

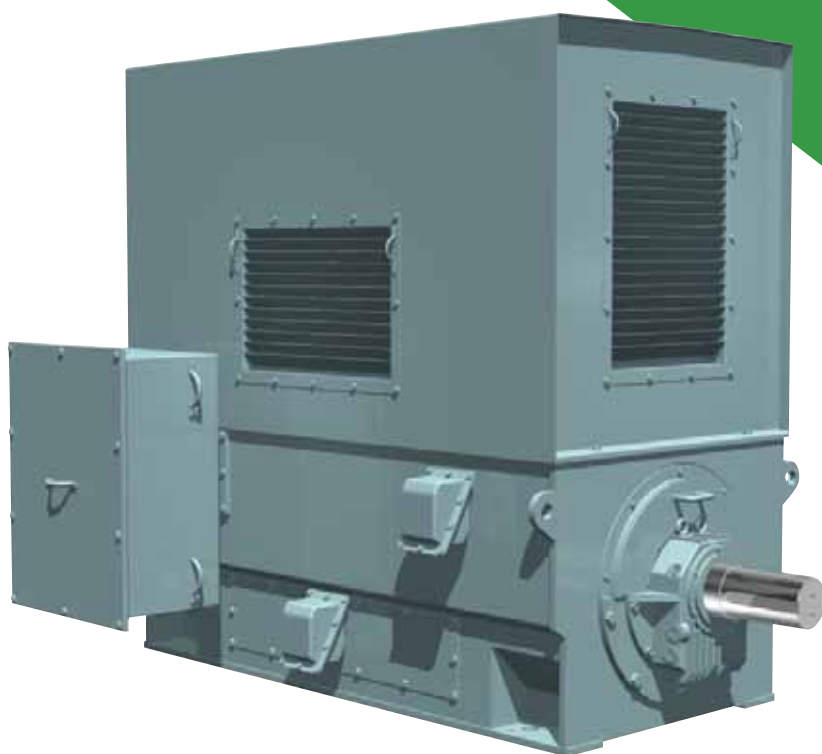


Medium Voltage Induction Motors

# 21-L Series

**New High Efficiency Design  
for High Capacity Applications**

*450 kW – 18,500 kW  
(600 HP – 25,000 HP)*



**21-L series: Combining over 100 years of experience with innovative new technology makes the 21-L series the right choice for the demanding needs of today's industry.**

## **Superior Electrical Performance, Unsurpassed Reliability**

The 21-L series three-phase high-voltage motors are at the leading edge of motor technology.

- Designs up to 18,500 kW (25,000 hp)
- From 2 pole up to 24 pole designs
- 2,300 – 13,800 Volts, 50 or 60 Hz
- Wide variety of enclosures
- Rugged, high quality fabricated steel construction
- Frame sizes from 450 mm ~ 900 mm shaft height
- Designed to be able to meet worldwide standards (NEMA, IEC, BS, AS and others)

## **Features/Benefits:**

### **Excellent Electrical Performance**

- Higher efficiency than any previous design
- High power factor
- Superior starting characteristics

### **Enclosure Options**

- ODP, WP1, WP2/IP24
- TEAAC, TEWAC, TESV/PIPE/IP55

### **New Compact Design derived Through**

- Extensive electrical magnetic field analysis
- Heat transfer analysis
- Improved ventilation

### **Lower Noise & Less Vibration**

- Advanced techniques in core/frame construction

### **Advanced VPI Insulation System**

- Compatible with VFD voltage supplies and effects of surge voltages

### **Excellent In-Service Availability**

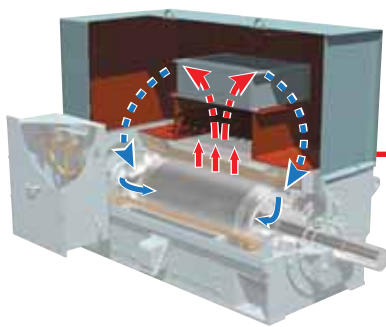
- Low operating and maintenance costs
- High reliability
- Oil-lubricated sleeve bearings or anti-friction bearings
- Extended re-greasing intervals

### **Designs for all Applications and Industries**

### **Compatible with Variable Frequency Drive Applications**

### **Fabricated Copper Bar Rotor Construction**

# 21-L Series Motor Enclosures



## Totally-Enclosed Air-Water-Cooled Type TEWAC/IP55

This type of motor is especially useful in a location where low noise operation is required or where it is desired to remove heat from the area where the motor is located.

The motor includes an air-to-water heat exchanger in the air housing above the motor.

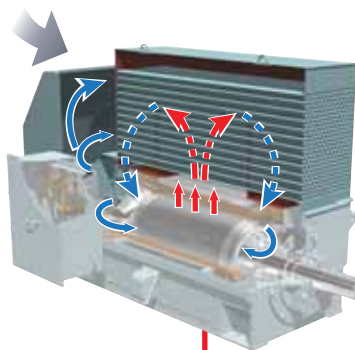
A drain in the air housing protects the motor from damage should any water leakage ever occur.

**Output:** 50 Hz 450 ~ 16,500 kW (600 ~ 22,000 HP)  
60 Hz 450 ~ 18,500 KW (600 ~ 25,000 HP)

**Voltages:** 2,300 V ~ 13,800 V

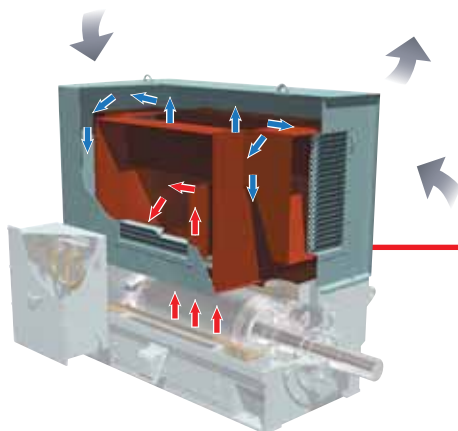
**Insulation Class:** F Class, with B design temperature rise

**Standards:** IEC, NEMA, BS, AS and others available



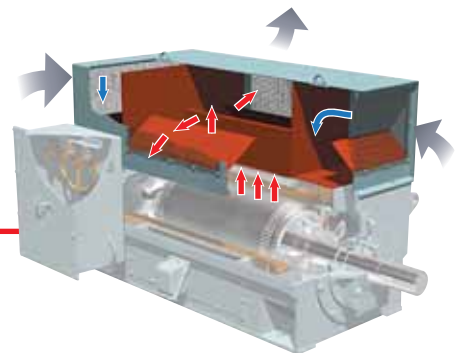
## Totally-Enclosed Air-Air Cooled Type TEAAC/IP55

In an environment containing corrosive or harmful gas, a totally-enclosed fan-cooled motor can be applied. An external fan mounted on the opposite drive end shaft directs fresh air through the pipes in the air housing above the motor. The pipes serve as a heat exchanger in which outside fresh air passing through cools the hot air inside.



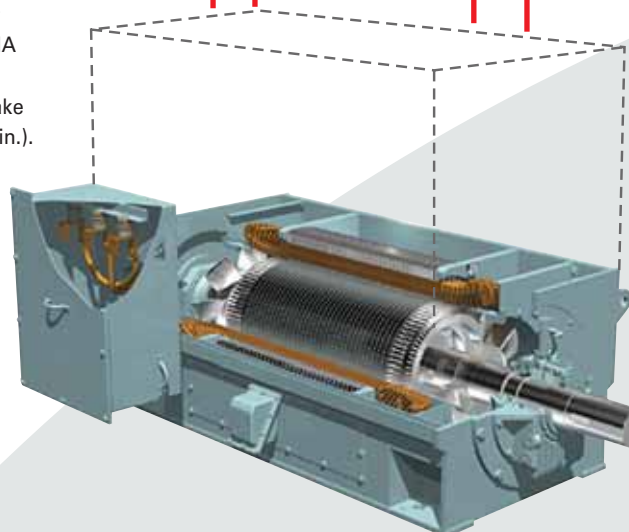
## NEMA Weather-Protected WP/II/IP24

This motor is designed for outdoor operation. In accordance with NEMA WP/II, the housing air path includes right-angled turns, dropping air intake air velocity below 3 m/sec (600 ft/min.). This traps water, dust, and foreign materials. A section is provided that allows air to pass through without being forced into the motor.



## Open Drip Proof Type ODP/IP22

A drip-proof type motor is a common choice for a protected, well-ventilated room. Cooling air intake and hot air exhaust windows are located at the top of the hood. Openings are covered by screens and enclosure is constructed to prevent intrusion of water drips and other foreign materials into the motor meeting NEMA WP-I requirements.



## Common Foundation Base

IC01, IC61 and IC81W cooling per IEC Standard construction are available by changing the top-mounted air housing.

The main terminal box can be rotated through 90° angles, and is large enough for easy cable connection.

A shaft current protection insulator in the non-drive end bearing on 450 frame and larger, and all sleeve bearing machines, is included as standard.

# Features of 21-L Series Motors

## Reliability & Easy Operation/Maintenance

### Main Terminal Box

NEMA Type II terminal box is standard. Boxes including surge protection and/or differential CT's are readily available.

Standard main terminal box can be rotated every 90°. Adequate space is allowed below main terminal box for cable connection.

### Stator Core

Stators use high grade electrical steel with low magnetic losses.

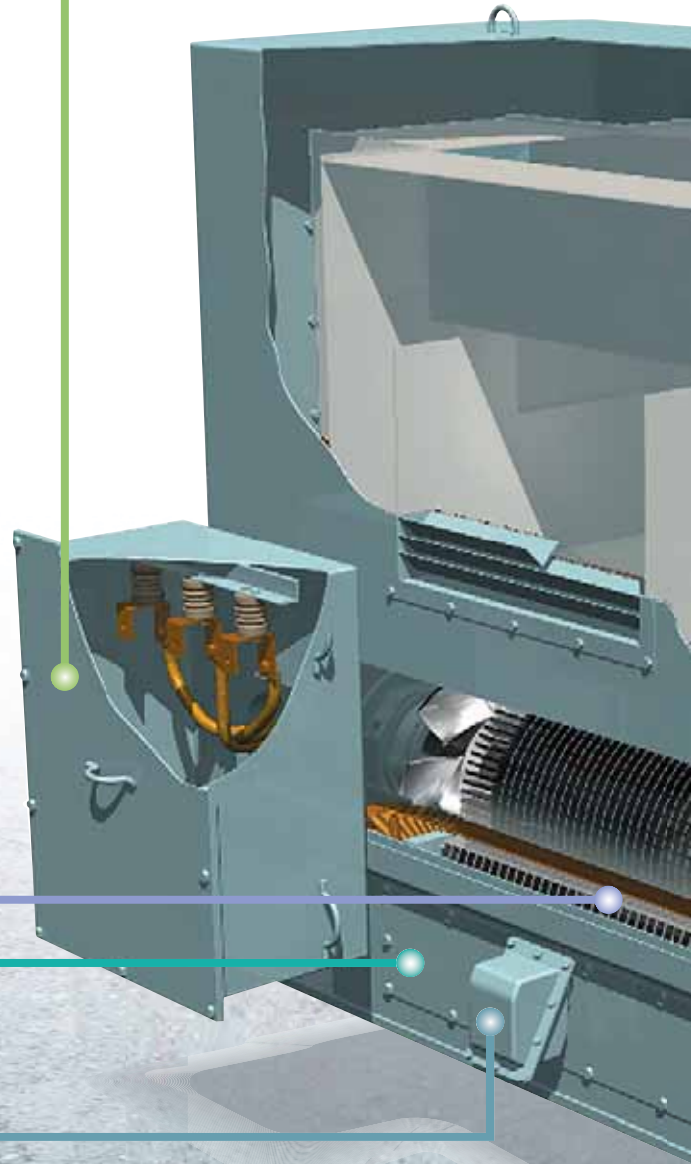
Stator assembly is easily removed from the stator frame if ever necessary.

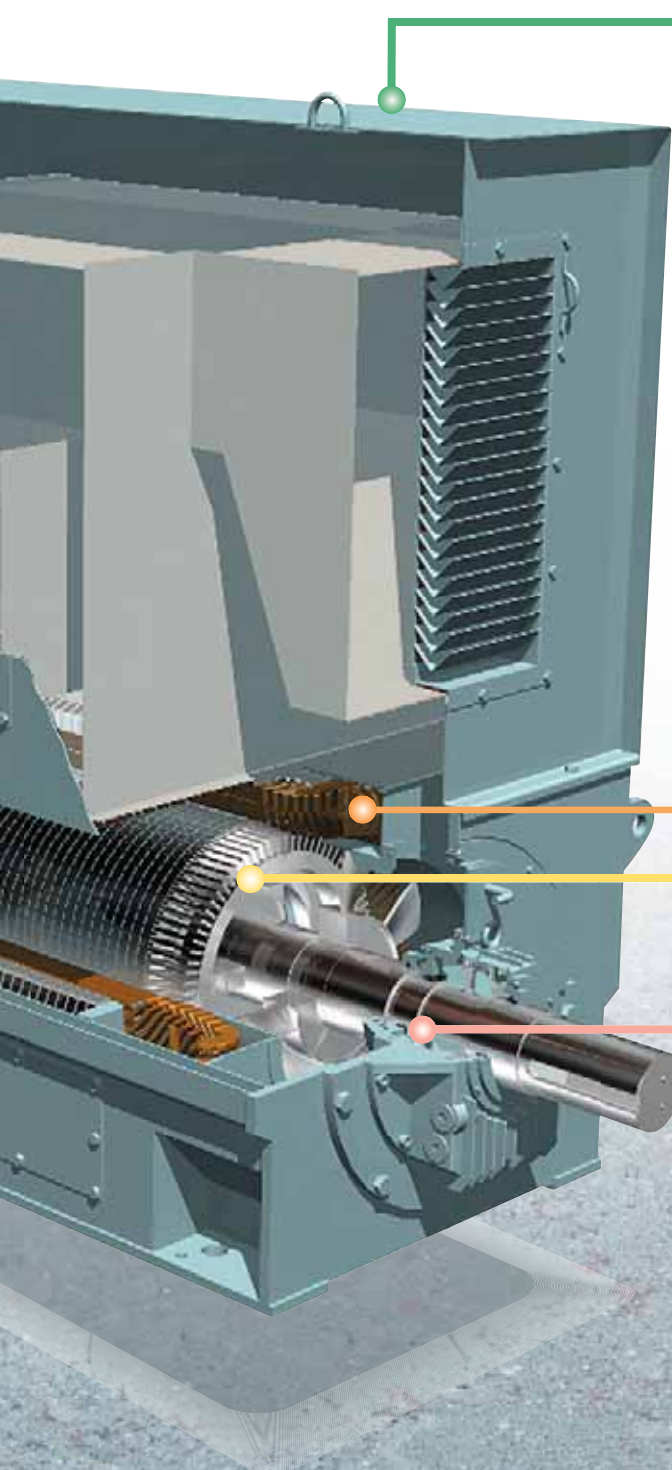
### Frame

Increased rigidity of stator frame and lower vibration are achieved through frequency analysis.

### Auxiliary Terminal Box

Modular arrangement for accessory connections allows flexibility with standardized mechanical construction.





## Air Housing

NEMA Open Drip Proof (IP22) construction provides protection from dripping liquids and foreign materials.

NEMA WPII (IP24) top hood construction prevents intrusion of rain water and foreign matter.

IP55 protection is standard on TEAAC (air-cooled) and TEWAC (water-cooled) motors, and isolates the motor interior from environmental contamination.

## Stator Coil

Utilizes a highly reliable, vacuum pressurized impregnation (VPI) insulation system providing firmly-fixed coil ends and the ability to withstand most environments.

Bracing ensures long life despite the stresses imposed by starting and duty cycles.

## Rotor

Copper rotor bars are standard. They are shaped to provide excellent torque characteristics and mechanical strength.

Bars are fixed firmly in the slots by continuous swaging of each rotor bar.

## Bearing

Antifriction and sleeve bearings are easily maintainable.

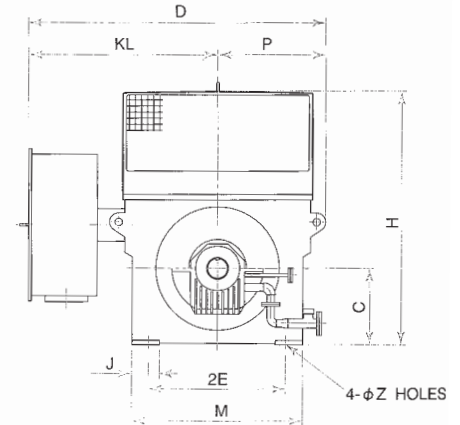
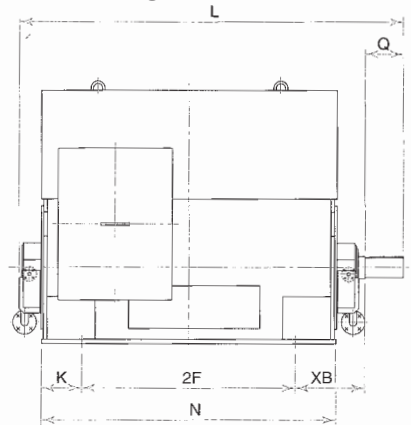
Antifriction (ball, roller) bearings use a refined lubrication design that makes regreasing simple.

# Open Drip Proof Induction Motor ODP/IP22

Forced feed lubricated sleeve bearings

Four Pole, 6.6 kV, 60 Hz

- Example outlines for 4 pole machine specifications shown below.
- 2 pole to 24 pole designs available



\* Example, not for construction

| Frame    | Poles | Dimensions (mm) |      |      |      |      |     |     |      |      |      |     |    |
|----------|-------|-----------------|------|------|------|------|-----|-----|------|------|------|-----|----|
|          |       | C               | D    | 2E   | 2F   | H    | J   | K   | L    | M    | N    | P   | Z  |
| 450-1400 | 4     | 450             | 1830 | 800  | 1400 | 1505 | 160 | 265 | 2550 | 1000 | 1930 | 650 | 48 |
| 450-1600 | 4     | 450             | 1830 | 800  | 1600 | 1505 | 160 | 265 | 2750 | 1000 | 2130 | 650 | 48 |
| 500-1600 | 4     | 500             | 1950 | 900  | 1600 | 1675 | 180 | 265 | 2800 | 1120 | 2130 | 710 | 56 |
| 500-1800 | 4     | 500             | 1950 | 900  | 1800 | 1675 | 180 | 265 | 3030 | 1120 | 2330 | 710 | 56 |
| 560-1800 | 4     | 560             | 2115 | 1000 | 1800 | 1880 | 225 | 265 | 3120 | 1260 | 2330 | 805 | 66 |
| 560-2000 | 4     | 560             | 2115 | 1000 | 2000 | 1880 | 225 | 265 | 3320 | 1260 | 2530 | 805 | 66 |
| 630-2000 | 4     | 630             | 2275 | 1120 | 2000 | 2115 | 250 | 265 | 3320 | 1420 | 2530 | 885 | 66 |
| 630-2240 | 4     | 630             | 2275 | 1120 | 2240 | 2115 | 250 | 265 | 3757 | 1420 | 2770 | 885 | 66 |

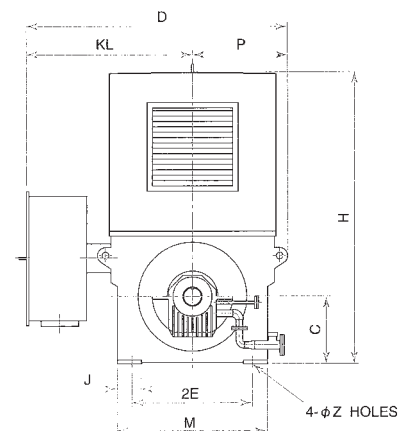
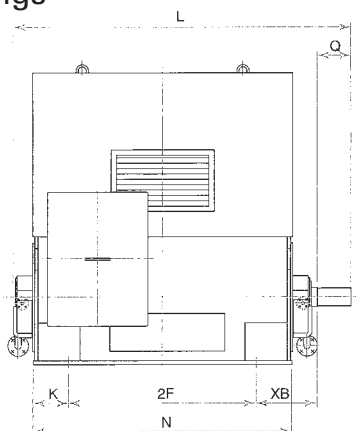
| Power (kW) | Frame    | Weight (kg) | Speed (rpm) | Current   |              | Torque       |          | Efficiency (%) |       |       | Power Factor (%) |       |       | Safe Stall Time (SEC) |      |
|------------|----------|-------------|-------------|-----------|--------------|--------------|----------|----------------|-------|-------|------------------|-------|-------|-----------------------|------|
|            |          |             |             | (A) Rated | (%) Starting | (%) Starting | (%) Max. | F.L.           | 3/4 L | 1/2 L | F.L.             | 3/4 L | 1/2 L | Hot                   | Cold |
| 1800       | 450-1400 | 4500        | 1775        | 185       | 500          | 60           | 190      | 96.6           | 96.4  | 95.6  | 88.3             | 87.5  | 84.0  | 12                    | 15   |
| 2000       | 450-1400 | 4700        | 1775        | 205       | 500          | 60           | 190      | 96.7           | 96.5  | 95.8  | 88.4             | 87.7  | 84.5  | 12                    | 15   |
| 2250       | 450-1400 | 4700        | 1775        | 230       | 500          | 60           | 190      | 96.8           | 96.6  | 95.9  | 88.5             | 87.9  | 84.8  | 12                    | 15   |
| 2500       | 450-1400 | 4900        | 1775        | 255       | 500          | 60           | 190      | 96.9           | 96.8  | 96.1  | 88.5             | 88.1  | 85.0  | 12                    | 15   |
| 2800       | 450-1400 | 5100        | 1775        | 285       | 550          | 60           | 190      | 97.1           | 96.9  | 96.3  | 88.6             | 88.2  | 85.1  | 12                    | 15   |
| 3150       | 450-1600 | 5900        | 1775        | 320       | 600          | 60           | 220      | 97.2           | 97.1  | 96.5  | 88.8             | 88.3  | 85.6  | 12                    | 15   |
| 3550       | 450-1600 | 5900        | 1775        | 360       | 600          | 60           | 200      | 97.3           | 97.2  | 96.6  | 88.9             | 88.3  | 86.2  | 12                    | 15   |
| 4000       | 500-1800 | 6800        | 1775        | 405       | 500          | 60           | 160      | 97.3           | 97.2  | 96.7  | 89.9             | 88.7  | 86.9  | 12                    | 15   |
| 4500       | 500-1800 | 7300        | 1775        | 452       | 500          | 60           | 170      | 97.5           | 97.3  | 96.7  | 89.4             | 88.9  | 87.5  | 12                    | 15   |
| 5000       | 500-1800 | 7700        | 1780        | 502       | 500          | 60           | 170      | 97.6           | 97.4  | 96.8  | 89.4             | 89.0  | 87.7  | 12                    | 15   |
| 5600       | 500-1800 | 8000        | 1780        | 560       | 500          | 60           | 170      | 97.7           | 97.5  | 96.8  | 89.6             | 89.0  | 87.8  | 12                    | 15   |
| 6000       | 500-1800 | 8200        | 1780        | 299       | 500          | 60           | 170      | 97.6           | 97.5  | 96.9  | 89.8             | 89.3  | 87.9  | 12                    | 15   |
| 6300       | 560-1800 | 9500        | 1780        | 629       | 500          | 60           | 180      | 97.7           | 97.5  | 96.8  | 89.8             | 89.4  | 88.2  | 10                    | 15   |
| 6500       | 560-1800 | 9500        | 1780        | 648       | 450          | 60           | 170      | 97.7           | 97.5  | 96.9  | 89.9             | 89.4  | 88.4  | 10                    | 15   |
| 7100       | 560-2000 | 9800        | 1780        | 708       | 450          | 60           | 170      | 97.7           | 97.5  | 96.9  | 89.9             | 89.4  | 88.5  | 10                    | 15   |
| 7500       | 560-2000 | 10300       | 1780        | 747       | 450          | 60           | 170      | 97.7           | 97.5  | 96.9  | 89.9             | 89.4  | 88.5  | 10                    | 15   |
| 8000       | 560-2000 | 10700       | 1780        | 797       | 500          | 60           | 180      | 97.8           | 97.6  | 96.9  | 89.8             | 89.4  | 88.6  | 10                    | 15   |
| 8500       | 560-2000 | 11000       | 1780        | 847       | 500          | 60           | 180      | 97.7           | 97.6  | 96.9  | 89.8             | 89.5  | 88.6  | 10                    | 15   |
| 9000       | 630-2000 | 12400       | 1780        | 897       | 500          | 60           | 170      | 97.7           | 97.6  | 96.9  | 89.8             | 89.4  | 88.6  | 10                    | 15   |
| 9500       | 630-2000 | 12400       | 1780        | 948       | 500          | 60           | 170      | 97.7           | 97.6  | 97.0  | 89.8             | 89.5  | 88.7  | 10                    | 15   |
| 10000      | 630-2000 | 12800       | 1780        | 997       | 500          | 60           | 170      | 97.8           | 97.6  | 97.1  | 89.8             | 89.6  | 88.6  | 10                    | 15   |
| 10500      | 630-2000 | 12800       | 1780        | 1046      | 500          | 60           | 170      | 97.8           | 97.7  | 97.1  | 89.8             | 89.7  | 88.8  | 10                    | 15   |
| 11000      | 630-2240 | 14600       | 1780        | 1094      | 550          | 60           | 170      | 97.9           | 97.7  | 97.1  | 89.9             | 89.8  | 88.9  | 10                    | 15   |
| 11500      | 630-2240 | 14600       | 1780        | 1143      | 550          | 60           | 170      | 97.9           | 97.7  | 97.1  | 90.0             | 89.9  | 89.0  | 10                    | 15   |

# Outdoor Induction Motor WP/II/IP24

Forced feed lubricated sleeve bearings

Four Pole, 6.6 kV, 60 Hz

- Example outlines for 4 pole machine specifications shown below.
- 2 pole to 24 pole designs available



\* Example, not for construction

| Frame    | Poles | Dimensions (mm) |      |      |      |      |     |     |      |      |      |     |    |
|----------|-------|-----------------|------|------|------|------|-----|-----|------|------|------|-----|----|
|          |       | C               | D    | 2E   | 2F   | H    | J   | K   | L    | M    | N    | P   | Z  |
| 450-1400 | 4     | 450             | 1830 | 800  | 1400 | 2135 | 160 | 265 | 2550 | 1000 | 1930 | 650 | 48 |
| 450-1600 | 4     | 450             | 1830 | 800  | 1600 | 2135 | 160 | 265 | 2750 | 1000 | 2130 | 650 | 48 |
| 500-1600 | 4     | 500             | 1950 | 900  | 1600 | 2375 | 180 | 265 | 2800 | 1120 | 2130 | 710 | 56 |
| 500-1800 | 4     | 500             | 1950 | 900  | 1800 | 2375 | 180 | 265 | 3030 | 1120 | 2330 | 710 | 56 |
| 560-1800 | 4     | 560             | 2115 | 1000 | 1800 | 2665 | 225 | 265 | 3120 | 1260 | 2330 | 805 | 66 |
| 560-2000 | 4     | 560             | 2115 | 1000 | 2000 | 2665 | 225 | 265 | 3320 | 1260 | 2530 | 805 | 66 |
| 630-2000 | 4     | 630             | 2275 | 1120 | 2000 | 2995 | 250 | 265 | 3320 | 1420 | 2530 | 885 | 66 |
| 630-2240 | 4     | 630             | 2275 | 1120 | 2240 | 2995 | 250 | 265 | 3757 | 1420 | 2770 | 885 | 66 |

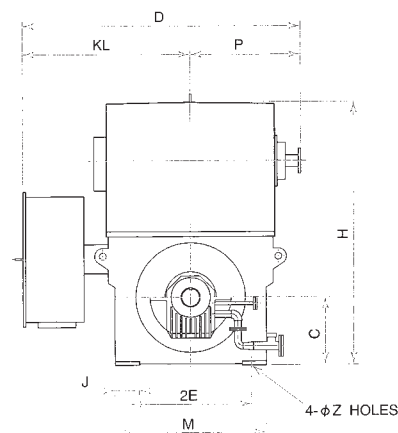
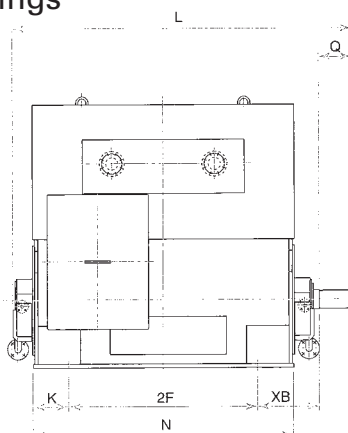
| Power (kW) | Frame    | Weight (kg) | Speed (rpm) | Current   |              | Torque       |          | Efficiency (%) |       |       | Power Factor (%) |       |       | Safe Stall Time (SEC) |      |
|------------|----------|-------------|-------------|-----------|--------------|--------------|----------|----------------|-------|-------|------------------|-------|-------|-----------------------|------|
|            |          |             |             | (A) Rated | (%) Starting | (%) Starting | (%) Max. | F.L.           | 3/4 L | 1/2 L | F.L.             | 3/4 L | 1/2 L | Hot                   | Cold |
| 1800       | 450-1400 | 4800        | 1775        | 185       | 500          | 60           | 190      | 96.6           | 96.4  | 95.6  | 88.3             | 87.5  | 84.0  | 12                    | 15   |
| 2000       | 450-1400 | 5000        | 1775        | 205       | 500          | 60           | 190      | 96.7           | 96.5  | 95.8  | 88.4             | 87.7  | 84.5  | 12                    | 15   |
| 2250       | 450-1400 | 5000        | 1775        | 230       | 500          | 60           | 190      | 96.8           | 96.6  | 95.9  | 88.5             | 87.9  | 84.8  | 12                    | 15   |
| 2500       | 450-1400 | 5200        | 1775        | 255       | 500          | 60           | 190      | 96.9           | 96.8  | 96.1  | 88.5             | 88.1  | 85.0  | 12                    | 15   |
| 2800       | 450-1400 | 5400        | 1775        | 285       | 550          | 60           | 190      | 97.1           | 96.9  | 96.3  | 88.6             | 88.2  | 85.1  | 12                    | 15   |
| 3150       | 450-1600 | 6200        | 1775        | 320       | 600          | 60           | 220      | 97.2           | 97.1  | 96.5  | 88.8             | 88.3  | 85.6  | 12                    | 15   |
| 3550       | 450-1600 | 6200        | 1775        | 360       | 600          | 60           | 200      | 97.3           | 97.2  | 96.6  | 88.9             | 88.3  | 86.2  | 12                    | 15   |
| 4000       | 500-1800 | 7100        | 1775        | 405       | 500          | 60           | 160      | 97.3           | 97.2  | 96.7  | 89.9             | 88.7  | 86.9  | 12                    | 15   |
| 4500       | 500-1800 | 7600        | 1775        | 452       | 500          | 60           | 170      | 97.5           | 97.3  | 96.7  | 89.4             | 88.9  | 87.5  | 12                    | 15   |
| 5000       | 500-1800 | 8100        | 1780        | 502       | 500          | 60           | 170      | 97.6           | 97.4  | 96.8  | 89.4             | 89.0  | 87.7  | 12                    | 15   |
| 5600       | 500-1800 | 8300        | 1780        | 560       | 500          | 60           | 170      | 97.7           | 97.5  | 96.8  | 89.6             | 89.0  | 87.8  | 12                    | 15   |
| 6000       | 500-1800 | 8600        | 1780        | 299       | 500          | 60           | 170      | 97.6           | 97.5  | 96.9  | 89.8             | 89.3  | 87.9  | 12                    | 15   |
| 6300       | 560-1800 | 9900        | 1780        | 629       | 500          | 60           | 180      | 97.7           | 97.5  | 96.8  | 89.8             | 89.4  | 88.2  | 10                    | 15   |
| 6500       | 560-1800 | 9900        | 1780        | 648       | 450          | 60           | 170      | 97.7           | 97.5  | 96.9  | 89.9             | 89.4  | 88.4  | 10                    | 15   |
| 7100       | 560-2000 | 10200       | 1780        | 708       | 450          | 60           | 170      | 97.7           | 97.5  | 96.9  | 89.9             | 89.4  | 88.5  | 10                    | 15   |
| 7500       | 560-2000 | 10800       | 1780        | 747       | 450          | 60           | 170      | 97.7           | 97.5  | 96.9  | 89.9             | 89.4  | 88.5  | 10                    | 15   |
| 8000       | 560-2000 | 11100       | 1780        | 797       | 500          | 60           | 180      | 97.8           | 97.6  | 96.9  | 89.8             | 89.4  | 88.6  | 10                    | 15   |
| 8500       | 560-2000 | 11400       | 1780        | 847       | 500          | 60           | 180      | 97.7           | 97.6  | 96.9  | 89.8             | 89.5  | 88.6  | 10                    | 15   |
| 9000       | 630-2000 | 12900       | 1780        | 897       | 500          | 60           | 170      | 97.7           | 97.6  | 96.9  | 89.8             | 89.4  | 88.6  | 10                    | 15   |
| 9500       | 630-2000 | 12900       | 1780        | 948       | 500          | 60           | 170      | 97.7           | 97.6  | 97.0  | 89.8             | 89.5  | 88.7  | 10                    | 15   |
| 10000      | 630-2000 | 13300       | 1780        | 997       | 500          | 60           | 170      | 97.8           | 97.6  | 97.1  | 89.8             | 89.6  | 88.6  | 10                    | 15   |
| 10500      | 630-2000 | 13300       | 1780        | 1046      | 500          | 60           | 170      | 97.8           | 97.7  | 97.1  | 89.8             | 89.7  | 88.8  | 10                    | 15   |
| 11000      | 630-2240 | 15100       | 1780        | 1094      | 550          | 60           | 170      | 97.9           | 97.7  | 97.1  | 89.9             | 89.8  | 88.9  | 10                    | 15   |
| 11500      | 630-2240 | 15100       | 1780        | 1143      | 550          | 60           | 170      | 97.9           | 97.7  | 97.1  | 90.0             | 89.9  | 89.0  | 10                    | 15   |

# Totally Enclosed Air to Water Cooled Induction Motor TEWAC/IP54

Forced feed lubricated sleeve bearings

Four Pole, 6.6 kV, 60 Hz

- Example outlines for 4 pole machine specifications shown below.
- 2 pole to 24 pole designs available



\* Example, not for construction

| Frame    | Poles | Dimensions (mm) |      |      |      |      |     |     |      |      |      |     |    |
|----------|-------|-----------------|------|------|------|------|-----|-----|------|------|------|-----|----|
|          |       | C               | D    | 2E   | 2F   | H    | J   | K   | L    | M    | N    | P   | Z  |
| 450-1400 | 4     | 450             | 1940 | 800  | 1400 | 1865 | 160 | 265 | 2550 | 1000 | 1930 | 760 | 48 |
| 450-1600 | 4     | 450             | 1940 | 800  | 1600 | 1865 | 160 | 265 | 2750 | 1000 | 2130 | 760 | 48 |
| 500-1600 | 4     | 500             | 2065 | 900  | 1600 | 2015 | 180 | 265 | 2800 | 1120 | 2130 | 825 | 56 |
| 500-1800 | 4     | 500             | 2065 | 900  | 1800 | 2015 | 180 | 265 | 3030 | 1120 | 2330 | 825 | 56 |
| 560-1800 | 4     | 560             | 2225 | 1000 | 1800 | 2130 | 225 | 265 | 3120 | 1260 | 2330 | 915 | 66 |
| 560-2000 | 4     | 560             | 2225 | 1000 | 2000 | 2130 | 225 | 265 | 3320 | 1260 | 2530 | 915 | 66 |
| 630-2000 | 4     | 630             | 2380 | 1120 | 2000 | 2330 | 250 | 265 | 3320 | 1420 | 2530 | 990 | 66 |
| 630-2240 | 4     | 630             | 2380 | 1120 | 2240 | 2330 | 250 | 265 | 3757 | 1420 | 2770 | 990 | 66 |

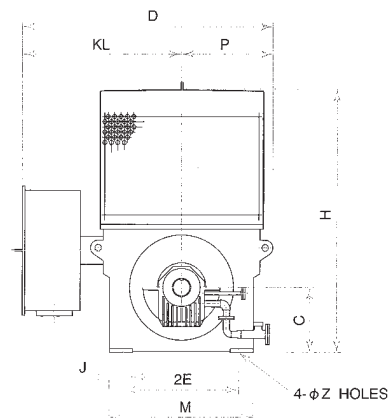
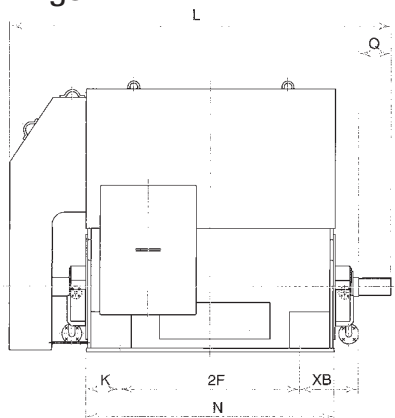
| Power (kW) | Frame    | Weight (kg) | Speed (rpm) | Current   |              | Torque       |          | Efficiency (%) |       |       | Power Factor (%) |       |       | Safe Stall Time (SEC) |      |
|------------|----------|-------------|-------------|-----------|--------------|--------------|----------|----------------|-------|-------|------------------|-------|-------|-----------------------|------|
|            |          |             |             | (A) Rated | (%) Starting | (%) Starting | (%) Max. | F.L.           | 3/4 L | 1/2 L | F.L.             | 3/4 L | 1/2 L | Hot                   | Cold |
| 1800       | 450-1400 | 5000        | 1775        | 185       | 500          | 60           | 190      | 96.6           | 96.4  | 95.6  | 88.3             | 87.5  | 84.0  | 12                    | 15   |
| 2000       | 450-1400 | 5200        | 1775        | 205       | 500          | 60           | 190      | 96.7           | 96.5  | 95.8  | 88.4             | 87.7  | 84.5  | 12                    | 15   |
| 2250       | 450-1400 | 5200        | 1775        | 230       | 500          | 60           | 190      | 96.8           | 96.6  | 95.9  | 88.5             | 87.9  | 84.8  | 12                    | 15   |
| 2500       | 450-1400 | 5400        | 1775        | 255       | 500          | 60           | 190      | 96.9           | 96.8  | 96.1  | 88.5             | 88.1  | 85.0  | 12                    | 15   |
| 2800       | 450-1400 | 5600        | 1775        | 285       | 550          | 60           | 190      | 97.1           | 96.9  | 96.3  | 88.6             | 88.2  | 85.1  | 12                    | 15   |
| 3150       | 450-1600 | 6400        | 1775        | 320       | 600          | 70           | 220      | 97.2           | 97.1  | 96.5  | 88.8             | 88.3  | 85.6  | 12                    | 15   |
| 3550       | 450-1600 | 6400        | 1775        | 360       | 600          | 70           | 200      | 97.3           | 97.2  | 96.6  | 88.9             | 88.3  | 86.2  | 12                    | 15   |
| 4000       | 500-1800 | 7300        | 1775        | 405       | 500          | 60           | 160      | 97.3           | 97.2  | 96.7  | 89.9             | 88.7  | 86.9  | 12                    | 15   |
| 4500       | 500-1800 | 7800        | 1775        | 452       | 500          | 60           | 170      | 97.5           | 97.3  | 96.7  | 89.4             | 88.9  | 87.5  | 12                    | 15   |
| 5000       | 500-1800 | 8300        | 1780        | 502       | 500          | 60           | 170      | 97.6           | 97.4  | 96.8  | 89.4             | 89.0  | 87.7  | 12                    | 15   |
| 5600       | 500-1800 | 8500        | 1780        | 560       | 500          | 60           | 170      | 97.7           | 97.5  | 96.8  | 89.6             | 89.0  | 87.8  | 12                    | 15   |
| 6000       | 500-1800 | 8800        | 1780        | 299       | 500          | 60           | 170      | 97.6           | 97.5  | 96.9  | 89.8             | 89.3  | 87.9  | 12                    | 15   |
| 6300       | 560-1800 | 10200       | 1780        | 629       | 500          | 60           | 180      | 97.7           | 97.5  | 96.8  | 89.8             | 89.4  | 88.2  | 10                    | 15   |
| 6500       | 560-1800 | 10200       | 1780        | 648       | 450          | 60           | 170      | 97.7           | 97.5  | 96.9  | 89.9             | 89.4  | 88.4  | 10                    | 15   |
| 7100       | 560-2000 | 10500       | 1780        | 708       | 450          | 60           | 170      | 97.7           | 97.5  | 96.9  | 89.9             | 89.4  | 88.5  | 10                    | 15   |
| 7500       | 560-2000 | 11000       | 1780        | 747       | 450          | 60           | 170      | 97.7           | 97.5  | 96.9  | 89.9             | 89.4  | 88.5  | 10                    | 15   |
| 8000       | 560-2000 | 11400       | 1780        | 797       | 500          | 60           | 180      | 97.8           | 97.6  | 96.9  | 89.8             | 89.4  | 88.6  | 10                    | 15   |
| 8500       | 560-2000 | 11700       | 1780        | 847       | 500          | 60           | 180      | 97.7           | 97.6  | 96.9  | 89.8             | 89.5  | 88.6  | 10                    | 15   |
| 9000       | 630-2000 | 13200       | 1780        | 897       | 500          | 60           | 170      | 97.7           | 97.6  | 96.9  | 89.8             | 89.4  | 88.6  | 10                    | 15   |
| 9500       | 630-2000 | 13200       | 1780        | 948       | 500          | 60           | 170      | 97.7           | 97.6  | 97.0  | 89.8             | 89.5  | 88.7  | 10                    | 15   |
| 10000      | 630-2000 | 13600       | 1780        | 997       | 500          | 60           | 170      | 97.8           | 97.6  | 97.1  | 89.8             | 89.6  | 88.6  | 10                    | 15   |
| 10500      | 630-2000 | 13600       | 1780        | 1046      | 500          | 60           | 170      | 97.8           | 97.7  | 97.1  | 89.8             | 89.7  | 88.8  | 10                    | 15   |
| 11000      | 630-2240 | 15300       | 1780        | 1094      | 550          | 60           | 170      | 97.9           | 97.7  | 97.1  | 89.9             | 89.8  | 88.9  | 10                    | 15   |
| 11500      | 630-2240 | 15300       | 1780        | 1143      | 550          | 60           | 170      | 97.9           | 97.7  | 97.1  | 90.0             | 89.9  | 89.0  | 10                    | 15   |

# Totally Enclosed Air to Air Cooled Induction Motor TEAAC/IP54

Forced feed lubricated sleeve bearings

Four Pole, 6.6 kV, 60 Hz

- Example outlines for 4 pole machine specifications shown below.
- 2 pole to 24 pole designs available



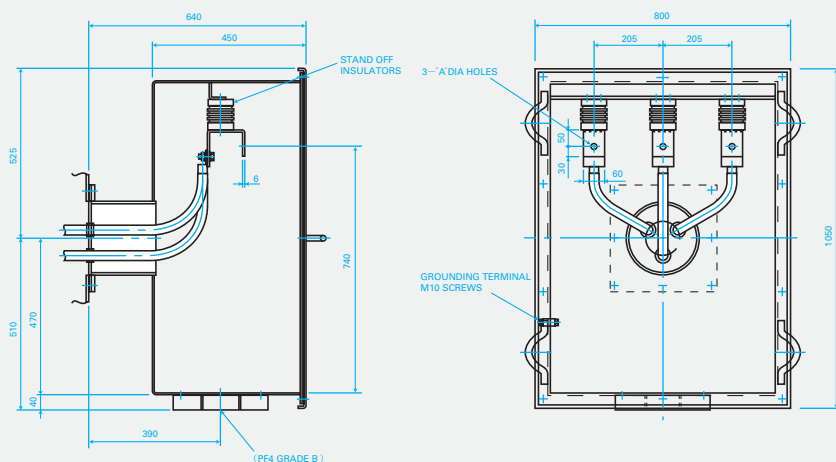
\* Example, not for construction

| Frame    | Poles | Dimensions (mm) |      |      |      |      |     |     |      |      |      |     |    |
|----------|-------|-----------------|------|------|------|------|-----|-----|------|------|------|-----|----|
|          |       | C               | D    | 2E   | 2F   | H    | J   | K   | L    | M    | N    | P   | Z  |
| 450-1400 | 4     | 450             | 1830 | 800  | 1400 | 1920 | 160 | 265 | 3015 | 1000 | 1930 | 650 | 48 |
| 450-1600 | 4     | 450             | 1830 | 800  | 1600 | 1920 | 160 | 265 | 3215 | 1000 | 2130 | 650 | 48 |
| 500-1600 | 4     | 500             | 1950 | 900  | 1600 | 2090 | 180 | 265 | 3215 | 1120 | 2130 | 710 | 56 |
| 500-1800 | 4     | 500             | 1950 | 900  | 1800 | 2090 | 180 | 265 | 3465 | 1120 | 2330 | 710 | 56 |
| 560-1800 | 4     | 560             | 2115 | 1000 | 1800 | 2280 | 225 | 265 | 3465 | 1260 | 2330 | 805 | 66 |
| 560-2000 | 4     | 560             | 2115 | 1000 | 2000 | 2280 | 225 | 265 | 3695 | 1260 | 2530 | 805 | 66 |
| 630-2000 | 4     | 630             | 2275 | 1120 | 2000 | 2420 | 250 | 265 | 3815 | 1420 | 2530 | 885 | 66 |
| 630-2240 | 4     | 630             | 2275 | 1120 | 2240 | 2420 | 250 | 265 | 4055 | 1420 | 2770 | 885 | 66 |

| Power (kW) | Frame    | Weight (kg) | Speed (rpm) | Current   |              | Torque       |          | Efficiency (%) |       |       | Power Factor (%) |       |       | Safe Stall Time (SEC) |      |
|------------|----------|-------------|-------------|-----------|--------------|--------------|----------|----------------|-------|-------|------------------|-------|-------|-----------------------|------|
|            |          |             |             | (A) Rated | (%) Starting | (%) Starting | (%) Max. | F.L.           | 3/4 L | 1/2 L | F.L.             | 3/4 L | 1/2 L | Hot                   | Cold |
| 1400       | 450-1400 | 5000        | 1780        | 145       | 550          | 60           | 200      | 96.0           | 95.5  | 94.2  | 88.5             | 88.0  | 84.8  | 12                    | 15   |
| 1600       | 450-1400 | 5200        | 1780        | 164       | 500          | 60           | 190      | 96.2           | 95.8  | 94.6  | 88.9             | 88.2  | 85.6  | 12                    | 15   |
| 1800       | 450-1400 | 5400        | 1780        | 184       | 600          | 60           | 210      | 96.4           | 96.0  | 94.8  | 88.9             | 88.2  | 85.5  | 12                    | 15   |
| 2000       | 450-1400 | 5600        | 1780        | 204       | 600          | 60           | 210      | 96.6           | 96.2  | 95.1  | 89.0             | 88.3  | 85.6  | 12                    | 15   |
| 2250       | 450-1400 | 5800        | 1780        | 229       | 600          | 60           | 210      | 96.7           | 96.4  | 95.3  | 89.0             | 88.3  | 85.6  | 12                    | 15   |
| 2500       | 450-1600 | 6300        | 1780        | 254       | 600          | 60           | 210      | 96.9           | 96.5  | 95.5  | 89.1             | 88.5  | 85.7  | 12                    | 15   |
| 2800       | 450-1600 | 6700        | 1780        | 283       | 600          | 60           | 220      | 97.0           | 96.6  | 95.6  | 89.3             | 88.6  | 86.1  | 12                    | 15   |
| 3150       | 500-1600 | 7400        | 1780        | 317       | 550          | 60           | 190      | 97.0           | 96.6  | 95.6  | 89.9             | 89.0  | 86.7  | 10                    | 15   |
| 3550       | 500-1600 | 7900        | 1780        | 355       | 550          | 60           | 200      | 97.2           | 96.8  | 95.8  | 90.2             | 89.4  | 87.1  | 10                    | 15   |
| 4000       | 500-1800 | 8400        | 1780        | 399       | 550          | 60           | 210      | 97.3           | 96.9  | 95.9  | 90.2             | 89.4  | 87.1  | 10                    | 15   |
| 4500       | 500-1800 | 8900        | 1780        | 448       | 600          | 60           | 220      | 97.4           | 96.9  | 96.0  | 90.3             | 89.5  | 86.9  | 10                    | 15   |
| 5000       | 560-1800 | 10400       | 1780        | 498       | 500          | 60           | 190      | 97.4           | 96.9  | 96.0  | 90.2             | 89.6  | 87.2  | 10                    | 15   |
| 5600       | 560-2000 | 11600       | 1780        | 557       | 550          | 60           | 210      | 97.4           | 97.0  | 96.0  | 90.5             | 89.6  | 87.3  | 10                    | 15   |
| 6000       | 630-2000 | 12500       | 1780        | 598       | 550          | 60           | 190      | 97.4           | 97.1  | 96.1  | 90.1             | 89.4  | 87.3  | 10                    | 15   |
| 6300       | 630-2000 | 12500       | 1780        | 628       | 500          | 60           | 190      | 97.4           | 97.1  | 96.1  | 90.2             | 89.3  | 87.4  | 10                    | 15   |
| 6500       | 630-2000 | 12900       | 1780        | 647       | 600          | 70           | 210      | 97.5           | 97.1  | 96.1  | 90.2             | 89.4  | 87.2  | 10                    | 15   |
| 7100       | 630-2000 | 13300       | 1780        | 706       | 600          | 70           | 210      | 97.6           | 97.2  | 96.2  | 90.3             | 89.5  | 87.2  | 10                    | 15   |
| 7500       | 630-2000 | 14200       | 1780        | 745       | 600          | 70           | 200      | 97.6           | 97.3  | 93.3  | 90.3             | 89.8  | 87.5  | 10                    | 15   |
| 8000       | 630-2000 | 14500       | 1780        | 794       | 600          | 70           | 200      | 97.7           | 97.3  | 93.3  | 90.3             | 89.8  | 87.4  | 10                    | 15   |
| 8500       | 630-2240 | 15400       | 1780        | 844       | 600          | 70           | 200      | 97.7           | 97.4  | 96.4  | 90.3             | 89.6  | 87.2  | 10                    | 15   |

# Main Terminal Box

## Drawing



| P. No. | A<br>Dimensions<br>(mm) |
|--------|-------------------------|
| 1      | 12                      |
| 2      | 15                      |
| 3      | 28                      |

Area available for accessories  
such as arrestors, surge  
capacitors, CTs, etc.



## Other Accessories Available

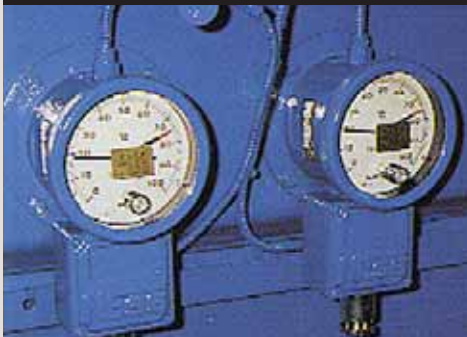
### RTDs



### Space Heaters



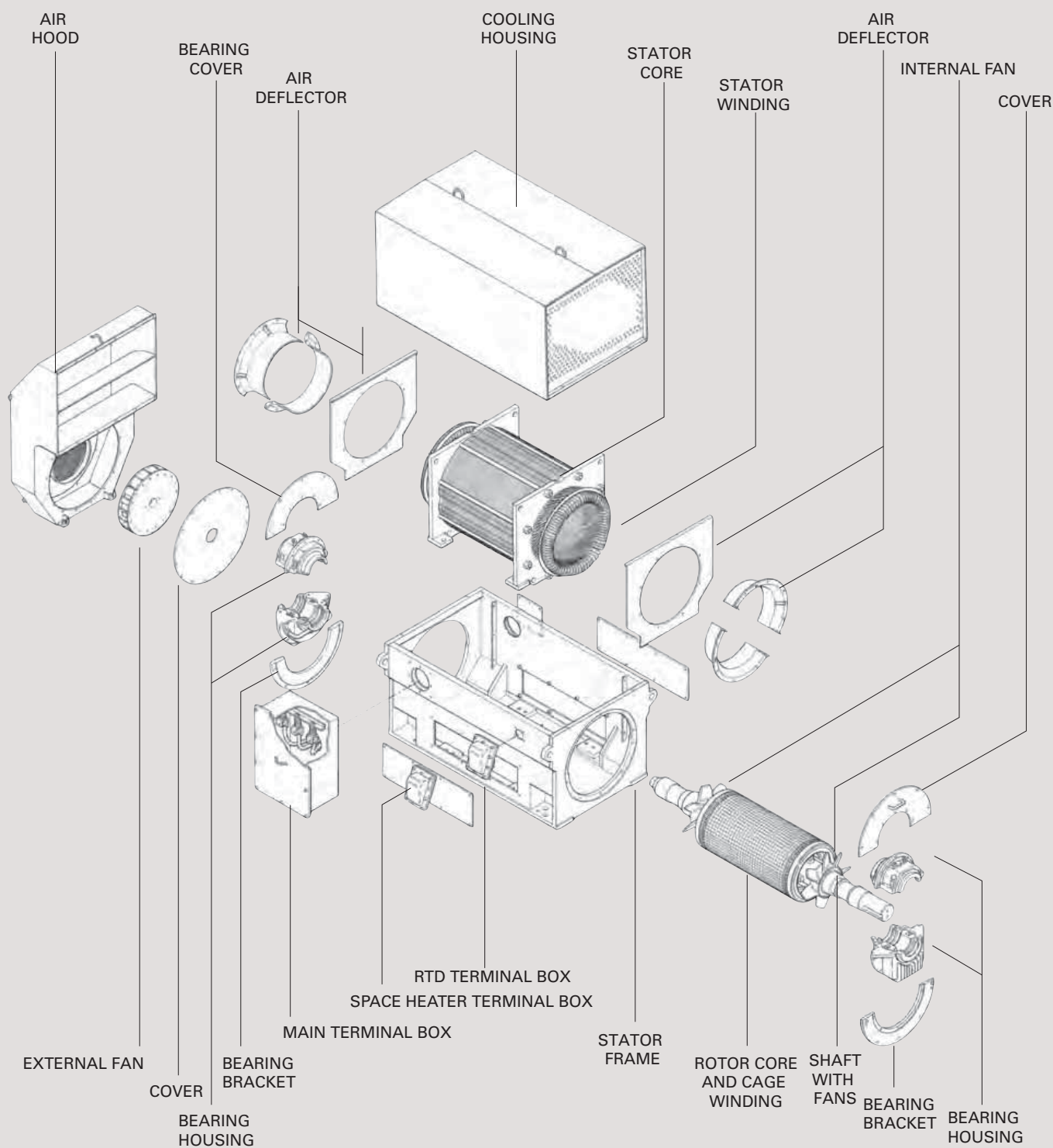
### Dial Thermometer



### Vibration Detector



# 21-L Series Internal Details





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