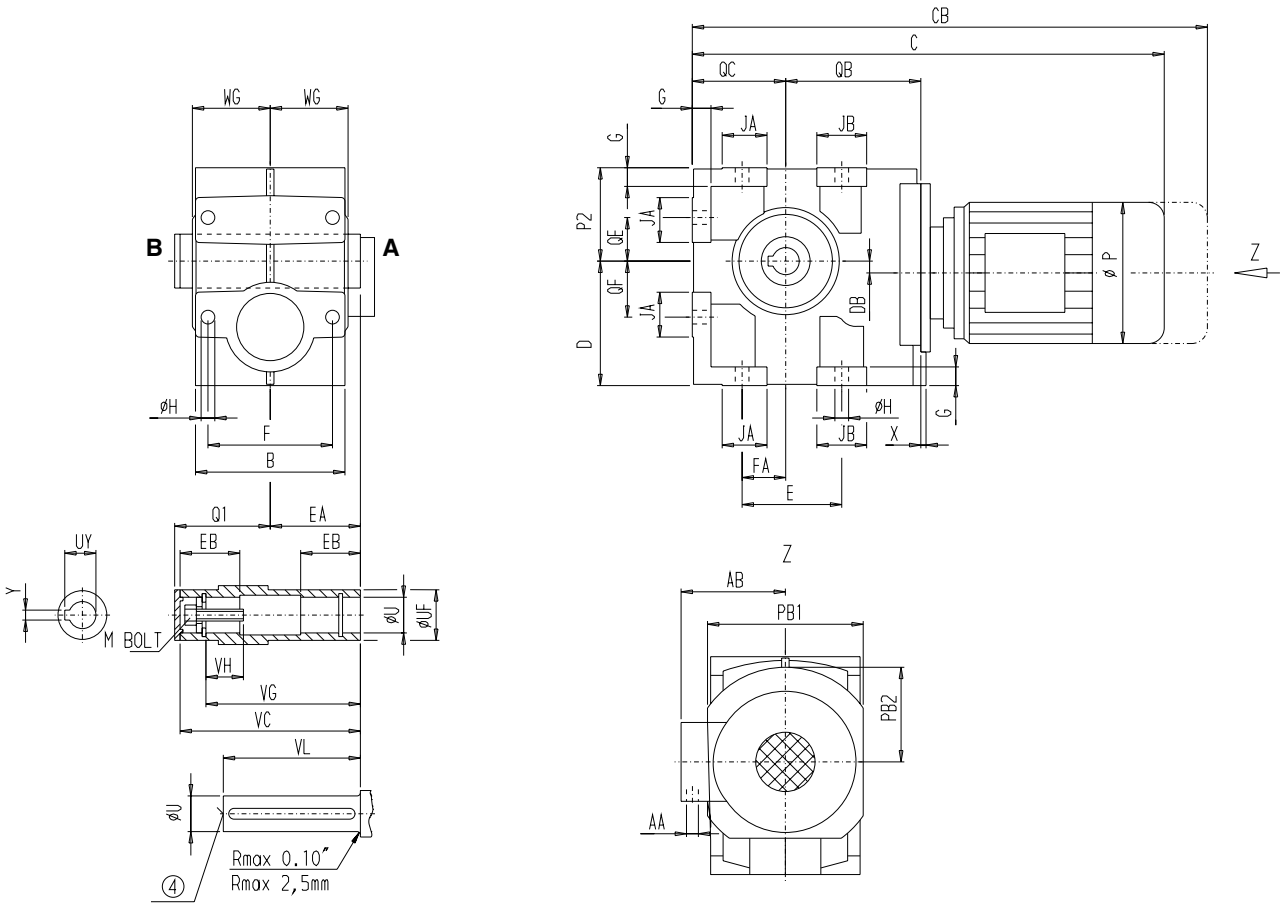
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted

CA38

CA 510

[mm]



Mounting

E	F	FA	G	H
80	*100*	*35*	*15*	*11*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
31,75	*45*	*120*	*102*	*90*	*35*	*3/8"-16UNC*	*35,05*	*6,35*	*60*	*44*	*63*

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2
120	*100*	*45*	*35*	*76*	*9,5*	*40*	*36*	*125*	*4*	*75*	*108,5*	*57*	*75*

Motor

	CA38					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CA38**
M71	*438*	*482*	*138*	*118,5*	*2x1/2"*	*24*
M80	*459,5*	*514,5*	*158*	*126,5*	*2x1/2"*	*26*
M90S	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*28*
M90L	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*30*
M100L	*545,5*	*617,5*	*194*	*160*	*2x3/4"*	*39*
M112M	*597,5*	*678,5*	*218*	*167,5*	*2x3/4"*	*47*

Tolerances see page 1 - 4

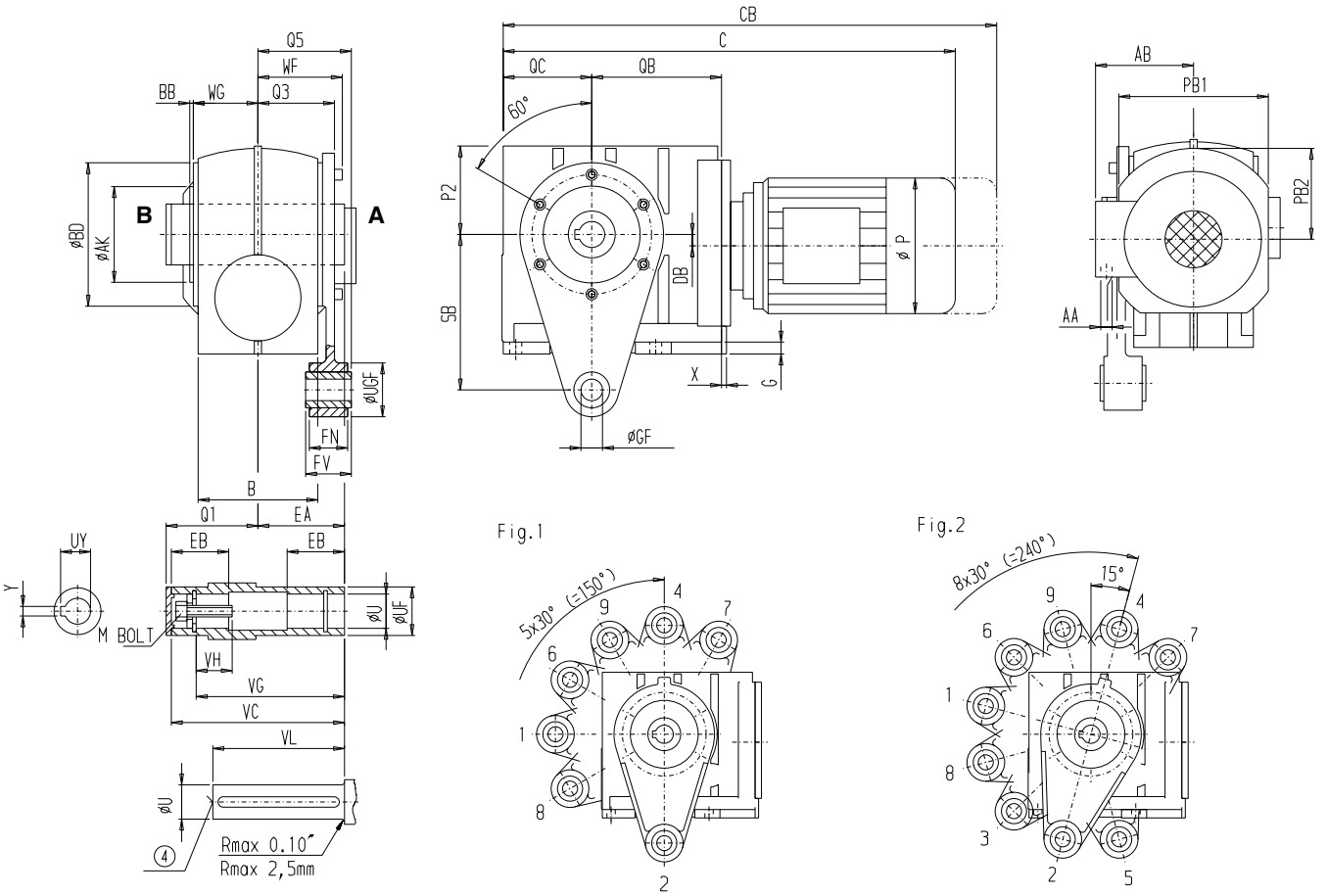
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with torque arm

CAD38

CAD 510

[inch]



Mounting

BD	AK	BB	G
4.72	3.15	0.12	0.39

Torque Arm

FN	FV	GF	UGF	SB	WF	Q3	Q5
1.26	1.5	0.63	1.77	5.12	2.72	2.52	3.07

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	Q1	EB
1.25	1.772	4.72	4.016	3.54	1.38	3/8-16UNC	1.38	0.25	2.36	2.48	1,732

Gearcase

B	PB2	DB	PB1	X	QC	QB	WG	P2	TAP BF
3.94	2.99	0.37	4.92	0.16	2.95	4.27	2.13	2.91	M8x14

Motor

	CAD38					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAD38**
M71	17.21	18.94	5.43	4.67	2x1/2"	60
M80	18.05	20.22	6.22	4.98	2x1/2"	64
M90S	19.67	22.26	6.93	5.91	2x3/4"	68
M90L	19.67	22.26	6.93	5.91	2x3/4"	73
M100L	21.44	24.27	7.64	6.3	2x3/4"	93
M112M	23.5	26.69	8.58	6.59	2x3/4"	110

Tolerances see page 1 - 4

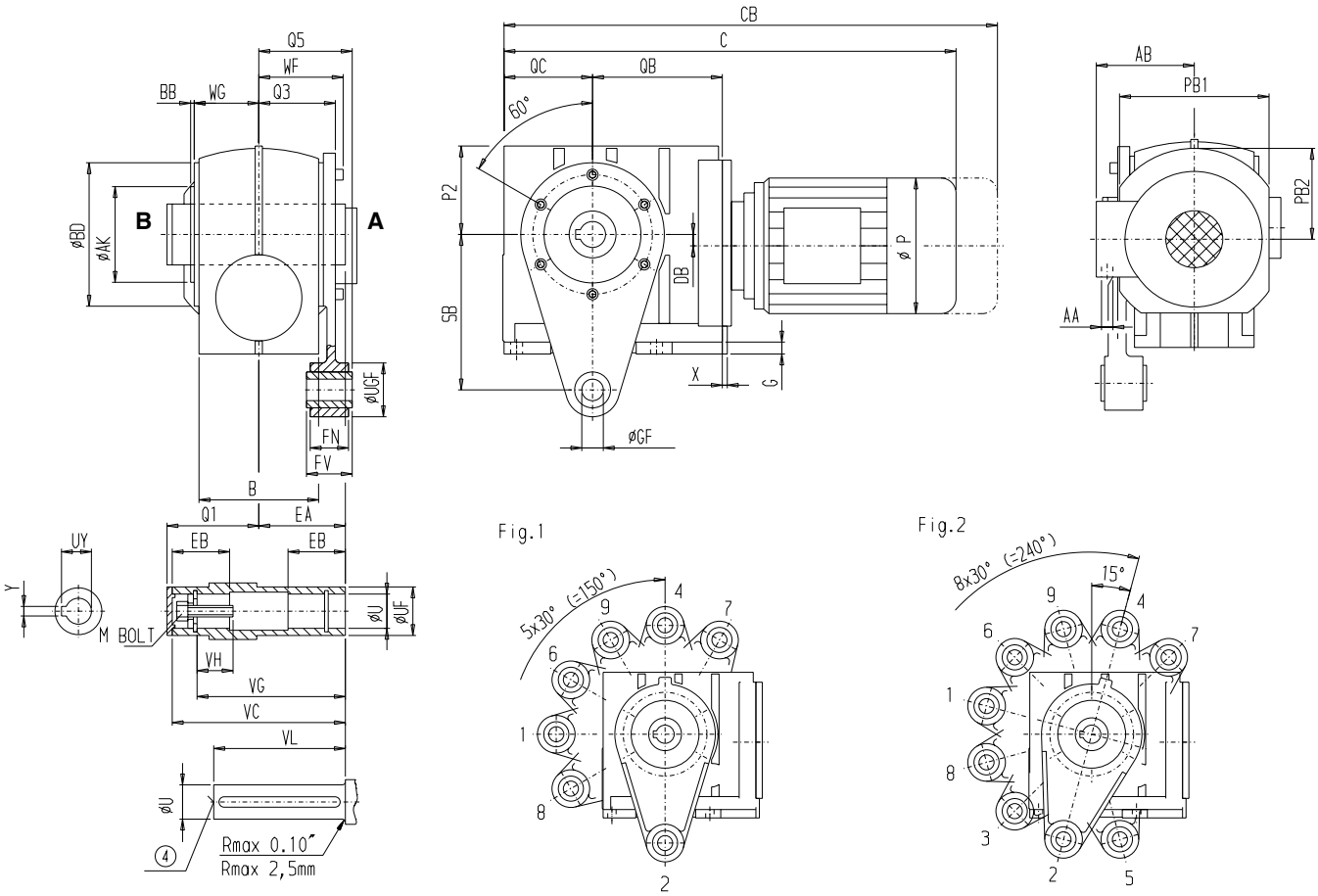
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with torque arm

CAD38

CAD 510

[mm]



6

Mounting

BD	AK	BB	G
120	*80*	*3*	*10*

Torque Arm

FN	FV	GF	UGF	SB	WF	Q3	Q5
32	*38*	*16*	*45*	*130*	*69*	*64*	*78*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
31,75	*45*	*120*	*102*	*90*	*35*	*3/8"-16UNC*	*35,05*	*6,35*	*60*	*44*	*63*

Gearcase

B	PB2	DB	PB1	X	QC	QB	WG	P2
100	*76*	*9,5*	*125*	*4*	*75*	*108,5*	*54*	*74*

Motor

	CAD38					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAD38**
M71	*438*	*482*	*138*	*118,5*	*2x1/2"*	*27*
M80	*459,5*	*514,5*	*158*	*126,5*	*2x1/2"*	*29*
M90S	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*31*
M90L	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*33*
M100L	*545,5*	*617,5*	*194*	*160*	*2x3/4"*	*42*
M112M	*597,5*	*678,5*	*218*	*167,5*	*2x3/4"*	*50*

Tolerances see page 1 - 4

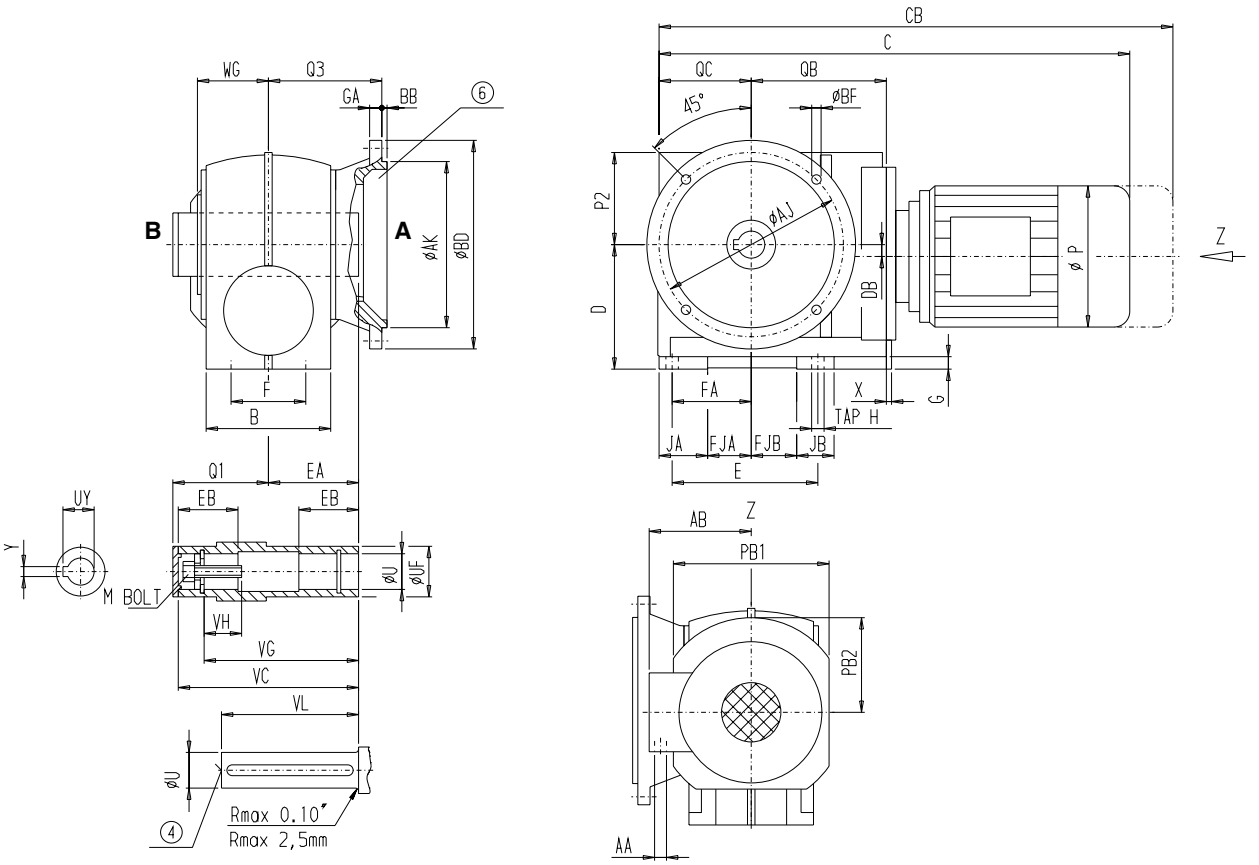
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with flange

CAF38

CAF 510

[inch]



Flange

BD	AK	GA	AJ	BB	Q3	BF
6.3	4.33	0.39	5.12	0.14	3.31	0.35

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.25	1.772	4.72	4.016	3.54	1.38	3/8-16UNC	1.38	0.25	2.36	1.732	2.48

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	TAP H
4.61	2.5	1.38	1.52	2.36	0.39	3.94	3.94	2.99	0.37	1.18	1.46	4.92	0.16	2.95	4.27	2.24	2.91	M10x17

Motor

	CAF38					Weight [lb]
Motor	C	CB	P	AB	AA	CAF38
M71	17.21	18.94	5.43	4.67	2x1/2"	62
M80	18.05	20.22	6.22	4.98	2x1/2"	66
M90S	19.67	22.26	6.93	5.91	2x3/4"	71
M90L	19.67	22.26	6.93	5.91	2x3/4"	75
M100L	21.44	24.27	7.64	6.3	2x3/4"	95
M112M	23.5	26.69	8.58	6.59	2x3/4"	112

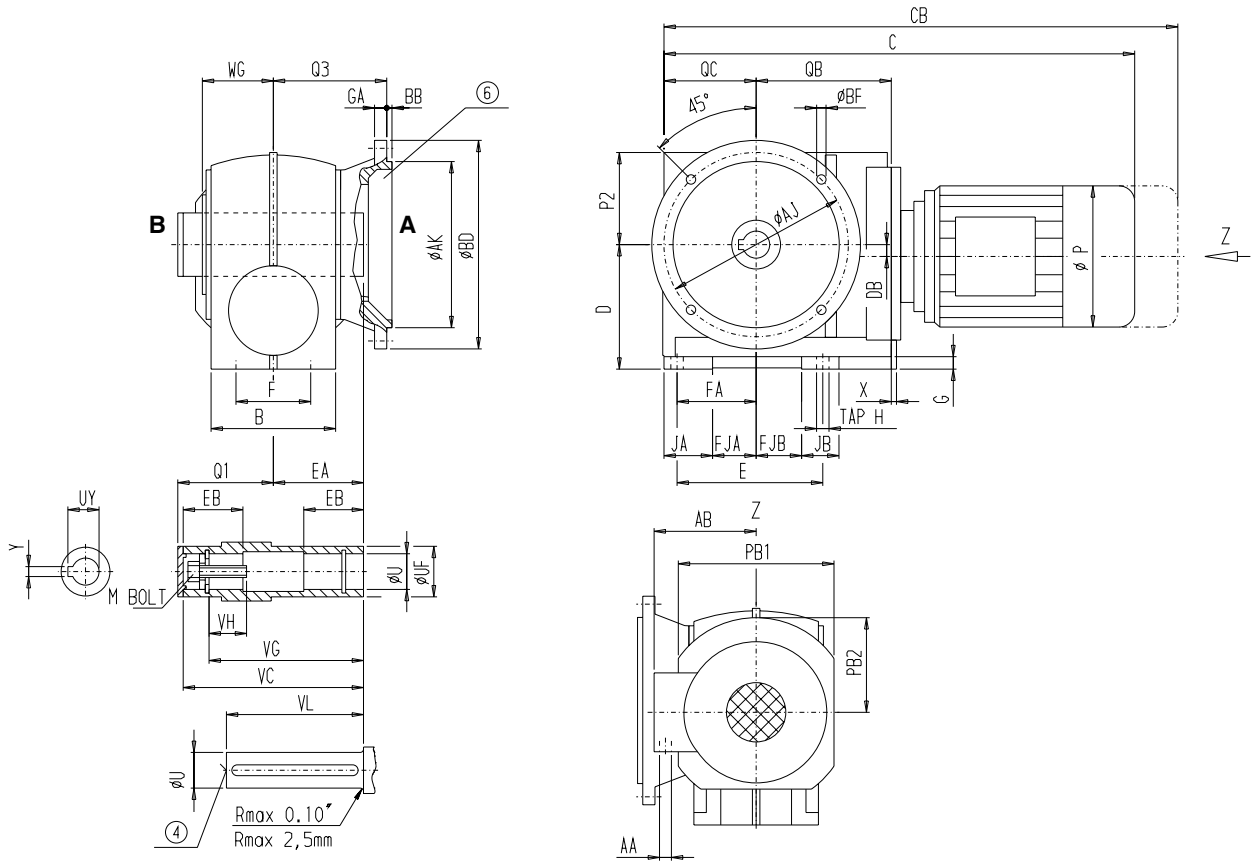
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 6 - 43

Worm Helical Gear Motors
Shaft mounted with flange

CAF38

CAF 510

[mm]



Flange

BD	AK	GA	AJ	BB	Q3	BF
160	*110*	*10*	*130*	*3,5*	*84*	*9*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
31,75	*45*	*120*	*102*	*90*	*35*	*3/8"-16UNC*	*35,05*	*6,35*	*60*	*44*	*63*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	TAP H
117	*63,5*	*35*	*38,5*	*60*	*10*	*100*	*100*	*76*	*9,5*	*30*	*37*	*125*	*4*	*75*	*108,5*	*57*	*74*	*M10x17*

Motor

	CAF38					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAF38**
M71	*438*	*482*	*138*	*118,5*	*2x1/2"*	*28*
M80	*459,5*	*514,5*	*158*	*126,5*	*2x1/2"*	*30*
M90S	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*32*
M90L	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*34*
M100L	*545,5*	*617,5*	*194*	*160*	*2x3/4"*	*43*
M112M	*597,5*	*678,5*	*218*	*167,5*	*2x3/4"*	*51*

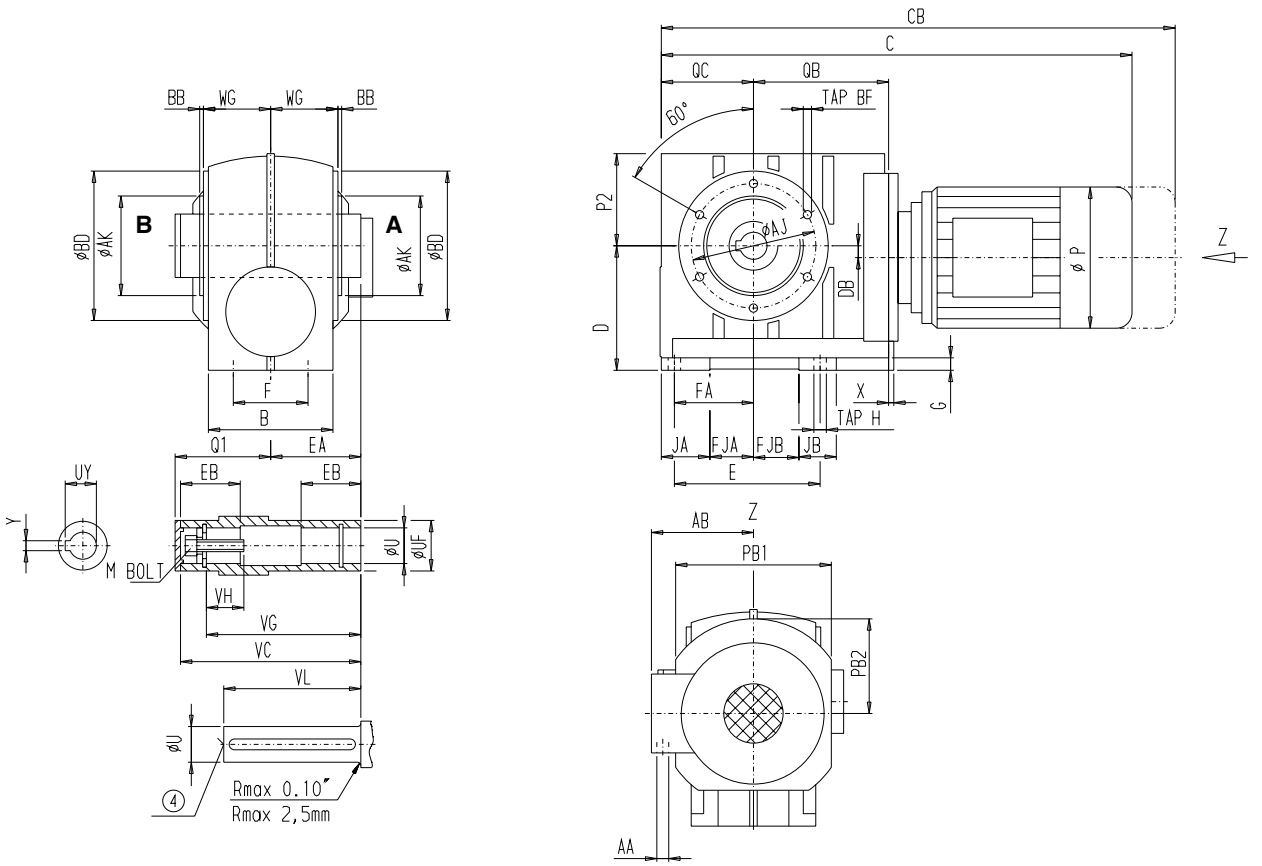
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 6 - 43

Worm Helical Gear Motors
Shaft mounted with housing flange (C-Type)

CAZ38

CAZ 510

[inch]



6

Mounting

BD	AK	AJ	BB	TAP BF
4.72	3.15	3.94	0.12	M8x14

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.25	1.772	4.72	4.016	3.54	1.38	3/8-16UNC	1.38	0.25	2.36	1.732	2.48

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	TAP H
4.61	2.5	1.38	1.52	2.36	0.39	3.94	3.94	2.99	0.37	1.18	1.46	4.92	0.16	2.95	4.27	2.13	2.91	M10x17

Motor

	CAZ38					Weight [lb]
Motor	C	CB	P	AB	AA	CAZ38
M71	17.21	18.94	5.43	4.67	2x1/2"	57
M80	18.05	20.22	6.22	4.98	2x1/2"	62
M90S	19.67	22.26	6.93	5.91	2x3/4"	66
M90L	19.67	22.26	6.93	5.91	2x3/4"	71
M100L	21.44	24.27	7.64	6.3	2x3/4"	90
M112M	23.5	26.69	8.58	6.59	2x3/4"	108

Tolerances see page 1 - 4

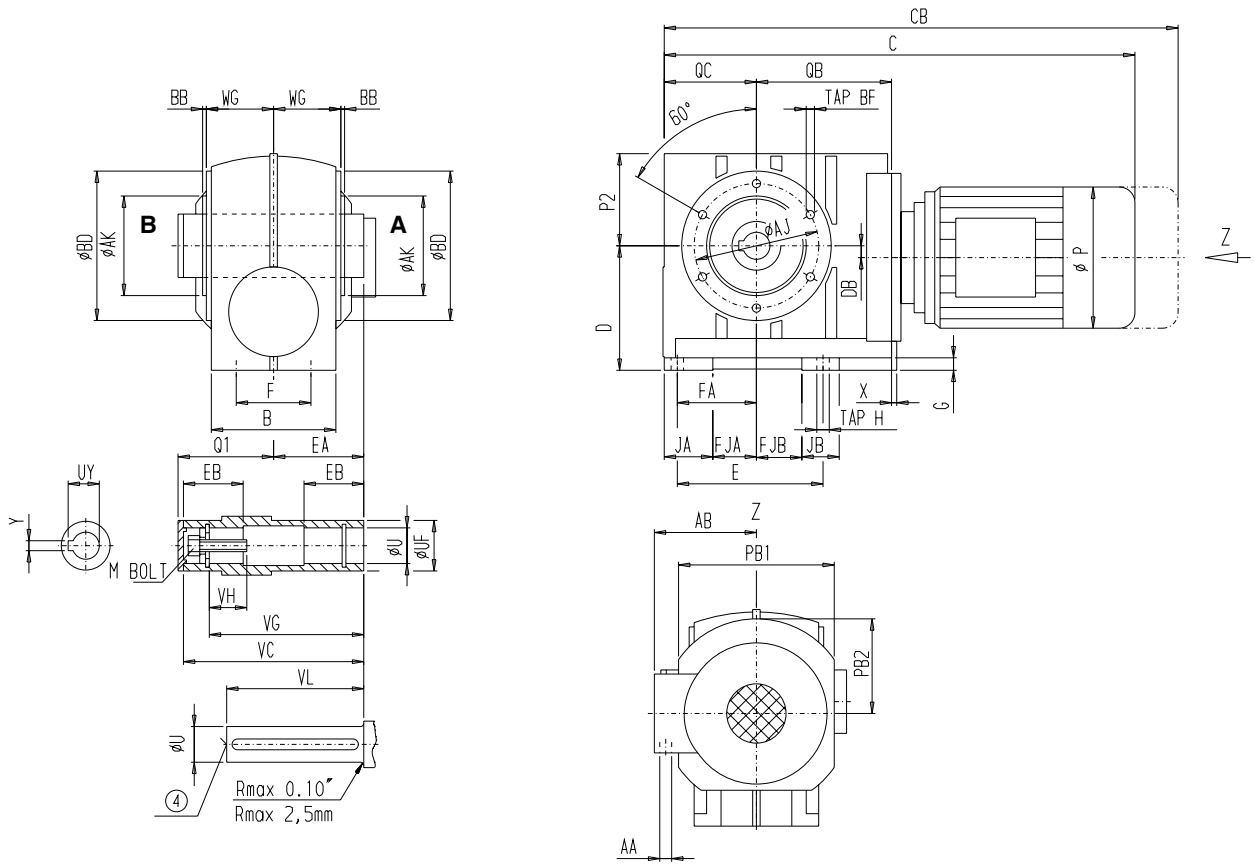
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with housing flange (C-Type)

CAZ38

CAZ 510

[mm]



Mounting

BD	AK	AJ	BB	TAP BF
120	*80*	*100*	*3*	*M8x14*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
31,75	*45*	*120*	*102*	*90*	*35*	*3/8"-16UNC*	*35,05*	*6,35*	*60*	*44*	*63*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	TAP H
117	*63,5*	*35*	*38,5*	*60*	*10*	*100*	*100*	*76*	*9,5*	*30*	*37*	*125*	*4*	*75*	*108,5*	*54*	*74*	*M10x17*

Motor

	CAZ38					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAZ38**
M71	*438*	*482*	*138*	*118,5*	*2x1/2"*	*26*
M80	*459,5*	*514,5*	*158*	*126,5*	*2x1/2"*	*28*
M90S	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*30*
M90L	*500,5*	*566,5*	*176*	*150*	*2x3/4"*	*32*
M100L	*545,5*	*617,5*	*194*	*160*	*2x3/4"*	*41*
M112M	*597,5*	*678,5*	*218*	*167,5*	*2x3/4"*	*49*

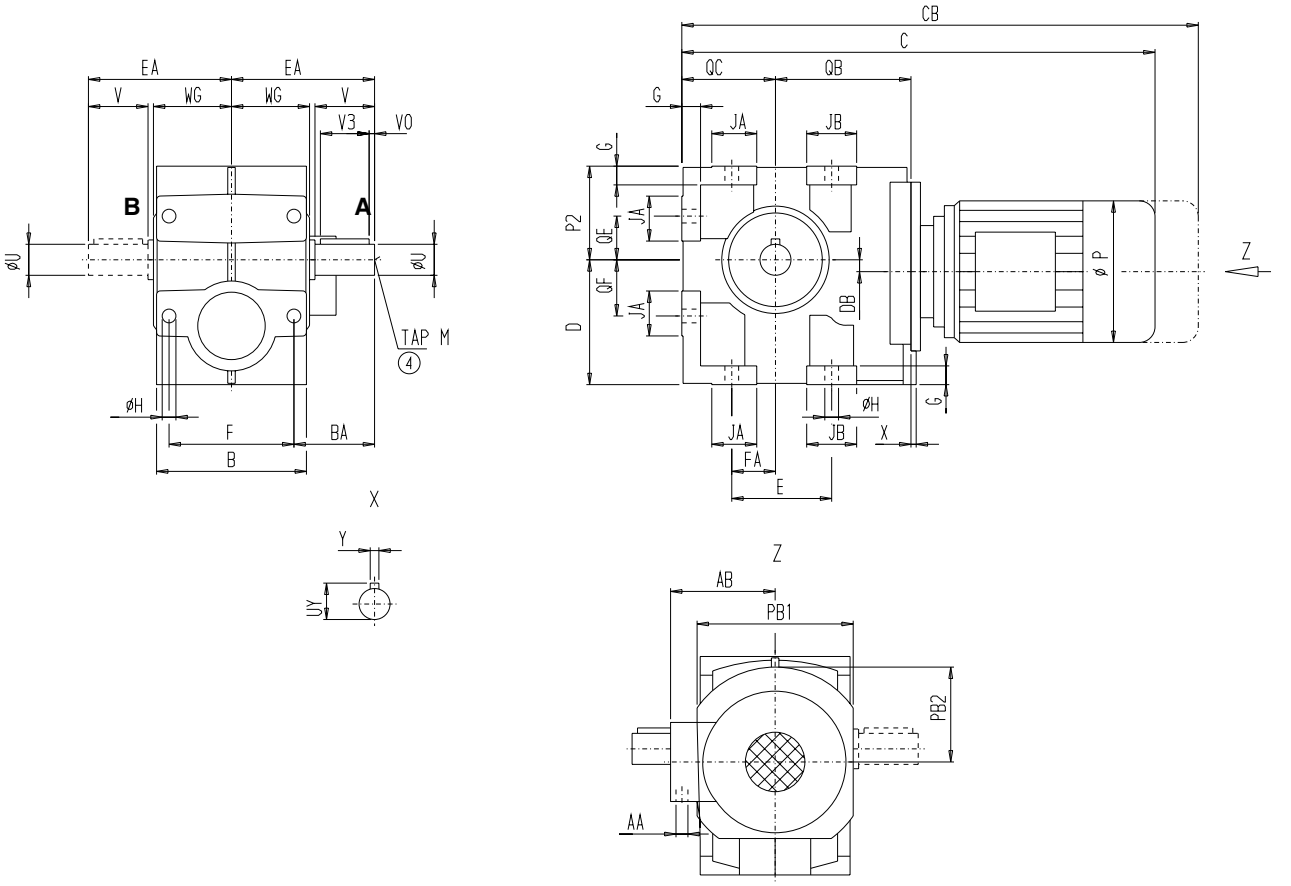
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Foot mounted

C48

C 510
[inch]



Mounting

E	F	FA	G	TAP H
3.94	4.33	1.77	0.59	0.43

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1.25	2.36	1.875	0.133	1.36	0.25	3.15	3/8-16UNC

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	EA
5.35	4.41	2.17	1.77	2.99	0.85	1.77	1.57	4.92	0.16	3.15	4.76	2.8	3.15	5.31

Motor

	C48					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**C48**
M71	17.9	19.63	5.43	4.67	2x1/2"	75
M80M	18.74	20.91	6.22	4.98	2x1/2"	79
M90S	20.36	22.95	6.93	5.91	2x3/4"	84
M90L	20.36	22.95	6.93	5.91	2x3/4"	88
M100L	22.13	24.96	7.64	6.3	2x3/4"	108
M112M	24.19	27.38	8.58	6.59	2x3/4"	123

Tolerances see page 1 - 4

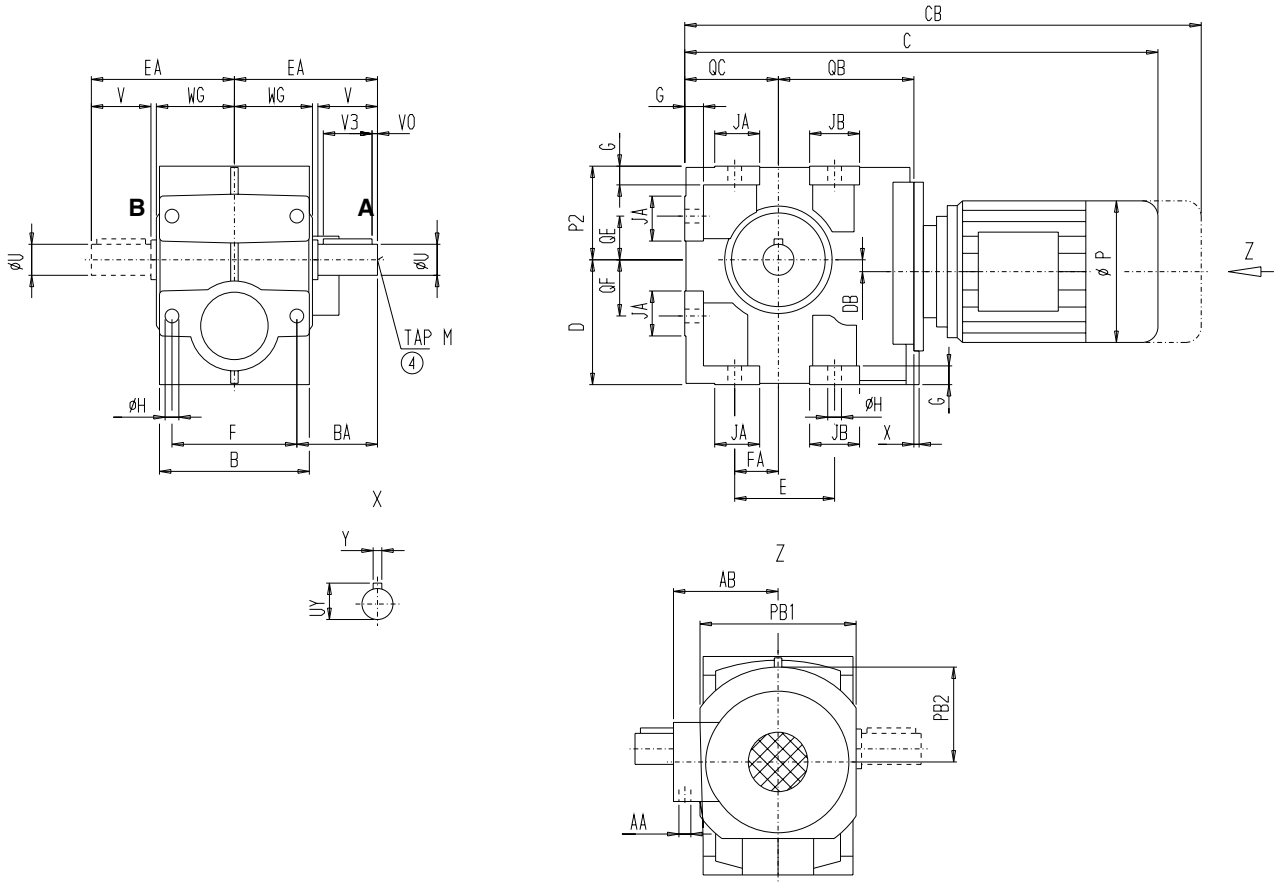
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Foot mounted

C48

C 510

[mm]



Mounting

E	F	FA	G	H
100	*110*	*45*	*15*	*11*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
31,75	*60*	*47,625*	*3,378*	*34,54*	*6,35*	*80*	*3/8"-16UNC*

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	EA
136	*112*	*55*	*45*	*76*	*21,5*	*45*	*40*	*125*	*4*	*80*	*121*	*71*	*80*	*135*

Motor

	C48					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**C48**
M71	*455,5*	*499,5*	*138*	*118,5*	*2x1/2"*	*34*
M80	*477*	*532*	*158*	*126,5*	*2x1/2"*	*36*
M90S	*518*	*584*	*176*	*150*	*2x3/4"*	*38*
M90L	*518*	*584*	*176*	*150*	*2x3/4"*	*40*
M100L	*563*	*635*	*194*	*160*	*2x3/4"*	*49*
M112M	*615*	*696*	*218*	*167,5*	*2x3/4"*	*56*

Tolerances see page 1 - 4

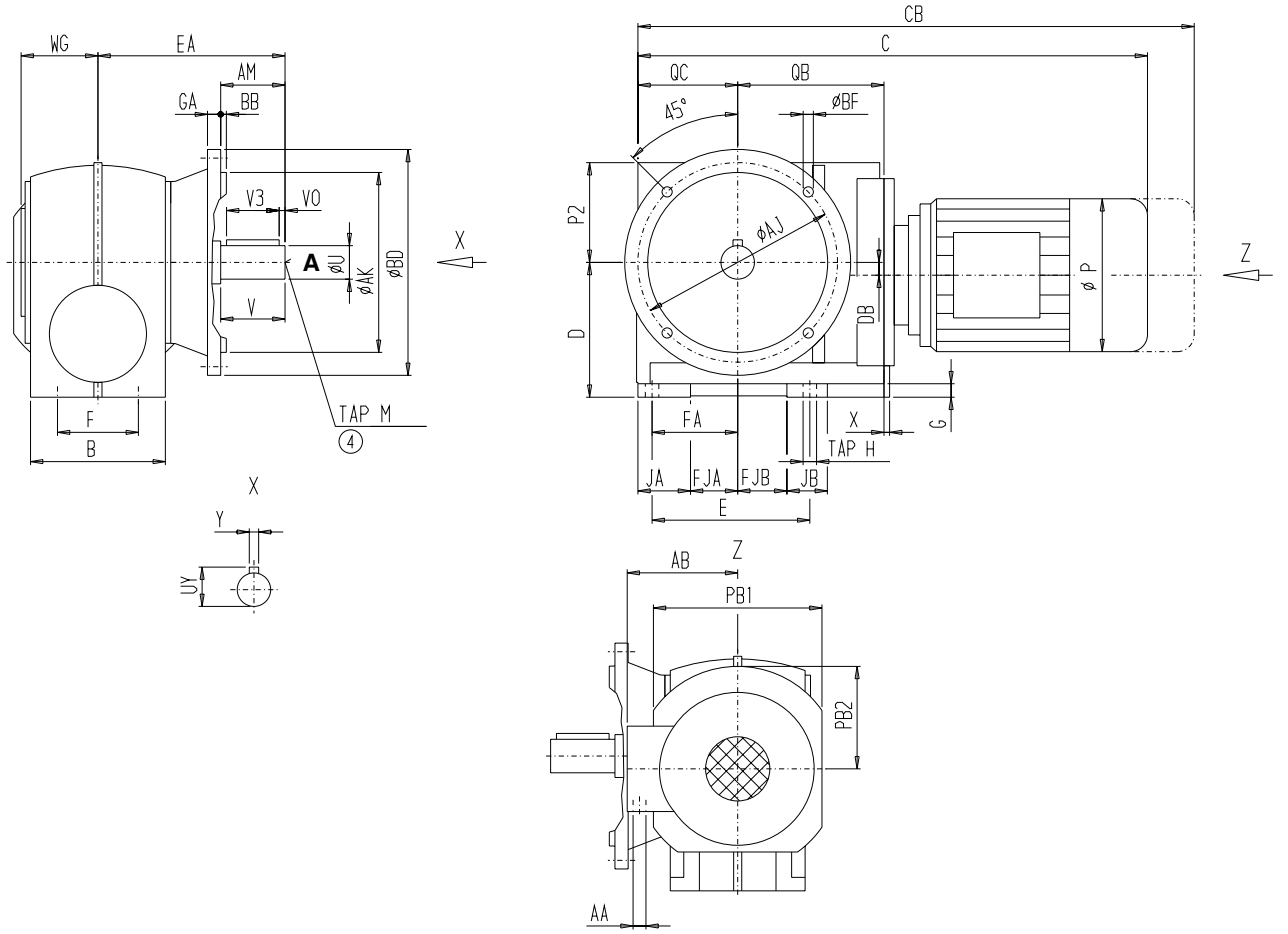
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Flange mounted

CF48

CF 510

[inch]



Flange

BD	AK	GA	AJ	BB	BF
7.87	5.12	0.47	6.5	0.14	0.43

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.25	2.36	1.875	0.133	1.36	0.25	2.36	3/8-16UNC

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	EA	TAP H
4.61	2.3	1.59	1.59	2.87	0.47	4.33	4.41	2.99	0.85	1.3	1.44	4.92	0.16	3.15	4.76	2.8	3.11	6.3	M10x17

Motor

	CF48					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CF48**
M71	17.9	19.63	5.43	4.67	2x1/2"	84
M80M	18.74	20.91	6.22	4.98	2x1/2"	88
M90S	20.36	22.95	6.93	5.91	2x3/4"	93
M90L	20.36	22.95	6.93	5.91	2x3/4"	97
M100L	22.13	24.96	7.64	6.3	2x3/4"	117
M112M	24.19	27.38	8.58	6.59	2x3/4"	135

Tolerances see page 1 - 4

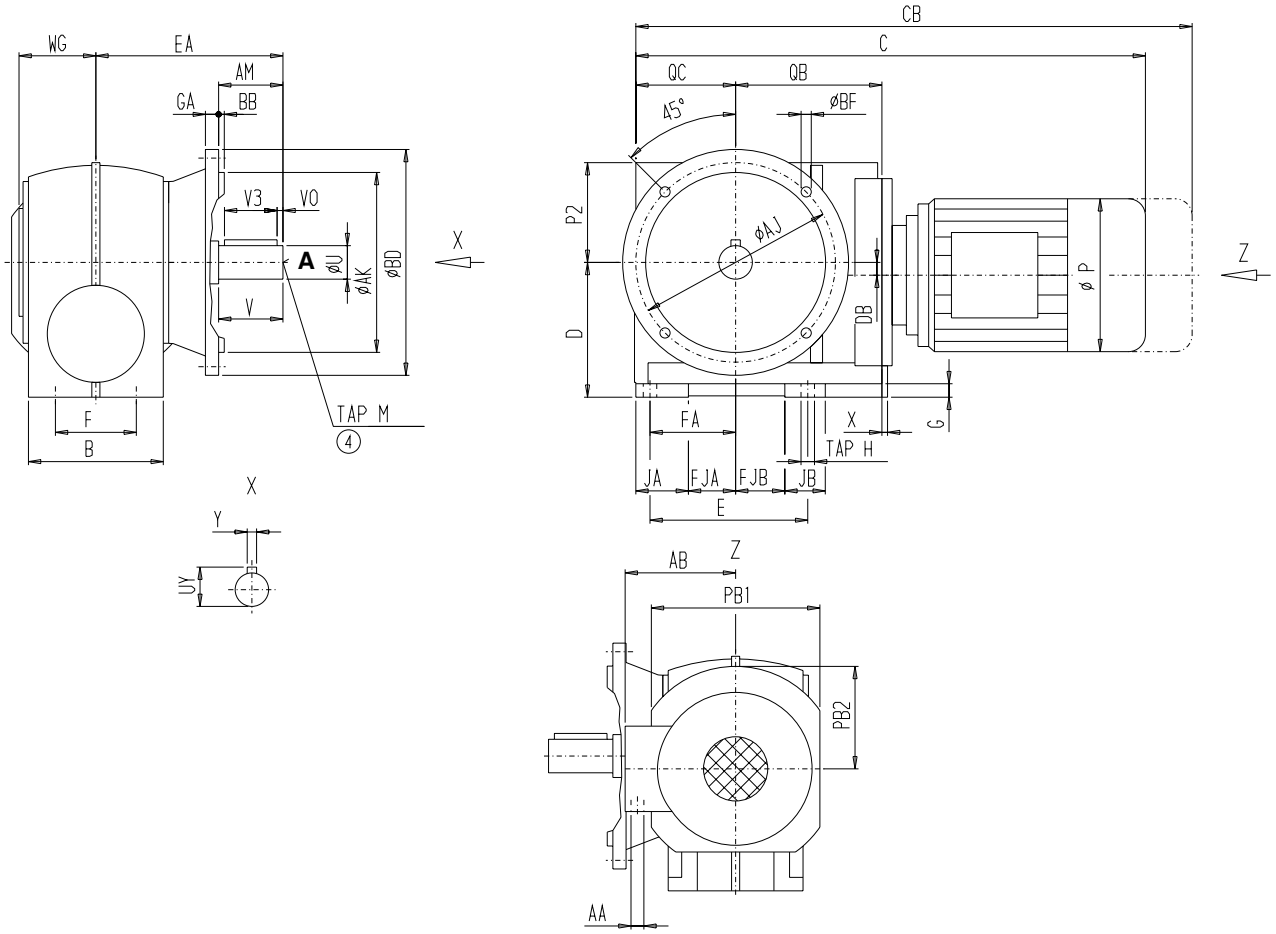
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Flange mounted

CF48

CF 510

[mm]



Flange

BD	AK	GA	AJ	BB	BF
200	*130*	*12*	*165*	*3,5*	*11*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
31,75	*60*	*47,625*	*3,378*	*34,54*	*6,35*	*60*	*3/8"-16UNC*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	EA	TAP H
117	*58,5*	*40,5*	*40,5*	*73*	*12*	*110*	*112*	*76*	*21,5*	*33*	*36,5*	*125*	*4*	*80*	*121*	*71*	*79*	*160*	*M10x17*

Motor

	CF48					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CF48**
M71	*455,5*	*499,5*	*138*	*118,5*	*2x1/2"*	*38*
M80	*477*	*532*	*158*	*126,5*	*2x1/2"*	*40*
M90S	*518*	*584*	*176*	*150*	*2x3/4"*	*42*
M90L	*518*	*584*	*176*	*150*	*2x3/4"*	*44*
M100L	*563*	*635*	*194*	*160*	*2x3/4"*	*53*
M112M	*615*	*696*	*218*	*167,5*	*2x3/4"*	*61*

Tolerances see page 1 - 4

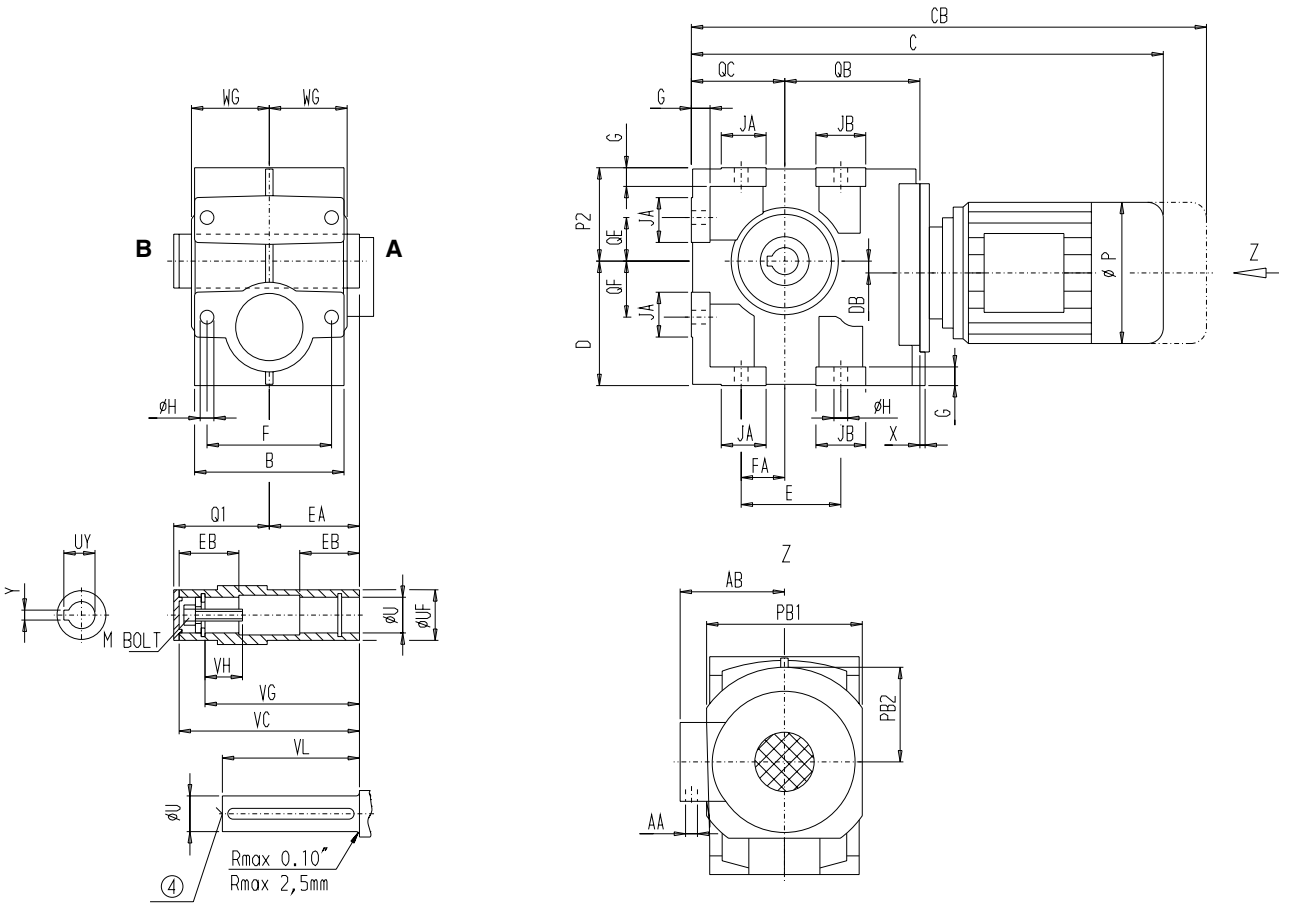
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted

CA48

CA 510

[inch]



Mounting

E	F	FA	G	H
3.94	4.33	1.77	0.59	0.43

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.375	2.165	5.91	5.039	4.53	1.37	3/8-16UNC	1.53	0.31	2.95	2.283	3.07

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2
5.35	4.41	2.17	1.77	2.99	0.85	1.77	1.57	4.92	0.16	3.15	4.76	2.8	3.15

Motor

	CA48					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CA48**
M71	17.9	19.63	5.43	4.67	2x1/2"	71
M80M	18.74	20.91	6.22	4.98	2x1/2"	75
M90S	20.36	22.95	6.93	5.91	2x3/4"	79
M90L	20.36	22.95	6.93	5.91	2x3/4"	84
M100L	22.13	24.96	7.64	6.3	2x3/4"	104
M112M	24.19	27.38	8.58	6.59	2x3/4"	121

Tolerances see page 1 - 4

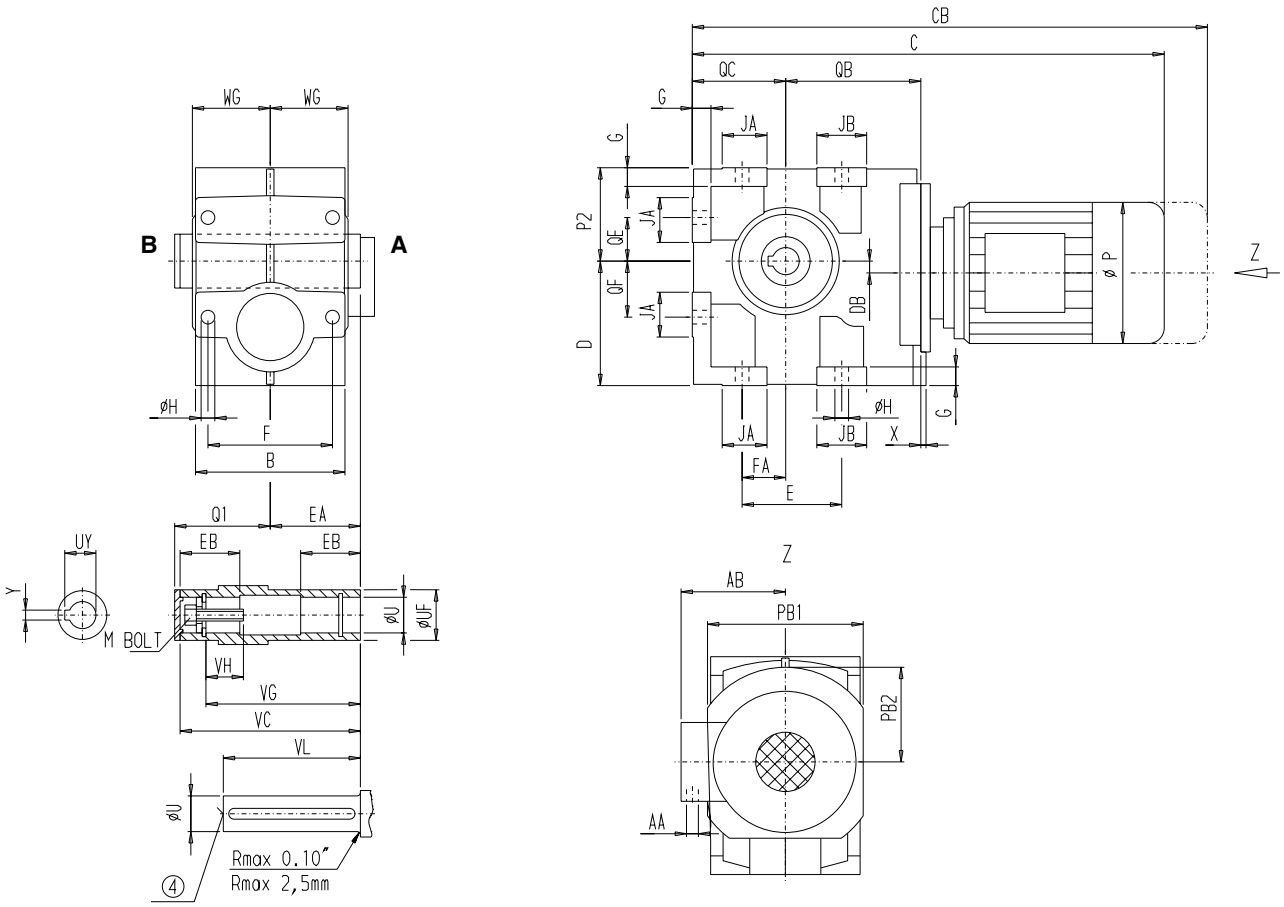
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted

CA48

CA 510

[mm]



Mounting

E	F	FA	G	H
100	*110*	*45*	*15*	*11*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
34,93	*55*	*150*	*128*	*115*	*35*	*3/8"-16UNC*	*38,86*	*7,874*	*75*	*58*	*78*

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2
136	*112*	*55*	*45*	*76*	*21,5*	*45*	*40*	*125*	*4*	*80*	*121*	*71*	*80*

Motor

	CA48					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CA48**
M71	*455,5*	*499,5*	*138*	*118,5*	*2x1/2"*	*32*
M80	*477*	*532*	*158*	*126,5*	*2x1/2"*	*34*
M90S	*518*	*584*	*176*	*150*	*2x3/4"*	*36*
M90L	*518*	*584*	*176*	*150*	*2x3/4"*	*38*
M100L	*563*	*635*	*194*	*160*	*2x3/4"*	*47*
M112M	*615*	*696*	*218*	*167,5*	*2x3/4"*	*55*

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

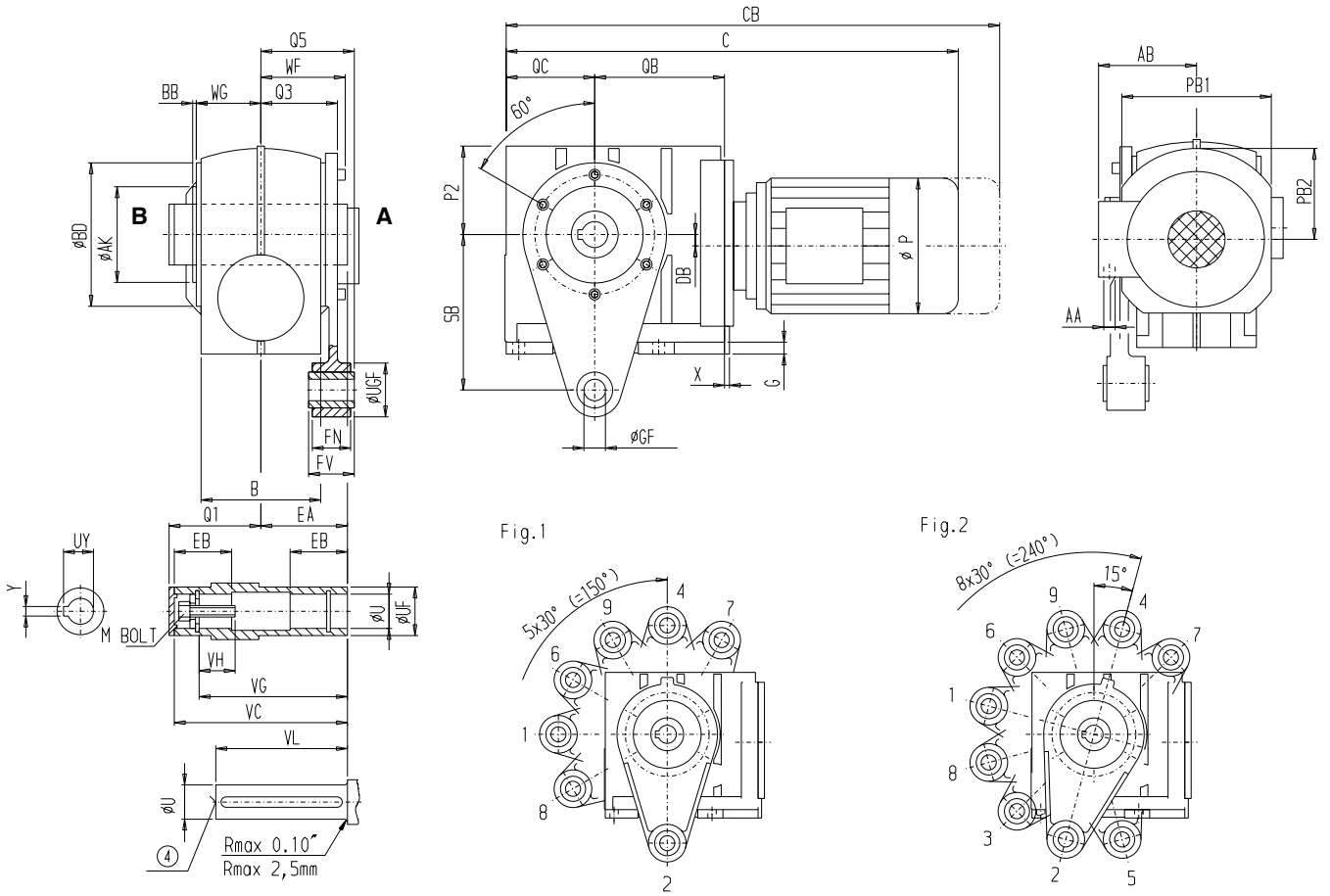
6

Worm Helical Gear Motors
Shaft mounted with torque arm

CAD48

CAD 510

[inch]



Mounting

BD	AK	BB	G
5.2	3.74	0.12	0.47

Torque Arm

FN	FV	GF	UGF	SB	WF	Q3	Q5
1.26	1.5	0.63	1.97	6.3	3.43	3.15	3.56

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.375	2.165	5.91	5.039	4.53	1.37	3/8-16UNC	1.53	0.31	2.95	2.283	3.07

Gearcase

B	PB2	DB	PB1	X	QC	QB	WG	P2
4.33	2.99	0.85	4.92	0.16	3.15	4.76	2.68	3.11

Motor

	CAD48					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAD48**
M71	17.9	19.63	5.43	4.67	2x1/2"	77
M80M	18.74	20.91	6.22	4.98	2x1/2"	82
M90S	20.36	22.95	6.93	5.91	2x3/4"	86
M90L	20.36	22.95	6.93	5.91	2x3/4"	90
M100L	22.13	24.96	7.64	6.3	2x3/4"	110
M112M	24.19	27.38	8.58	6.59	2x3/4"	128

Tolerances see page 1 - 4

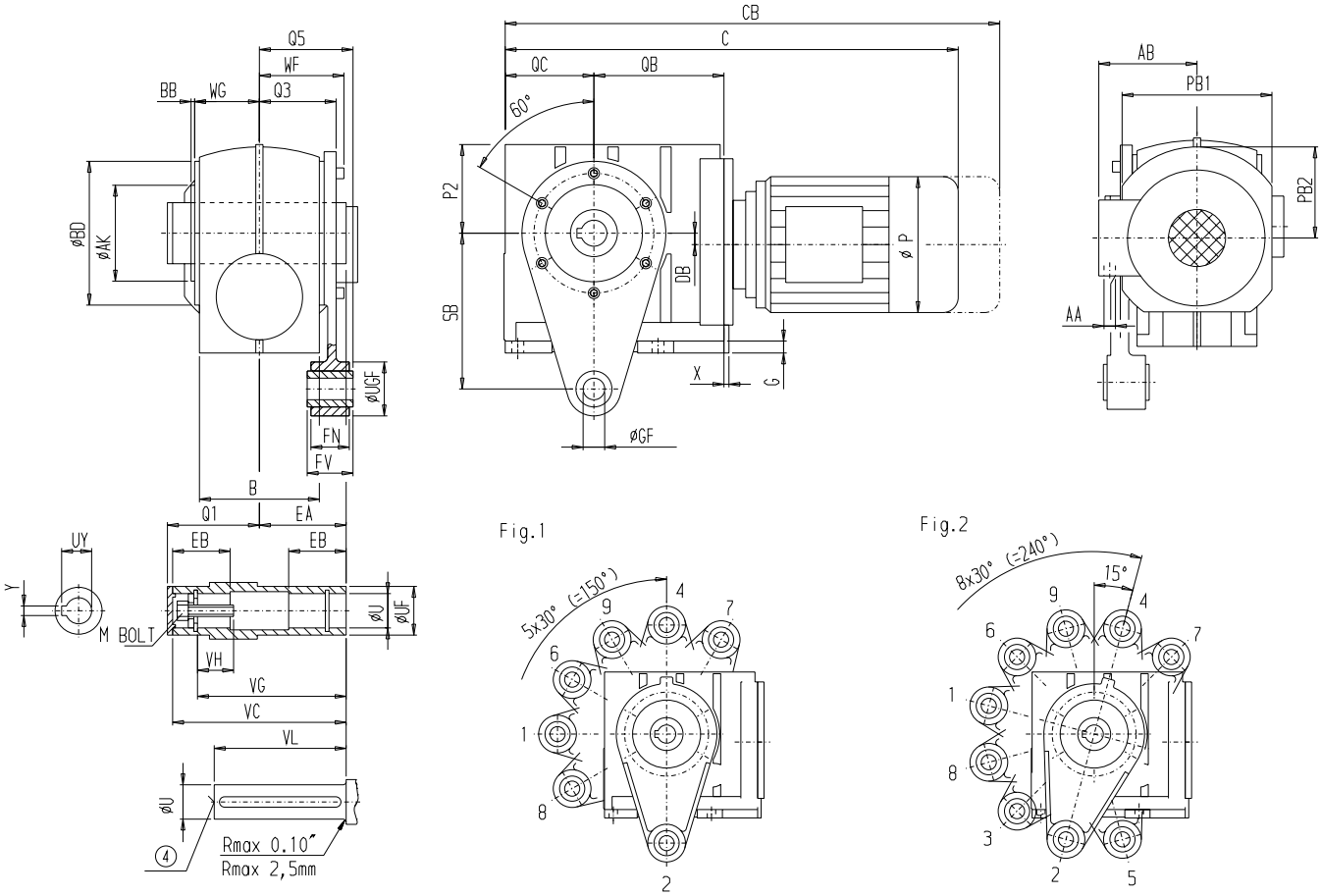
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with torque arm

CAD48

CAD 510

[mm]



Mounting

BD	AK	BB	G
132	*95*	*3*	*12*

Torque Arm

FN	FV	GF	UGF	SB	WF	Q3	Q5
32	*38*	*16*	*50*	*160*	*87*	*80*	*90,5*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
34,93	*55*	*150*	*128*	*115*	*35*	*3/8"-16UNC*	*38,86*	*7,874*	*75*	*58*	*78*

Gearcase

B	PB2	DB	PB1	X	QC	QB	WG	P2
110	*76*	*21,5*	*125*	*4*	*80*	*121*	*68*	*79*

Motor

	CAD48					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAD48**
M71	*455,5*	*499,5*	*138*	*118,5*	*2x1/2"*	*35*
M80	*477*	*532*	*158*	*126,5*	*2x1/2"*	*37*
M90S	*518*	*584*	*176*	*150*	*2x3/4"*	*39*
M90L	*518*	*584*	*176*	*150*	*2x3/4"*	*41*
M100L	*563*	*635*	*194*	*160*	*2x3/4"*	*50*
M112M	*615*	*696*	*218*	*167,5*	*2x3/4"*	*58*

Tolerances see page 1 - 4

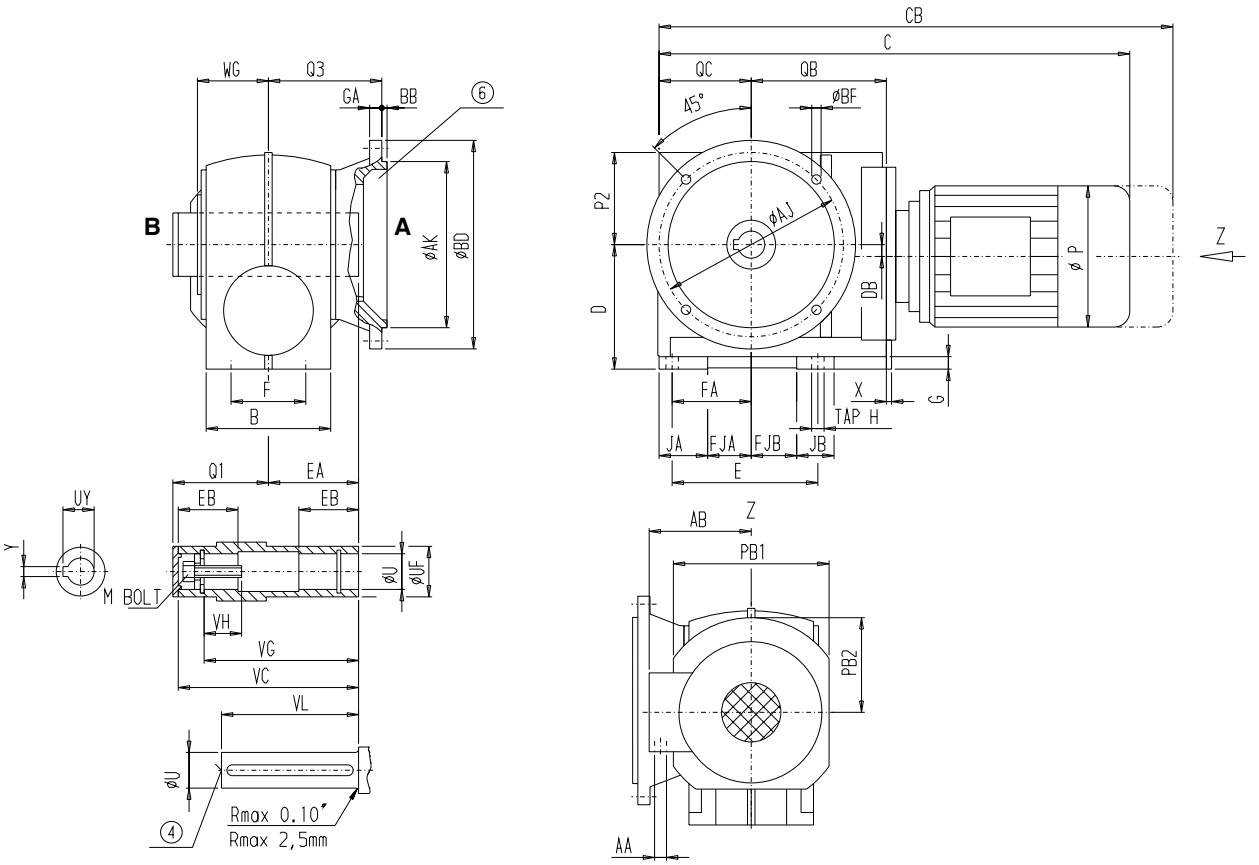
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with flange

CAF48

CAF 510

[inch]



6

Mounting

BD	AK	GA	AJ	BB	Q3	BF
7.87	5.12	0.47	6.5	0.14	3.94	0.43

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.375	2.165	5.91	5.039	4.53	1.37	3/8-16UNC	1.53	0.31	2.95	2.283	3.07

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	TAP H
4.61	2.3	1.59	1.59	2.87	0.47	4.33	4.41	2.99	0.85	1.3	1.44	4.92	0.16	3.15	4.76	2.8	3.11	M10x17

Motor

	CAF48					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAF48**
M71	17.9	19.63	5.43	4.67	2x1/2"	79
M80M	18.74	20.91	6.22	4.98	2x1/2"	84
M90S	20.36	22.95	6.93	5.91	2x3/4"	88
M90L	20.36	22.95	6.93	5.91	2x3/4"	93
M100L	22.13	24.96	7.64	6.3	2x3/4"	112
M112M	24.19	27.38	8.58	6.59	2x3/4"	130

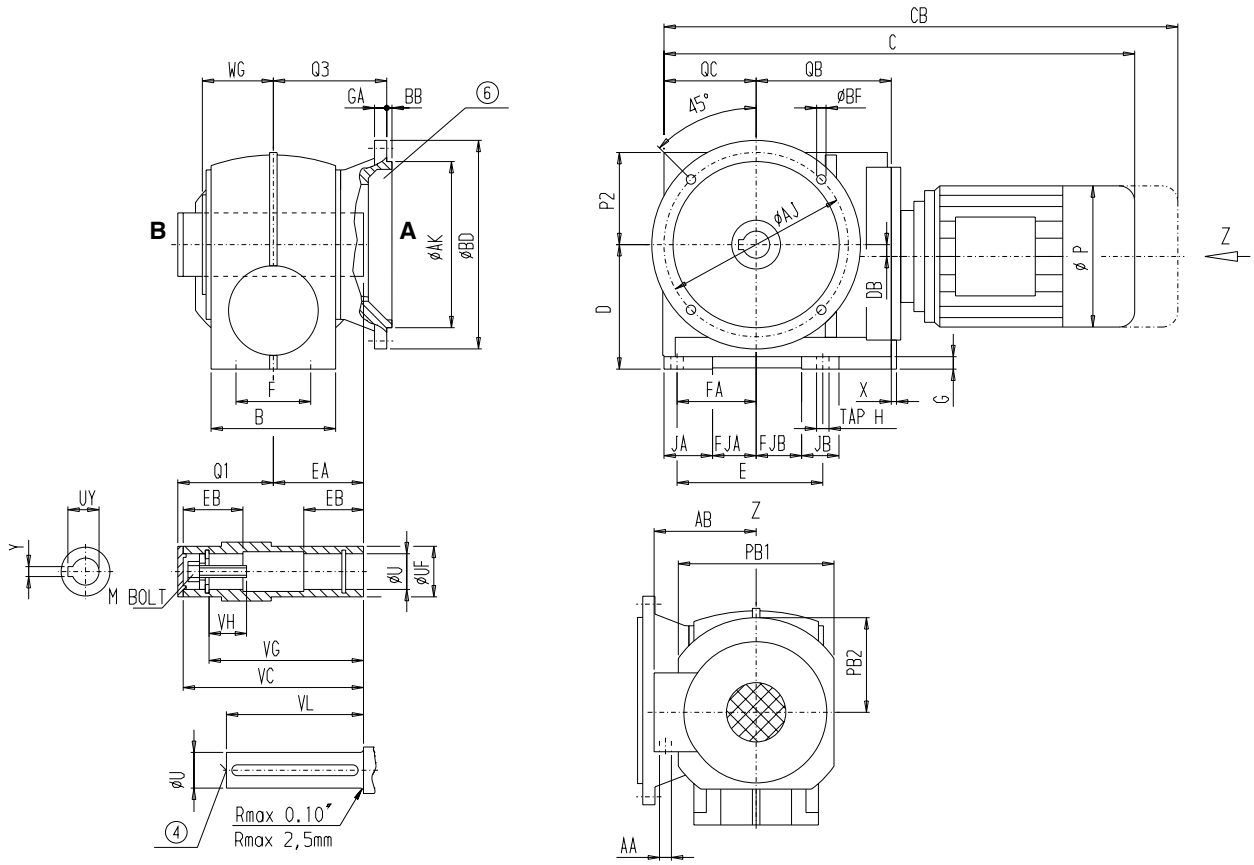
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 6 - 43

Worm Helical Gear Motors
Shaft mounted with flange

CAF48

CAF 510

[mm]



Mounting

BD	AK	GA	AJ	BB	Q3	BF
200	*130*	*12*	*165*	*3,5*	*100*	*11*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
34,93	*55*	*150*	*128*	*115*	*35*	*3/8"-16UNC*	*38,86*	*7,874*	*75*	*58*	*78*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	TAP H
117	*58,5*	*40,5*	*40,5*	*73*	*12*	*110*	*112*	*76*	*21,5*	*33*	*36,5*	*125*	*4*	*80*	*121*	*71*	*79*	*M10x17*

Motor

	CAF48					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAF48**
M71	*455,5*	*499,5*	*138*	*118,5*	*2x1/2"*	*36*
M80	*477*	*532*	*158*	*126,5*	*2x1/2"*	*38*
M90S	*518*	*584*	*176*	*150*	*2x3/4"*	*40*
M90L	*518*	*584*	*176*	*150*	*2x3/4"*	*42*
M100L	*563*	*635*	*194*	*160*	*2x3/4"*	*51*
M112M	*615*	*696*	*218*	*167,5*	*2x3/4"*	*59*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 6 - 43

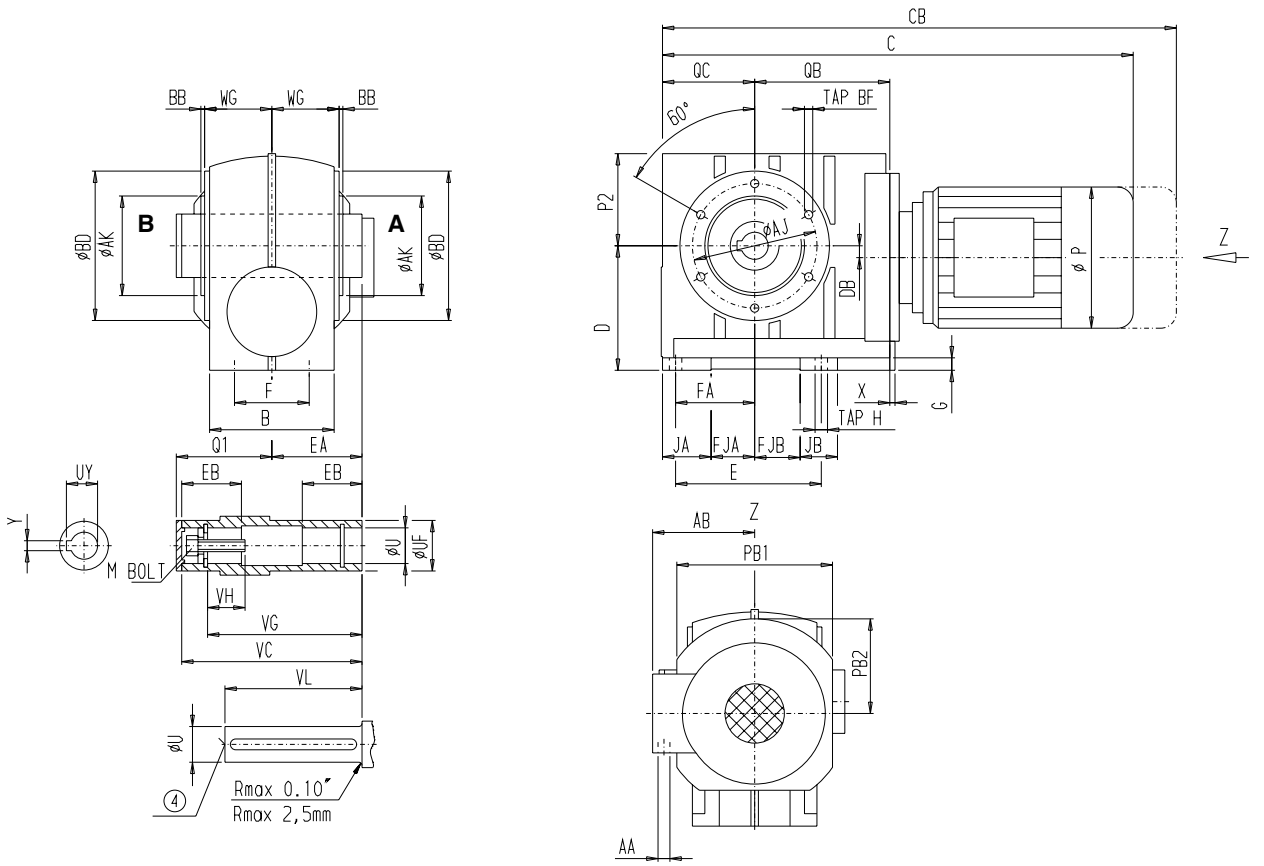
6

Worm Helical Gear Motors
Shaft mounted with housing flange (C-Type)

CAZ48

CAZ 510

[inch]



6

Mounting

BD	AK	AJ	BB	TAP BF
5.2	3.74	4.53	0.12	M10x17

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.375	2.165	5.91	5.039	4.53	1.37	3/8-16UNC	1.53	0.31	2.95	2.283	3.07

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	TAP H
4.61	2.3	1.59	1.59	2.87	0.47	4.33	4.41	2.99	0.85	1.3	1.44	4.92	0.16	3.15	4.76	2.68	3.11	M10x17

Motor

	CAZ48					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAZ48**
M71	17.9	19.63	5.43	4.67	2x1/2"	75
M80M	18.74	20.91	6.22	4.98	2x1/2"	79
M90S	20.36	22.95	6.93	5.91	2x3/4"	84
M90L	20.36	22.95	6.93	5.91	2x3/4"	88
M100L	22.13	24.96	7.64	6.3	2x3/4"	108
M112M	24.19	27.38	8.58	6.59	2x3/4"	126

Tolerances see page 1 - 4

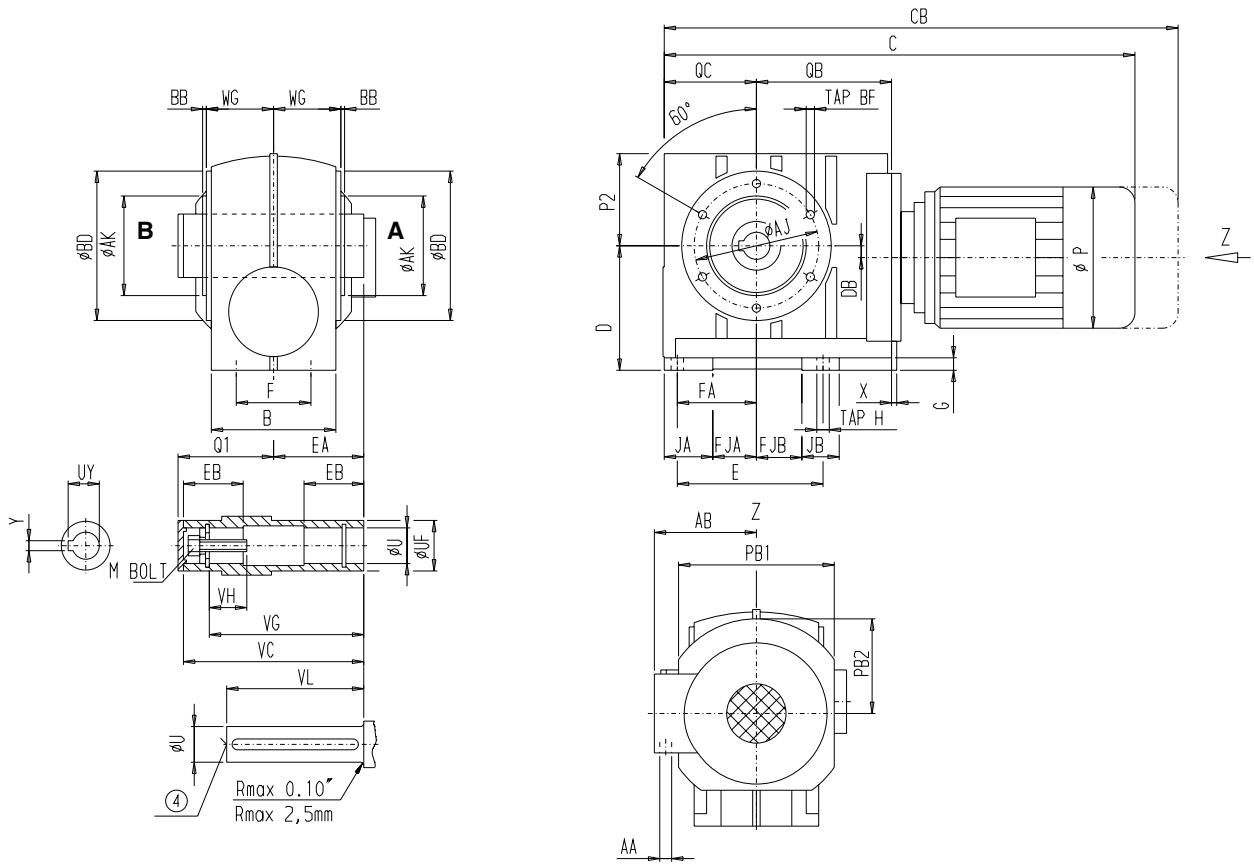
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with housing flange (C-Type)

CAZ48

CAZ 510

[mm]



Mounting

BD	AK	AJ	BB	TAP BF
132	*95*	*115*	*3*	*M10x17*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
34,93	*55*	*150*	*128*	*115*	*35*	*3/8"-16UNC*	*38,86*	*7,874*	*75*	*58*	*78*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	TAP H
117	*58,5*	*40,5*	*40,5*	*73*	*12*	*110*	*112*	*76*	*21,5*	*33*	*36,5*	*125*	*4*	*80*	*121*	*68*	*79*	*M10x17*

Motorr

	CAZ48					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAZ48**
M71	*455,5*	*499,5*	*138*	*118,5*	*2x1/2"*	*34*
M80	*477*	*532*	*158*	*126,5*	*2x1/2"*	*36*
M90S	*518*	*584*	*176*	*150*	*2x3/4"*	*38*
M90L	*518*	*584*	*176*	*150*	*2x3/4"*	*40*
M100L	*563*	*635*	*194*	*160*	*2x3/4"*	*49*
M112M	*615*	*696*	*218*	*167,5*	*2x3/4"*	*57*

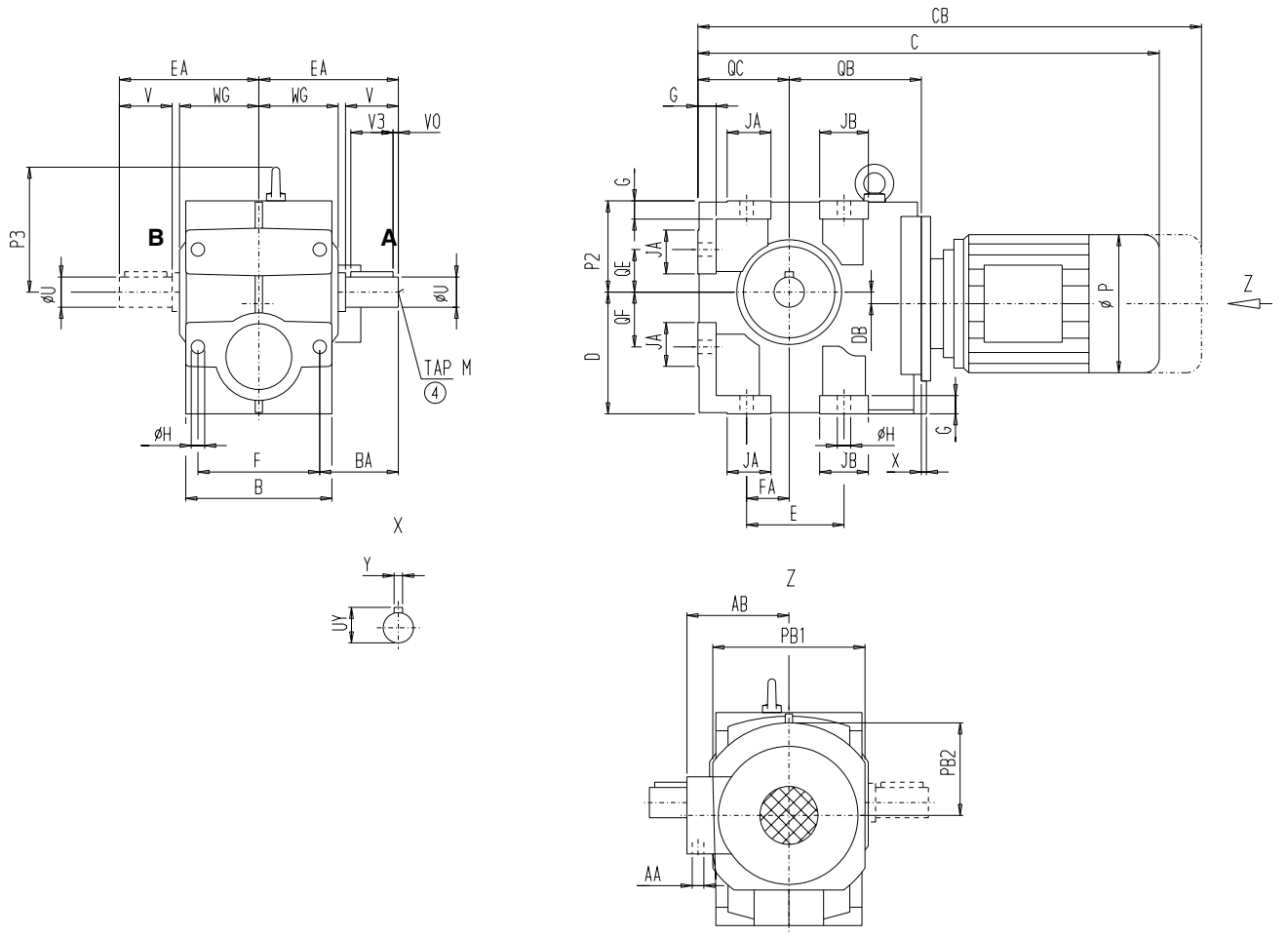
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Foot mounted

C68

C 510
[inch]



Mounting

E	F	FA	G	H
5.12	5.12	2.36	0.71	0.53

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
1.625	3.15	2.75	0.065	1.79	0.375	4.13	5/8-11UNC

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	EA
6.3	5.51	2.76	2.36	3.74	1.22	2.24	2.01	6.3	0.16	4.17	5.71	3.39	4.17	5.91	6.69

Motor

	C68					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**C68**
M71	19.69	21.42	5.43	4.67	2x1/2"	110
M80M	20.53	22.7	6.22	4.98	2x1/2"	115
M90S	22.15	24.74	6.93	5.91	2x3/4"	119
M90L	22.15	24.74	6.93	5.91	2x3/4"	123
M100L	23.92	26.75	7.64	6.3	2x3/4"	143
M112M	25.94	29.13	8.58	6.59	2x3/4"	161
M132S	29.61	33.54	10.16	7.13	1"+3/4"	183
M132M	29.61	33.54	10.16	7.13	1“+3/4"	229

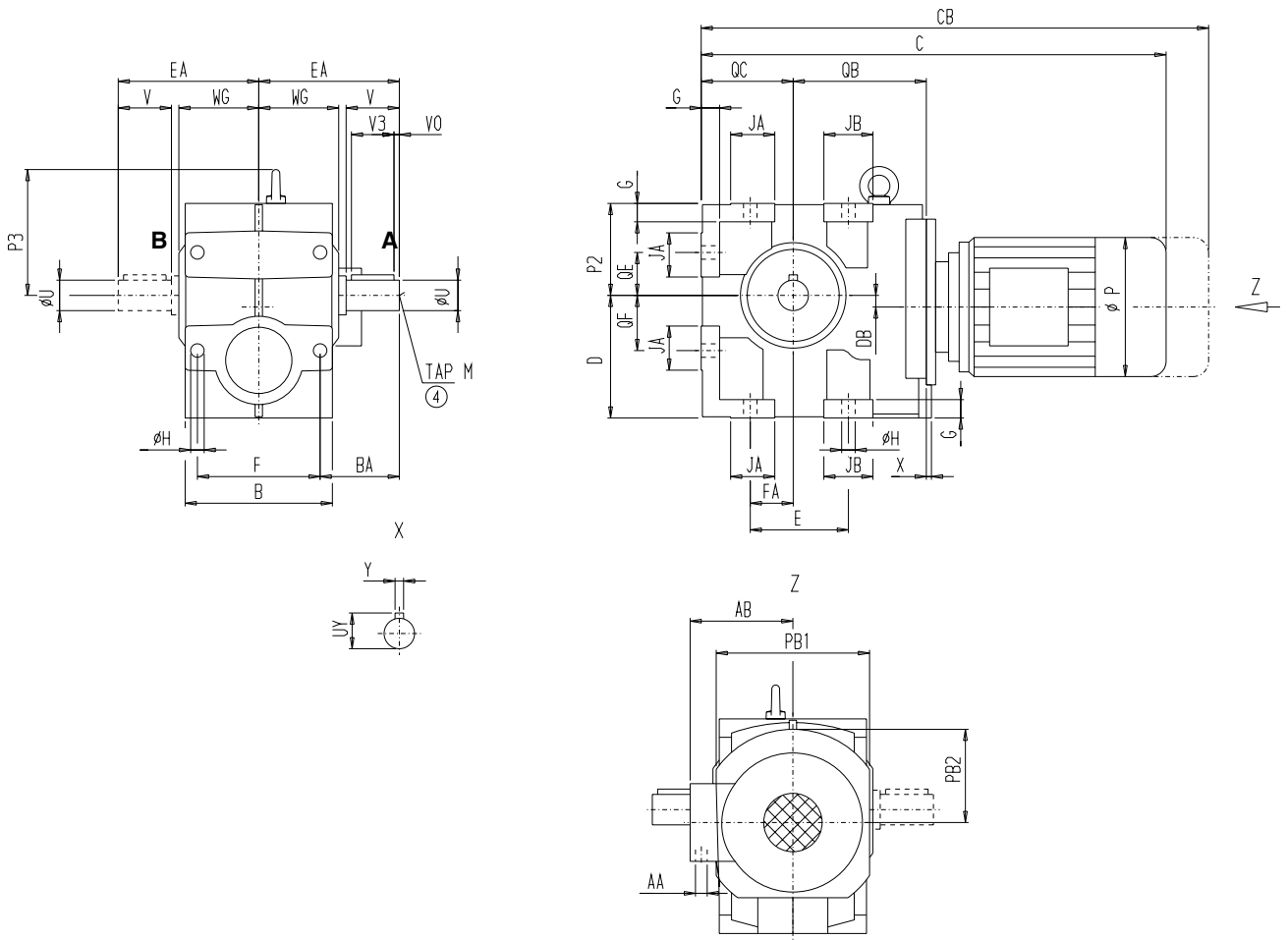
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Foot mounted

C68

C 510
[mm]



Mounting

E	F	FA	G	H
130	*130*	*60*	*18*	*13,5*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
41,275	*80*	*69,85*	*1,651*	*45,47*	*9,525*	*105*	*5/8"-11UNC*

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	EA
160	*140*	*70*	*60*	*95*	*31*	*57*	*51*	*160*	*4*	*106*	*145*	*86*	*106*	*150*	*170*

Motor

	C68					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**C68**
M71	*500*	*544*	*138*	*118,5*	*2x1/2"*	*50*
M80	*521,5*	*576,5*	*158*	*126,5*	*2x1/2"*	*52*
M90S	*562,5*	*628,5*	*176*	*150*	*2x3/4"*	*54*
M90L	*562,5*	*628,5*	*176*	*150*	*2x3/4"*	*56*
M100L	*607,5*	*679,5*	*194*	*160*	*2x3/4"*	*65*
M112M	*659*	*740*	*218*	*167,5*	*2x3/4"*	*73*
M132S	*752*	*852*	*258*	*181*	*1"+3/4"*	*83*
M132M	*752*	*852*	*258*	*181*	*1"+3/4"*	*104*

Tolerances see page 1 - 4

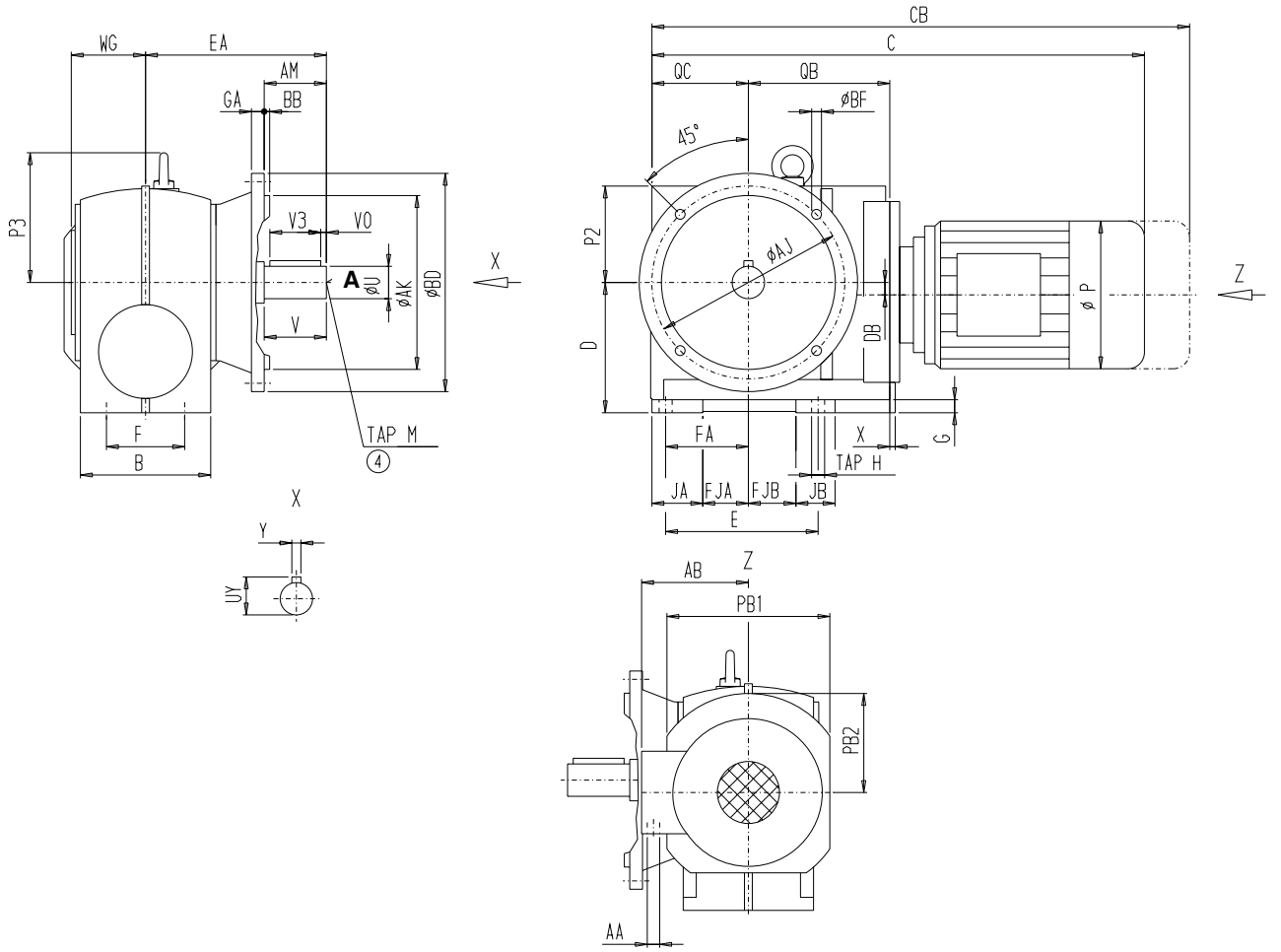
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Flange mounted

CF68

CF 510

[inch]



Mounting

BD	AK	GA	AJ	BB	BF
9.84	7.09	0.59	8.46	0.16	0.53

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
1.625	3.15	2.75	0.065	1.79	0.375	3.15	5/8-11UNC

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	EA	TAP H
5.98	2.99	2.09	2.09	3.46	0.47	5.51	5.51	3.74	1.22	1.5	1.5	6.3	0.16	4.21	5.71	3.39	4.13	5.83	7.6	M12x21

Motor

	CF68					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CF68**
M71	19.73	21.46	5.43	4.67	2x1/2"	130
M80M	20.57	22.74	6.22	4.98	2x1/2"	135
M90S	22.19	24.78	6.93	5.91	2x3/4"	139
M90L	22.19	24.78	6.93	5.91	2x3/4"	143
M100L	23.96	26.79	7.64	6.3	2x3/4"	163
M112M	25.98	29.17	8.58	6.59	2x3/4"	181
M132S	29.65	33.58	10.16	7.13	1"+3/4"	201
M132M	29.61	33.54	10.16	7.13	1“+3/4"	249

Tolerances see page 1 - 4

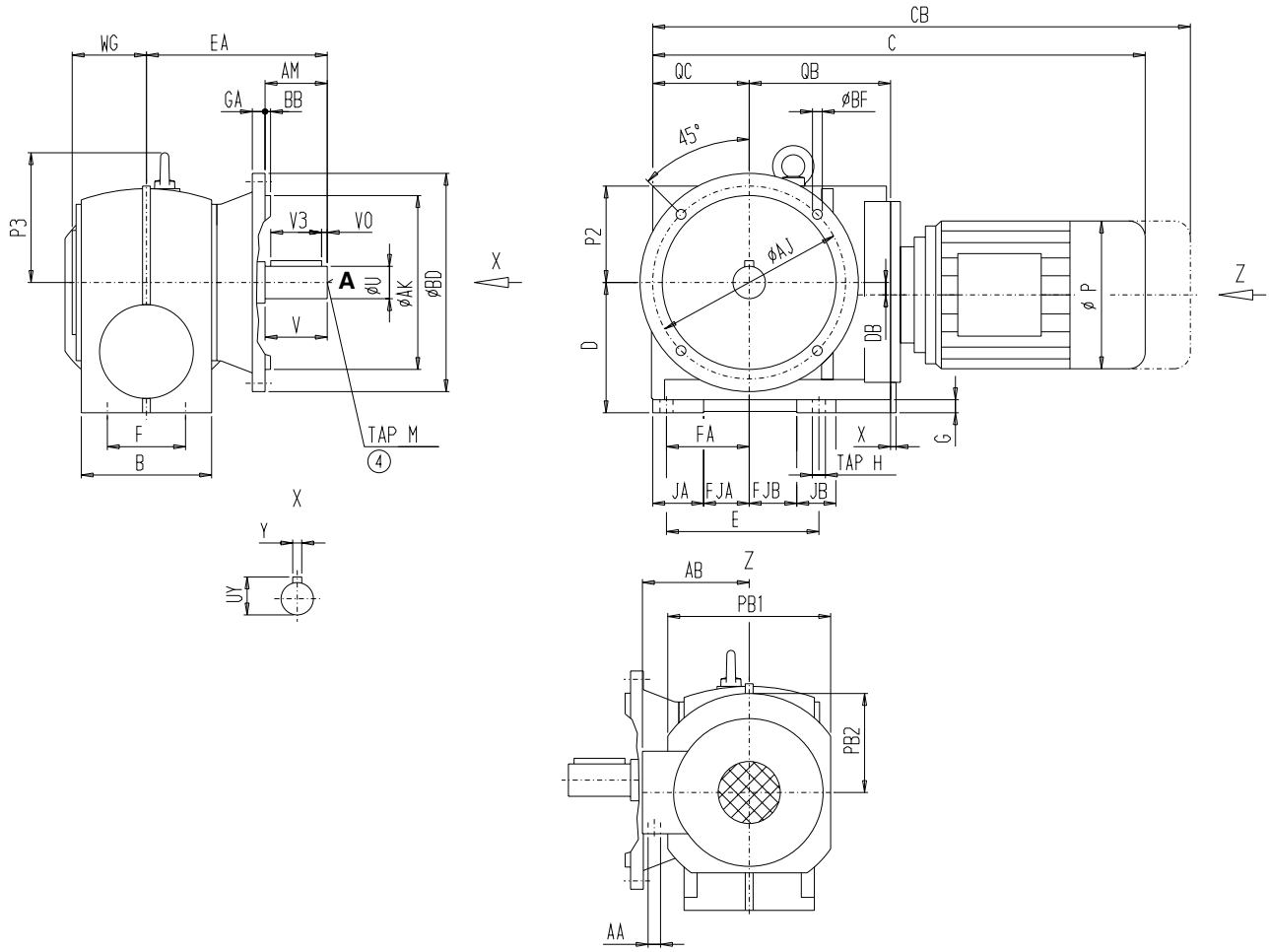
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Flange mounted

CF68

CF 510

[mm]



Mounting

BD	AK	GA	AJ	BB	BF
250	*180*	*15*	*215*	*4*	*13,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
41,275	*80*	*69,85*	*1,651*	*45,47*	*9,525*	*80*	*5/8"-11UNC*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	EA	TAP H
152	*76*	*53*	*53*	*88*	*12*	*140*	*140*	*95*	*31*	*38*	*38*	*160*	*4*	*107*	*145*	*86*	*105*	*148*	*193*	*M12x21*

Motor

	CF68					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CF68**
M71	*501*	*545*	*138*	*118,5*	*2x1/2"*	*59*
M80	*522,5*	*577,5*	*158*	*126,5*	*2x1/2"*	*61*
M90S	*563,5*	*629,5*	*176*	*150*	*2x3/4"*	*63*
M90L	*563,5*	*629,5*	*176*	*150*	*2x3/4"*	*65*
M100L	*608,5*	*680,5*	*194*	*160*	*2x3/4"*	*74*
M112M	*660*	*741*	*218*	*167,5*	*2x3/4"*	*82*
M132S	*753*	*853*	*258*	*181*	*1"+3/4"*	*92*
M132M	*753*	*853*	*258*	*181*	*1"+3/4"*	*113*

Tolerances see page 1 - 4

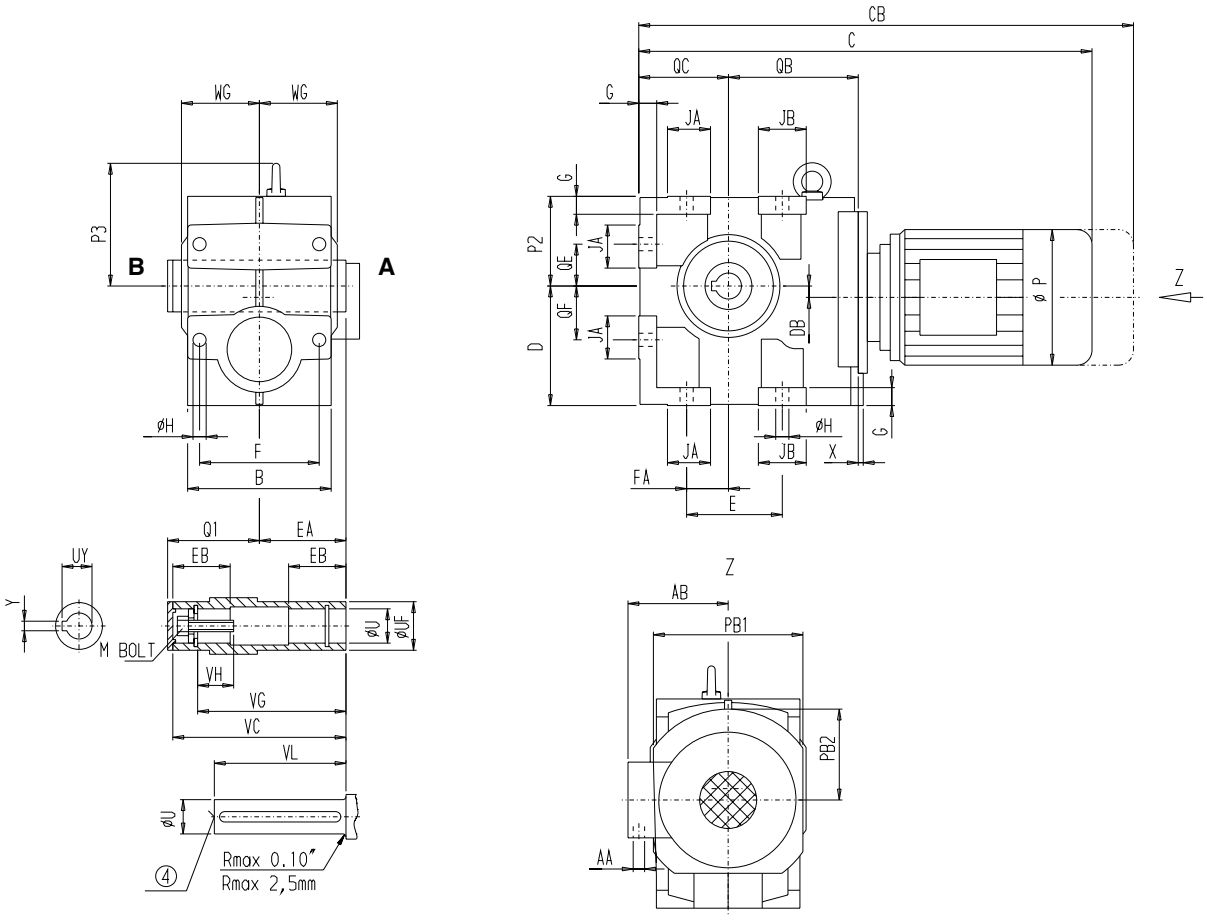
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted

CA68

CA 510

[inch]



Mounting

E	F	FA	G	H
5.12	5.12	2.36	0.71	0.53

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.5	2.559	7.09	5.906	5.31	1.93	5/8-11UNC	1.68	0.38	3.54	2.717	3.66

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3
6.3	5.51	2.76	2.36	3.74	1.22	2.24	2.01	6.3	0.16	4.17	5.71	3.39	4.17	5.91

Motor

	CA68					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CA68**
M71	19.69	21.42	5.43	4.67	2x1/2"	104
M80M	20.53	22.7	6.22	4.98	2x1/2"	108
M90S	22.15	24.74	6.93	5.91	2x3/4"	112
M90L	22.15	24.74	6.93	5.91	2x3/4"	117
M100L	23.92	26.75	7.64	6.3	2x3/4"	137
M112M	25.94	29.13	8.58	6.59	2x3/4"	154
M132S	29.61	33.54	10.16	7.13	1"+3/4"	176
M132M	29.61	33.54	10.16	7.13	1"+3/4"	223

Tolerances see page 1 - 4

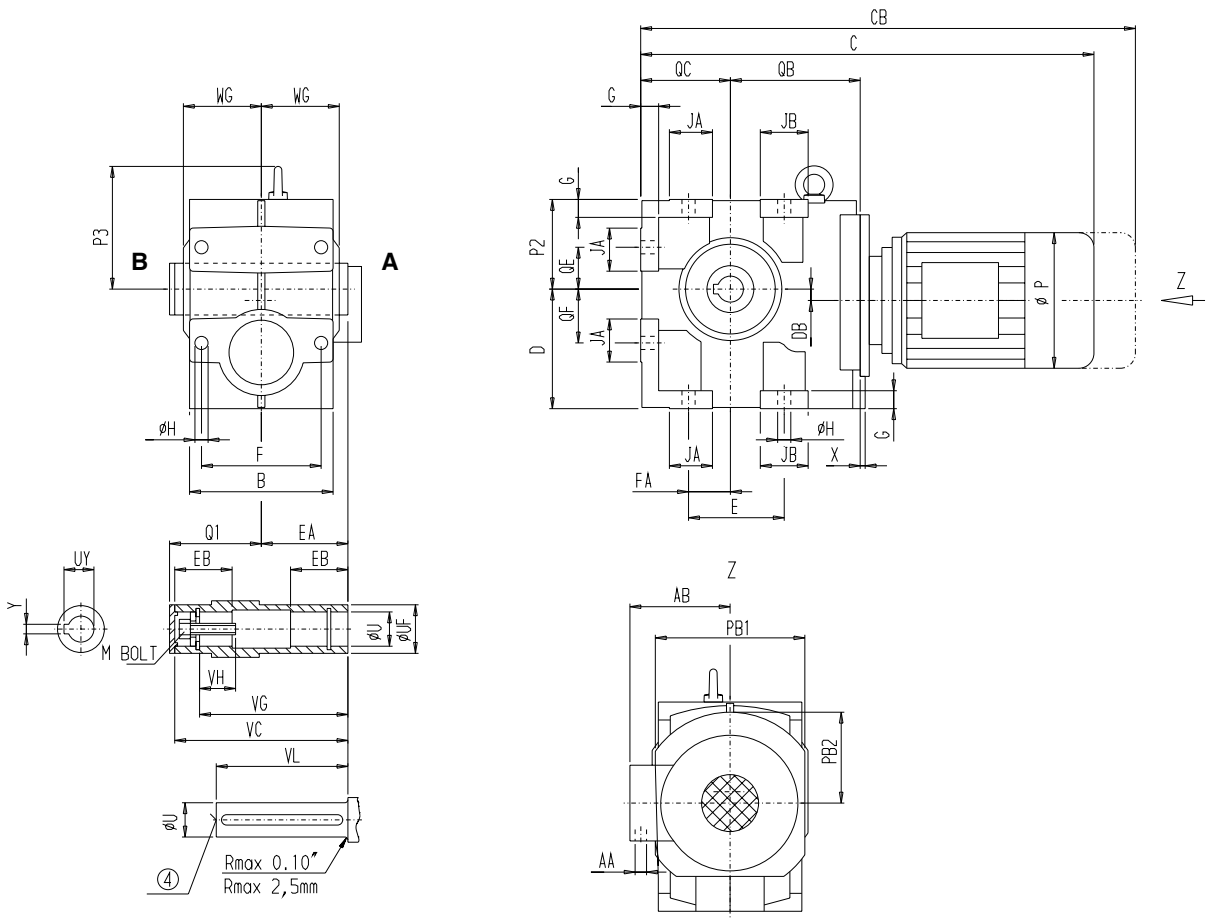
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted

CA68

CA 510

[mm]



Mounting

E	F	FA	G	H
130	*130*	*60*	*18*	*13,5*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
38,1	*65*	*180*	*150*	*135*	*49*	*5/8"-11UNC*	*42,67*	*9,652*	*90*	*69*	*93*

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3
160	*140*	*70*	*60*	*95*	*31*	*57*	*51*	*160*	*4*	*106*	*145*	*86*	*106*	*150*

Motor

	CA68					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CA68**
M71	*500*	*544*	*138*	*118,5*	*2x1/2"*	*47*
M80	*521,5*	*576,5*	*158*	*126,5*	*2x1/2"*	*49*
M90S	*562,5*	*628,5*	*176*	*150*	*2x3/4"*	*51*
M90L	*562,5*	*628,5*	*176*	*150*	*2x3/4"*	*53*
M100L	*607,5*	*679,5*	*194*	*160*	*2x3/4"*	*62*
M112M	*659*	*740*	*218*	*167,5*	*2x3/4"*	*70*
M132S	*752*	*852*	*258*	*181*	*1"+3/4"*	*80*
M132M	*752*	*852*	*258*	*181*	*1"+3/4"*	*101*

Tolerances see page 1 - 4

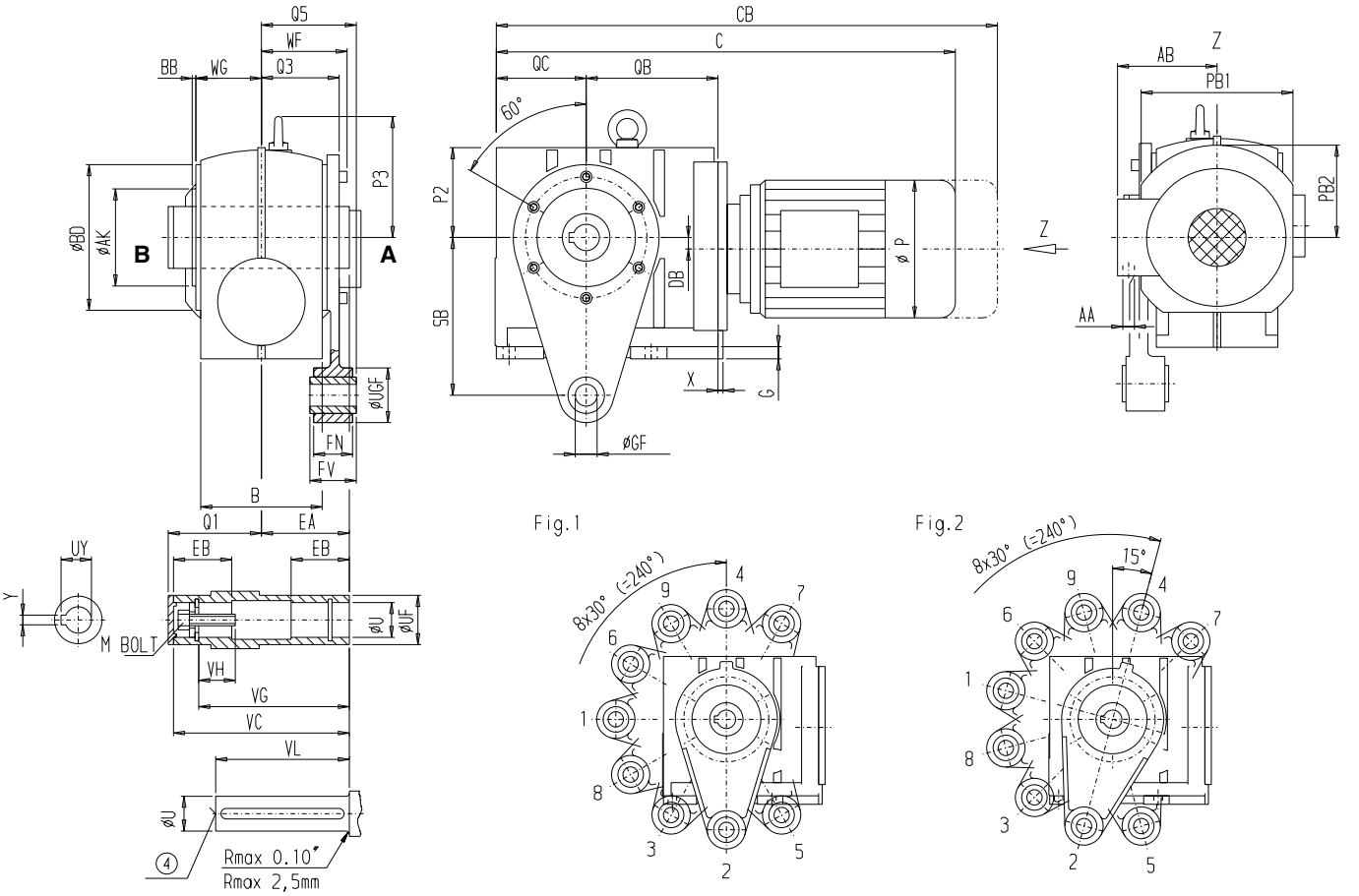
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with torque arm

CAD68

CAD 510

[inch]



Mounting

BD	AK	BB	G
5.91	4.33	0.14	0.47

Torque Arm

FN	FV	GF	UGF	SB	WF	Q3	Q5
1.57	1.81	0.98	2.36	7.87	4.17	3.84	4.19

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.5	2.559	7.09	5.906	5.31	1.93	5/8-11UNC	1.68	0.38	3.54	2.717	3.66

Gearcase

B	PB2	DB	PB1	X	QC	QB	WG	P2	P3
5.51	3.74	1.22	6.3	0.16	4.21	5.71	3.25	4.13	5.83

Motor

	CAD68					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAD68**
M71	19.73	21.46	5.43	4.67	2x1/2"	117
M80M	20.57	22.74	6.22	4.98	2x1/2"	121
M90S	22.19	24.78	6.93	5.91	2x3/4"	126
M90L	22.19	24.78	6.93	5.91	2x3/4"	130
M100L	23.96	26.79	7.64	6.3	2x3/4"	150
M112M	25.98	29.17	8.58	6.59	2x3/4"	168
M132S	29.65	33.58	10.16	7.13	1"+3/4"	190
M132M	29.61	33.54	10.16	7.13	1"+3/4"	234

Tolerances see page 1 - 4

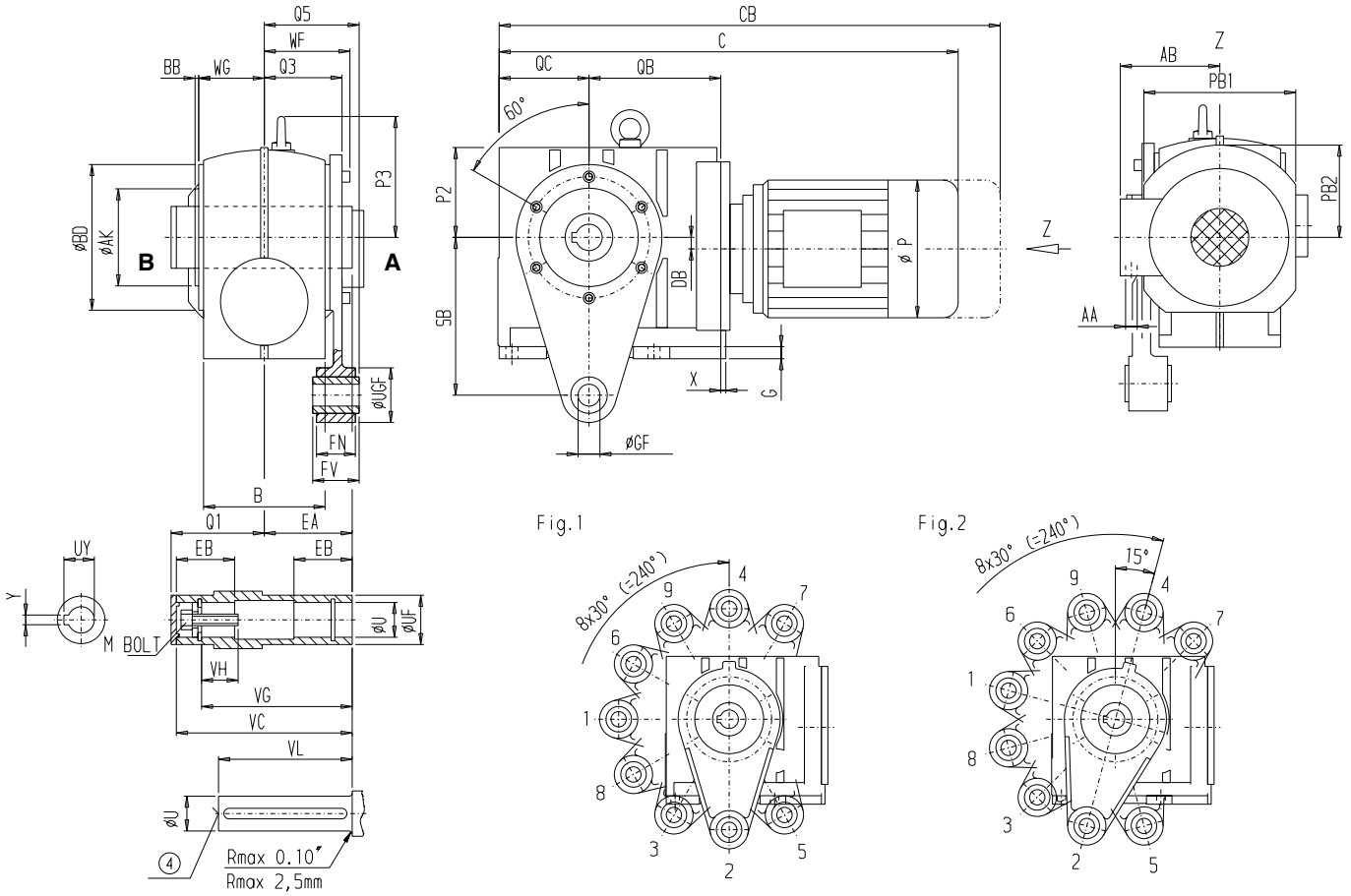
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with torque arm

CAD68

CAD 510

[mm]



Mounting

AK	BB	BD	G
110	*3,5*	*150*	*12*

Torque Arm

FN	FV	GF	UGF	SB	WF	Q3	Q5
40	*46*	*25*	*60*	*200*	*106*	*97,5*	*106,5*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
38,1	*65*	*180*	*150*	*135*	*49*	*5/8"-11UNC*	*42,67*	*9,652*	*90*	*69*	*93*

Gearcase

B	PB2	DB	PB1	X	QC	QB	WG	P2	P3
140	*95*	*31*	*160*	*4*	*107*	*145*	*82,5*	*105*	*148*

Motor

	CAD68					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAD68**
M71	*501*	*545*	*138*	*118,5*	*2x1/2"*	*53*
M80	*522,5*	*577,5*	*158*	*126,5*	*2x1/2"*	*55*
M90S	*563,5*	*629,5*	*176*	*150*	*2x3/4"*	*57*
M90L	*563,5*	*629,5*	*176*	*150*	*2x3/4"*	*59*
M100L	*608,5*	*680,5*	*194*	*160*	*2x3/4"*	*68*
M112M	*660*	*741*	*218*	*167,5*	*2x3/4"*	*76*
M132S	*753*	*853*	*258*	*181*	*1"+3/4"*	*86*
M132M	*753*	*853*	*258*	*181*	*1"+3/4"*	*107*

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

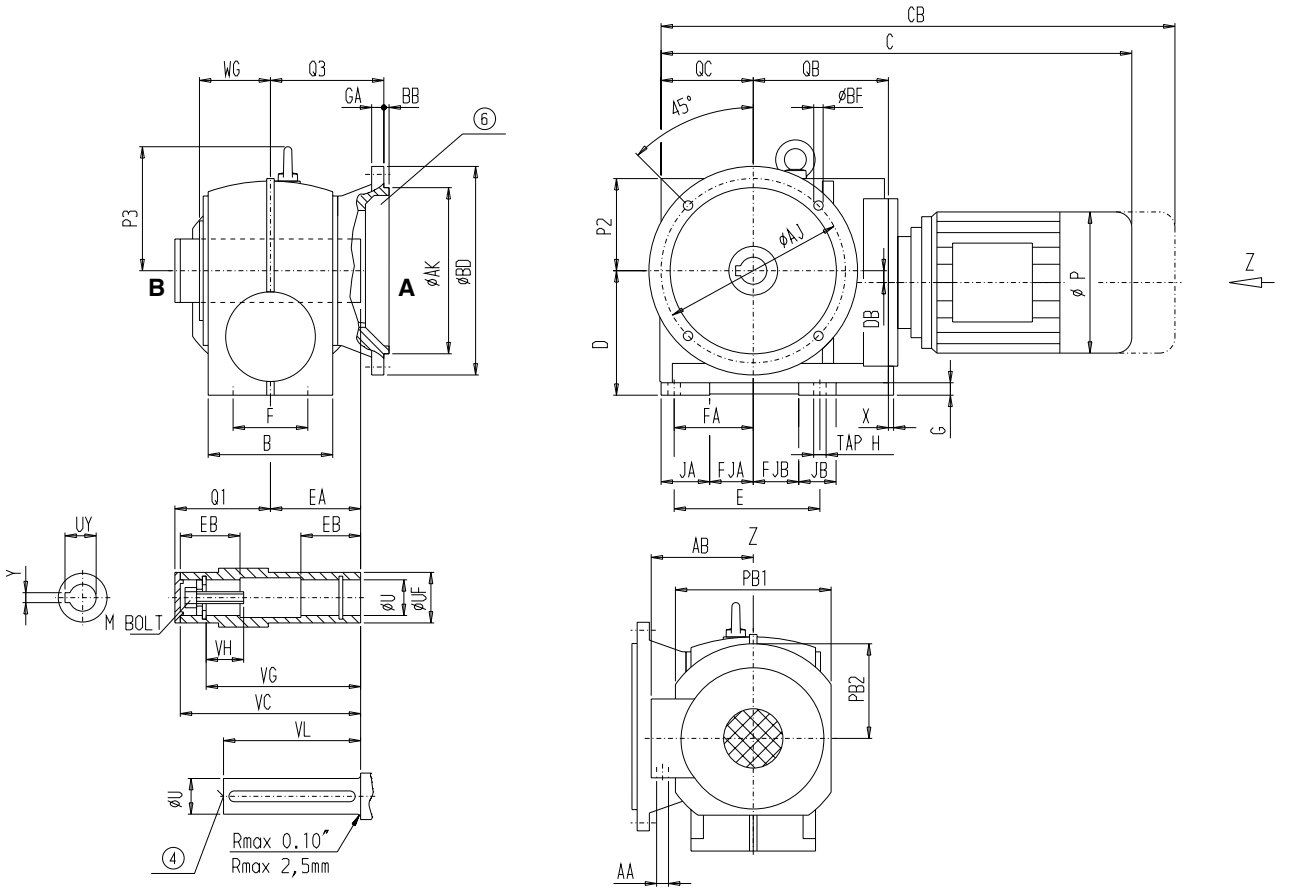
6

Worm Helical Gear Motors
Shaft mounted with flange

CAF68

CAF 510

[inch]



Mounting

BD	AK	GA	AJ	BB	Q3	BF
7.87	5.12	0.47	6.5	0.16	5.22	0.43
9.84	7.09	0.59	8.46	0.16	4.45	0.53

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.5	2.559	7.09	5.906	5.31	1.93	5/8-11UNC	1.68	0.38	3.54	2.717	3.66

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	TAP H
5.98	2.99	2.09	2.09	3.46	0.47	5.51	5.51	3.74	1.22	1.5	1.5	6.3	0.16	4.21	5.71	3.39	4.13	5.83	M12x21

Motor

	CAF68					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAF68**
M71	19.73	21.46	5.43	4.67	2x1/2"	123
M80M	20.57	22.74	6.22	4.98	2x1/2"	128
M90S	22.19	24.78	6.93	5.91	2x3/4"	132
M90L	22.19	24.78	6.93	5.91	2x3/4"	137
M100L	23.96	26.79	7.64	6.3	2x3/4"	157
M112M	25.98	29.17	8.58	6.59	2x3/4"	174
M132S	29.65	33.58	10.16	7.13	1"+3/4"	196
M132M	29.61	33.54	10.16	7.13	1“+3/4"	243

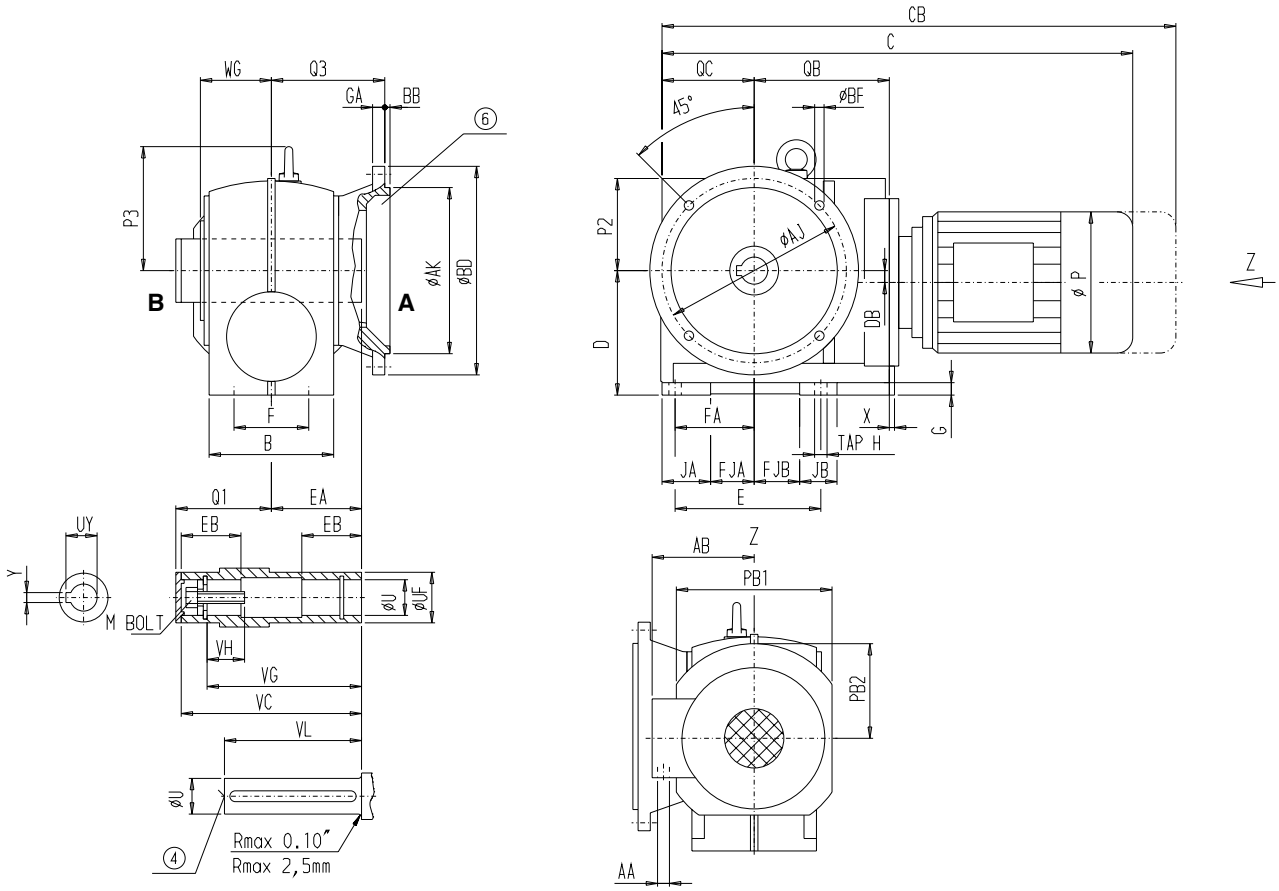
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 6 - 43

Worm Helical Gear Motors
Shaft mounted with flange

CAF68

CAF 510

[mm]



Mounting

BD	AK	GA	AJ	BB	Q3	BF
200	*130*	*12*	*165*	*4*	*132,5*	*11*
250	*180*	*15*	*215*	*4*	*113*	*13,5*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
38,1	*65*	*180*	*150*	*135*	*49*	*5/8"-11UNC*	*42,67*	*9,652*	*90*	*69*	*93*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	TAP H
152	*76*	*53*	*53*	*88*	*12*	*140*	*140*	*95*	*31*	*38*	*38*	*160*	*4*	*107*	*145*	*86*	*105*	*148*	*M12x21*

Motor

	CAF68					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAF68**
M71	*501*	*545*	*138*	*118,5*	*2x1/2"*	*56*
M80	*522,5*	*577,5*	*158*	*126,5*	*2x1/2"*	*58*
M90S	*563,5*	*629,5*	*176*	*150*	*2x3/4"*	*60*
M90L	*563,5*	*629,5*	*176*	*150*	*2x3/4"*	*62*
M100L	*608,5*	*680,5*	*194*	*160*	*2x3/4"*	*71*
M112M	*660*	*741*	*218*	*167,5*	*2x3/4"*	*79*
M132S	*753*	*853*	*258*	*181*	*1"+3/4"*	*89*
M132M	*753*	*853*	*258*	*181*	*1"+3/4"*	*110*

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 6 - 43

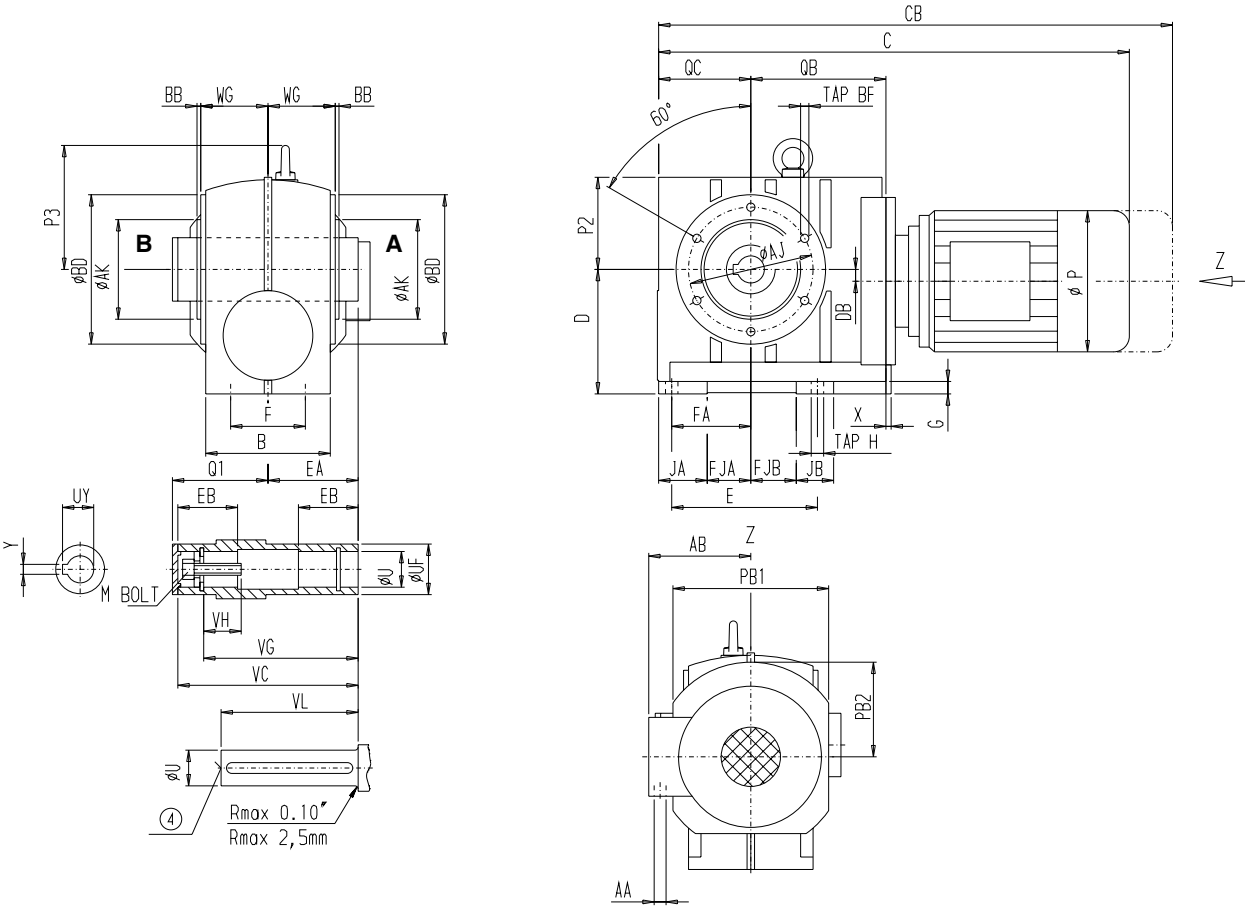
6

Worm Helical Gear Motors
Shaft mounted with housing flange (C-Type)

CAZ68

CAZ 510

[inch]



Mounting

BD	AK	AJ	BB	TAP BF
5.91	4.33	5.12	0.14	M12x21

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
1.5	2.559	7.09	5.906	5.31	1.93	5/8-11UNC	1.68	0.38	3.54	2.717	3.66

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	TAP H
5.98	2.99	2.09	2.09	3.46	0.47	5.51	5.51	3.74	1.22	1.5	1.5	6.3	0.16	4.21	5.71	3.25	4.13	5.83	M12x21

Motor

	CAZ68					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAZ68**
M71	19.73	21.46	5.43	4.67	2x1/2"	112
M80M	20.57	22.74	6.22	4.98	2x1/2"	117
M90S	22.19	24.78	6.93	5.91	2x3/4"	121
M90L	22.19	24.78	6.93	5.91	2x3/4"	126
M100L	23.96	26.79	7.64	6.3	2x3/4"	146
M112M	25.98	29.17	8.58	6.59	2x3/4"	163
M132S	29.65	33.58	10.16	7.13	1"+3/4"	187
M132M	29.61	33.54	10.16	7.13	1“+3/4"	234

Tolerances see page 1 - 4

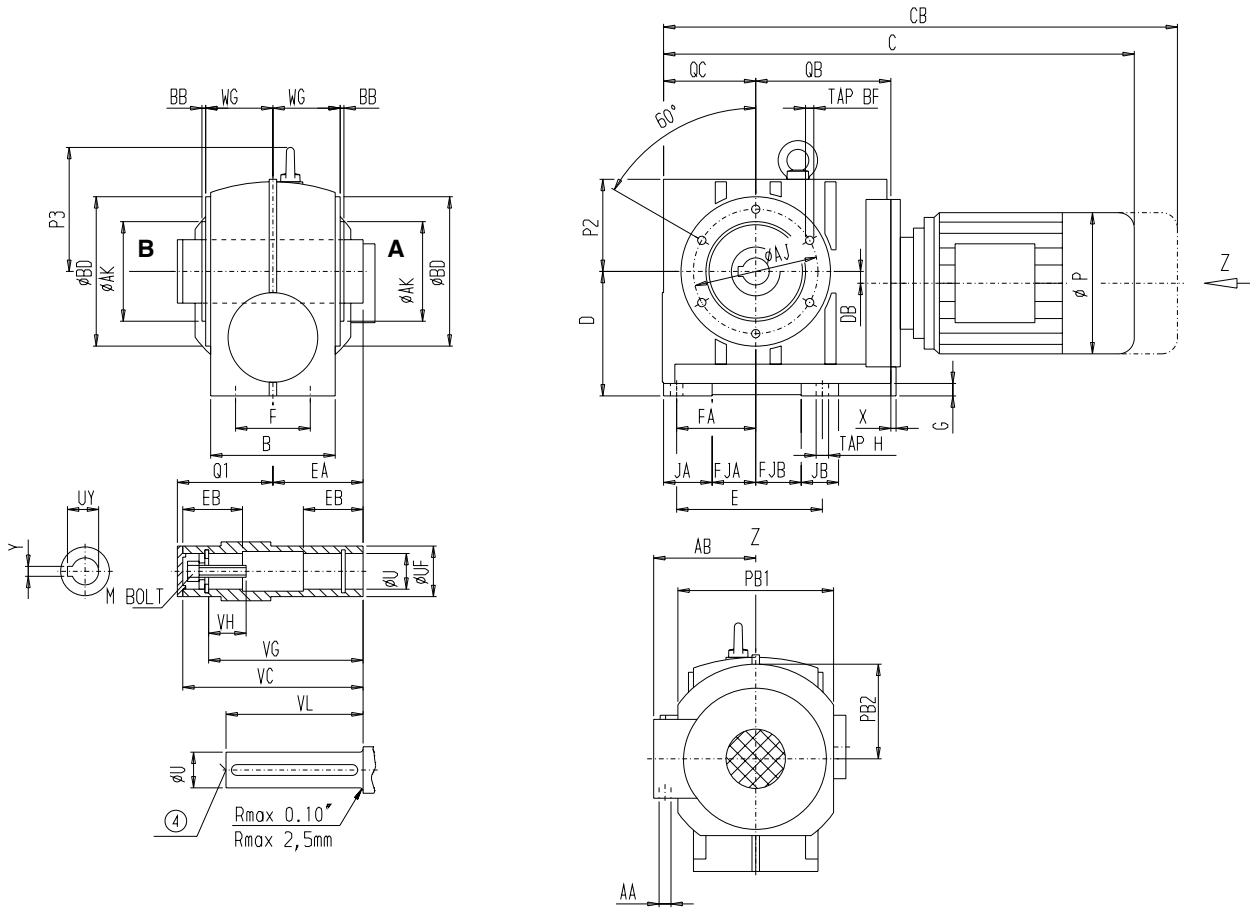
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with housing flange (C-Type)

CAZ68

CAZ 510

[mm]



Mounting

BD	AK	AJ	BB	TAP BF
150	*110*	*130*	*3,5*	*M12x21*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
38,1	*65*	*180*	*150*	*135*	*49*	*5/8"-11UNC*	*42,67*	*9,652*	*90*	*69*	*93*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	TAP H
152	*76*	*53*	*53*	*88*	*12*	*140*	*140*	*95*	*31*	*38*	*38*	*160*	*4*	*107*	*145*	*82,5*	*105*	*148*	*M12x21*

Motor

	CAZ68					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAZ68**
M71	*501*	*545*	*138*	*118,5*	*2x1/2"*	*51*
M80	*522,5*	*577,5*	*158*	*126,5*	*2x1/2"*	*53*
M90S	*563,5*	*629,5*	*176*	*150*	*2x3/4"*	*55*
M90L	*563,5*	*629,5*	*176*	*150*	*2x3/4"*	*57*
M100L	*608,5*	*680,5*	*194*	*160*	*2x3/4"*	*66*
M112M	*660*	*741*	*218*	*167,5*	*2x3/4"*	*74*
M132S	*753*	*853*	*258*	*181*	*1"+3/4"*	*85*
M132M	*753*	*853*	*258*	*181*	*1"+3/4"*	*106*

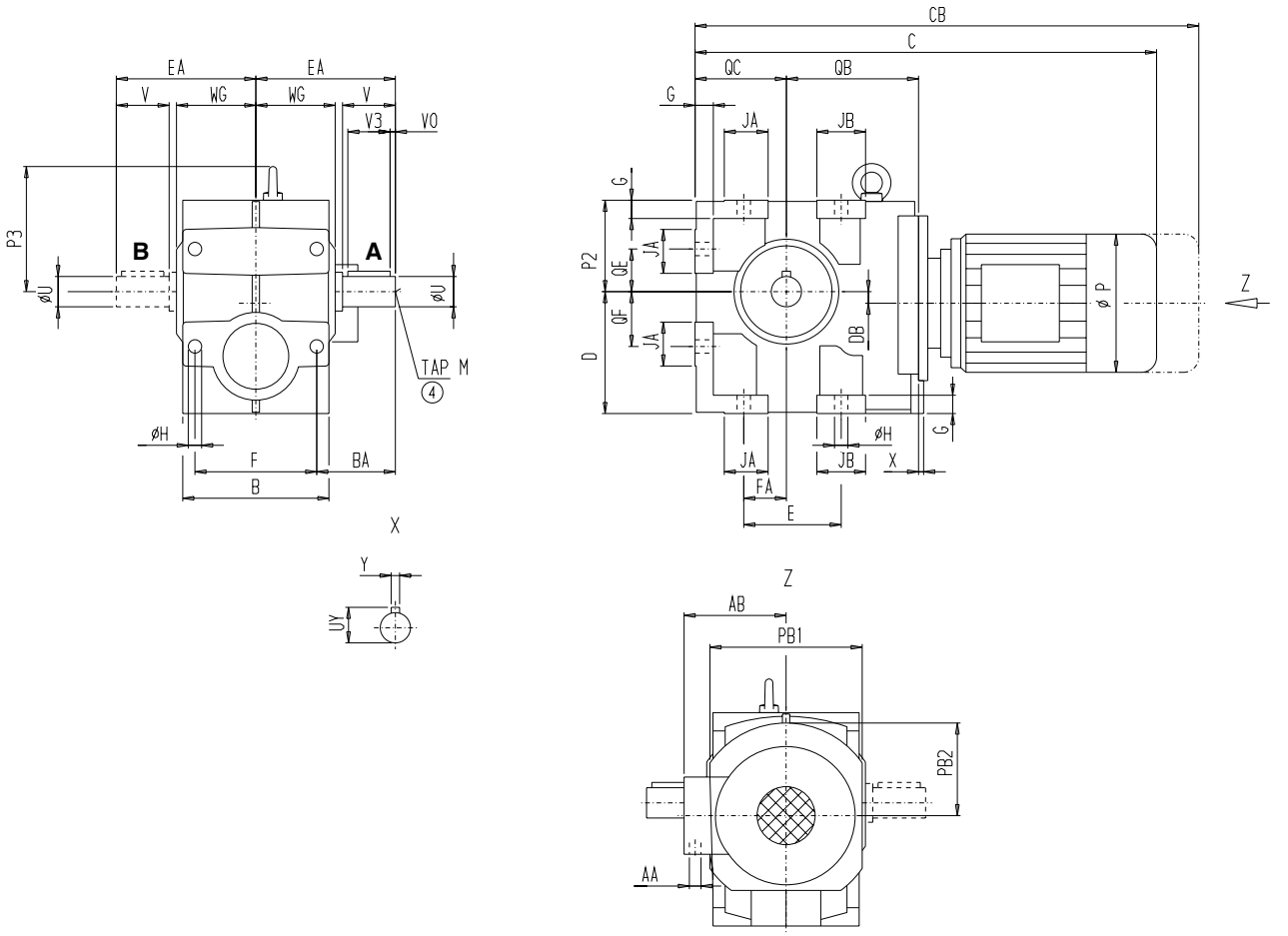
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Foot mounted

C88

C 510
[inch]



Mounting

E	F	FA	G	H
5.31	5.91	2.95	0.98	0.69

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
2	3.94	3.5	0.004	2.22	0.5	5.12	3/4-10UNC

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	EA
7.28	7.09	2.36	2.95	4.69	1.59	2.72	2.44	7.87	0.04	4.92	6.24	3.94	4.92	6.97	8.07

Motor

	C88					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**C88**
M71	20.69	22.42	5.43	4.67	2x1/2"	172
M80S	21.53	23.7	6.22	4.98	2x1/2"	176
M90S	23.15	25.74	6.93	5.91	2x3/4"	181
M90L	23.15	25.74	6.93	5.91	2x3/4"	185
M100L	24.92	27.75	7.64	6.3	2x3/4"	205
M112M	26.87	30.06	8.58	6.59	2x3/4"	223
M132S	30.44	34.41	10.16	7.13	1"+3/4"	245
M132M	30.44	34.41	10.16	7.13	1"+3/4"	293
M160M	33.74	38.35	12.2	7.83	1"+3/4"	329
M160L	33.74	38.35	12.2	7.83	1"+3/4"	329

Tolerances see page 1 - 4

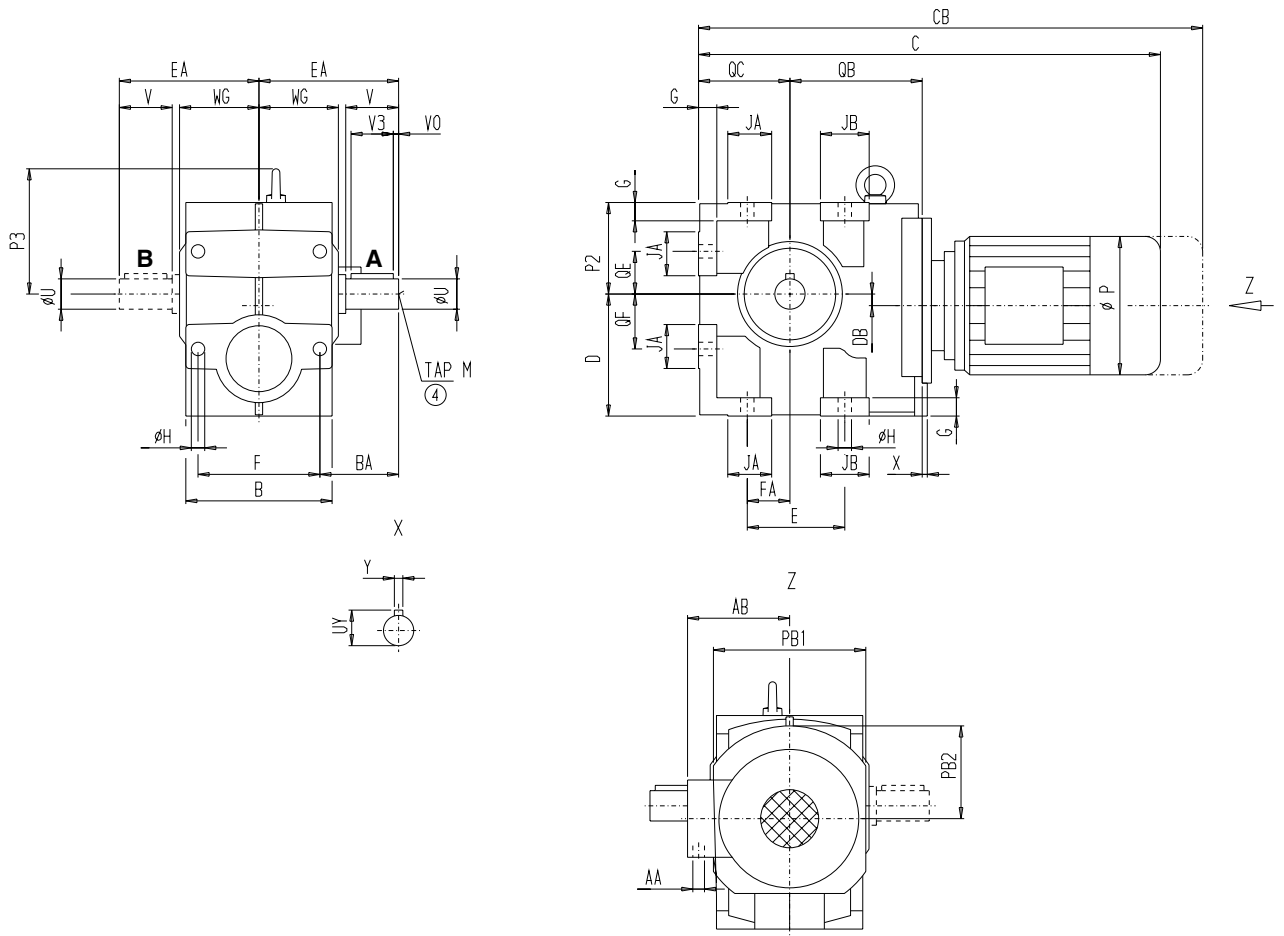
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Foot mounted

C88

C 510

[mm]



Mounting

E	F	FA	G	H
135	*150*	*75*	*25*	*17,5*

Output Shaft

U	V	V3	VO	UY	Y	BA	TAP M
50,8	*100*	*88,9*	*0,102*	*56,39*	*12,7*	*130*	*3/4"-10UNC*

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	EA
185	*180*	*60*	*75*	*119*	*40,5*	*69*	*62*	*200*	*1*	*125*	*158,5*	*100*	*125*	*177*	*205*

Motor

	C88					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**C88**
M71	*526,5*	*570,5*	*138*	*118,5*	*2x1/2"*	*78*
M80	*548*	*603*	*158*	*126,5*	*2x1/2"*	*80*
M90S	*589*	*655*	*176*	*150*	*2x3/4"*	*82*
M90L	*589*	*655*	*176*	*150*	*2x3/4"*	*84*
M100L	*634*	*706*	*194*	*160*	*2x3/4"*	*93*
M112M	*683,5*	*764,5*	*218*	*167,5*	*2x3/4"*	*101*
M132S	*774*	*875*	*258*	*181*	*1"+3/4"*	*112*
M132M	*774*	*875*	*258*	*181*	*1"+3/4"*	*133*
M160M	*858*	*975*	*310*	*199*	*1"+3/4"*	*149*
M160L	*858*	*975*	*310*	*199*	*1"+3/4"*	*149*

Tolerances see page 1 - 4

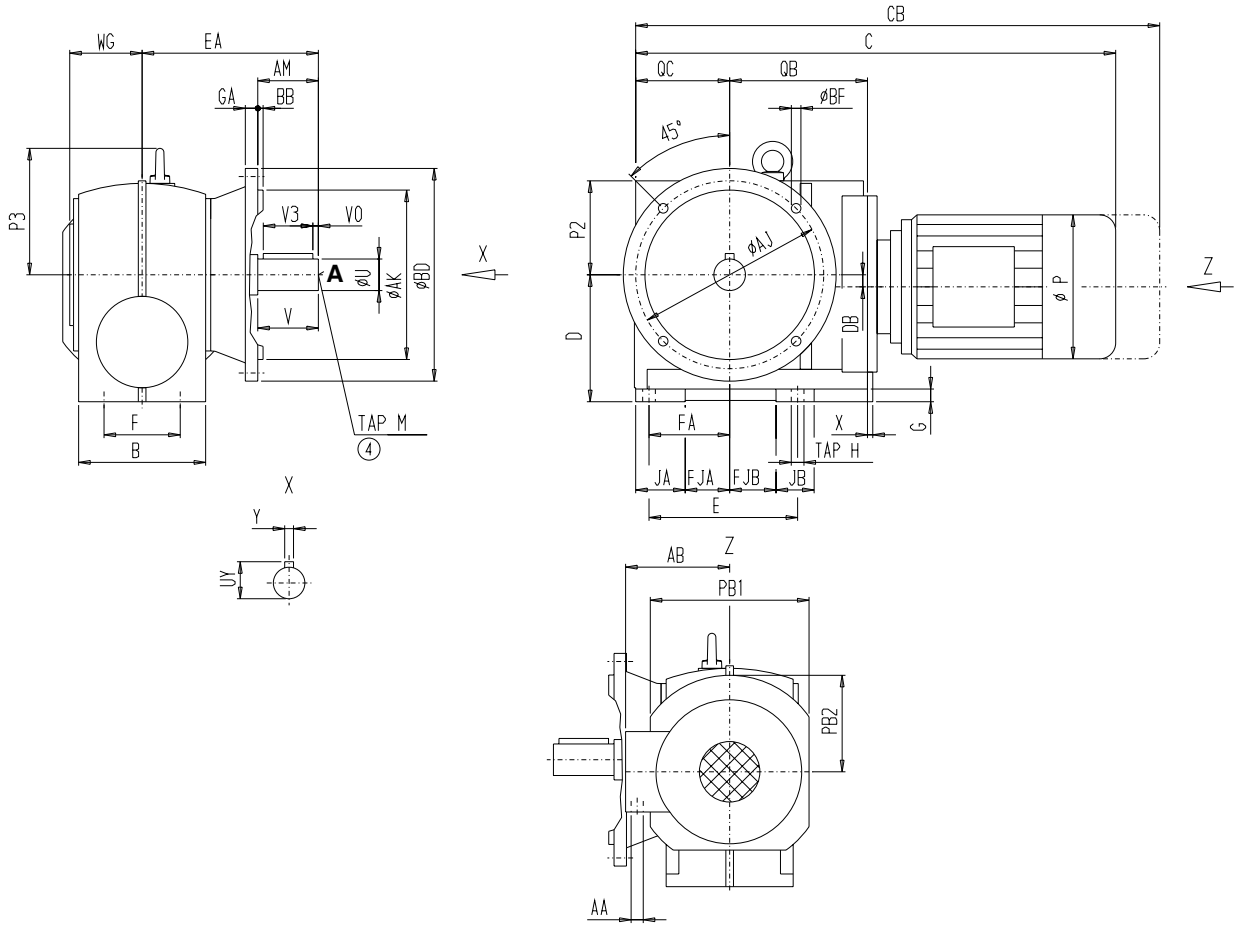
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Flange mounted

CF88

CF 510

[inch]



Mounting

BD	AK	GA	AJ	BB	BF
11.81	9.06	0.63	10.43	0.16	0.53

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
2	3.94	3.5	0.004	2.22	0.5	3.94	3/4-10UNC

Gearca3se

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	EA	TAP H
6.69	3.35	2.13	2.13	4.53	0.79	6.69	7.09	4.69	1.59	2.01	2.01	7.87	0.04	4.92	6.24	3.94	4.8	6.81	9.53	M16x36

Motor

	CF88					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CF88**
M71	20.69	22.42	5.43	4.67	2x1/2"	201
M80S	21.53	23.7	6.22	4.98	2x1/2"	205
M90S	23.15	25.74	6.93	5.91	2x3/4"	209
M90L	23.15	25.74	6.93	5.91	2x3/4"	214
M100L	24.92	27.75	7.64	6.3	2x3/4"	234
M112M	26.87	30.06	8.58	6.59	2x3/4"	254
M132S	30.44	34.41	10.16	7.13	1"+3/4"	278
M132M	30.44	34.41	10.16	7.13	1"+3/4"	324
M160M	33.74	38.35	12.2	7.83	1"+3/4"	359
M160L	33.74	38.35	12.2	7.83	1"+3/4"	359

Tolerances see page 1 - 4

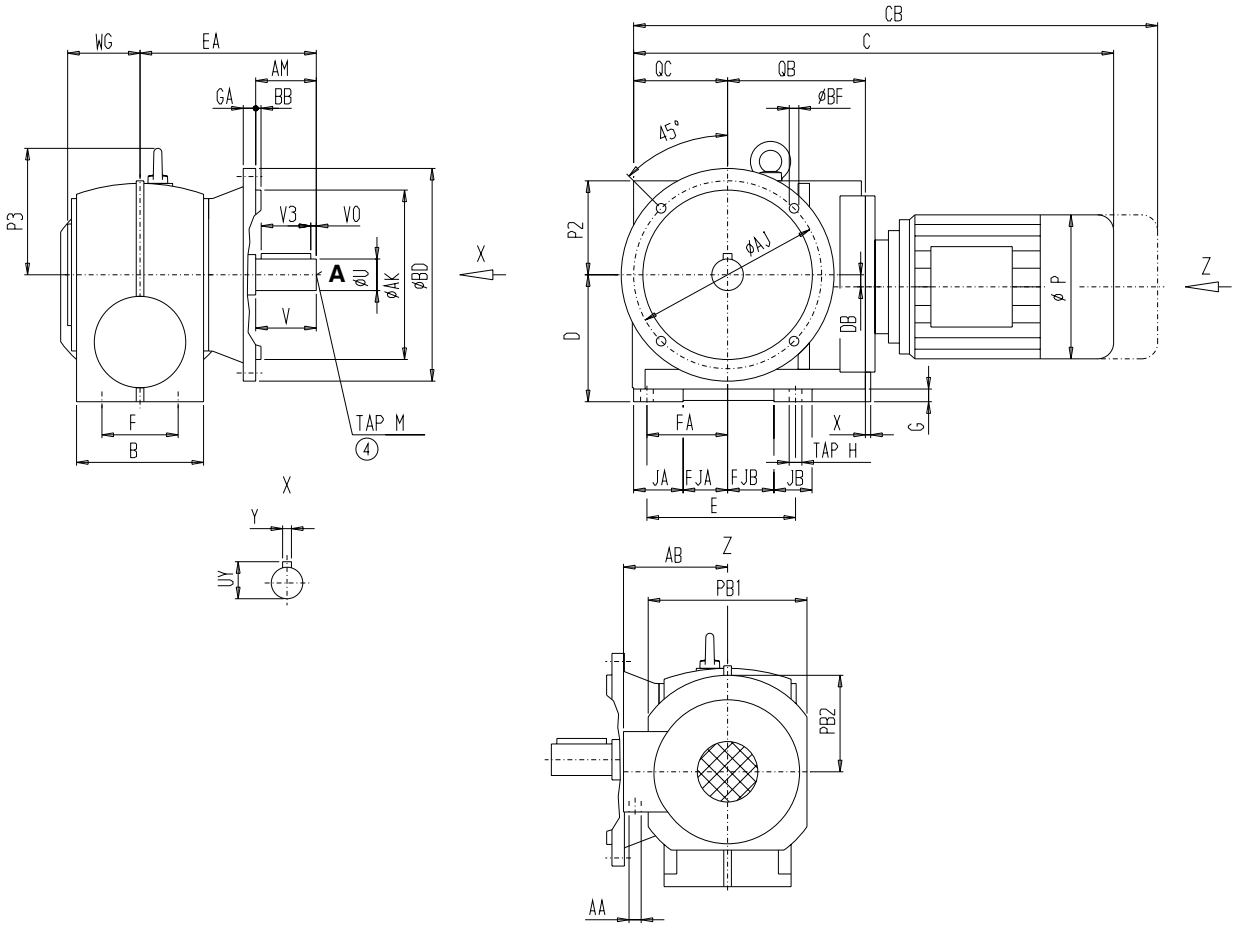
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Flange mounted

CF88

CF 510

[mm]



Mounting

BD	AK	GA	AJ	BB	BF
300	*230*	*16*	*265*	*4*	*13,5*

Output Shaft

U	V	V3	VO	UY	Y	AM	TAP M
50,8	*100*	*88,9*	*0,102*	*56,39*	*12,7*	*100*	*3/4"-10UNC*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	EA	TAP H
170	*85*	*54*	*54*	*115*	*20*	*170*	*180*	*119*	*40,5*	*51*	*51*	*200*	*1*	*125*	*158,5*	*100*	*122*	*173*	*242*	*M16x36*

Motor

	CF88					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CF88**
M71	*526,5*	*570,5*	*138*	*118,5*	*2x1/2"*	*91*
M80	*548*	*603*	*158*	*126,5*	*2x1/2"*	*93*
M90S	*589*	*655*	*176*	*150*	*2x3/4"*	*95*
M90L	*589*	*655*	*176*	*150*	*2x3/4"*	*97*
M100L	*634*	*706*	*194*	*160*	*2x3/4"*	*106*
M112M	*683,5*	*764,5*	*218*	*167,5*	*2x3/4"*	*115*
M132S	*774*	*875*	*258*	*181*	*1"+3/4"*	*126*
M132M	*774*	*875*	*258*	*181*	*1"+3/4"*	*147*
M160M	*858*	*975*	*310*	*199*	*1"+3/4"*	*163*
M160L	*858*	*975*	*310*	*199*	*1"+3/4"*	*163*

Tolerances see page 1 - 4

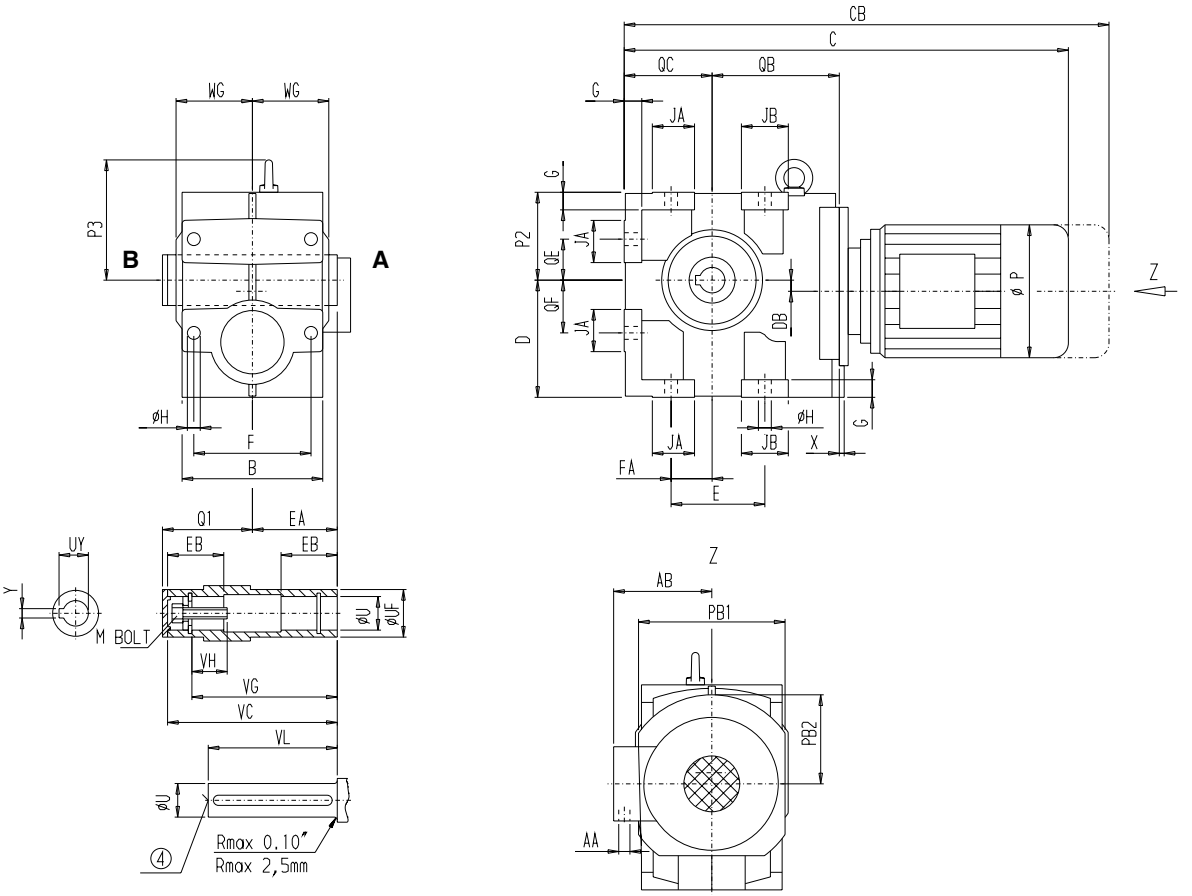
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted

CA88

CA 510

[inch]



Mounting

E	F	FA	G	H
5.31	5.91	2.95	0.98	0.69

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
2	3.15	8.27	7.087	6.5	1.62	3/4-10UNC	2.23	0.5	4.13	3.071	4.25

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3
7.28	7.09	2.36	2.95	4.69	1.59	2.72	2.44	7.87	0.04	4.92	6.24	3.94	4.92	6.97

Motor

	CA88					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CA88**
M71	20.69	22.42	5.43	4.67	2x1/2"	152
M80S	21.53	23.7	6.22	4.98	2x1/2"	157
M90S	23.15	25.74	6.93	5.91	2x3/4"	161
M90L	23.15	25.74	6.93	5.91	2x3/4"	165
M100L	24.92	27.75	7.64	6.3	2x3/4"	185
M112M	26.87	30.06	8.58	6.59	2x3/4"	205
M132S	30.44	34.41	10.16	7.13	1"+3/4"	229
M132M	30.44	34.41	10.16	7.13	1"+3/4"	276
M160M	33.74	38.35	12.2	7.83	1"+3/4"	311
M160L	33.74	38.35	12.2	7.83	1"+3/4"	311

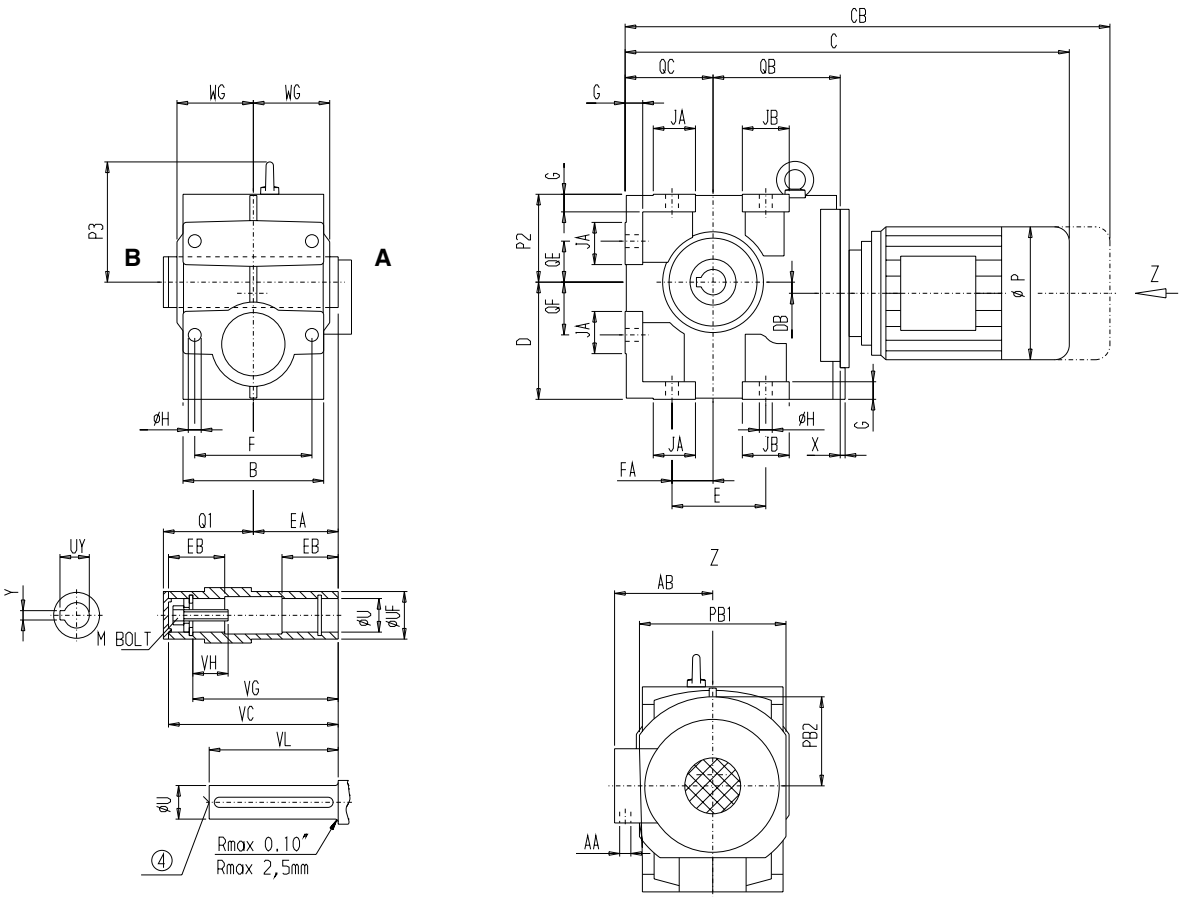
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted

CA88

CA 510

[mm]



Mounting

E	F	FA	G	H
135	*150*	*75*	*25*	*17,5*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
50,8	*80*	*210*	*180*	*165*	*41*	*3/4"-10UNC*	*56,64*	*12,7*	*105*	*78*	*108*

Gearcase

B	D	QF	QE	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3
185	*180*	*60*	*75*	*119*	*40,5*	*69*	*62*	*200*	*1*	*125*	*158,5*	*100*	*125*	*177*

Motor

	CA88					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CA88**
M71	*526,5*	*570,5*	*138*	*118,5*	*2x1/2"*	*69*
M80	*548*	*603*	*158*	*126,5*	*2x1/2"*	*71*
M90S	*589*	*655*	*176*	*150*	*2x3/4"*	*73*
M90L	*589*	*655*	*176*	*150*	*2x3/4"*	*75*
M100L	*634*	*706*	*194*	*160*	*2x3/4"*	*84*
M112M	*683,5*	*764,5*	*218*	*167,5*	*2x3/4"*	*93*
M132S	*774*	*875*	*258*	*181*	*1"+3/4"*	*104*
M132M	*774*	*875*	*258*	*181*	*1"+3/4"*	*125*
M160M	*858*	*975*	*310*	*199*	*1"+3/4"*	*141*
M160L	*858*	*975*	*310*	*199*	*1"+3/4"*	*141*

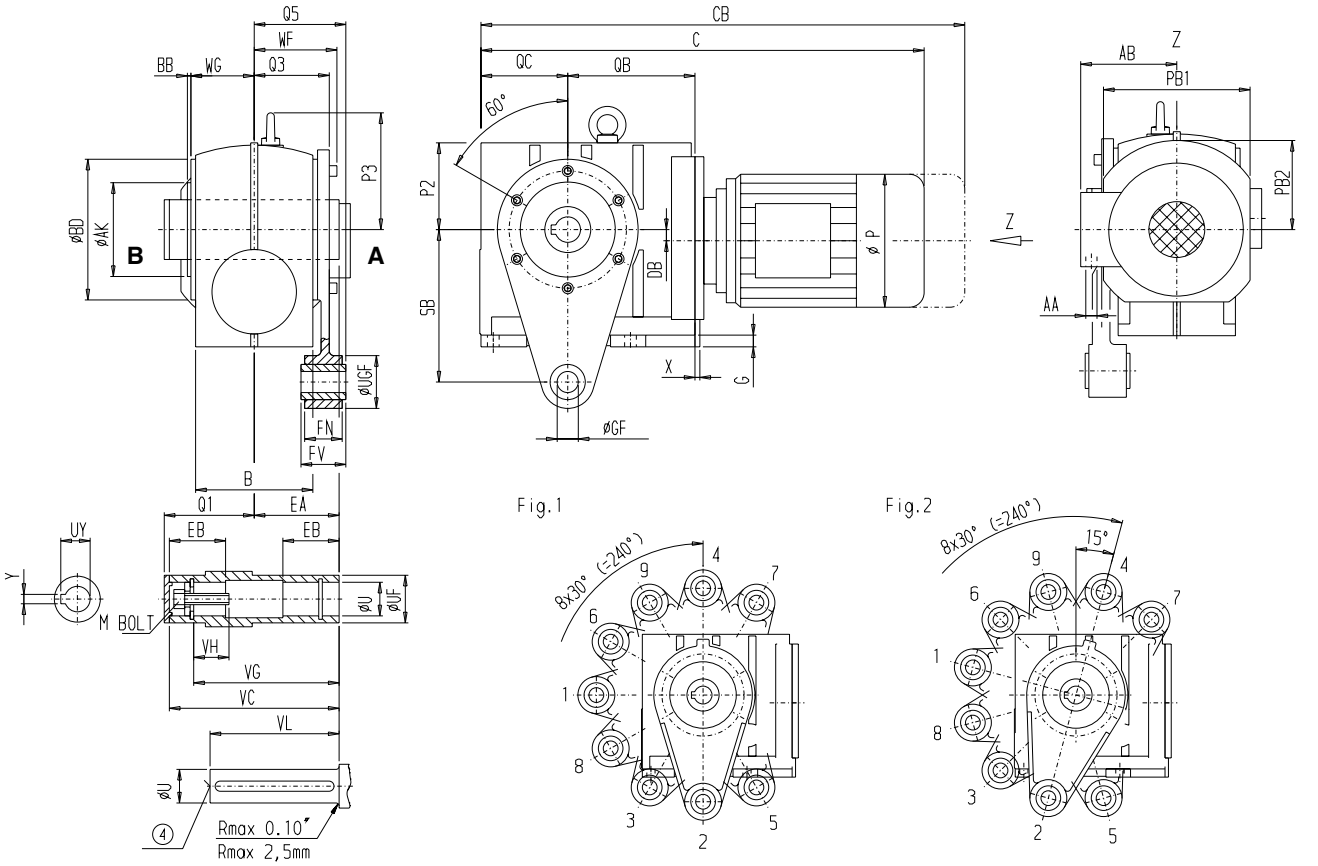
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with torque arm

CAD88

CAD 510
[inch]



Mounting

BD	AK	BB	G
7.48	5.12	0.14	0.79

Torque Arm

FN	FV	GF	UGF	SB	WF	Q3	Q5
1.57	1.81	0.98	2.36	9.84	4.72	4.39	5.26

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
2	3.15	8.27	7.087	6.5	1.62	3/4-10UNC	2.23	0.5	4.13	3.071	4.25

Gearcase

B	PB2	DB	PB1	X	QC	QB	WG	P2	P3
6.69	4.69	1.59	7.87	0.04	4.92	6.24	3.8	4.8	6.81

Motor

	CAD88					Weight [lb]
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAD88**
M71	20.69	22.42	5.43	4.67	2x1/2"	174
M80S	21.53	23.7	6.22	4.98	2x1/2"	179
M90S	23.15	25.74	6.93	5.91	2x3/4"	183
M90L	23.15	25.74	6.93	5.91	2x3/4"	187
M100L	24.92	27.75	7.64	6.3	2x3/4"	207
M112M	26.87	30.06	8.58	6.59	2x3/4"	225
M132S	30.44	34.41	10.16	7.13	1"+3/4"	251
M132M	30.44	34.41	10.16	7.13	1"+3/4"	298
M160M	33.74	38.35	12.2	7.83	1"+3/4"	333
M160L	33.74	38.35	12.2	7.83	1"+3/4"	333

Tolerances see page 1 - 4
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with torque arm

CAD88

CAD 510

[mm]

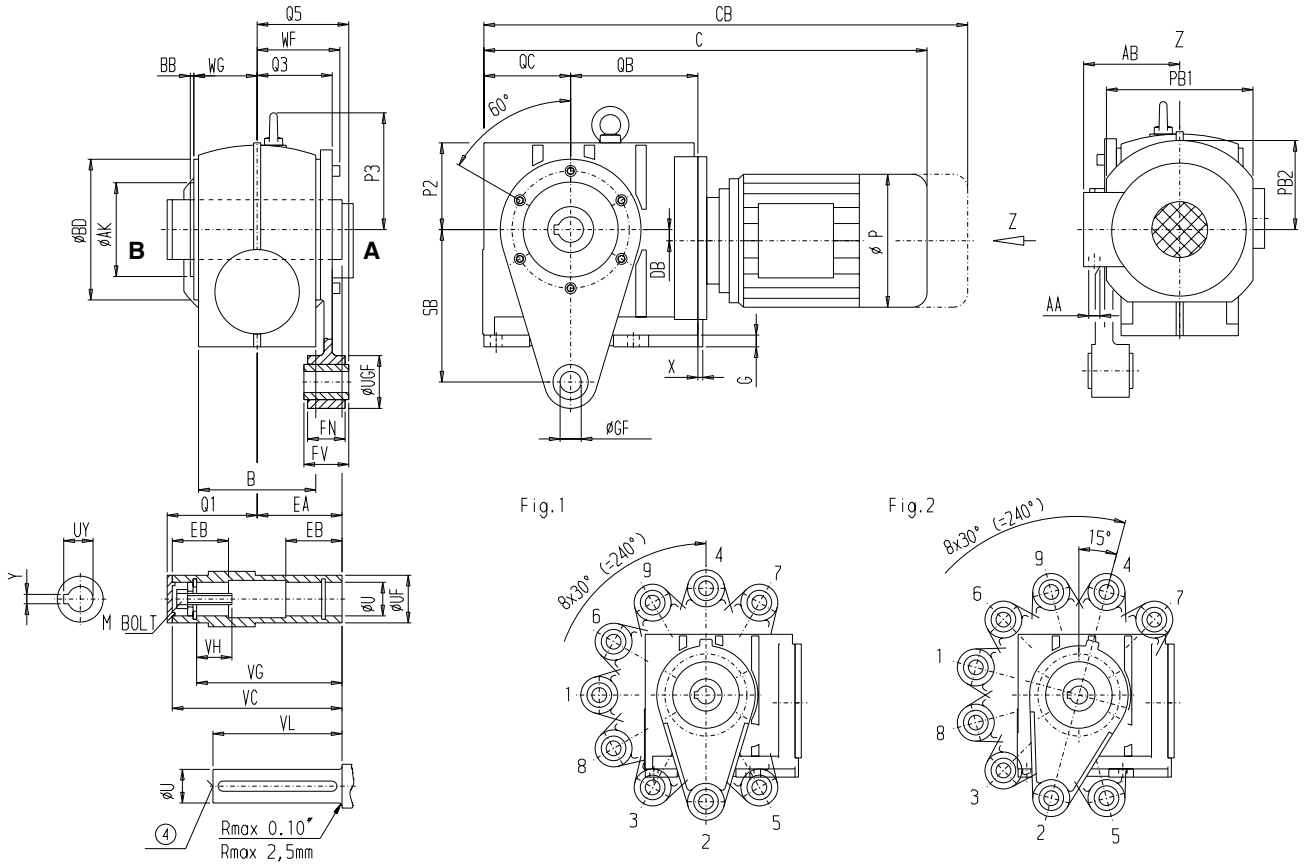


Fig.1

Fig.2

Mounting

BD	AK	BB	G
190	*130*	*3,5*	*20*

Torque Arm

FN	FV	GF	UGF	SB	WF	Q3	Q5
40	*46*	*25*	*60*	*250*	*120*	*111,5*	*133,5*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
50,8	*80*	*210*	*180*	*165*	*41*	*3/4"-10UNC*	*56,64*	*12,7*	*105*	*78*	*108*

Gearcase

B	PB2	DB	PB1	X	QC	QB	WG	P2	P3
170	*119*	*40,5*	*200*	*1*	*125*	*158,5*	*96,5*	*122*	*173*

Motor

	CAD88					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAD88**
M71	*526,5*	*570,5*	*138*	*118,5*	*2x1/2"*	*79*
M80	*548*	*603*	*158*	*126,5*	*2x1/2"*	*81*
M90S	*589*	*655*	*176*	*150*	*2x3/4"*	*83*
M90L	*589*	*655*	*176*	*150*	*2x3/4"*	*85*
M100L	*634*	*706*	*194*	*160*	*2x3/4"*	*94*
M112M	*683,5*	*764,5*	*218*	*167,5*	*2x3/4"*	*102*
M132S	*774*	*875*	*258*	*181*	*1"+3/4"*	*114*
M132M	*774*	*875*	*258*	*181*	*1"+3/4"*	*135*
M160M	*858*	*975*	*310*	*199*	*1"+3/4"*	*151*
M160L	*858*	*975*	*310*	*199*	*1"+3/4"*	*151*

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

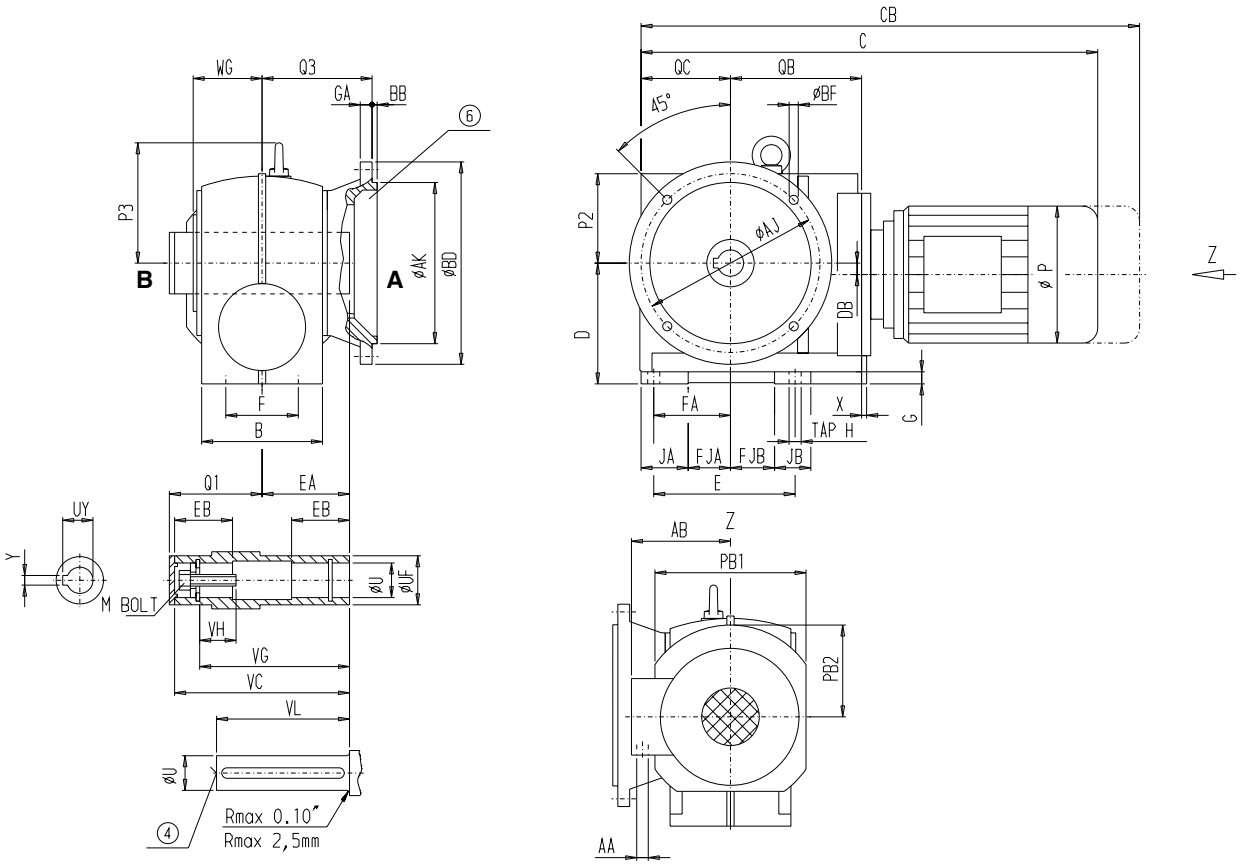
6

Worm Helical Gear Motors
Shaft mounted with flange

CAF88

CAF 510

[inch]



Mounting

BD	AK	GA	AJ	BB	Q3	TAP BF
9.84	7.09	0.59	8.46	0.16	5.93	0.53
11.81	9.06	0.63	10.43	0.16	5.59	0.53

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
2	3.15	8.27	7.087	6.5	1.62	3/4-10UNC	2.23	0.5	4.13	3.071	4.25

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	TAP H
6.69	3.35	2.13	2.13	4.53	0.79	6.69	7.09	4.69	1.59	2.01	2.01	7.87	0.04	4.92	6.24	3.94	4.8	6.81	M16x28

Motor

	CAF88					Weight [lb]
Motor	C	CB	P	AB	AA	CAF88
M71	20.69	22.42	5.43	4.67	2x1/2"	183
M80S	21.53	23.7	6.22	4.98	2x1/2"	187
M90S	23.15	25.74	6.93	5.91	2x3/4"	192
M90L	23.15	25.74	6.93	5.91	2x3/4"	196
M100L	24.92	27.75	7.64	6.3	2x3/4"	216
M112M	26.87	30.06	8.58	6.59	2x3/4"	234
M132S	30.44	34.41	10.16	7.13	1"+3/4"	260
M132M	30.44	34.41	10.16	7.13	1"+3/4"	306
M160M	33.74	38.35	12.2	7.83	1"+3/4"	342
M160L	33.74	38.35	12.2	7.83	1"+3/4"	342

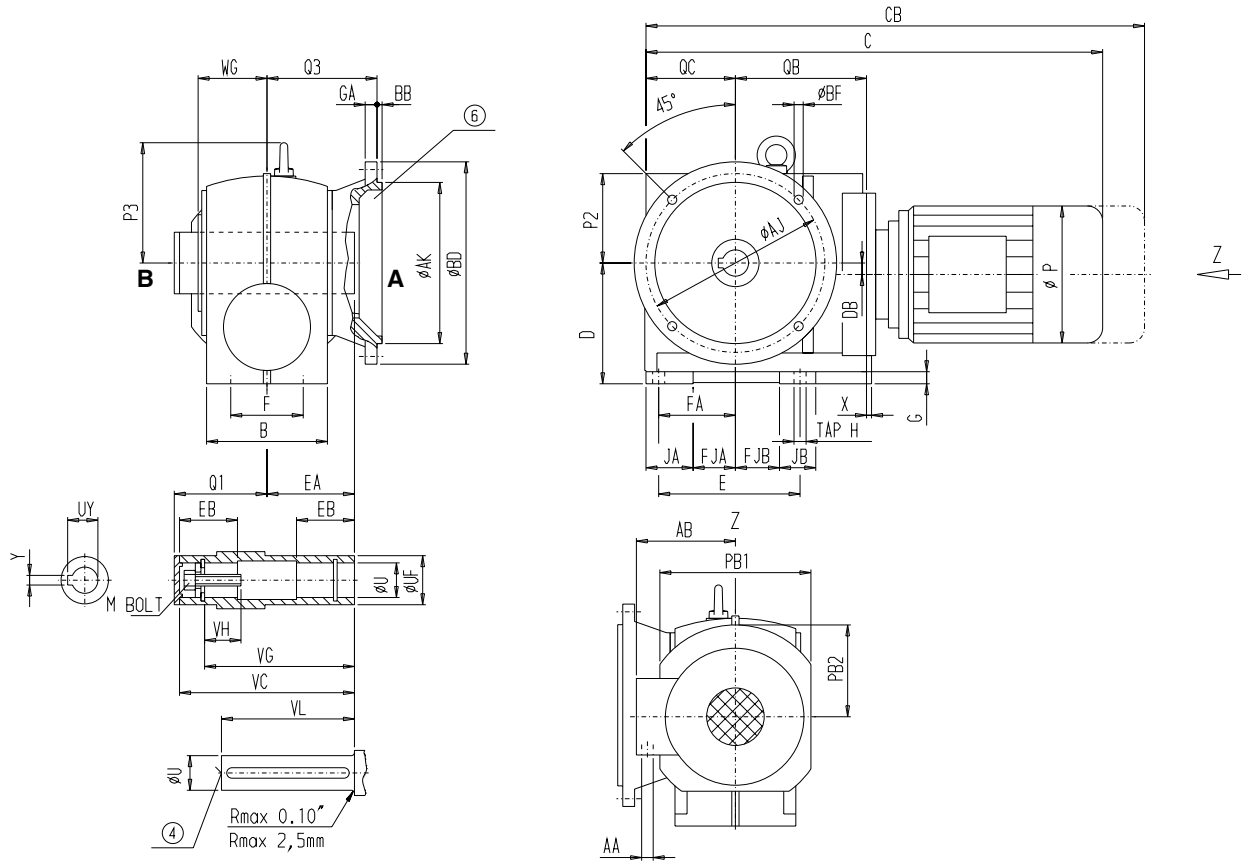
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 6 - 43

Worm Helical Gear Motors
Shaft mounted with flange

CAF88

CAF 510

[mm]



Mounting

BD	AK	GA	AJ	BB	Q3	BF
250	*180*	*15*	*215*	*4*	*150,5*	*13,5*
300	*230*	*16*	*265*	*4*	*142*	*13,5*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
50,8	*80*	*210*	*180*	*165*	*41*	*3/4"-10UNC*	*56,64*	*12,7*	*105*	*78*	*108*

Gearcase

E	FA	FJA	FJB	F	G	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	P2	P3	TAP H
170	*85*	*54*	*54*	*115*	*20*	*170*	*180*	*119*	*40,5*	*51*	*51*	*200*	*1*	*125*	*158,5*	*100*	*122*	*173*	*M16x28*

Motor

	CAF88					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAF88**
M71	*526,5*	*570,5*	*138*	*118,5*	*2x1/2"*	*83*
M80	*548*	*603*	*158*	*126,5*	*2x1/2"*	*85*
M90S	*589*	*655*	*176*	*150*	*2x3/4"*	*87*
M90L	*589*	*655*	*176*	*150*	*2x3/4"*	*89*
M100L	*634*	*706*	*194*	*160*	*2x3/4"*	*98*
M112M	*683,5*	*764,5*	*218*	*167,5*	*2x3/4"*	*106*
M132S	*774*	*875*	*258*	*181*	*1"+3/4"*	*118*
M132M	*774*	*875*	*258*	*181*	*1"+3/4"*	*139*
M160M	*858*	*975*	*310*	*199*	*1"+3/4"*	*155*
M160L	*858*	*975*	*310*	*199*	*1"+3/4"*	*155*

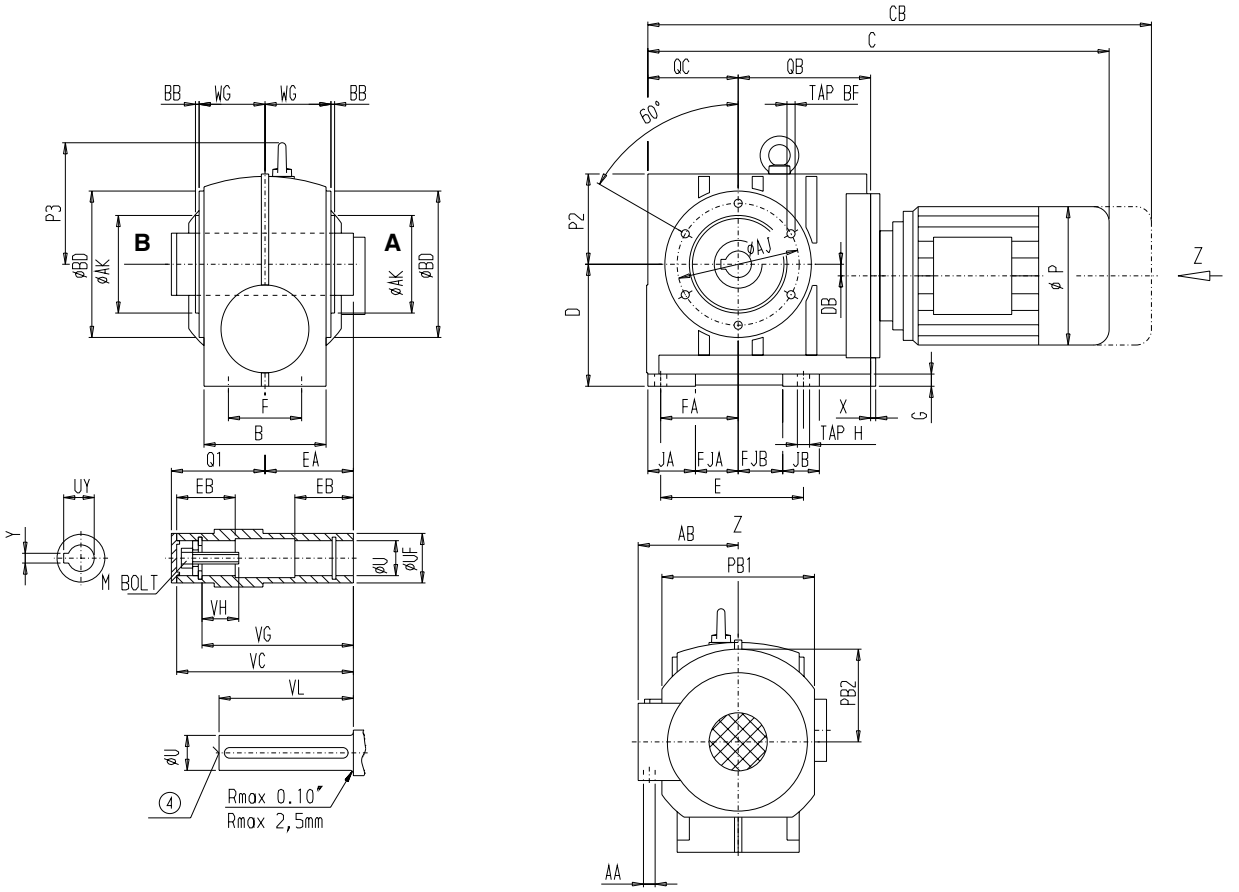
Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7 ⑥ Note see page 6 - 43

Worm Helical Gear Motors
Shaft mounted with housing flange (C-Type)

CAZ88

CAZ 510

[inch]



6

Mounting

BD	AK	AJ	BB	TAP BF
7.48	5.12	6.5	0.14	M12x21

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
2	3.15	8.27	7.087	6.5	1.62	3/4-10UNC	2.23	0.5	4.13	3.071	4.25

Gearcase

E	FA	FJA	FJB	F	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	G	P2	P3	TAP H
6.69	3.35	2.13	2.13	4.53	6.69	7.09	4.69	1.59	2.01	2.01	7.87	0.04	4.92	6.24	3.8	0.79	4.8	6.81	M16x28

Motor

	CAZ88					Weight [lb]
Motor	C	CB	P	AB	AA	CAZ88
M71	20.69	22.42	5.43	4.67	2x1/2"	168
M80S	21.53	23.7	6.22	4.98	2x1/2"	172
M90S	23.15	25.74	6.93	5.91	2x3/4"	176
M90L	23.15	25.74	6.93	5.91	2x3/4"	181
M100L	24.92	27.75	7.64	6.3	2x3/4"	201
M112M	26.87	30.06	8.58	6.59	2x3/4"	220
M132S	30.44	34.41	10.16	7.13	1"+3/4"	245
M132M	30.44	34.41	10.16	7.13	1"+3/4"	291
M160M	33.74	38.35	12.2	7.83	1"+3/4"	326
M160L	33.74	38.35	12.2	7.83	1"+3/4"	326

Tolerances see page 1 - 4

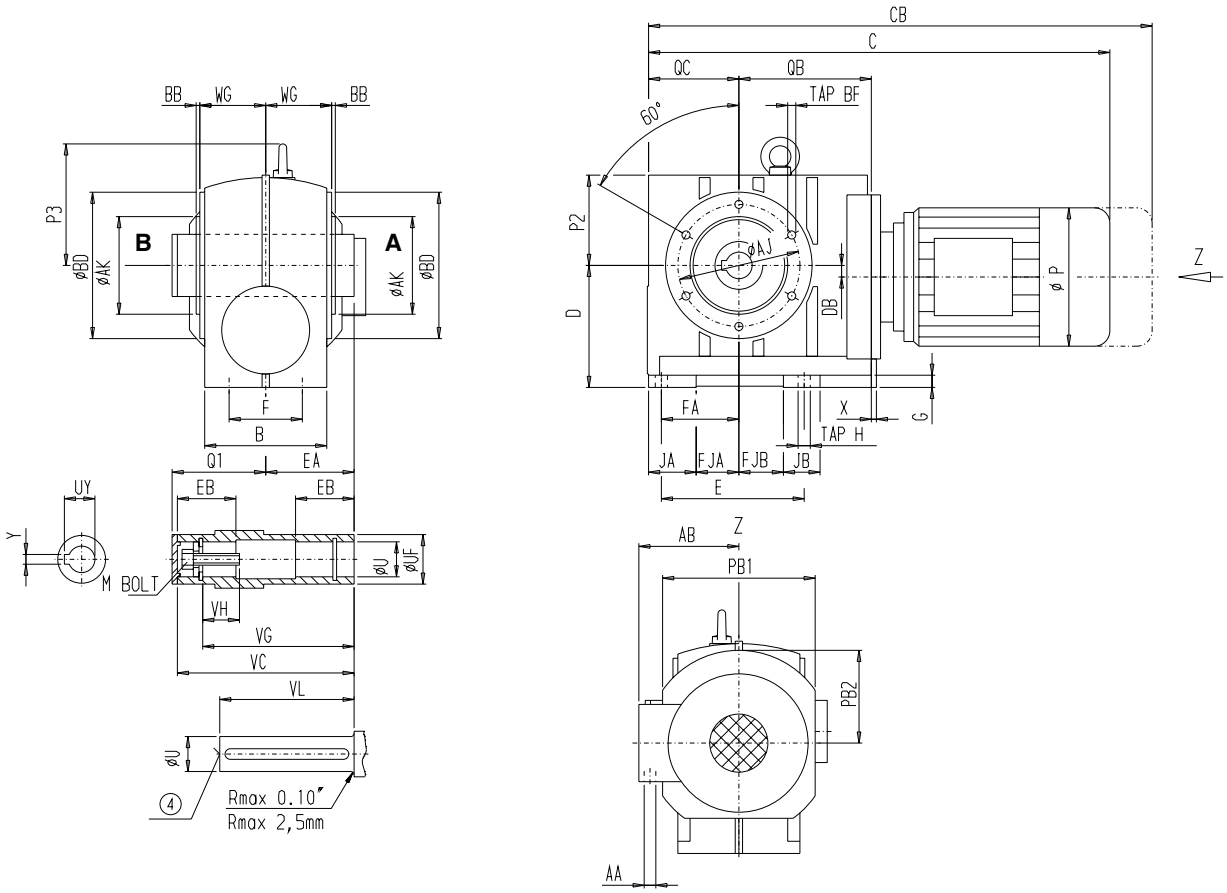
④ Tap specification see page 1 - 7

Worm Helical Gear Motors
Shaft mounted with housing flange (C-Type)

CAZ88

CAZ 510

[mm]



Mounting

BD	AK	AJ	BB	TAP BF
190	*130*	*165*	*3.5*	*M12x21*

Output Shaft

U	UF	VC	VG	VL	VH	M BOLT	UY	Y	EA	EB	Q1
50,8	*80*	*210*	*180*	*165*	*41*	*3/4"-10UNC*	*56.64*	*12.7*	*105*	*78*	*108*

Gearcase

E	FA	FJA	FJB	F	B	D	PB2	DB	JB	JA	PB1	X	QC	QB	WG	G	P2	P3	TAP H
170	*85*	*54*	*54*	*115*	*170*	*180*	*119*	*40.5*	*51*	*51*	*200*	*1*	*125*	*158.5*	*96.5*	*20*	*122*	*173*	*M16x28*

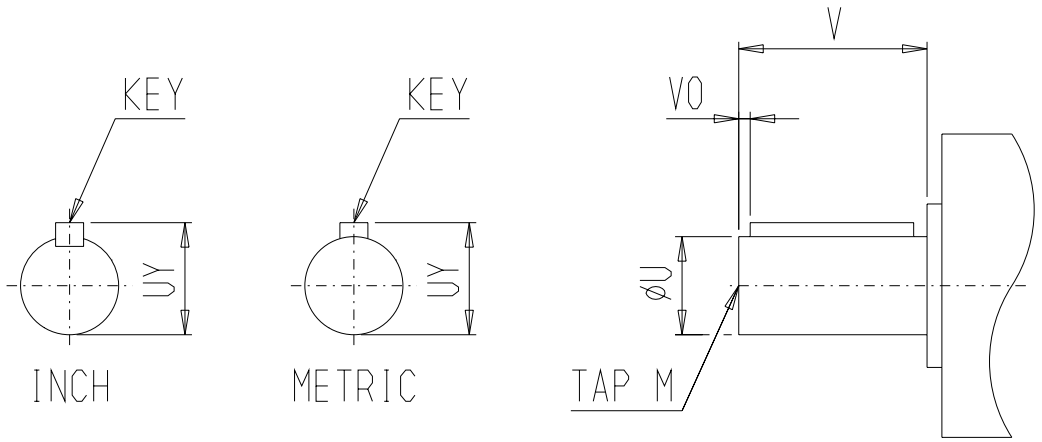
Motor

	CAZ88					Weight *[kg]*
Motor	**C**	**CB**	**P**	**AB**	**AA**	**CAZ88**
M71	*526,5*	*570,5*	*138*	*118,5*	*2x1/2"*	*76*
M80	*548*	*603*	*158*	*126,5*	*2x1/2"*	*78*
M90S	*589*	*655*	*176*	*150*	*2x3/4"*	*80*
M90L	*589*	*655*	*176*	*150*	*2x3/4"*	*82*
M100L	*634*	*706*	*194*	*160*	*2x3/4"*	*91*
M112M	*683,5*	*764,5*	*218*	*167,5*	*2x3/4"*	*100*
M132S	*774*	*875*	*258*	*181*	*1"+3/4"*	*111*
M132M	*774*	*875*	*258*	*181*	*1"+3/4"*	*132*
M160M	*858*	*975*	*310*	*199*	*1"+3/4"*	*148*
M160L	*858*	*975*	*310*	*199*	*1"+3/4"*	*148*

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Available Output Solid Shafts



INCH

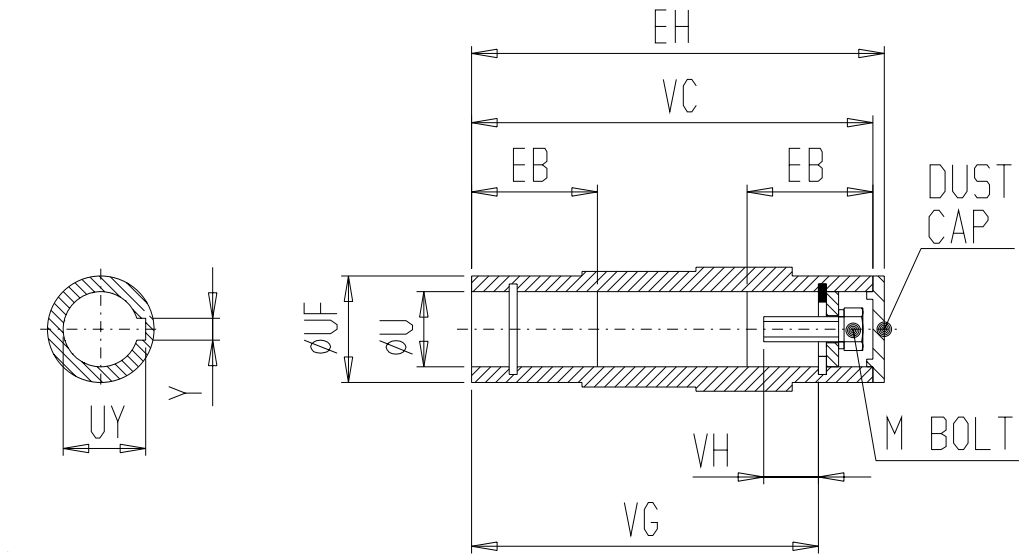
Size	U [inch]	UY [inch]	V [inch]	VO [inch]	KEY [inch]	TAP M [inch]
C/CF28	3/4	0.83	1.57	0.01	3/16 x 3/16 x 1 1/4	1/4 - 20 x 0.63
C/CF38 *	1	1.11	1.97	0.252	1/4 x 1/4 x 1 1/2	3/8 - 16 x 0.87
C/CF48 *	1 1/4	1.36	2.36	0.133	1/4 x 1/4 x 1 7/8	3/8 - 16 x 0.87
C.38	1 3/8	1.51	2.76	0.027	5/16 x 5/16 x 2 3/8	3/8 - 16 x 0.87
C.48 / **C/CF68 ***	1 5/8	1.79	3.15	0.065	3/8 x 3/8 x 2 3/4	5/8 - 11 x 1.42
C.68 / **C/CF88 ***	2	2.22	3.94	0.004	1/2 x 1/2 x 3 1/2	3/4 - 10 x 1.65
C.88	2 3/4	3.03	5.51	0.671	5/8 x 5/8 x 4 1/4	3/4 - 10 x 1.65

METRIC

Size	U [*mm*]	UY [*mm*]	V [*mm*]	VO [*mm*]	KEY [*mm*]	TAP M [*mm*]
C/CF28	*20*	*22.5*	*40*	*4*	*6 x 6 x 32*	*M6 x 16*
C/CF38 *	*25*	*28*	*50*	*5*	*8 x 7 x 40*	*M10 x 22*
C/CF48 *	*30*	*33*	*60*	*3.5*	*8 x 7 x 50*	*M10 x 22*
C/CF68 *	*40*	*43*	*80*	*5*	*12 x 8 x 70*	*M16 x 36*
C/CF88 *	*50*	*53.5*	*100*	*10*	*14 x 9 x 80*	*M16 x 36*

***** Second Shaft Extension possible (not for CF). Tolerances see page 1 - 4. Tap specification see page 1 - 7.

Available Output Hollow Shafts



INCH

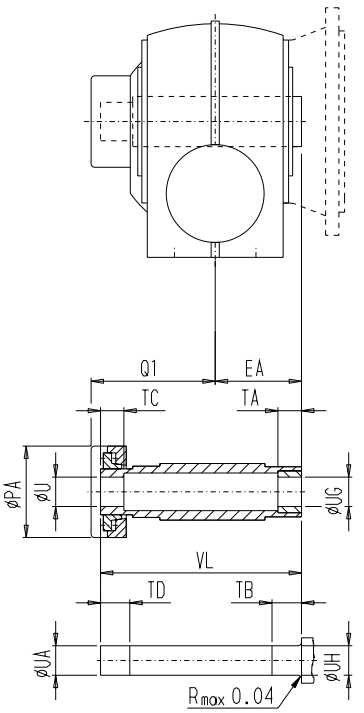
Size	VC [inch]	EH [inch]	EB [inch]	U [inch]	UF [inch]	UY [inch]	Y [inch]	VG [inch]	VH [inch]	M BOLT [inch]
CA.28	4.72	4.82	1.58	3/4	1.58	0.85	3/16	4.18	1.047	1/2 -13 UNC
CA.38		4.84	1.73	1 1/4	1.77	1.38	1/4	4.02	1.38	3/8 - 16 UNC
CA.48	5.91	6.02	2.28	1 3/8	2.17	1.53	5/16	5.04	1.37	3/8 - 16 UNC
				1 1/2		1.68	3/8		1.93	
CA.68	7.09	7.20	2.72	1 1/2	2.56	1.68	3/8	5.91	1.93	5/8 - 11 UNC
CA.88	8.27	8.39	3.07	2	3.15	2.23	1/2	7.09	1.62	3/4 - 10 UNC

METRIC

Size	VC [*mm*]	EH [*mm*]	EB [*mm*]	U [*mm*]	UF [*mm*]	UY [*mm*]	Y [*mm*]	VG [*mm*]	VH [*mm*]	M BOLT [*mm*]
CA.28	*120*	*122*	*40*	*20*	*40*	*22.8*	*6*	*106*	*23.4*	*M6 x 30*
CA.38		*123*	*44*	*30*	*45*	*33.3*	*8*	*102*	*31*	*M10 x 40*
CA.48	*150*	*153*	*58*	*35*	*55*	*38.3*	*10*	*128*	*40*	*M12 x 50*
CA.68	*180*	*183*	*69*	*45*	*65*	*48.8*	*14*	*150*	*47*	*M16 x 60*
CA.88	*210*	*213*	*78*	*60*	*80*	*64.4*	*18*	*180*	*54*	*M20 x 70*

Tolerances see page 1 - 4.

Helical Worm Gear Motors shaft mounted with shrink disk



Model	U UA [inch] [*mm*]	UG UH [inch] [*mm*]	VL [inch] [*mm*]	TA [inch] [*mm*]	TB [inch] [*mm*]	TC [inch] [*mm*]	TD [inch] [*mm*]	PA [inch] [*mm*]	EA [inch] [*mm*]	Q1 [inch] [*mm*]	1) Motor size
CA.S28	-	-	5.59	0.91	0.98	0.91	0.98	2.28	2.36	3.58	
	20	*20*	*142*	*23*	*25*	*23*	*25*	*58*	*60*	*91*	*100 **
CA.S38	-	-	6.54	0.79	0.98	1.06	1.26	3.03	2.76	4.09	
	30	*30*	*166*	*20*	*25*	*27*	*32*	*77*	*70*	*104*	*100*
CA.S38	-	-	5.75	0.79	0.98	0.87	1.06	3.03	2.36	3.70	
	30	*30*	*146*	*20*	*25*	*22*	*27*	*77*	*60*	*94*	*100*
CA.S48	-	-	6.97	0.79	0.98	0.98	1.18	3.66	2.95	4.29	
	40	*40*	*177*	*20*	*25*	*25*	*30*	*93*	*75*	*109*	*112*
CA.S68	-	-	8.23	0.79	0.98	1.06	1.26	4.41	3.54	4.96	
	50	*50*	*209*	*20*	*25*	*27*	*32*	*112*	*90*	*126*	*132*
CA.S88	-	-	9.49	1.18	1.38	1.14	1.34	5.20	4.13	5.67	
	60	*60*	*241*	*30*	*35*	*29*	*34*	*132*	*105*	*144*	*160*

1) Largest mountable motor size

*) CA. S 28-90 not possible

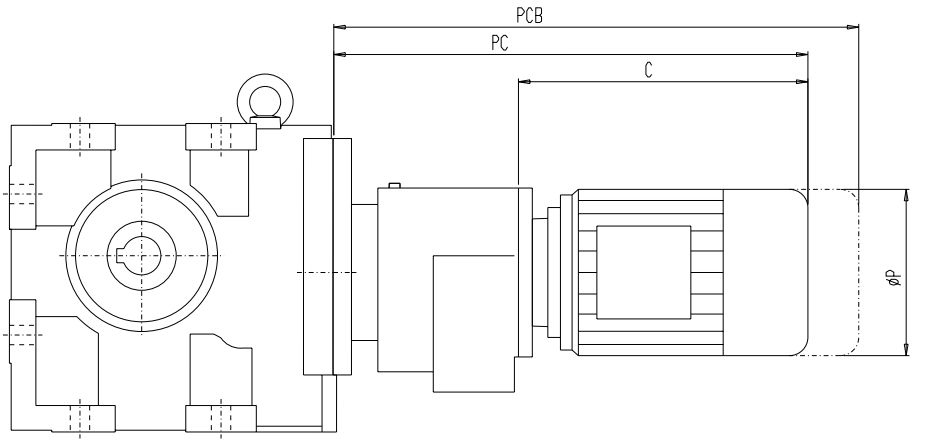
Tolerances see page 1 - 4.

Minimum strength of machines drive shaft 50000 psi (360 N/mm^2)

Tandem-Helical Worm Gear Motors

C 710

[inch]



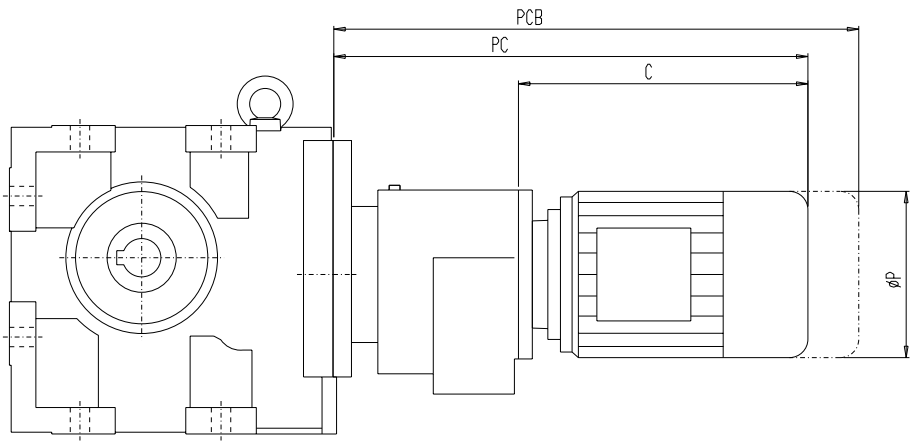
Gear Units		P	PC	PCB	C
C.38-Z28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
	M100L	7.64	20.87	23.7	14.57
C.38-D28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
C.48-Z28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42
	M100L	7.64	20.87	23.7	14.57
C.48-D28	M71	5.43	14.35	16.08	8.09
	M71MP	5.43	14.94	17.11	8.68
	M90S	6.93	17.68	20.28	11.42
	M90L	6.93	17.68	20.28	11.42

Gear Units		P	PC	PCB	C
C.68-Z28	M71	5.43	14.14	15.87	8.09
	M71MP	5.43	14.73	16.9	8.68
	M90S	6.93	17.47	20.07	11.42
	M90L	6.93	17.47	20.07	11.42
	M100L	7.64	20.66	23.49	14.57
C.68-D28	M71	5.43	14.14	15.87	8.09
	M71MP	5.43	14.73	16.9	8.68
	M90S	6.93	17.47	20.07	11.42
	M90L	6.93	17.47	20.07	11.42
C.88-Z28	M71	5.43	13.9	15.63	8.09
	M71MP	5.43	14.49	16.66	8.68
	M90S	6.93	17.23	19.83	11.42
	M90L	6.93	17.23	19.83	11.42
	M100L	7.64	20.42	23.25	14.57
C.88-D28	M71	5.43	13.9	15.63	8.09
	M71MP	5.43	14.49	16.66	8.68
	M90S	6.93	17.23	19.83	11.42
	M90L	6.93	17.23	19.83	11.42

Tandem-Helical Worm Gear Motors

C 710

[*mm*]



Gear Units		P	PC	PCB	C
C.38-Z28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
	M100L	194	531,5	603,5	370
C.38-D28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
C.48-Z28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290
	M100L	194	531,5	603,5	370
C.48-D28	M71	138	366	410	205,5
	M71MP	138	381	436	220,5
	M90S	176	450,5	516,5	290
	M90L	176	450,5	516,5	290

Gear Units		P	PC	PCB	C
C.68-Z28	M71	138	360,5	404,5	205,5
	M71MP	138	375,5	430,5	220,5
	M90S	176	445	511	290
	M90L	176	445	511	290
	M100L	194	526	598	370
C.68-D28	M71	138	360,5	404,5	205,5
	M71MP	138	375,5	430,5	220,5
	M90S	176	445	511	290
	M90L	176	445	511	290
C.88-Z28	M71	138	354,5	398,5	205,5
	M71MP	138	369,5	424,5	220,5
	M90S	176	439	505	290
	M90L	176	439	505	290
	M100L	194	520	592	370
C.88-D28	M71	138	354,5	398,5	205,5
	M71MP	138	369,5	424,5	220,5
	M90S	176	439	505	290
	M90L	176	439	505	290

Helical Worm Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

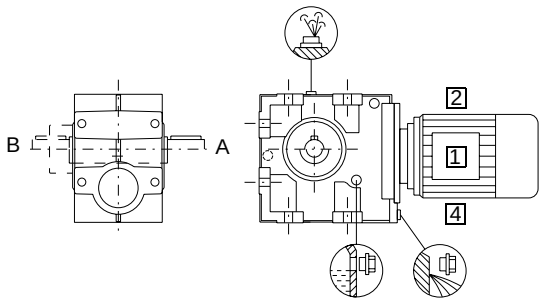
Frame size 28:
These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.

From frame size 38:

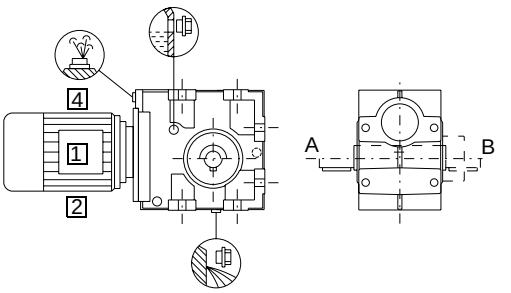
Oil level Ventilation Oil drain

* on opposite side
A, B position of solid shaft or assembly shaft of customer

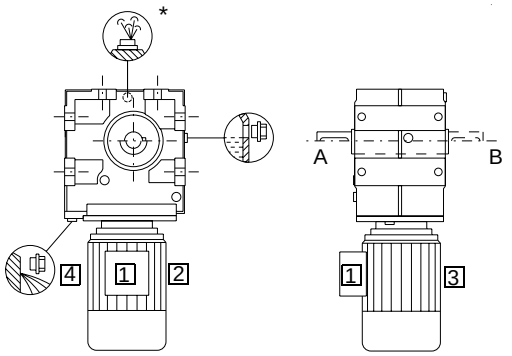
C
CA, CAS, CAT
B3-00 (IM B3-00)
H-01



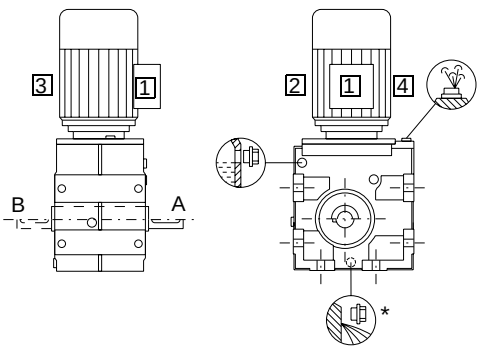
C
CA, CAS, CAT
B8-00 (IM B8-00)
H-02



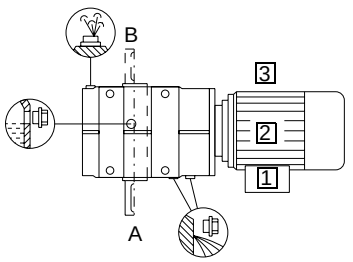
C
CA, CAS, CAT
B6-00 (IM B6-00)
H-04



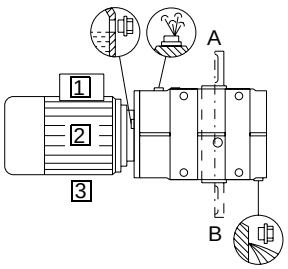
C
CA, CAS, CAT
B7-00 (IM B7-00)
H-03



C
CA, CAS, CAT
V5-00 (IM V5-00)
H-05



C
CA, CAS, CAT
V6-00 (IM V6-00)
H-06



Helical Worm Gear Motors and Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

IM designations correspond to IEC 60034-7.

1 ... 4 Position of terminal box, see also Electrical Part.

Oil fitting

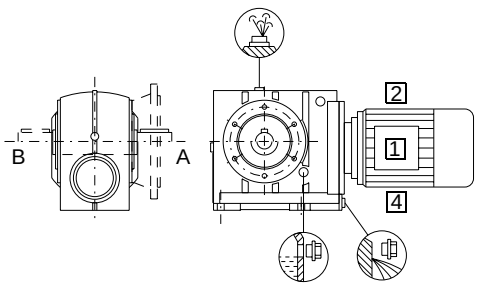
Frame size 28:
These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.

From frame size 38:

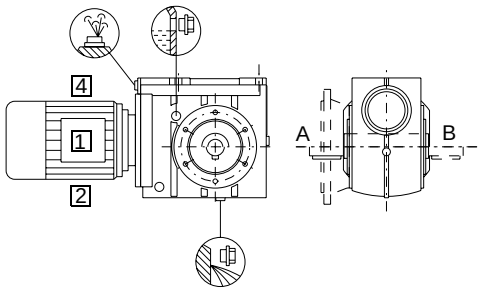
Oil level Ventilation Oil drain

A, B position of solid shaft or assembly shaft of customer

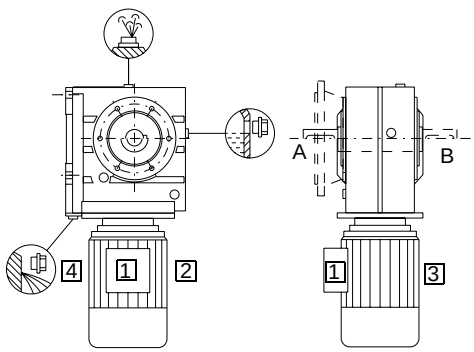
CF
CAD., CAF. CAZ.
B5-01 (IM B5-01**)**
H-01



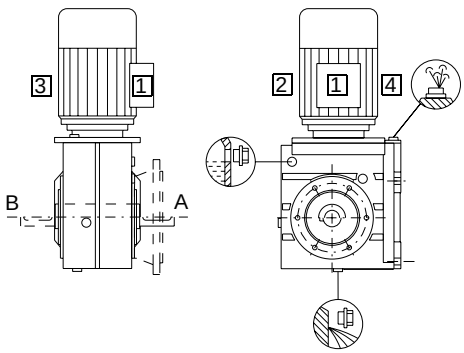
CF
CAD., CAF. CAZ.
B5-03 (IM B5-03**)**
H-02



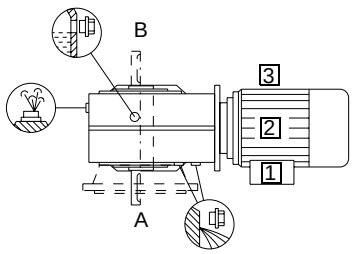
CF
CAD., CAF. CAZ.
B5-00 (IM B5-00**)**
H-04



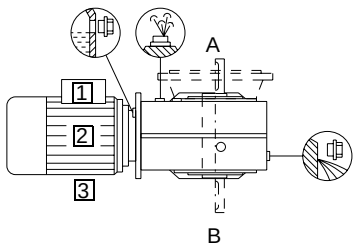
CF
CAD., CAF. CAZ.
B5-02 (IM B5-02**)**
H-03



CF
CAD., CAF. CAZ.
V1-00 (IM V1-00**)**
H-05



CF
CAD., CAF. CAZ.
V3-00 (IM V3-00**)**
H-06



6

Tandem-Helical Worm Gear Motors and Tandem-Gear Units

Mounting positions

When ordering, please state the mounting position in order to assure correct oil quantity.
In case of mounting position other than shown here with regard to the oil quantity please contact FLENDER.

Note:
In a horizontal mounting position the smaller gear unit generally is turned to the bottom.

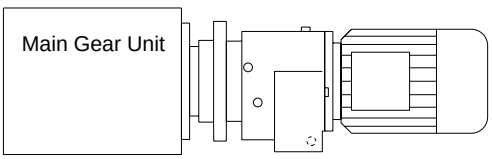
IM designations correspond to IEC 60034-7.

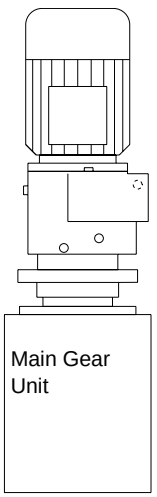
1 ... 4 Position of terminal box, see also Electrical Part.

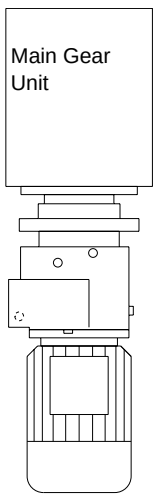
Oil fitting

Frame size 28:

These types are supplied with lifetime-lubrication. Vent-, oil-level- and oil drain-plugs are not available.







Lubrication

MOTOX-N-Helical Worm Gear Units of sizes 38...88 are furnished with filler, oil level and drain plug. Before starting operations the separately supplied breather plug has to replace the filler plug.
The size 28 have no venting, oil level and oil drain screw. Because of the low thermal load, no lubricant-change is necessary.
All speed reducers are supplied with oil, ready for service, unless otherwise indicated. In order to supply units with an adequate quantity of lubricant, the type of **mounting positions must be stated when ordering.**

MOTOX-N Helical Worm Geared Units are supplied with long term lubrication. The synthetic oil filling is added at the factory unless otherwise indicated. The unit's name plate refers oil type (PGLP) and ISO-viskosity class.

Maintenance
of the helical worm gear units has to be carried out in accordance with the Operating Instructions manual supplied with the units.

Lubricant selection table

Ambient temperature °C	Marking according to DIN 51502	Examples of Lubricants							
		ARAL	bp	Castrol	DEA	Esso	FUCHS	KLÜBER LUBRICATION	Shell
-20* ... + 50	CLP PG ISO VG 220	Degol GS 220	Enersyn SG-XP 220	Optiflex A220 Tribol 800/220	Polydea PGLP 220	Glycolube 220	Renolin PG 220	Syntheso D 220 EP	Tivela S 220
0* ... + 60*	CLP PG ISO VG 460	Degol GS 450	Enersyn SG-XP 460	Optiflex A460 Tribol 800/460	Polydea PGLP 460	Glycolube 460	Renolin PG 460	Syntheso D 460 EP	Tivela S 460

Other brands on request or see operating instruction BA7300.

* **Note:**
Ambient temperatures for motors according to EN 60034-1; see "Greasing of the bearings" in electrical section of this catalogue.

Oil quantities (*litre* / US gallon)

The quantities listed in the following tables are reference values.
The exact oil quantities are specified on the rating plates of the drives.

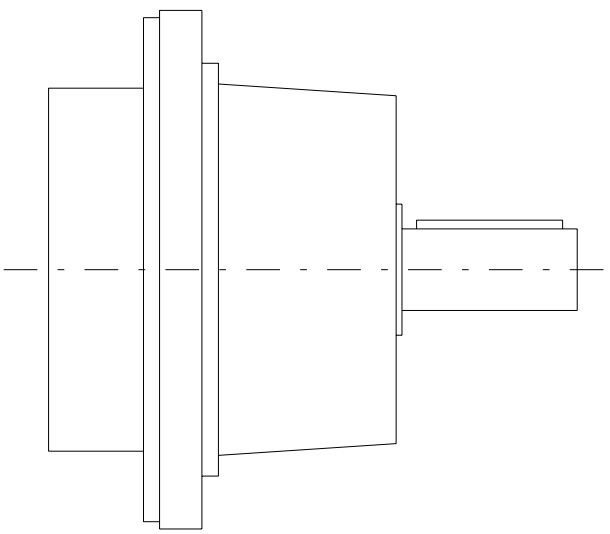
Important:
The value on the left (*italic*) is in litres; the value on the right is in U.S. gallons.

Types of gear unit
C, CA, CAS, CAT

Typ(e)	Mounting position					
	B3-00 H-01	B8-00 H-02	B7-00 H-03	B6-00 H-04	V5-00 H-05	V6-00 H-06
C.28	*0.20* / 0.05	*0.40* / 0.11	*0.60* / 0.16	*0.20* / 0.05	*0.65* / 0.17	*0.35* / 0.09
C.38	*0.50* / 0.13	*1.2* / 0.32	*1.3* / 0.34	*1.2* / 0.32	*1.2* / 0.32	*1.2* / 0.32
C.48	*0.70* / 0.18	*1.6* / 0.42	*1.7* / 0.45	*1.6* / 0.42	*1.3* / 0.34	*1.3* / 0.34
C.68	*1.5* / 0.4	*3.3* / 0.87	*4.1* / 1.08	*3.3* / 0.87	*2.8* / 0.74	*2.9* / 0.77
C.88	*1.7* / 0.45	*6.1* / 1.61	*6.5* / 1.72	*5.1* / 1.35	*4.5* / 1.19	*4.5* / 1.19

Types of gear unit
CF, CAD, CAF, CAZ, CADS, CAFS, CAZS, CADT, CAFT, CAZT

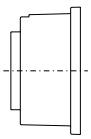
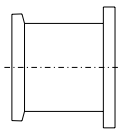
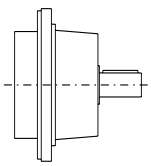
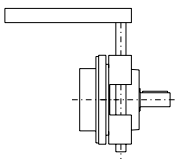
Typ(e)	Mounting position					
	B5-01 H-01	B5-03 H-02	B5-02 H-03	B5-00 H-04	V1-00 H-05	V3-00 H-06
C.28	*0.20* / 0.05	*0.40* / 0.11	*0.60* / 0.16	*0.20* / 0.05	*0.65* / 0.17	*0.35* / 0.09
C.38	*0.40* / 0.11	*1.2* / 0.32	*1.3* / 0.34	*1.1* / 0.29	*1.00* / 0.26	*1.00* / 0.26
C.48	*0.50* / 0.13	*1.7* / 0.45	*1.8* / 0.48	*1.6* / 0.42	*1.3* / 0.34	*1.3* / 0.34
C.68	*1.5* / 0.4	*3.6* / 0.95	*4.2* / 1.11	*3.3* / 0.87	*3.1* / 0.82	*3.2* / 0.85
C.88	*1.7* / 0.45	*5.9* / 1.56	*7.3* / 1.93	*5.2* / 1.37	*4.8* / 1.27	*4.8* / 1.27



Input Units

7

Table of Contents **Page**

Typ(e)	Description	elastic three piece coupling	Clamp collar	Backstop optional	Belt protection cover optional
 **K5TC (K4)**	short lantern with clamp collar for NEMA C-face-Motor (IEC on request)		✔		
 **KTC (K2)**	lantern three-piece coupled for NEMA C-face-Motor (IEC on request)	✔			
 **A5 (A)**	lantern with free-input shaft (metric shaft av.)			✔	
 **P5 (P)**	lantern with free-input shaft and piggy-back (IEC on request)			✔	✔

7

Maximum Allowable Weight of Motors with MOTOX-N Input Adaptor for C-face / IEC Motors

It is necessary to verify whether a Motor can be fully supported by the Gear-box. This can be verified by comparing the maximum moment exerted on the Gear-box to what is allowable. If the calculated moment exceeds the maximum allowable moment, it is recommended that a seperate Gear-box and Foot-mounted Motor be used. If a C-Face / IEC connection is still required, the Motor must be supported independently from the Gear-box. Utmost care must be taken to ensure that the support for the Motor does not impose forces on the Gear-box.

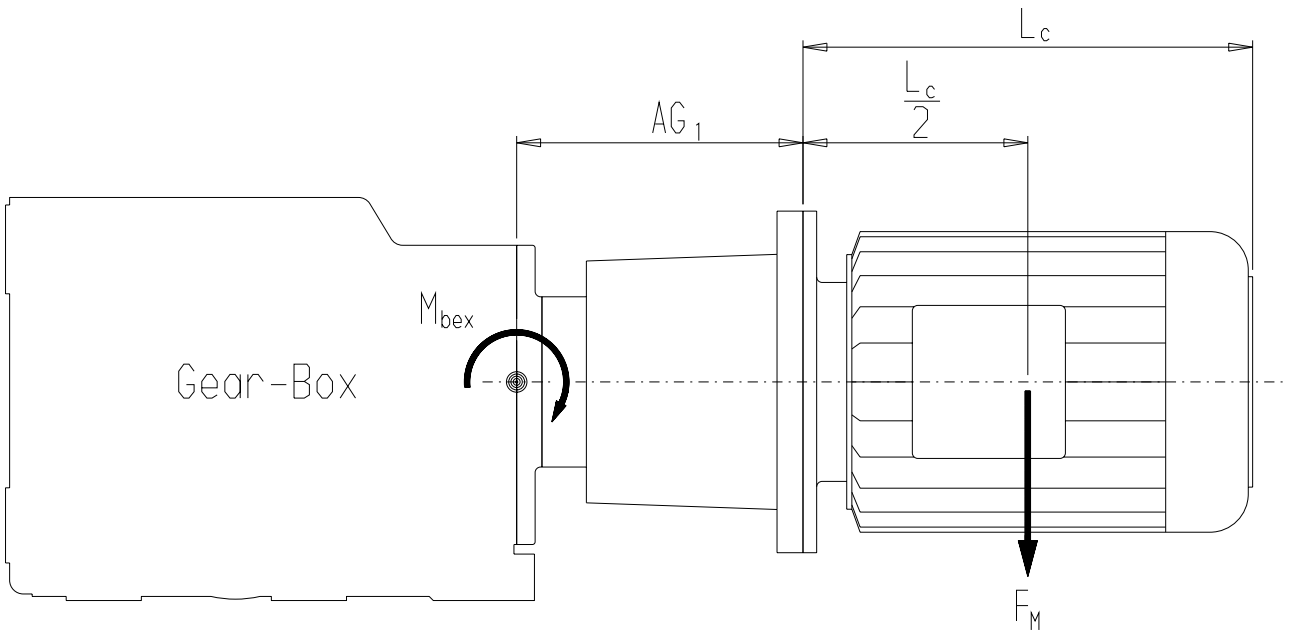
For the following Cases, Reference to this Document is necessary :

For all Gear-box combinations which are not depicted in this Catalogue.

For Motors which are connected through a K2, K4, KTC, K5TC Lantern to the Gear-box.

For Gear-boxes with Lantern, which are subjected to Shock Loads and Vibration. (e.g: Travel-Drives)

For Tandem-Gear-boxes, which are subjected to Shock Loads and Vibration. (e.g: Travel-Drives)



Input Adaptor

Nema Frame Size	56C	-	140TC	180TC	-	210TC	250TC	280TC	-	320TC	360TC
IEC Frame Size	71	80	90	100	112	132	160	180	200	225	250
Allowable Bending Moment M_{ba} [lb.in]	1408	1408	1408	1408	3906	6776	20274	54074	54074	53233	52205

AG_1 Dimension as in chapter 7 “Input Units” [in]

L_c Length of the motor [in]

F_M Weight of the motor [lbf]

M_{bex}* existing Bending Moment [lb.in]

*For application under shock load or vibration, multiply **M_{bex}** by **2**

Calculation of M_{bex} $M_{bex} = F_M * \{ AG_1 + (L_c / 2) \}$

Condition $M_{bex} < M_{ba}$

Motox-N backstops in input units

Optional backstops are offered on 3-Piece Coupled (KTC, K2) and separate input assemblies (A5, P5, A, P) for service conditions that require the prevention of reverse direction.

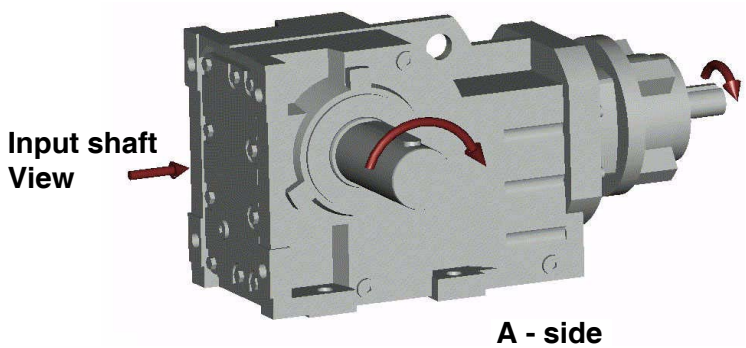
All backstops are internally mounted in the input adapter and will not interfere with usable shaft extensions. Backstops are sprag style and can be used up to a maximum speed of 3600 RPM. These backstops are considered to have limitless life when operating above the lift-off speed as given in the table below. Lift-off speed is defined as the speed at which the centrifugal force causes the sprag to lift off of the outer race when the shaft is rotating. Once the speed of the inner ring has dropped sufficiently to reduce the centrifugal force to less than the spring force, the sprag locates again on the outer ring and is ready to lock. No special lubrication is required for speeds above the lift-off speed. Backstops are not recommended for speeds below the lift-off speed due to lubrication concerns.

When ordering a reducer with a backstop, it will be necessary to indicate on the order the desired direction of rotation of the output shaft. The direction of rotation is determined by looking at the end of the output shaft. Indicate the direction of output shaft rotation as “CW” for clockwise or “CCW” for counter-clockwise. For helical bevel, parallel shafts, helical worm units it is also necessary to indicate from which side the output shaft extension is being viewed from, either “A” or “B”. “A” and “B” sides are clearly shown in the mounting position charts. The direction of rotation of the input unit is determined by looking at the drive end of the input shaft.

K2, KTC, A, A5, P, P5													
Nema Frame Size		56C		140TC	180TC		210TC	250TC		280TC	320TC	360TC	
IEC Frame Size		71	80	90	100	112	132	160	180	200	225	250	280
Lift-Off speed	[rpm]	890	820	820	750	750	670	670	610	610	610	610	400
Maximum allowable locking torque of backstop	[lb-in]	109	109	219	437	583	1340	2185	2695	4370	6556	8013	13111
	[Nm]	12.3	12.3	25	49	66	151	247	305	494	741	906	1482

Model	Unit size	Reduction stages	Output shaft (OS) view	Output shaft direction of rotation	Input shaft direction of rotation
Z	28 - 188	2	into OS	CW	CW
Z	28 - 188	2	into OS	CCW	CCW
D	28 - 188	3	into OS	CW	CCW
D	28 - 188	3	into OS	CCW	CW
FZ	28 - 188 B	2	into OS - A side	CW	CW
FZ	28 - 188 B	2	into OS - A side	CCW	CCW
FD	28 - 188 B	3	into OS - A side	CW	CCW
FD	28 - 188 B	3	into OS - A side	CCW	CW
C / B	38 - 88 / 28 - 38	2	into OS - A side	CW	CW
C / B	38 - 88 / 28 - 38	2	into OS - A side	CCW	CCW
K	38 - 88	3	into OS - A side	CW	CCW
K	38 - 88	3	into OS - A side	CCW	CW
K *	108 - 188	3	into OS - A side	CW	CW
K	108 - 188	3	into OS - A side	CCW	CCW
K	38 - 188	3	into OS - B side	CW	CCW
K	38 - 188	3	into OS - B side	CCW	CW

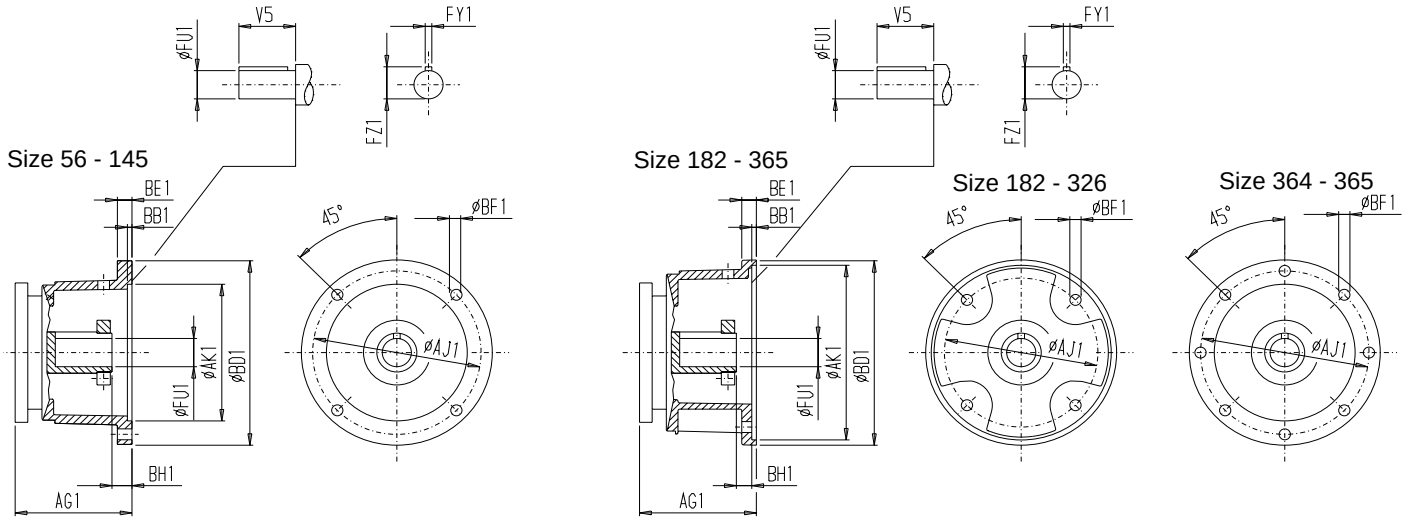
Example :
*** K 108 - 188**
view into OS - A side
rotation of output shaft = CW
rotation of input shaft = CW



Input Unit K5TC

K5TC

[inch]



Gear Units E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
					(56)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.625	2.06	0.03	0.007	2.44
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.11
-	-	B38	38B	-K5TC	(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.11
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	3.42
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	3.42
					(56)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.625	2.06	0.03	0.007	3.42
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	4.09
38	-	38/48	48B	-K5TC	(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	4.09
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.4
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.4
					(56)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.625	2.06	0.03	0.007	4.02
-	38	-	-	-K5TC	(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	4.69
					(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	4.69
					(56)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.625	2.06	0.03	0.007	3.21
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.88
48	-	68	68B	-K5TC	(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.88
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.19
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.19
					(56)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.625	2.06	0.03	0.007	3.88
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	4.55
-	48	-	-	-K5TC	(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	4.55
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.86
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.86
					(56)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.625	2.06	0.03	0.007	2.97
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.64
					(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.64
68	-	88	88B	-K5TC	(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	3.95
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	3.95
					(213)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	7.03
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	7.03
					(56)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.625	2.06	0.03	0.007	3.7
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	4.37
-	68	-	-	-K5TC	(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	4.37
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.68
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.68

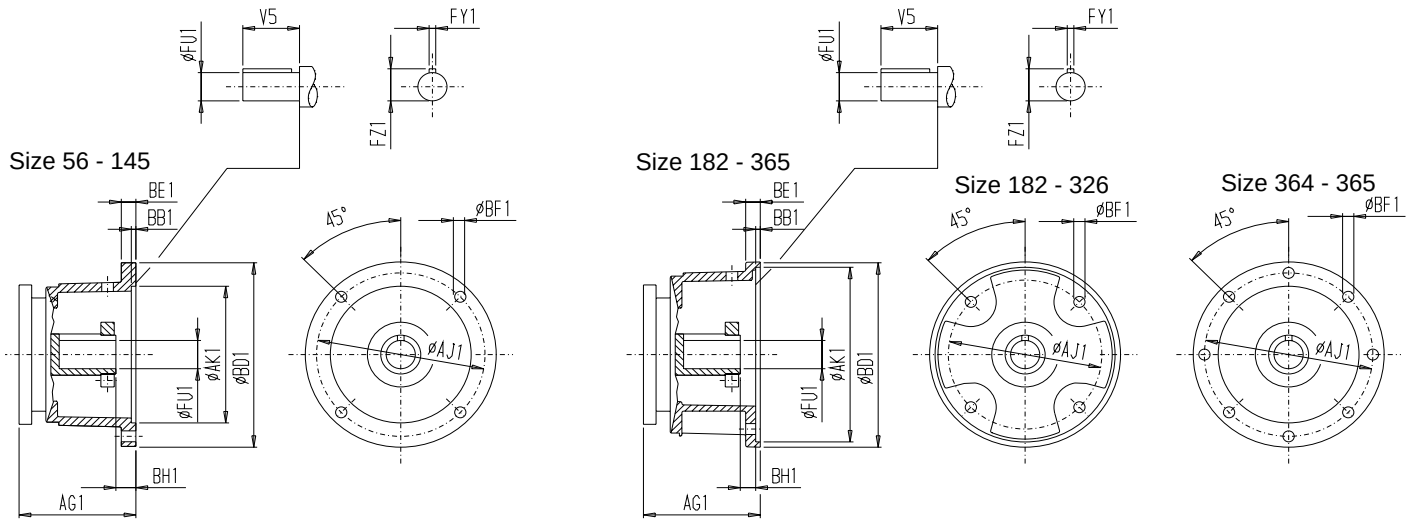
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit K5TC

K5TC

[mm]



Gear Units E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
					(56)	168	114,3	12	149,2	5	11	16,5	15,875	52,324	0,72	0,188	62,5
					(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	79,5
-	-	B38	38B	-K5TC	(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	79,5
					(182)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	87,5
					(184)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	87,5
					(56)	168	114,3	12	149,2	5	11	16,5	15,875	52,324	0,72	0,188	87,5
					(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	104,5
38	-	38/48	48B	-K5TC	(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	104,5
					(182)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	112,5
					(184)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	112,5
					(56)	168	114,3	12	149,2	5	11	16,5	15,875	52,324	0,72	0,188	102,5
-	38	-	-	-K5TC	(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	119,5
					(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	119,5
					(56)	168	114,3	12	149,2	5	11	16,5	15,875	52,324	0,72	0,188	82
					(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	99
48	-	68	68B	-K5TC	(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	99
					(182)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	107
					(184)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	107
					(56)	168	114,3	12	149,2	5	11	16,5	15,875	52,324	0,72	0,188	99
					(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	116
-	48	-	-	-K5TC	(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	116
					(182)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	124
					(184)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	124
					(56)	168	114,3	12	149,2	5	11	16,5	15,875	52,324	0,72	0,188	76
					(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	93
					(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	93
68	-	88	88B	-K5TC	(182)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	101
					(184)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	101
					(213)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	179
					(215)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	179
					(56)	168	114,3	12	149,2	5	11	16,5	15,875	52,324	0,72	0,188	94,5
					(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	111,5
-	68	-	-	-K5TC	(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	111,5
					(182)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	119,5
					(184)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	119,5

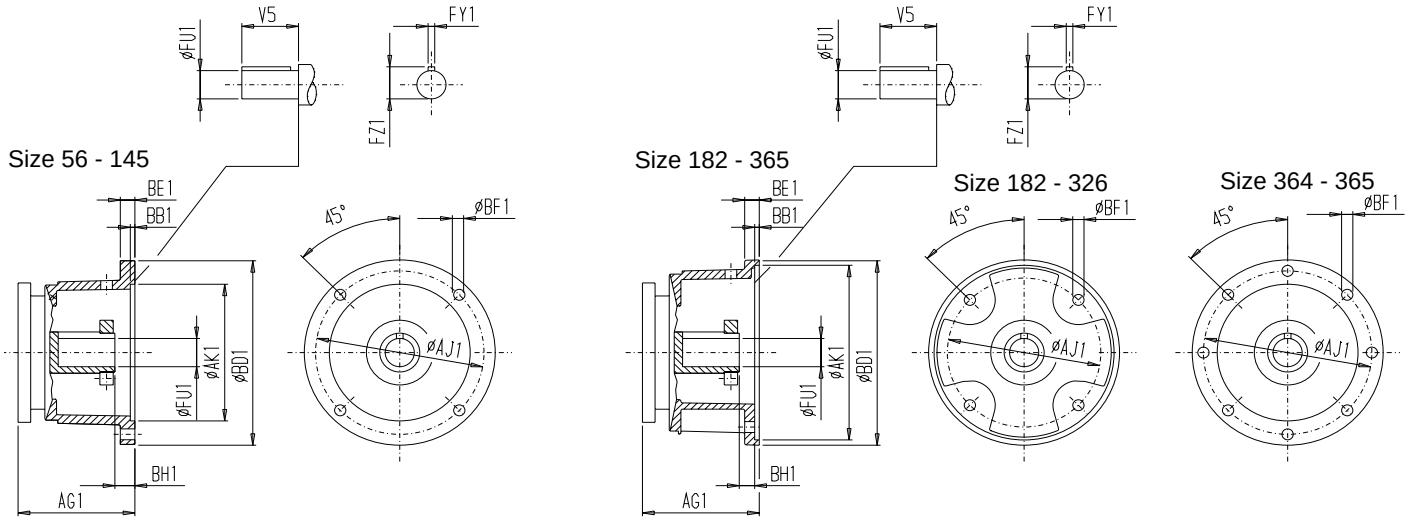
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit K5TC

K5TC

[inch]



Gear Units E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.05
					(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.05
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	3.26
88	**-**	**108**	**108B**	**-K5TC**	**(184)**	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	3.26
					(213)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	6.3
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	6.3
					(254)	10.23	8.5	0.94	7.25	0.2	0.53	0,93	1.625	3.98	0.07	0.015	6.24
					(256)	10.23	8.5	0.94	7.25	0.2	0.53	0,93	1.625	3.98	0.07	0.015	6.24
					(56)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.625	2.06	0.03	0.007	3.37
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	4.04
					(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	4.04
-	**88**	**-**	**-**	**-K5TC**	**(182)**	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.35
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.35
					(213)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	7.4
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	7.4
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	2.6
					(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	2.6
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	2.79
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	2.79
108	**-**	**128**	**128B**	**-K5TC**	**(213)**	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	5.81
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	5.81
					(254)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	5.79
					(256)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	5.79
					(286)	11.89	10.5	0.94	9	0.2	0.53	1.1	1.875	4.61	0.08	0.02	6.57
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.8
					(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.8
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.11
-	**108**	**-**	**-**	**-K5TC**	**(184)**	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	4.11
					(213)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	7.09
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	7.09
					(254)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	6.95
					(256)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	6.95

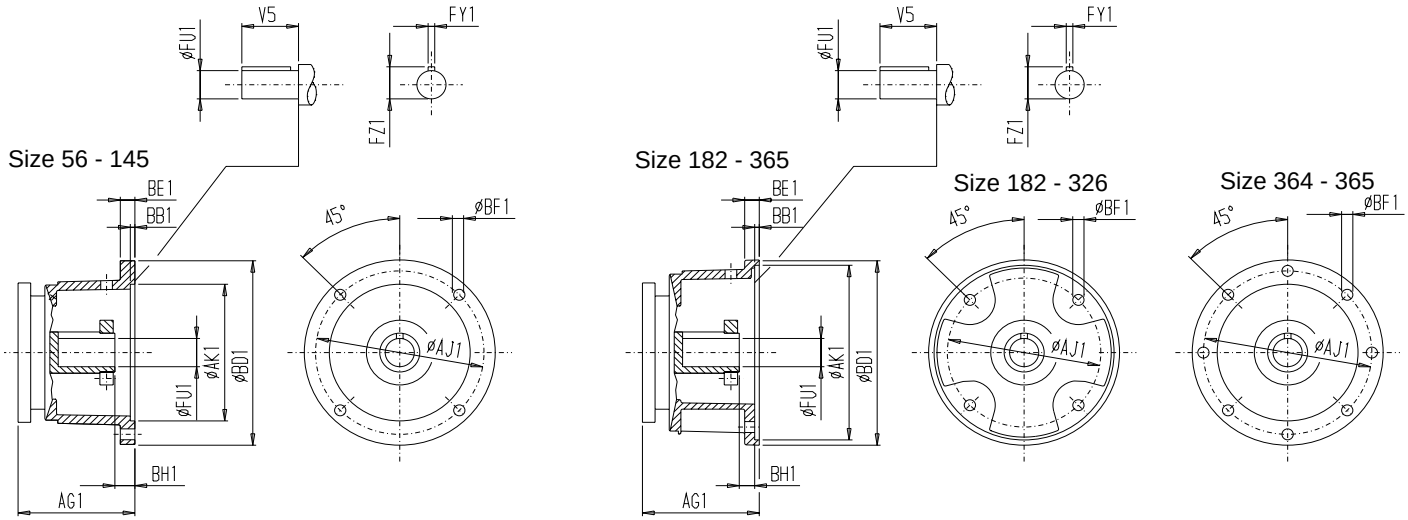
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit K5TC

K5TC

[mm]



Gear Units																		
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
88	-	108	108B	-K5TC	(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	78
					(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	78
					(182)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	83,5
					(184)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	83,5
					(213)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	160,5
					(215)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	160,5
					(254)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	159
					(256)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	159
-	88	-	-	-K5TC	(56)	168	114,3	12	149,2	5	11	16,5	15,875	52,324	0,72	0,188	86
					(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	103
					(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	103
					(182)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	111
					(184)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	111
					(213)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	188,5
					(215)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	188,5
108	-	128	128B	-K5TC	(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	66,5
					(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	66,5
					(182)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	71,5
					(184)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	71,5
					(213)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	148
					(215)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	148
					(254)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	147,5
					(256)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	147,5
					(286)	302	266,7	24	228,6	5	13,5	27,9	47,625	117,094	2,1	0,5	167,5
-	108	-	-	-K5TC	(143)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	97
					(145)	168	114,3	12	149,2	5	11	16,5	22,225	53,85	0,97	0,188	97
					(182)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	105
					(184)	228	215,9	17,5	184,15	5,5	13,5	17,5	28,6	69,9	1,25	0,25	105
					(213)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	180,5
					(215)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	180,5
					(254)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	177
					(256)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	177

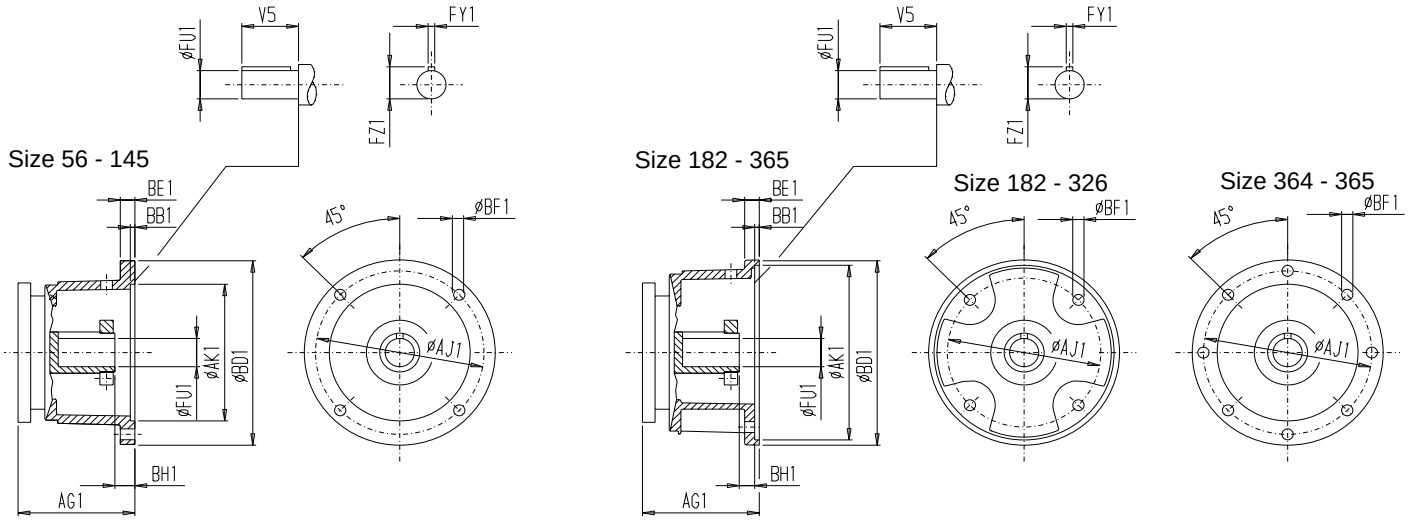
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit K5TC

K5TC

[inch]



Gear Units E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	2.42
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	2.42
					(213)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	5.39
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	5.39
128	**-**	**148**	**148B**	**-K5TC**	**(254)**	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	5.26
					(256)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	5.26
					(286)	11.89	10.5	0.94	9	0.2	0.53	1.1	1.875	4.61	0.08	0.02	6.04
					(324)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	7.64
					(326)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	7.64
					(143)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.52
					(145)	6.61	4.5	0.47	5.87	0.2	0.43	0.65	0.875	2.12	0.04	0.007	3.52
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	3.83
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	3.83
-	**128**	**-**	**-**	**-K5TC**	**(213)**	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	6.73
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	6.73
					(254)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	6.6
					(256)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	6.6
					(286)	11.89	10.5	0.94	9	0.2	0.53	1.1	1.875	4.61	0.08	0.02	7.5
					(213)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	5.08
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	5.08
					(254)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	4.85
					(256)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	4.85
148	**-**	**168**	**168B**	**-K5TC**	**(286)**	11.89	10.5	0.94	9	0.2	0.53	1.1	1.875	4.61	0.08	0.02	5.74
					(324)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	7.35
					(326)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	7.35
					(364)	14.01	12.5	1.02	11	0.02	0.67	1.28	2.375	5.87	0.1	0.025	9.08
					(365)	14.01	12.5	1.02	11	0.02	0.67	1.28	2.375	5.87	0.1	0.025	9.08
					(182)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	3.64
					(184)	8.98	8.5	0.69	7.25	0.22	0.53	0.69	1.126	2.75	0.05	0.01	3.64
					(213)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	6.57
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	6.57
-	**148**	**-**	**-**	**-K5TC**	**(254)**	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	6.34
					(256)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	6.34
					(286)	11.89	10.5	0.94	9	0.2	0.53	1.1	1.875	4.61	0.08	0.02	7.24
					(324)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	8.84
					(326)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	8.84

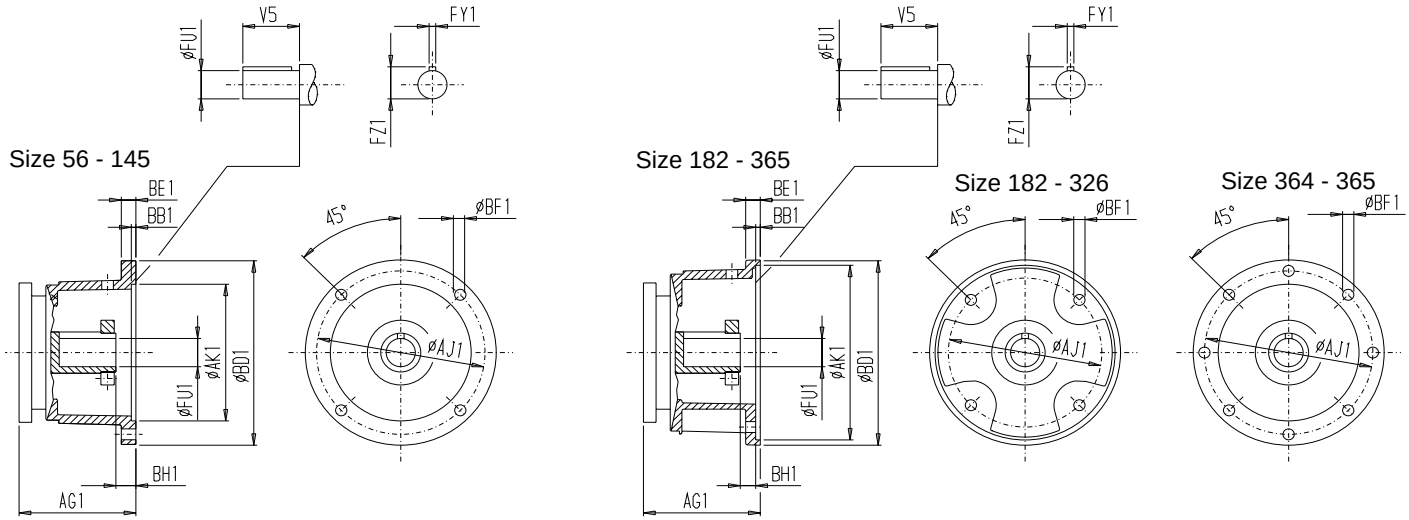
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit K5TC

K5TC

[mm]



Gear Units						BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
E./Z.	D.	K./C.	FZ./FD.														
					(182)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*17,5*	*28,6*	*69,9*	*1,25*	*0,25*	*62*
					(184)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*17,5*	*28,6*	*69,9*	*1,25*	*0,25*	*62*
					(213)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*18,5*	*34,925*	*85,6*	*1,53*	*0,313*	*137,5*
					(215)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*18,5*	*34,925*	*85,6*	*1,53*	*0,313*	*137,5*
128	**-**	**148**	**148B**	**-K5TC**	**(254)**	*260*	*215,9*	*24*	*184,15*	*5*	*13,5*	*23,6*	*41,275*	*101,092*	*1,79*	*0,375*	*134*
					(256)	*260*	*215,9*	*24*	*184,15*	*5*	*13,5*	*23,6*	*41,275*	*101,092*	*1,79*	*0,375*	*134*
					(286)	*302*	*266,7*	*24*	*228,6*	*5*	*13,5*	*27,9*	*47,625*	*117,094*	*2,1*	*0,5*	*154*
					(324)	*356*	*317,5*	*26*	*279,4*	*5*	*17*	*25,1*	*53,975*	*133,096*	*2,35*	*0,5*	*194,5*
					(326)	*356*	*317,5*	*26*	*279,4*	*5*	*17*	*25,1*	*53,975*	*133,096*	*2,35*	*0,5*	*194,5*
					(143)	*168*	*114,3*	*12*	*149,2*	*5*	*11*	*16,5*	*22,225*	*53,85*	*0,97*	*0,188*	*90*
					(145)	*168*	*114,3*	*12*	*149,2*	*5*	*11*	*16,5*	*22,225*	*53,85*	*0,97*	*0,188*	*90*
					(182)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*17,5*	*28,6*	*69,9*	*1,25*	*0,25*	*98*
					(184)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*17,5*	*28,6*	*69,9*	*1,25*	*0,25*	*98*
-	**128**	**-**	**-**	**-K5TC**	**(213)**	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*18,5*	*34,925*	*85,6*	*1,53*	*0,313*	*171,5*
					(215)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*18,5*	*34,925*	*85,6*	*1,53*	*0,313*	*171,5*
					(254)	*260*	*215,9*	*24*	*184,15*	*5*	*13,5*	*23,6*	*41,275*	*101,092*	*1,79*	*0,375*	*168*
					(256)	*260*	*215,9*	*24*	*184,15*	*5*	*13,5*	*23,6*	*41,275*	*101,092*	*1,79*	*0,375*	*168*
					(286)	*302*	*266,7*	*24*	*228,6*	*5*	*13,5*	*27,9*	*47,625*	*117,094*	*2,1*	*0,5*	*191*
					(213)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*18,5*	*34,925*	*85,6*	*1,53*	*0,313*	*129,5*
					(215)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*18,5*	*34,925*	*85,6*	*1,53*	*0,313*	*129,5*
					(254)	*260*	*215,9*	*24*	*184,15*	*5*	*13,5*	*23,6*	*41,275*	*101,092*	*1,79*	*0,375*	*123,5*
					(256)	*260*	*215,9*	*24*	*184,15*	*5*	*13,5*	*23,6*	*41,275*	*101,092*	*1,79*	*0,375*	*123,5*
148	**-**	**168**	**168B**	**-K5TC**	**(286)**	*302*	*266,7*	*24*	*228,6*	*5*	*13,5*	*27,9*	*47,625*	*117,094*	*2,1*	*0,5*	*146,5*
					(324)	*356*	*317,5*	*26*	*279,4*	*5*	*17*	*25,1*	*53,975*	*133,096*	*2,35*	*0,5*	*187*
					(326)	*356*	*317,5*	*26*	*279,4*	*5*	*17*	*25,1*	*53,975*	*133,096*	*2,35*	*0,5*	*187*
					(364)	*356*	*317,5*	*26*	*279,4*	*5*	*17*	*32,5*	*60,325*	*149,098*	*2,65*	*0,625*	*231*
					(365)	*356*	*317,5*	*26*	*279,4*	*5*	*17*	*32,5*	*60,325*	*149,098*	*2,65*	*0,625*	*231*
					(182)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*17,5*	*28,6*	*69,9*	*1,25*	*0,25*	*93*
					(184)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*17,5*	*28,6*	*69,9*	*1,25*	*0,25*	*93*
					(213)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*18,5*	*34,925*	*85,6*	*1,53*	*0,313*	*167,5*
					(215)	*228*	*215,9*	*17,5*	*184,15*	*5,5*	*13,5*	*18,5*	*34,925*	*85,6*	*1,53*	*0,313*	*167,5*
-	**148**	**-**	**-**	**-K5TC**	**(254)**	*260*	*215,9*	*24*	*184,15*	*5*	*13,5*	*23,6*	*41,275*	*101,092*	*1,79*	*0,375*	*161,5*
					(256)	*260*	*215,9*	*24*	*184,15*	*5*	*13,5*	*23,6*	*41,275*	*101,092*	*1,79*	*0,375*	*161,5*
					(286)	*302*	*266,7*	*24*	*228,6*	*5*	*13,5*	*27,9*	*47,625*	*117,094*	*2,1*	*0,5*	*184,5*
					(324)	*356*	*317,5*	*26*	*279,4*	*5*	*17*	*25,1*	*53,975*	*133,096*	*2,35*	*0,5*	*225*
					(326)	*356*	*317,5*	*26*	*279,4*	*5*	*17*	*25,1*	*53,975*	*133,096*	*2,35*	*0,5*	*225*

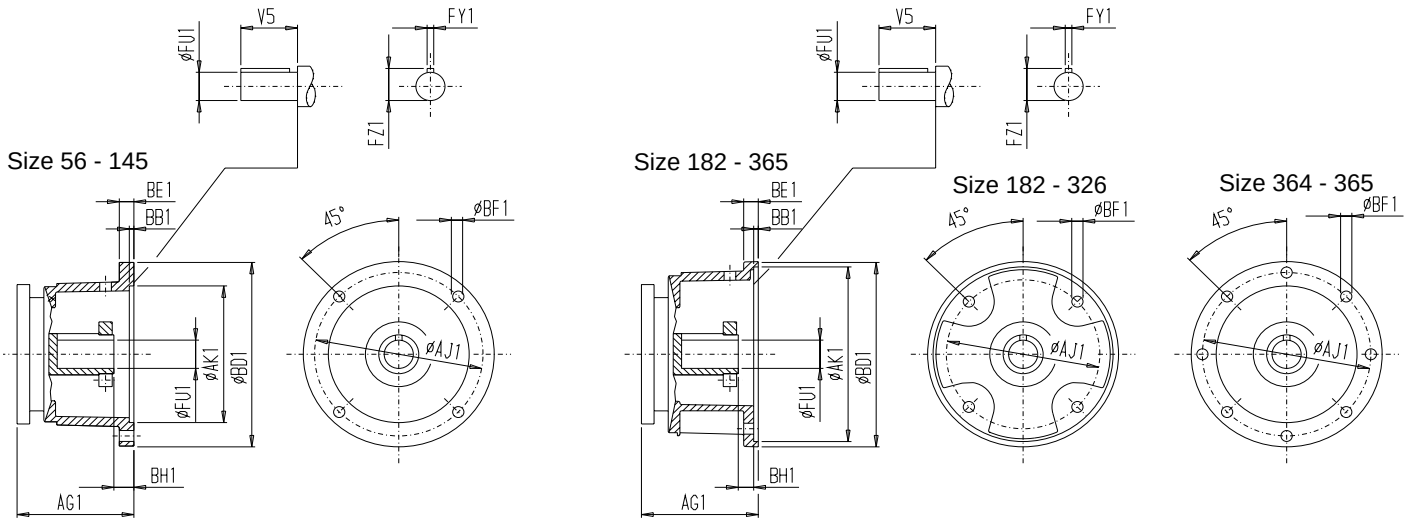
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit K5TC

K5TC

[inch]



Gear Units						BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
E./Z.	D.	K./C.	FZ./FD.														
					(213)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	4.51
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	4.51
					(254)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	4.28
					(256)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	4.28
168	**-**	**188**	**188B**	**-K5TC**	**(286)**	11.89	10.5	0.94	9	0.2	0.53	1.1	1.875	4.61	0.08	0.02	5.17
					(324)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	6.78
					(326)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	6.78
					(364)	14.01	12.5	1.02	11	0.02	0.67	1.28	2.375	5.87	0.1	0.025	8.51
					(365)	14.01	12.5	1.02	11	0.02	0.67	1.28	2.375	5.87	0.1	0.025	8.51
					(213)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	6.12
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	6.12
					(254)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	5.89
-	**168**	**-**	**-**	**-K5TC**	**(256)**	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	5.89
					(286)	11.89	10.5	0.94	9	0.2	0.53	1.1	1.875	4.61	0.08	0.02	6.79
					(324)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	8.39
					(326)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	8.39
					(254)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	4.28
					(256)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	4.28
					(286)	11.89	10.5	0.94	9	0.2	0.53	1.1	1.875	4.61	0.08	0.02	5.17
188	**-**	**-**	**-**	**-K5TC**	**(324)**	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	6.78
					(326)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	6.78
					(364)	14.01	12.5	1.02	11	0.02	0.67	1.28	2.375	5.87	0.1	0.025	8.51
					(365)	14.01	12.5	1.02	11	0.02	0.67	1.28	2.375	5.87	0.1	0.025	8.51
					(213)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	4.51
					(215)	8.98	8.5	0.69	7.25	0.22	0.53	0.73	1.375	3.37	0.06	0.012	4.51
					(254)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	4.28
					(256)	10.23	8.5	0.94	7.25	0.2	0.53	0.93	1.625	3.98	0.07	0.015	4.28
-	**188**	**-**	**-**	**-K5TC**	**(286)**	11.89	10.5	0.94	9	0.2	0.53	1.1	1.875	4.61	0.08	0.02	5.17
					(324)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	6.78
					(326)	14.01	12.5	1.02	11	0.2	0.67	0.99	2.125	5.24	0.09	0.02	6.78
					(364)	14.01	12.5	1.02	11	0.02	0.67	1.28	2.375	5.87	0.1	0.025	8.51
					(365)	14.01	12.5	1.02	11	0.02	0.67	1.28	2.375	5.87	0.1	0.025	8.51

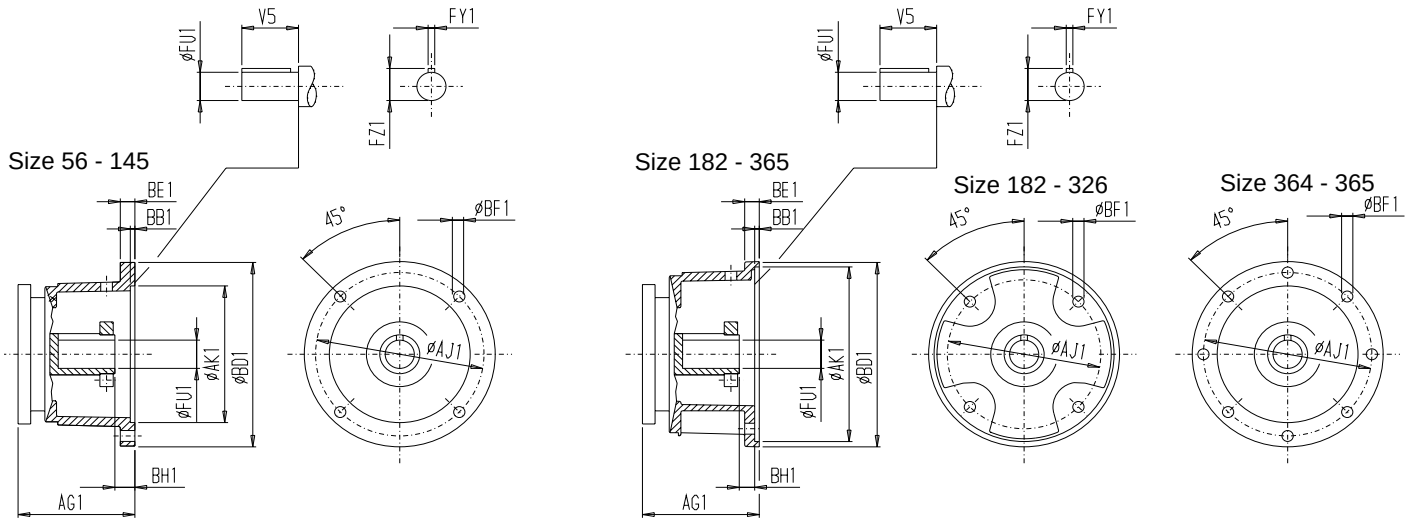
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit K5TC

K5TC

[mm]



Gear Units																		
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
168	-	188	188B	-K5TC	(213)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	115
					(215)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	115
					(254)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	109
					(256)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	109
					(286)	302	266,7	24	228,6	5	13,5	27,9	47,625	117,094	2,1	0,5	132
					(324)	356	317,5	26	279,4	5	17	25,1	53,975	133,096	2,35	0,5	172,5
					(326)	356	317,5	26	279,4	5	17	25,1	53,975	133,096	2,35	0,5	172,5
					(364)	356	317,5	26	279,4	5	17	32,5	60,325	149,098	2,65	0,625	216,5
					(365)	356	317,5	26	279,4	5	17	32,5	60,325	149,098	2,65	0,625	216,5
-	168	-	-	-K5TC	(213)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	156
					(215)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	156
					(254)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	150
					(256)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	150
					(286)	302	266,7	24	228,6	5	13,5	27,9	47,625	117,094	2,1	0,5	173
					(324)	356	317,5	26	279,4	5	17	25,1	53,975	133,096	2,35	0,5	213,5
					(326)	356	317,5	26	279,4	5	17	25,1	53,975	133,096	2,35	0,5	213,5
188	-	-	-	-K5TC	(254)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	109
					(256)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	109
					(286)	302	266,7	24	228,6	5	13,5	27,9	47,625	117,094	2,1	0,5	132
					(324)	356	317,5	26	279,4	5	17	25,1	53,975	133,096	2,35	0,5	172,5
					(326)	356	317,5	26	279,4	5	17	25,1	53,975	133,096	2,35	0,5	172,5
					(364)	356	317,5	26	279,4	5	17	32,5	60,325	149,098	2,65	0,625	216,5
					(365)	356	317,5	26	279,4	5	17	32,5	60,325	149,098	2,65	0,625	216,5
-	188	-	-	-K5TC	(213)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	115
					(215)	228	215,9	17,5	184,15	5,5	13,5	18,5	34,925	85,6	1,53	0,313	115
					(254)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	109
					(256)	260	215,9	24	184,15	5	13,5	23,6	41,275	101,092	1,79	0,375	109
					(286)	302	266,7	24	228,6	5	13,5	27,9	47,625	117,094	2,1	0,5	132
					(324)	356	317,5	26	279,4	5	17	25,1	53,975	133,096	2,35	0,5	172,5
					(326)	356	317,5	26	279,4	5	17	25,1	53,975	133,096	2,35	0,5	172,5
					(364)	356	317,5	26	279,4	5	17	32,5	60,325	149,098	2,65	0,625	216,5
					(365)	356	317,5	26	279,4	5	17	32,5	60,325	149,098	2,65	0,625	216,5

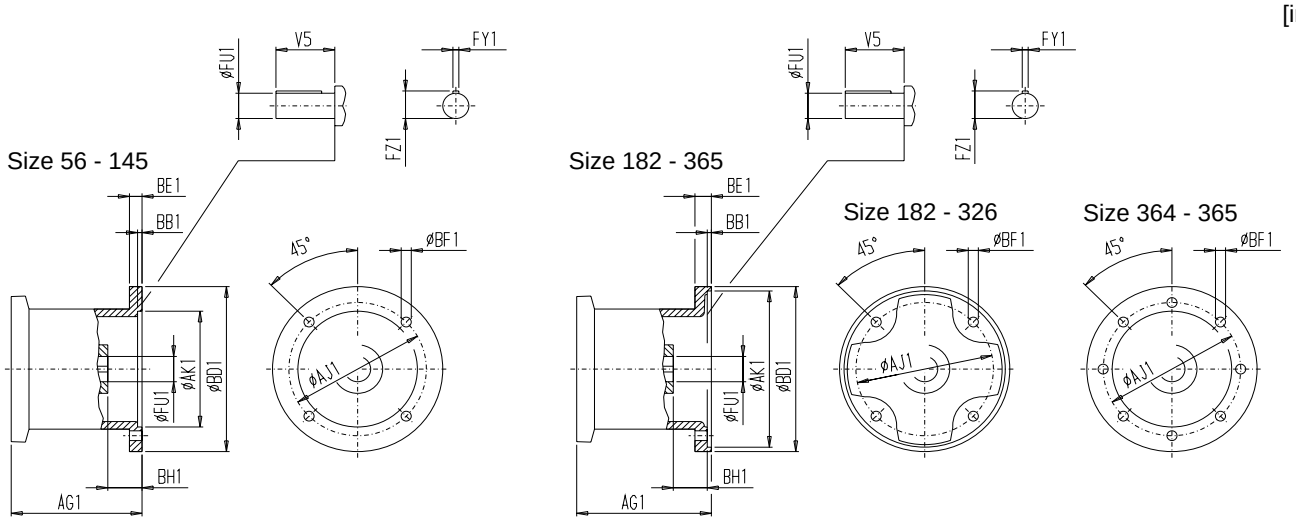
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit KTC

KTC

[inch]



Gear Units E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
					(56)	6.61	4.5	0.55	5.874	0.2	0.43	1.08	0.626	2.06	0.72	0.188	5.57
					(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	6.91
-	**-**	**B38**	**38B**	**-KTC**	**(145)**	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	6.91
					(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.27
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.27
					(56)	6.61	4.5	0.55	5.874	0.2	0.43	1.08	0.626	2.06	0.72	0.188	6.55
					(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.89
38	**-**	**38/48**	**48B**	**-KTC**	**(145)**	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.89
					(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	9.25
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	9.25
					(56)	6.61	4.5	0.55	5.874	0.2	0.43	1.08	0.626	2.06	0.72	0.188	7.15
-	**38**	**-**	**-**	**-KTC**	**(143)**	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	8.49
					(145)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	8.49
					(56)	6.61	4.5	0.55	5.874	0.2	0.43	1.08	0.626	2.06	0.72	0.188	6.34
					(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.68
48	**-**	**68**	**68B**	**-KTC**	**(145)**	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.68
					(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	9.04
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	9.04
					(56)	6.61	4.5	0.55	5.874	0.2	0.43	1.08	0.626	2.06	0.72	0.188	7.01
					(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	8.35
-	**48**	**-**	**-**	**-KTC**	**(145)**	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	8.35
					(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	9.71
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	9.71
					(56)	6.61	4.5	0.55	5.874	0.2	0.43	1.08	0.626	2.06	0.72	0.188	6.1
					(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.44
					(145)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.44
68	**-**	**88**	**88B**	**-KTC**	**(182)**	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.8
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.8
					(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	10.87
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	10.87
					(56)	6.61	4.5	0.55	5.874	0.2	0.43	1.08	0.626	2.06	0.72	0.188	6.83
					(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	8.17
-	**68**	**-**	**-**	**-KTC**	**(145)**	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	8.17
					(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	9.53
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	9.53

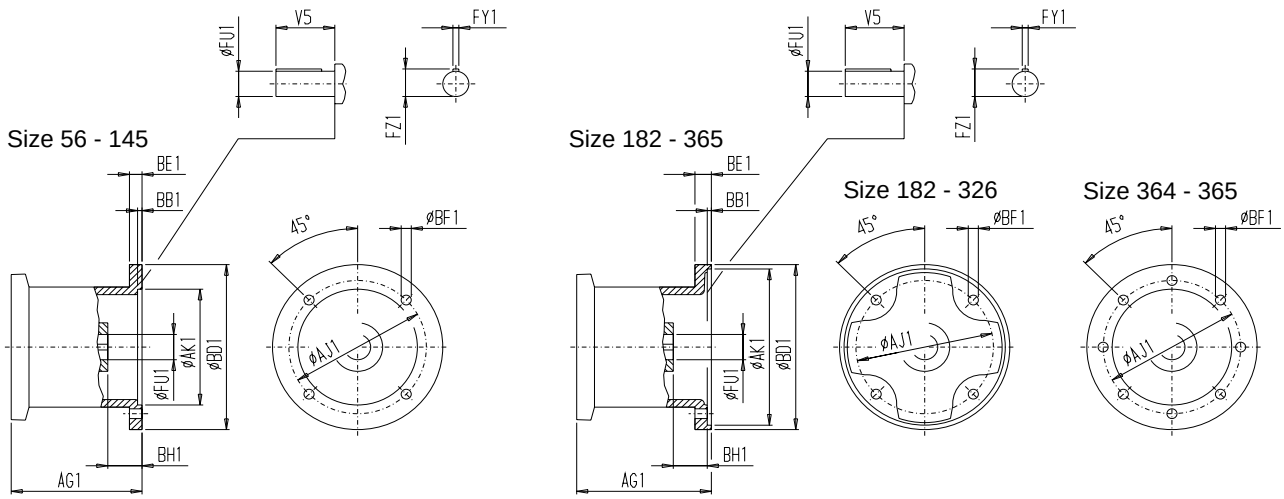
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit KTC

KTC

[mm]



Gear Units																	
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
-	-	B38	38B	-KTC	(56)	168	114,3	14	149,2	5	11	27,5	15,9	52,324	18,288	4,7752	142
					(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	176
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	176
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	210,5
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	210,5
38	-	38/48	48B	-KTC	(56)	168	114,3	14	149,2	5	11	27,5	15,9	52,324	18,288	4,7752	167
					(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	201
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	201
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	235,5
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	235,5
-	38	-	-	-KTC	(56)	168	114,3	14	149,2	5	11	27,5	15,9	52,324	18,288	4,7752	182
					(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	216
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	216
48	-	68	68B	-KTC	(56)	168	114,3	14	149,2	5	11	27,5	15,9	52,324	18,288	4,7752	161,5
					(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	195,5
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	195,5
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	230
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	230
-	48	-	-	-KTC	(56)	168	114,3	14	149,2	5	11	27,5	15,9	52,324	18,288	4,7752	178,5
					(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	212,5
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	212,5
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	247
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	247
68	-	88	88B	-KTC	(56)	168	114,3	14	149,2	5	11	27,5	15,9	52,324	18,288	4,7752	155,5
					(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	189,5
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	189,5
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	224
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	224
					(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	276,5
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	276,5
-	68	-	-	-KTC	(56)	168	114,3	14	149,2	5	11	27,5	15,9	52,324	18,288	4,7752	174
					(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	208
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	208
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	242,5
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	242,5

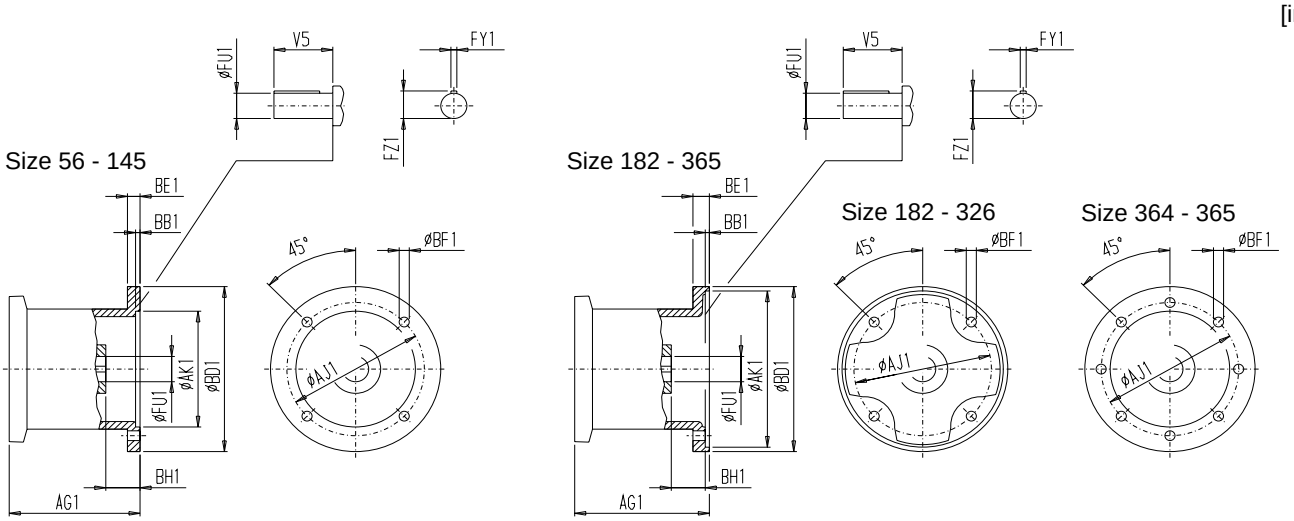
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit KTC

KTC

[inch]



Gear Units						BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
E./Z.	D.	K./C.	FZ./FD.														
88	-	108	108B	-KTC	(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	6.85
					(145)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	6.85
					(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.11
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.11
					(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	10.14
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	10.14
					(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	12.08
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	12.08
-	88	-	-	-KTC	(56)	6.61	4.5	0.55	5.874	0.2	0.43	1.08	0.626	2.06	0.72	0.188	6.5
					(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.84
					(145)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.84
					(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	9.2
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	9.2
					(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	11.24
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	11.24
108	-	128	128B	-KTC	(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	6.4
					(145)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	6.4
					(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	7.64
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	7.64
					(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	9.65
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	9.65
					(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	11.63
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	11.63
					(284)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	14.33
					(286)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	14.33
-	108	-	-	-KTC	(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.6
					(145)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.6
					(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.96
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.96
					(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	10.93
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	10.93
					(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	12.79
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	12.79

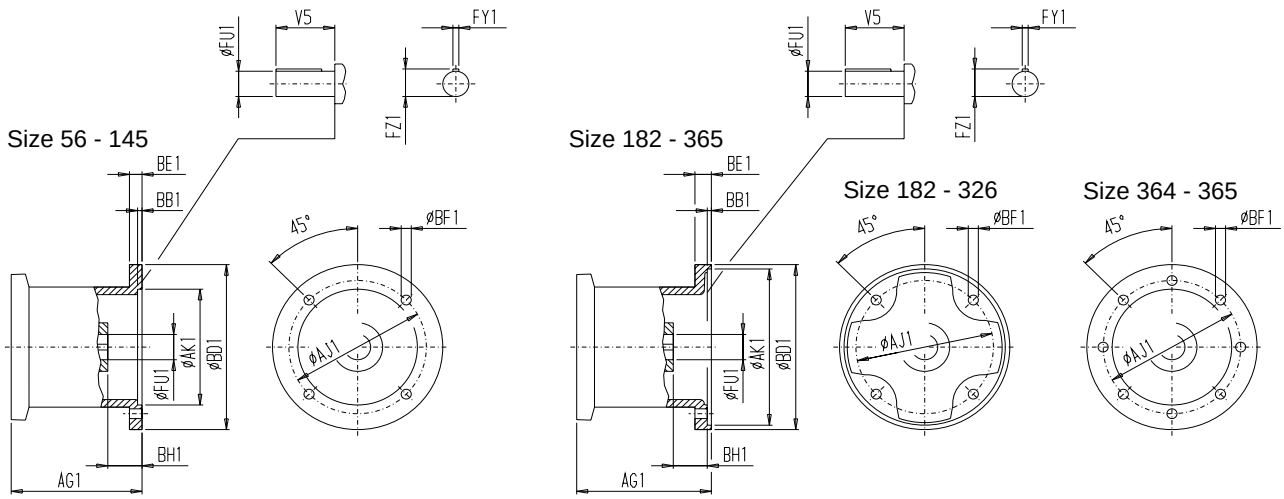
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit KTC

KTC

[mm]



Gear Units																	
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
88	-	108	108B	-KTC	(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	174,5
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	174,5
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	206,5
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	206,5
					(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	258
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	258
					(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	307,5
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	307,5
-	88	-	-	-KTC	(56)	168	114,3	14	149,2	5	11	27,5	15,9	52,324	18,288	4,7752	165,5
					(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	199,5
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	199,5
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	234
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	234
					(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	286
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	286
108	-	128	128B	-KTC	(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	163
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	163
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	194,5
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	194,5
					(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	245,5
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	245,5
					(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	296
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	296
					(284)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	364,5
					(286)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	364,5
-	108	-	-	-KTC	(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	193,5
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	193,5
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	228
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	228
					(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	278
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	278
					(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	325,5
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	325,5

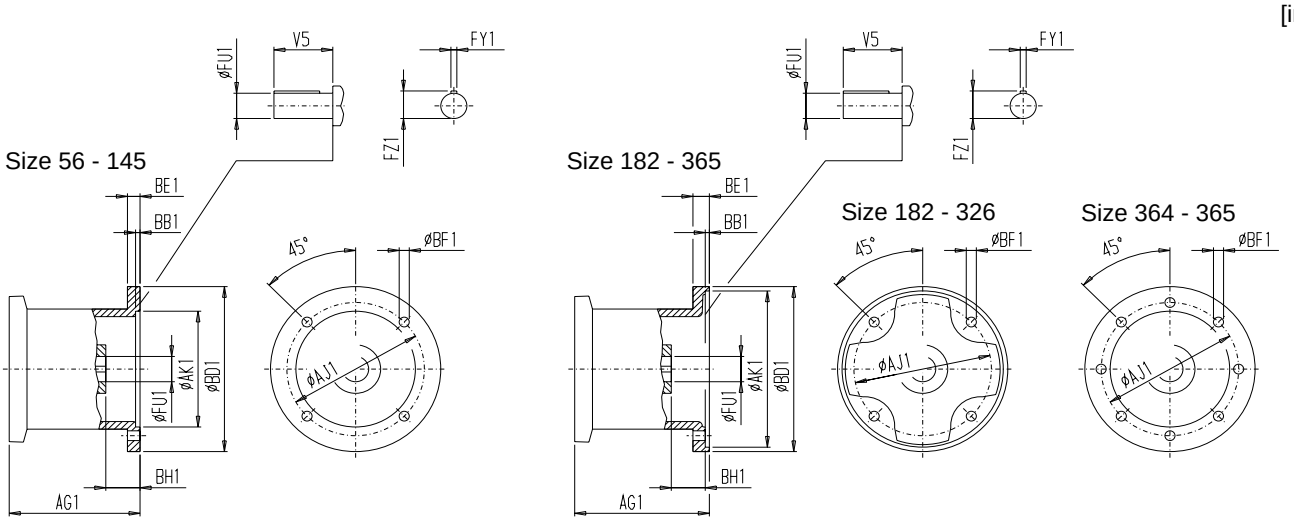
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit KTC

KTC

[inch]



Gear Units						BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
E./Z.	D.	K./C.	FZ./FD.														
128	-	148	148B	-KTC	(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	7.27
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	7.27
					(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	9.23
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	9.23
					(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	10.98
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	10.98
					(284)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	13.8
					(286)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	13.8
					(324)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	16.3
					(326)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	16.3
-	128	-	-	-KTC	(143)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.32
					(145)	6.61	4.5	0.55	5.874	0.2	0.43	1.1	0.874	2.12	0.97	0.188	7.32
					(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.68
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.68
					(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	10.57
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	10.57
					(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	12.44
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	12.44
					(284)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	15.26
					(286)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	15.26
148	-	168	168B	-KTC	(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	8.92
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	8.92
					(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	10.69
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	10.69
					(284)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	13.5
					(286)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	13.5
					(324)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	16.01
					(326)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	16.01
					(364)	13.98	12.5	1.02	11	0.2	0.67	3.07	2.375	5.62	2.69	0.625	17.05
					(365)	13.98	12.5	1.02	11	0.2	0.67	3.07	2.375	5.62	2.69	0.625	17.05
-	148	-	-	-KTC	(182)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.49
					(184)	8.98	8.5	0.87	7.25	0.22	0.53	1.44	1.126	2.75	1.25	0.25	8.49
					(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	10.41
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	10.41
					(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	12.18
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	12.18
					(284)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	15
					(286)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	15
					(324)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	17.5
					(326)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	17.5

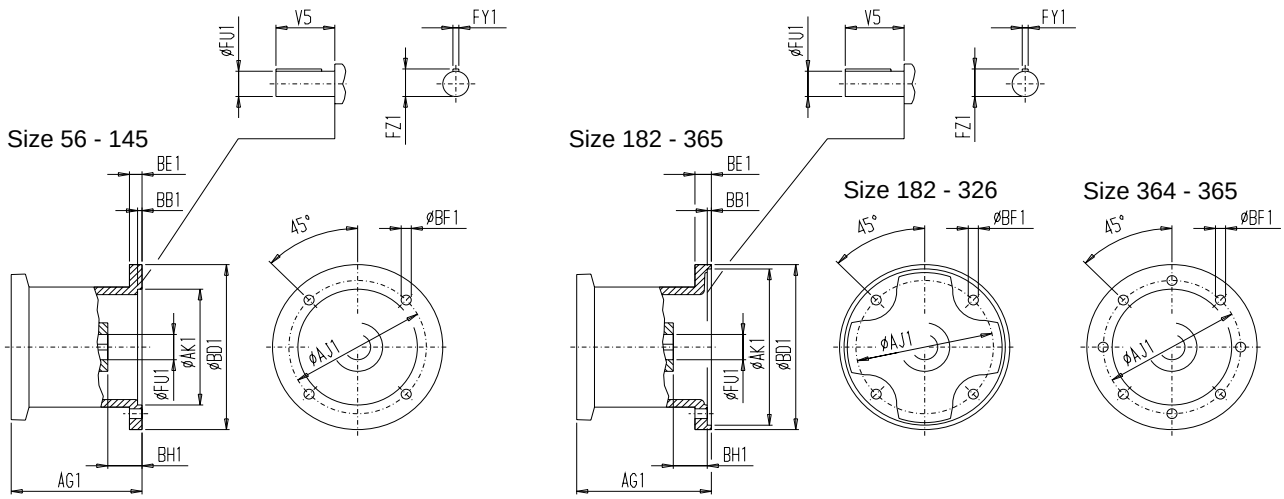
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit KTC

KTC

[mm]



Gear Units E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
128	-	148	148B	-KTC	(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	185
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	185
					(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	235
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	235
					(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	279,5
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	279,5
					(284)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	351
					(286)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	351
					(324)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	414,5
					(326)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	414,5
-	128	-	-	-KTC	(143)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	186,5
					(145)	168	114,3	14	149,2	5	11	28	22,2	53,848	24,638	4,7752	186,5
					(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	221
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	221
					(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	269
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	269
					(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	316,5
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	316,5
					(284)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	388
					(286)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	388
148	-	168	168B	-KTC	(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	227
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	227
					(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	272
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	272
					(284)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	343,5
					(286)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	343,5
					(324)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	407
					(326)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	407
					(364)	355	317,5	26	279,4	5	17	78	60,325	142,748	68,326	15,875	433,5
					(365)	355	317,5	26	279,4	5	17	78	60,325	142,748	68,326	15,875	433,5
-	148	-	-	-KTC	(182)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	216
					(184)	228	215,9	22	184,15	5,5	13,5	36,5	28,6	69,9	31,75	6,35	216
					(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	265
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	265
					(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	310
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	310
					(284)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	381,5
					(286)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	381,5
					(324)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	445
					(326)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	445

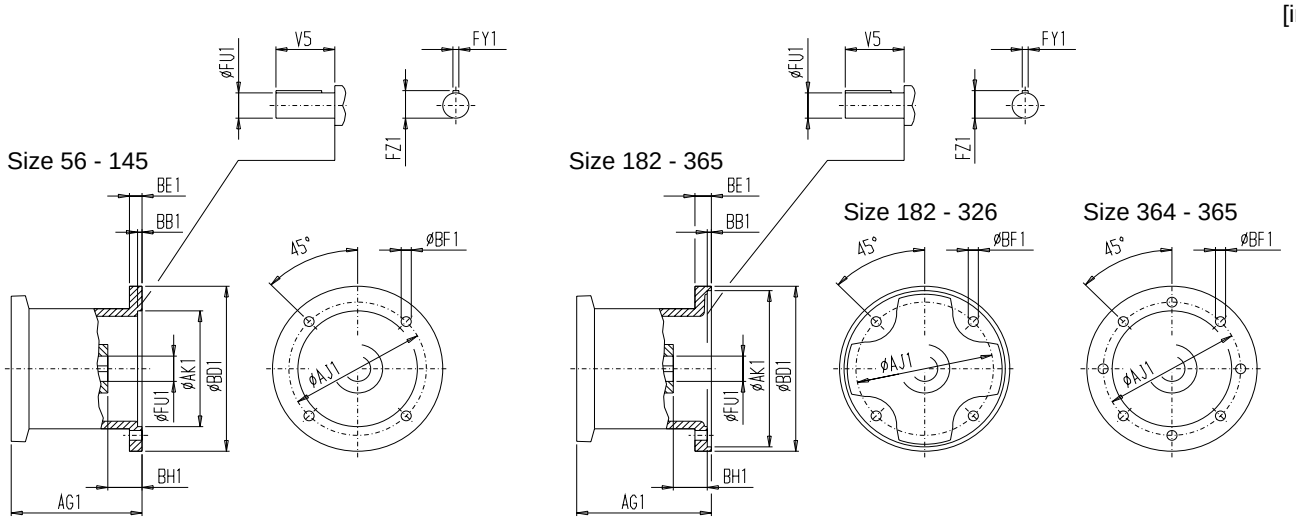
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit KTC

KTC

[inch]



Gear Units																	
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
168	-	188	188B	-KTC	(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	8.35
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	8.35
					(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	10.12
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	10.12
					(284)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	12.93
					(286)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	12.93
					(324)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	15.44
					(326)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	15.44
					(364)	13.98	12.5	1.02	11	0.2	0.67	3.07	2.375	5.62	2.69	0.625	16.48
					(365)	13.98	12.5	1.02	11	0.2	0.67	3.07	2.375	5.62	2.69	0.625	16.48
-	168	-	-	-KTC	(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	9.96
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	9.96
					(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	11.73
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	11.73
					(284)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	14.55
					(286)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	14.55
					(324)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	17.05
					(326)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	17.05
188	-	-	-	-KTC	(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	10.12
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	10.12
					(284)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	12.93
					(286)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	12.93
					(324)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	15.44
					(326)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	15.44
					(364)	13.98	12.5	1.02	11	0.2	0.67	3.07	2.375	5.62	2.69	0.625	16.48
					(365)	13.98	12.5	1.02	11	0.2	0.67	3.07	2.375	5.62	2.69	0.625	16.48
-	188	-	-	-KTC	(213)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	8.35
					(215)	8.98	8.5	0.87	7.25	0.22	0.53	1.79	1.375	3.37	1.53	0.313	8.35
					(254)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	10.12
					(256)	10.12	8.5	0.94	7.25	0.2	0.53	1.97	1.625	3.75	1.81	0.375	10.12
					(284)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	12.93
					(286)	11.22	10.49	0.94	9	0.2	0.53	2.38	1.875	4.38	2.13	0.5	12.93
					(324)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	15.44
					(326)	13.98	12.5	1.02	11	0.2	0.67	2.8	2.125	5	2.38	0.5	15.44
					(364)	13.98	12.5	1.02	11	0.2	0.67	3.07	2.375	5.62	2.69	0.625	16.48
					(365)	13.98	12.5	1.02	11	0.2	0.67	3.07	2.375	5.62	2.69	0.625	16.48

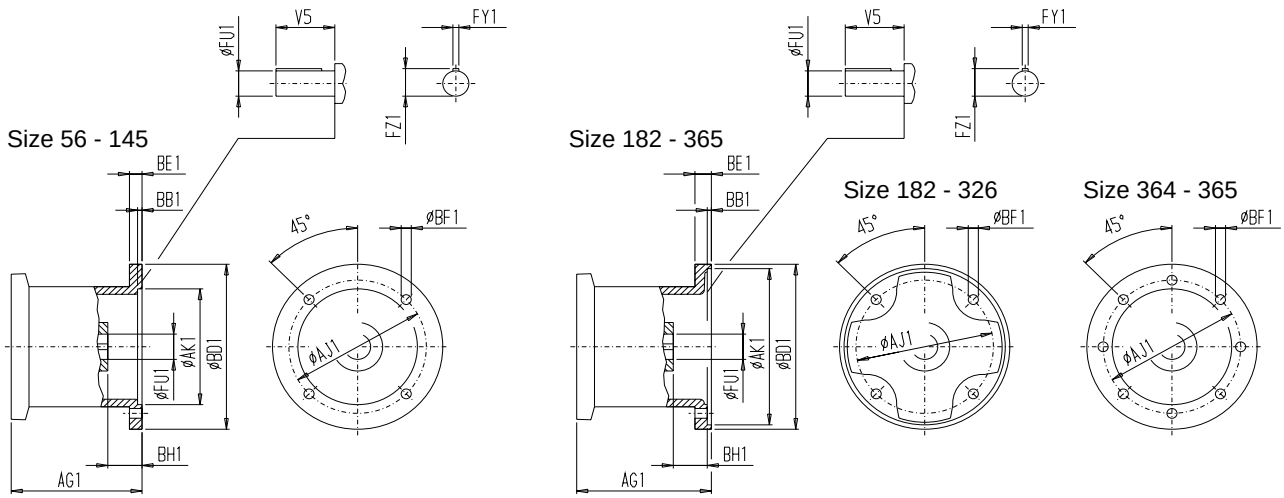
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit KTC

KTC

[mm]



Gear Units																	
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	BE1	AJ1	BB1	BF1	BH1	FU1	V5	FZ1	FY1	AG1
168	-	188	188B	-KTC	(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	212,5
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	212,5
					(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	257,5
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	257,5
					(284)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	329
					(286)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	329
					(324)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	392,5
					(326)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	392,5
					(364)	355	317,5	26	279,4	5	17	78	60,325	142,748	68,326	15,875	419
					(365)	355	317,5	26	279,4	5	17	78	60,325	142,748	68,326	15,875	419
-	168	-	-	-KTC	(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	253,5
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	253,5
					(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	298,5
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	298,5
					(284)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	370
					(286)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	370
					(324)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	433,5
					(326)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	433,5
188	-	-	-	-KTC	(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	257,5
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	257,5
					(284)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	329
					(286)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	329
					(324)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	392,5
					(326)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	392,5
					(364)	355	317,5	26	279,4	5	17	78	60,325	142,748	68,326	15,875	419
					(365)	355	317,5	26	279,4	5	17	78	60,325	142,748	68,326	15,875	419
-	188	-	-	-KTC	(213)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	212,5
					(215)	228	215,9	22	184,15	5,5	13,5	45,5	34,925	85,6	38,862	7,9502	212,5
					(254)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	257,5
					(256)	257	215,9	24	184,15	5	13,5	50	41,275	95,25	45,974	9,525	257,5
					(284)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	329
					(286)	285	266,5	24	228,6	5	13,5	60,5	47,625	111,252	54,102	12,7	329
					(324)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	392,5
					(326)	355	317,5	26	279,4	5	17	71	53,975	127	60,452	12,7	392,5
					(364)	355	317,5	26	279,4	5	17	78	60,325	142,748	68,326	15,875	419
					(365)	355	317,5	26	279,4	5	17	78	60,325	142,748	68,326	15,875	419

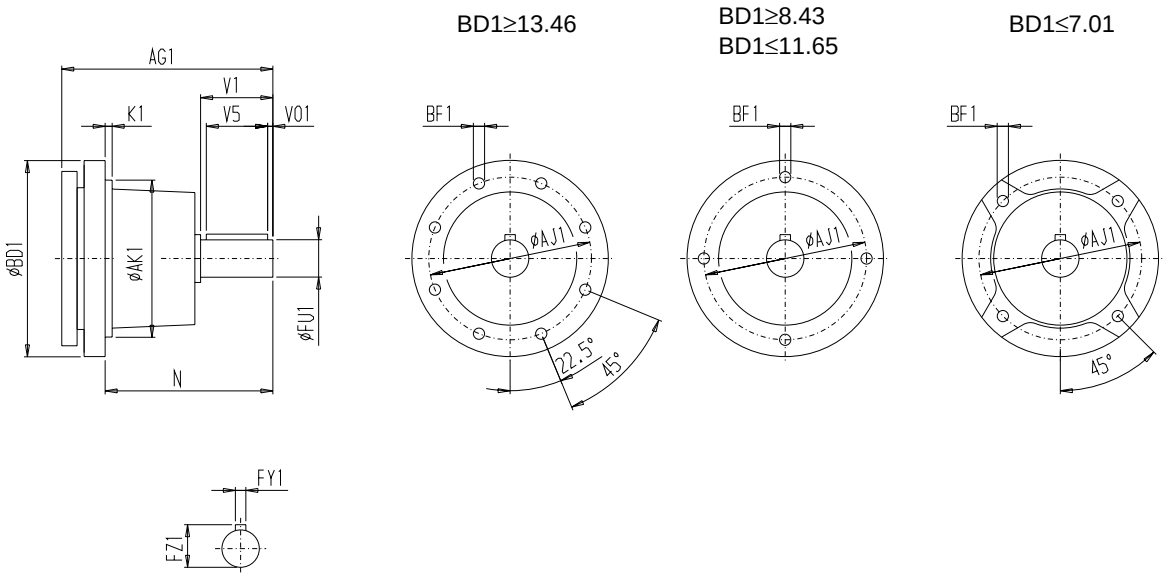
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit A5

A5

[inch]



Gear Units																		
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	AJ1	K1	BF1	FU1	V1	V5	V01	FZ1	FY1	N	AG1
-	-	B38	38B	-A5	(71)	5.35	3.74	4.57	0.16	M8x14	0.625	1.57	1.25	0.17	0.7	0.188	2.4	4.92
					(80)	5.51	3.74	4.57	0.16	M8x14	0.75	1.57	1.25	0.17	0.83	0.188	2.4	6.3
					(90)	5.51	3.74	4.57	0.16	M8x14	0.875	1.97	1.5	0.27	0.96	0.188	2.8	6.69
					(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	7.32
38	-	38/48	48B	-A5	(71)	5.35	3.74	4.57	0.16	M8x14	0.63	1.57	1.25	0.17	0.7	0.188	2.4	5.9
					(80)	5.51	3.74	4.57	0.16	M8x14	0.75	1.57	1.25	0.17	0.83	0.188	2.4	7.28
					(90)	5.51	3.74	4.57	0.16	M8x14	0.88	1.97	1.5	0.27	0.96	0.188	2.8	7.67
					(100)	6.85	4.72	5.71	0.16	M10x17	1.13	2.36	1.88	0.29	1.24	0.25	3.27	8.3
-	38	-	-	-A5	(71)	5.35	3.74	4.57	0.16	M8x14	0.63	1.57	1.25	0.17	0.7	0.188	2.4	6.5
					(80)	5.51	3.74	4.57	0.16	M8x14	0.75	1.57	1.25	0.17	0.83	0.188	2.4	7.88
					(90)	5.51	3.74	4.57	0.16	M8x14	0.88	1.97	1.5	0.27	0.96	0.188	2.8	8.27
48	-	68	68B	-A5	(71)	5.35	3.74	4.57	0.16	M8x14	0.625	1.57	1.25	0.17	0.7	0.188	2.4	5.69
					(80)	5.51	3.74	4.57	0.16	M8x14	0.75	1.57	1.25	0.17	0.83	0.188	2.4	7.07
					(90)	5.51	3.74	4.57	0.16	M8x14	0.875	1.97	1.5	0.27	0.96	0.188	2.8	7.46
					(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	8.09
					(112)	7.01	4.72	5.71	0.16	M10x17	1.25	2.36	1.88	0.37	1.36	0.25	3.27	8.13
-	48	-	-	-A5	(71)	5.35	3.74	4.57	0.16	M8x14	0.625	1.57	1.25	0.17	0.7	0.188	2.4	6.36
					(80)	5.51	3.74	4.57	0.16	M8x14	0.75	1.57	1.25	0.17	0.83	0.188	2.4	7.74
					(90)	5.51	3.74	4.57	0.16	M8x14	0.875	1.97	1.5	0.27	0.96	0.188	2.8	8.13
					(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	8.76
68	-	88	88B	-A5	(71)	5.35	3.74	4.57	0.16	M8x14	0.625	1.57	1.25	0.17	0.7	0.188	2.4	5.45
					(80)	5.51	3.74	4.57	0.16	M8x14	0.75	1.57	1.25	0.17	0.83	0.188	2.4	6.83
					(90)	5.51	3.74	4.57	0.16	M8x14	0.875	1.97	1.5	0.27	0.96	0.188	2.8	7.22
					(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	7.85
					(112)	7.01	4.72	5.71	0.16	M10x17	1.25	2.36	1.88	0.37	1.36	0.25	3.27	7.82
					(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	11.15
-	68	-	-	-A5	(71)	5.35	3.74	4.57	0.16	M8x14	0.625	1.57	1.25	0.17	0.7	0.188	2.4	6.18
					(80)	5.51	3.74	4.57	0.16	M8x14	0.75	1.57	1.25	0.17	0.83	0.188	2.4	7.56
					(90)	5.51	3.74	4.57	0.16	M8x14	0.875	1.97	1.5	0.27	0.96	0.188	2.8	7.95
					(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	8.58

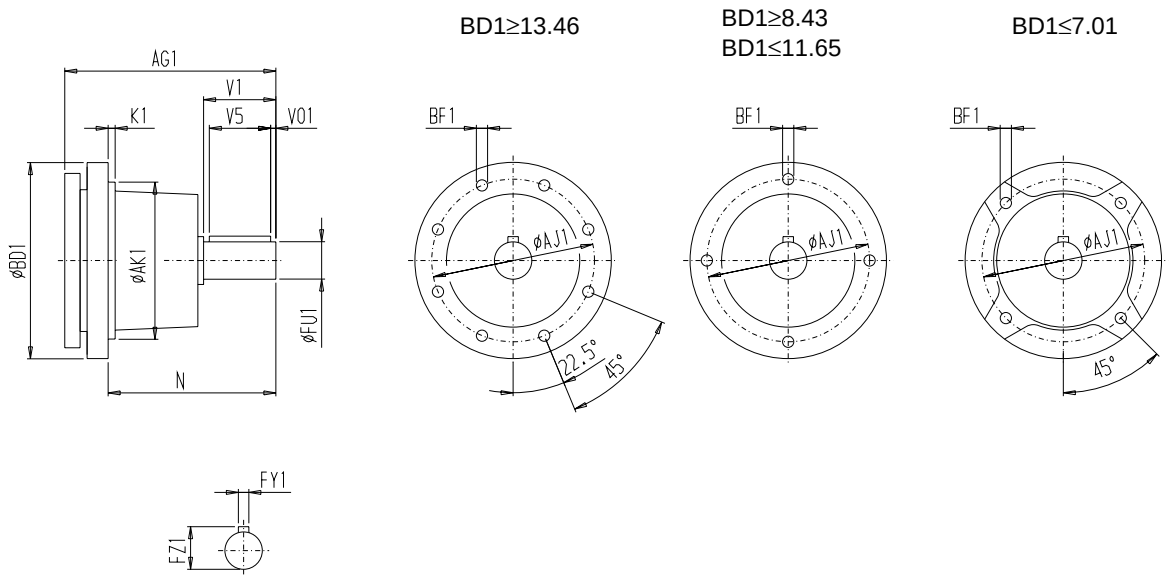
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit A5

A5

[mm]



Gear Units																		
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	AJ1	K1	BF1	FU1	V1	V5	V01	FZ1	FY1	N	AG1
-	-	B38	38B	-A5	(71)	136	95	116	4	M8x14	15,875	40	31,75	4,25	17,9	4,763	61	125,5
					(80)	140	95	116	4	M8x14	19,05	40	31,75	4,25	21,15	4,763	61	160,5
					(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	170,5
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	
38	-	38/48	48B	-A5	(71)	136	95	116	4	M8x14	15,875	40	31,75	4,25	17,9	4,763	61	150,5
					(80)	140	95	116	4	M8x14	19,05	40	31,75	4,25	21,15	4,763	61	185,5
					(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	195,5
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	211,5
-	38	-	-	-A5	(71)	136	95	116	4	M8x14	15,875	40	31,75	4,25	17,9	4,763	61	165,5
					(80)	140	95	116	4	M8x14	19,05	40	31,75	4,25	21,15	4,763	61	200,5
					(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	210,5
48	-	68	68B	-A5	(71)	136	95	116	4	M8x14	15,875	40	31,75	4,25	17,9	4,763	61	145
					(80)	140	95	116	4	M8x14	19,05	40	31,75	4,25	21,15	4,763	61	180
					(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	190
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	206
					(112)	178	120	145	4	M10x17	31,75	60	55,56	1,44	35,27	7,938	83	207
-	48	-	-	-A5	(71)	136	95	116	4	M8x14	15,875	40	31,75	4,25	17,9	4,763	61	162
					(80)	140	95	116	4	M8x14	19,05	40	31,75	4,25	21,15	4,763	61	197
					(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	207
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	223
68	-	88	88B	-A5	(71)	136	95	116	4	M8x14	15,875	40	31,75	4,25	17,9	4,763	61	139
					(80)	140	95	116	4	M8x14	19,05	40	31,75	4,25	21,15	4,763	61	174
					(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	184
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	200
					(112)	178	120	145	4	M10x17	31,75	60	55,56	1,44	35,27	7,938	83	199
					(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	283,5
-	68	-	-	-A5	(71)	136	95	116	4	M8x14	15,875	40	31,75	4,25	17,9	4,763	61	157,5
					(80)	140	95	116	4	M8x14	19,05	40	31,75	4,25	21,15	4,763	61	192,5
					(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	202,5
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	218,5

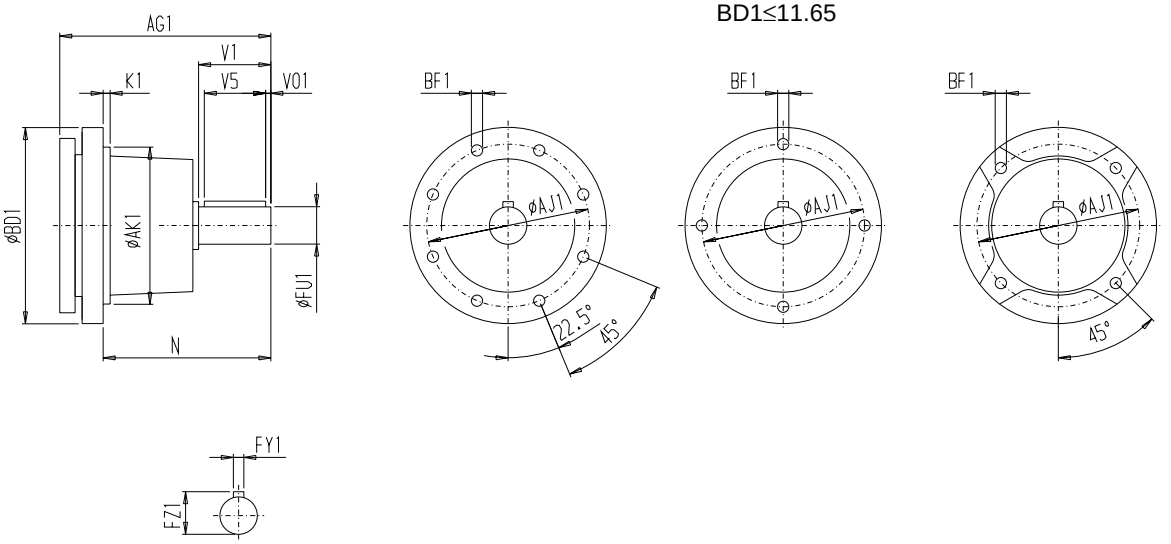
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit A5

A5

[inch]



Gear Units																	
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	AJ1	K1	BF1	FU1	V1	V5	V01	FZ1	FY1	N	AG1
88	-	108	108B	-A5	(90)	5.51	3.74	4.57	0.16	M8x14	0.875	1.97	1.5	0.27	0.96	0.188	2.8	6.63
					(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	7.16
					(112)	7.01	4.72	5.71	0.16	M10x17	1.25	2.36	1.88	0.37	1.36	0.25	3.27	7.09
					(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	10.42
					(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	12.12
-	88	-	-	-A5	(71)	5.35	3.74	4.57	0.16	M8x14	0.625	1.57	1.25	0.17	0.7	0.188	2.4	5.85
					(80)	5.51	3.74	4.57	0.16	M8x14	0.75	1.57	1.25	0.17	0.83	0.188	2.4	7.23
					(90)	5.51	3.74	4.57	0.16	M8x14	0.875	1.97	1.5	0.27	0.96	0.188	2.8	7.62
					(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	8.25
					(112)	7.01	4.72	5.71	0.16	M10x17	1.25	2.36	1.88	0.37	1.36	0.25	3.27	8.23
					(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	11.52
108	-	128	128B	-A5	(90)	5.51	3.74	4.57	0.16	M8x14	0.875	1.97	1.5	0.27	0.96	0.188	2.8	6.18
					(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	6.69
					(112)	7.01	4.72	5.71	0.16	M10x17	1.25	2.36	1.88	0.37	1.36	0.25	3.27	6.64
					(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	9.93
					(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	11.67
					(200)	11.65	7.68	9.06	0.2	M16x28	2.125	4.33	3.5	0.44	2.35	0.5	9.25	12.48
-	108	-	-	-A5	(80)	5.51	3.74	4.57	0.16	M8x14	0.75	1.57	1.25	0.17	0.83	0.188	2.4	6.99
					(90)	5.51	3.74	4.57	0.16	M8x14	0.875	1.97	1.5	0.27	0.96	0.188	2.8	7.38
					(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	8.01
					(112)	7.01	4.72	5.71	0.16	M10x17	1.25	2.36	1.88	0.37	1.36	0.25	3.27	7.88
					(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	11.21
					(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	12.83
128	-	148	148B	-A5	(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	6.32
					(112)	7.01	4.72	5.71	0.16	M10x17	1.25	2.36	1.88	0.37	1.36	0.25	3.27	6.22
					(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	9.51
					(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	11.02
					(200)	11.65	7.68	9.06	0.2	M16x28	2.125	4.33	3.5	0.44	2.35	0.5	9.25	11.95
					(225)	13.46	9.84	11.81	0.2	M16x22	2.125	5.51	3.5	0.44	2.35	0.5	10.2	14.21
-	128	-	-	-A5	(90)	5.51	3.74	4.57	0.16	M8x14	0.875	1.97	1.5	0.27	0.96	0.188	2.8	7.1
					(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	7.73
					(112)	7.01	4.72	5.71	0.16	M10x17	1.25	2.36	1.88	0.37	1.36	0.25	3.27	7.56
					(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	10.85
					(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	12.48
					(200)	11.65	7.68	9.06	0.2	M16x28	2.125	4.33	3.5	0.44	2.35	0.5	9.25	13.41

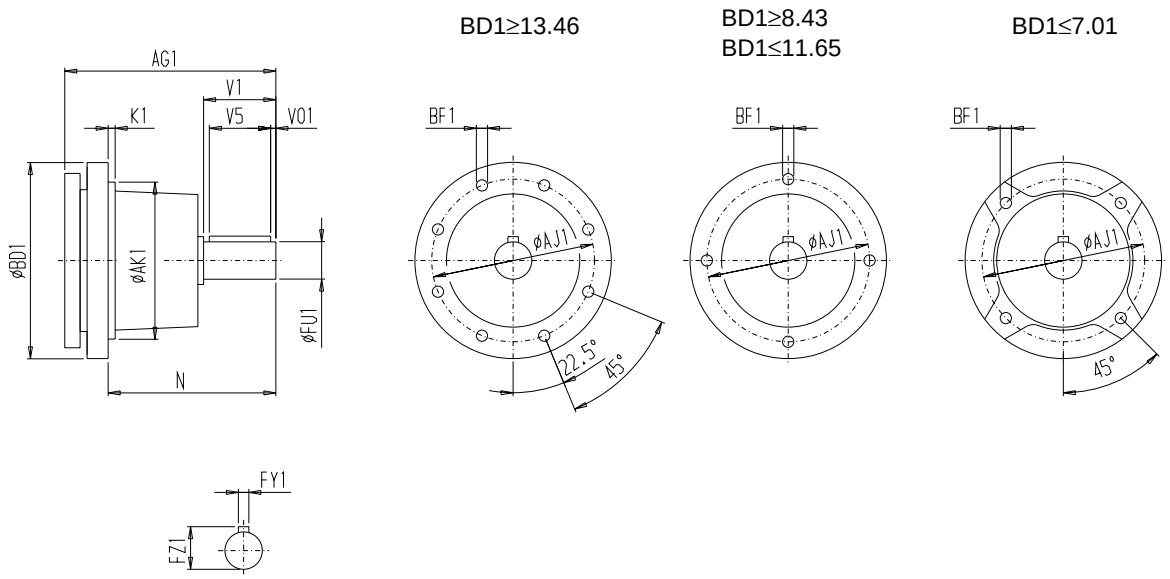
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit A5

A5

[mm]



Gear Units																		
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	AJ1	K1	BF1	FU1	V1	V5	V01	FZ1	FY1	N	AG1
88	-	108	108B	-A5	(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	169
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	182,5
					(112)	178	120	145	4	M10x17	31,75	60	55,56	1,44	35,27	7,938	83	180,5
					(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	265
					(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	308,5
-	88	-	-	-A5	(71)	136	95	116	4	M8x14	15,875	40	31,75	4,25	17,9	4,763	61	149
					(80)	140	95	116	4	M8x14	19,05	40	31,75	4,25	21,15	4,763	61	184
					(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	194
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	210
					(112)	178	120	145	4	M10x17	31,75	60	55,56	1,44	35,27	7,938	83	209,5
					(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	293
108	-	128	128B	-A5	(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	157,5
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	170,5
					(112)	178	120	145	4	M10x17	31,75	60	55,56	1,44	35,27	7,938	83	169
					(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	252,5
					(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	297
					(200)	296	195	230	5	M16x28	53,975	110	88,9	11,1	59,58	12,7	235	317,5
-	108	-	-	-A5	(80)	140	95	116	4	M8x14	19,05	40	31,75	4,25	21,15	4,763	61	178
					(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	188
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	204
					(112)	178	120	145	4	M10x17	31,75	60	55,56	1,44	35,27	7,938	83	200,5
					(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	285
					(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	326,5
128	-	148	148B	-A5	(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	161
					(112)	178	120	145	4	M10x17	31,75	60	55,56	1,44	35,27	7,938	83	158,5
					(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	242
					(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	280,5
					(200)	296	195	230	5	M16x28	53,975	110	88,9	11,1	59,58	12,7	235	304
					(225)	342	250	300	5	M16x22	53,975	140	88,9	11,1	59,58	12,7	259	361,5
-	128	-	-	-A5	(90)	140	95	116	4	M8x14	22,225	50	38,1	6,9	24,35	4,763	71	181
					(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	197
					(112)	178	120	145	4	M10x17	31,75	60	55,56	1,44	35,27	7,938	83	192,5
					(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	276
					(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	317,5
					(200)	296	195	230	5	M16x28	53,975	110	88,9	11,1	59,58	12,7	235	341

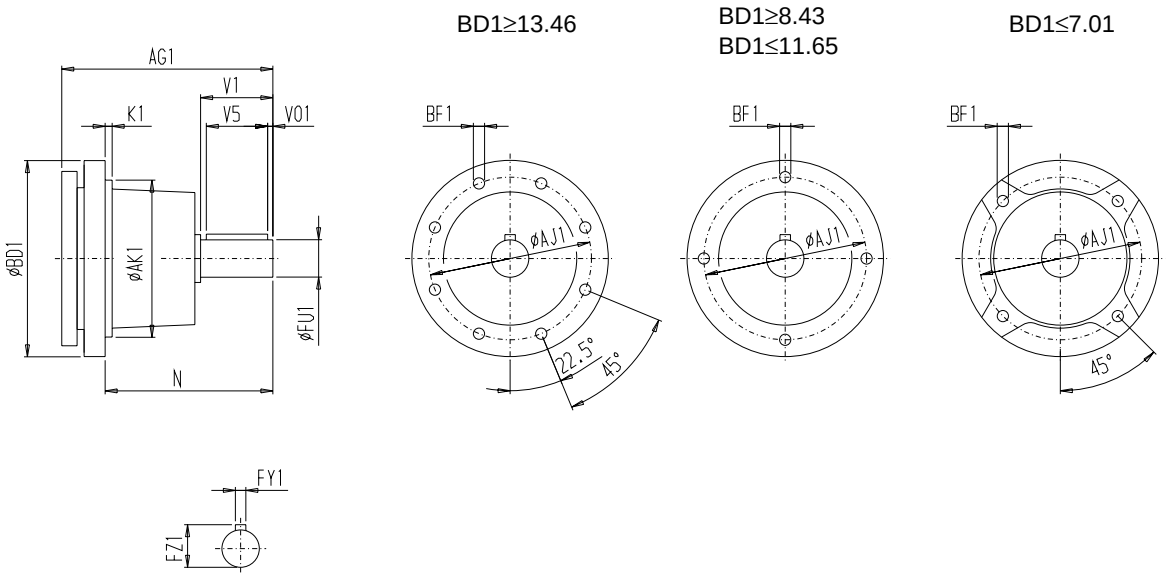
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit A5

A5

[inch]



Gear Units																		
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	AJ1	K1	BF1	FU1	V1	V5	V01	FZ1	FY1	N	AG1
148	-	168	168B	-A5	(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	9.2
					(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	10.73
					(200)	11.65	7.68	9.06	0.2	M16x28	2.125	4.33	3.5	0.44	2.35	0.5	9.25	11.65
					(225)	13.46	9.84	11.81	0.2	M16x22	2.125	5.51	3.5	0.44	2.35	0.5	10.2	13.92
					(250)	15.59	9.84	11.81	0.2	M16x22	2.375	5.51	4.25	0.67	2.65	0.625	10.2	13.9
-	148	-	-	-A5	(100)	6.85	4.72	5.71	0.16	M10x17	1.125	2.36	1.88	0.29	1.24	0.25	3.27	7.54
					(112)	7.01	4.72	5.71	0.16	M10x17	1.25	2.36	1.88	0.37	1.36	0.25	3.27	7.44
					(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	10.69
					(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	12.22
					(200)	11.65	7.68	9.06	0.2	M16x28	2.125	4.33	3.5	0.44	2.35	0.5	9.25	13.15
					(225)	13.46	9.84	11.81	0.2	M16x22	2.125	5.51	3.5	0.44	2.35	0.5	10.2	15.41
168	-	188	188B	-A5	(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	8.63
					(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	10.16
					(200)	11.65	7.68	9.06	0.2	M16x28	2.125	4.33	3.5	0.44	2.35	0.5	9.25	11.08
					(225)	13.46	9.84	11.81	0.2	M16x22	2.125	5.51	3.5	0.44	2.35	0.5	10.2	13.35
					(250)	15.59	9.84	11.81	0.2	M16x22	2.375	5.51	4.25	0.67	2.65	0.625	10.2	13.33
-	168	-	-	-A5	(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	10.24
					(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	11.77
					(200)	11.65	7.68	9.06	0.2	M16x28	2.125	4.33	3.5	0.44	2.35	0.5	9.25	12.7
					(225)	13.46	9.84	11.81	0.2	M16x22	2.125	5.51	3.5	0.44	2.35	0.5	10.2	14.48
188	-	-	-	-A5	(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	10.16
					(200)	11.65	7.68	9.06	0.2	M16x28	2.125	4.33	3.5	0.44	2.35	0.5	9.25	11.08
					(225)	13.46	9.84	11.81	0.2	M16x22	2.125	5.51	3.5	0.44	2.35	0.5	10.2	13.35
					(250)	15.59	9.84	11.81	0.2	M16x22	2.375	5.51	4.25	0.67	2.65	0.625	10.2	13.33
-	188	-	-	-A5	(132)	8.43	6.3	7.24	0.14	M16x22	1.375	3.15	2.75	0.2	1.51	0.313	6.61	8.63
					(160)	9.88	6.3	7.24	0.2	M16x28	1.625	4.33	3.09	0.64	1.79	0.375	8.46	10.16
					(200)	11.65	7.68	9.06	0.2	M16x28	2.125	4.33	3.5	0.44	2.35	0.5	9.25	11.08
					(225)	13.46	9.84	11.81	0.2	M16x22	2.125	5.51	3.5	0.44	2.35	0.5	10.2	13.35
					(250)	15.59	9.84	11.81	0.2	M16x22	2.375	5.51	4.25	0.67	2.65	0.625	10.2	13.33

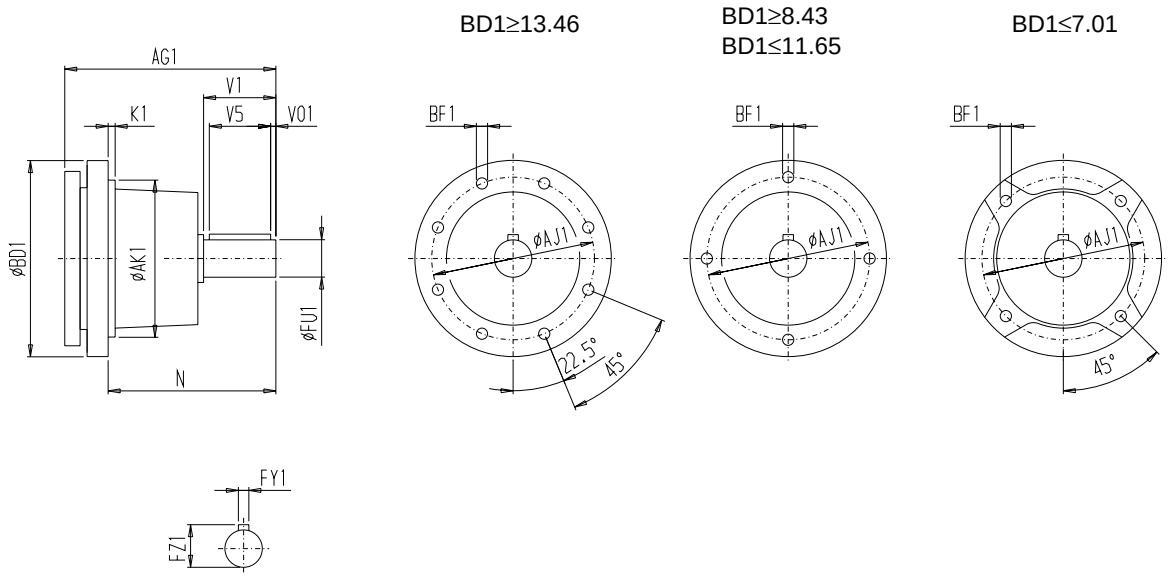
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit A5

A5

[mm]

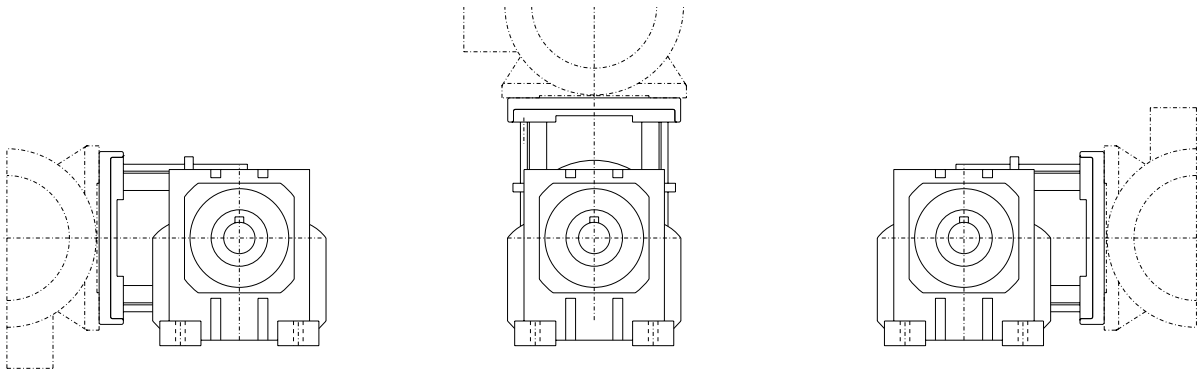


Gear Units																		
E./Z.	D.	K./C.	FZ./FD.			BD1	AK1	AJ1	K1	BF1	FU1	V1	V5	V01	FZ1	FY1	N	AG1
148	-	168	168B	-A5	(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	234
					(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	273
					(200)	296	195	230	5	M16x28	53,975	110	88,9	11,1	59,58	12,7	235	296,5
					(225)	342	250	300	5	M16x22	53,975	140	88,9	11,1	59,58	12,7	259	354
					(250)	396	250	300	5	M16x22	60,325	140	107,95	17,05	67,36	15,875	259	353,5
-	148	-	-	-A5	(100)	174	120	145	4	M10x17	28,575	60	47,63	7,37	31,4	6,35	83	192
					(112)	178	120	145	4	M10x17	31,75	60	55,56	1,44	35,27	7,938	83	189,5
					(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	272
					(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	311
					(200)	296	195	230	5	M16x28	53,975	110	88,9	11,1	59,58	12,7	235	334,5
					(225)	342	250	300	5	M16x22	53,975	140	88,9	11,1	59,58	12,7	259	392
168	-	188	188B	-A5	(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	219,5
					(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	258,5
					(200)	296	195	230	5	M16x28	53,975	110	88,9	11,1	59,58	12,7	235	282
					(225)	342	250	300	5	M16x22	53,975	140	88,9	11,1	59,58	12,7	259	339,5
					(250)	396	250	300	5	M16x22	60,325	140	107,95	17,05	67,36	15,875	259	339
-	168	-	-	-A5	(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	260,5
					(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	299,5
					(200)	296	195	230	5	M16x28	53,975	110	88,9	11,1	59,58	12,7	235	323
					(225)	342	250	300	5	M16x22	53,975	140	88,9	11,1	59,58	12,7	259	380,5
188	-	-	-	-A5	(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	258,5
					(200)	296	195	230	5	M16x28	53,975	110	88,9	11,1	59,58	12,7	235	282
					(225)	342	250	300	5	M16x22	53,975	140	88,9	11,1	59,58	12,7	259	339,5
					(250)	396	250	300	5	M16x22	60,325	140	107,95	17,05	67,36	15,875	259	339
-	188	-	-	-A5	(132)	214	160	184	3,5	M16x22	34,925	80	69,85	5,15	38,44	7,938	168	219,5
					(160)	251	160	184	5	M16x28	41,275	110	78,58	16,24	45,45	9,53	215	258,5
					(200)	296	195	230	5	M16x28	53,975	110	88,9	11,1	59,58	12,7	235	282
					(225)	342	250	300	5	M16x22	53,975	140	88,9	11,1	59,58	12,7	259	339,5
					(250)	396	250	300	5	M16x22	60,325	140	107,95	17,05	67,36	15,875	259	339

Tolerances see page 1 - 4

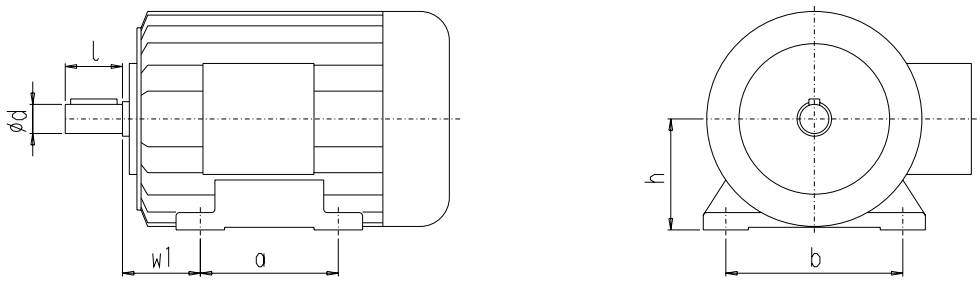
④ Tap specification see page 1 - 7

Input unit P5
Position of „piggy back“



9h 12h 3h

Connection dimensions for surface cooled asynchronous motors, foot mounted acc. to NEMA MG-1

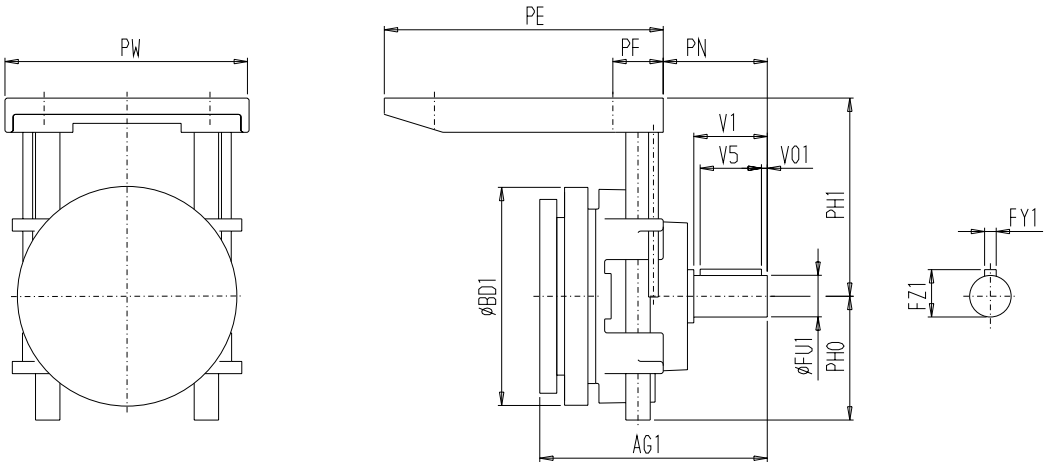


Frame size	d [inch] *[mm]*	l [inch] *[mm]*	w1 [inch] *[mm]*	h [inch] *[mm]*	a [inch] *[mm]*	b [inch] *[mm]*
143	7/8 *22,225*	2.25 *57,15*	2.25 *57,15*	3.5 *88,9*	4 *101,6*	5.5 *139,7*
145	7/8 *22,225*	2.25 *57,15*	2.25 *57,15*	3.5 *88,9*	5 *127*	5.5 *139,7*
182	1 1/8 *28,575*	2.5 *63,5*	2.75 *69,85*	4.5 *114,3*	4.5 *114,3*	3.75 *95,25*
184	1 1/8 *28,575*	2.5 *63,5*	2.75 *69,85*	4.5 *114,3*	5.5 *139,7*	3.75 *95,25*
213	1 3/8 *34,925*	3.125 *79,375*	3.5 *88,9*	5.25 *133,35*	5.5 *139,7*	4.25 *107,95*
215	1 3/8 *34,925*	3.125 *79,375*	3.5 *88,9*	5.25 *133,35*	7 *177,8*	4.25 *107,95*
254	1 5/8 *41,275*	3.75 *95,25*	4.25 *107,95*	6.25 *158,75*	8.5 *215,9*	5 *127*
256	1 5/8 *41,275*	3.75 *95,25*	4.25 *107,95*	6.25 *158,75*	10 *254*	5 *127*
286	1 7/8 *47,625*	3 *76,2*	4.75 *120,65*	7 *177,8*	11 *279,4*	5.5 *139,7*
324	2 1/8 *53,975*	5 *127*	5.25 *133,35*	8 *203,2*	10.5 *266,7*	6.25 *158,75*
326	2 1/8 *53,975*	3.5 *88,9*	5.25 *133,35*	8 *203,2*	12 *304,8*	6.25 *158,75*
364	2 3/8 *60,325*	5.625 *142,875*	5.875 *149,225*	9 *228,6*	11.25 *285,75*	7 *177,8*
365	2 3/8 *60,325*	3.5 *88,9*	5.875 *149,225*	9 *228,6*	12.25 *311,15*	7 *177,8*

Input Unit P5

P5

[inch]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
F.38B	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	8.86	3.46	5.12	8.86	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.69
	-P5 (145)	5.51	8.86	6.85	2.09	3.46	5.12	8.86	3.46	5.12	8.86	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.69
	-P5 (182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.32
	-P5 (184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.32
E.38	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (145)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
	-P5 (184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
Z.38	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (145)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
	-P5 (184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
K.38	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (145)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
	-P5 (184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
K.48	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (145)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
	-P5 (184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
C.38	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (145)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
	-P5 (184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
C.48	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.31	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (145)	5.51	8.86	6.85	2.09	3.46	5.31	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	-P5 (182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
	-P5 (184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
D.38	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	8.27
	-P5 (145)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	8.27
E.48	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.46
	-P5 (145)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.46
	-P5 (182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.09
	-P5 (184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.09

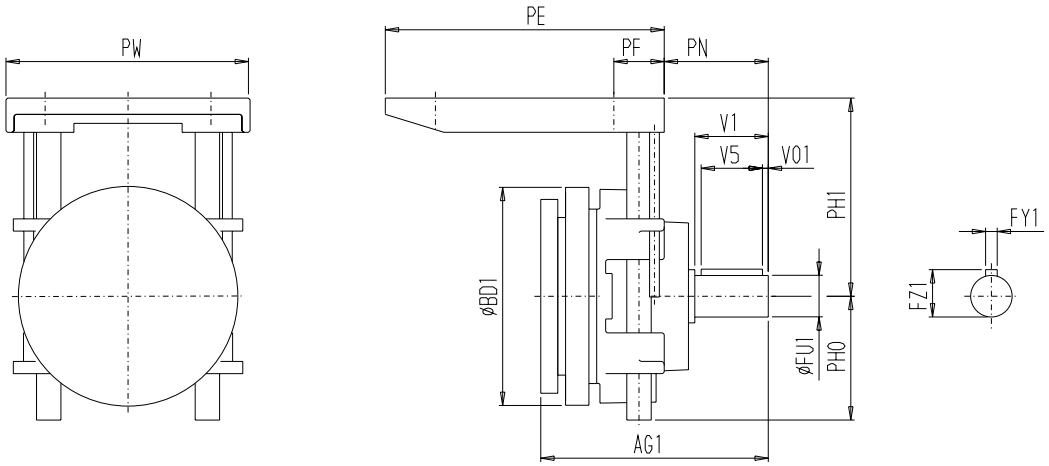
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[mm]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
F.38B	-P5	(143)	140	225	174	53	88	130	225	88	130	225	22,225	50	38,1	6,9	24,35	4,763	63	170,5
		(145)	140	225	174	53	88	130	225	88	130	225	22,225	50	38,1	6,9	24,35	4,763	63	170,5
		(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	186,5
		(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	186,5
E.38	-P5	(143)	140	225	174	53	88	130	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(145)	140	225	174	53	88	130	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
		(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
Z.38	-P5	(143)	140	225	174	53	88	130	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(145)	140	225	174	53	88	130	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
		(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
K.38	-P5	(143)	140	225	174	53	88	130	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(145)	140	225	174	53	88	130	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
		(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
K.48	-P5	(143)	140	225	174	53	88	130	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(145)	140	225	174	53	88	130	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
		(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
C.38	-P5	(143)	140	225	174	53	88	130	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(145)	140	225	174	53	88	130	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
		(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
C.48	-P5	(143)	140	225	174	53	88	135	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(145)	140	225	174	53	88	135	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	195,5
		(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
		(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
D.38	-P5	(143)	140	225	174	53	88	130	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	210,5
		(145)	140	225	174	53	88	130	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	210,5
E.48	-P5	(143)	140	225	174	53	88	130	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	190
		(145)	140	225	174	53	88	130	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	190
		(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	206
		(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	206

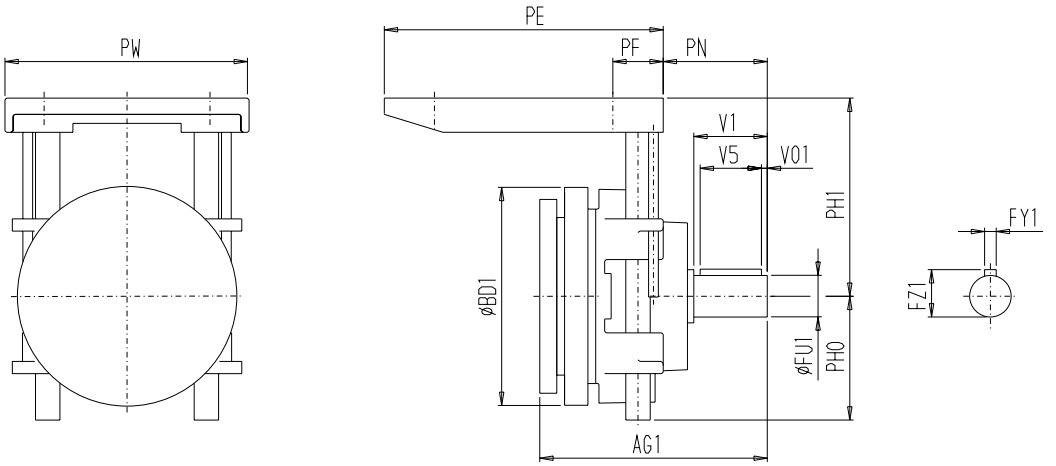
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[inch]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
Z.48	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.46
	(145)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.46
	(182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.09
	(184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.09
D.48	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	8.13
	(145)	5.51	8.86	6.85	2.09	3.46	5.12	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	8.13
	(182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.76
	(184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.76
F.48B	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.12	8.86	3.46	5.12	8.86	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	(145)	5.51	8.86	6.85	2.09	3.46	5.12	8.86	3.46	5.12	8.86	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.67
	(182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
	(184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.3
E.68	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.51	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.22
	(145)	5.51	8.86	6.85	2.09	3.46	5.51	9.25	3.46	5.12	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.22
	(182)	6.85	9.84	9.13	2.36	3.46	5.91	9.45	3.46	5.91	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.85
	(184)	6.85	9.84	9.13	2.36	3.46	5.91	9.45	3.46	5.91	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.85
	(213)	8.43	14.72	11.81	3.31	8.23	7.09	10.63	7.24	7.09	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.15
	(215)	8.43	14.72	11.81	3.31	8.23	7.09	10.63	7.24	7.09	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.15
D.68	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.51	9.25	3.46	6.3	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.95
	(145)	5.51	8.86	6.85	2.09	3.46	5.51	9.25	3.46	6.3	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.95
	(182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	6.3	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.58
	(184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	6.3	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.58
Z.68	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.51	9.25	3.46	6.3	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.22
	(145)	5.51	8.86	6.85	2.09	3.46	5.51	9.25	3.46	6.3	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.22
	(182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	6.3	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.85
	(184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	6.3	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.85
	(213)	8.43	14.72	11.81	3.31	5.47	7.09	9.06	5.47	7.09	9.06	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.15
	(215)	8.43	14.72	11.81	3.31	5.47	7.09	9.06	5.47	7.09	9.06	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.15
K.68	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.51	9.25	3.46	6.3	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.46
	(145)	5.51	8.86	6.85	2.09	3.46	5.51	9.25	3.46	6.3	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.46
	(182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	6.3	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.09
	(184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	6.3	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.09
F.68B	-P5 (143)	5.51	8.86	6.85	2.09	3.46	5.51	8.86	3.46	5.51	8.86	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.46
	(145)	5.51	8.86	6.85	2.09	3.46	5.51	8.86	3.46	5.51	8.86	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.46
	(182)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.83	9.37	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.09
	(184)	6.85	9.84	9.13	2.36	3.46	5.71	9.45	3.46	5.83	9.37	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.09

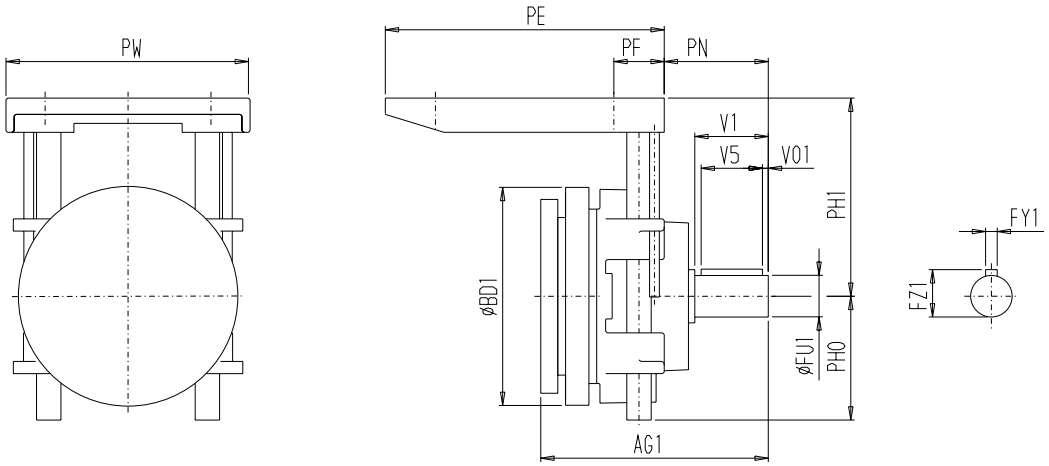
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[mm]



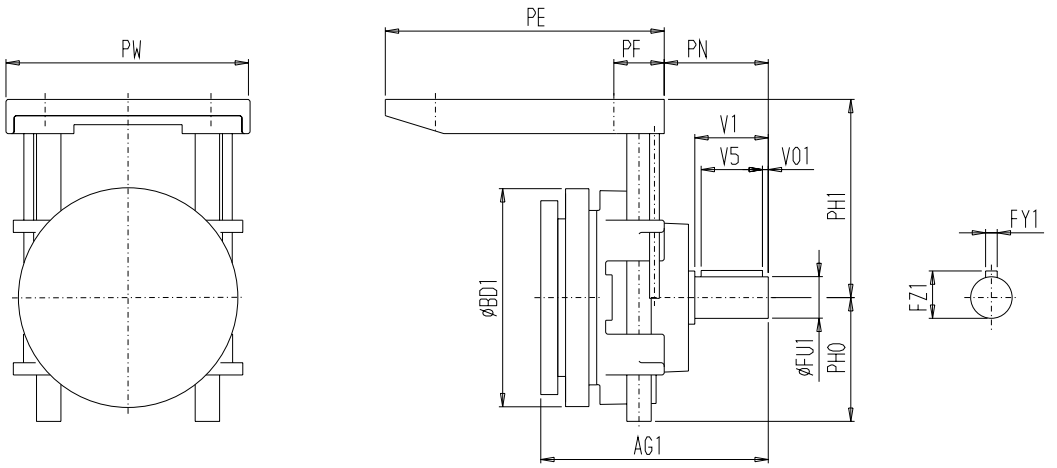
Gear Units		BD1	PE	PW	PF	12h PH0 max	12h PH1 min	12h PH1 max	3/9h PH0 max	3/9h PH1 min	3/9h PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
Z.48 -P5	**(143)**	140	225	174	53	88	130	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	190
	(145)	140	225	174	53	88	130	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	190
	(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	206
	(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	206
D.48 -P5	**(143)**	140	225	174	53	88	130	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	207
	(145)	140	225	174	53	88	130	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	207
	(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	223
	(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	223
F.48B -P5	**(143)**	140	225	174	53	88	130	225	88	130	225	22,225	50	38,1	6,9	24,35	4,763	63	195,5
	(145)	140	225	174	53	88	130	225	88	130	225	22,225	50	38,1	6,9	24,35	4,763	63	195,5
	(182)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
	(184)	174	250	232	60	88	145	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	211,5
E.68 -P5	**(143)**	140	225	174	53	88	140	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	184
	(145)	140	225	174	53	88	140	235	88	130	235	22,225	50	38,1	6,9	24,35	4,763	63	184
	(182)	174	250	232	60	88	150	240	88	150	240	28,575	60	47,63	7,37	31,4	6,35	73	200
	(184)	174	250	232	60	88	150	240	88	150	240	28,575	60	47,63	7,37	31,4	6,35	73	200
	(213)	214	374	300	84	209	180	270	184	180	270	34,925	80	69,85	5,15	38,44	7,938	85	283,5
	(215)	214	374	300	84	209	180	270	184	180	270	34,925	80	69,85	5,15	38,44	7,938	85	283,5
D.68 -P5	**(143)**	140	225	174	53	88	140	235	88	160	235	22,225	50	38,1	6,9	24,35	4,763	63	202,5
	(145)	140	225	174	53	88	140	235	88	160	235	22,225	50	38,1	6,9	24,35	4,763	63	202,5
	(182)	174	250	232	60	88	145	240	88	160	240	28,575	60	47,63	7,37	31,4	6,35	73	218,5
	(184)	174	250	232	60	88	145	240	88	160	240	28,575	60	47,63	7,37	31,4	6,35	73	218,5
Z.68 -P5	**(143)**	140	225	174	53	88	140	235	88	160	235	22,225	50	38,1	6,9	24,35	4,763	63	184
	(145)	140	225	174	53	88	140	235	88	160	235	22,225	50	38,1	6,9	24,35	4,763	63	184
	(182)	174	250	232	60	88	145	240	88	160	240	28,575	60	47,63	7,37	31,4	6,35	73	200
	(184)	174	250	232	60	88	145	240	88	160	240	28,575	60	47,63	7,37	31,4	6,35	73	200
	(213)	214	374	300	84	139	180	230	139	180	230	34,925	80	69,85	5,15	38,44	7,938	85	283,5
	(215)	214	374	300	84	139	180	230	139	180	230	34,925	80	69,85	5,15	38,44	7,938	85	283,5
K.68 -P5	**(143)**	140	225	174	53	88	140	235	88	160	235	22,225	50	38,1	6,9	24,35	4,763	63	190
	(145)	140	225	174	53	88	140	235	88	160	235	22,225	50	38,1	6,9	24,35	4,763	63	190
	(182)	174	250	232	60	88	145	240	88	160	240	28,575	60	47,63	7,37	31,4	6,35	73	206
	(184)	174	250	232	60	88	145	240	88	160	240	28,575	60	47,63	7,37	31,4	6,35	73	206
F.68B -P5	**(143)**	140	225	174	53	88	140	225	88	140	225	22,225	50	38,1	6,9	24,35	4,763	63	190
	(145)	140	225	174	53	88	140	225	88	140	225	22,225	50	38,1	6,9	24,35	4,763	63	190
	(182)	174	250	232	60	88	145	240	88	148	238	28,575	60	47,63	7,37	31,4	6,35	73	206
	(184)	174	250	232	60	88	145	240	88	148	238	28,575	60	47,63	7,37	31,4	6,35	73	206

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5
[inch]



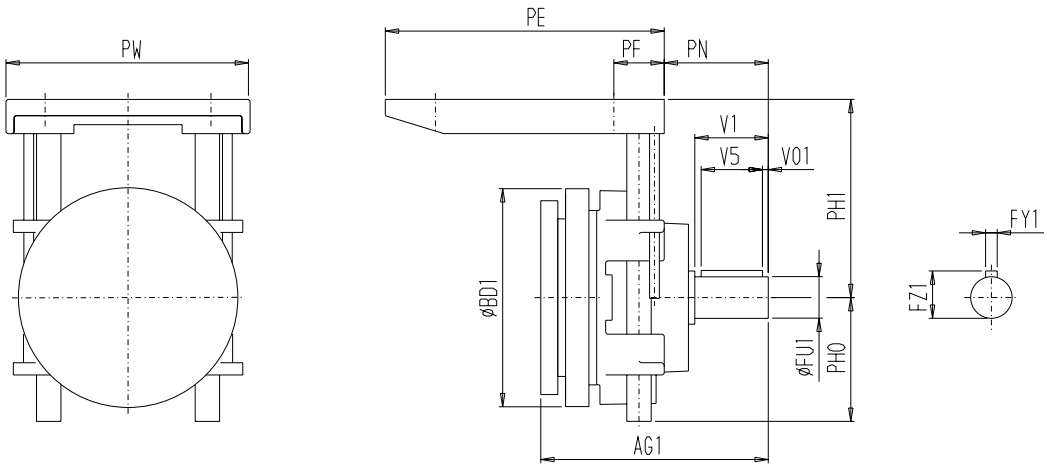
Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	12h PH1 max	3/9h PH0 max	3/9h PH1 min	3/9h PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
C.68 -P5	(143)	5.51	8.86	6.85	2.09	3.46	6.69	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.46
	(145)	5.51	8.86	6.85	2.09	3.46	6.69	9.25	3.46	5.51	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.46
	(182)	6.85	9.84	9.13	2.36	3.46	6.89	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.09
	(184)	6.85	9.84	9.13	2.36	3.46	6.89	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.09
E.88 -P5	(143)	5.51	8.86	6.85	2.09	3.46	6.5	9.25	3.46	6.3	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.63
	(145)	5.51	8.86	6.85	2.09	3.46	6.5	9.25	3.46	6.3	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.63
	(182)	6.85	9.84	9.13	2.36	3.46	6.3	9.45	3.46	6.3	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.16
	(184)	6.85	9.84	9.13	2.36	3.46	6.3	9.45	3.46	6.3	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.16
	(213)	8.43	14.72	11.81	3.31	5.47	7.87	10.63	5.47	7.09	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.42
	(215)	8.43	14.72	11.81	3.31	5.47	7.87	10.63	5.47	7.09	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.42
	(254)	9.88	14.72	11.81	3.39	5.47	7.87	10.63	5.28	7.09	10.63	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.12
	(256)	9.88	14.72	11.81	3.39	5.47	7.87	10.63	5.28	7.09	10.63	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.12
Z.88 -P5	(143)	5.51	8.86	6.85	2.09	3.46	6.3	9.25	3.46	7.48	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.63
	(145)	5.51	8.86	6.85	2.09	3.46	6.3	9.25	3.46	7.48	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.63
	(182)	6.85	9.84	9.13	2.36	3.46	6.3	9.45	3.46	7.48	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.16
	(184)	6.85	9.84	9.13	2.36	3.46	6.3	9.45	3.46	7.48	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.16
	(213)	8.43	14.72	11.81	3.31	6.06	7.09	9.06	4.88	8.66	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.42
	(215)	8.43	14.72	11.81	3.31	6.06	7.09	9.06	4.88	8.66	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.42
	(254)	9.88	14.72	11.81	3.39	8.23	7.09	9.06	7.24	8.66	10.63	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.12
	(256)	9.88	14.72	11.81	3.39	8.23	7.09	9.06	7.24	8.66	10.63	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.12
K.88 -P5	(143)	5.51	8.86	6.85	2.09	3.46	6.3	9.25	3.46	7.48	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.22
	(145)	5.51	8.86	6.85	2.09	3.46	6.3	9.25	3.46	7.48	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.22
	(182)	6.85	9.84	9.13	2.36	3.46	6.3	9.45	3.46	7.48	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.85
	(184)	6.85	9.84	9.13	2.36	3.46	6.3	9.45	3.46	7.48	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.85
	(213)	8.43	14.72	11.81	3.31	5.47	7.09	9.06	5.47	7.09	9.06	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.15
	(215)	8.43	14.72	11.81	3.31	5.47	7.09	9.06	5.47	7.09	9.06	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.15
F.88B -P5	(143)	5.51	8.86	6.85	2.09	3.46	6.42	8.98	3.46	6.61	8.98	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.22
	(145)	5.51	8.86	6.85	2.09	3.46	6.42	8.98	3.46	6.61	8.98	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.22
	(182)	6.85	9.84	9.13	2.36	3.46	6.42	9.37	3.46	6.3	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.85
	(184)	6.85	9.84	9.13	2.36	3.46	6.42	9.37	3.46	6.3	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.85
	(213)	8.43	14.72	11.81	3.31	5.39	7.01	8.98	5	7.4	8.98	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.15
	(215)	8.43	14.72	11.81	3.31	5.39	7.01	8.98	5	7.4	8.98	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.15
C.88 -P5	(143)	5.51	8.86	6.85	2.09	3.46	7.87	9.25	3.46	5.91	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.22
	(145)	5.51	8.86	6.85	2.09	3.46	7.87	9.25	3.46	5.91	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.22
	(182)	6.85	9.84	9.13	2.36	3.46	7.87	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.85
	(184)	6.85	9.84	9.13	2.36	3.46	7.87	9.45	3.46	5.71	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.85
	(213)	8.43	14.72	11.81	3.31	5.47	8.66	10.63	5.28	8.66	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.15
	(215)	8.43	14.72	11.81	3.31	5.47	8.66	10.63	5.28	8.66	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.15

Tolerances see page 1 - 4 ④ Tap specification see page 1 - 7

Input Unit P5

P5

[mm]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
C.68	-P5 (143)	140	225	174	53	88	170	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	190
	(145)	140	225	174	53	88	170	235	88	140	235	22,225	50	38,1	6,9	24,35	4,763	63	190
	(182)	174	250	232	60	88	175	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	206
	(184)	174	250	232	60	88	175	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	206
E.88	-P5 (143)	140	225	174	53	88	165	235	88	160	235	22,225	50	38,1	6,9	24,35	4,763	63	169
	(145)	140	225	174	53	88	165	235	88	160	235	22,225	50	38,1	6,9	24,35	4,763	63	169
	(182)	174	250	232	60	88	160	240	88	160	240	28,575	60	47,63	7,37	31,4	6,35	73	182,5
	(184)	174	250	232	60	88	160	240	88	160	240	28,575	60	47,63	7,37	31,4	6,35	73	182,5
	(213)	214	374	300	84	139	200	270	139	180	270	34,925	80	69,85	5,15	38,44	7,938	85	265
	(215)	214	374	300	84	139	200	270	139	180	270	34,925	80	69,85	5,15	38,44	7,938	85	265
	(254)	251	374	300	86	139	200	270	134	180	270	41,275	110	78,58	16,24	45,45	9,53	132	308,5
	(256)	251	374	300	86	139	200	270	134	180	270	41,275	110	78,58	16,24	45,45	9,53	132	308,5
Z.88	-P5 (143)	140	225	174	53	88	160	235	88	190	235	22,225	50	38,1	6,9	24,35	4,763	63	169
	(145)	140	225	174	53	88	160	235	88	190	235	22,225	50	38,1	6,9	24,35	4,763	63	169
	(182)	174	250	232	60	88	160	240	88	190	240	28,575	60	47,63	7,37	31,4	6,35	73	182,5
	(184)	174	250	232	60	88	160	240	88	190	240	28,575	60	47,63	7,37	31,4	6,35	73	182,5
	(213)	214	374	300	84	154	180	230	124	220	270	34,925	80	69,85	5,15	38,44	7,938	85	265
	(215)	214	374	300	84	154	180	230	124	220	270	34,925	80	69,85	5,15	38,44	7,938	85	265
	(254)	251	374	300	86	209	180	230	184	220	270	41,275	110	78,58	16,24	45,45	9,53	132	308,5
	(256)	251	374	300	86	209	180	230	184	220	270	41,275	110	78,58	16,24	45,45	9,53	132	308,5
K.88	-P5 (143)	140	225	174	53	88	160	235	88	190	235	22,225	50	38,1	6,9	24,35	4,763	63	184
	(145)	140	225	174	53	88	160	235	88	190	235	22,225	50	38,1	6,9	24,35	4,763	63	184
	(182)	174	250	232	60	88	160	240	88	190	240	28,575	60	47,63	7,37	31,4	6,35	73	200
	(184)	174	250	232	60	88	160	240	88	190	240	28,575	60	47,63	7,37	31,4	6,35	73	200
	(213)	214	374	300	84	139	180	230	139	180	230	34,925	80	69,85	5,15	38,44	7,938	85	283,5
	(215)	214	374	300	84	139	180	230	139	180	230	34,925	80	69,85	5,15	38,44	7,938	85	283,5
F.88B	-P5 (143)	140	225	174	53	88	163	228	88	168	228	22,225	50	38,1	6,9	24,35	4,763	63	184
	(145)	140	225	174	53	88	163	228	88	168	228	22,225	50	38,1	6,9	24,35	4,763	63	184
	(182)	174	250	232	60	88	163	238	88	160	240	28,575	60	47,63	7,37	31,4	6,35	73	200
	(184)	174	250	232	60	88	163	238	88	160	240	28,575	60	47,63	7,37	31,4	6,35	73	200
	(213)	214	374	300	84	137	178	228	127	188	228	34,925	80	69,85	5,15	38,44	7,938	85	283,5
	(215)	214	374	300	84	137	178	228	127	188	228	34,925	80	69,85	5,15	38,44	7,938	85	283,5
C.88	-P5 (143)	140	225	174	53	88	200	235	88	150	235	22,225	50	38,1	6,9	24,35	4,763	63	184
	(145)	140	225	174	53	88	200	235	88	150	235	22,225	50	38,1	6,9	24,35	4,763	63	184
	(182)	174	250	232	60	88	200	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	200
	(184)	174	250	232	60	88	200	240	88	145	240	28,575	60	47,63	7,37	31,4	6,35	73	200
	(213)	214	374	300	84	139	220	270	134	220	270	34,925	80	69,85	5,15	38,44	7,938	85	283,5
	(215)	214	374	300	84	139	220	270	134	220	270	34,925	80	69,85	5,15	38,44	7,938	85	283,5

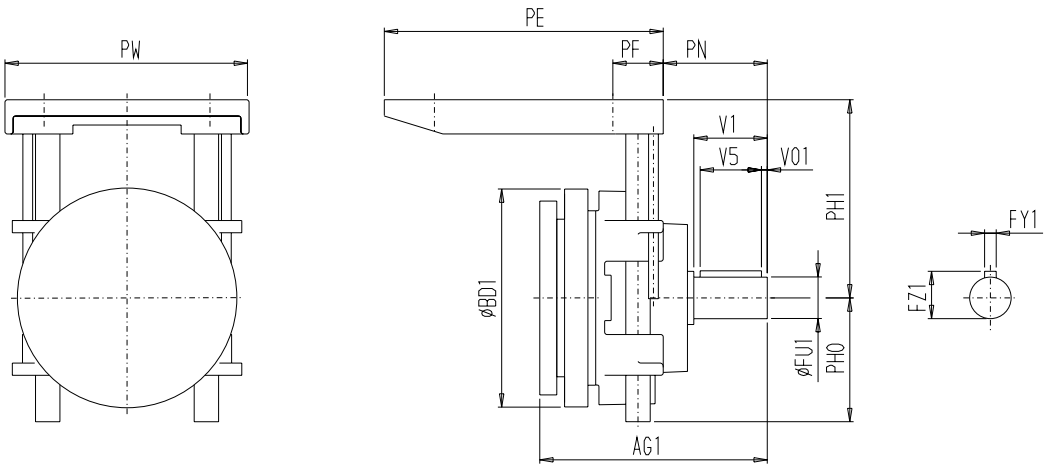
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[inch]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
	(143)	5.51	8.86	6.85	2.09	3.46	6.3	9.25	3.46	7.48	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.62
	(145)	5.51	8.86	6.85	2.09	3.46	6.3	9.25	3.46	7.48	9.25	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.62
	(182)	6.85	9.84	9.13	2.36	3.46	6.3	9.45	3.46	7.48	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.25
D.88 -P5	**(184)**	6.85	9.84	9.13	2.36	3.46	6.3	9.45	3.46	7.48	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.25
	(213)	8.43	14.72	11.81	3.31	6.06	7.09	9.06	4.88	8.66	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.52
	(215)	8.43	14.72	11.81	3.31	6.06	7.09	9.06	4.88	8.66	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.52
	(143)	5.51	8.86	6.85	2.09	3.46	7.68	11.81	3.46	7.68	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.18
	(145)	5.51	8.86	6.85	2.09	3.46	7.68	11.81	3.46	7.68	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.18
	(182)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	8.66	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.69
	(184)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	8.66	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.69
E.108 -P5	**(213)**	8.43	14.72	11.81	3.31	8.23	9.45	13.39	7.24	8.66	13.39	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.93
	(215)	8.43	14.72	11.81	3.31	8.23	9.45	13.39	7.24	8.66	13.39	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.93
	(254)	9.88	14.72	11.81	3.39	7.24	9.45	13.39	6.26	8.66	13.39	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.67
	(256)	9.88	14.72	11.81	3.39	7.24	9.45	13.39	6.26	8.66	13.39	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.67
	(286)	11.65	18.74	15.75	4.25	8.58	9.84	13.86	8.58	11.42	13.86	2.13	4.33	3.5	0.44	2.35	0.5	5.31	12.48
	(143)	5.51	8.86	6.85	2.09	3.46	7.48	11.81	3.46	9.06	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.18
	(145)	5.51	8.86	6.85	2.09	3.46	7.48	11.81	3.46	9.06	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.18
	(182)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	9.06	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.69
	(184)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	9.06	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.69
Z.108 -P5	**(213)**	8.43	14.72	11.81	3.31	5.28	8.66	10.63	8.23	10.04	11.81	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.93
	(215)	8.43	14.72	11.81	3.31	5.28	8.66	10.63	8.23	10.04	11.81	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.93
	(254)	9.88	14.72	11.81	3.39	5.28	8.66	10.63	8.23	10.04	12.01	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.67
	(256)	9.88	14.72	11.81	3.39	5.28	8.66	10.63	8.23	10.04	12.01	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.67
	(286)	11.65	18.74	15.75	4.25	9.57	10.55	13.86	9.17	10.55	13.86	2.13	4.33	3.5	0.44	2.35	0.5	5.31	12.48
	(143)	5.51	8.86	6.85	2.09	3.46	7.48	11.81	3.46	9.06	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.63
	(145)	5.51	8.86	6.85	2.09	3.46	7.48	11.81	3.46	9.06	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.63
	(182)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	9.06	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.16
K.108 -P5	**(184)**	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	9.06	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.16
	(213)	8.43	14.72	11.81	3.31	6.06	7.09	9.06	4.88	8.66	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.42
	(215)	8.43	14.72	11.81	3.31	6.06	7.09	9.06	4.88	8.66	10.63	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.42
	(254)	9.88	14.72	11.81	3.39	8.23	7.09	9.06	7.24	8.66	10.63	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.12
	(256)	9.88	14.72	11.81	3.39	8.23	7.09	9.06	7.24	8.66	10.63	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.12

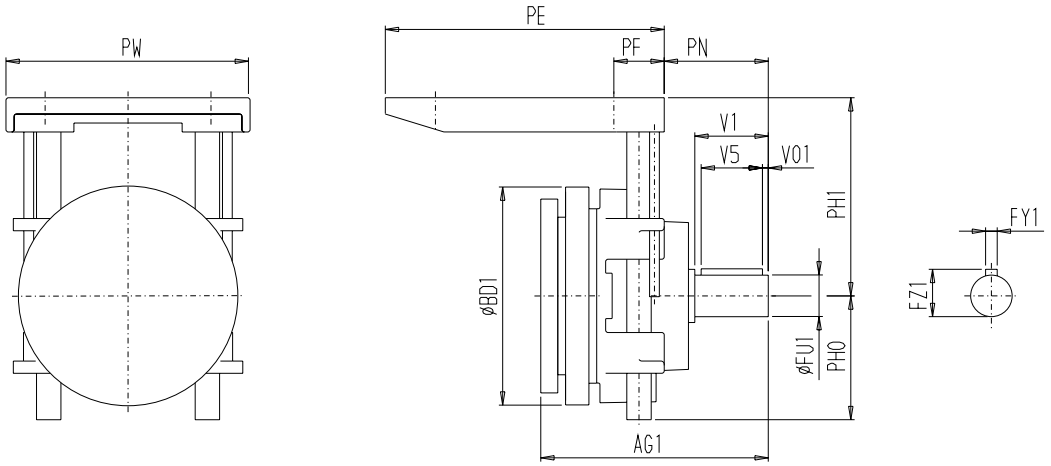
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[mm]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
D.88 -P5	**(143)**	140	225	174	53	88	160	235	88	190	235	22,225	50	38,1	6,9	24,35	4,763	63	194
	(145)	140	225	174	53	88	160	235	88	190	235	22,225	50	38,1	6,9	24,35	4,763	63	194
	(182)	174	250	232	60	88	160	240	88	190	240	28,575	60	47,63	7,37	31,4	6,35	73	210
	(184)	174	250	232	60	88	160	240	88	190	240	28,575	60	47,63	7,37	31,4	6,35	73	210
	(213)	214	374	300	84	154	180	230	124	220	270	34,925	80	69,85	5,15	38,44	7,938	85	293
	(215)	214	374	300	84	154	180	230	124	220	270	34,925	80	69,85	5,15	38,44	7,938	85	293
E.108 -P5	**(143)**	140	225	174	53	88	195	300	88	195	300	22,225	50	38,1	6,9	24,35	4,763	63	157,5
	(145)	140	225	174	53	88	195	300	88	195	300	22,225	50	38,1	6,9	24,35	4,763	63	157,5
	(182)	174	250	232	60	88	220	320	88	220	320	28,575	60	47,63	7,37	31,4	6,35	73	170,5
	(184)	174	250	232	60	88	220	320	88	220	320	28,575	60	47,63	7,37	31,4	6,35	73	170,5
	(213)	214	374	300	84	209	240	340	184	220	340	34,925	80	69,85	5,15	38,44	7,938	85	252,5
	(215)	214	374	300	84	209	240	340	184	220	340	34,925	80	69,85	5,15	38,44	7,938	85	252,5
	(254)	251	374	300	86	184	240	340	159	220	340	41,275	110	78,58	16,24	45,45	9,53	132	297
	(256)	251	374	300	86	184	240	340	159	220	340	41,275	110	78,58	16,24	45,45	9,53	132	297
	(286)	296	476	400	108	218	250	352	218	290	352	53,975	110	88,9	11,1	59,58	12,7	135	317,5
Z.108 -P5	**(143)**	140	225	174	53	88	190	300	88	230	300	22,225	50	38,1	6,9	24,35	4,763	63	157,5
	(145)	140	225	174	53	88	190	300	88	230	300	22,225	50	38,1	6,9	24,35	4,763	63	157,5
	(182)	174	250	232	60	88	220	320	88	230	320	28,575	60	47,63	7,37	31,4	6,35	73	170,5
	(184)	174	250	232	60	88	220	320	88	230	320	28,575	60	47,63	7,37	31,4	6,35	73	170,5
	(213)	214	374	300	84	134	220	270	209	255	300	34,925	80	69,85	5,15	38,44	7,938	85	252,5
	(215)	214	374	300	84	134	220	270	209	255	300	34,925	80	69,85	5,15	38,44	7,938	85	252,5
	(254)	251	374	300	86	134	220	270	209	255	305	41,275	110	78,58	16,24	45,45	9,53	132	297
	(256)	251	374	300	86	134	220	270	209	255	305	41,275	110	78,58	16,24	45,45	9,53	132	297
	(286)	296	476	400	108	243	268	352	233	268	352	53,975	110	88,9	11,1	59,58	12,7	135	317,5
K.108 -P5	**(143)**	140	225	174	53	88	190	300	88	230	300	22,225	50	38,1	6,9	24,35	4,763	63	169
	(145)	140	225	174	53	88	190	300	88	230	300	22,225	50	38,1	6,9	24,35	4,763	63	169
	(182)	174	250	232	60	88	220	320	88	230	320	28,575	60	47,63	7,37	31,4	6,35	73	182,5
	(184)	174	250	232	60	88	220	320	88	230	320	28,575	60	47,63	7,37	31,4	6,35	73	182,5
	(213)	214	374	300	84	154	180	230	124	220	270	34,925	80	69,85	5,15	38,44	7,938	85	265
	(215)	214	374	300	84	154	180	230	124	220	270	34,925	80	69,85	5,15	38,44	7,938	85	265
	(254)	251	374	300	86	209	180	230	184	220	270	41,275	110	78,58	16,24	45,45	9,53	132	308,5
	(256)	251	374	300	86	209	180	230	184	220	270	41,275	110	78,58	16,24	45,45	9,53	132	308,5

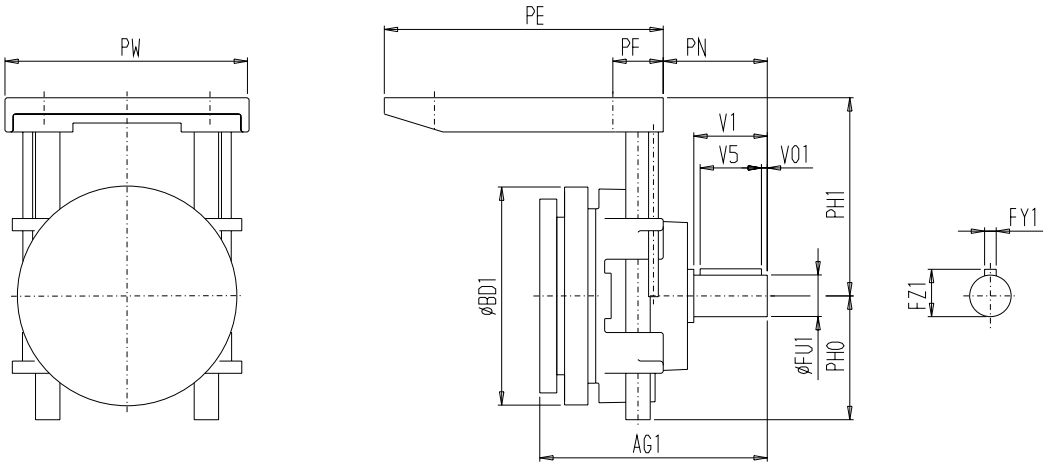
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[inch]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
F.108B -P5	(143)	5.51	8.86	6.85	2.09	3.46	7.48	11.61	3.46	7.48	11.61	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.63
	(145)	5.51	8.86	6.85	2.09	3.46	7.48	11.61	3.46	7.48	11.61	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.63
	(182)	6.85	9.84	9.13	2.36	3.46	8.78	12.52	3.46	7.48	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.16
	(184)	6.85	9.84	9.13	2.36	3.46	8.78	12.52	3.46	7.48	9.45	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.16
	(213)	8.43	14.72	11.81	3.31	5.63	8.15	10.12	5.31	8.46	10.43	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.42
	(215)	8.43	14.72	11.81	3.31	5.63	8.15	10.12	5.31	8.46	10.43	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.42
	(254)	9.88	14.72	11.81	3.39	5.63	8.15	10.12	5.31	8.46	10.43	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.12
	(256)	9.88	14.72	11.81	3.39	5.63	8.15	10.12	5.31	8.46	10.43	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.12
D.108 -P5	(143)	5.51	8.86	6.85	2.09	3.46	7.48	11.81	3.46	9.06	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.38
	(145)	5.51	8.86	6.85	2.09	3.46	7.48	11.81	3.46	9.06	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.38
	(182)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	9.06	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.01
	(184)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	9.06	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	8.01
	(213)	8.43	14.72	11.81	3.31	5.28	8.66	10.63	8.23	10.04	11.81	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.21
	(215)	8.43	14.72	11.81	3.31	5.28	8.66	10.63	8.23	10.04	11.81	1.38	3.15	2.75	0.2	1.51	0.31	3.35	11.21
	(254)	9.88	14.72	11.81	3.39	5.28	8.66	10.63	8.23	10.04	12.01	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.83
	(256)	9.88	14.72	11.81	3.39	5.28	8.66	10.63	8.23	10.04	12.01	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.83
E.128 -P5	(182)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	8.66	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.32
	(184)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	8.66	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.32
	(213)	8.43	14.72	11.81	3.31	6.06	9.84	13.39	4.88	9.84	13.39	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.51
	(215)	8.43	14.72	11.81	3.31	6.06	9.84	13.39	4.88	9.84	13.39	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.51
	(254)	9.88	14.72	11.81	3.39	8.23	9.84	13.39	7.24	9.84	13.39	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.02
	(256)	9.88	14.72	11.81	3.39	8.23	9.84	13.39	7.24	9.84	13.39	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.02
	(286)	11.65	18.74	15.75	4.25	9.57	10.63	13.86	9.57	10.63	13.86	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.95
	(324)	13.46	21.93	18.9	5.59	8.23	11.61	13.58	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	14.21
	(326)	13.46	21.93	18.9	5.59	8.23	11.61	13.58	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	14.21
Z.128 -P5	(182)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	10.04	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.32
	(184)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	10.04	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.32
	(213)	8.43	14.72	11.81	3.31	5.47	10.04	12.01	5.28	11.02	12.99	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.51
	(215)	8.43	14.72	11.81	3.31	5.47	10.04	12.01	5.28	11.02	12.99	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.51
	(254)	9.88	14.72	11.81	3.39	5.47	10.04	12.01	5.28	11.02	12.99	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.02
	(256)	9.88	14.72	11.81	3.39	5.47	10.04	12.01	5.28	11.02	12.99	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.02
	(286)	11.65	18.74	15.75	4.25	9.17	9.96	13.86	8.23	11.54	13.86	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.95
	(324)	13.46	21.93	18.9	5.59	7.83	11.61	13.39	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	14.21
	(326)	13.46	21.93	18.9	5.59	7.83	11.61	13.39	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	14.21

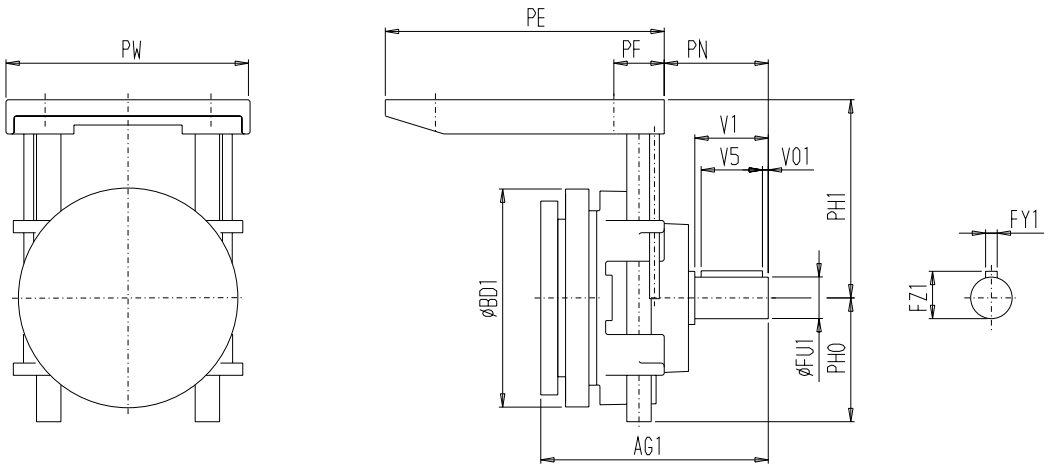
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[mm]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
	(143)	140	225	174	53	88	190	295	88	190	295	22,225	50	38,1	6,9	24,35	4,763	63	169
	(145)	140	225	174	53	88	190	295	88	190	295	22,225	50	38,1	6,9	24,35	4,763	63	169
	(182)	174	250	232	60	88	223	318	88	190	240	28,575	60	47,63	7,37	31,4	6,35	73	182,5
F.108B **-P5**	**(184)**	174	250	232	60	88	223	318	88	190	240	28,575	60	47,63	7,37	31,4	6,35	73	182,5
	(213)	214	374	300	84	143	207	257	135	215	265	34,925	80	69,85	5,15	38,44	7,938	85	265
	(215)	214	374	300	84	143	207	257	135	215	265	34,925	80	69,85	5,15	38,44	7,938	85	265
	(254)	251	374	300	86	143	207	257	135	215	265	41,275	110	78,58	16,24	45,45	9,53	132	308,5
	(256)	251	374	300	86	143	207	257	135	215	265	41,275	110	78,58	16,24	45,45	9,53	132	308,5
	(143)	140	225	174	53	88	190	300	88	230	300	22,225	50	38,1	6,9	24,35	4,763	63	188
	(145)	140	225	174	53	88	190	300	88	230	300	22,225	50	38,1	6,9	24,35	4,763	63	188
	(182)	174	250	232	60	88	220	320	88	230	320	28,575	60	47,63	7,37	31,4	6,35	73	204
D.108 **-P5**	**(184)**	174	250	232	60	88	220	320	88	230	320	28,575	60	47,63	7,37	31,4	6,35	73	204
	(213)	214	374	300	84	134	220	270	209	255	300	34,925	80	69,85	5,15	38,44	7,938	85	285
	(215)	214	374	300	84	134	220	270	209	255	300	34,925	80	69,85	5,15	38,44	7,938	85	285
	(254)	251	374	300	86	134	220	270	209	255	305	41,275	110	78,58	16,24	45,45	9,53	132	326,5
	(256)	251	374	300	86	134	220	270	209	255	305	41,275	110	78,58	16,24	45,45	9,53	132	326,5
	(182)	174	250	232	60	88	220	320	88	220	320	28,575	60	47,63	7,37	31,4	6,35	73	161
	(184)	174	250	232	60	88	220	320	88	220	320	28,575	60	47,63	7,37	31,4	6,35	73	161
	(213)	214	374	300	84	154	250	340	124	250	340	34,925	80	69,85	5,15	38,44	7,938	85	242
	(215)	214	374	300	84	154	250	340	124	250	340	34,925	80	69,85	5,15	38,44	7,938	85	242
E.128 **-P5**	**(254)**	251	374	300	86	209	250	340	184	250	340	41,275	110	78,58	16,24	45,45	9,53	132	280,5
	(256)	251	374	300	86	209	250	340	184	250	340	41,275	110	78,58	16,24	45,45	9,53	132	280,5
	(286)	296	476	400	108	243	270	352	243	270	352	53,975	110	88,9	11,1	59,58	12,7	135	304
	(324)	342	557	480	142	209	295	345	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	361,5
	(326)	342	557	480	142	209	295	345	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	361,5
	(182)	174	250	232	60	88	220	320	88	255	320	28,575	60	47,63	7,37	31,4	6,35	73	161
	(184)	174	250	232	60	88	220	320	88	255	320	28,575	60	47,63	7,37	31,4	6,35	73	161
	(213)	214	374	300	84	139	255	305	134	280	330	34,925	80	69,85	5,15	38,44	7,938	85	242
	(215)	214	374	300	84	139	255	305	134	280	330	34,925	80	69,85	5,15	38,44	7,938	85	242
Z.128 **-P5**	**(254)**	251	374	300	86	139	255	305	134	280	330	41,275	110	78,58	16,24	45,45	9,53	132	280,5
	(256)	251	374	300	86	139	255	305	134	280	330	41,275	110	78,58	16,24	45,45	9,53	132	280,5
	(286)	296	476	400	108	233	253	352	209	293	352	53,975	110	88,9	11,1	59,58	12,7	135	304
	(324)	342	557	480	142	199	295	340	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	361,5
	(326)	342	557	480	142	199	295	340	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	361,5

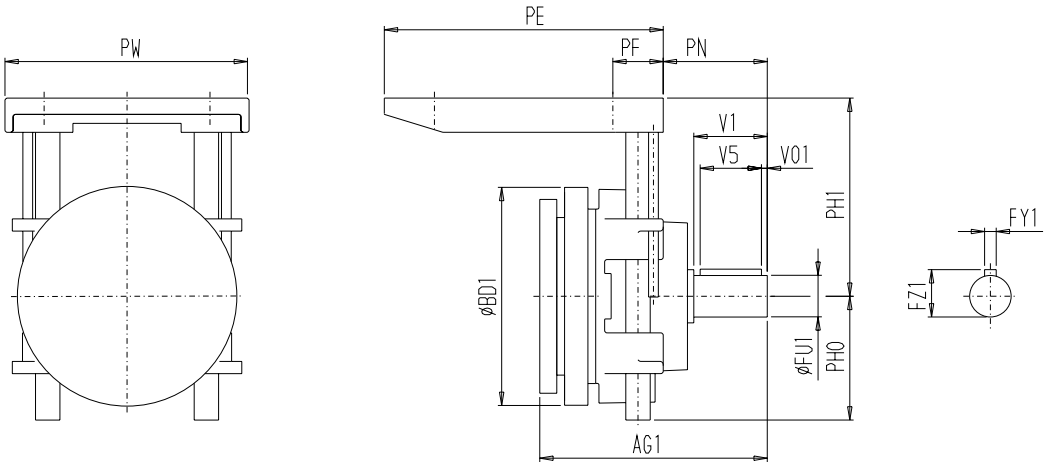
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[inch]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
	(143)	5.51	8.86	6.85	2.09	3.46	9.06	11.81	3.46	10.04	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.18
	(145)	5.51	8.86	6.85	2.09	3.46	9.06	11.81	3.46	10.04	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.18
	(182)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	10.04	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.69
	(184)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	10.04	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.69
K.128 -P5	(213)	8.43	14.72	11.81	3.31	5.28	8.66	10.63	8.23	10.04	11.81	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.93
	(215)	8.43	14.72	11.81	3.31	5.28	8.66	10.63	8.23	10.04	11.81	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.93
	(254)	9.88	14.72	11.81	3.39	5.28	8.66	10.63	8.23	10.04	12.01	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.67
	(256)	9.88	14.72	11.81	3.39	5.28	8.66	10.63	8.23	10.04	12.01	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.67
	(286)	11.65	18.74	15.75	4.25	7.72	9.57	13.86	10.28	9.57	13.86	2.13	4.33	3.5	0.44	2.35	0.5	5.31	12.48
	(143)	5.51	8.86	6.85	2.09	3.46	9.25	11.61	3.46	9.06	11.61	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.18
	(145)	5.51	8.86	6.85	2.09	3.46	9.25	11.61	3.46	9.06	11.61	0.88	1.97	1.5	0.27	0.96	0.19	2.48	6.18
	(182)	6.85	9.84	9.13	2.36	3.46	9.84	12.6	3.46	9.25	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.69
	(184)	6.85	9.84	9.13	2.36	3.46	9.84	12.6	3.46	9.25	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.69
F.128B -P5	(213)	8.43	14.72	11.81	3.31	7.68	10.43	14.37	6.89	11.22	14.37	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.93
	(215)	8.43	14.72	11.81	3.31	7.68	10.43	14.37	6.89	11.22	14.37	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.93
	(254)	9.88	14.72	11.81	3.39	7.68	10.43	14.37	6.89	11.22	14.37	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.67
	(256)	9.88	14.72	11.81	3.39	7.68	10.43	14.37	6.89	11.22	14.37	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.67
	(286)	11.65	18.74	15.75	4.25	8.54	10.55	14.09	8.54	10.55	14.09	2.13	4.33	3.5	0.44	2.35	0.5	5.31	12.48
	(143)	5.51	8.86	6.85	2.09	3.46	9.06	11.81	3.46	10.04	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.1
	(145)	5.51	8.86	6.85	2.09	3.46	9.06	11.81	3.46	10.04	11.81	0.88	1.97	1.5	0.27	0.96	0.19	2.48	7.1
	(182)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	10.04	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.73
	(184)	6.85	9.84	9.13	2.36	3.46	8.66	12.6	3.46	10.04	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.73
D.128 -P5	(213)	8.43	14.72	11.81	3.31	5.47	10.04	12.01	5.28	11.02	12.99	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.85
	(215)	8.43	14.72	11.81	3.31	5.47	10.04	12.01	5.28	11.02	12.99	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.85
	(254)	9.88	14.72	11.81	3.39	5.47	10.04	12.01	5.28	11.02	12.99	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.48
	(256)	9.88	14.72	11.81	3.39	5.47	10.04	12.01	5.28	11.02	12.99	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.48
	(286)	11.65	18.74	15.75	4.25	9.17	9.96	13.86	8.23	11.54	13.86	2.13	4.33	3.5	0.44	2.35	0.5	5.31	13.41
	(213)	8.43	14.72	11.81	3.31	5.28	11.02	14.96	8.23	11.02	14.96	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.2
	(215)	8.43	14.72	11.81	3.31	5.28	11.02	14.96	8.23	11.02	14.96	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.2
	(254)	9.88	14.72	11.81	3.39	5.28	11.02	14.96	8.23	11.02	14.96	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.73
	(256)	9.88	14.72	11.81	3.39	5.28	11.02	14.96	8.23	11.02	14.96	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.73
E.148 -P5	(286)	11.65	18.74	15.75	4.25	7.6	11.81	16.73	9.17	11.81	16.73	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.65
	(324)	13.46	21.93	18.9	5.59	10	12.4	16.34	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.92
	(326)	13.46	21.93	18.9	5.59	10	12.4	16.34	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.92
	(364)	15.59	21.93	18.9	6.34	10	12.01	13.78	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.9
	(365)	15.59	21.93	18.9	6.34	10	12.01	13.78	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.9

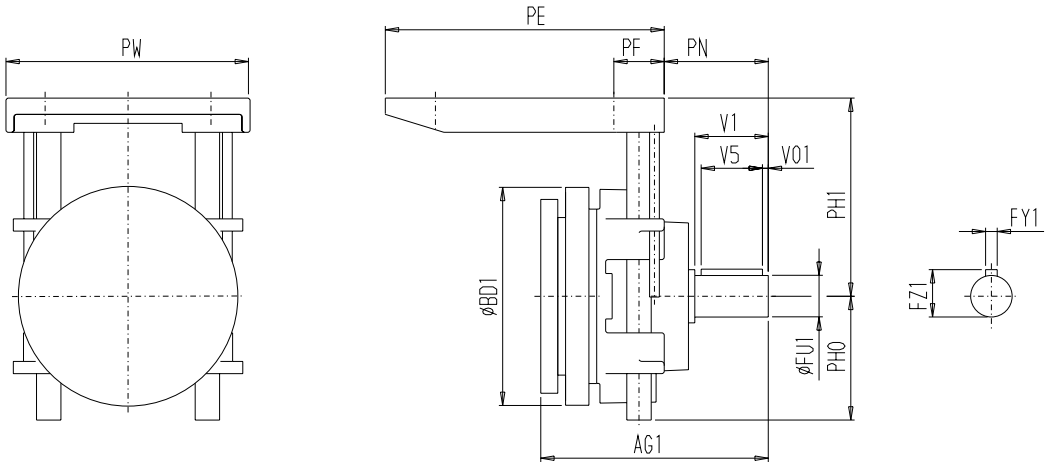
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[mm]



Gear Units		BD1	PE	PW	PF	12h PH0 max	12h PH1 min	12h PH1 max	3/9h PH0 max	3/9h PH1 min	3/9h PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
	(143)	140	225	174	53	88	230	300	88	255	300	22,225	50	38,1	6,9	24,35	4,763	63	157,5
	(145)	140	225	174	53	88	230	300	88	255	300	22,225	50	38,1	6,9	24,35	4,763	63	157,5
	(182)	174	250	232	60	88	220	320	88	255	320	28,575	60	47,63	7,37	31,4	6,35	73	170,5
	(184)	174	250	232	60	88	220	320	88	255	320	28,575	60	47,63	7,37	31,4	6,35	73	170,5
K.128 -P5	(213)	214	374	300	84	134	220	270	209	255	300	34,925	80	69,85	5,15	38,44	7,938	85	252,5
	(215)	214	374	300	84	134	220	270	209	255	300	34,925	80	69,85	5,15	38,44	7,938	85	252,5
	(254)	251	374	300	86	134	220	270	209	255	305	41,275	110	78,58	16,24	45,45	9,53	132	297
	(256)	251	374	300	86	134	220	270	209	255	305	41,275	110	78,58	16,24	45,45	9,53	132	297
	(286)	296	476	400	108	196	243	352	261	243	352	53,975	110	88,9	11,1	59,58	12,7	135	317,5
	(143)	140	225	174	53	88	235	295	88	230	295	22,225	50	38,1	6,9	24,35	4,763	63	157,5
	(145)	140	225	174	53	88	235	295	88	230	295	22,225	50	38,1	6,9	24,35	4,763	63	157,5
	(182)	174	250	232	60	88	250	320	88	235	320	28,575	60	47,63	7,37	31,4	6,35	73	170,5
	(184)	174	250	232	60	88	250	320	88	235	320	28,575	60	47,63	7,37	31,4	6,35	73	170,5
F.128B -P5	(213)	214	374	300	84	195	265	365	175	285	365	34,925	80	69,85	5,15	38,44	7,938	85	252,5
	(215)	214	374	300	84	195	265	365	175	285	365	34,925	80	69,85	5,15	38,44	7,938	85	252,5
	(254)	251	374	300	86	195	265	365	175	285	365	41,275	110	78,58	16,24	45,45	9,53	132	297
	(256)	251	374	300	86	195	265	365	175	285	365	41,275	110	78,58	16,24	45,45	9,53	132	297
	(286)	296	476	400	108	217	268	358	217	268	358	53,975	110	88,9	11,1	59,58	12,7	135	317,5
	(143)	140	225	174	53	88	230	300	88	255	300	22,225	50	38,1	6,9	24,35	4,763	63	181
	(145)	140	225	174	53	88	230	300	88	255	300	22,225	50	38,1	6,9	24,35	4,763	63	181
	(182)	174	250	232	60	88	220	320	88	255	320	28,575	60	47,63	7,37	31,4	6,35	73	197
	(184)	174	250	232	60	88	220	320	88	255	320	28,575	60	47,63	7,37	31,4	6,35	73	197
D.128 -P5	(213)	214	374	300	84	139	255	305	134	280	330	34,925	80	69,85	5,15	38,44	7,938	85	276
	(215)	214	374	300	84	139	255	305	134	280	330	34,925	80	69,85	5,15	38,44	7,938	85	276
	(254)	251	374	300	86	139	255	305	134	280	330	41,275	110	78,58	16,24	45,45	9,53	132	317,5
	(256)	251	374	300	86	139	255	305	134	280	330	41,275	110	78,58	16,24	45,45	9,53	132	317,5
	(286)	296	476	400	108	233	253	352	209	293	352	53,975	110	88,9	11,1	59,58	12,7	135	341
	(213)	214	374	300	84	134	280	380	209	280	380	34,925	80	69,85	5,15	38,44	7,938	85	234
	(215)	214	374	300	84	134	280	380	209	280	380	34,925	80	69,85	5,15	38,44	7,938	85	234
	(254)	251	374	300	86	134	280	380	209	280	380	41,275	110	78,58	16,24	45,45	9,53	132	273
	(256)	251	374	300	86	134	280	380	209	280	380	41,275	110	78,58	16,24	45,45	9,53	132	273
E.148 -P5	(286)	296	476	400	108	193	300	425	233	300	425	53,975	110	88,9	11,1	59,58	12,7	135	296,5
	(324)	342	557	480	142	254	315	415	-			53,975	140	88,9	11,1	59,58	12,7	147	354
	(326)	342	557	480	142	254	315	415	-			53,975	140	88,9	11,1	59,58	12,7	147	354
	(364)	396	557	480	161	254	305	350	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	353,5
	(365)	396	557	480	161	254	305	350	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	353,5

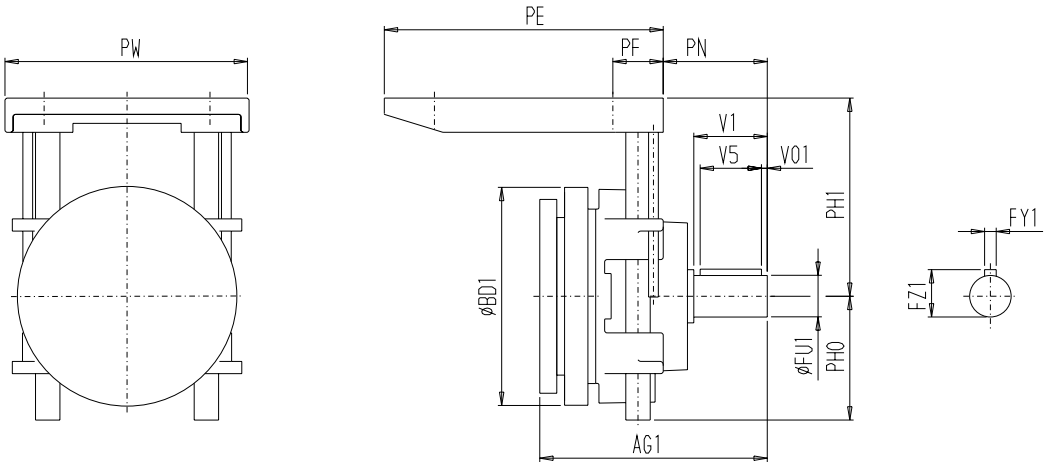
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[inch]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	12h PH1 max	3/9h PH0 max	3/9h PH1 min	3/9h PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
	(182)	6.85	9.84	9.13	2.36	3.46	9.65	12.6	3.46	11.02	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.54
	(184)	6.85	9.84	9.13	2.36	3.46	9.65	12.6	3.46	11.02	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	7.54
	(213)	8.43	14.72	11.81	3.31	7.24	11.02	12.99	6.26	12.01	13.98	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.69
	(215)	8.43	14.72	11.81	3.31	7.24	11.02	12.99	6.26	12.01	13.98	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.69
D.148 -P5	(254)	9.88	14.72	11.81	3.39	7.24	11.02	12.99	6.26	12.01	13.98	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.22
	(256)	9.88	14.72	11.81	3.39	7.24	11.02	12.99	6.26	12.01	13.98	1.63	4.33	3.09	0.64	1.79	0.38	5.2	12.22
	(286)	11.65	18.74	15.75	4.25	9.76	11.54	13.86	9.76	12.52	16.02	2.13	4.33	3.5	0.44	2.35	0.5	5.31	13.15
	(324)	13.46	21.93	18.9	5.59	7.83	12.01	13.78	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	15.41
	(326)	13.46	21.93	18.9	5.59	7.83	12.01	13.78	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	15.41
	(213)	8.43	14.72	11.81	3.31	7.24	11.02	12.99	6.26	12.01	13.98	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.2
	(215)	8.43	14.72	11.81	3.31	7.24	11.02	12.99	6.26	12.01	13.98	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.2
	(254)	9.88	14.72	11.81	3.39	7.24	11.02	12.99	6.26	12.01	13.98	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.73
	(256)	9.88	14.72	11.81	3.39	7.24	11.02	12.99	6.26	12.01	13.98	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.73
Z.148 -P5	(286)	11.65	18.74	15.75	4.25	9.76	11.54	13.86	9.76	12.52	16.02	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.65
	(324)	13.46	21.93	18.9	5.59	7.83	12.01	13.78	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.92
	(326)	13.46	21.93	18.9	5.59	7.83	12.01	13.78	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.92
	(364)	15.59	21.93	18.9	6.34	10	12.01	13.78	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.9
	(365)	15.59	21.93	18.9	6.34	10	12.01	13.78	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.9
	(182)	6.85	9.84	9.13	2.36	3.46	9.65	12.6	3.46	11.02	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.32
	(184)	6.85	9.84	9.13	2.36	3.46	9.65	12.6	3.46	11.02	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.32
	(213)	8.43	14.72	11.81	3.31	5.47	10.04	12.01	5.28	11.02	12.99	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.51
	(215)	8.43	14.72	11.81	3.31	5.47	10.04	12.01	5.28	11.02	12.99	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.51
K.148 -P5	(254)	9.88	14.72	11.81	3.39	5.47	10.04	12.01	5.28	11.02	12.99	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.02
	(256)	9.88	14.72	11.81	3.39	5.47	10.04	12.01	5.28	11.02	12.99	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.02
	(286)	11.65	18.74	15.75	4.25	7.6	11.54	13.86	9.17	9.96	13.86	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.95
	(324)	13.46	21.93	18.9	5.59	7.83	13.58	15.35	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	14.21
	(326)	13.46	21.93	18.9	5.59	7.83	13.58	15.35	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	14.21
	(182)	6.85	9.84	9.13	2.36	3.46	10.04	12.6	3.46	10.04	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.32
	(184)	6.85	9.84	9.13	2.36	3.46	10.04	12.6	3.46	10.04	12.6	1.13	2.36	1.88	0.29	1.24	0.25	2.87	6.32
	(213)	8.43	14.72	11.81	3.31	6.69	11.42	14.37	6.89	11.22	14.37	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.51
	(215)	8.43	14.72	11.81	3.31	6.69	11.42	14.37	6.89	11.22	14.37	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.51
F.148B -P5	(254)	9.88	14.72	11.81	3.39	6.69	11.42	14.37	6.89	11.22	14.37	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.02
	(256)	9.88	14.72	11.81	3.39	6.69	11.42	14.37	6.89	11.22	14.37	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.02
	(286)	11.65	18.74	15.75	4.25	7.56	11.54	14.09	7.8	11.3	14.06	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.95
	(324)	13.46	21.93	18.9	5.59	9.61	12.72	13.9	7.38	15.47	16.65	2.13	5.51	3.5	0.44	2.35	0.5	5.79	14.21
	(326)	13.46	21.93	18.9	5.59	9.61	12.72	13.9	7.38	15.47	16.65	2.13	5.51	3.5	0.44	2.35	0.5	5.79	14.21

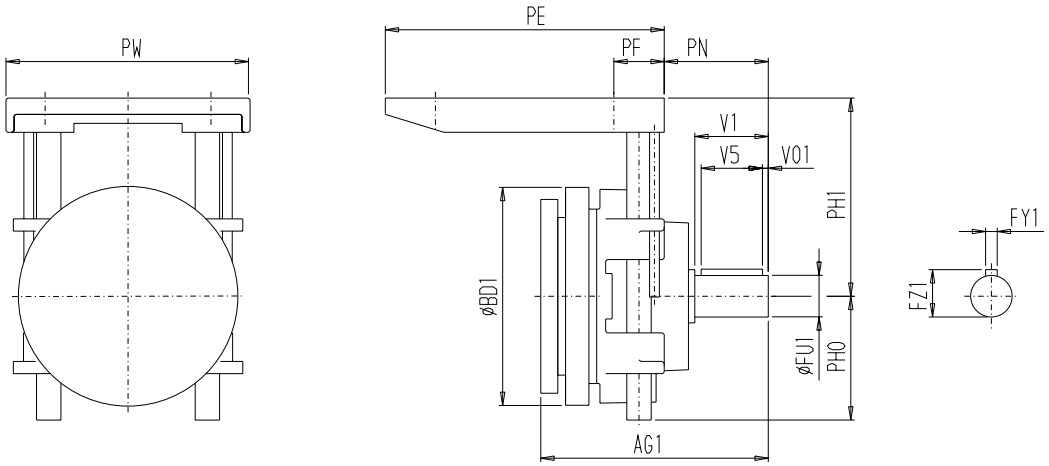
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[mm]



Gear Units		BD1	PE	PW	PF	12h PH0 max	12h PH1 min	12h PH1 max	3/9h PH0 max	3/9h PH1 min	3/9h PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
	(182)	174	250	232	60	88	245	320	88	280	320	28,575	60	47,63	7,37	31,4	6,35	73	192
	(184)	174	250	232	60	88	245	320	88	280	320	28,575	60	47,63	7,37	31,4	6,35	73	192
	(213)	214	374	300	84	184	280	330	159	305	355	34,925	80	69,85	5,15	38,44	7,938	85	272
	(215)	214	374	300	84	184	280	330	159	305	355	34,925	80	69,85	5,15	38,44	7,938	85	272
D.148 -P5	(254)	251	374	300	86	184	280	330	159	305	355	41,275	110	78,58	16,24	45,45	9,53	132	311
	(256)	251	374	300	86	184	280	330	159	305	355	41,275	110	78,58	16,24	45,45	9,53	132	311
	(286)	296	476	400	108	248	293	352	248	318	407	53,975	110	88,9	11,1	59,58	12,7	135	334,5
	(324)	342	557	480	142	199	305	350	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	392
	(326)	342	557	480	142	199	305	350	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	392
	(213)	214	374	300	84	184	280	330	159	305	355	34,925	80	69,85	5,15	38,44	7,938	85	234
	(215)	214	374	300	84	184	280	330	159	305	355	34,925	80	69,85	5,15	38,44	7,938	85	234
	(254)	251	374	300	86	184	280	330	159	305	355	41,275	110	78,58	16,24	45,45	9,53	132	273
	(256)	251	374	300	86	184	280	330	159	305	355	41,275	110	78,58	16,24	45,45	9,53	132	273
Z.148 -P5	(286)	296	476	400	108	248	293	352	248	318	407	53,975	110	88,9	11,1	59,58	12,7	135	296,5
	(324)	342	557	480	142	199	305	350	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	354
	(326)	342	557	480	142	199	305	350	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	354
	(364)	396	557	480	161	254	305	350	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	353,5
	(365)	396	557	480	161	254	305	350	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	353,5
	(182)	174	250	232	60	88	245	320	88	280	320	28,575	60	47,63	7,37	31,4	6,35	73	161
	(184)	174	250	232	60	88	245	320	88	280	320	28,575	60	47,63	7,37	31,4	6,35	73	161
	(213)	214	374	300	84	139	255	305	134	280	330	34,925	80	69,85	5,15	38,44	7,938	85	242
	(215)	214	374	300	84	139	255	305	134	280	330	34,925	80	69,85	5,15	38,44	7,938	85	242
K.148 -P5	(254)	251	374	300	86	139	255	305	134	280	330	41,275	110	78,58	16,24	45,45	9,53	132	280,5
	(256)	251	374	300	86	139	255	305	134	280	330	41,275	110	78,58	16,24	45,45	9,53	132	280,5
	(286)	296	476	400	108	193	293	352	233	253	352	53,975	110	88,9	11,1	59,58	12,7	135	304
	(324)	342	557	480	142	199	345	390	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	361,5
	(326)	342	557	480	142	199	345	390	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	361,5
	(182)	174	250	232	60	88	255	320	88	255	320	28,575	60	47,63	7,37	31,4	6,35	73	161
	(184)	174	250	232	60	88	255	320	88	255	320	28,575	60	47,63	7,37	31,4	6,35	73	161
	(213)	214	374	300	84	170	290	365	175	285	365	34,925	80	69,85	5,15	38,44	7,938	85	242
	(215)	214	374	300	84	170	290	365	175	285	365	34,925	80	69,85	5,15	38,44	7,938	85	242
F.148B -P5	(254)	251	374	300	86	170	290	365	175	285	365	41,275	110	78,58	16,24	45,45	9,53	132	280,5
	(256)	251	374	300	86	170	290	365	175	285	365	41,275	110	78,58	16,24	45,45	9,53	132	280,5
	(286)	296	476	400	108	192	293	358	198	287	357	53,975	110	88,9	11,1	59,58	12,7	135	304
	(324)	342	557	480	142	244	323	353	187,5	393	423	53,975	140	88,9	11,1	59,58	12,7	147	361,5
	(326)	342	557	480	142	244	323	353	187,5	393	423	53,975	140	88,9	11,1	59,58	12,7	147	361,5

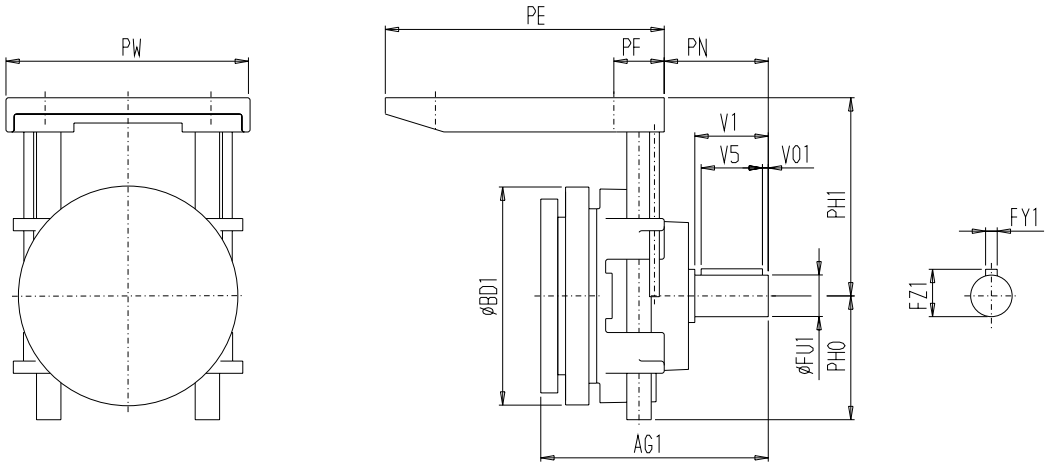
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[inch]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
	(213)	8.43	14.72	11.81	3.31	6.06	12.2	14.17	4.88	13.39	15.35	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.24
	(215)	8.43	14.72	11.81	3.31	6.06	12.2	14.17	4.88	13.39	15.35	1.38	3.15	2.75	0.2	1.51	0.31	3.35	10.24
	(254)	9.88	14.72	11.81	3.39	6.06	12.2	14.17	4.88	13.39	15.35	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.77
D.168 -P5	(256)	9.88	14.72	11.81	3.39	6.06	12.2	14.17	4.88	13.39	15.35	1.63	4.33	3.09	0.64	1.79	0.38	5.2	11.77
	(286)	11.65	18.74	15.75	4.25	9.41	13.27	16.02	9.17	13.5	16.02	2.13	4.33	3.5	0.44	2.35	0.5	5.31	12.7
	(324)	13.46	21.93	18.9	5.59	7.83	13.58	15.35	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	14.96
	(326)	13.46	21.93	18.9	5.59	7.83	13.58	15.35	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	14.96
	(213)	8.43	14.72	11.81	3.31	6.06	12.2	14.17	4.88	13.39	15.35	1.38	3.15	2.75	0.2	1.51	0.31	3.35	8.63
	(215)	8.43	14.72	11.81	3.31	6.06	12.2	14.17	4.88	13.39	15.35	1.38	3.15	2.75	0.2	1.51	0.31	3.35	8.63
	(254)	9.88	14.72	11.81	3.39	6.06	12.2	14.17	4.88	13.39	15.35	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.16
	(256)	9.88	14.72	11.81	3.39	6.06	12.2	14.17	4.88	13.39	15.35	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.16
Z.168 -P5	(286)	11.65	18.74	15.75	4.25	9.41	13.27	16.02	9.17	13.5	16.02	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.08
	(324)	13.46	21.93	18.9	5.59	7.83	13.58	15.35	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.35
	(326)	13.46	21.93	18.9	5.59	7.83	13.58	15.35	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.35
	(364)	15.59	21.93	18.9	6.34	7.64	13.58	15.35	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.33
	(365)	15.59	21.93	18.9	6.34	7.64	13.58	15.35	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.33
	(213)	8.43	14.72	11.81	3.31	7.24	11.02	12.99	6.26	12.01	13.98	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.2
	(215)	8.43	14.72	11.81	3.31	7.24	11.02	12.99	6.26	12.01	13.98	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.2
	(254)	9.88	14.72	11.81	3.39	7.24	11.02	12.99	6.26	12.01	13.98	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.73
	(256)	9.88	14.72	11.81	3.39	7.24	11.02	12.99	6.26	12.01	13.98	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.73
K.168 -P5	(286)	11.65	18.74	15.75	4.25	9.41	13.27	16.02	8.23	10.91	13.86	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.65
	(324)	13.46	21.93	18.9	5.59	7.83	15.35	17.13	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.92
	(326)	13.46	21.93	18.9	5.59	7.83	15.35	17.13	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.92
	(364)	15.59	21.93	18.9	6.34	7.83	15.35	17.13	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.9
	(365)	15.59	21.93	18.9	6.34	7.83	15.35	17.13	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.9
	(213)	8.43	14.72	11.81	3.31	5.98	12.13	14.49	6.1	12.01	14.37	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.2
	(215)	8.43	14.72	11.81	3.31	5.98	12.13	14.49	6.1	12.01	14.37	1.38	3.15	2.75	0.2	1.51	0.31	3.35	9.2
	(254)	9.88	14.72	11.81	3.39	5.98	12.13	14.49	6.1	12.01	14.37	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.73
	(256)	9.88	14.72	11.81	3.39	5.98	12.13	14.49	6.1	12.01	14.37	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.73
F.168B -P5	(286)	11.65	18.74	15.75	4.25	10.16	12.52	17.01	10.31	12.32	16.85	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.65
	(324)	13.46	21.93	18.9	5.59	8.6	15.47	16.65	8.6	15.47	16.65	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.92
	(326)	13.46	21.93	18.9	5.59	8.6	15.47	16.65	8.6	15.47	16.65	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.92
	(364)	15.59	21.93	18.9	6.34	10.06	14.02	15.2	7.38	16.69	17.87	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.9
	(365)	15.59	21.93	18.9	6.34	10.06	14.02	15.2	7.38	16.69	17.87	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.9

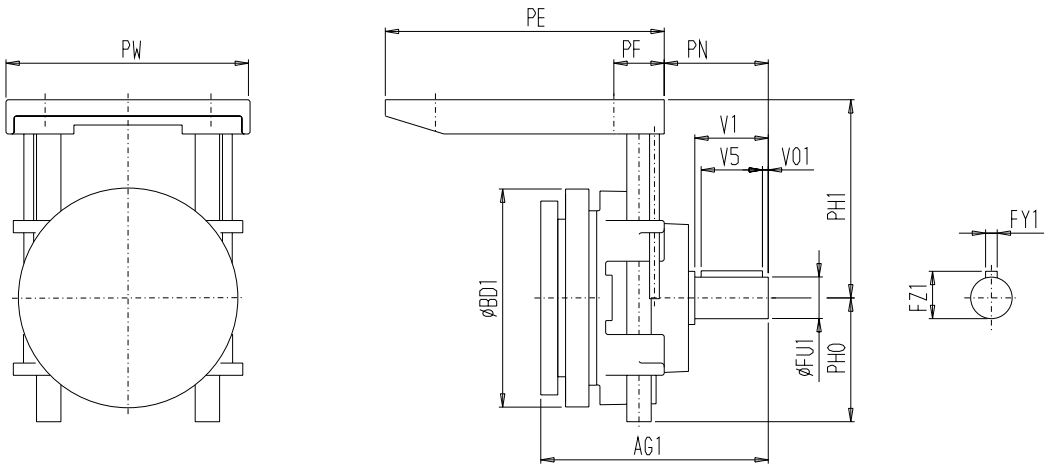
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[mm]



Gear Units		BD1	PE	PW	PF	12h PH0 max	12h PH1 min	12h PH1 max	3/9h PH0 max	3/9h PH1 min	3/9h PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
	(213)	214	374	300	84	154	310	360	124	340	390	34,925	80	69,85	5,15	38,44	7,938	85	260,5
	(215)	214	374	300	84	154	310	360	124	340	390	34,925	80	69,85	5,15	38,44	7,938	85	260,5
	(254)	251	374	300	86	154	310	360	124	340	390	41,275	110	78,58	16,24	45,45	9,53	132	299,5
D.168 -P5	(256)	251	374	300	86	154	310	360	124	340	390	41,275	110	78,58	16,24	45,45	9,53	132	299,5
	(286)	296	476	400	108	239	337	407	233	343	407	53,975	110	88,9	11,1	59,58	12,7	135	323
	(324)	342	557	480	142	199	345	390	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	380,5
	(326)	342	557	480	142	199	345	390	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	380,5
	(213)	214	374	300	84	154	310	360	124	340	390	34,925	80	69,85	5,15	38,44	7,938	85	219,5
	(215)	214	374	300	84	154	310	360	124	340	390	34,925	80	69,85	5,15	38,44	7,938	85	219,5
	(254)	251	374	300	86	154	310	360	124	340	390	41,275	110	78,58	16,24	45,45	9,53	132	258,5
	(256)	251	374	300	86	154	310	360	124	340	390	41,275	110	78,58	16,24	45,45	9,53	132	258,5
Z.168 -P5	(286)	296	476	400	108	239	337	407	233	343	407	53,975	110	88,9	11,1	59,58	12,7	135	282
	(324)	342	557	480	142	199	345	390	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	339,5
	(326)	342	557	480	142	199	345	390	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	339,5
	(364)	396	557	480	161	194	345	390	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	339
	(365)	396	557	480	161	194	345	390	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	339
	(213)	214	374	300	84	184	280	330	159	305	355	34,925	80	69,85	5,15	38,44	7,938	85	234
	(215)	214	374	300	84	184	280	330	159	305	355	34,925	80	69,85	5,15	38,44	7,938	85	234
	(254)	251	374	300	86	184	280	330	159	305	355	41,275	110	78,58	16,24	45,45	9,53	132	273
	(256)	251	374	300	86	184	280	330	159	305	355	41,275	110	78,58	16,24	45,45	9,53	132	273
K.168 -P5	(286)	296	476	400	108	239	337	407	209	277	352	53,975	110	88,9	11,1	59,58	12,7	135	296,5
	(324)	342	557	480	142	199	390	435	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	354
	(326)	342	557	480	142	199	390	435	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	354
	(364)	396	557	480	161	199	390	435	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	353,5
	(365)	396	557	480	161	199	390	435	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	353,5
	(213)	214	374	300	84	152	308	368	155	305	365	34,925	80	69,85	5,15	38,44	7,938	85	234
	(215)	214	374	300	84	152	308	368	155	305	365	34,925	80	69,85	5,15	38,44	7,938	85	234
	(254)	251	374	300	86	152	308	368	155	305	365	41,275	110	78,58	16,24	45,45	9,53	132	273
	(256)	251	374	300	86	152	308	368	155	305	365	41,275	110	78,58	16,24	45,45	9,53	132	273
F.168B -P5	(286)	296	476	400	108	258	318	432	262	313	428	53,975	110	88,9	11,1	59,58	12,7	135	296,5
	(324)	342	557	480	142	218,5	393	423	218,5	393	423	53,975	140	88,9	11,1	59,58	12,7	147	354
	(326)	342	557	480	142	218,5	393	423	218,5	393	423	53,975	140	88,9	11,1	59,58	12,7	147	354
	(364)	396	557	480	161	255,5	356	386	187,5	424	454	60,325	140	107,95	17,05	67,36	15,875	147	353,5
	(365)	396	557	480	161	255,5	356	386	187,5	424	454	60,325	140	107,95	17,05	67,36	15,875	147	353,5

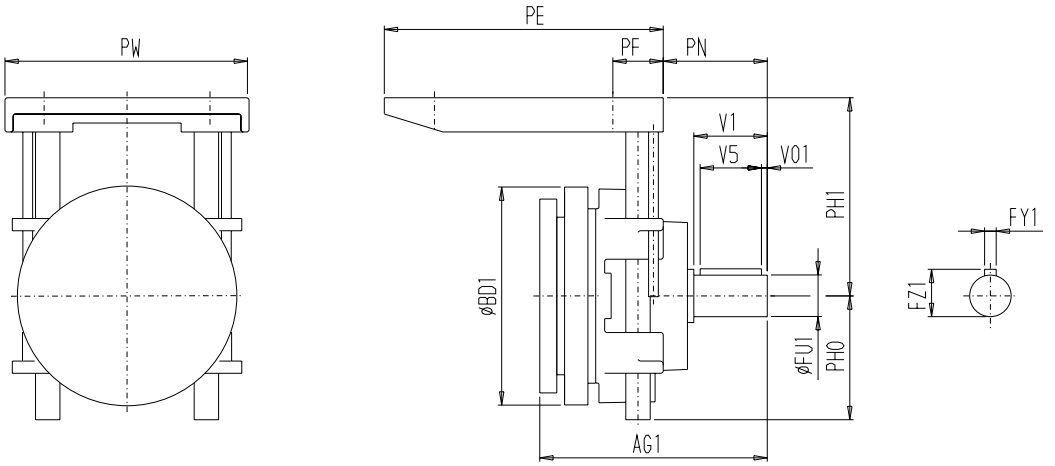
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[inch]



Gear Units		BD1	PE	PW	PF	PH0 max	12h PH1 min	PH1 max	PH0 max	3/9h PH1 min	PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
	(213)	8.43	14.72	11.81	3.31	4.72	13.39	14.96	4.92	14.65	16.22	1.38	3.15	2.75	0.2	1.51	0.31	3.35	8.63
	(215)	8.43	14.72	11.81	3.31	4.72	13.39	14.96	4.92	14.65	16.22	1.38	3.15	2.75	0.2	1.51	0.31	3.35	8.63
	(254)	9.88	14.72	11.81	3.39	4.72	13.39	14.96	4.92	14.65	16.22	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.16
	(256)	9.88	14.72	11.81	3.39	4.72	13.39	14.96	4.92	14.65	16.22	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.16
D.188 **-P5**	**(286)**	11.65	18.74	15.75	4.25	8.15	14.49	17.05	7.6	15.04	17.01	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.08
	(324)	13.46	21.93	18.9	5.59	7.62	15.47	16.65	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.35
	(326)	13.46	21.93	18.9	5.59	7.62	15.47	16.65	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.35
	(364)	15.59	21.93	18.9	6.34	7.62	16.46	17.64	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.33
	(365)	15.59	21.93	18.9	6.34	7.62	16.46	17.64	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.33
	(254)	9.88	14.72	11.81	3.39	4.72	13.39	14.96	4.92	14.65	16.22	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.16
	(256)	9.88	14.72	11.81	3.39	4.72	13.39	14.96	4.92	14.65	16.22	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.16
	(286)	11.65	18.74	15.75	4.25	8.15	14.49	17.05	7.6	15.04	17.01	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.08
Z.188 **-P5**	**(324)**	13.46	21.93	18.9	5.59	7.62	15.47	16.65	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.35
	(326)	13.46	21.93	18.9	5.59	7.62	15.47	16.65	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.35
	(364)	15.59	21.93	18.9	6.34	7.62	16.46	17.64	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.33
	(365)	15.59	21.93	18.9	6.34	7.62	16.46	17.64	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.33
	(213)	8.43	14.72	11.81	3.31	5.51	14.17	16.14	6.3	11.81	14.57	1.38	3.15	2.75	0.2	1.51	0.31	3.35	8.63
	(215)	8.43	14.72	11.81	3.31	5.51	14.17	16.14	6.3	11.81	14.57	1.38	3.15	2.75	0.2	1.51	0.31	3.35	8.63
	(254)	9.88	14.72	11.81	3.39	5.51	14.17	16.14	6.3	11.81	14.57	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.16
	(256)	9.88	14.72	11.81	3.39	5.51	14.17	16.14	6.3	11.81	14.57	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.16
K.188 **-P5**	**(286)**	11.65	18.74	15.75	4.25	7.76	14.88	17.05	7.2	11.89	14.06	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.08
	(324)	13.46	21.93	18.9	5.59	8.8	18.23	19.41	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.35
	(326)	13.46	21.93	18.9	5.59	8.8	18.23	19.41	-	-	-	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.35
	(364)	15.59	21.93	18.9	6.34	7.62	19.41	20.59	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.33
	(365)	15.59	21.93	18.9	6.34	7.62	19.41	20.59	-	-	-	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.33
	(213)	8.43	14.72	11.81	3.31	4.92	13.19	14.76	4.92	13.19	14.76	1.38	3.15	2.75	0.2	1.51	0.31	3.35	8.63
	(215)	8.43	14.72	11.81	3.31	4.92	13.19	14.76	4.92	13.19	14.76	1.38	3.15	2.75	0.2	1.51	0.31	3.35	8.63
	(254)	9.88	14.72	11.81	3.39	4.92	13.19	14.76	4.92	13.19	14.76	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.16
	(256)	9.88	14.72	11.81	3.39	4.92	13.19	14.76	4.92	13.19	14.76	1.63	4.33	3.09	0.64	1.79	0.38	5.2	10.16
F.188B **-P5**	**(286)**	11.65	18.74	15.75	4.25	8.98	13.66	17.01	9.13	13.5	16.85	2.13	4.33	3.5	0.44	2.35	0.5	5.31	11.08
	(324)	13.46	21.93	18.9	5.59	7.74	15.35	16.54	8.8	18.23	19.41	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.35
	(326)	13.46	21.93	18.9	5.59	7.74	15.35	16.54	8.8	18.23	19.41	2.13	5.51	3.5	0.44	2.35	0.5	5.79	13.35
	(364)	15.59	21.93	18.9	6.34	7.58	16.5	17.68	7.38	16.69	17.87	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.33
	(365)	15.59	21.93	18.9	6.34	7.58	16.5	17.68	7.38	16.69	17.87	2.38	5.51	4.25	0.67	2.65	0.63	5.79	13.33

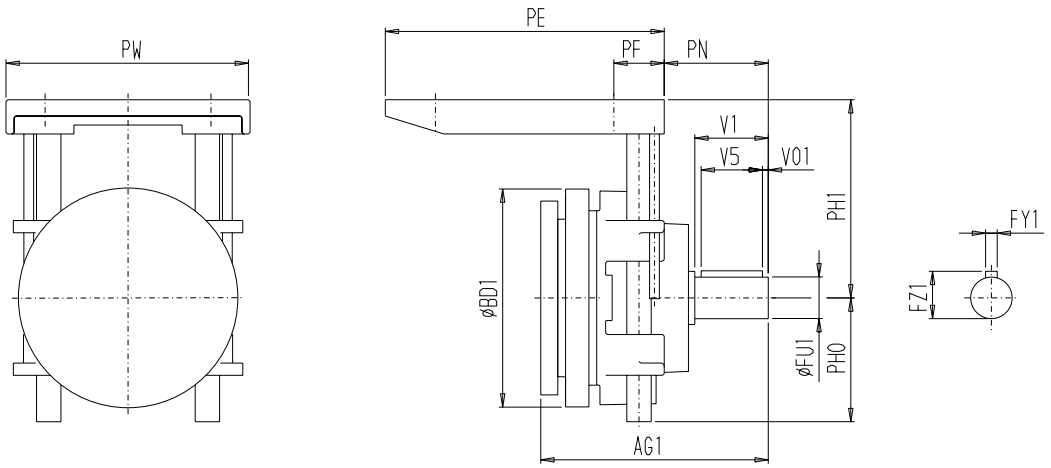
Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Input Unit P5

P5

[mm]



Gear Units		BD1	PE	PW	PF	12h PH0 max	12h PH1 min	12h PH1 max	3/9h PH0 max	3/9h PH1 min	3/9h PH1 max	FU1	V1	V5	V01	FZ1	FY1	PN	AG1
	(213)	214	374	300	84	120	340	380	125	372	412	34,925	80	69,85	5,15	38,44	7,938	85	219,5
	(215)	214	374	300	84	120	340	380	125	372	412	34,925	80	69,85	5,15	38,44	7,938	85	219,5
	(254)	251	374	300	86	120	340	380	125	372	412	41,275	110	78,58	16,24	45,45	9,53	132	258,5
	(256)	251	374	300	86	120	340	380	125	372	412	41,275	110	78,58	16,24	45,45	9,53	132	258,5
D.188 -P5	(286)	296	476	400	108	207	368	433	193	382	432	53,975	110	88,9	11,1	59,58	12,7	135	282
	(324)	342	557	480	142	193,5	393	423	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	339,5
	(326)	342	557	480	142	193,5	393	423	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	339,5
	(364)	396	557	480	161	193,5	418	448	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	339
	(365)	396	557	480	161	193,5	418	448	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	339
	(254)	251	374	300	86	120	340	380	125	372	412	41,275	110	78,58	16,24	45,45	9,53	132	258,5
	(256)	251	374	300	86	120	340	380	125	372	412	41,275	110	78,58	16,24	45,45	9,53	132	258,5
	(286)	296	476	400	108	207	368	433	193	382	432	53,975	110	88,9	11,1	59,58	12,7	135	282
Z.188 -P5	(324)	342	557	480	142	193,5	393	423	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	339,5
	(326)	342	557	480	142	193,5	393	423	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	339,5
	(364)	396	557	480	161	193,5	418	448	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	339
	(365)	396	557	480	161	193,5	418	448	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	339
	(213)	214	374	300	84	140	360	410	160	300	370	34,925	80	69,85	5,15	38,44	7,938	85	219,5
	(215)	214	374	300	84	140	360	410	160	300	370	34,925	80	69,85	5,15	38,44	7,938	85	219,5
	(254)	251	374	300	86	140	360	410	160	300	370	41,275	110	78,58	16,24	45,45	9,53	132	258,5
	(256)	251	374	300	86	140	360	410	160	300	370	41,275	110	78,58	16,24	45,45	9,53	132	258,5
K.188 -P5	(286)	296	476	400	108	197	378	433	183	302	357	53,975	110	88,9	11,1	59,58	12,7	135	282
	(324)	342	557	480	142	223,5	463	493	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	339,5
	(326)	342	557	480	142	223,5	463	493	-	-	-	53,975	140	88,9	11,1	59,58	12,7	147	339,5
	(364)	396	557	480	161	193,5	493	523	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	339
	(365)	396	557	480	161	193,5	493	523	-	-	-	60,325	140	107,95	17,05	67,36	15,875	147	339
	(213)	214	374	300	84	125	335	375	125	335	375	34,925	80	69,85	5,15	38,44	7,938	85	219,5
	(215)	214	374	300	84	125	335	375	125	335	375	34,925	80	69,85	5,15	38,44	7,938	85	219,5
	(254)	251	374	300	86	125	335	375	125	335	375	41,275	110	78,58	16,24	45,45	9,53	132	258,5
	(256)	251	374	300	86	125	335	375	125	335	375	41,275	110	78,58	16,24	45,45	9,53	132	258,5
F.188B -P5	(286)	296	476	400	108	228	347	432	232	343	428	53,975	110	88,9	11,1	59,58	12,7	135	282
	(324)	342	557	480	142	196,5	390	420	223,5	463	493	53,975	140	88,9	11,1	59,58	12,7	147	339,5
	(326)	342	557	480	142	196,5	390	420	223,5	463	493	53,975	140	88,9	11,1	59,58	12,7	147	339,5
	(364)	396	557	480	161	192,5	419	449	187,5	424	454	60,325	140	107,95	17,05	67,36	15,875	147	339
	(365)	396	557	480	161	192,5	419	449	187,5	424	454	60,325	140	107,95	17,05	67,36	15,875	147	339

Tolerances see page 1 - 4

④ Tap specification see page 1 - 7

Gear Unit Weights

The total weight of a unit can be calculated by adding its components.
These weights are only approximate (+5%; -20%)

Gear Units

		KG	LB
E.	**38**	8,5	19
E.	**48**	11	24
E.	**68**	22	49
E.	**88**	37	82
E.	**108**	65	143
E.	**128**	96	212
E.	**148**	127	280

		KG	LB
B.	**28**	5,5	12
B.	**38**	18	40
K.	**38**	16	35
K.	**48**	21	46
K.	**68**	42	93
K.	**88**	75	165
K.	**108**	134	295
K.	**128**	215	474
K.	**148**	320	705
K.	**168**	520	1146
K.	**188**	760	1676

		KG	LB
C.	**38**	19	42
C.	**48**	28	62
C.	**68**	49	108
C.	**88**	83	183

		KG	LB
D./Z.	**28**	4	9
D./Z.	**38**	12,5	28
D./Z.	**48**	22	49
D./Z.	**68**	39,5	87
D./Z.	**88**	72	159
D./Z.	**108**	117	258
D./Z.	**128**	191	421
D./Z.	**148**	268	591
D./Z.	**168**	419	924
D./Z.	**188**	510	1124

		KG	LB
F.	**28**	5	11
F.	**38**	14	31
F.	**48**	22	49
F.	**68**	42	93
F.	**88**	76	168
F.	**108**	122	269
F.	**128**	209	461
F.	**148**	300	661
F.	**168**	472	1041
F.	**188**	686	1512

Input Units

		KG	LB
A5	**71**	6	13
A5	**80**	9	20
A5	**90**	10	22
A5	**100**	14	31
A5	**112**	16	35
A5	**132**	25	55
A5	**160**	37	82
A5	**200**	51	112
A5	**225**	78	172
A5	**250**	88	194

		KG	LB
P5	**143**	27	60
P5	**145**	27	60
P5	**182**	36	79
P5	**184**	36	79
P5	**213**	111	245
P5	**215**	111	245
P5	**254**	125	276
P5	**256**	125	276
P5	**286**	211	465
P5	**324**	307	677
P5	**326**	307	677
P5	**364**	327	721
P5	**365**	327	721

		KG	LB
K5TC	**56**	3	7
K5TC	**140**	6	13
K5TC	**180**	7	15
K5TC	**210**	16	34
K5TC	**250**	39	85
K5TC	**280**	54	120
K5TC	**320**	78	172
K5TC	**360**	114	252

		KG	LB
KTC	**56**	14	31
KTC	**140**	14	31
KTC	**180**	19	42
KTC	**210**	31	67
KTC	**250**	54	118
KTC	**280**	85	188
KTC	**320**	131	289
KTC	**360**	168	371

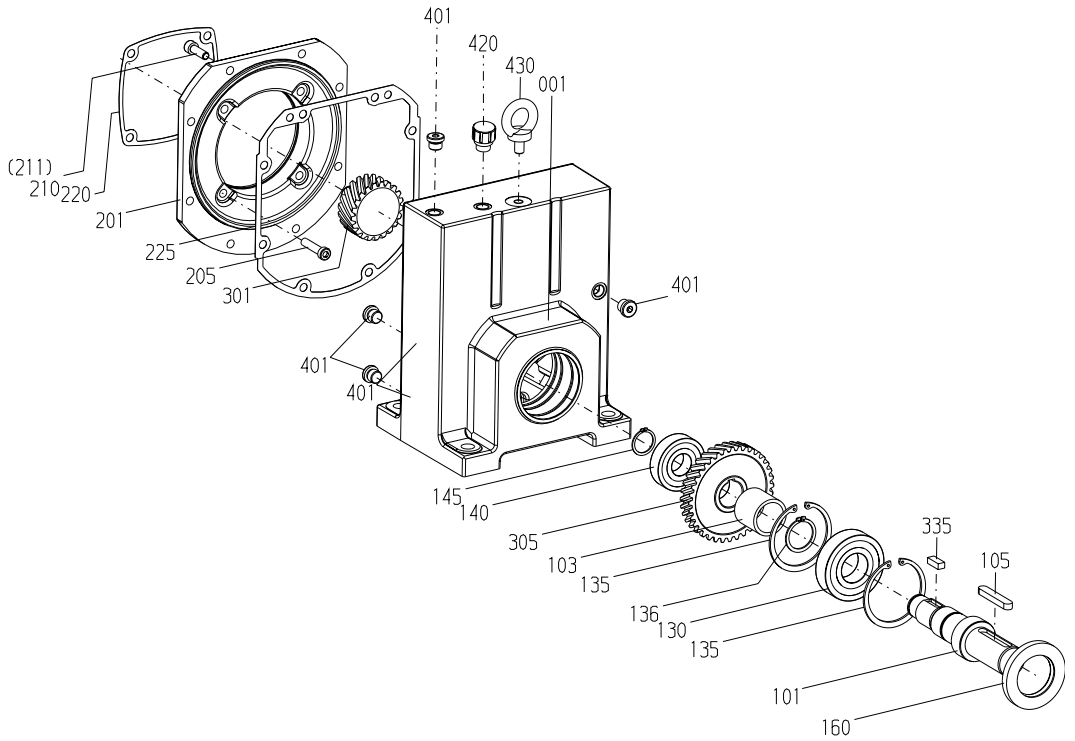
Lubricant weight
Mineral oil (CLP) = 0,9 kg/l (2lbs/l)
Synthetic oil (PGLP) = 1,05 kg/l (2.3lbs/l)
In order to know the oil volume, please refer to „OIL Type and Quantities“

Documentation

Table of Contents **Page**

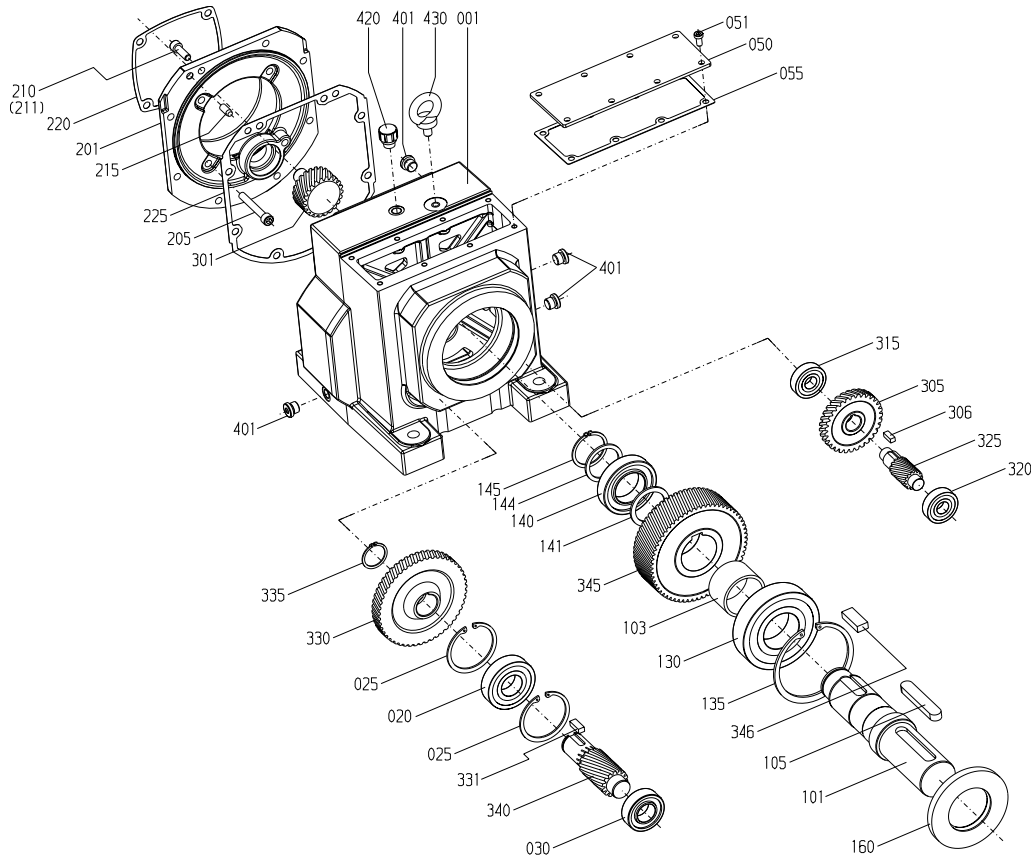
Documentation

Spare parts list One-stage helical gear units size 38 - 148



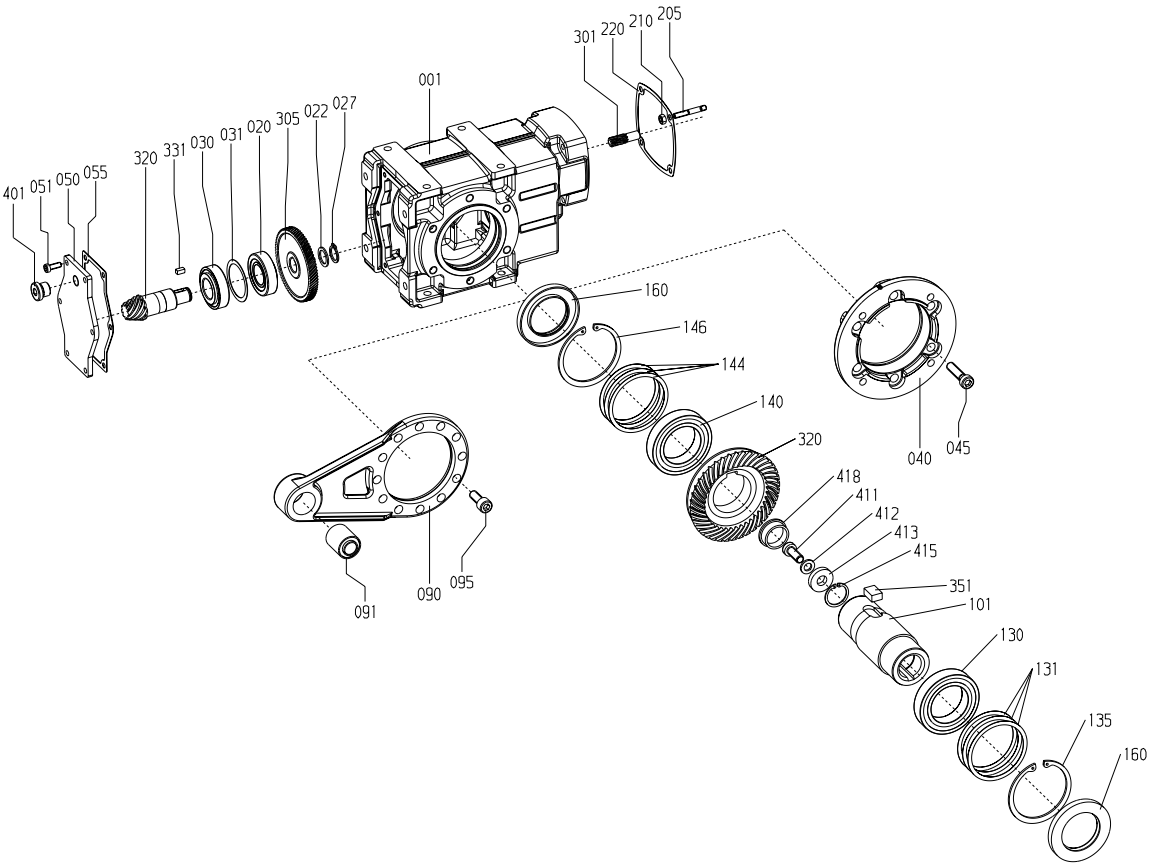
001 Gear unit housing
101 Output shaft
103 Spacer/bush
105 Parallel key
130 Bearings
135 Locking ring
136 Locking ring
140 Bearings
145 Locking ring
160 Shaft seal
201 Adapter plate
205 Bolt
210 Bolt
211 Screw lock
220 Seal
225 Seal
301 Plug-in pinion
305 Gear wheel
335 Parallel key
401 Screw plug
420 Breather filter
430 Eye bolt

Spare parts list Two and three-stage helical gear units size 38 - 188



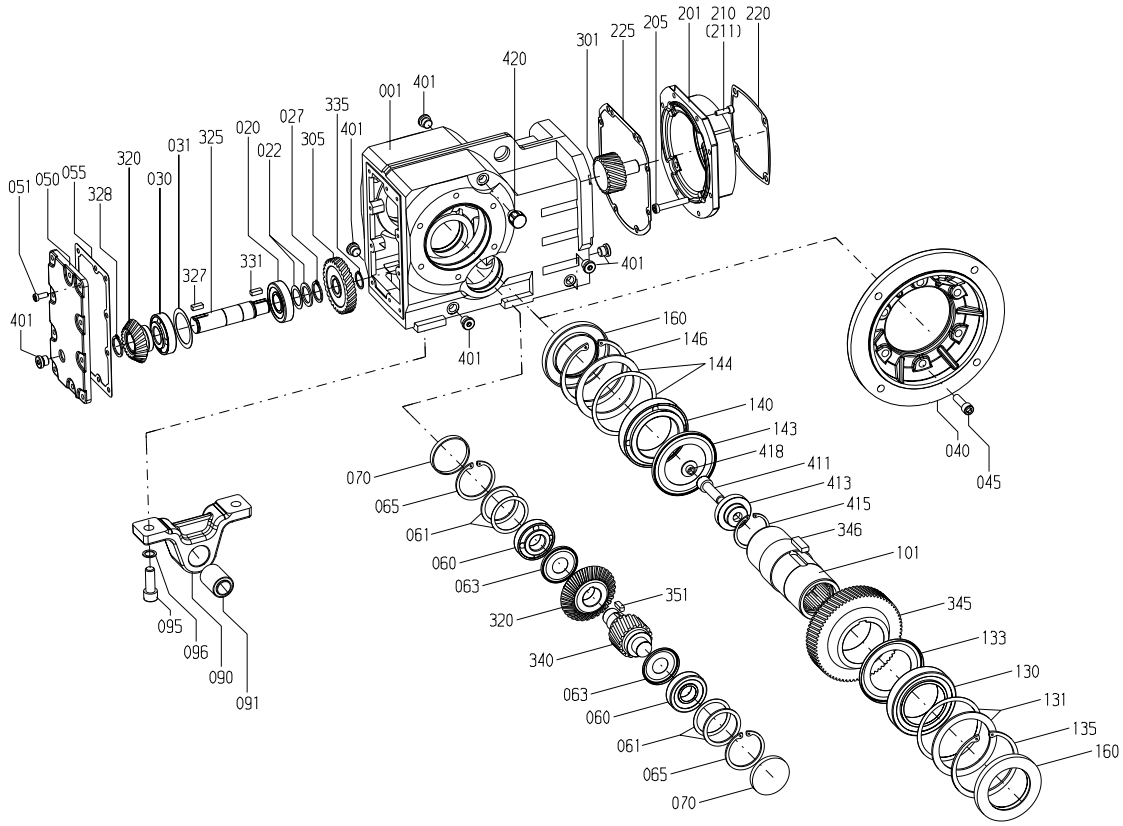
001 Gear unit housing
020 Bearings
025 Locking ring
030 Bearings
050 Housing cover
051 Bolt
055 Seal
101 Output shaft
103 Spacer/bush
105 Parallel key
130 Bearings
135 Locking ring
140 Bearings
141 Supporting disk/shim
144 Supporting disk/shim
145 Locking ring
160 Shaft seal
201 Adapter plate
205 Bolt
210 Bolt
211 Screw lock
215 Parallel pin
220 Seal
225 Seal
301 Plug-in pinion
305 Gear wheel
306 Parallel key
315 Bearings
320 Bearings
325 Pinion shaft
330 Gear wheel
331 Parallel key
335 Locking ring
340 Pinion shaft
345 Gear wheel
346 Parallel key
401 Screw plug
420 Breather filter
430 Eye bolt

Spare parts list Bevel helical gear units size B38



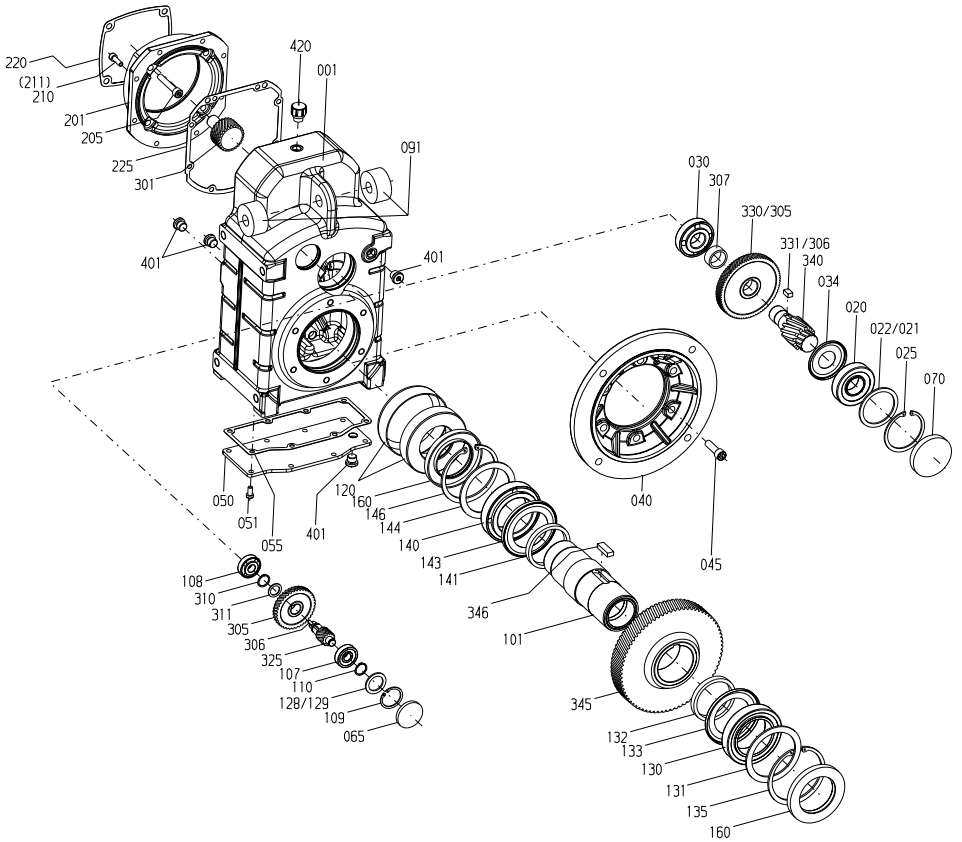
001 Gear unit housing
020 Taper roller bearing
022 Supporting disk/shim
027 Locking ring
030 Taper roller bearing
031 Supporting disk/shim
040 Output flange
045 Bolt
050 Housing cover
051 Bolt
055 Seal
090 Torque arm
091 Rubber bush
095 Bolt
101 Output shaft
130 Deep-groove ball bearing
131 Supporting disk/shim
135 Locking ring
140 Deep-groove ball bearing
144 Supporting disk/shim
146 Locking ring
160 Shaft seal
205 Bolt
210 Nut
220 Seal
301 Plug-in pinion
305 Gear wheel
320 Bevel-gear pair
331 Parallel key
351 Parallel key
401 Screw plug
411 Bolt
412 Spring washer
413 Washer
415 Locking ring
418 Plug/sealing cap

Spare parts list Bevel helical gear units size 38 - 188



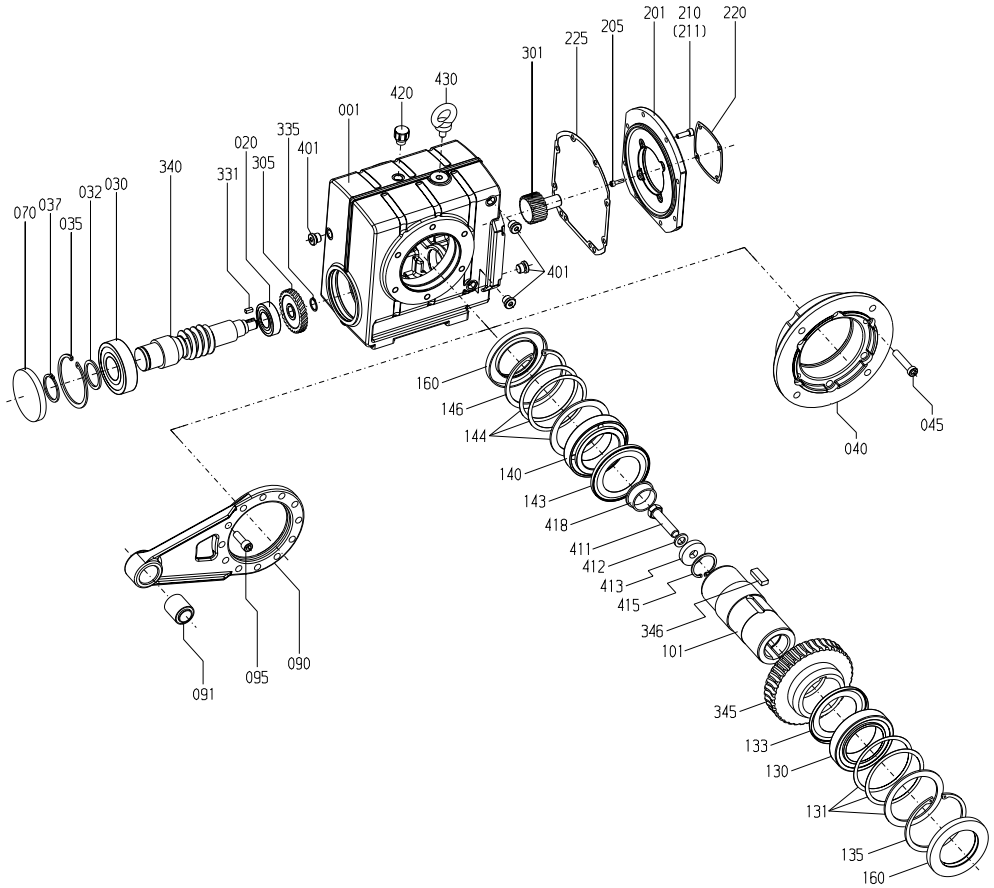
001 Gear unit housing
020 Bearings
022 Supporting disk/shim
027 Locking ring
030 Bearings
031 Supporting disk/shim
040 Output flange
045 Bolt
050 Housing cover
051 Bolt
055 Seal
060 Bearings
061 Supporting disk/shim
063 Nilos ring
065 Locking ring
070 Sealing cap
090 Torque arm
091 Rubber bush
095 Bolt
096 Screw lock
101 Output shaft
130 Bearings
131 Supporting disk/shim
133 Nilos ring
135 Locking ring
140 Bearings
143 Nilos ring
144 Supporting disk/shim
146 Locking ring
160 Shaft seal
201 Adapter plate
205 Bolt
210 Bolt
211 Screw lock
220 Seal
225 Seal
301 Plug-in pinion
305 Gear wheel
320 Bevel-gear pair
325 Bevel pinion shaft
327 Parallel key
328 Locking ring
331 Parallel key
335 Locking ring
340 Pinion shaft
345 Gear wheel
346 Parallel key
351 Parallel key
401 Screw plug
411 Bolt
413 Washer
415 Locking ring
418 Plug/sealing cap
420 Breather filter

Spare parts list Parallel shaft helical gear units size 38B - 188B



001 Gear unit housing
020 Bearings
021 Supporting disk/shim
022 Supporting disk/shim
025 Locking ring
030 Bearings
034 Nilos ring
040 Output flange
045 Bolt
050 Housing cover
051 Bolt
055 Seal
065 Sealing cap
070 Sealing cap
091 Rubber bush
101 Drive shaft
107 Bearings
108 Bearings
109 Locking ring
110 Locking ring
120 Shrink disc
128 Supporting disk/shim
129 Supporting disk/shim
130 Bearings
131 Supporting disk/shim
132 Spacer/bush
133 Nilos ring
135 Locking ring
140 Bearings
141 Spacer/bush
143 Nilos ring
144 Supporting disk/shim
146 Locking ring
160 Shaft seal
201 Adapter plate
205 Bolt
210 Bolt
211 Screw lock
220 Seal
225 Seal
301 Pinion
305 Gear wheel
306 Parallel key
307 Spacer/bush
310 Locking ring
311 Supporting disk/shim
325 Pinion shaft
330 Gear wheel
331 Parallel key
340 Pinion shaft
345 Gear wheel
346 Parallel key
401 Screw plug
420 Breather filter

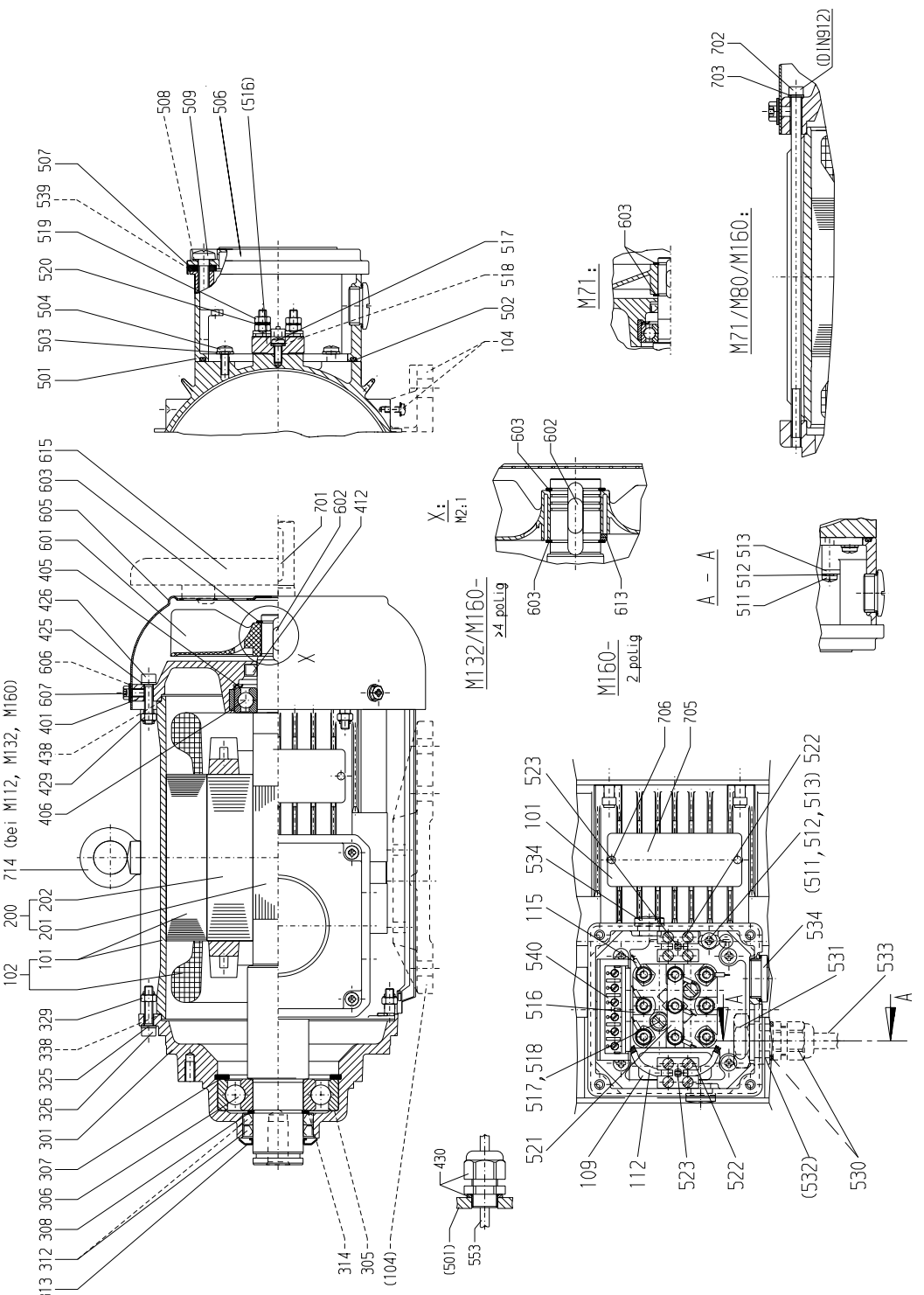
Spare parts list Helical worm gear units size 38 - 88



001 Gear unit housing
020 Bearings
030 Bearings
032 Supporting disk/shim
035 Locking ring
037 Locking ring
040 Output flange
045 Bolt
070 Sealing cap
090 Torque arm
091 Rubber bush
095 Bolt
101 Output shaft
130 Bearings
131 Supporting disk/shim
133 Nilos ring
135 Locking ring
140 Bearings
143 Nilos ring
144 Supporting disk/shim
146 Locking ring
160 Shaft seal

201 Adapter plate
205 Bolt
210 Bolt
211 Screw lock
220 Seal
225 Seal
301 Plug-in pinion
305 Gear wheel
331 Parallel key
335 Locking ring
340 Worm shaft
345 Worm wheel
346 Parallel key
401 Screw plug
411 Bolt
412 Screw lock
413 Washer
415 Locking ring
418 Plug/sealing cap
420 Breather filter
430 Eye bolt

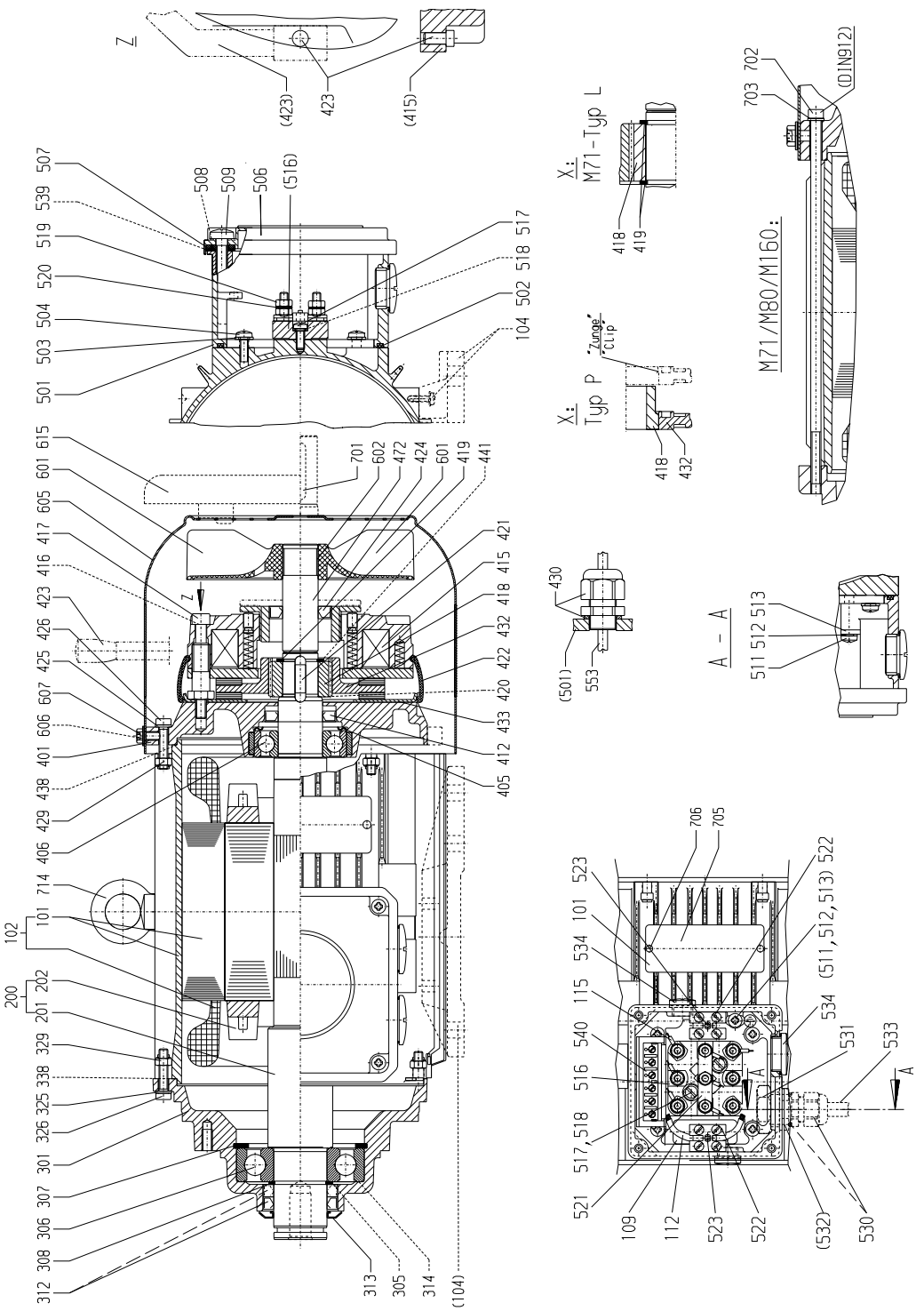
Spare parts list MODULOG-Motors size 71 - 200



Spare parts list MODULOG-Motors size 71 - 200

101 Stator housing with laminated core (non-wound)
102 Stator housing with laminated core (wound)
103 Plate fastening
104 Housing bases with fastenings
109 Plug for cable slot
112 Insulating plastic tube
115 Multicore cable end/cable terminal
200 Rotor
201 Shaft
202 Rotor core
301 Bearing end plate (input side)
305 Spring washer/shim
306 Bearings
307 Locking ring
308 Locking ring
312 Shaft seal
313 Deflector
314 Supporting disk/shim
325 Screw lock
326 Bolt
329 Nut
338 Seal
401 Bearing end plate (output-side)
403 Spring band
405 Spring washer
406 Bearings
412 Shaft seal
425 Screw lock
426 Bolt
429 Nut
430 Cable bush, complete
437 Supporting disk/shim
438 Seal
439 Supporting disk/shim
501 Bottom section for terminal box
502 Seal
503 Screw lock
504 Bolt
506 Cover for terminal box
507 Seal
508 Screw lock
509 Bolt
511 Bolt
512 Screw lock
513 Bracket/washer
516 Terminal strip, complete
517 Bolt
518 Screw lock
519 Bolt
520 Washer
521 Terminal connector
522 Terminal strip
523 Support/screw
530 Cable bush, complete
531 Nut
532 Seal
533 Cable/lead
534 Plug, complete
539 Retainer
540 Rectifier
553 Cable/lead
555 Fastening bolt
556 Screw lock
558 Earth plate
601 Fan blades
602 Parallel key
603 Locking ring
605 Fan cowl
606 Screw lock
607 Bolt
613 Supporting disk/shim
614 Supporting disk/shim
615 Protective cover
701 Parallel key
702 Bolt
703 Screw lock
705 Rating plate
706 Rivet/screw
714 Eye bolt

Spare parts list MODULOG brake motors size 71 - 200



Spare parts list MODULOG brake motors size 71 - 200

101 Stator housing with laminated core (non-wound)
102 Stator housing with laminated core (wound)
104 Housing bases with fastenings
109 Plug for cable slot
112 Insulating plastic tube
115 Multicore cable end/cable terminal
200 Rotor
201 Shaft
202 Rotor core
301 Bearing end plate (input side)
305 Spring washer/shim
306 Bearings
307 Locking ring
308 Locking ring
312 Shaft seal
313 Deflector
314 Supporting disk/shim
325 Screw lock
326 Bolt
329 Nut
338 Seal
401 Bearing end plate
403 Spring band
405 Spring washer
406 Bearings
412 Shaft seal
415 Magnet part brake
416 Screw lock
417 Bolt
418 Driver
419 Locking ring
420 Supporting disk/shim
421 Parallel key
422 Supporting disk/shim
423 Hand ventilation lever
423 Plug, if no hand ventilation lever
424 Shaft seal
425 Screw lock
426 Bolt
429 Nut
430 Cable bush, complete
432 Brake disc
433 Friction plate
437 Screw set
438 Seal
441 Supporting disk/shim
472 Shaft extension
501 Bottom section for terminal box
502 Seal
503 Screw lock
504 Bolt
506 Cover for terminal box
507 Seal
508 Screw lock
509 Bolt
511 Bolt
512 Screw lock
513 Bracket/washer
516 Terminal strip, complete
517 Bolt
518 Screw lock
519 Bolt
520 Washer
521 Terminal connector
522 Terminal strip
523 Support/screw
530 Cable bush, complete
531 Nut
532 Seal
533 Cable/lead
534 Plug, complete
539 Retainer
540 Rectifier
553 Cable/lead
555 Fastening bolt
556 Screw lock
558 Earth plate
601 Fan blades
602 Tolerance ring
603 Locking ring
605 Fan cowl
606 Screw lock
607 Bolt
613 Supporting disk/shim
615 Protective cover
701 Parallel key
702 Bolt
703 Screw lock
705 Rating plate
706 Rivet/screw
714 Eye bolt

Installation / Removal of hollow shaft gearmotors and gear units

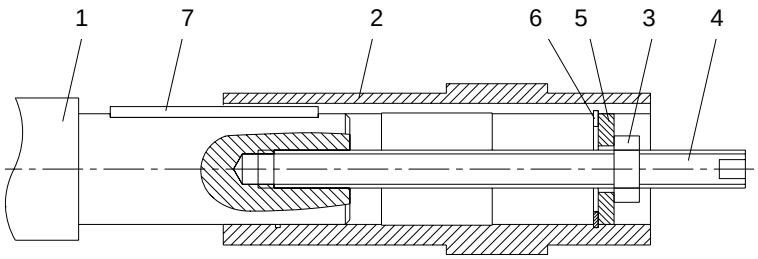
Installation of unit

- Carefully clean anti-corrosion paint off the inside of the hollow shaft and off the machine shaft with cleaning benzine or solvent. (Ensure adequate ventilation)
- Check the hollow and machine shaft for damaged seats or edges.Rework parts with a suitable tool and clean them again if necessary.

Note: to prevent fretting corrosion, apply a mounting paste or a suitable lubricating medium (e.g. Calypsol H 443 HD88 grease) on the contact surfaces.

- Fit the drive by means of a nut and a threaded rod. The support is realized by the hollow shaft.

Important: - The hollow shaft must be perfectly aligned with the machine shaft to avoid canting.
- With Flange or Face mounted units, there must not be any additional radial or axial stress on the shaft to prevent damage to the bearings.



1 Machine shaft
2 Hollow shaft
3 Hexagonal nut
4 Threaded rod
5 Disc
6 Locking ring
7 Parallel key

Parts 3 and 4 are not supplied by FLENDER

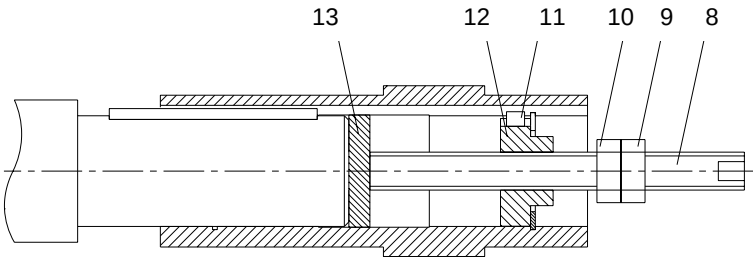
Note: A hydraulic lifting device may be used instead of the nut and threaded spindle shown above.

Removal of unit

Important: Before removal, an adequately dimensioned load suspension device should be mounted under the drive. The load suspension device should be slightly pre-tensioned to prevent the drive from falling into it when released from the machine shaft.

- Remove axial safety device of the hollow shaft.
- If rust is present on the seat surfaces, apply penetrating oil on these surfaces.
- After the oil has penetrated, pull off the drive as outlined in the drawing below.

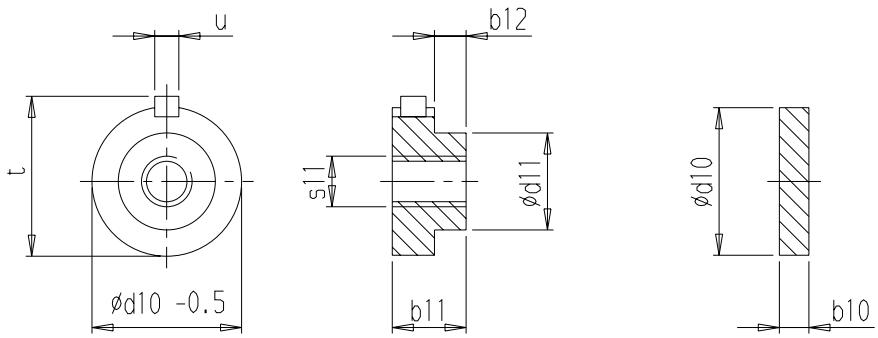
Important: Make sure there is no canting during this operation.



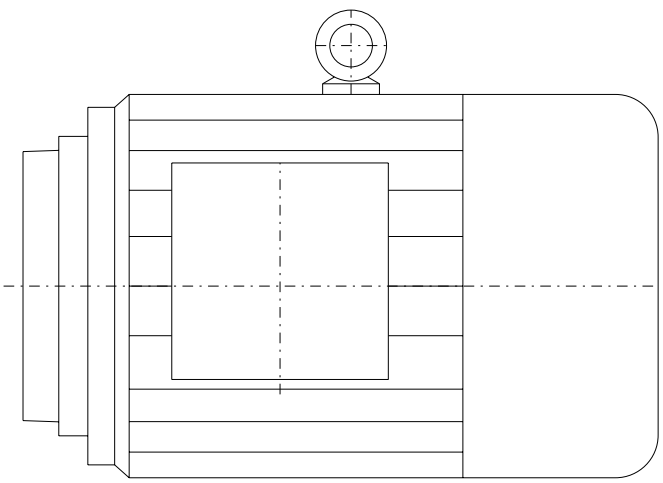
8 Threaded rod
9 Hexagonal nut
10 Hexagonal nut
11 Parallel key
12 Threaded washer
13 Disc

These parts are not supplied by FLENDER

Suggested design for threaded washer (12) and disc (13)



Size	b10	b11	b12	d10	d11	s11	t max	u
28	0.12 *3*	0.59 *15*	0.39 *10*	d 10 = U (hollow shaft diameter) - 0.004" [0.1 mm]	d 11 = U (hollow shaft diameter) x 0.55	s 11 tap = M (hollow shaft bolt)	t max = UY - 0.016" [0.4 mm]	u = Y (hollow shaft keyway width)
38	0.24 *6*	0.59 *15*	0.39 *10*					
48	0.24 *6*	0.59 *15*	0.20 *5*					
68	0.28 *7*	0.79 *20*	0.28 *7*					
88	0.28 *7*	0.79 *20*	0.39 *10*					
108	0.39 *10*	0.94 *24*	0.39 *10*					
128	0.39 *10*	0.94 *24*	0.20 *5*					
148	0.39 *10*	0.94 *24*	0.28 *7*					
168	0.39 *10*	1.18 *30*	0.31 *8*					
188	0.39 *10*	1.18 *30*	0.43 *11*					



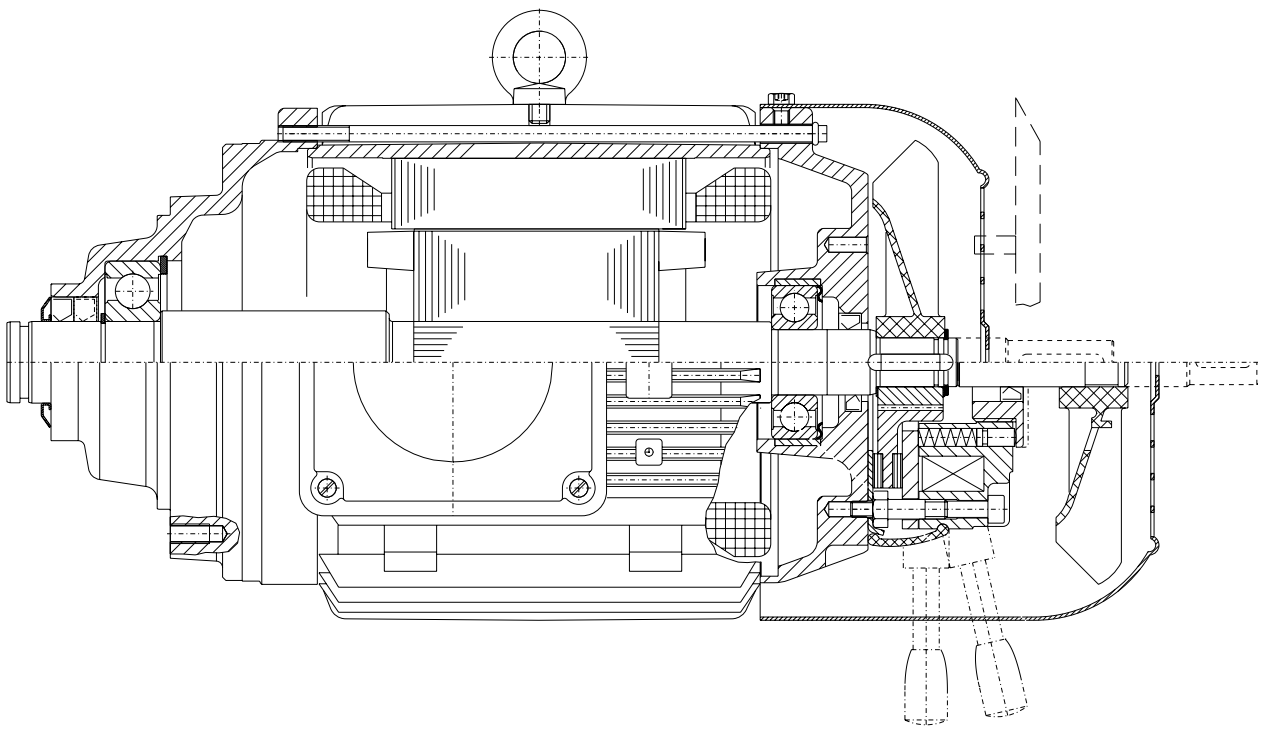
Gear motors

Table of Contents **Page**

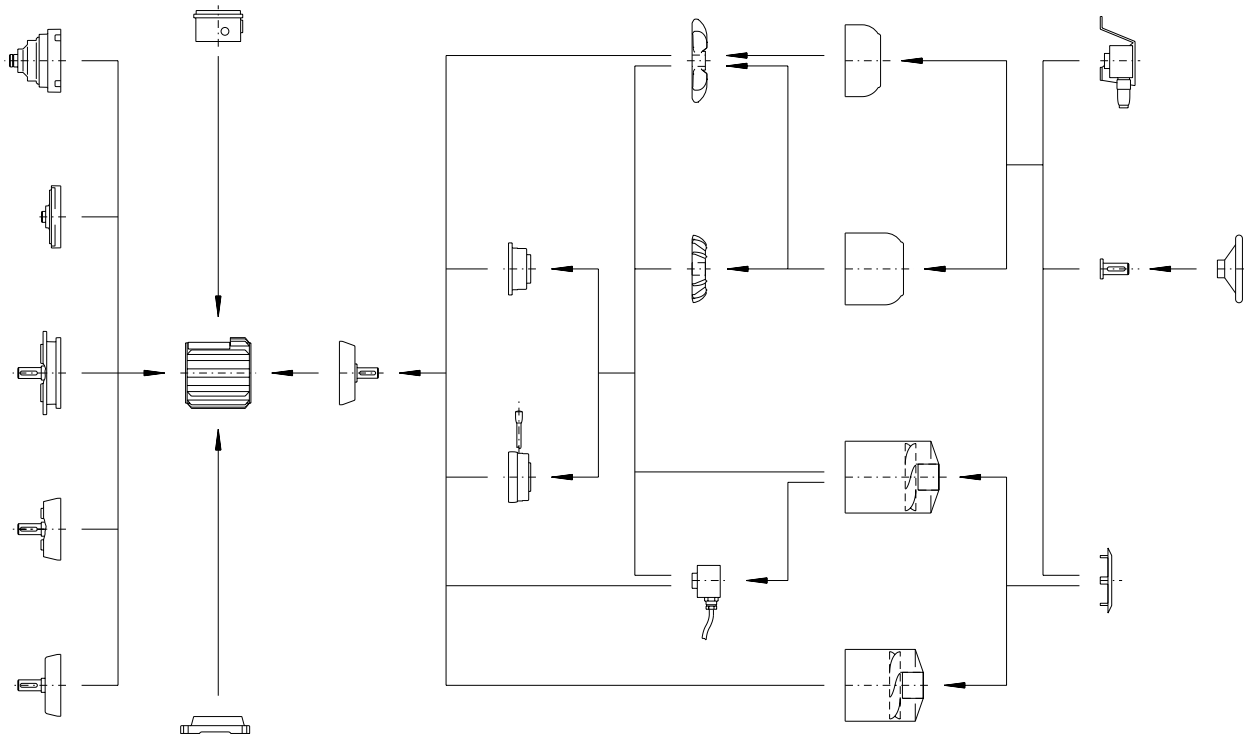
Gear Motors

MOTOX-N

Modular geared motor



Modular System



Three-phase squirrel cage induction motors

Output ratings :

- **0.12 hp to 125 hp [0.09 kW to 90 kW]**

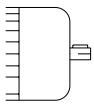
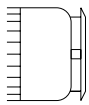
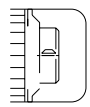
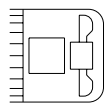
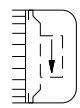
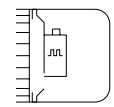
Designs:

- Gear motor MOTOX-N Types / Frame sizes M71 to M280M

Additional features, built-in and attached elements:

- second motor shaft extension
- protection cover
- brake
- external fan
- backstop
- encoder system
- ... other on request.

Combination of additional features, built-in and attached elements

	Second motor shaft extension	Protection cover	Brake	External fan	Back stop	Encoder system
Second motor shaft extension		-	❍	-	❍	1
Protection cover	-		❍	❍	❍	2
Brake	❍	❍		❍	-	❍
External fan	-	❍	❍		❍	❍
Back stop	❍	❍	-	❍		❍
Encoder system	1	2	❍	❍	❍	

- not possible

❍ possible without restrictions

1 on request as a special design

2 only possible with external fan

Note

All above mentioned motor options can be attached or built-in, now or later, to the MODULOG-Motors, frame size M71 to M160, i.e. the motors are modifiable or retrofitable even after installation and putting into operation.

Standards and specifications

The motors comply with all appropriate international (IEC-), American (NEMA-, CSA-, UL-R-), European (EN-, CENELEC-) and national (DIN/VDE-) standards:

Overview

IEC	EN / HD	DIN / VDE	Title
IEC 60027-4	HD 245.4	DIN 1304-7	Symbols to be used for electrical machines
IEC 60034-1	EN 60034-1	DIN EN 60034-1 VDE 0530-1	Rotating electrical machines: - Rating and performance
IEC 60034-2	EN 60034-2	DIN EN 60034-2 VDE 0530-2	- Methods for determining losses and efficiency of rotating electrical machinery from tests (excluding machines for traction vehicles)
IEC 60034-5	EN 60034-5	DIN EN 60034-5 VDE 0530-5	- Degrees of protection provided by the integral design of rotation electrical machines (IP code) - Classification
IEC 60034-6	EN 60034-6	DIN EN 60034-6 VDE 0530-6	- Methods of cooling (IC-Code)
IEC 60034-7	EN 60034-7	DIN EN 60034-7 VDE 0530-7	- Classification of types of constructions, mounting arrangements and the terminal box position (IM code)
IEC 60034-8	EN 60034-8	DIN EN 60034-8 VDE 0530-8	- Terminal markings and direction of rotation
IEC 60034-9	EN 60034-9	DIN EN 60034-9 VDE 0530-9	- Noise limits
IEC 60034-12	EN 60034-12	DIN EN 60034-12 VDE 0530-12	- Starting performance of single-speed three- phase cage induction motors
IEC 60034-14	EN 60034-14	DIN EN 60034-14 VDE 0530-14	- Mechanical vibration of certain machines with shaft heights 56 mm and higher
IEC TS 60034-17	-	DIN IEC / TS 60034-17 VDE 0530-17	- Cage induction motors when fed from converters - Application Guide
IEC 60038	HD 472	DIN IEC 60038	IEC standard voltages
-	EN 50347	DIN EN 50347	General purpose 3 phase induction motors having standard dimensions and outputs.
IEC 60085	HD 566	DIN IEC 60085	Thermal evaluation and classification of electrical insulation
IEC 60445	EN 60445	DIN EN 60445	Identification of equipment terminals and of terminations of certain designated conductors
IEC 60529	EN 60529	DIN EN 60529 VDE 0470-1	Degrees of protection provided by enclosures (IP-Code)
-	EN 50262	DIN EN 50262	Metric cable glands for electrical installations.
-	-	EDIN 42925	Terminal box cable entries for three-phase cage induction motors at rated voltages 400V to 690V.

NEMA	CSA	UL-R	Title
MG 1	-	-	Motors and Generators
-	C22.2 No. 100 - 95	-	Motors and Generators
-	C22.2 No 0	-	General Requirements - Canadian Electrical Code Part II
-	C22.2 No 25	-	Enclosures for Use in Class II Groups E, F and G - Hazardous Locations
-	C22.2 No 30	-	Explosion-Proof Enclosures for Use in Class 1 Hazardous Locations
-	C22.2 No 77	-	Motors with Inherent Overheating Protection
-	C22.2 No 145	-	Motors and Generators for Use in Hazardous Locations Class I Groups C and D, Class II Groups E, F and G
-	-	UL 1004	Electric Motors

EC-Directives

CE

In addition to the previous standards all applicable harmonised standards for motors, geared motors and gear units are taken into consideration to put the EC-Directives shown below into action. These standards are published by the EC-Commission in the Official Journal of the European Community.

EC-Directives:

- **73/23/EEC**
  Low voltage directive "LVD",
  changed by 93/68/EEC, changed by GPSG (Equipment and Product Safety Act)
  (Electrical machinery tools for use within certain voltage limits)

- **89/336/EEC**
  EMC-Directive "EMCD",
  changed by 91/263/EEC, 92/31/EEC and 93/68/EEC,
  changed by GPSG(Equipment and Product Safety Act)
  (Electromagnetic Compatibility)

- **98/37/EC**
  Machine Directive "MD", codified, changed by GPSG (Equipment and Product Safety Act)

Applied standards:

Within the scope of the Low voltage directive "LVD":
EN 60204-1

Within the scope of the EMC-Directive "EMCD":
EN 55011, EN 55014 and standards from EN 61000

Within the scope of the Machine Directive "MD":
EN 292-1, EN 292-2, EN 294, EN 349, EN 563, EN 60204-1

The **CE-Marking** (based on the LVD and EMCD) of the motors is used since December 1995.

The **Conformity Declarations** and the complete product documentation are archived by us in accordance with the rules of the EC-Low Voltage and EMC-Directives (1. GSGV and EMVG).

Manufacturer Declarations (based on the MD) are to be found in the corresponding operation manuals.
On request, seperate Manufacturer Declarations can be ordered from your corresponding Sales Centre.

Motor Challenge Program

Motor Challenge Endorser

The Motor Challenge program is a program of the European commission for helping industrial enterprises to improve the energetic efficiency of its engine systems.
The program addresses itself to all users and manufacturers of engines and planners of equipements, which are operated with electric motors.
Participating companies commit themselves in the context of a plan of action to the identification and realization of energy saving measures.

The European commission convinced itself of the quality and effectiveness of the action and promotion plan of FLENDER TÜBINGEN.

To 07.10.2003 the Endorser status was conferred.

Branch specific regulations

VIK design

The motors can be supplied in accordance with the "technical requirements" of the VIK (Association of Industrial Power Generators).

Maritime regulations

The motors are available in accordance with the following regulations:
- **ABS** American Bureau of Shipping
- **BV** Bureau Veritas
- **GL** Germanischer Lloyd
- **LR** Lloyd's Register of Shipping
- **DNV** Det Norske Veritas
- **RINa** Registro Italiano Navale

International regulations

North America regulations
Design of the motors to following North America approvals is possible (extra Charge):
NEMA

National Electrical Manufacturing Association
Canada and USA

CSA-C/US design (formerly: CSA-NRTL/C):
Compliance with all related U.S. Standards as identified by the OSHA, U.S. Dept. of Labor and all related CSA Standards, is CSA certified.
Motors M71 to M160
Brakes L, A
External fan units

Canada

CSA design:
Motors M71 to M160
Motors M225S to M280M
Brakes L, A
External fan units

Energy Efficiency Verification
Motors M225S to M280M

Hazloc (Division System)

Class I Division 1 Groups A, B, C, D T4

- T4 — Temperature Code
  T3 : (200 °C)
  T4 : (135 °C)
  T5 : (100 °C)
- Groups A, B, C, D — Gas groups
  A : acetylene B: hydrogen C : ethylene D : propane
  Dust groups
  E : metal dust T : coal dust G : grain dust
- Division 1 — Area classification
  Division 1:A location where a classified hazard is likely to exist.
  Division 2:A location where a classified hazard does not normally exist but is possible under abnormal conditions.
- Class I — Flammable gas or vapour
  Class I: A location where a quantity of flammable gas or vapour, sufficient to produce an explosive or ignitable mixture, may be present in the air.
  Class II: A location made hazardous by the presence of combustible or electrically conductive dust, including groups E, T, G

Motors M71 to M160
Class I Division 2 groups B, C, D, T3
Class II Division 2 groups F, G, T3
USA and Canada

UL-C/US design:
Compliance with all related U.S. Standards as identified by the OSHA, U.S. Dept. of Labor and all related CSA Standards, are UL certified.
Motors M71 to M200
USA

UL design:
Mechanical design of motors with (Component-Motors)
Motors M225S to M280M

Chinese regulations

VR China

CCC: China Compulsory Certification

Motors M71 to M90L

Russian regulations

Russia

MP03

GOST-R-Design
Helical Gear Motors and Gear Units
Bevel Helical Gear Motors and Gear Units
Parallel Shaft Gear Motors and Gear Units
Helical Worm Gear Motors and Gear Units
Three phase-asynchronous motors and single phase AC motors with squirrel cage for low voltage
CAVEX®-Worm Gear Units

Smooth running / vibration characteristics

In all motors, the rotors are balanced dynamically at operating speed. A maximum of running smoothness and minimum of vibration is also achieved through the careful selection of roller bearings and precise observation of fits. The motors in catalogue correspond to vibration level A according to DIN EN 60034-14. At the customer's request, the vibration level design B can be supplied.

Motor noise levels

All motors meet the requirements of DIN EN 60034-9.
As a rule motor noise levels are below given limits by 10...15%.

Measuring surface-sound power level at rated load and 60Hz

Motor	Measuring surface measurement L_S dB	Measuring surface-sound pressure level $\overline{L}_{pfA}$ for three-phase motors with squirrel cage rotor 4 pole dB (A)
M71	on request	
M80		
M90S/L		
M100L		
M112M		
M132S/M		
M160M/L		
M180M/L		
M200L		
M225S/M	on request	61
M250M		66
M280S/M		68
M315S/M/L		69

Acoustic power level (A) $L_{wA} = \overline{L}_{pfA} + L_S$

All values quoted for $\overline{L}_{pfA}$ can vary by +3 dB (A).

Noise level values for 60 Hz, and the noise supressed design are available on request.

Note:

The specified values apply to motors only.
During the interaction with the gear, each of the noise levels $\overline{L}_{pfA}$ and L_S generally increases to an average of 3-5 dB (A).
However, this depends upon:
- gear type
- speed and transmission ratios
- construction types
- other influencing factors

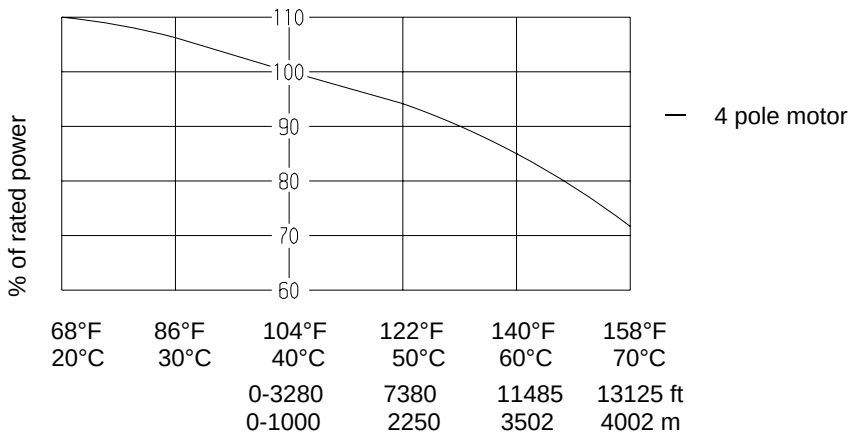
Please enquire for more specific information.

Electrical Data

Rated Power

Ratings are coordinated with frame sizes according to EN 50347. The motor power data indicated in this list refer to continuous operation (S1) and a frequency of 60Hz. Temperature rise lies within the limits of the specifications as per EN 60034-1 at rated power and at rated voltage and rated frequency in continuous operation.
Installation altitude up to 3280 ft (1000 m) above sea level with a maximum ambient temperature of 104 °F (40°C). Overload capacity in accordance with EN 60034-1.
Motor design for ambient (coolant) temperatures > 104 °F (40°C) at rated power is possible on request (at extra charge).

Output changes for abnormal coolant temperature or altitudes



Coolant temperature	normal up to 104°F (40°C)
Altitude	normal up to 3280 ft (1000 m) altitude above sea level

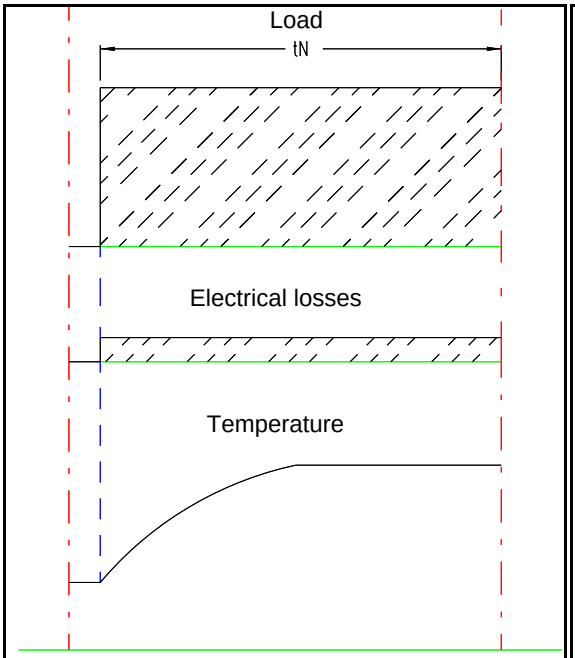
Service Factor

The service factor is a measure of continuous overload capacity at which a motor can operate without overload or damage. The standard service factor for MODULOG Motors is 1.15.

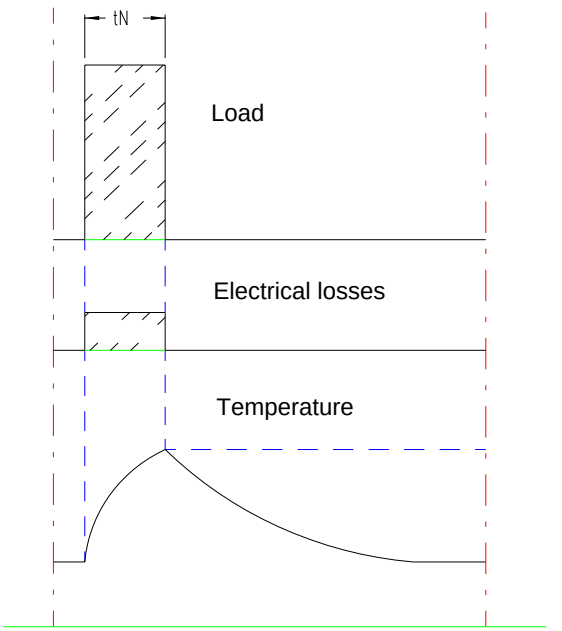
Motor Duty Cycles according to EN 60034-1

The output ratings stated in the performance tables apply to duty type S1 (continuous running with constant load). All types of duties are described below.

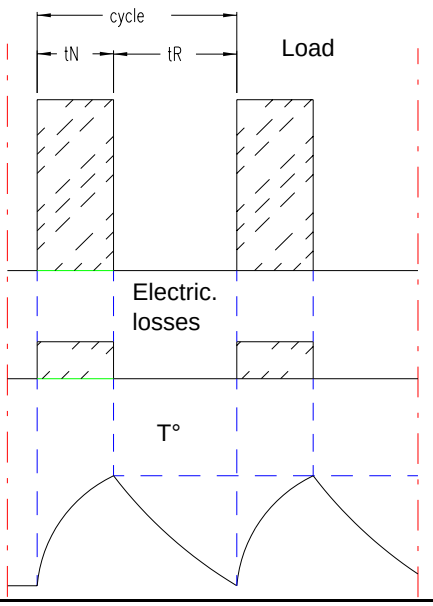
1. Duty types where starting or electrical braking do not influence the T° rise of the motor



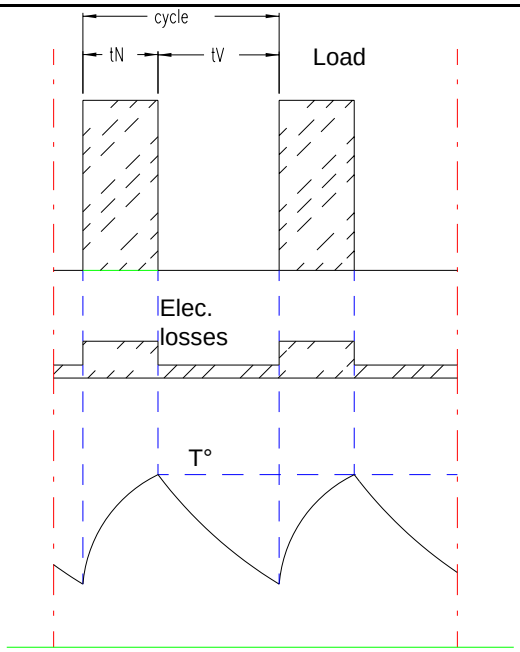
Duty type **S1**
Working at constant load, long enough to reach thermal equilibrium.
tN= running at constant load



Duty type **S2**
Working at constant load, during a certain period of time, which is shorter than required to reach thermal equilibrium, followed by a period of rest long enough for the motor to cool down to ambient temperature.
tN= running at constant load

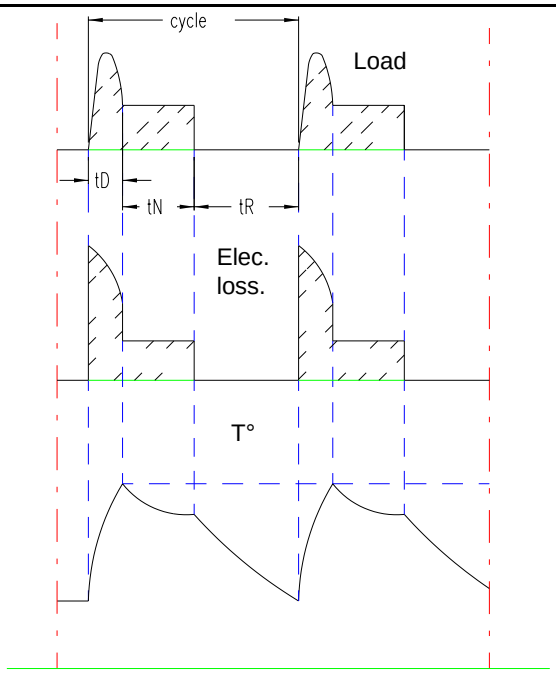


Duty type **S3**
Sequence of identical cycles, each one include a running period at constant load, and a period of rest. Thermal equilibrium is not achieved during a working cycle. Temperature rise is not significantly influenced by the starting current.
tN= running at constant load
tR= rest

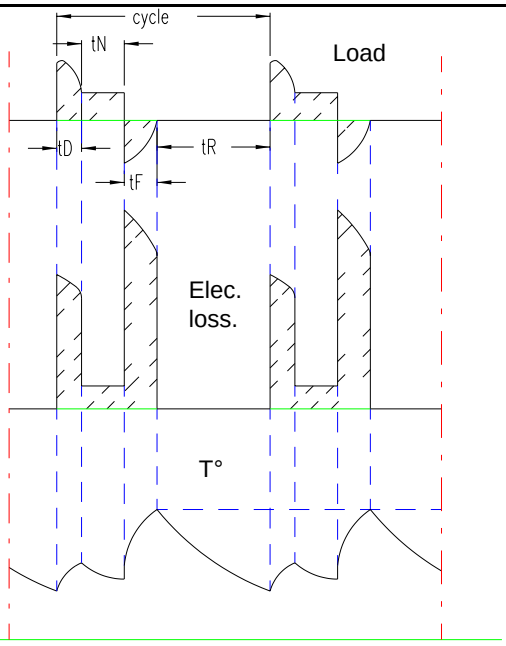


Duty type **S6**
Sequence of identical duty cycles, consisting of a running period at constant load and a running period at no load, with no period of rest.
tN=running at constant load
tV=running at no load

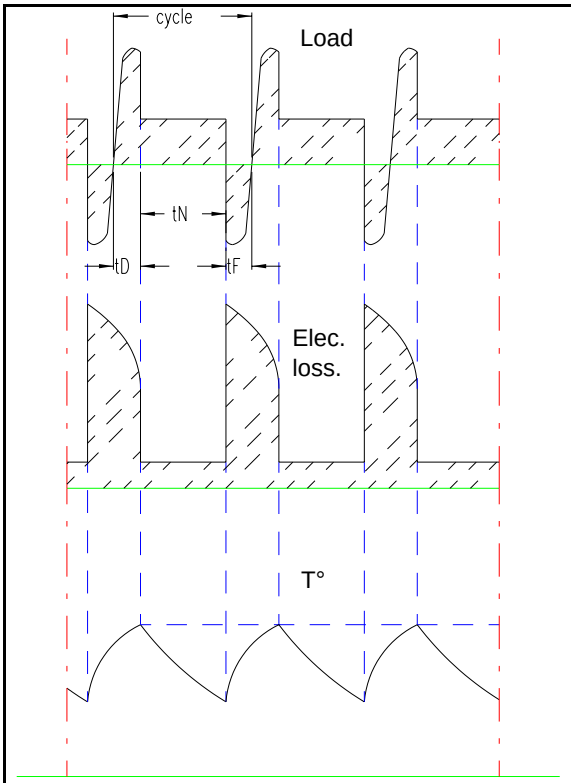
2. Duty types where starting or electrical braking influence the T° rise of the motor



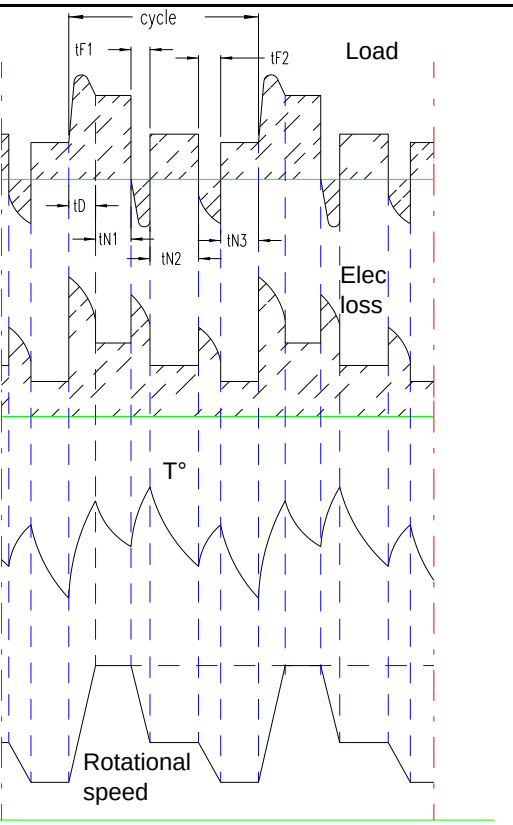
Duty type **S4**
Sequence of identical duty cycles, consisting of a starting period, a running period at constant load, and a period of rest. Thermal equilibrium is never reached during the cycle.
tD=start / tN=running at constant load / tR=rest



Duty type **S5**
Sequence of identical duty cycles, consisting of a starting period at constant load, a period of rapid electric braking and a period of rest. Thermal equilibrium is never reached during the cycle.
tD=start / tN / tF=electric braking / tR=rest



Duty type **S7**
Sequence of identical duty cycles, each one consisting of a starting period, a running period at constant load and a period of electric braking. There is no period of rest.
tD=start
tN=running at constant load
tF=electric braking



Duty type **S8**
Sequence of identical duty cycles, each one consisting of a starting period, followed by running periods at constant load corresponding to different rotational speeds. There is no period of rest.
tD=start
tN1, tN2, tN3=running at constant speed
tF1, tF2=electric braking

Speed

The rated speeds shown in the data sheets are valid for 60 Hz. The rated speed equals synchronous speed less slip speed. The following speeds result from the number of poles and the main frequency of 60 Hz:

No. of poles	Synchronous speed at mains frequencies **n** (60 Hz) [rpm]
2	3600
4	1800
6	1200
8	900
10	720
12	600
16	450

Rated current

The rated currents shown in the tables are valid for nominal voltage as shown. The rated currents of motors wound for different voltages vary in inverse proportion to the voltages:

$$\frac{U}{U'} = \frac{I'}{I}$$

From this it follows that:

$$I' = \frac{U \cdot I}{U'}$$

Legally prescribed minimum efficiency levels

In 1997 a law was passed concerning the introduction of minimum efficiency levels for three-phase low-voltage motors (EPACT). A broadly similar law, based, however, on a different verification process, is in effect in Canada. Efficiency in the case of these motors is determined for the USA according to IEEE 112, Test Method B, and for Canada according to CSA-C390. With a few exceptions all three-phase low-voltage motors to be exported to the USA and Canada must conform to the legal efficiency requirements. The law requires minimum efficiency levels for motors with a voltage of 230 and 460 V/60 Hz, in the power range 1 to 200 HP (0.75 to 160 kW) and 2, 4 and 6 poles. Explosion-protected motors are also included.

Excluded from the efficiency requirements according to EPACT are e.g.:

1. Motors whose size-power classification does not conform to the standard series according to NEMA MG1-12.

2. Flange-mounted motors.

3. Brake motors.

4. Inverter motors.

5. Motors with design letter C and above.

For further information on EPACT: http://www.eren.doe.gov/

Special requirements for the USA: Energy Policy Act.

The law requires the nominal efficiency level at full load and a compliance certification (CC) number to be entered on the rating plate. The CC number is issued by the U.S. Department af Energy (DOE). EPACT motors requiring marking have the following information stamped on the rating plate:

nominal efficiency level, design letter, code letter, CONT, CC 032A (Siemens) and NEMA MG1-12.

Special requirements for Canada: CSA Energy Efficiency Verification

These motors satisfy the minimum efficiency requirements in accordance with CSA Standard C390.

Motors which satisfy the requirements must also have the CSA-E mark on the rating plate.

Tolerances

The following tolerances apply to the electrical values of the rating tables, according to EN 60034-1:

Efficiency:

≤ 50 kW / 67 hp : - 0.15 (1 - η)
> 50 kW / 67 hp : - 0.1 (1 - η)

Power factor:

$$- \frac{1 - \cos\varphi}{6}$$

(minimum 0.02 / maximum 0.07)

Slip at nominal load and operating temperature:
±120 % of nominal slip at $P_N \geq 1$ kW / 1.34 hp
± 30 % of nominal slip at $P_N < 1$ kW / 1.34 hp
Starting torque: -15 % and +25 %
Break-away torque: -10 % without upper limit
Starting current: + 20 % without lower limit
Moment of inertia (of motor): ± 10%

Direction of rotation

The motors can be operated in both directions of rotation. If the phases are connected in the sequence L1, L2, L3 to the motor terminals T1, T2, T3, the motor turns clockwise. The direction of rotation can be reversed by interchanging any two phase conductors.
If a particular rotational direction is required, e.g. at the driven shaft of the gear, or the drive is equipped with a back stop, please specify these details in the order.

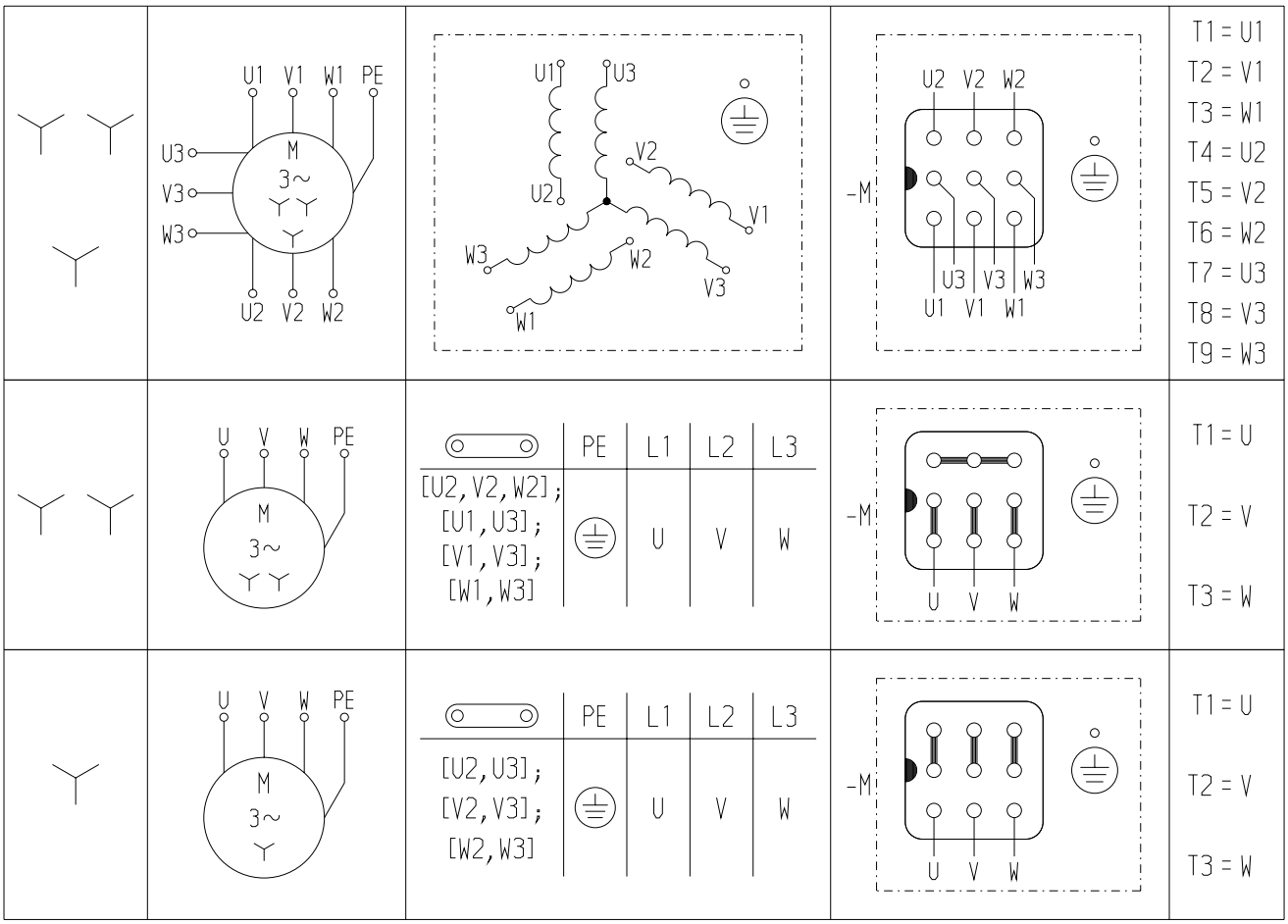
Insulation

The stator windings of the motors are manufactured in thermal class F, temperature rise is calculated to thermal class B.

High-quality enamelled wires, suitable surface insulating materials and the type of impregnation go together to make insulating systems for the motor windings which guarantee high mechanical and electrical strength combined with excellent service ability and a long service life. These insulating systems protect the winding to a large extent against the influence of aggressive substances. They can withstand loads under normal climates according to DIN 50014 and are tropicproof up to a relative air humidity of 92%. In the case of higher air humidity or damp alternating atmospheres according to DIN 50016, which also occur in tropical zones, the special design with increased moisture-proofing or increased tropical protection is required.
In such cases, an additional internal anti-corrosive agent is recommended.

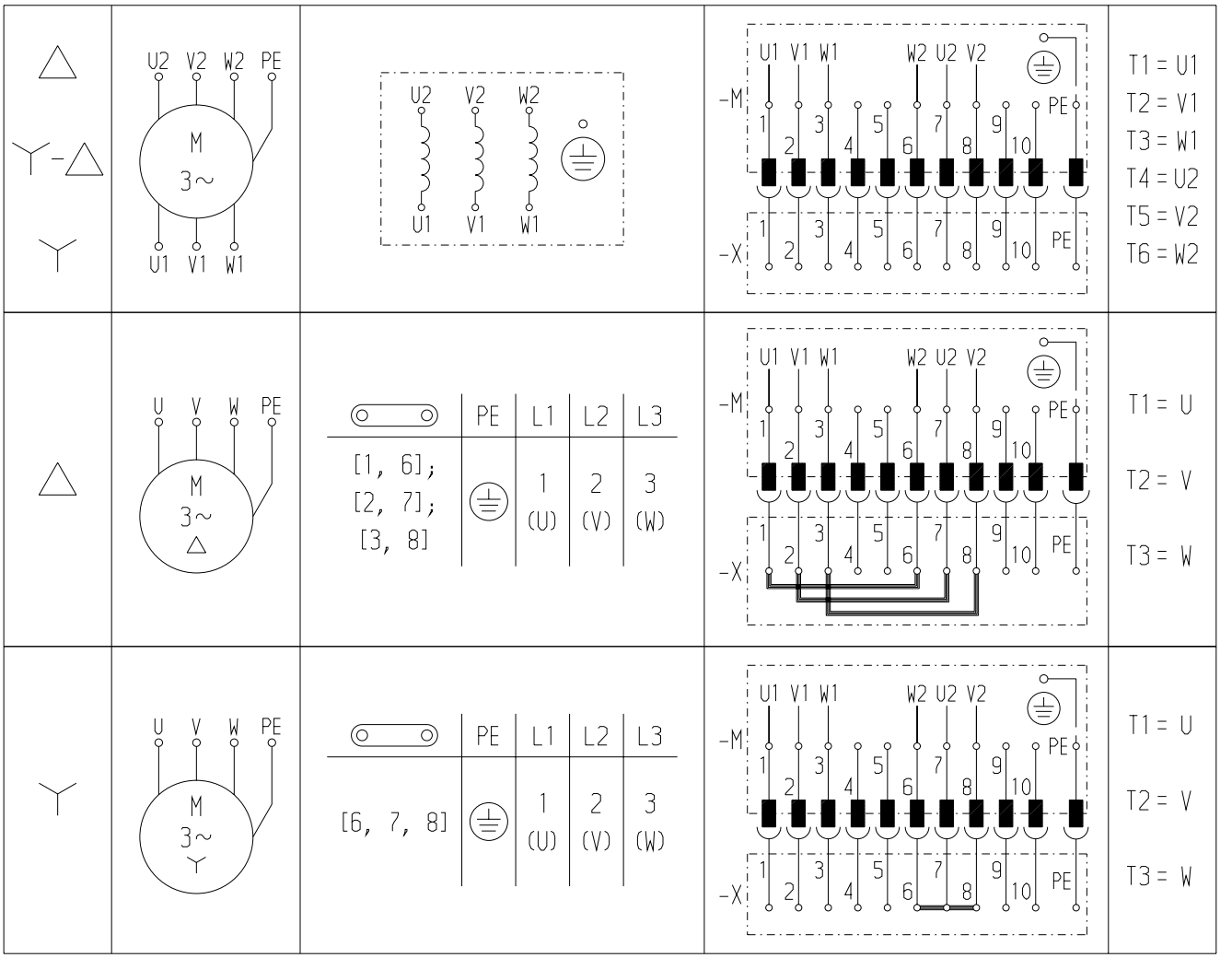
Electrical connection

Motor connection - Example



The motors normally have a terminal board with 6 or 9 terminals and one earth terminal depending on the voltage. The stator winding can be connected for proper operation by repositioning the connecting bridges. For star delta starting, the operating voltage must be specified; the operating circuit of the motor must in this case be the delta circuit.

Motors with plug box
Standard pin definition



Pin definition plans for pole-changeable motors, different connections and additional features on request.

Motor protection

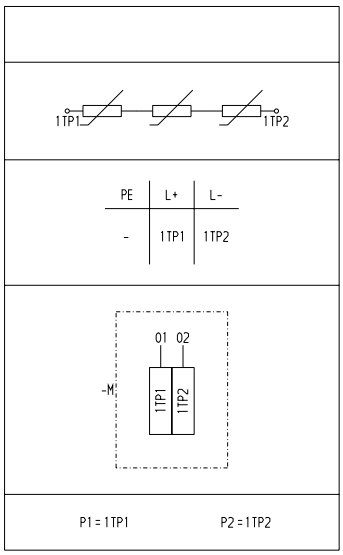
Available as optional extra.

1. Temperature sensors (PTC...)

(For all motors)

Temperature sensors which are embedded in the stator windings change their resistance rapidly upon reaching a preset temperature, activating a control relay.

Connection sample:



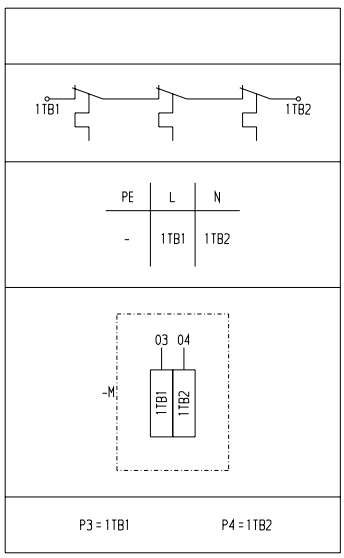
1TP1 (P1) - 1TP2 (P2):
$U_{max.}$ = 2.5 V

2. Winding protection contacts (WT...)

(Motors to M112M)

On reaching a pre-determined temperature thermal contacts open (normally closed). Normally they are connected with the retaining circuit of motor relay.

Connection sample:



1TB1 (P3) - 1TB2 (P4):
$U_{max.}$ = 250 V AC
$I_{max.}$ = 1.6 A

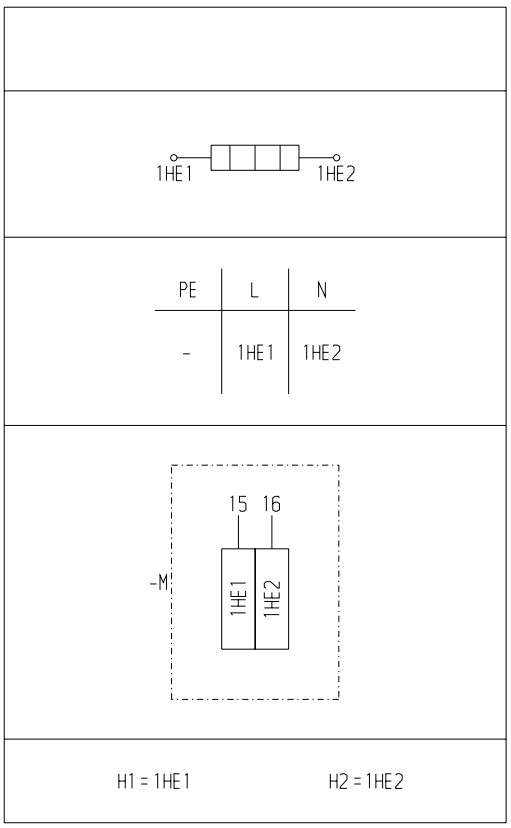
Anti-condensation heating

Available as optional extra.

As protection against condensed water inside the motors, these can be equipped with a space heater, if requested by the customer. The standard supply voltages are shown in the table. Other supply voltages on request. The space heater must never be switched on during operation of the motor.
Alternatively it is possible to keep the stator winding warm by applying a single-phase voltage of about 5-10% of the rated motor voltage to terminals T1 and T2.

Motor	Supply voltage [V]	Filament wattage [W]	[hp]
M71	230	28	0.04
M80	230		
M90S/L	230		
M100L	230		
M112M	230	29	0.04
M132S/M	230		
M160M/L	230	44	0.06
M180M/L	230		
M200L	230		
M225S/M	230	92	0.12
M250M	230	92	0.12
M280S/M	230	92	0.12

Connection sample:



Mechanical data

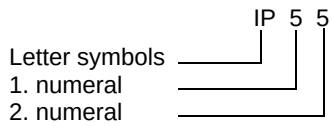
Degrees of motor protection to EN 60034-5**

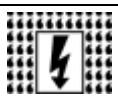
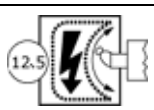
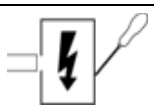
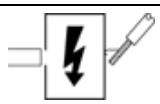
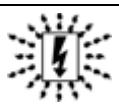
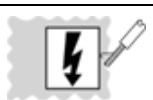
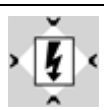
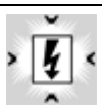
** Refer **only** for the motors.

Degrees of gear protection to EN 60529. The gears are equipped with a breather. This could cause, their degree of protection to be different from that of the motor. If this is of concern, please provide our office with the operating conditions for a new selection.

Standard degree of motor protection is IP55, higher degree of protection upon request.

Example for designation of type of protection:



First Number Protection against solid objects			Second Number Protection against liquid		
IP		Test	IP		Test
0		no protection	0		no protection
1		protected against solid objects up to 50mm (2”), e.g. accidental touch by hands	1		protected against vertically falling drops of water, e.g. condensation water
2		protected against solid objects up to 12mm (0.5”), e.g. fingers	2		protected against direct sprays of water up to 15° from the vertical
3		protected against solid objects over 2.5mm (0.1”) [tools and wires]	3		protected against sprays to 60° from the vertical
4		protected against solid objects over 1mm (0.04”) [tools, small wires]	4		protected against water sprayed from all directions-limited ingress permitted
5		protected against dust-limited ingress (no harmful deposit)	5		protected against low pressure jets of water from all directions-limited ingress permitted
6		totally protected against dust	6		protected against strong jets of water, e.g. for use on ship decks-limited ingress permitted
			7		protected against the effects of immersion between 15cm (6”) and 1m (3.3ft.)
			8		protected against long periods of immersion under pressure

Note: Protection IP65 is no longer common for rotating electrical machines, but it might be applied, according to EN 60529 if an improvement is required.

Cables passage

According to the degree of protection IP56 and IP66, the cable passage from the terminal box to the motors inner space is filled with a PU-sealing compound. Also on request, according to the degree of protecion IP56 and IP65, the cable passage can be casted (extra charge).

Housing

Sturdy design with ribs for surface cooling.
Aluminium pressure die-casting frame to size M200L, grey cast iron from M225S.

Feet

The motor-housings of types M71 to M200, can be equipped with feet on request (extra charge).
These are not provided for foot-mounted gear motors, but can be used as a fixation support for additional elements, e.g. switch boxes, carrying brackets, protection covers, etc.
Dimensions available on request.

Condensation drainage

Condensation develops, if steam cools down under the dew point and strikes down in the housing of the motor. In the deepest place in the housing of the motor the condensation collects itself. On order, a condensation drainage can be inserted.

Degrees of protection	Function of condensation drainage	Fig.
IP 55	Automatic draining of the condensation by drainage plugs.	1
IP 56, IP 66 (IP 65)	Manual draining of the condensation by opening the fastener	2

Fig.1:

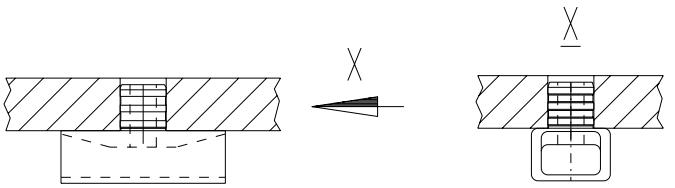
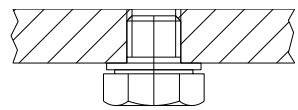


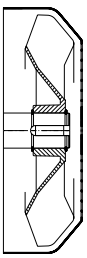
Fig.2:



Internal corrosive protection

On order, the surface in the housing of the motor can be equipped with a internal corrosive protection.
The internal corrosive protection should be used when a condensation drainage is used.

Fans



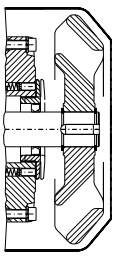
The fans are suitable for both rotational directions.

Cooling type: IC 411 (IEC 60034-6)

Standard materials:

Glass-fibre reinforced plastic
(to 200L and 225S/M / 4-, 6-, 8-pole)

High inertia fans

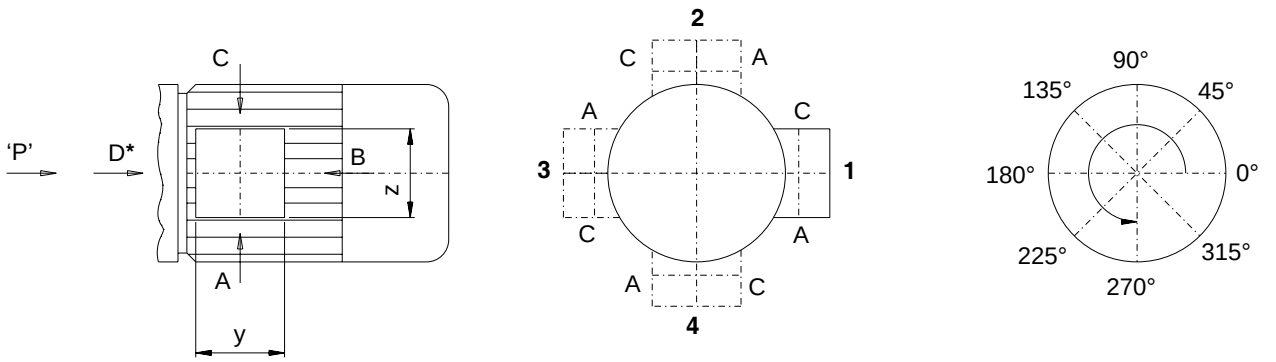


For Motors of size M71 to M132, with or without brake standard cast iron high inertia fans are available on request to serve as an additional moment of inertia.
These fans are finely dynamically balanced (DIN ISO 1940), so that smooth running of the motors is not impaired. Typical applications are in running gear and material handling gear drives, etc. (see also catalogue "EHBN01"), or generally for supporting smooth starting and/or braking.
Please inquire regarding the choice of the correct motor design (Silumin rotor, adapted winding, etc.).

Motor	**Moment of inertia**					
	Rotor (4 pole)		**High inertia fan**			
	J_{rotor}		J_{fan}		m_{fan}	
	[lb-ft^2]	[kgm^2]	[lb-ft^2]	[kgm^2]	[lb]	[kg]
M71B4/C4/S4	0.01804	0.00076	0.04059	0.00171	3.04	1.38
M71M4	0.02350	0.00099				
M71MB4	0.02635	0.00111				
M71MP4	0.03109	0.00131				
M80S4	0.04106	0.00173	0.06622	0.00279	3.86	1.75
M80M4	0.04984	0.00210				
M90S4	0.05981	0.00252	0.12817	0.00540	5.62	2.55
M90L4	0.07880	0.00332				
M90LB4	0.08877	0.00374				
M100L4	0.09992	0.00421	0.27532	0.01160	7.28	3.30
M100LB4	0.11749	0.00495				
M112MB4	0.23213	0.00978	0.54590	0.02300	11.69	5.30
M132SB4	0.52620	0.02217	1.33389	0.05620	20.07	9.10
M132M4	0.68095	0.02869				
M132MB4	0.68095	0.02869				

Terminal box

Location of terminal box



y = Terminal box length for standard design
z = Width of terminal box for standard design

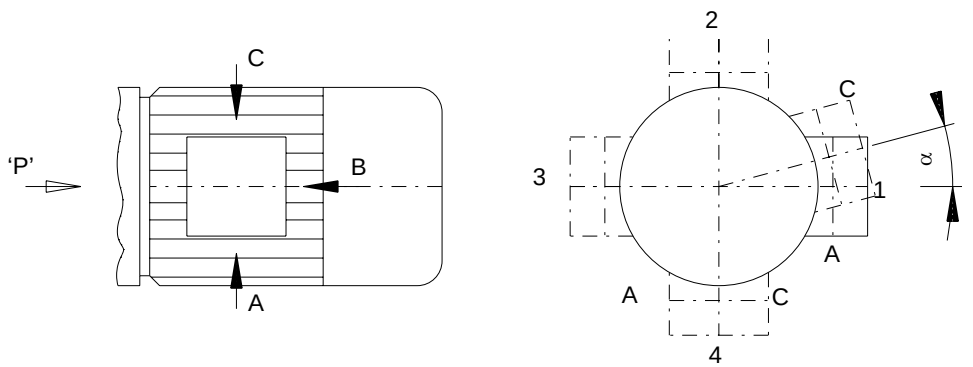
Explanations:

Numerals 1-4 give position of terminal box with view in direction of 'P'.
Letters A, B, C and D denote cable entry for position of terminal box fixed by numerals 1 to 4.
The letter K codes location of terminal box towards the fan side.

*** Note:**

Position 'D' of cable entries is only possible with restrictions in case of large gear units with small motors (collision or bending radii of power supply cables).
For double check please contact FLENDER office.

Location of plug box



Explanations

Numerals 1 to 4 give positions of plug box seen from 'P'. Letters A, B, C denote position of socket at location of plug box fixed by numeral 1 to 4.

Terminal box

Cable inlet can be turned 4 x by 90°.

Material

Motor	Standard for IP55, IP65 (IP56, IP66)
M71, M80, M90S/L, M100L, M112M, M132S/M, M160M/L, M180M/L, M200L	GDAL
M225S/M	GDAL
M250M, M280S/M	GG

GDAL = die cast aluminium alloy
GG = cast iron

Structure

The terminal box consists of a lower part sealed off from the motor housing and a lid sealed off from the lower part.

One-piece terminal boxes or terminal boxes with connecting cables are available on request and specification of the required details.

Threads

The threads can be found in the relevant dimension sheets.

Plug box

The motors M71 to M112M can optionally be equipped at extra cost with **plug box** (SK), i.e. **with integrated connection socket** in the terminal box.

The plug box with standard inset 'Han10E' is in conformity to **DESINA**®.

The associated plugs are industrial standard and available worldwide from all electrical distributors.

For the design of the associated plugs many variations are possible, example:
- Housing design low or high shaped
- Cable exit straight or angular
- Spring terminal-, screw- or crimp-connection technology

We are pleased to provide further information for selection of associated plug on request.

If required associated plug can be supplied by us on specification of the required details.

Furthermore it generally is designed for attachment of the systems **SIEMENS-ecofast** and **Harting-Motorstarter**®.

Technical Datas

	Standard „Han10E“		
Contacts	Number	Voltage $U_{\sim\ max.}$	Current $I_{max.}$
	10 + ⏚	**500V**	**16A**
Degree of protection	**IP65**		
Type of plug housing	**"Han 10 B"** with 1 bracket		
Options	Han-Modular®, e.g: Module C / Empty module / Module E 3/ - /6 + ⏚ ; U = 400 / - /500V 40/ - /16A		

Bearings

Ball bearings are fitted on the drive and nondrive ends (DE, NE) of the motors.

The bearings of the size range M71 to M280 are permanently lubricated. The stock of lubricating grease supplied during installation in the factory generally lasts for several years.

The quality of roller bearing greases today allows permanent lubrication for a bearing service life of at least 22000 operating hours at 1800 rpm under normal operating conditions.
The bearing design is simplified and the motor is virtually maintenance-free. This avoids damage to the bearings due to maintenance errors such as exceeding the lubrication interval or using a different, incompatible grease type.

Grease lifetime at rated speed n_N in operating hours [h]

<table>
<tr><th rowspan="3">Motor</th><th colspan="6">Horizontal operating positions (IM B.)</th><th colspan="6">Vertical operating positions (IM V.)</th></tr>
<tr><th colspan="6">n_N [rpm]</th><th colspan="6">n_N [rpm]</th></tr>
<tr><th>3600</th><th>3000</th><th>1800</th><th>1500</th><th>1200</th><th>≤1000</th><th>3600</th><th>3000</th><th>1800</th><th>1500</th><th>1200</th><th>≤1000</th></tr>
<tr><td>M71</td><td rowspan="3">33000</td><td rowspan="3">33000</td><td rowspan="6">33000</td><td rowspan="6">33000</td><td rowspan="6">33000</td><td rowspan="6">33000</td><td rowspan="3">24000</td><td>33000</td><td rowspan="3">33000</td><td rowspan="3">33000</td><td rowspan="5">33000</td><td rowspan="6">33000</td></tr>
<tr><td>M80</td><td rowspan="2">24000</td></tr>
<tr><td>M90S/L</td></tr>
<tr><td>M100L</td><td rowspan="3">24000</td><td rowspan="2">17000</td><td rowspan="3">33000</td></tr>
<tr><td>M112M</td></tr>
<tr><td>M132S/M</td><td rowspan="4">24000</td><td rowspan="4">12000</td><td rowspan="4">24000</td><td rowspan="4">24000</td></tr>
<tr><td>M160M/L</td><td rowspan="3">17000</td></tr>
<tr><td>M180M/L</td><td>12000</td><td>24000</td></tr>
<tr><td>M200L</td></tr>
<tr><td>M225S/M</td><td colspan="12" rowspan="4">on request</td></tr>
<tr><td>M250M</td></tr>
<tr><td>M280S/M</td></tr>
<tr><td>M315S/M/L</td></tr>
</table>

Greasing of the bearings

The specified life of the grease (bearing service life) is valid for an ambient temperature of 104 °F (40 °C) maximum *.
At an ambient temperature of 77 °F (25 °C), the life of the grease can be doubled.

Lubricants for roller bearings of motors

At ambient temperature* °F (°C)	Name of the lubricant									
	ARAL	bp	Castrol	DEA	Esso	FUCHS	KLÜBER LUBRICATION	Mobil	Shell	SRS
-22 ... +140 (-30 ... +60)	Aralub HL3, HL2	Energrease LS3, LS2	Longtime PD2 TRIBOL 4020/220-2	Glissando 30, 20	Beacon 3	Renolit FWA160, FWA220	Centroplex GLP402	Mobilux 3, 2	Alvania R3, R2	Wiloub LFK2
-22 ... +212 (-30 ... +100)		Energrease HTB2	TRIBOL 4747			Unitemp 2	COSTRAC AK 302	Mobiltemp SHC 100		

Other brands on request.

*** Attention**

In EN 60034-1 following ambient temperatures at power rating are provided for normal operation:

< 0.8 hp (0.6 kW) 32°F ... 104°F (0°C ... 40°C)
≥ 0.8 hp (0.6 kW) 5°F ... 104°F (-15°C ... 40°C)

For higher or lower ambient temperatures please contact our agency.

Second motor shaft extension
Geared motor

The motors can be equipped with a second shaft extension on request (extra charge).
The second shaft extension of motors M71 to M200 is not provided for a permanent transmission of full motor torque or for severe radial forces. For instance it serves for adding on a handwheel, crank, etc. for manual positioning, or installation of a speed control device by the customer, or driving any auxilary appartus, such as coolant pumps, etc..
For exact specification please contact your FLENDER office.

Note:

For Brakemotors or Motors with backstop M71 to M160 a hexagon socket is existing in the shaft end of fan side:

Motor	SW (Inch / mm)
M71 ... M100L	0.24 / *6*
M112M ...M160M/L	0.39 / *10*

SW = key width / size of hexagon socket

Thus in many cases a second shaft extension is super- **fluous**, e.g. for manual positioning.
For more information please contact your FLENDER office.

Brakes

General

Geared motors can optionally be supplied with built-in spring loaded disc brake on motor side.
In spring loaded brake, the braking force is developed mechanically by spring action, so that it can be used (with additional parts) as safety brake for the purpose of complying with accident prevention regulations.
The Brakes are released electrically via d.c. exicitation. For connection with single phase AC mains the brake motors are equipped with rectifier. Please specify supply voltage when ordering.
All spring-loaded brakes can be supplied with **manual release** on request. This allows manual releasing of the brake, e.g. in the event of a power failure, or for positioning.
Due to a generous air gap and a high resistance against wear a long brake service life is ensured, even without resetting feature.

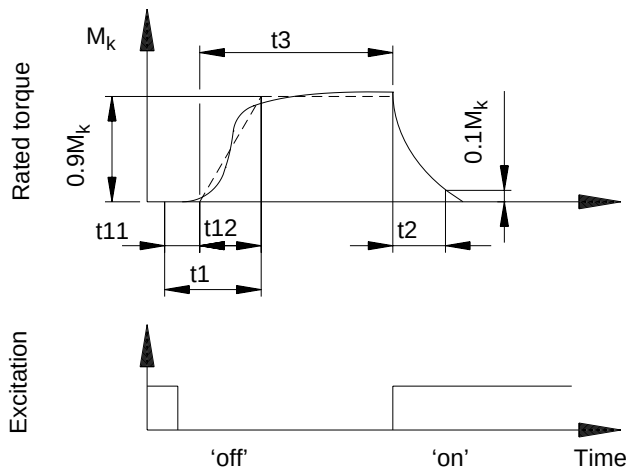
Braking torques refer to a speed of n = 100 rpm

All brake linings are generally **asbestos free**.

The brakes of size L32 can optionally be supplied with microswitch on request.

Definition of operating times (VDI 2241)

Operating times:
t11= Response delay
t12= Torque-rise space-of-time
t1 = Engaging space-of-time
t2 = Disengaging space-of-time
t3 = Sliding time



SEGE and SER switching devices can be integrated to reduce engaging time up to 6 times without any additional relays or leads. Details on request.

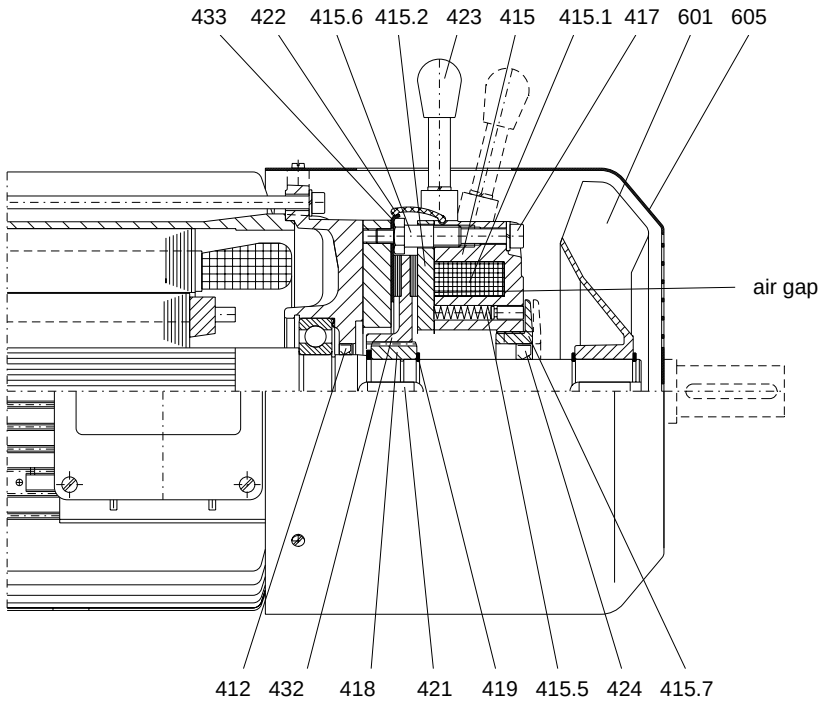
Brake selection

Motor	Spring loaded single disc brakes (DC excitation)												
	Brake types (N=normal, G=encapsulated)	Braking torque											
		Nominal torque		Adjusted braking torques (other special adjustments are available upon request)									
		[lb-in]	[*Nm*]	[lb-in]	[*Nm*]	[lb-in]	[*Nm*]	[lb-in]	[*Nm*]	[lb-in]	[*Nm*]	[lb-in]	[*Nm*]
M71	L4N/G	35.4	*4*	12.4	*1.4*	17.7	*2*	26.6	*3*			44.3	*5*
M71MP	L4N/G	35.4	*4*	12.4	*1.4*	17.7	*2*	26.6	*3*			44.3	*5*
	L8N/G	70.9	*8*	26.6	*3*	35.4	*4*	44.3	*5*	55.8	*6.3*	88.6	*10*
M80	L4N/G	35.4	*4*	12.4	*1.4*	17.7	*2*	26.6	*3*			44.3	*5*
	L8N/G	70.9	*8*	26.6	*3*	35.4	*4*	44.3	*5*	55.8	*6.3*	88.6	*10*
M90S/L	L8N/G	70.9	*8*	26.6	*3*	35.4	*4*	44.3	*5*	55.8	*6.3*	88.6	*10*
	L16N/G	141.7	*16*	70.9	*8*	88.6	*10*	115.1	*13*			177.1	*20*
M100L	L16N/G	141.7	*16*	70.9	*8*	88.6	*10*	115.1	*13*			177.1	*20*
	L32N/G	283.4	*32*	159.4	*18*	203.7	*23*					354.3	*40*
M112M	L32N/G	283.4	*32*	159.4	*18*	203.7	*23*					354.3	*40*
	L60N/G	531.4	*60*	336.6	*38*	442.9	*50*						
M132S/M	L80N/G	708.6	*80*	221.4	*25*	310.0	*35*	442.9	*50*	558.0	*63*	885.7	*100*
	L150N/G	1328.6	*150*	531.4	*60*	708.6	*80*	885.7	*100*	1107.1	*125*		
M160M/L	L150N/G	1328.6	*150*	531.4	*60*	708.6	*80*	885.7	*100*	1107.1	*125*		
	L260N/G	2302.8	*260*	1284.3	*145*	1594.3	*180*	1771.4	*200*	2125.7	*240*		
M180M/L	L260N/G	2302.8	*260*	885.7	*100*	1284.3	*145*	1594.3	*180*	1771.4	*200*	2125.7	*240*
M200L	L260N/G	2302.8	*260*	885.7	*100*	1284.3	*145*	1594.3	*180*	1771.4	*200*	2125.7	*240*
	L400N/G	3542.8	*400*	2347.1	*265*	2657.1	*300*	3188.5	*360*				

For all combinations of brakes with motors listed in the selection row, the kB dimensions apply in the dimension sheets.

Other combinations or other adjusted braking torques are possible on request.

L ... N/G-Brakes



412	Sealing ring	419	Circlip
415	Magnet body	421	Key
415.1	Brake magnet coil	422	Sealing sleeve
415.2	Armature plate	423	Manual release lever
415.5	Brake springs	424	Sealing ring
415.6	Resetting screw	432	Friction disc (rotor)
415.7	Adjusting ring	433	Friction steel plate
417	Fixing screw	601	Fan
418	Hub	605	Fan cowl

Micro-switch (at L32 - L400)

Should air gap monitoring be necessary or required, a microswitch can be used as a special equipment. When the armature plate touches the magnet body, the motor contactor is activated via the micro-switch: the motor cannot start up until the brake is released. When the maximum air gap is reached, the magnet body no longer attracts the armature plate. The motor contactor is not connected, and the motor cannot start. The air gap must be readjusted.

Technical data

Legend / Explanations

T_N = Braking torque, dynamical (n = 100 min^{-1})

W_{1max} = Max. friction work per brake operation

P_N = Perm friction work

W_V = Air gap adjustment required after

S_{LSN} = Nominal air gap

S_{LSM} = Max. air gap

Z_N = Number of possible adjustments

J_{br} = Moment of inertia

m_{br} = Weight of brake

P_{20} = Input power (20°C)

I_{br} = Nominal current an 103V=

t_2 = Release response time of brake

t_{1D} = Engagement time of brake DC and AC switched (Fig.2)

t_{1A} = Engagement time of brake Switched by AC only (Fig.1)

Typ(e)		L4	L8	L16	L32	L60	L80	L150	L260	L400
TN	[lb-in]	35.4	70.8	141.6	283.2	531	708.1	1327.6	2301.2	3540.3
	[Nm]	*4*	*8*	*16*	*32*	*60*	*80*	*150*	*260*	*400*
W1max	[ft-lb]	2.2	5.2	8.9	17.7	22.1	26.6	44.3	59	88.5
	[kJ]	*3*	*7.5*	*12*	*24*	*30*	*36*	*60*	*80*	*120*
$x10^3$	[ft-lb/h]	175	277	354	531	620	717	885	1121	1328
PN	[kJ/h]	*237*	*375*	*480*	*720*	*840*	*972*	*1200*	*1520*	*1800*
$x10^6$	[ft-lb]	27	48	80	157	175	292	451	690	1062
WV	[MJ]	*36*	*64.8*	*108*	*212.4*	*237.6*	*396*	*612*	*936*	*1440*
SLSN	[in]	0.008	0.008	0.008	0.012	0.012	0.012	0.016	0.016	0.020
	[mm]	*0.2*	*0.2*	*0.2*	*0.3*	*0.3*	*0.3*	*0.4*	*0.4*	*0.5*
SLSM	[in]	0.020	0.020	0.020	0.030	0.030	0.030	0.039	0.039	0.049
	[mm]	*0.5*	*0.5*	*0.5*	*0.75*	*0.75*	*0.75*	*1*	*1*	*1.25*
ZN	[-]	6	6	6	3	4	6	4	5	5
$x10^{-2}$	[lb-ft^2]	0.03	0.08	0.47	1.07	1.5	3.56	6.88	17.33	47.46
Jbr	[kgcm^2]	*0.11*	*0.34*	*2*	*4.5*	*6.3*	*15*	*29*	*73*	*200*
mbr	[lb]	2	3.1	5.5	8.8	12.3	18.5	27.8	43	68.3
	[kg]	*0.9*	*1.4*	*2.5*	*4*	*5.6*	*8.4*	*12.6*	*19.5*	*31*
P20	[hp]	0.027	0.034	0.04	0.054	0.067	0.074	0.114	0.134	0.148
	[W]	*20*	*25*	*30*	*40*	*50*	*55*	*85*	*100*	*110*
Ibr	[A]	0.19	0.24	0.29	0.39	0.49	0.53	0.83	0.97	1.07
t2	[ms]	45	57	76	115	210	220	270	340	390
t1D	[ms]	28	31	47	53	42	57	78	165	230
t1A	[ms]	190	245	460	490	580	1200	1080	2100	2400

Adjustment of braking torque:

The motor with brake is supplied with a set braking torque T_N. This can be reduced by unscrewing the adjusting ring using a hook spanner. Per notch of the adjusting ring, the braking torque T_N is reduced by the amounts of following table.

Type		**L4**	**L8**	**L16**	**L32**	**L60**	**L80**	**L150**	**L260**	**L400**
Reduction per notch	[lb-in]	1.8	3.1	7.1	11.5	15.0	14.2	31.9	49.6	54.9
	[*Nm*]	*0.2*	*0.35*	*0.8*	*1.3*	*1.7*	*1.6*	*3.6*	*5.6*	*6.2*
Excess end of adjuster nut o_{max}	[inch]	0.18	0.18	0.30	0.37	0.43	0.39	0.59	0.67	0.77
	[*mm*]	*4.5*	*4.5*	*7.5*	*9.5*	*11*	*10*	*15*	*17*	*19.5*

If required the brake is supplied with a set reduced or increased braking torque T_{rN} as per following table.

The reaction times change to t_{1r} and t_{2r}.

* for 45° angle of twist

Typ(e)		**L4**	**L8**	**L16**	**L32**	**L60**	**L80**	**L150**	**L260**	**L400**
TrN	[lb-in]	12.4	26.6	70.8	159.3	336.3	221.3	531	885	2345
	[*Nm*]	*1,4*	*3*	*8*	*18*	*38*	*25*	*60*	*100*	*265*
	[lb-in]	17.7	35.4	88.5	203.6	442.5	309.8		1283	2655
	[*Nm*]	*2*	*4*	*10*	*23*	*50*	*35*	-	*145*	*300*
	[lb-in]	26.6	44.3	115.1	354		442.5	708.1	1593	3186
	[*Nm*]	*3*	*5*	*13*	*40*	-	*50*	*80*	*180*	*360*
	[lb-in]	35.4	55.8	177			557.6	885	1770	
	[*Nm*]	*4*	*6,3*	*20*	-	-	*63*	*100*	*200*	-
	[lb-in]	44.3	88.5				885	1106	2124	
	[*Nm*]	*5*	*10*	-	-	-	*100*	*125*	*240*	-
t2r [ms]		t2r = TrN/TN x t2								

Voltage

These brakes can be operated on:

1. DC network directly (U-)
2. AC network with rectifier (U1~)
3. AC network between phase and neutral (U1~) with rectifier
4. AC network between 2 phases (U1~) with rectifier

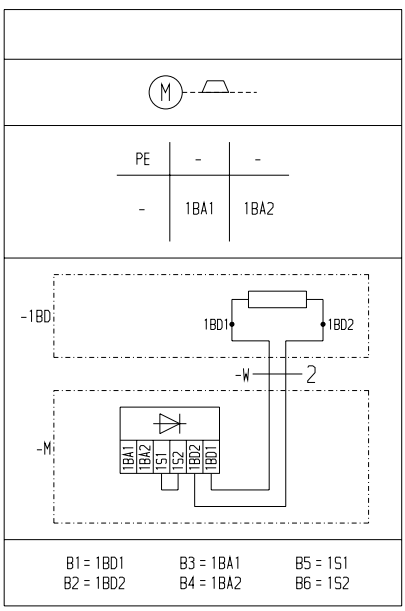
Standard voltages

U-nominal (and range) [V]	**U1**~range [V]	**f** [Hz]	**Type of rectifier or connection by**
24 (± 10%)	-	-	2 terminals
	23 - 29	50 / 60	bridge
	48 - 60		one way
103 (92 - 110)	-	-	2 terminals
	95 - 120	50 / 60	bridge
	190 - 240		one way
180 (170 - 200)	-	-	2 terminals
	190 - 220	50 / 60	bridge
	380 - 440		one way
205 (194 - 218)	-	-	2 terminals
	205 - 240	50 / 60	bridge
	410 - 480		one way

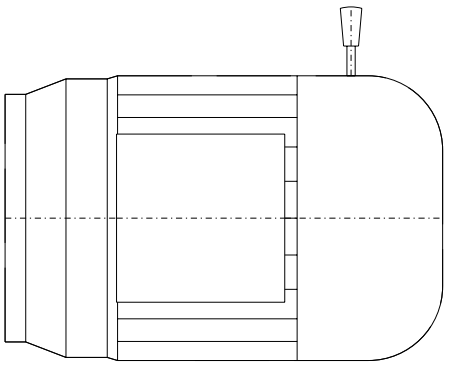
When a choice has to be made between a one way and bridge rectifier, a **one way rectifier** should be preferred.

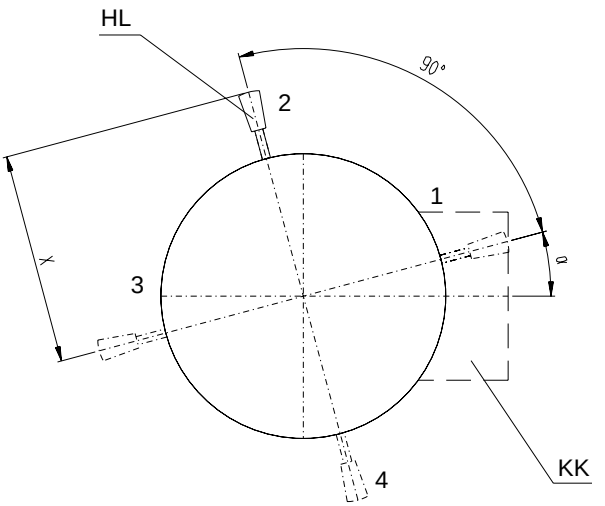
Special voltages

U-: 37 (33-43)V ... 250 (235-270)V
or U1~: 37-48V ... 520-600V
on request (extra charge)



Location of Manual Release of Brakes





HL = manual release

KK = terminal box

Motor	**Standard-Pos.**	α
M71, M80, M90S/L, M100L, M112M, M132S/M, M160M/L, M180M/L, M200L	2	0°

9

Dimension X

Brake		L4	L8	L16	L32	L60	L80	L150	L260	L400
X	[inch]	4.21	4.57	5.20	6.34	7.68	9.45	10.98	12.56	17.52
	[*mm*]	*107*	*116*	*132*	*161*	*195*	*240*	*279*	*319*	*445*

Finding of the correct brake

The braking torque T_{Br} is defined through the following
factors
or: the maximum stopping distance
or: security instructions
(e.g. lifting appliance)

For calculation formulas see "Engineering formulae" in our catalogue- introduction.

If those data do not have to be taken into account:

$T_{Br} \approx 1 \ldots 1.5 \bullet T_{Nmot}$
(T_{Nmot} = Rated torque of motor)

With: W_1 = Friction work / Braking operation
$P = Z \bullet W_1$ Friction power (Z: Operating cycles)

the following conditions have to be realized:

$T_{Br} \leq T_N$

$W1 \leq W_{1max}$

$Px \leq P_N$

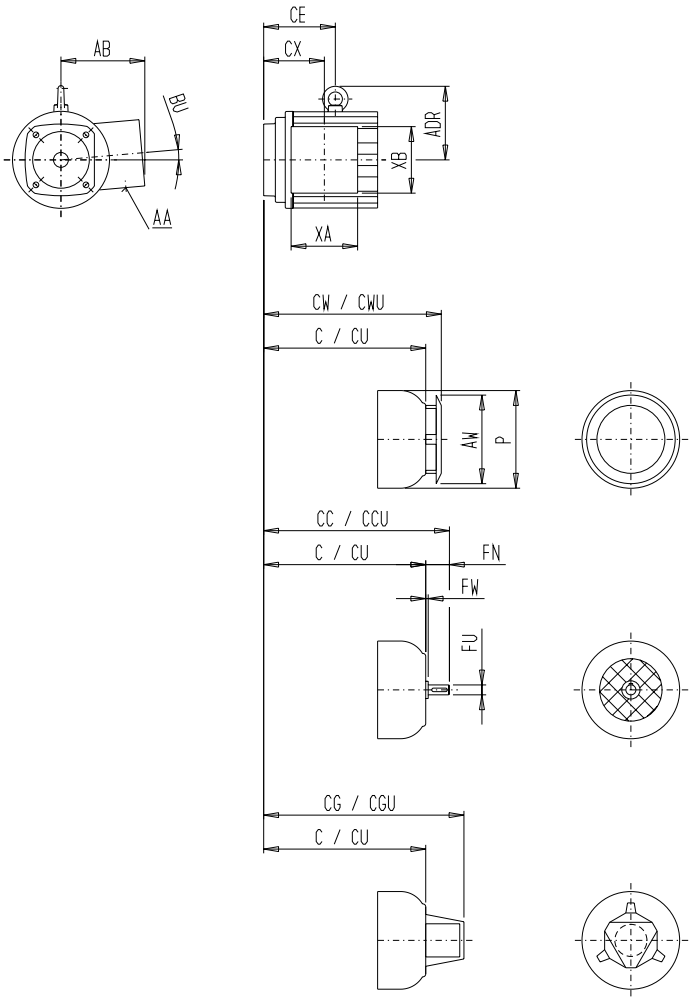
Number of possible operation cycles until readjustment of air gap:

$$S = \frac{W_V}{W_1}$$

T_N, P_N, W_V and W_{1max} as per tables

In any case, you should check after defining the brake size, the stress of the gear during the brake operation.

Dimensions
Standard Motors (without brake)



Dimensions in **inch**
mm

Motor	Gearbox Type						CX	C/CU	CW CWU	CC CCU	CG CGU	P	AB	BU	AA	XA	XB	ADR	AW	FU	FN	FW
	E.	Z.	D.	K.	C.	FZ./FD.																
M71		18	18		28		1.74 *44.25*	7.38 *187.5*	8.41 *213.5*	8.44 *214.5*	10.14 *257.5*											
		28	28	B28		28	2.45 *62.25*	8.09 *205.5*	9.11 *231.5*	8.09 *205.5*	10.85 *275.5*	5.43	4.67			3.70	3.70		5.42	0.43	1.06	0.16
M71MP		18	18				1.74 *44.25*	7.97 *202.5*	9.00 *228.5*	8.02 *203.56*	10.73 *272.5*											
		28	28	B28	28	28	2.45 *62.25*	8.68 *220.5*	9.70 *246.5*	8.68 *220.5*	11.44 *290.5*			0°	2 x 1/2"			-				
M71				B38		38B																
	38	38	38	38/48	38/48	48B	3.38	9.02	10.04	10.08	11.77											
	48	48	48	68	68	68B						*138*	*118.5*			*94*	*94*		*137.76*	*11*	*27*	*4*
	68	68	68	88	88	88B	*85.75*	*229*	255	*256*	*299*											
			88																			
M80		28	28	B28		28	3.48 *88.5*	9.84 *250*	10.87 *276*	10.90 *277*	12.60 *320*											
				B38		38B						6.22	4.98			3.70	3.70		5.42	0.43	1.06	0.16
	38	38	38	38/48	38/48	48B	3.50	9.86	10.86	10.93	12.62											
	48	48	48	68	68	68B								0°	2 x 1/2"			-				
	68	68	68	88	88	88B	*89*	*250.5*	*276.5*	*277.5*	*320.5*	*158*	*126.5*			*94*	*94*		*137.76*	*11*	*27*	*4*
	88	88	88	108		108B																
			108																			
M90S/L		28	28	B28		28	3.62 *92*	11.42 *290*	11.99 *304.5*	13.19 *335*	14.17 *360*	6.93 176	5.91 *150*	0°	2 x 3/4"	4.33 *110*	4.33 *110*	-	6.92 *175.76*	0.75 *19*	1.77 *45*	0.20 *5*

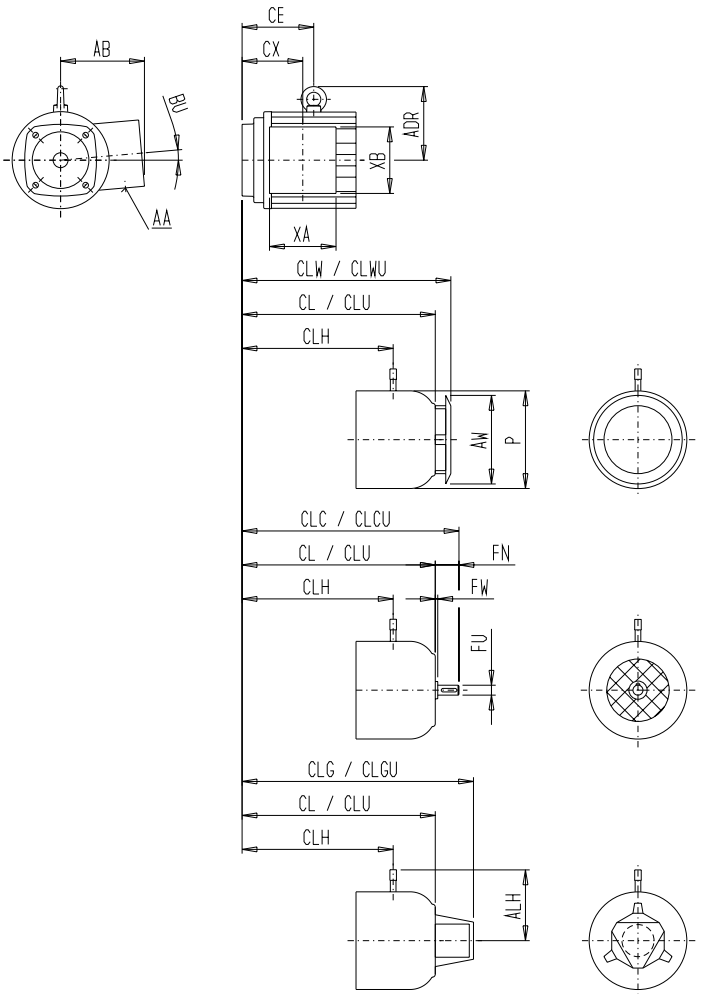
Motor	Gearbox Type						CX	C/CU	CW	CC	CG	P	AB	BU	AA	XA	XB	ADR	AW	FU	FN	FW
	E.	Z.	D.	K.	C.	FZ./FD.			CWU	CCU	CGU											
M90S/L				B38		38B																
	38	38	38	38/48	38/48	48B	3.68	11.47	12.50	11.48	14.23	6.93	5.91			4.33	4.33		6.92	0.75	1.77	0.20
	48	48	48	68	68	68B																
	68	68	68	88	88	88B								0°	2 x 3/4"			-				
	88	88	88	108		108B																
	108	108	108	128		128B	*93.5*	*291.5*	*317.5*	*291.5*	*361.5*	176	*150*			*110*	*1110*		*175.76*	*19*	*45*	*5*
			128																			
M100L		28		B28		28	4.27	13.25	13.82	15.04	16.00											
							108.5	*336.5*	*351*	*382*	*406.5*											
M100L				B38		38B	4.25	13.23	13.80	15.02	15.98	7.64	6.30			4.33	4.33		7.63	0.75	1.79	0.22
							108	*336*	*350.5*	*381.5*	*406*											
M100L	38	38	48	38/48	38/48	48B																
	48	48	68	68	68	68B	4.27	13.25	13.82	15.04	16.00											
	68	68	88	88	88	88B								0°	2 x 3/4"			-				
	88	88	108	108		108B																
	108	108	128	128		128B	*108.5*	*336.5*	*351*	*382*	*406.5*	*194*	*160*			*110*	*110*		*193.8*	*19*	*45.5*	*5.5*
	128	128	148	148		148B																
M112M	38	38		38/48	38/48	48B																
	48	48		68	68	68B	4.27	15.00	15.57	16.81	17.76	8.58	6.59			4.33	4.33	5.57	8.58	0.75	1.81	0.20
	68	68	88	88	88	88B								0°	2 x 3/4“							
	88	88	108	108		108B																
	108	108	128	128		128B	*108.5*	*381*	*395.5*	*427*	*451*	*218*	*167.5*			*110*	*110*	*141.5*	*218*	*19*	*46*	*6*
	128	128	148	148		148B																
M132S/M	48	48		68	68	68B																
	68	68	88	88	88	88B																
	88	88	108	108		108B	4.96	17.17	17.81	19.84	19.92	10.16	7.13		1 x 1"	5.00	5.00	6.38	10.12	1.10	2.68	0.31
	108	108	128	128		128B								0°	1 x 3/4"							
	128	128	148	148		148B	*126*	*436*	*452.5*	*504*	*506*	*258*	*181*			*127*	*127*	*162*	*257*	*28*	*68*	*8*
	148	148	168	168		168B																
		168	188	188		188B																
M160M/L	68	68		88	88	88B																
	88	88		108		108B																
	108	108	108	128		128B	5.19	20.94		23.62	23.70	12.20	7.83		1 x 1“	5.00	5.00	7.32	12.20	1.10	2.68	0.31
	128	128	128	148		148B			*AA*					0°	1 x 3/4"							
	148	148	148	168		168B	*132*	*532*		*600*	*602*	*310*	*199*			*127*	*127*	*186*	*310*	*28*	*68*	*8*
		168	168	188		188B																
		188	188																			
M180M/L	88	88		108		108B																
	108	108		128		128B	5.43	22.24	23.62	27.36	25.00	13.70	9.69		1 x 1/4"	5.79	5.79	8.09	13.58	1.65	5.12	0.79
	128	128	128	148		148B								0°	1 x 3/4"							
	148	148	148	168		168B	*138*	*565*	*600*	*695*	*635*	*348*	*246*			*147*	*147*	*205.5*	*345*	*42*	*130*	*20*
		168	168	188		188B																
		188	188																			
M200L	108	108		128		128B																
	128	128	128	148		148B	6.26	23.23	24.80	27.93	25.98	15.16	10.24		1 x 1/4"	7.19	7.19	8.94	15.04	1.65	4.70	0.77
	148	148	148	168		168B								0°	1 x 3/4“							
		168	168	188		188B	*159*	*590*	*630*	*709.5*	*660*	*385*	*260*			*182.5*	*182.5*	*227*	*382*	*42*	*119.5*	*19.5*
		188	188																			
MI225S	128	128		148		148B		32.95														
								837														
MI225M	148	148	148	168		168B		35.31														
							-	*897*	-	-	-	17.40	12.80	0°	2x1 1/2“*	7.56*	10.24*	-	-	-	-	-
M225S		168	168	188		188B		26.69				*442.00*	*325.00*			*192**	*260**					
								678														
M225M		188	188					29.06														
								738														
MI250M	148	148		168		168B		39.53														
							-	*1004*	-	-	-	19.49	15.43	0°	2x2 1/2“ *	9.29*	11.81*	-	-	-	-	-
M250M		168		188		188B		33.29				*495*	*392*			*236**	*300**					
		188	188					*845.5*														
MI280S	148	148		168		168B																
	168	168		188		188B	-	41.08	-	-	-							-	-	-	-	-
	188	188						*1043.5*				21.85	17.01	0°	2x2 1/2“ *	9.29*	11.81*					
MI280M	148	148		168		168B						*555*	*432*			*236**	*300**					
	168	168		188		188B	-	45.41	-	-	-							-	-	-	-	-
	188	188						*1153.5*														

***** values for motors with changeable voltages on request

AA on request

9

Dimensions
Brake options



Dimensions in **inch**
mm

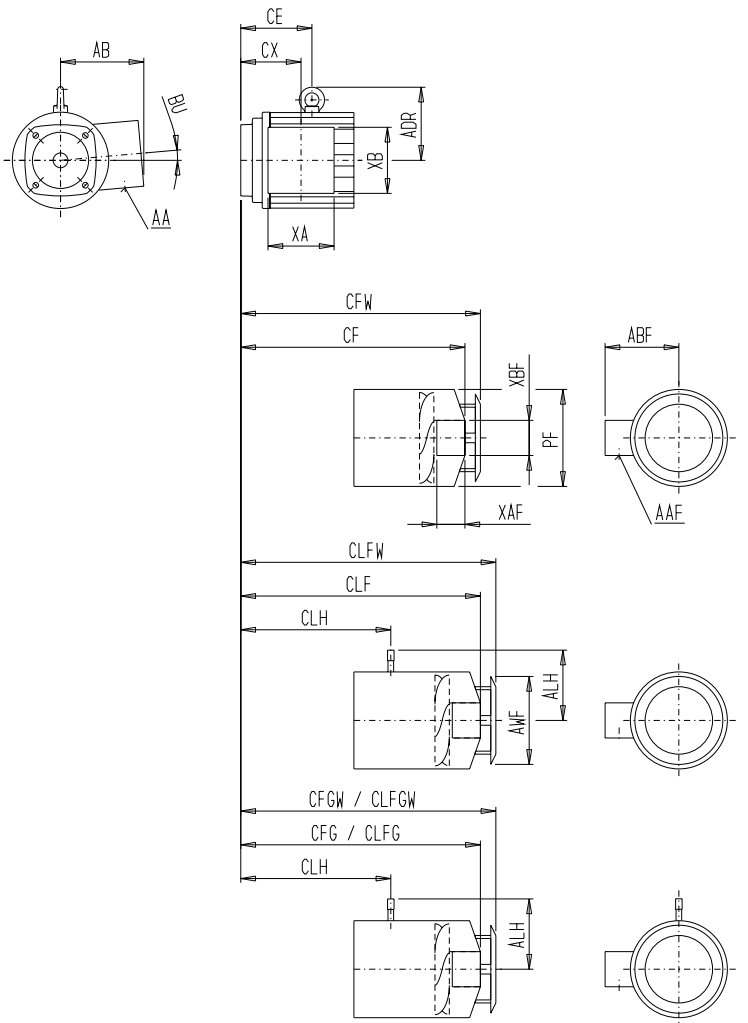
Motor	Gearbox Type						CX	CL	CLW	CLC	CLG	P	AB	BU	AA	XA	XB	ADR	AW	FU	FN	FW	ALH	
	E.	Z.	D.	K.	C.	FZ./FD.		CLU	CLWU	CLCU	CLGU													
M71		18	18		28		1.73	9.11	10.14	10.18	11.87												L4	
							44	*231.5*	*257.5*	*258.5*	*301.5*												4.21 *107*	
		28	28	B28		28	2.44	9.82	10.85	10.89	12.58													
							62	*249.5*	*275.5*	*276.5*	*319.5*	5.43	4.67			3.70	3.70		5.42	0.43	1.06	0.16		
M71MP		18	18				1.74	10.14	11.16	11.20	12.89												L4	L8
							44.25	*257.5*	*283.5*	*284.5*	*327.5*												4.21 *107*	4.57 *116*
		28	28	B28	28	28	2.45	10.85	11.87	11.91	13.60			0°	2 x 1/2"			-					
							62.25	*275.5*	*301.5*	*302.5*	*345.5*													
M71				B38		38B	3.38	10.75	11.77	11.81	13.50	*138*	*118.5*			*94*	*94*		*137.76*	*11*	*27*	*4*	L4	
	38	38	38	38/48	38/48	48B																	4.21	
	48	48	48	68	68	68B																		
	68	68	68	88	88	88B	*85.75*	*273*	*299*	*300*	*343*												*107*	
			88																					

Motor	Gearbox Type						CX	CL	CLW	CLC	CLG	P	AB	BU	AA	XA	XB	ADR	AW	FU	FN	FW	ALH	
	E.	Z.	D.	B./K.	C.	FZ./FD.		CLU	CLWU	CLCU	CLGU													
		28	28	B28		28	3.48	12.01	13.03	13.07	14.76	6.22	4.98			3.70	3.70		5.42	0.43	1.06	0.16	L4	L8
							88.5	*305*	*331*	*332*	*375*													
				B38		38B																		
M80	38	38	38	38/48	38/48	48B	3.50	12.03	13.05	13.09	14.78			0°	2 x 1/2"			-					4.21	4.57
	48	48	48	68	68	68B																		
	68	68	68	88	88	88B																		
	88	88	88	108		108B	*89*	*305.5*	*331.5*	*332.5*	*375.5*	*158*	*126.5*			*94*	94		*137.76*	*11*	*27*	*4*	*107*	*116*
			108																					
M90S/L		28	28	B28		28	3.62	14.02	14.59	14.02	16.77	6.93	5.91			4.33	4.33		6.92	0.75	1.77	0.20	L8	L16
							92	*356*	*370.5*	*356*	*426*													
				B38		38B																		
	38	38	38	38/48	38/48	48B	3.68	14.07	14.65	14.07	16.83			0°	2 x 3/4"			-					4.57	5.20
	48	48	48	68	68	68B																		
M90S/L	68	68	68	88	88	88B																		
	88	88	88	108		108B																		
	108	108	108	128		128B	*93.5*	*357.5*	*372*	*357.5*	*427.5*	*176*	*150*			*110*	*110*		*175.76*	*19*	*45*	*5*	*116*	*132*
			128																					
M100L		28	28	B28		28	4.27	16.08	16.65	17.87	18.84	7.64	6.30			4.33	4.33		7.63	0.75	1.79	0.22	L16	L32
							108.5	*408.5*	*423*	*454*	*478.5*													
M100L				B38		38B	4.25	16.06	16.63	17.75	18.82													
							108	*408*	*422.5*	*453.5*	*478*													
	38	38		38/48	38/48	48B																		
	48	48	48	68	68	68B																		
	68	68	68	88	88	88B	4.27	16.08	16.65	17.87	18.84			0°	2 x 3/4"			-					5.20	6.34
M100L	88	88	88	108		108B																		
	108	108	108	128		128B																		
	128	128	128	148		148B	*108.5*	*408.5*	*423*	*454*	*478.5*	*194*	*160*			*110*	*110*		*193.76*	*19*	*45.5*	*5.5*	*132*	*161*
			148																					
	38	38		38/48	38/48	48B																	L32	L60
	48	48		68	68	68B																		
	68	68		88	88	88B	4.27	18.19	18.76	20.00	20.94	8.58	6.59			4.33	4.33	5.57	8.58	0.75	1.81	0.24		
M112M	88	88	88	108		108B								0°	2 x 3/4"								6.34	7.68
	108	108	108	128		128B																		
	128	128	128	148		148B	*108.5*	*462*	*476.5*	*508*	*532*	*218*	*167.5*			*110*	*110*	*141.5*	*218*	*19*	*46*	*6*	161	*195*
			148																					
	48	48		68	68	68B																	L80	L150
	68	68		88	88	88B																		
	88	88	88	108		108B	4.96	21.10	21.75	23.78	23.86	10.16	7.13			5.00	5.00	6.38	10.12	1.10	2.68	0.31		
M132S/M	108	108	108	128		128B								0°	1 x 1" 1 x 3/4"								9.45	10.98
	128	128	128	148		148B																		
	148	148	148	168		168B	*126*	*536*	*552.5*	*604*	*606*	*258*	*181*			*127*	*127*	*162*	*257*	*28*	*68*	*8*	*240*	*279*
		168	168	188		188B																		
			188																					
	68	68		88	88	88B																	L150	L260
	88	88		108		108B																		
	108	108	108	128		128B	5.20	25.55		28.23	28.31	12.20	7.83			5.00	5.00	7.32	12.20	1.10	2.68	0.31		
M160M/L	128	128	128	148		148B			*AA*					0°	1 x 1" 1 x 3/4"								10.98	12.56
	148	148	148	168		168B																		
		168	168	188		188B	*132*	*649*		*717*	*719*	*310*	*199*			*127*	*127*	*186*	*310*	*28*	*68*	*8*	*279*	*319*
		188	188																					
	88	88		108		108B																		
	108	108		128		128B	5.43	26.89	28.27	32.01	29.65	13.70	9.69			5.79	5.79	8.09	13.58	1.65	5.12	0.79	L260	
M180M/L	128	128	128	148		148B								0°	1 x 1/4" 1 x 3/4"									
	148	148	148	168		168B																	12.56	
		168	168	188		188B	*138*	*683*	*718*	*813*	*753*	*348*	*246*			*147*	*147*	*205.5*	*345*	*42*	*130*	*20*	*319*	
		188	188																					
	108	108		128		128B																	L260	L400
	128	128	128	148		148B	6.26	28.35	29.92	33.44	31.10	15.16	10.24			7.19	7.19	8.94	15.04	1.65	4.70	0.77		
M200L	148	148	148	168		168B								0°	1 x 1/4" 1 x 3/4"								12.56	17.52
		168	168	188		188B	159	720	760	849.5	790	385	260			182.5	182.5	227	382	42	129.5	19.5	*319*	*445*
		188	188																					

AA on request

9

Dimensions
Forced cooling options



Dimensions in **inch**
mm

Motor	Gearbox Type						CX	CF	CFW	CFG CLFG	CFGW CLFGW	CLF	CLFW	P	AB	BU	AA	XA	XB	ADR	ABF	PF	AWF	ALH	
	E.	Z.	D.	K.	C.	FZ./ FD.																			
M71		18	18		28		5.26	10.93	12.38	14.55	16.00	11.79	13.25	5.43	4.67	0°	2 x 1/2"	3.70	3.70	-	7.44	5.55	5.91	L4	
							134.25	*277.5*	*314.5*	*369.5*	*406.5*	*299.5*	*336.5*												
		28	28	B28		28	5.99	11.63	13.09	15.26	16.75	12.50	13.96												
							152.25	*295.5*	*332.5*	*387.5*	*424.5*	*317.5*	*354.5*												
M71MP		18	18				5.26	11.52	12.97	15.14	16.59	12.38	13.84												4.21
							134.25	*292.5*	*329.5*	*384.5*	*421.5*	*314.5*	*351.5*												
		28	28	B28	28	28	5.99	12.22	13.68	15.85	17.30	13.09	14.55												
							152.25	*310.5*	*347.5*	*402.5*	*439.5*	*332.5*	*369.5*												
M71				B38		38B	6.92	12.56	14.02	16.18	17.64	13.42	14.88	*138*	*118.5*			*94*	*94*		*189*	*136*	*150*	*107*	
	38	38	38	38/48	38/48	48B																			
	48	48	48	68	68	68B																			
	68	68	68	88	88	88B	*175.75*	*319*	*356*	*411*	*448*	*341*	*378*												
			88																						
M80		28	28	B28		28	7.19	13.54	15.12	17.35	19.29	14.72	16.30	6.22	4.98	0°	2 x 1/2"	3.70	3.70	-	8.23	6.14	6.69	L4	L8
							182.5	*344*	*384*	*450*	*490*	*374*	*414*												
				B38		38B	7.20	13.56	15.14	17.37	19.31	14.74	16.32											4.21	4.57
	38	38	38	38/48	38/48	48B																			
	48	48	48	68	68	68B																			
	68	68	68	88	88	88B	*183*	*344.5*	*384.5*	*450.5*	*490.5*	*374.5*	*414.5*	*158*	*126.5*			*94*	*94*		*209*	*156*	*170*	*107*	*116*
	88	88	88	108		108B																			
			108																						

Motor	Gearbox Type						CX	CF	CFW	CFG	CFGW	CLF	CLFW	P	AB	BU	AA	XA	XB	ADR	ABF	PF	AWF	ALH	
	E.	Z.	D.	K.	C.	FZ./ FD.				CLFG	CLFGW														
		28	28	B28		28	7.52	15.31	16.50	19.80	20.98	16.85	18.03											L8	L16
							191	*389*	*419*	*503*	*533*	*428*	*458*												
				B38		38B																			
	38	38	38	38/48	38/48	48B																			
M90S/L	48	48	48	68	68	68B	7.54	15.33	16.52	19.82	21.00	16.87	18.05	6.93	5.91	0°	2 x 3/4"	4.33	4.33	-	8.94	6.85	7.4	4.57	5.20
	68	68	68	88	88	88B																			
	88	88	88	108		108B																			
	108	108	108	128		128B	*191.5*	*389.5*	*419.5*	*503.5*	*533.5*	*428.5*	*458.5*	*176*	*150*			*110*	*110*		*227*	*174*	*188*	*116*	*132*
			128																						
M100L		28		B28		28	8.19	17.15	18.25	21.99	23.09	18.64	19.74											L16	L32
							207.5	*435.5*	*463.5*	*558.5*	*586.5*	*473.5*	*501.5*												
M100L				B38		38B	8.15	17.13	18.23	21.97	23.07	18.62	19.72												
							207	*435*	*463*	*558*	*586*	*473*	*501*	7.64	6.30			4.33	4.33		9.65	7.56	8.27		
	38	38		38/48	38/48	48B																		5.20	6.34
	48	48	48	68	68	68B										0°	2 x 3/4"			-					
	68	68	68	88	88	88B	8.19	17.15	18.25	21.99	23.09	18.64	19.74												
M100L	88	88	88	108		108B																			
	108	108	108	128		128B	*207.5*	*435.5*	*463.5*	*558.5*	*586.5*	*473.5*	*501.5*	*194*	*160*			*110*	110		*245*	*192*	*210*	*132*	*161*
	128	128	128	148		148B																			
			148																						
	38	38		38/48	38/48	48B																		L32	L60
	48	48		68	68	68B																			
	68	68		88	88	88B	8.05	18.78	20.08	23.70	25.00	20.35	21.65	8.58	6.59			4.33	4.33	5.57	10.59	8.5	9.8		
M112M	88	88	88	108		108B										0°	2 x 3/4"							6.34	7.68
	108	108	108	128		128B																			
	128	128	128	148		148B	*204.5*	*477*	*510*	*602*	635	*517*	*550*	*218*	*167.5*			*110*	*110*	*141.5*	*269*	*216*	*249*	*161*	*195*
			148																						
	48	48		68	68	68B																		L80	L150
	68	68		88	88	88B																			
	88	88	88	108		108B	9.88	22.09	23.07	27.80	28.78	24.25	25.24	10.16	7.13			5.00	5.00	6.38	12.17	10.04	11.81	9.45	10.98
M132S/M	108	108	108	128		128B										0°	1 x 1" 1 x 3/4"								
	128	128	128	148		148B																			
	148	148	148	168		168B	*251*	*561*	*586*	*706*	*731*	*616*	*641*	*258*	*181*			*127*	*127*	*162*	*309*	*255*	*300*	*240*	*279*
		168	168	188		188B																			
			188																						
	68	68		88	88	88B																		L150	L260
	88	88		108		108B																			
	108	108	108	128		128B	10.98	26.73	27.99	32.83	34.09	29.13	30.39	12.20	7.83			5.00	5.00	7.32	14.21	12.09	13.31	10.98	12.56
M160M/L	128	128	128	148		148B										0°	1 x 1" 1 x 3/4"								
	148	148	148	168		168B																			
		168	168	188		188B	*279*	*679*	*711*	*834*	*866*	*740*	*772*	*310*	*199*			*127*	*127*	*186*	*361*	*307*	*338*	*279*	*319*
		188	188																						
	88	88		108		108B																		L260	
	108	108		128		128B	17.32	34.13	35.39	34.13	35.39	34.13	35.99	13.70	9.69			5.79	5.79	8.09	15.71	13.58	13.31		
M180M/L	128	128	128	148		148B										0°	1 x 1/4" 1 x 3/4"							12.56´	
	148	148	148	168		168B																			
		168	168	188		188B	*440*	*867*	*899*	*867*	*899*	*867*	*899*	*348*	*246*			*147*	*147*	*205.5*	*399*	*345*	*338*	*319*	
		188	188																						
	108	108		128		128B	18.15	35.12	36.38	35.12	36.38	35.12	36.38	15.16	10.24			7.19	7.19	8.94	17.17	15.04	13.31	L260	L400
	128	128	128	148		148B																			
M200L	148	148	148	168		168B										0°	1 x 1/4" 1 x 3/4"							12.56	17.52
		168	168	188		188B	*461*	*892*	*924*	*892*	*924*	*892*	*924*	*385*	*260*			*182.5*	*182.5*	*227*	*436*	*382*	*338*	*319*	*445*
		188	188																						

Electric Motors AM, M
Data

Legend / Explanations

IEC = IEC frame size

P_N = Rated power

n_N = Rated speed

I_N = Rated current

cos φ = Power factor

η = Efficiency
(1/1) at full load
(3/4) at 3/4 -load

EEV = Energy Efficiency Verification

CL = Code Letter

DL = Design Letter

I_A / I_N = relative starting current with direct line on starting

T_A / T_N = relative starting torque with direct line on starting

T_K / T_N = relative breakdown torque with direct line on starting

T_{Hm} / T_N = relative average run-up torque

J_{mot} = Moment of inertia

m_{mot} = Weight

Electric Motors types M
Data

Three phase squirrel cage motor
4 pole

1800 rpm **60 Hz**

Synchronous Speed
230/460 V Y/Y 60 Hz
265/460 V Δ/Y 60 Hz or 460 V 60 Hz
332/575 V Δ/Y 60 Hz or 575 V Y 60 Hz

For frame size 18 and 28 :

IEC	Type	P_N		n_N	I_N (230 V)	I_N (460 V)	I_N (575 V)	cos φ	η (4/4)	Des	Cod	I_A/I_N	T_A/T_N	T_K/T_N	T_{Hm}/T_N	J_{mot}		m_{mot}	
		[HP]	[kW]	[rpm]	[A]	[A]	[A]	[-]	[%]	[-]	[-]	[-]	[-]	[-]	[-]	[lb-ft^2]	[kgm^2]	[lb]	[kg]
63	**M71C4**	**0.25**	**0.19**	1695	1.2	0.60	0.48	0.58	64.2	-	-	3.7	2.4	2.5	2.1	0.01804	0.00076	13.7	6.2
71	**M71S4**	**0.33**	**0.25**	1685	2.08	1.04	0.60	0.64	64.5	-	-	3.7	2.4	2.5	2.1	0.01804	0.00076	13.7	6.2
	M71M4	**0.50**	**0.37**	1685	2.06	1.03	0.82	0.65	69.9			4.2	2.5	2.9	2.7	0.02350	0.00099	15.7	7.1
	M71MB4	**0.75**	**0.56**	1685	2.8	1.4	1.12	0.66	74.4			4.2	2.4	2.7	2.3 -	0.02635	0.00111	16.8	7.6
	M71MP4	**1.0**	**0.75**	1680	3.54	1.77	1.42	0.68	77.6			4.5	2.2	2.6	2.1 -	0.03110	0.00131	19.0	8.6
90S	**M90S4**	**1.5**	**1.12**	1715	5.70	2.85	2.29	0.64	75.5	-	-	5.0	3.0	3.1	2.7	0.05982	0.00252	30.2	13.7
90L	**M90L4**	**2.0**	**1.49**	1715	8.6	4.3	3.40	0.55	80.0			5.1	3.5	3.9	3.1	0.07881	0.00332	34.6	15.7
	M90LB4	**3.0**	**2.24**	1715	9.3	4.65	3.72	0.72	82.2			5.5	2.8	3.3	2.6 -	0.08878	0.00374	38.1	17.3
100L	**M100LB4**	**4.0**	**2.98**	1730	11.2	5.6	4.46	0.79	84.8	-	-	6.0	2.8	3.1	2.5	0.11750	0.00495	52.9	24.0

From frame size 38 :

IEC	Type	P_N		n_N	I_N (230 V)	I_N (460 V)	I_N (575 V)	cos φ	η (4/4)	Des	Cod	I_A/I_N	T_A/T_N	T_K/T_N	T_{Hm}/T_N	J_{mot}		m_{mot}	
		[HP]	[kW]	[rpm]	[A]	[A]	[A]	[-]	[%]	[-]	[-]	[-]	[-]	[-]	[-]	[lb-ft^2]	[kgm^2]	[lb]	[kg]
63	**M71C4**	**0.25**	**0.19**	1695	1.2	0.60	0.48	0.58	64.2	-	-	3.7	2.4	2.5	2.1	0.01804	0.00076	13.7	7.6
71	**M71S4**	**0.33**	**0.25**	1685	2.08	1.04	0.60	0.64	64.5	-	-	3.7	2.4	2.5	2.1	0.01804	0.00076	13.7	7.7
	M71M4	**0.50**	**0.37**	1685	2.06	1.03	0.82	0.65	69.9			4.2	2.5	2.9	2.7	0.02350	0.00099	15.7	8.5
	M71MB4	**0.75**	**0.56**	1685	2.8	1.4	1.12	0.66	74.4			4.2	2.4	2.7	2.3 -	0.02635	0.00111	16.8	9.0
80	**M80S4**	**0.75**	**0.56**	1700	2.72	1.36	1.09	0.70	72.4	-	-	4.3	2.4	2.6	2.4	0.04106	0.00173	23.6	10.7
	M80M4	**1.0**	**0.75**	1700	3.50	1.75	1.41	0.71	74.8			4.5	2.6	2.9	2.5	0.04985	0.00210	26.0	11.8
90S	**M90S4**	**1.5**	**1.12**	1715	5.70	2.85	2.29	0.64	75.5	-	-	5.0	3.0	3.1	2.7	0.05982	0.00252	30.2	15
90L	**M90L4**	**2.0**	**1.49**	1715	8.6	4.3	3.40	0.55	80.0			5.1	3.5	3.9	3.1	0.07881	0.00332	34.6	17
100L	**M100L4**	**3**	**2.24**	1720	8.4	4.2	3.37	0.79	83.5	-	-	5.8	2.8	3.0	2.6	0.09993	0.00421	48.5	22
	M100LB4	**4**	**2.98**	1730	11.2	5.6	4.46	0.79	84.8			6.0	2.8	3.1	2.5	0.11750	0.00495	52.9	24
112M	**M112MB4**	**5.5**	**4.10**	1745	14.6	7.3	5.80	0.80	85.9	-	-	6.6	2.6	3.2	2.0	0.23215	0.00978	72.8	33
132S	**M132SB4**	**7.5**	**5.60**	1745	19.4	9.7	7.80	0.81	87.2	-	-	6.2	2.5	2.9	2.1	0.52624	0.02217	116.9	53
132M	**M132M4**	**10**	**7.46**	1745	22	12.75	10.2	0.82	90.2			6.3	2.5	2.8	2.0	0.68101	0.02869	141.1	64
	M132MB4	**12.3**	**9.18**	1745	31.6	15.8	12.65	0.83	87.2			6.1	2.6	2.9	2.0	0.68101	0.02869	141.1	64
160M	**M160MB4**	**15**	**11.19**	1735	36.0	18.0	14.41	0.85	90.4	-	-	6.2	2.2	2.7	1.9	1.38314	0.05827	200.7	91
160L	**M160L4**	**20**	**14.92**	1735	49.0	24.5	19.63	0.84	90.8			5.9	2.2	2.9	1.9	1.71071	0.07207	231.5	105
M180M	**M180MB4E**	**25**	**18.65**	1730	60.6	30.3	24.2	0.84	90.9	-	-	6.0	2.2	2.3	2.0	2.66326	0.11220	275.6	125
M180L	**M180LB4E**	**30**	**22.38**	1745	72.0	36.0	28.8	0.83	92.4			5.8	2.1	2.4	1,9	3.03189	0.12773	291.1	132
M200L	**M200LB4E**	**40**	**29.84**	1770	91.5	45.75	36.6	0.87	94.2	-	-	6.3	2.0	2.8	1.7	5.94249	0.25035	399.1	181
225S	**M225S4E**	**50**	**37.30**	1785	120	60	48	0.84	93.6	A	L	7.5	3.1	3.4	AA	8.45028	0.356	639.5	290
225M	**M225M4E**	**60**	**44.76**	1785	140	70	56	0.85	94.1	A	L	7.9	3.3	3.5	AA	10.94264	0.461	727.7	330
250M	**M250M4E**	**75**	**55.95**	1790	172	86	69	0.86	94.5	A	L	8.2	2.9	3.4	AA	16.06977	0.677	882.0	400
280S	**M280S4E**	**100**	**74.60**	1788	228	114	91	0.86	95.0	A	L	7.6	2.9	3.2	AA	25.16094	1.060	1168.7	530
280M	**M280M4E**	**125**	**93.25**	1790	288	144	115	0.86	95.0	A	K	8.2	3.0	3.4	AA	29.90829	1.260	1245.8	565