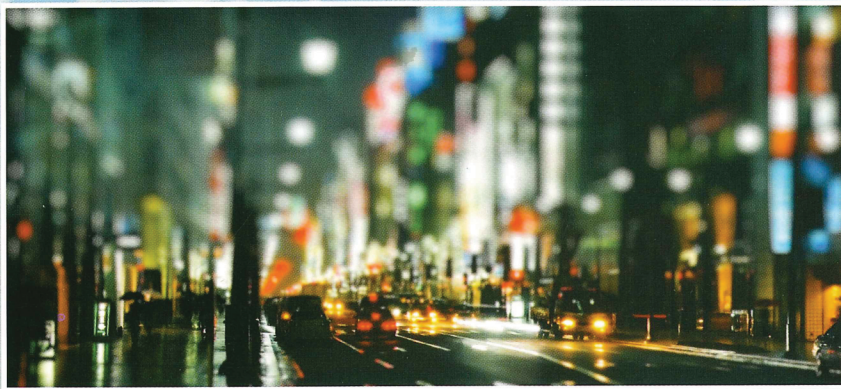
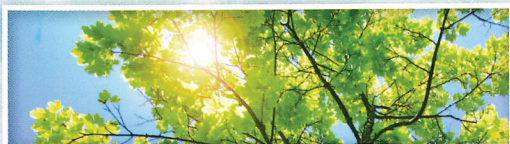
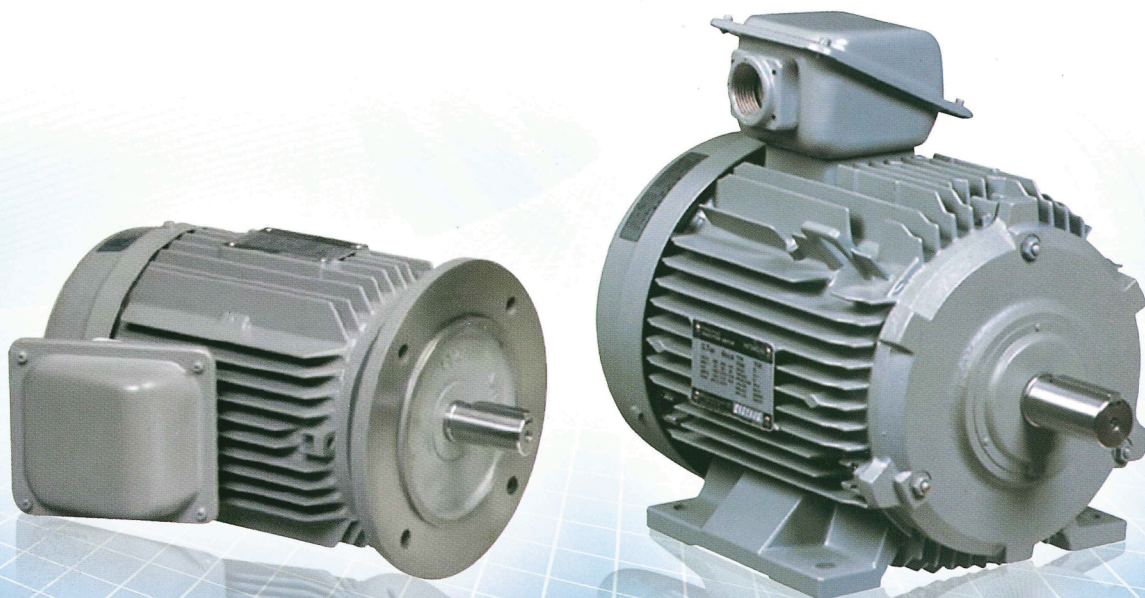


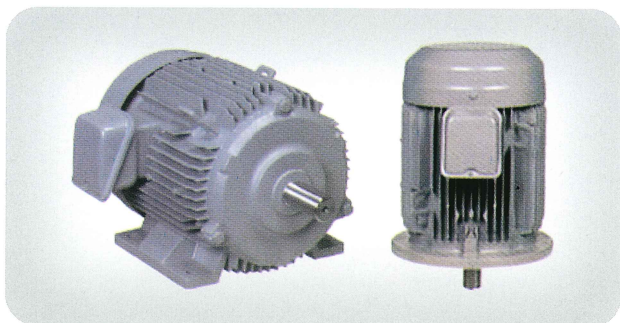


# **Hitachi Electric Motors For Industrial application**



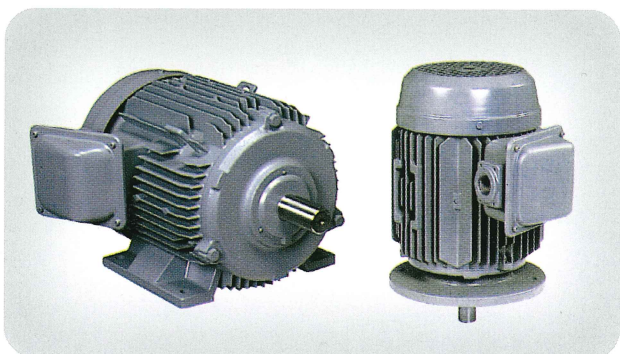


## Three-Phase Motors



### **IP44 Series**

Foot / Flange Mount  
1/7~175HP (0.1~132kW)  
2 / 4 / 6 / 8 pole



### **IP55 Series**

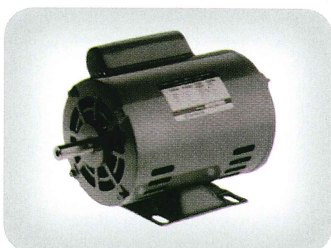
Foot / Flange Mount  
1/2~175HP (0.4~132kW)  
2 / 4 / 6 / 8 pole

## Single-Phase Motors



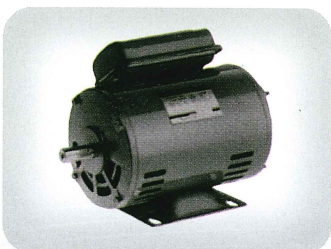
### **Split-Phase Start**

1/8~1/2HP (0.09~0.75kW)  
4 pole



### **Capacitor Start**

1/8~1HP (0.09~0.75kW)  
4 pole



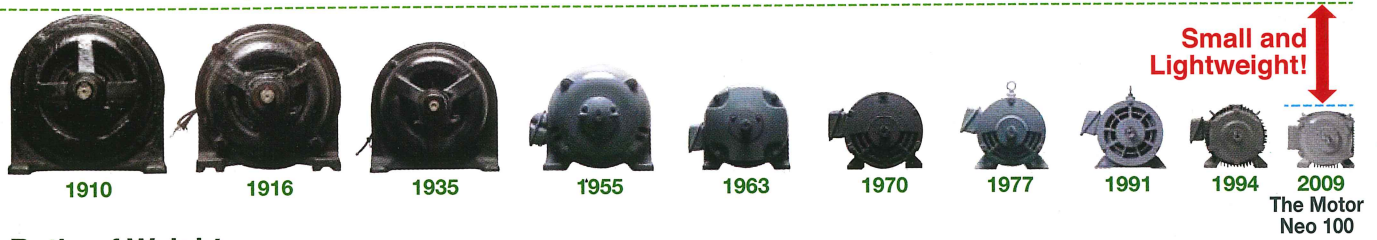
### **Capacitor Start Capacitor Run**

1.5~10HP (1.1~7.5kW)  
4 pole

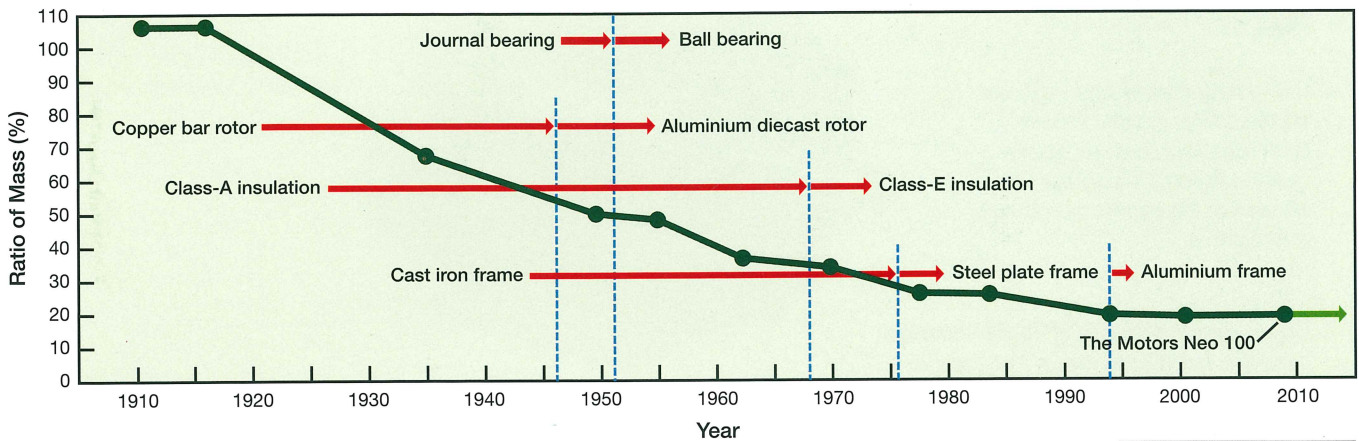


# Historical transition of Hitachi Motor Development.

Motor Size: 5HP (3.7kW 4P)



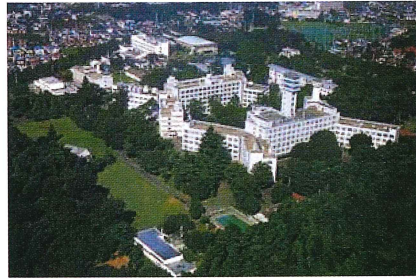
## Ratio of Weight



## Facilities of Production and Development.



Hitachi Narashino Plant in Japan



Central Research Laboratory



Administrative Division

## Production Plant in Thailand.





# High performance with latest technologies.

## 2. The insulated lead-wire has high performance and efficiency.

In our high technology, we developed high quality insulated wire and varnish that can support various hostile environments, even under high temperature.

## 1. Aluminum-alloy frame is beneficial for light weight.

Aluminum-alloy is used as raw material of motor housing (Used in parts for airplane, shinkansen, etc), which makes the motor to effectively ventilate heat and provides light weight

## 4. Using high quality bearings also adopted high graded grease.

On of major importance for motor is quality of bearings. The Hitachi motors are used the high quality one with high graded grease.

## 5. Liquid gasket seal (For IP55 construction)

Using high quality liquid seal for IP55 series in order to establish durability and long life for the motors.

## 6. End brackets (Front and back) that have a robust construction for strength.

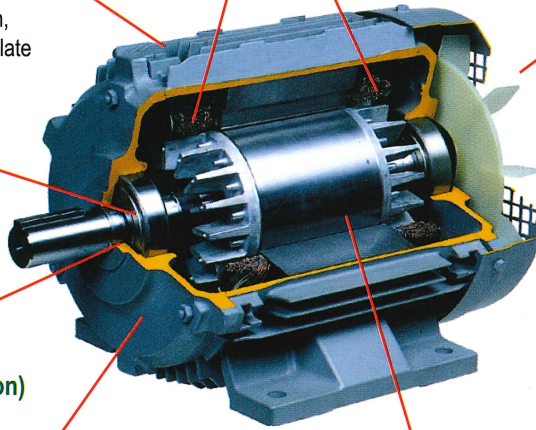
The end brackets are made by cast iron in order to establish robustness for motor construction.

## 7. Special slot and compact coil effect to lower sound and high performance.

From a start for running, the motor can smoothly start with high torque and reduces a damage for machine because of low vibration. The motor does not harm construction in the motor and the machine.

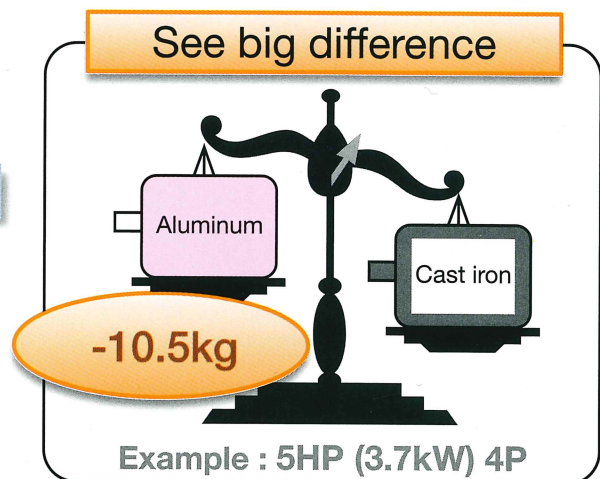
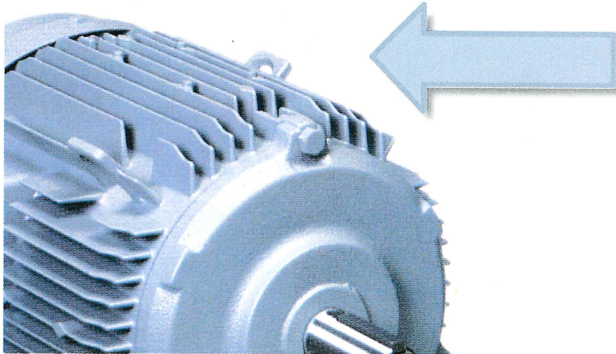
## 3. Silent and highest cooling efficiency.

The ventilation process is developed from CAE (Computer Aided Engineering) and has high efficiency fan with quietness. This high quality motor is accomplished through the effective use aluminum alloy.



# Easy handing on site because of light weight.

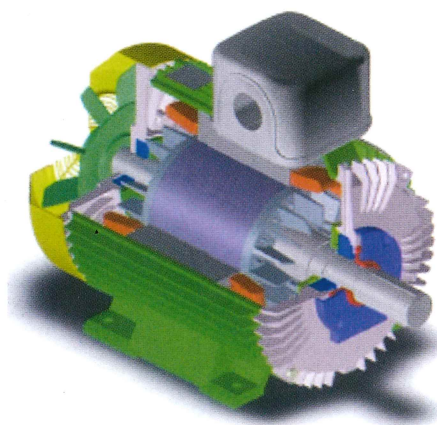
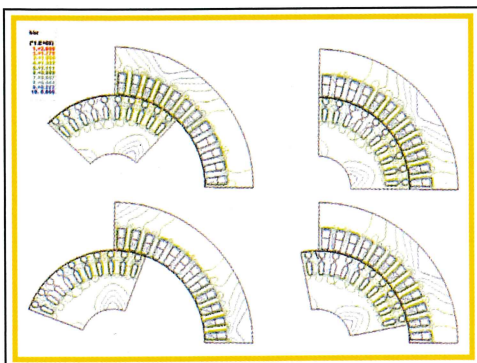
Aluminum alloy housing realize light weight.



The average weight decreased by 30%



# Furthermore technologies on motor design & development.



## Secret formula of silence is energy

We have researched and found the right vibrational level and calculated the durability of motor structure by computer systems. You can rely upon our high-quality motors. We have also discovered and designed the methods that could reduce high frequency while machines are running in addition, we have planned to utilize brand-new materials with high-precision machines, which pertain technology that could control silence and low vibration. We are proud to present our new technology and have strived to produce products that have the best quality.

## Insulated wire system that you can rely on

From lead wires to any insulated wires. we have wisely selected high-quality materials in every step of our production process. We use lead wires, which can tolerate high heat, humidity, and coldness. These lead wires can basically tolerate to any climates with high-quality standards, even when using in a very high temperature

## Reliability of high-power torque energy

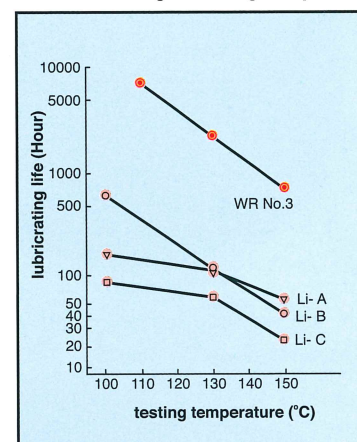
Hitachi motors have been designed from slot in rotor for aluminum injection, which is a specific technique that provides high-power torque for better start. You can notice from the start to a running period. You would find that Hitachi motor have a very smooth start with an increase in usage capacity.

## Energy source Compact-Coil structure

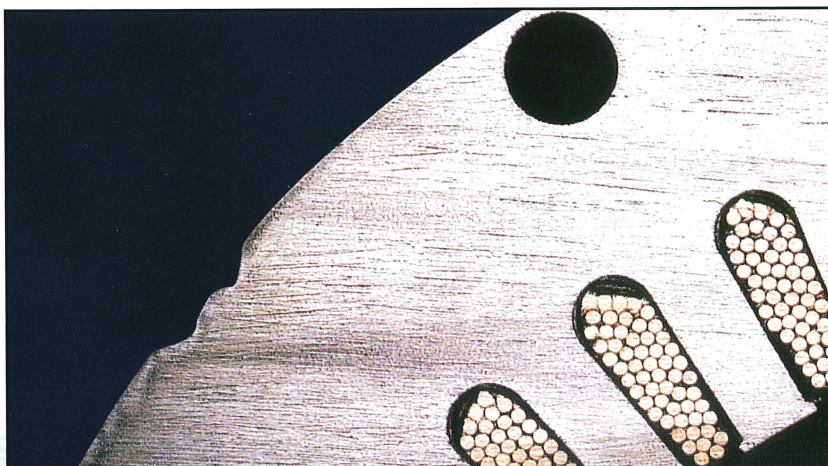
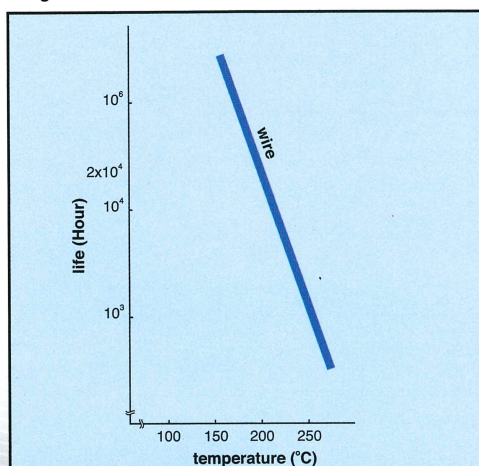
One of our new technologies is Compact Coil. When the Coil is small, It can control all system errors with high capacity. Insulate has a round shape placed parallel to each other in which it to create high conserved energy. As a result, internal structure has an increase in space, which provides a better ventilating system for cooling efficiency.

Hitachi **WR Grease** has capability of tolerating heat four times more than ordinary lithium. The grease can also be operated or tolerated from the highest temperature to the lowest temperature with excellent performance. On the other hand, it can extend the usage life of motors because of shield Bearing technology.

## The test result of grease in high temperature



## Usage life of lead wires in a heat situation





# Main Feature for Single-phase motors.

## More reliable in various fields.

### Economical and High Efficiency

Following IEC standard, insulation class E comes with low vibration level and low noise, which is the advantage of 3-phase motor developed from 1-phase motor of Hitachi. Your satisfaction is guaranteed because it can be used in a variety of industries with high engine performance. We believe in high quality products in which we strictly control our manufacturing process for high quality and performance. Therefore, high engine performance with low vibration level makes our Hitachi motor one of the best and highly satisfies our customers worldwide.

### Compact size

Hitachi Motor uses housing-steel iron (state of the art technology used widely), aluminum alloy cover for impact protection, and the modern shape.

### Efficient Ventilation System

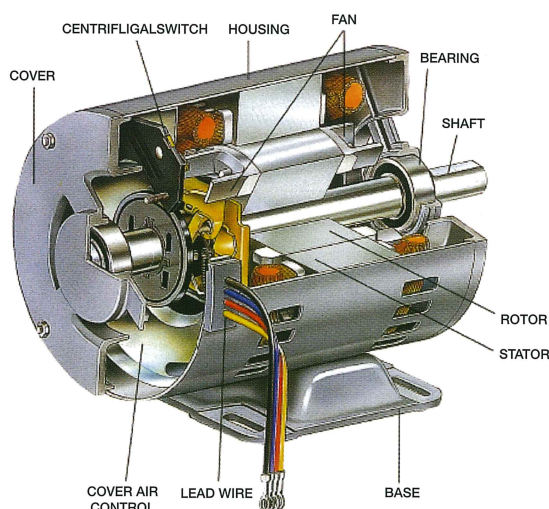
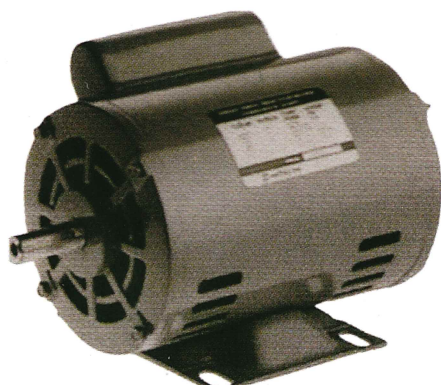
We use a high-performance ventilation system that effectively exchanges air from inside to outside environment with dust protection into the centrifugal switch. All of these features contribute to a high performance machine.

### Switch works constantly

The centrifugal switch was developed that install to the rotor. It can be guaranteed that the switch will work constantly.

### High temperature resistance plastic insulator

We carefully choose to use plastic insulation that can support high heat, which is one of the components that makes Hitachi Motor one of the safest motor used in industries.

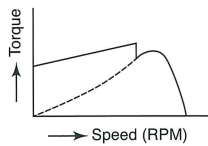
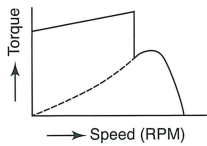
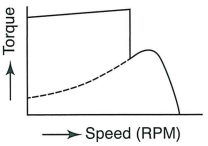
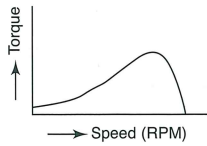
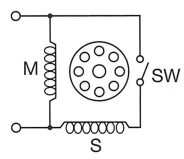
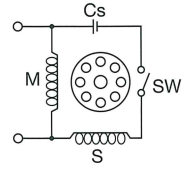
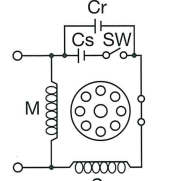
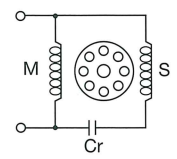


## SPECIFICATIONS

| ITEM                       |               | SPECIFICATION                                                                        |       |                  |            |
|----------------------------|---------------|--------------------------------------------------------------------------------------|-------|------------------|------------|
| STANDARD                   |               | JIS C4203, 4034, JEC-2137-2000                                                       |       |                  |            |
| RATING                     |               | CONTINUOUS [S1]                                                                      |       |                  |            |
| INSULATION CLASS           |               | E TYPE                                                                               |       |                  |            |
| ENCLOSURES TYPE PROTECTION |               | ENCLOSURES                                                                           |       | TYPE             | PROTECTION |
|                            |               | OPEN TYPE                                                                            | DRIP  | EFOU-KT, KR, KQ  | IP22       |
|                            |               |                                                                                      | PROOF | EFOUP-KT, KR, KQ |            |
| VOLTAGE FREQUENCY          |               | 220V 50Hz                                                                            |       |                  |            |
| TYPE OF CABLE              |               | Made from high temperature resistance plastic (end of pole conduct electric current) |       |                  |            |
| NUMBER OF CABLE            |               | 4 WIRES (1/4-1/3 HP-KT, -KR, 2-10 HP-KQ)<br>3 WIRES (1/2-1.5 HP-KR, KQ)              |       |                  |            |
| COLOR                      |               | Rigail gray (MUNSELL 8.9Y5.1/0.3)                                                    |       |                  |            |
| TRANSMISSION               |               | DIRECT COUPLING OR BELT DRIVE                                                        |       |                  |            |
| ROTATION                   |               | CW (VIEW FROM MOTOR DRIVE END)                                                       |       |                  |            |
| ENVIRON-<br>MENT           | TEMPERATURE   | -20 °C ~ 40 °C                                                                       |       |                  |            |
|                            | HUMIDITY      | Max 90%RH                                                                            |       |                  |            |
|                            | ALTITUDE      | Max 1,000 m                                                                          |       |                  |            |
|                            | ESTABLISHMENT | IN DOOR                                                                              |       |                  |            |
| ATMOSPHERE                 |               | NO CORROSIVE GAS, NO EXPLOSIVE GAS, NO STEAM, NO DEW, LITTLE DUST                    |       |                  |            |



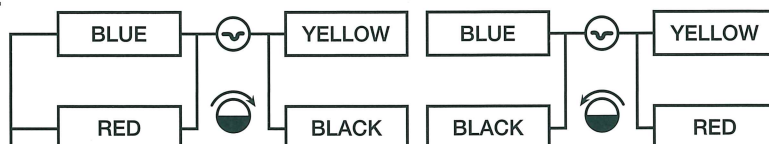
# Variety of motor

| TYPE                  | SPLIT-PHASE START                                                                                                  | CAPACITOR START                                                                   | CAPACITOR START CAPACITOR RUN                                                      | CAPACITOR RUN                                                                       |
|-----------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| MODEL                 | KT                                                                                                                 | KR                                                                                | KQ                                                                                 | KP                                                                                  |
| APPEARANCE            |                                   |  |  |  |
| CHARACTERISTIC -CURVE |                                   |  |  |  |
| CONNECTION            |                                   |  |  |  |
|                       | M : Main Coil<br>S : Starting coil<br>SW : Certrifugal Switch<br>Gs : Starting Capacitor<br>Cr : Running Capacitor |                                                                                   |                                                                                    |                                                                                     |
| FEATURES              | Simple Structure                                                                                                   | High Starting Torque                                                              | High Starting Torque<br>Lower Running Current                                      | Low Starting Torque<br>Lower Running Current                                        |
| APPLICATION           | Drilling Machine<br>Blower                                                                                         | Conveyor<br>Pump                                                                  | Compressor                                                                         | Fan                                                                                 |

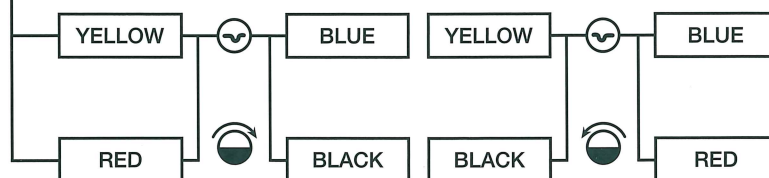
## The Wiring Connection and Propelling Direction

### 1/4HP, 1/3HP-KT

#### 4 LEAD WIRE



### 1/2HP-KT - 10HP-KQ



#### 3 LEAD WIRE





# Three-phase Motors

## Basic Specifications

| Item               |               | Specifications                                                                            |                                             |                                                       |            |
|--------------------|---------------|-------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------|------------|
| Standard           |               | JEC-2137-2000, JIS C 4210, 4034, etc.                                                     |                                             |                                                       |            |
| Rating             |               | Continuous [S1]                                                                           |                                             |                                                       |            |
| Insulation Class   |               | 2, 4, 6 Pole (8 Pole for some range)                                                      |                                             |                                                       |            |
|                    |               | B Type                                                                                    |                                             | ~180 M                                                |            |
|                    |               | F Type                                                                                    |                                             | 180 L~                                                |            |
| Enclosures Type    |               | Enclosures                                                                                |                                             | Type                                                  | Protection |
|                    |               | Indoor                                                                                    | Fan cooled type<br>Vertical Fan cooled type | TFO-K, KK<br>VTFO-K, KK                               | IP44       |
| Protection         |               | Outdoor                                                                                   | Fan cooled type<br>Vertical Fan cooled type | TFO-K, KK<br>VTFO-K, KK                               | IP55       |
| Voltage, Frequency |               | 1/2 ~ 5 HP : 220/380V 50Hz<br>7.5HP ~ : 380/415V 50Hz                                     |                                             |                                                       |            |
| Number of Cable    |               | ~ 5 HP 6 Wires (Direct starting 220V or 380V)                                             |                                             |                                                       |            |
|                    |               | 7.5 HP ~ 6 Wires (Star $\Delta$ - $\Delta$ Delta starting)                                |                                             |                                                       |            |
|                    |               | 2 pole 30 HP ~<br>4 pole 40 HP ~<br>6 pole 50 HP ~                                        |                                             | 12 Wires<br>(Star $\Delta$ - $\Delta$ Delta starting) |            |
| Color              |               | Alcron gray                                                                               |                                             |                                                       |            |
| Transmission       |               | 2 pole 15 HP ~ Direct coupling<br>2 pole 10 HP and 4 pole ~ Direct coupling or Belt drive |                                             |                                                       |            |
| Rotation           |               | CCW (View from motor drive end)                                                           |                                             |                                                       |            |
| Environ ment       | Temperature   | -30 ~ 40°C                                                                                |                                             |                                                       |            |
|                    | Humidity      | Enclosed type Max 95% RH                                                                  |                                             |                                                       |            |
|                    | Altitude      | Max 1,000 m                                                                               |                                             |                                                       |            |
|                    | Establishment | [IP44] Indoor type, [IP44 Special, IP55] Outdoor type                                     |                                             |                                                       |            |
| Atmosphere         |               | No corrosive gas, No explosive gas,<br>No Steam, No dew, little dust                      |                                             |                                                       |            |

## Nameplate on motors

Model : CE Version

| THREE PHASE<br>INDUCTION MOTOR                 |            | HITACHI    |        |
|------------------------------------------------|------------|------------|--------|
| MODEL : TFO-K (TFOD-112M)-4P                   |            | RATING     | S1     |
| 5 HP 4 POLE                                    |            | TH. CLASS  | F      |
|                                                |            | AMB. TEMP. | 40 °C  |
| VOLTS                                          | 220 380    | PROTECTION | IP55   |
| HERTZ                                          | 50 50      | COOLING    | IC411  |
| AMP'S                                          | 13.8 8.0   | BRG. D. S. | 6306ZZ |
| RPM                                            | 1410 1410  | BRG. O. S. | 6306ZZ |
| STANDARD                                       | EN 60034-1 | WEIGHT     | 28 kg. |
| Hitachi Industrial Technology (Thailand), Ltd. |            | MFG. No.   | 205830 |

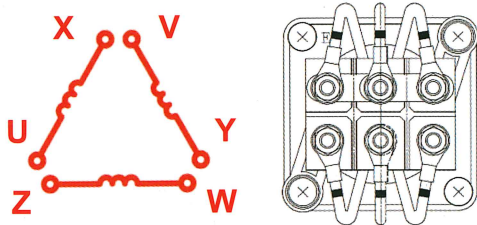


# The Wiring Connection and Propelling Direction

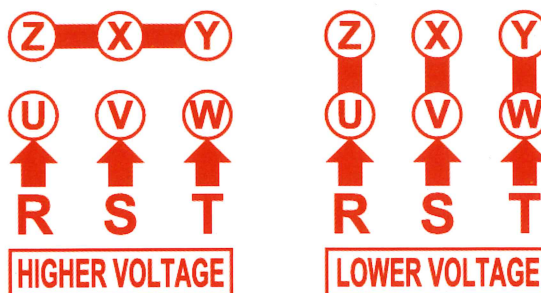
Circuit Diagram for the use of motor wiring connection

## 6-wire 220/380V

Connect to power source to start-up

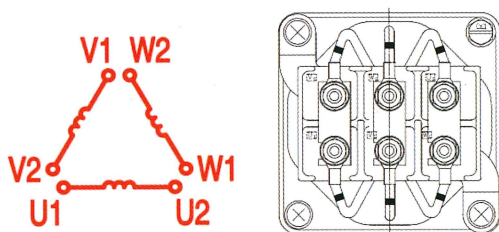


### Direct on Line Start

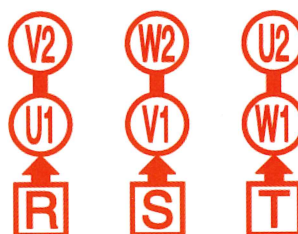


## 6-wire 380/415V

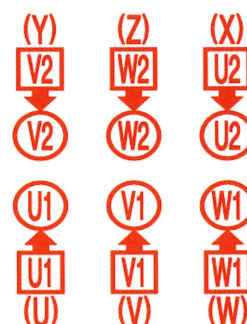
Connect to power source to start-up or Star-Delta



### Direct on Line Start

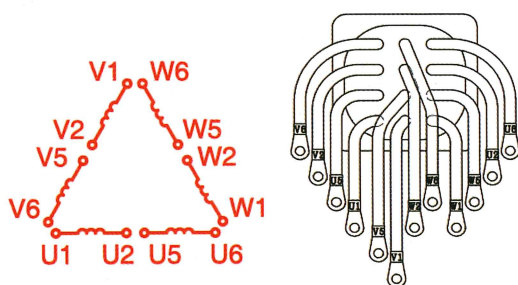


### Star-Delta Start

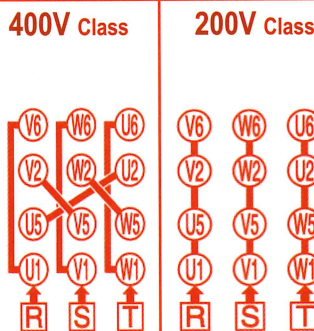


## 12-wire 200/380/400V

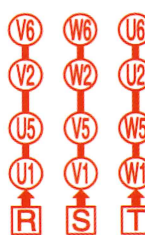
Connect to power source to start-up or Star-Delta



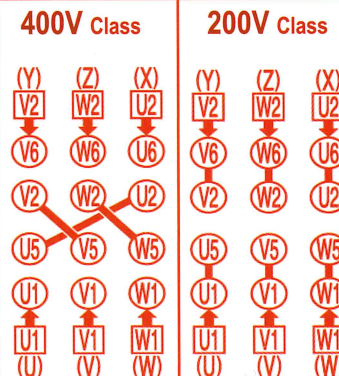
### Direct on Line Start



### 200V Class

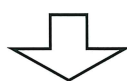


### Star-Delta Start

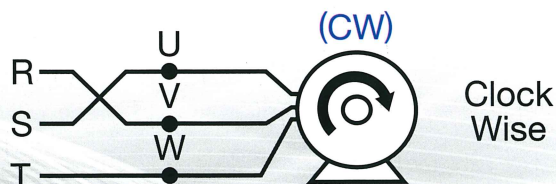
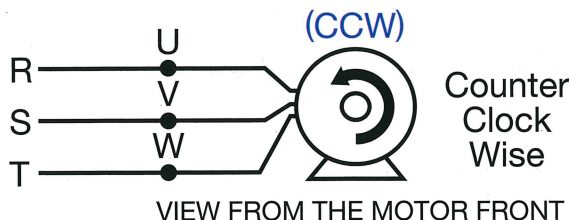


## Rotation

COUNTER CLOCK WISE  
(Hitachi Standard)



CLOCK WISE





# High-Efficiency Motors / IE3 class

## Main Features :

### 1. Global standard

- Conformity to JIS C 4213 (Japan) [Efficiency class: IEC60034-30 Premium efficiency class (IE3)]

### 2. High-efficiency

- Compare to the standard motors, iron core shape is improved and material quality is raised
- Motor loss is reduced 30~40%
- This improvement realizes higher efficiency when compared with the standard motors

### 3. Long motor life

- The temperature of stator coil has been decreased at 10~20°C under a rationalization design and a high cooling effect for an electric part
- The coil insulation is achieved two times longer on operation life compared with the standard motor
- The bearings are also 2.5 times longer on operation life
- The operation life changes depending on operation conditions

### 4. Inverter operation is also available (1:10 or 1:20 constant torque)

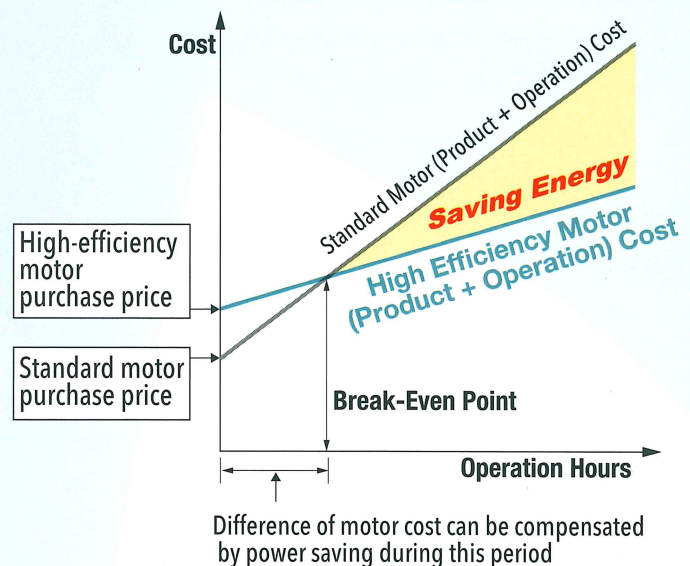
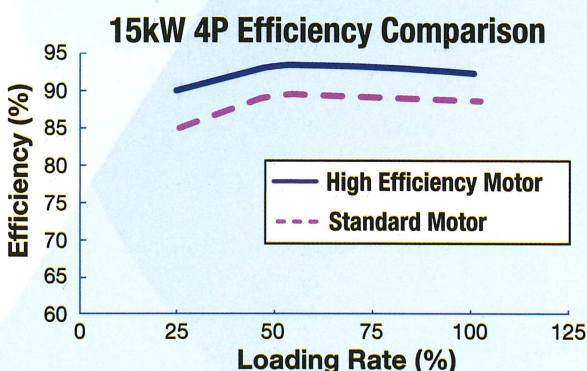
- 0.4~1.5kW 4P is available to operate with 1:10 (6~60Hz) speed under 100% constant torque operation using the inverters (In case the sensorless vector inverters are used) 1:20 (3~60Hz) is also available with special design motors. These motors are adopted durable insulation system with advanced technology.

### 5. Furthermore benefit

- Low noise and vibration can be realized with advanced technologies

### 6. Operational cost saving

- Considering the operational cost under long term period, the best idea is to adopt the high efficiency motors
- The point is just not to consider the initial cost of motor but overall cost including long term operation



- The annual energy savings with high efficiency motor can be estimated by following formula

$$\text{The annual saving fee} = \text{Output (kW)} \times \text{Operation hour (hour / year)} \times \text{Power charge cost (Cost / kWh)} \times \left( \frac{100}{\text{Standard Motor efficiency (\%)}} - \frac{100}{\text{High efficiency motor efficiency (\%)}} \right)$$

High efficiency motor saves energy consumption in proportion to operating hour.

#### Sample calculation

Motor output : 15kW  
 High-efficiency motor efficiency : 93.0%  
 Standard motor efficiency : 88.5%  
 Annual operation hours : 4,800hours (16h/day)  
 Electric power rate : US\$0.15/kWh

Annual energy saving  
 Approx. US\$590.49



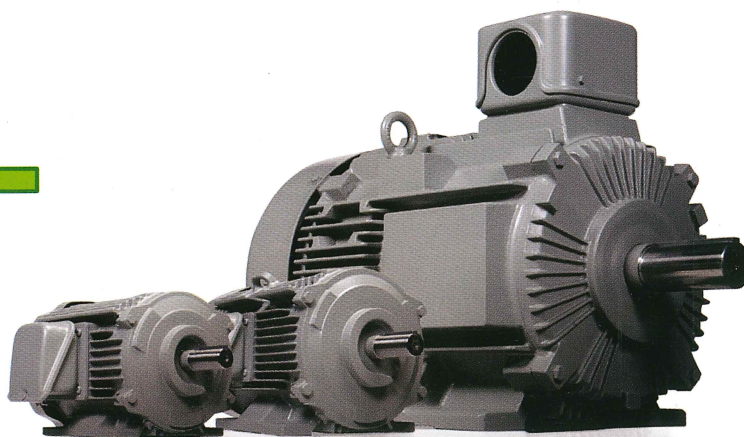
# Basic Specifications

## Efficiency class

IE3 Premium Efficiency ←

IE2 High Efficiency

IE1 Standard



| Item                   |              |              | Specifications                                                                                       |
|------------------------|--------------|--------------|------------------------------------------------------------------------------------------------------|
| Standard               |              |              | JIS C 4213 (Efficiency classes:JIS C 4034-30:2011 Premium efficiency class (IE3))                    |
| Construction           |              |              | Totally enclosed fan-cooled types (Indoor and outdoor types)                                         |
| Model                  | Foot mount   | Indoor type  | TFO-LK (0.75~3.7kW), TFO-LKK (5.5kW~)                                                                |
|                        |              | Outdoor type | TFOA-LK (0.75~3.7kW), TFOA-LKK (5.5kW~)                                                              |
|                        | Flange mount | Indoor type  | VTFO-LK (0.75~3.7kW), VTFO-LKK (5.5kW~)                                                              |
|                        |              | Outdoor type | VTFOA-LK (0.75~3.7kW), VTFOA-LKK (5.5kW~)                                                            |
| Output                 | 2 Poles      |              | 0.75~132kW                                                                                           |
|                        | 4 Poles      |              | 0.75~132kW                                                                                           |
|                        | 6 Poles      |              | 0.75~110kW                                                                                           |
| Heat-resistant class   |              |              | 155(F) ※ 1                                                                                           |
| Rating                 |              |              | S1 (Continuous)                                                                                      |
| Protection             |              |              | Indoor types : IP44 Outdoor types : IP55                                                             |
| Voltage / Frequency    |              |              | 220/380V or 380/415V 50Hz                                                                            |
|                        |              |              | 2 Poles 22kW~, 4 Poles 18.5kW~, 6 Poles 15kW~200V 50/60Hz, 220/230V 60Hz 400V 50/60Hz, 440/460V 60Hz |
| Lead wire construction |              |              | Lug connection : 2 Poles 22kW~, 4 Poles 18.5kW~, 6 Poles 15kW~※ 5.5kW~Available Y – △ starting       |
| Number of lead wires   |              |              | 6 : (5.5kW~) 12 : 2 Poles 22kW~, 4 Poles 18.5kW~, 6 Poles 15kW~                                      |
| Painting color         |              |              | Rigail gray (munsell 8.9Y 5.1/0.3)                                                                   |
| Transmission system    |              |              | 2 Poles 11kW~ : Direct coupling only 2 Poles~7.5kW and all of 4 Poles~ : Direct or belt coupling     |
| Rotation               |              |              | Clockwise when viewed from the anti-load side                                                        |
| Environment            | Temperature  |              | –30~40°C                                                                                             |
|                        | Humidity     |              | 95%RH or less                                                                                        |
|                        | Altitude     |              | 1,000m or less                                                                                       |
| Atmosphere             |              |              | No corrosive gas, no explosive gas, no steam, no dew condensation, and little dust                   |

Note : Request a dimensional drawing to us for design use because the specifications may be subject to change.

※ 1 Temperature rise : Frame size 112M or less class E, Frame size 132S~180M class B

## Production Plant

Prachinburi, Thailand



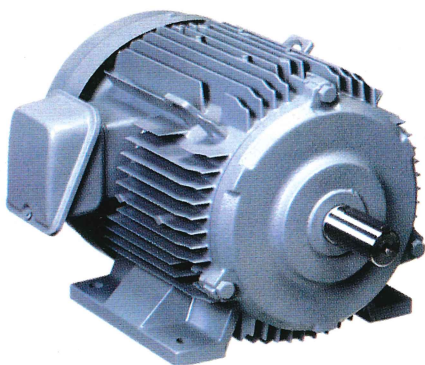
Narashino, Japan





# Three-Phase Induction Motors

Totally Enclosed Fan-Cooled Type (TEFC)  
IP44 Series / Foot Mount Type [ TFO-K(KK) ]  
1/7~180HP (0.1~132kW)



**Model:**

**xxHP or kW TFO-K(KK) xP IP44**

Output

No of pole

| Item               |                                                  | Specifications                                          |
|--------------------|--------------------------------------------------|---------------------------------------------------------|
| Motor Output       |                                                  | 1/7~180HP (0.1~132kW)                                   |
| Rating             |                                                  | Continuous [S1]                                         |
| Number of pole     |                                                  | 2, 4, 6 pole [ 8 Pole : only some range ]               |
| Insulation Class   | B type                                           | ~180 M                                                  |
|                    | F type                                           | 180 L~                                                  |
| Enclosure          |                                                  | IP44 (Outdoor type is also available)                   |
| Voltage, Frequency |                                                  | Consult to nearest representative                       |
| Number of Cable    | ~5 HP 6 Wires (Direct starting 220V or 380V)     |                                                         |
|                    | 7.5 HP ~ 6 Wires (Star $\Delta$ Delta Starting ) |                                                         |
|                    | 2 pole 30 HP ~                                   | 12 Wires<br>( Star $\Delta$ - $\Delta$ Delta Starting ) |
|                    | 4 pole 40 HP ~                                   |                                                         |
|                    | 6 pole 50 HP ~                                   |                                                         |
| Color              |                                                  | Alcron gray                                             |
| Rotation           |                                                  | CCW (View from motor drive end)                         |
| Environment        | Temperature<br>Humidity<br>Altitude              | -30 ~ 40 °C<br>Enclosed type Max 95% RH<br>Max 1,000 m  |

| Type From | Frame size      | Output (HP)                    |                               |                               | Insulation | Fig. No  | Dimension in mm  |                  |       |                  |     |       |      |    |      |       |                                  |       |       |     |     |
|-----------|-----------------|--------------------------------|-------------------------------|-------------------------------|------------|----------|------------------|------------------|-------|------------------|-----|-------|------|----|------|-------|----------------------------------|-------|-------|-----|-----|
|           |                 | 2 Pole                         | 4 Pole                        | 6 Pole                        |            |          | L                | R                | A     | B                | D   | KL    | K    | KD | J    | H     | C                                | F     | E     | N   | M   |
| TO-K      | 63M             | -                              | 1/7                           | -                             | B          | 1        | 186              | 103              | 80    | -                | 116 | -     | -    | -  | -    | 121   | 63 <sup>0</sup> <sub>-0.5</sub>  | 40    | 50    | 100 | 130 |
|           |                 | -                              | 1/4                           | -                             | B          | 1        | 186              | 103              | 90    | -                | 116 | -     | -    | -  | -    | 121   | 63 <sup>0</sup> <sub>-0.5</sub>  | 40    | 50    | 100 | 130 |
| TFO-K     | 71M             | 1/2                            | 1/2                           | -                             | B          | 2        | 236              | 120              | 116   | 87               | 145 | 129   | 25   | 22 | 30   | 146.5 | 71 <sup>0</sup> <sub>-0.5</sub>  | 45    | 56    | 115 | 140 |
|           | 80M             | 1                              | 1                             | 1/2                           | B          | 2        | 268.5            | 140              | 128.5 | 97               | 163 | 135   | 25   | 22 | 35   | 161.5 | 80 <sup>0</sup> <sub>-0.5</sub>  | 50    | 62.5  | 125 | 160 |
|           | 90L             | <sup>2</sup> / <sub>3</sub>    | 2                             | 1                             | B          | 3        | 315              | 168.5            | 146.5 | 116              | 180 | 145   | 49   | 22 | 35.5 | 180   | 90 <sup>0</sup> <sub>-0.5</sub>  | 62.5  | 70    | 155 | 170 |
|           | 100L            | -                              | 3                             | 2                             | B          | 3        | 356              | 193              | 163   | 130.5            | 199 | 153   | 51.5 | 28 | 45   | 199.5 | 100 <sup>0</sup> <sub>-0.5</sub> | 70    | 80    | 175 | 195 |
|           | 112M            | 5                              | 5                             | 3                             | B          | 3        | 372              | 200              | 172   | 137.5            | 223 | 166.5 | 51.5 | 28 | 45   | 223.5 | 112 <sup>0</sup> <sub>-0.5</sub> | 70    | 95    | 175 | 224 |
| TFO-KK    | 132S            | <sup>7.5</sup> / <sub>10</sub> | 7.5                           | 5                             | B          | 4        | 427.5            | 239              | 188.5 | 153              | 250 | 197   | 56   | 36 | 50   | 257   | 132 <sup>0</sup> <sub>-0.5</sub> | 70    | 108   | 175 | 250 |
|           | 132M            | -                              | 10                            | 7.5                           | B          | 4        | 465.5            | 258              | 207.5 | 172              | 250 | 197   | 56   | 36 | 50   | 257   | 132 <sup>0</sup> <sub>-0.5</sub> | 89    | 108   | 212 | 250 |
|           | 160M            | <sup>15</sup> / <sub>20</sub>  | 15                            | 10                            | B          | 4        | 595              | 323              | 272   | 198              | 292 | 256   | 107  | 52 | 60   | 303.5 | 160 <sup>0</sup> <sub>-0.5</sub> | 105   | 127   | 300 | 300 |
|           | 160L            | 25                             | 20                            | 15                            | B          | 4        | 595              | 345              | 250   | 220              | 292 | 256   | 107  | 52 | 60   | 303.5 | 160 <sup>0</sup> <sub>-0.5</sub> | 127   | 127   | 300 | 300 |
|           | 180M            | 30                             | <sup>25</sup> / <sub>30</sub> | 20                            | B          | 4        | 643              | 351.5            | 291.5 | 226.5            | 340 | 279   | 75   | 52 | 90   | 350   | 180 <sup>0</sup> <sub>-0.5</sub> | 120.5 | 139.5 | 300 | 350 |
| TFO-KK    | 180L            | 40                             | 40                            | <sup>25</sup> / <sub>30</sub> | F          | 5        | 716              | 370.5            | 345.5 | 245.5            | 340 | -     | 75   | 52 | 90   | 494   | 180 <sup>0</sup> <sub>-0.5</sub> | 139.5 | 139.5 | 335 | 350 |
|           | (200LB)<br>200L | 50<br>60                       | 50<br>60                      | 40<br>50                      | F          | (6)<br>5 | (790)<br>820     | (395.5)<br>425.5 | 394.5 | (276.5)<br>270.5 | 391 | -     | 85   | 78 | 110  | 541.5 | 200 <sup>0</sup> <sub>-0.5</sub> | 152.5 | 159   | 365 | 400 |
|           | (225SB)<br>225S | 75                             | 75                            | 60                            | F          | (6)<br>5 | (826.5)<br>856.5 | (402)<br>432     | 424.5 | (283)<br>270.5   | 391 | -     | 85   | 78 | 110  | 566.5 | 225 <sup>0</sup> <sub>-0.5</sub> | 143   | 178   | 350 | 450 |
|           | (250SD)<br>250S | 100                            | 100                           | 75                            | F          | 7        | (909)<br>939     | (433.5)<br>463.5 | 475.5 | (313.5)<br>312.5 | 490 | -     | -    | 78 | 100  | 735   | 250 <sup>0</sup> <sub>-0.5</sub> | 155.5 | 203   | 428 | 500 |
|           | (250MD)<br>250M | 120                            | 120                           | 100                           | F          | 7        | (909)<br>939     | (452.5)<br>482.5 | 456.5 | (332.5)<br>331.5 | 490 | -     | -    | 78 | 100  | 735   | 250 <sup>0</sup> <sub>-0.5</sub> | 174.5 | 203   | 428 | 500 |
|           | (280SD)<br>280S | 150                            | 150                           | 120                           | F          | 7        | (1008)<br>1068   | (484)<br>544     | 524   | (364)<br>363     | 550 | -     | -    | 92 | 100  | 795   | 280 <sup>0</sup> <sub>-1.0</sub> | 184   | 228.5 | 501 | 550 |
|           | (280MD)<br>280M | 180                            | 180                           | 150                           | F          | 7        | (1008)<br>1068   | (509.5)<br>569.5 | 498.5 | (389.5)<br>388.5 | 550 | -     | -    | 92 | 100  | 795   | 280 <sup>0</sup> <sub>-1.0</sub> | 209.5 | 228.5 | 501 | 550 |
|           | 315S            | -                              | -                             | 180                           | F          | 7        | 1178             | 589              | 589   | 408              | 633 | -     | -    | 92 | 125  | 865   | 315 <sup>0</sup> <sub>-1.0</sub> | 203   | 254   | 540 | 615 |

( ) : 2 pole Motor



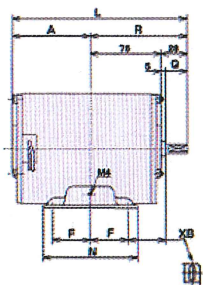


Fig.1

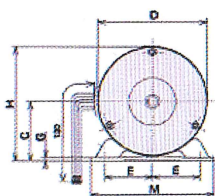


Fig.2

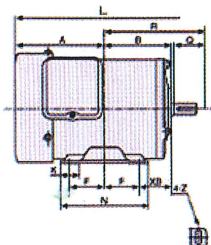


Fig.3

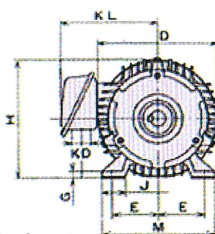


Fig.4

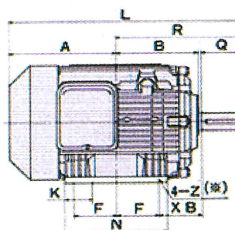


Fig.5

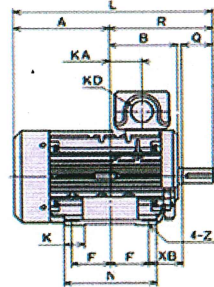


Fig.6

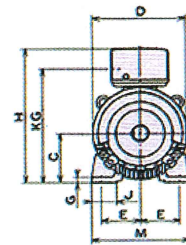
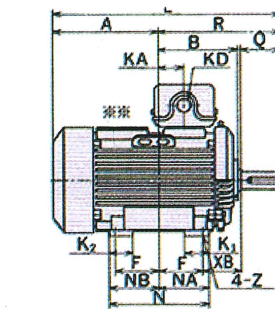


Fig.7



Shaft Dimension

| Dimension in mm |       |     |                                                            |            |            |            |              |            |  | Bearing No.       |                    | Approx Weight (kg) |            |            | Approx Packing Dimension (cm) |
|-----------------|-------|-----|------------------------------------------------------------|------------|------------|------------|--------------|------------|--|-------------------|--------------------|--------------------|------------|------------|-------------------------------|
| G               | Z     | XB  | S                                                          | W          | U          | T          | Q            | QR         |  | Drive End Side    | Opposite Side      | 2 Pole             | 4 Pole     | 6 Pole     | H x W x L                     |
| 3.2             | 7x21  | 40  | 14 <sup>+0/-0.011</sup>                                    | -          | 1          | -          | 23           | -          |  | 6202ZZ            | 6202ZZ             | -                  | 5          | -          | 14.5 x 15 x 26                |
| 3.2             | 7x21  | 40  | 14 <sup>+0/-0.011</sup>                                    | -          | 1          | -          | 23           | -          |  | 6202ZZ            | 6202ZZ             | -                  | 5.5        | -          | 14.5 x 15 x 26                |
| 3.2             | 7x20  | 45  | 14 <sup>+0.008/-0.003</sup>                                | 5          | 3          | 5          | 30           | 1          |  | 6203ZZ            | 6203ZZ             | 9.5                | 8.2        | -          | 16 x 22 x 27                  |
| 3.2             | 10x25 | 50  | 19 <sup>+0.009/-0.004</sup>                                | 6          | 3.5        | 6          | 40           | 0.3        |  | 6204ZZ            | 6204ZZ             | 13.5               | 12.5       | 16         | 18 x 24 x 31                  |
| 10              | 10    | 56  | 24 <sup>+0.009/-0.004</sup>                                | 8          | 4          | 7          | 50           | 0.3        |  | 6205ZZ            | 6205ZZ             | 15/16              | 16         | 16         | 20 x 27 x 37                  |
| 12.5            | 12    | 63  | 28 <sup>+0.009/-0.004</sup>                                | 8          | 4          | 7          | 60           | 0.5        |  | 6206ZZ            | 6206ZZ             | -                  | 21         | 23         | 25 x 29 x 39                  |
| 14              | 12    | 70  | 28 <sup>+0.009/-0.004</sup>                                | 8          | 4          | 7          | 60           | 0.5        |  | 6306ZZ            | 6306ZZ             | 27.5               | 28         | 30         | 27 x 32 x 41                  |
| 16              | 12    | 89  | 38 <sup>+0.018/+0.002</sup>                                | 10         | 5          | 8          | 80           | 0.5        |  | 6308ZZ            | 6306ZZ             | 39/44              | 40         | 41         | 34.2 x 45.5 x 57.5            |
| 16              | 12    | 89  | 38 <sup>+0.018/+0.002</sup>                                | 10         | 5          | 8          | 80           | 0.5        |  | 6308ZZ            | 6306ZZ             | -                  | 48         | 52         | 34.2 x 45.5 x 57.5            |
| 18              | 14.5  | 108 | 42 <sup>+0.018/+0.002</sup>                                | 12         | 5          | 8          | 110          | 1          |  | 6309ZZ            | 6307ZZ             | 70/79              | 73         | 75         | 39 x 51 x 72.5                |
| 18              | 14.5  | 108 | 42 <sup>+0.018/+0.002</sup>                                | 12         | 5          | 8          | 110          | 1          |  | 6309ZZ            | 6307ZZ             | 85                 | 85         | 90         | 39 x 51 x 72.5                |
| 20              | 14.5  | 121 | 48 <sup>+0.018/+0.002</sup>                                | 14         | 5.5        | 9          | 110          | 1.5        |  | 6311ZZ            | 6309ZZ             | 115                | 120/130    | 130        | 53 x 60 x 73                  |
| 20              | 14.5  | 121 | 55 <sup>+0.030/+0.011</sup>                                | 16         | 6          | 10         | 110          | 1.5        |  | 6312ZZ            | 6309ZZ             | 140                | 155        | 150/160    | 64 x 45 x 86                  |
| 23              | 18.5  | 133 | 55 <sup>+0.030/+0.011</sup><br>60 <sup>+0.030/+0.011</sup> | (16)<br>18 | (6)<br>7   | (10)<br>11 | (110)<br>140 | (-)<br>1.5 |  | (6312)<br>6313ZZ  | (6312ZZ)<br>6312ZZ | 200<br>210         | 210<br>230 | 220<br>240 | 67 x 50 x 91                  |
| 23              | 18.5  | 149 | 55 <sup>+0.030/+0.011</sup><br>65 <sup>+0.030/+0.011</sup> | (16)<br>18 | (6)<br>7   | (10)<br>11 | (110)<br>140 | (-)<br>2.5 |  | (6312)<br>6315ZZ  | (6312ZZ)<br>6312ZZ | 235                | 260        | 265        | 72 x 56 x 96                  |
| 30              | 24    | 168 | 55 <sup>+0.030/+0.011</sup><br>75 <sup>+0.030/+0.011</sup> | (16)<br>20 | (6)<br>7.5 | (10)<br>12 | (110)<br>140 | -          |  | (6313C3)<br>NU316 | (6313C3)<br>6313ZZ | 430                | 450        | 420        | 84 x 63 x 108                 |
| 30              | 24    | 168 | 55 <sup>+0.030/+0.011</sup><br>75 <sup>+0.030/+0.011</sup> | (16)<br>20 | (6)<br>7.5 | (10)<br>12 | (110)<br>140 | -          |  | (6313C3)<br>NU316 | (6313C3)<br>6313ZZ | 450                | 515        | 500        | 84 x 63 x 108                 |
| 30              | 24    | 190 | 55 <sup>+0.030/+0.011</sup><br>85 <sup>+0.030/+0.011</sup> | (16)<br>22 | (6)<br>9   | (10)<br>14 | (110)<br>170 | -          |  | (6313C3)<br>NU318 | (6313C3)<br>6315ZZ | 615                | 625        | 630        | 94 x 70 x 123                 |
| 30              | 24    | 190 | 55 <sup>+0.030/+0.011</sup><br>85 <sup>+0.030/+0.011</sup> | (16)<br>22 | (6)<br>9   | (10)<br>14 | (110)<br>170 | -          |  | (6313C3)<br>NU318 | (6313C3)<br>6315ZZ | 630                | 680        | 720        | 94 x 70 x 123                 |
| 28              | 28    | 216 | 95 <sup>+0.035/+0.013</sup>                                | 25         | 9          | 14         | 170          | -          |  | NU320             | 6318               | -                  | -          | 930        | 97 x 73 x 134                 |

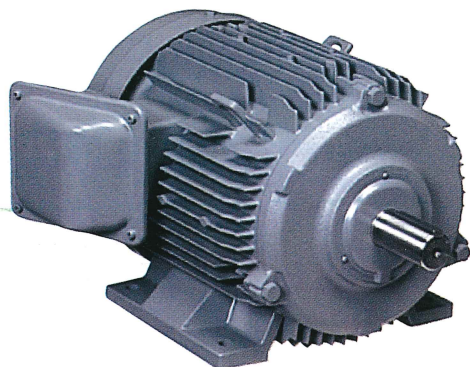


# Three-Phase Induction Motors

Totally Enclosed Fan-Cooled Type (TEFC)

IP55 Series / Foot Mount Type [ TFO-K(KK) ]

1/7~180HP (0.1~132kW) / Left terminal box position (upto 180M)



**Model:**

**xxHP or kW TFO-K(KK) xP IP55 TML**

Output

No of pole

| Item               |             | Specifications                                              |                                                         |
|--------------------|-------------|-------------------------------------------------------------|---------------------------------------------------------|
| Motor Output       |             | 1/7~180HP (0.1~132kW)                                       |                                                         |
| Rating             |             | Continuous [S1]                                             |                                                         |
| Number of pole     |             | 2, 4, 6 pole                                                |                                                         |
| Insulation Class   |             | F type                                                      |                                                         |
| Enclosure          |             | IP55 (Outdoor use)                                          |                                                         |
| Voltage, Frequency |             | Consult to nearest representative                           |                                                         |
| Number of Cable    |             | ~5 HP 6 Wires (Direct starting 220V or 380V)                |                                                         |
|                    |             | 7.5 HP ~ 6 Wires (Star $\Delta$ - $\Delta$ Delta Starting ) |                                                         |
|                    |             | 2 pole 30 HP ~                                              | 12 Wires<br>( Star $\Delta$ - $\Delta$ Delta Starting ) |
|                    |             | 4 pole 40 HP ~                                              |                                                         |
|                    |             | 6 pole 50 HP ~                                              |                                                         |
| Color              |             | Alcron gray (MUNSAELL 8.9Y5.1/0.3)                          |                                                         |
| Rotation           |             | CCW (View from motor drive end)                             |                                                         |
| Environment        | Temperature | -30 ~ 40 °C                                                 |                                                         |
|                    | Humidity    | Enclosed type Max 95% RH                                    |                                                         |
|                    | Altitude    | Max 1,000 m                                                 |                                                         |

| Type From | Frame size      | Output (HP)      |                 |                 | Insulation | Fig. No  | Dimension in mm  |                  |       |                  |     |     |                   |      |      |       |                      |
|-----------|-----------------|------------------|-----------------|-----------------|------------|----------|------------------|------------------|-------|------------------|-----|-----|-------------------|------|------|-------|----------------------|
|           |                 | 2 Pole           | 4 Pole          | 6 Pole          |            |          | L                | R                | A     | B                | D   | KL  | KD                | K    | J    | H     | C                    |
| TO-K      | 63M             | -                | 1/7             | -               | B          | 1        | 212              | 103              | 109   | 78.5             | 116 | 125 | PF1/2             | 25   | 25   | 134.5 | 63 $\frac{0}{-0.5}$  |
|           | 63M             | -                | 1/4             | -               | B          | 1        | 212              | 103              | 109   | 78.5             | 116 | 125 | PF1/2             | 25   | 25   | 134.5 | 63 $\frac{0}{-0.5}$  |
| TFO-K     | 71M             | 1/2              | 1/2             | -               | B          | 2        | 236              | 120              | 116   | 87               | 145 | 158 | PF3/4             | 25   | 30   | 164   | 71 $\frac{0}{-0.5}$  |
|           | 80M             | 1                | 1               | 1/2             | B          | 2        | 268.5            | 140              | 128.5 | 97               | 163 | 166 | PF3/4             | 25   | 35   | 175   | 80 $\frac{0}{-0.5}$  |
|           | 90L             | $\frac{2}{3}$    | 2               | 1               | B          | 3        | 315              | 168.5            | 146.5 | 116              | 180 | 168 | PF3/4             | 49   | 35.5 | 180   | 90 $\frac{0}{-0.5}$  |
|           | 100L            | -                | 3               | 2               | B          | 3        | 356              | 193              | 163   | 130.5            | 199 | 176 | PF 1              | 51.5 | 45   | 199.5 | 100 $\frac{0}{-0.5}$ |
|           | 112M            | 5                | 5               | 3               | B          | 3        | 372              | 200              | 172   | 137.5            | 223 | 190 | PF 1              | 51.5 | 45   | 223.5 | 112 $\frac{0}{-0.5}$ |
| TFO-KK    | 132S            | $\frac{7.5}{10}$ | 7.5             | 5               | B          | 4        | 427.5            | 239              | 188.5 | 153              | 250 | 234 | PF1 $\frac{1}{4}$ | 56   | 50   | 257   | 132 $\frac{0}{-0.5}$ |
|           | 132M            | -                | 10              | 7.5             | B          | 4        | 465.5            | 258              | 207.5 | 172              | 250 | 234 | PF1 $\frac{1}{4}$ | 56   | 50   | 257   | 132 $\frac{0}{-0.5}$ |
|           | 160M            | $\frac{15}{20}$  | 15              | 10              | B          | 4        | 595              | 323              | 272   | 198              | 292 | 260 | PF1 $\frac{1}{2}$ | 107  | 60   | 303.5 | 160 $\frac{0}{-0.5}$ |
|           | 160L            | 25               | 20              | 15              | B          | 4        | 595              | 345              | 250   | 220              | 292 | 260 | PF1 $\frac{1}{2}$ | 107  | 60   | 303.5 | 160 $\frac{0}{-0.5}$ |
|           | 180M            | 30               | $\frac{25}{30}$ | 20              | B          | 4        | 643              | 351.5            | 291.5 | 226.5            | 340 | 283 | PF 2              | 75   | 90   | 350   | 180 $\frac{0}{-0.5}$ |
| TFO-KK    | 180L            | 40               | 40              | $\frac{25}{30}$ | F          | 5        | 716              | 370.5            | 345.5 | 245.5            | 340 | -   | PF2 $\frac{1}{2}$ | 75   | 90   | 494   | 180 $\frac{0}{-0.5}$ |
|           | (200LB)<br>200L | 50<br>60         | 50<br>60        | 40<br>50        | F          | (6)<br>5 | (790)<br>820     | (395.5)<br>425.5 | 394.5 | (276.5)<br>270.5 | 391 | -   | PF2 $\frac{1}{2}$ | 85   | 110  | 541.5 | 200 $\frac{0}{-0.5}$ |
|           | (225SB)<br>225S | 75               | 75              | 60              | F          | (6)<br>5 | (826.5)<br>856.5 | (402)<br>432     | 424.5 | (283)<br>270.5   | 391 | -   | PF2 $\frac{1}{2}$ | 85   | 110  | 566.5 | 225 $\frac{0}{-0.5}$ |
|           | (250SD)<br>250S | 100              | 100             | 75              | F          | 6        | (909)<br>939     | (433.5)<br>463.5 | 475.5 | (313.5)<br>312.5 | 490 | -   | PF2 $\frac{1}{2}$ | -    | 100  | 735   | 250 $\frac{0}{-0.5}$ |
|           | (250MD)<br>250M | 120              | 120             | 100             | F          | 6        | (909)<br>939     | (452.5)<br>482.5 | 456.5 | (332.5)<br>331.5 | 490 | -   | PF2 $\frac{1}{2}$ | -    | 100  | 735   | 250 $\frac{0}{-0.5}$ |
|           | (280SD)<br>280S | 150              | 150             | 120             | F          | 6        | (1008)<br>1068   | (484)<br>544     | 524   | (364)<br>363     | 550 | -   | PF 3              | -    | 100  | 795   | 280 $\frac{0}{-1.0}$ |
|           | (280MD)<br>280M | 180              | 180             | 150             | F          | 6        | (1008)<br>1068   | (509.5)<br>569.5 | 498.5 | (389.5)<br>388.5 | 550 | -   | PF 3              | -    | 100  | 795   | 280 $\frac{0}{-1.0}$ |
|           | 315S            | -                | -               | 180             | F          | 6        | 1178             | 589              | 589   | 408              | 633 | -   | PF 3              | -    | 125  | 865   | 315 $\frac{0}{-1.0}$ |

( ) : 2 pole Motor



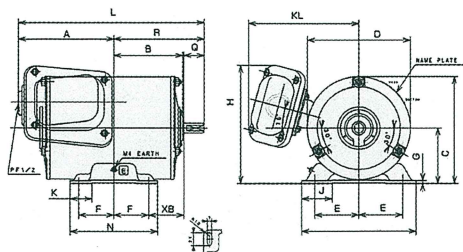


Fig.1

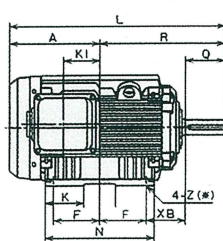


Fig.4

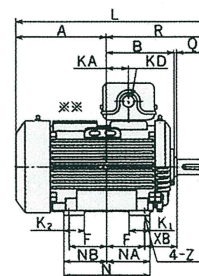


Fig.6

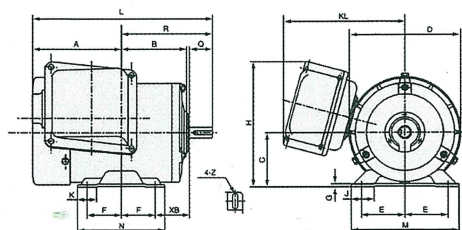


Fig.2

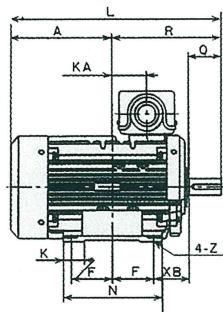


Fig.5

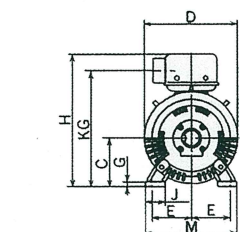
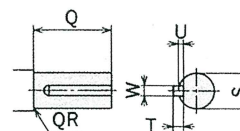


Fig.3



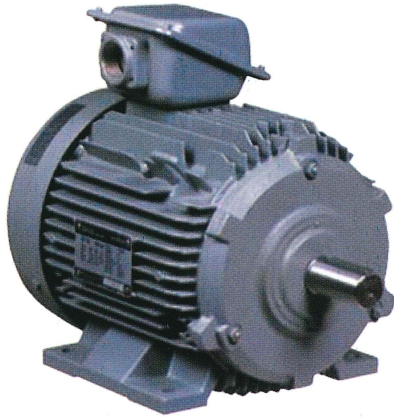
Shaft Dimension

| Dimension in mm |       |     |     |      |       |     |                                                                                        |            |            |            |              |            | Approx Weight (kg) |            |            | Approx Packing Dimension (cm) |
|-----------------|-------|-----|-----|------|-------|-----|----------------------------------------------------------------------------------------|------------|------------|------------|--------------|------------|--------------------|------------|------------|-------------------------------|
| F               | E     | N   | M   | G    | Z     | XB  | S                                                                                      | W          | U          | T          | Q            | QR         | 2 Pole             | 4 Pole     | 6 Pole     | H x W x L                     |
| 40              | 50    | 100 | 130 | 3.2  | 7x21  | 40  | 11 <sup>+0.011</sup> <sub>-0.011</sub>                                                 | —          | 1          | —          | 23           | 1.5        | 8                  | 8.5        | —          |                               |
| 40              | 50    | 100 | 130 | 3.2  | 7x21  | 40  | 11 <sup>+0.011</sup> <sub>-0.011</sub>                                                 | —          | 1          | —          | 23           | 1.5        | 8                  | 8.5        | —          |                               |
| 45              | 56    | 115 | 140 | 3.2  | 7x20  | 45  | 14 <sup>+0.008</sup> <sub>-0.003</sub>                                                 | 5          | 3          | 5          | 30           | 1.0        | 8                  | 8.5        | —          | 16 x 22 x 27                  |
| 50              | 62.5  | 125 | 160 | 3.2  | 10x25 | 50  | 19 <sup>+0.009</sup> <sub>-0.004</sub>                                                 | 6          | 3.5        | 6          | 40           | 0.3        | 10                 | 12         | 12         | 18 x 24 x 31                  |
| 62.5            | 70    | 155 | 170 | 10   | 10    | 56  | 24 <sup>+0.009</sup> <sub>-0.004</sub>                                                 | 8          | 4          | 7          | 50           | 0.3        | 15<br>16           | 16         | 16         | 20 x 27 x 37                  |
| 70              | 80    | 175 | 195 | 12.5 | 12    | 63  | 28 <sup>+0.009</sup> <sub>-0.004</sub>                                                 | 8          | 4          | 7          | 60           | 0.5        | —                  | 21         | 23         | 25 x 29 x 39                  |
| 70              | 95    | 175 | 224 | 14   | 12    | 70  | 28 <sup>+0.009</sup> <sub>-0.004</sub>                                                 | 8          | 4          | 7          | 60           | 0.5        | 27.5               | 28         | 30         | 27 x 32 x 41                  |
| 70              | 108   | 175 | 250 | 16   | 12    | 89  | 38 <sup>+0.018</sup> <sub>+0.002</sub>                                                 | 10         | 5          | 8          | 80           | 0.5        | 39<br>44           | 40         | 41         | 34.2 x 45.5 x 57.5            |
| 89              | 108   | 212 | 250 | 16   | 12    | 89  | 38 <sup>+0.018</sup> <sub>+0.002</sub>                                                 | 10         | 5          | 8          | 80           | 0.5        | —                  | 48         | 52         | 34.2 x 45.5 x 57.5            |
| 105             | 127   | 300 | 300 | 18   | 14.5  | 108 | 42 <sup>+0.018</sup> <sub>+0.002</sub>                                                 | 12         | 5          | 8          | 110          | 1          | 70<br>79           | 73         | 75         | 39 x 51 x 72.5                |
| 127             | 127   | 300 | 300 | 18   | 14.5  | 108 | 42 <sup>+0.018</sup> <sub>+0.002</sub>                                                 | 12         | 5          | 8          | 110          | 1          | 85                 | 85         | 90         | 39 x 51 x 72.5                |
| 120.5           | 139.5 | 300 | 350 | 20   | 14.5  | 121 | 48 <sup>+0.018</sup> <sub>+0.002</sub>                                                 | 14         | 5.5        | 9          | 110          | 1.5        | 115                | 120<br>130 | 130        | 53 x 60 x 73                  |
| 139.5           | 139.5 | 335 | 350 | 20   | 14.5  | 121 | 55 <sup>+0.030</sup> <sub>+0.011</sub>                                                 | 16         | 6          | 10         | 110          | 1.5        | 140                | 155        | 150<br>160 | 64 x 45 x 86                  |
| 152.5           | 159   | 365 | 400 | 23   | 18.5  | 133 | (55 <sup>+0.030</sup> <sub>+0.011</sub> )<br>(60 <sup>+0.030</sup> <sub>+0.011</sub> ) | (16)<br>18 | (6)<br>7   | (10)<br>11 | (110)<br>140 | (—)<br>1.5 | 200<br>210         | 210<br>230 | 220<br>240 | 67 x 50 x 91                  |
| 143             | 178   | 350 | 450 | 23   | 18.5  | 149 | (55 <sup>+0.030</sup> <sub>+0.011</sub> )<br>(65 <sup>+0.030</sup> <sub>+0.011</sub> ) | (16)<br>18 | (6)<br>7   | (10)<br>11 | (110)<br>140 | (—)<br>2.5 | 235                | 260        | 265        | 72 x 56 x 96                  |
| 155.5           | 203   | 428 | 500 | 30   | 24    | 168 | (55 <sup>+0.030</sup> <sub>+0.011</sub> )<br>(75 <sup>+0.030</sup> <sub>+0.011</sub> ) | (16)<br>20 | (6)<br>7.5 | (10)<br>12 | (110)<br>140 | —          | 430                | 450        | 420        | 84 x 63 x 108                 |
| 174.5           | 203   | 428 | 500 | 30   | 24    | 168 | (55 <sup>+0.030</sup> <sub>+0.011</sub> )<br>(75 <sup>+0.030</sup> <sub>+0.011</sub> ) | (16)<br>20 | (6)<br>7.5 | (10)<br>12 | (110)<br>140 | —          | 450                | 515        | 500        | 84 x 63 x 108                 |
| 184             | 228.5 | 501 | 550 | 30   | 24    | 190 | (55 <sup>+0.030</sup> <sub>+0.011</sub> )<br>(85 <sup>+0.030</sup> <sub>+0.011</sub> ) | (16)<br>22 | (6)<br>9   | (10)<br>14 | (110)<br>170 | —          | 610                | 625        | 630        | 94 x 70 x 123                 |
| 209.5           | 228.5 | 501 | 550 | 30   | 24    | 190 | (55 <sup>+0.030</sup> <sub>+0.011</sub> )<br>(85 <sup>+0.030</sup> <sub>+0.011</sub> ) | (16)<br>22 | (6)<br>9   | (10)<br>14 | (110)<br>170 | —          | 630                | 680        | 720        | 94 x 70 x 123                 |
| 203             | 254   | 540 | 615 | 28   | 28    | 216 | 95 <sup>+0.035</sup> <sub>+0.013</sub>                                                 | 25         | 9          | 14         | 170          | —          | —                  | —          | 930        | 97 x 73 x 134                 |



# Three-Phase Induction Motors

Totally Enclosed Fan-Cooled Type (TEFC)  
IP55 Series / Foot Mount Type [ TFO-K(KK) ]  
1/2~180HP (0.4~132kW)



**Model:**

**xxHP or kW TFO-K(KK) xP IP55 TMU**

Output

No of pole

| Item               |                                     | Specifications                                        |                                            |
|--------------------|-------------------------------------|-------------------------------------------------------|--------------------------------------------|
| Motor Output       |                                     | 1/2~180HP (0.4~132kW)                                 |                                            |
| Rating             |                                     | Continuous [S1]                                       |                                            |
| Number of pole     |                                     | 2, 4, 6 pole [ 8 Pole : only some range ]             |                                            |
| Insulation Class   |                                     | F Type                                                |                                            |
| Enclosure          |                                     | IP55 (Outdoor use)                                    |                                            |
| Voltage, Frequency |                                     | Consult to nearest representative                     |                                            |
| Number of Cable    |                                     | ~5HP : 6 Wires (Direct starting 220V or 380V)         |                                            |
|                    |                                     | 7.5 HP ~ : 6 Wires (Star $\Delta$ Delta Starting)     |                                            |
|                    |                                     | 2 pole 30 HP ~<br>4 pole 40 HP ~<br>6 pole 50 HP ~    | 12 Wires<br>(Star $\Delta$ Delta Starting) |
| Color              |                                     | Alcron gray                                           |                                            |
| Rotation           |                                     | CCW (View from motor drive end)                       |                                            |
| Environment        | Temperature<br>Humidity<br>Altitude | -30 ~ 40°C<br>Enclosed type Max 95% RH<br>Max 1,000 m |                                            |

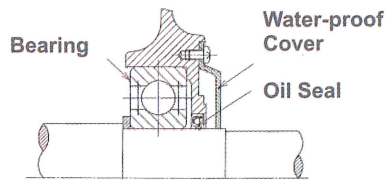
## DIMENSIONS (in mm)

| Type From | Frame size      | Output (HP)                  |                             |                             | Insulation | Fig. No | Dimension in mm  |                  |                  |                  |       |          |      |      |       |                                  |       |       |
|-----------|-----------------|------------------------------|-----------------------------|-----------------------------|------------|---------|------------------|------------------|------------------|------------------|-------|----------|------|------|-------|----------------------------------|-------|-------|
|           |                 | 2 Pole                       | 4 Pole                      | 6 Pole                      |            |         | L                | R                | A                | B                | D     | KD       | K    | J    | H     | C                                | F     | E     |
| TFO-K     | 71M             | 1/2                          | 1/2                         | —                           | F          | 1       | 239              | 120              | 119              | 90               | 145   | PF 3/4   | 25   | 30   | 225   | 71 <sup>0</sup> <sub>-0.5</sub>  | 45    | 56    |
|           | 80M             | 1                            | 1                           | 1/2                         | F          | 1       | 271.5            | 140              | 131.5            | 100              | 163   | PF 3/4   | 25   | 35   | 240   | 80 <sup>0</sup> <sub>-0.5</sub>  | 50    | 62.5  |
|           | 90L             | <sup>2</sup> <sub>3</sub>    | 2                           | 1                           | F          | 2       | 320              | 168.5            | 151.5            | 118.5            | 180   | PF 3/4   | 49   | 35.5 | 258   | 90 <sup>0</sup> <sub>-0.5</sub>  | 62.5  | 70    |
|           | 100L            | —                            | 3                           | 2                           | F          | 2       | 361              | 193              | 168              | 133              | 199   | PF 1     | 51.5 | 45   | 258   | 100 <sup>0</sup> <sub>-0.5</sub> | 70    | 80    |
|           | 112M            | 5                            | 5                           | 3                           | F          | 2       | 377              | 200              | 177              | 140              | 223   | PF 1     | 51.5 | 45   | 301   | 112 <sup>0</sup> <sub>-0.5</sub> | 70    | 95    |
| TFO-KK    | 132S            | <sup>7.5</sup> <sub>10</sub> | 7.5                         | 5                           | F          | 3       | 431.5            | 239              | 192.5            | 158              | 252   | PF 1 1/4 | 56   | 50   | 359.5 | 132 <sup>0</sup> <sub>-0.5</sub> | 70    | 108   |
|           | 132M            | —                            | 10                          | 7.5                         | F          | 3       | 469.5            | 258              | 211.5            | 177              | 252   | PF 1 1/4 | 56   | 50   | 359.5 | 132 <sup>0</sup> <sub>-0.5</sub> | 89    | 108   |
|           | 160M            | <sup>15</sup> <sub>20</sub>  | 15                          | 10                          | F          | 3       | 599              | 323              | 276              | 213              | 292   | PF 1 1/2 | 107  | 60   | 413.5 | 160 <sup>0</sup> <sub>-0.5</sub> | 105   | 127   |
|           | 160L            | 25                           | 20                          | 15                          | F          | 3       | 599              | 345              | 254              | 225              | 292   | PF 1 1/2 | 107  | 60   | 413.5 | 160 <sup>0</sup> <sub>-0.5</sub> | 127   | 127   |
|           | 180M            | 25                           | <sup>25</sup> <sub>30</sub> | 20                          | F          | 4       | 644              | 348.5            | 295.5            | 238.5            | 340   | PF 1 1/2 | 75   | 90   | 462   | 180 <sup>0</sup> <sub>-0.5</sub> | 120.5 | 139.5 |
| TFO-KK    | 180L            | 40                           | 40                          | <sup>25</sup> <sub>30</sub> | F          | 5       | 717              | 367.5            | 349.5            | 257.5            | 340   | PF 1 1/2 | 75   | 90   | 494   | 180 <sup>0</sup> <sub>-0.5</sub> | 139.5 | 139.5 |
|           | (200LB)<br>200L | 50<br>60                     | 50<br>60                    | 40                          | F          | 5       | (794)<br>824     | (395.5)<br>425.5 | 398.5            | (276.5)<br>285.5 | 389.2 | PF 2 1/2 | 85   | 110  | 541.5 | 200 <sup>0</sup> <sub>-0.5</sub> | 152.5 | 159   |
|           | (225SB)<br>225S | 75                           | 75                          | 50<br>60                    | F          | 5       | (830.5)<br>860.5 | (402)<br>432     | 428.5            | (283)<br>285.5   | 389.2 | PF 2 1/2 | 85   | 110  | 566.5 | 225 <sup>0</sup> <sub>-0.5</sub> | 143   | 178   |
|           | (250SD)<br>250S | 100                          | 100                         | 75                          | F          | 6       | (913)<br>943     | (433.5)<br>463.5 | 479.5            | (313.5)<br>312.5 | 520   | PF 2 1/2 | —    | 100  | 745   | 250 <sup>0</sup> <sub>-0.5</sub> | 155.5 | 203   |
|           | (250MD)<br>250M | 120                          | 120                         | 100                         | F          | 6       | (913)<br>943     | (452.5)<br>482.5 | 460.5            | (332.5)<br>331.5 | 520   | PF 2 1/2 | —    | 100  | 745   | 250 <sup>0</sup> <sub>-0.5</sub> | 174.5 | 203   |
|           | (280SD)<br>280S | 150                          | 150                         | 120                         | F          | 6       | (1016)<br>1072   | (484)<br>544     | (532)<br>528     | (364)<br>363     | 575   | PF 3     | —    | 100  | 805   | 280 <sup>0</sup> <sub>-1.0</sub> | 184   | 228.5 |
|           | (280MD)<br>280M | 180                          | 180                         | 150                         | F          | 6       | (1016)<br>1072   | (507.5)<br>569.5 | (506.5)<br>502.5 | (389.5)<br>388.5 | 575   | PF 3     | —    | 100  | 805   | 280 <sup>0</sup> <sub>-1.0</sub> | 209.5 | 228.5 |
|           | 315S            | —                            | —                           | 180                         | F          | 6       | 1182             | 589              | 593              | 408              | 633   | PF 3     | —    | 125  | 865   | 315 <sup>0</sup> <sub>-1.0</sub> | 203   | 254   |

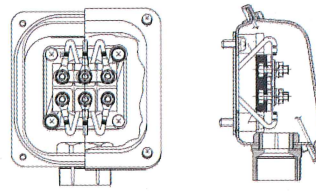
( ) : 2 pole Motor



### Construction around drive shaft



### Construction for Terminal Box



### Shaft Dimension

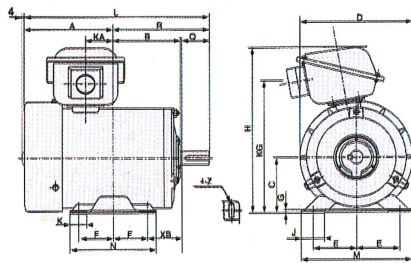
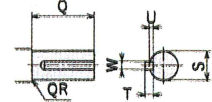


Fig.1

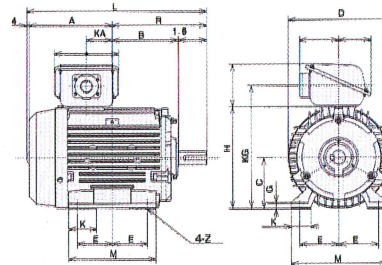


Fig.2

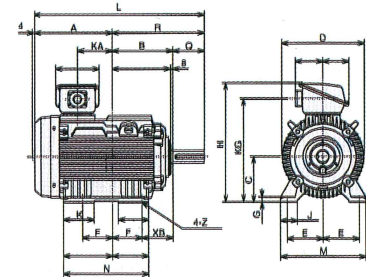


Fig.3

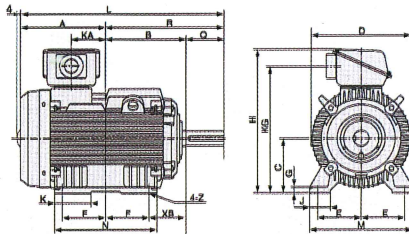


Fig.4

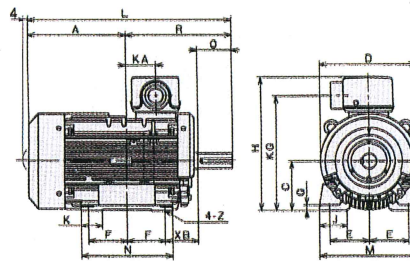


Fig.5

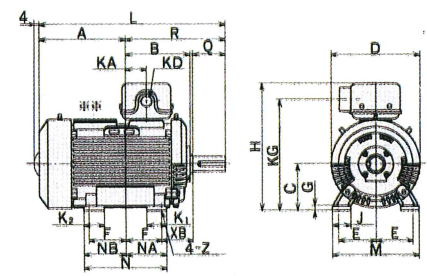


Fig.6

| Dimension in mm |     |      |       |     |                                                               |            |            |            |              |            | Approx Weight (kg) |            |            | Approx Packing Dimension (cm) |
|-----------------|-----|------|-------|-----|---------------------------------------------------------------|------------|------------|------------|--------------|------------|--------------------|------------|------------|-------------------------------|
| N               | M   | G    | Z     | XB  | S                                                             | W          | U          | T          | Q            | QR         | 2 Pole             | 4 Pole     | 6 Pole     | H x W x L                     |
| 115             | 140 | 3.2  | 7x20  | 45  | 14 <sup>+0.008/-0.003</sup>                                   | 5          | 3          | 5          | 30           | 1          | 9.5                | 8.2        | —          | 29 x 19 x 30                  |
| 125             | 160 | 3.2  | 10x25 | 50  | 19 <sup>+0.009/-0.004</sup>                                   | 6          | 3.5        | 6          | 40           | 0.3        | 13.5               | 12.5       | 16         | 30 x 20 x 34                  |
| 155             | 170 | 10   | 10    | 56  | 24 <sup>+0.009/-0.004</sup>                                   | 8          | 4          | 7          | 50           | 0.3        | 15 16              | 16         | 16         | 32 x 23 x 39                  |
| 175             | 195 | 12.5 | 12    | 63  | 28 <sup>+0.009/-0.004</sup>                                   | 8          | 4          | 7          | 60           | 0.5        | —                  | 21         | 23         | 36 x 30 x 40                  |
| 175             | 224 | 14   | 12    | 70  | 28 <sup>+0.009/-0.004</sup>                                   | 8          | 4          | 7          | 60           | 0.5        | 27.5               | 28         | 30         | 36 x 32 x 41                  |
| 175             | 250 | 16   | 12    | 89  | 38 <sup>+0.018/+0.002</sup>                                   | 10         | 5          | 8          | 80           | 0.5        | 39 44              | 40         | 41         | 42 x 35 x 52                  |
| 212             | 250 | 16   | 12    | 89  | 38 <sup>+0.018/+0.002</sup>                                   | 10         | 5          | 8          | 80           | 0.5        | —                  | 48         | 52         | 42 x 35 x 56                  |
| 300             | 300 | 18   | 14.5  | 108 | 42 <sup>+0.018/+0.002</sup>                                   | 12         | 5          | 8          | 110          | 1          | 70 79              | 73         | 75         | 50 x 51 x 66                  |
| 300             | 300 | 18   | 14.5  | 108 | 42 <sup>+0.018/+0.002</sup>                                   | 12         | 5          | 8          | 110          | 1          | 85                 | 85         | 90         | 50 x 51 x 66                  |
| 300             | 350 | 20   | 14.5  | 118 | 48 <sup>+0.018/+0.002</sup>                                   | 14         | 5.5        | 9          | 110          | 1.5        | 115                | 120 130    | 130        | 61 x 45 x 73                  |
| 335             | 350 | 20   | 14.5  | 118 | 55 <sup>+0.030/+0.011</sup>                                   | 16         | 6          | 10         | 110          | 1.5        | 145                | 160        | 155 165    | 64 x 45 x 86                  |
| 365             | 400 | 23   | 18.5  | 133 | (55 <sup>+0.030/-0.011</sup> )<br>60 <sup>+0.030/+0.011</sup> | (16)<br>18 | (6)<br>7   | (10)<br>11 | (110)<br>140 | (—)<br>1.5 | 205<br>215         | 215<br>235 | 225<br>245 | 67 x 50 x 94                  |
| 350             | 450 | 23   | 18.5  | 149 | (55 <sup>+0.030/-0.011</sup> )<br>65 <sup>+0.030/+0.011</sup> | (16)<br>18 | (6)<br>7   | (10)<br>11 | (110)<br>140 | (—)<br>2.5 | 240                | 265        | 270        | 72 x 56 x 96                  |
| 420             | 500 | 30   | 24    | 168 | (55 <sup>+0.030/-0.011</sup> )<br>75 <sup>+0.030/+0.011</sup> | (16)<br>20 | (6)<br>7.5 | (10)<br>12 | (110)<br>140 | —          | 470                | 490        | 475        | 85 x 62 x 112                 |
| 420             | 500 | 30   | 24    | 168 | (55 <sup>+0.030/-0.011</sup> )<br>75 <sup>+0.030/+0.011</sup> | (16)<br>20 | (6)<br>7.5 | (10)<br>12 | (110)<br>140 | —          | 490                | 535        | 555        | 85 x 62 x 112                 |
| 490             | 550 | 30   | 24    | 190 | (55 <sup>+0.030/-0.011</sup> )<br>85 <sup>+0.030/+0.011</sup> | (16)<br>22 | (6)<br>9   | (10)<br>14 | (110)<br>170 | —          | 630                | 645        | 685        | 92 x 67 x 122                 |
| 490             | 550 | 30   | 24    | 190 | (55 <sup>+0.030/-0.011</sup> )<br>85 <sup>+0.030/+0.011</sup> | (16)<br>22 | (6)<br>9   | (10)<br>14 | (110)<br>170 | —          | 675                | 725        | 745        | 92 x 67 x 122                 |
| 540             | 615 | 28   | 28    | 216 | 95 <sup>+0.035/+0.013</sup>                                   | 25         | 9          | 14         | 170          | —          | —                  | —          | 930        | 97 x 73 x 134                 |

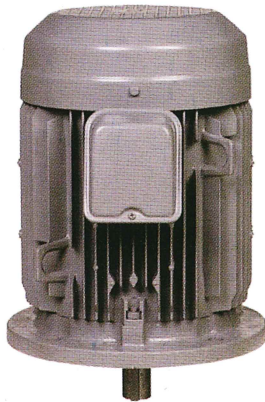


# Three-Phase Induction Motors

Totally Enclosed Fan-Cooled Type (TEFC)

IP44 Series / Flange Type (Vertical Type) [ VTFO-K(KK) ]

1/7~180HP (0.1~132kW)



**Model:**

**xxHP or kW VTFO-K(KK) xP IP44**

Output

No of pole

| Item               |             | Specifications                                  |                                            |
|--------------------|-------------|-------------------------------------------------|--------------------------------------------|
| Motor Output       |             | 1/7~180HP (0.1~132kW)                           |                                            |
| Rating             |             | Continuous [S1]                                 |                                            |
| Number of pole     |             | 2, 4, 6 pole [ 8 Pole : only some range ]       |                                            |
| Insulation Class   | B Type      | ~180 M                                          |                                            |
|                    | F Type      | 180 L~                                          |                                            |
| Enclosure          |             | IP44 (Outdoor type is also available)           |                                            |
| Voltage, Frequency |             | Consult to nearest representative               |                                            |
| Number of Cable    |             | ~5 HP 6 Wires (Direct starting 220V or 380V)    |                                            |
|                    |             | 7.5 HP ~ 6 Wires (Star $\Delta$ Delta Starting) |                                            |
|                    |             | 2 pole 30 HP ~                                  | 12 Wires<br>(Star $\Delta$ Delta Starting) |
|                    |             | 4 pole 40 HP ~                                  |                                            |
|                    |             | 6 pole 50 HP ~                                  |                                            |
| Color              |             | Alcron gray                                     |                                            |
| Rotation           |             | CCW (View from motor drive end)                 |                                            |
| Environment        | Temperature | -30 ~ 40 °C                                     |                                            |
|                    | Humidity    | Enclosed type Max 95% RH                        |                                            |
|                    | Altitude    | Max 1,000 m                                     |                                            |

| Type From | Flange size | Frame size      | Output (HP) |            |            | Insulation | Fig. No | Dimension in mm |                      |     |     |    |      |     |
|-----------|-------------|-----------------|-------------|------------|------------|------------|---------|-----------------|----------------------|-----|-----|----|------|-----|
|           |             |                 | 2 Pole      | 4 Pole     | 6 Pole     |            |         | LA              | LB                   | LC  | LE  | LG | LZ   | D   |
| VTO-K     | FF130       | 63M             | -           | 1/7<br>1/4 | -          | B          | 1       | 130             | 110 +0.013<br>-0.009 | 160 | 3.5 | 8  | 10   | 116 |
| VTFO-K    | FF130       | 71M             | 1/2         | 1/2        | -          | B          | 2       | 130             | 110 +0.013<br>-0.009 | 160 | 3.5 | 10 | 10   | 145 |
|           | FF165       | 80M             | 1           | 1          | 1/2        | B          | 2       | 165             | 130 +0.014<br>-0.011 | 200 | 3.5 | 12 | 12   | 163 |
|           |             | 90L             | 2<br>3      | 2          | 1          | B          | 3       | 165             | 130 +0.014<br>-0.011 | 200 | 3.5 | 12 | 12   | 180 |
|           | FF215       | 100L            | -           | 3          | 2          | B          | 4       | 215             | 180 +0.014<br>-0.011 | 250 | 4   | 16 | 14.5 | 199 |
|           |             | 112M            | 5           | 5          | 3          | B          | 4       | 215             | 180 +0.014<br>-0.011 | 250 | 4   | 16 | 14.5 | 223 |
| VTFO-KK   | FF265       | 132S            | 7.5<br>10   | 7.5        | 5          | B          | 5       | 265             | 230 +0.016<br>-0.013 | 300 | 4   | 20 | 14.5 | 250 |
|           |             | 132M            | -           | 10         | 7.5        | B          | 5       | 265             | 230 +0.016<br>-0.013 | 300 | 4   | 20 | 14.5 | 250 |
|           | FF300       | 160M            | 15<br>20    | 15         | 10         | B          | 5       | 300             | 250 +0.016<br>-0.013 | 350 | 5   | 20 | 18.5 | 290 |
|           |             | 160L            | 25          | 20         | 15         | B          | 5       | 300             | 250 +0.016<br>-0.013 | 350 | 5   | 20 | 18.5 | 290 |
|           | FF350       | 180M            | 30          | 25<br>30   | 20         | B          | 5       | 350             | 300 +0.016<br>-0.016 | 395 | 5   | 20 | 18.5 | 340 |
| VTFO-KK   | FF350       | 180L            | 40          | 40         | 25<br>30   | F          | 5       | 350             | 300 +0.016<br>-0.016 | 395 | 5   | 20 | 18.5 | 340 |
|           | FF400       | (200LB)<br>200L | 50<br>60    | 50<br>60   | 40<br>50   | F          | 6       | 400             | 350 +0.018<br>-0.018 | 445 | 5   | 22 | 18.5 | 391 |
|           |             | (225SB)<br>225S | 75          | 75         | 60         | F          | 6       | 500             | 450 +0.020<br>-0.020 | 545 | 5   | 22 | 18.5 | 391 |
|           | FF500       | (250MD)<br>250M | 100<br>120  | 100<br>120 | 75<br>100  | F          | 7       | 500             | 450 +0.020<br>-0.020 | 545 | 5   | 22 | 18.5 | 490 |
|           |             | (280MD)<br>280M | 150<br>180  | 150<br>180 | 120<br>150 | F          | 7       | 600             | 550 +0.022<br>-0.022 | 655 | 6   | 25 | 24   | 550 |
|           | FF600       | 315M            | -           | -          | 180        | F          | 7       | 600             | 550 +0.022<br>-0.022 | 655 | 6   | 25 | 24   | 633 |
|           |             |                 |             |            |            |            |         |                 |                      |     |     |    |      |     |

( ) : 2 pole Motor



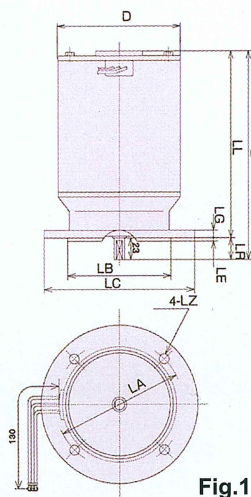


Fig.1

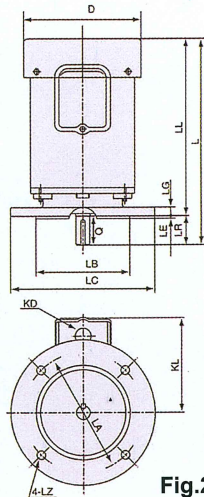


Fig.2

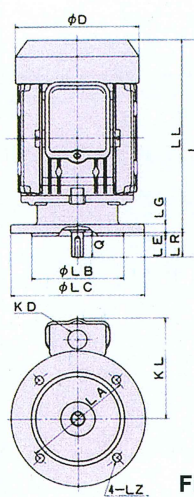


Fig.3

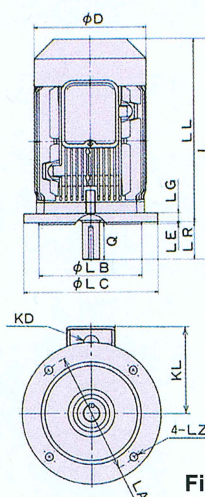


Fig.4

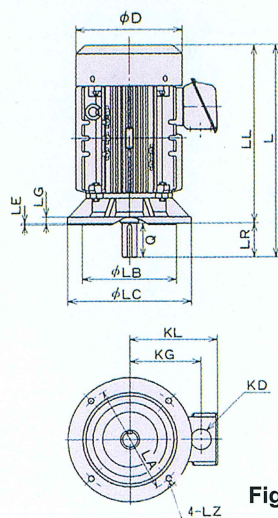


Fig.5

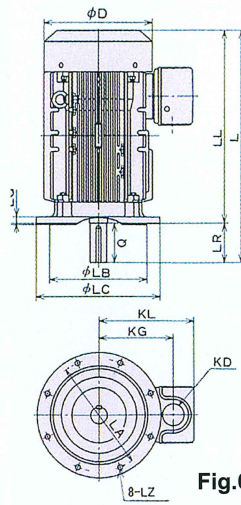


Fig.6

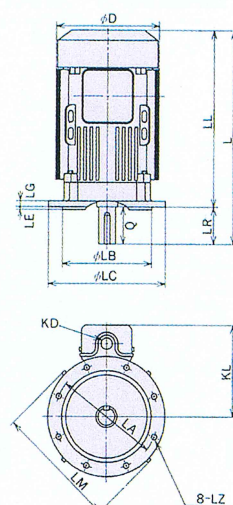
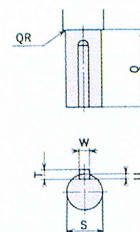


Fig.7



Shaft Dimension

| Dimension in mm  |              |       |    |              |                                                                                     |            |            |            |              |            | Bearing No.      |                    | Approx Weight (kg)             |                                   |                                   | Approx Packing Dimension (cm)      |
|------------------|--------------|-------|----|--------------|-------------------------------------------------------------------------------------|------------|------------|------------|--------------|------------|------------------|--------------------|--------------------------------|-----------------------------------|-----------------------------------|------------------------------------|
| L                | LL           | KL    | KD | LR           | S                                                                                   | W          | U          | T          | Q            | QR         | Drive End Side   | Opposite Side      | 2 Pole                         | 4 Pole                            | 6 Pole                            | H x W x L                          |
| 219              | 196          | -     | -  | 23           | 11 <sup>+0</sup> <sub>-0.011</sub>                                                  | -          | 1          | -          | 23           | -          | 6202ZZ           | 6202ZZ             | 6.9                            | -                                 | -                                 | 23 x 21.5 x 31.5                   |
| 256              | 226          | 123   | 22 | 30           | 14 <sup>+0.008</sup> <sub>-0.003</sub>                                              | 5          | 3          | 5          | 30           | 1          | 6203ZZ           | 6203ZZ             | 10.5                           | 9                                 | -                                 | 32 x 25 x 28                       |
| 283              | 243          | 131   | 22 | 40           | 19 <sup>+0.009</sup> <sub>-0.004</sub>                                              | 6          | 3.5        | 6          | 40           | 0.3        | 6204ZZ           | 6204ZZ             | 15.5                           | 14.4                              | 17.5                              | 34 x 30 x 32                       |
| 324              | 274          | 145   | 22 | 50           | 24 <sup>+0.009</sup> <sub>-0.004</sub>                                              | 8          | 4          | 7          | 50           | 0.3        | 6205ZZ           | 6205ZZ             | 17 <sup>17</sup> <sub>18</sub> | 18                                | 17                                | 40 x 30 x 33                       |
| 356              | 296          | 153   | 28 | 60           | 28 <sup>+0.009</sup> <sub>-0.004</sub>                                              | 8          | 4          | 7          | 60           | 0.5        | 6206ZZ           | 6206ZZ             | -                              | 24                                | 25                                | 41 x 35 x 37                       |
| 372              | 312          | 166.5 | 28 | 60           | 28 <sup>+0.009</sup> <sub>-0.004</sub>                                              | 8          | 4          | 7          | 60           | 0.5        | 6306ZZ           | 6306ZZ             | 30                             | 32                                | 32                                | 47 x 35 x 37                       |
| 427.5            | 347.5        | 197   | 36 | 80           | 38 <sup>+0.018</sup> <sub>+0.002</sub>                                              | 10         | 5          | 8          | 80           | 0.5        | 6308ZZ           | 6306ZZ             | 43 <sup>43</sup> <sub>48</sub> | 44                                | 45                                | 55 x 41 x 43                       |
| 465.5            | 385.5        | 197   | 36 | 80           | 38 <sup>+0.018</sup> <sub>+0.002</sub>                                              | 10         | 5          | 8          | 80           | 0.5        | 6308ZZ           | 6306ZZ             | -                              | 52                                | 57                                | 59 x 41 x 43                       |
| 595              | 485          | 256   | 52 | 110          | 42 <sup>+0.018</sup> <sub>+0.002</sub>                                              | 12         | 5          | 8          | 110          | 1.0        | 6309ZZ           | 6307ZZ             | 83 <sup>83</sup> <sub>89</sub> | 85                                | 82                                | 70 x 42 x 52                       |
| 595              | 485          | 256   | 52 | 110          | 42 <sup>+0.018</sup> <sub>+0.002</sub>                                              | 12         | 5          | 8          | 110          | 1.0        | 6309ZZ           | 6307ZZ             | 90                             | 90                                | 96                                | 70 x 42 x 52                       |
| 670              | 560          | 279   | 52 | 110          | 48 <sup>+0.018</sup> <sub>+0.002</sub>                                              | 14         | 5.5        | 9          | 110          | 1.0        | 6312ZZ           | 6309ZZ             | 130                            | 130 <sup>130</sup> <sub>140</sub> | 140                               | 80 x 50 x 56                       |
| 743              | 633          | 314   | 52 | 110          | 55 <sup>+0.030</sup> <sub>+0.011</sub>                                              | 16         | 6          | 10         | 110          | 1.5        | 6312ZZ           | 6309ZZ             | 140                            | 165                               | 160 <sup>160</sup> <sub>170</sub> | 87 x 50 x 59                       |
| (790)<br>820     | 680          | 341.5 | 52 | (110)<br>140 | (55 <sup>+0.030</sup> <sub>+0.011</sub> )<br>60 <sup>+0.030</sup> <sub>+0.011</sub> | (16)<br>18 | (6)<br>7   | (10)<br>11 | (110)<br>140 | (-)<br>1.5 | (6312)<br>6313ZZ | (6312ZZ)<br>6312ZZ | 210<br>220                     | 220<br>240                        | 230<br>250                        | (90 x 53 x 64)<br>93 x 53 x 64     |
| (826.5)<br>856.5 | 716.5        | 341.5 | 78 | (110)<br>140 | (55 <sup>+0.030</sup> <sub>+0.011</sub> )<br>65 <sup>+0.030</sup> <sub>+0.011</sub> | (16)<br>18 | (6)<br>7   | (10)<br>11 | (110)<br>140 | (-)<br>2.5 | (6312)<br>6315ZZ | (6312ZZ)<br>6312ZZ | 245                            | 270                               | 275                               | (93 x 65 x 68)<br>96 x 65 x 68     |
| (909)<br>939     | 799          | 485   | 78 | (110)<br>140 | (55 <sup>+0.030</sup> <sub>+0.011</sub> )<br>75 <sup>+0.030</sup> <sub>+0.011</sub> | (16)<br>20 | (6)<br>7.5 | (10)<br>12 | (110)<br>140 | -          | (6313C3)<br>6316 | (6313C3)<br>6313ZZ | 470<br>490                     | 490<br>540                        | 490<br>550                        | (103 x 71 x 91)<br>106 x 71 x 91   |
| (1012)<br>1068   | (902)<br>898 | 515   | 92 | (110)<br>170 | (55 <sup>+0.030</sup> <sub>+0.011</sub> )<br>85 <sup>+0.030</sup> <sub>+0.011</sub> | (16)<br>22 | (6)<br>9   | (10)<br>14 | (110)<br>170 | -          | (6313C3)<br>6318 | (6313C3)<br>6315ZZ | 660<br>680                     | 675<br>730                        | 680<br>750                        | (113 x 81 x 100)<br>119 x 81 x 100 |
| 1228             | 1058         | 550   | 92 | 170          | 95 <sup>+0.035</sup> <sub>+0.013</sub>                                              | 25         | 9          | 14         | 170          | -          | 6320             | 6318               | -                              | -                                 | 980                               | 135 x 96 x 110                     |



# Three-Phase Induction Motors

Totally Enclosed Fan-Cooled Type (TEFC)

IP55 Series / Flange Type (Vertical Type) [ VTFO-K(KK) ]

1/2~180HP (0.4~132kW)



**Model:**

**xxHP or kW VTFO-K(KK) xP IP55**

Output

No of pole

| Item               |                                     | Specifications                                         |                                       |
|--------------------|-------------------------------------|--------------------------------------------------------|---------------------------------------|
| Motor Output       |                                     | 1/2 ~ 180HP (0.4 ~ 132kW)                              |                                       |
| Rating             |                                     | Continuous [S1]                                        |                                       |
| Number of pole     |                                     | 2, 4, 6 pole [ 8 Pole : only some range ]              |                                       |
| Insulation Class   |                                     | F Type                                                 |                                       |
| Enclosure          |                                     | IP55 (Outdoor use)                                     |                                       |
| Voltage, Frequency |                                     | Consult to nearest representative                      |                                       |
| Number of Cable    |                                     | ~5 HP : 6 Wires (Direct starting 220V or 380V)         |                                       |
|                    |                                     | 7.5HP ~ : 6 Wires (Star Δ-Δ Delta Starting)            |                                       |
|                    |                                     | 2 pole 30 HP ~<br>4 pole 40 HP ~<br>6 pole 50 HP ~     | 12 Wires<br>(Star Δ-Δ Delta Starting) |
| Color              |                                     | Alcron gray                                            |                                       |
| Rotation           |                                     | CCW (View from motor drive end)                        |                                       |
| Environment        | Temperature<br>Humidity<br>Altitude | -30 ~ 40 °C<br>Enclosed type Max 95% RH<br>Max 1,000 m |                                       |

## DIMENSIONS (in mm)

| Type From | Flange size | Frame size      | Output (HP) |            |           | Insulation | Fig. No  | Dimension in mm |                      |     |     |    |      |     |                  |
|-----------|-------------|-----------------|-------------|------------|-----------|------------|----------|-----------------|----------------------|-----|-----|----|------|-----|------------------|
|           |             |                 | 2 Pole      | 4 Pole     | 6 Pole    |            |          | LA              | LB                   | LC  | LE  | LG | LZ   | D   | L                |
| VTFO-K    | FF130       | 71M             | 1/2         | 1/2        | —         | F          | 1        | 130             | 110 +0.013<br>-0.009 | 160 | 3.5 | 10 | 10   | 145 | 260              |
|           | FF165       | 80M             | 1           | 1          | 1/2       | F          | 1        | 165             | 130 +0.014<br>-0.011 | 200 | 3.5 | 12 | 12   | 163 | 287              |
|           |             | 90L             | 2<br>3      | 2          | 1         | F          | 2        | 165             | 130 +0.014<br>-0.011 | 200 | 3.5 | 12 | 12   | 180 | 327              |
|           | FF215       | 100L            | —           | 3          | 2         | F          | 2        | 215             | 180 +0.014<br>-0.011 | 250 | 4   | 16 | 14.5 | 199 | 360              |
|           |             | 112M            | 5           | 5          | 3         | F          | 3        | 215             | 180 +0.014<br>-0.011 | 250 | 4   | 16 | 14.5 | 223 | 376              |
| VTFO-KK   | FF265       | 132S            | 7.5<br>10   | 7.5        | 5         | F          | 4        | 265             | 230 +0.014<br>-0.011 | 300 | 4   | 20 | 14.5 | 250 | 431.5            |
|           |             | 132M            | —           | 10         | 7.5       | F          | 4        | 265             | 230 +0.016<br>-0.013 | 300 | 4   | 20 | 14.5 | 250 | 469.5            |
|           | FF300       | 160M            | 15<br>20    | 15         | 10        | F          | 4        | 300             | 250 +0.016<br>-0.013 | 350 | 5   | 20 | 18.5 | 285 | 599              |
|           |             | 160L            | 25          | 20         | 15        | F          | 4        | 300             | 250 +0.016<br>-0.013 | 350 | 5   | 20 | 18.5 | 285 | 599              |
|           | FF350       | 180M            | 25          | 25<br>30   | 20        | F          | 5        | 350             | 300 +0.016<br>-0.013 | 395 | 5   | 20 | 18.5 | 340 | 674              |
| VTFO-KK   | FF350       | 180L            | 40          | 40         | 25<br>30  | F          | 5        | 350             | 300 +0.016<br>-0.013 | 395 | 5   | 20 | 18.5 | 340 | 747              |
|           | FF400       | (200LB)<br>200L | 50<br>60    | 50<br>60   | 40<br>50  | F          | (7)<br>6 | 400             | 350 +0.018<br>-0.018 | 445 | 5   | 22 | 18.5 | 391 | (790)<br>820     |
|           |             | (225SB)<br>225S | 75          | 75         | 60        | F          | (7)<br>6 | 500             | 450 +0.020<br>-0.020 | 545 | 5   | 22 | 18.5 | 391 | (826.5)<br>856.5 |
|           | FF500       | (250MD)<br>250M | 100<br>120  | 100<br>120 | 75<br>100 | F          | 8        | 500             | 450 +0.020<br>-0.020 | 545 | 5   | 22 | 18.5 | 490 | (909)<br>939     |
|           |             | (280MD)<br>280M | 150<br>180  | 150<br>180 | 90<br>150 | F          | 8        | 600             | 550 +0.022<br>-0.022 | 655 | 6   | 25 | 24   | 550 | (1012)<br>1068   |
|           | FF600       | 315M            | —           | —          | 180       | F          | 8        | 600             | 550 +0.022<br>-0.022 | 655 | 6   | 25 | 24   | 633 | 1228             |

( ) : 2 pole Motor



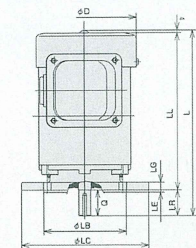


Fig.1

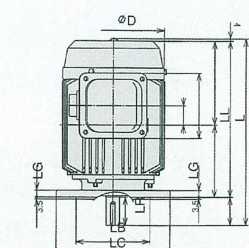


Fig.2

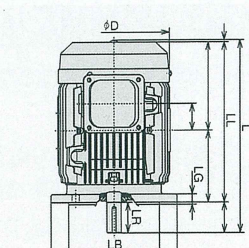


Fig.3

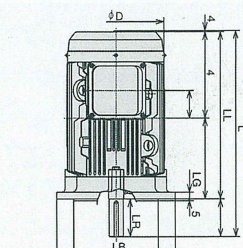


Fig.4

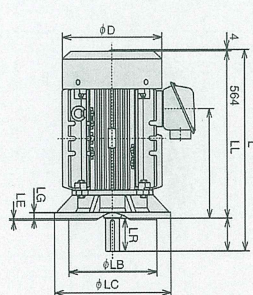


Fig.5

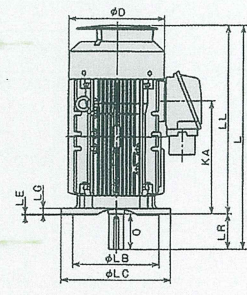


Fig.6

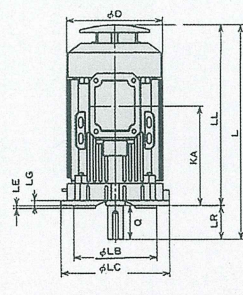


Fig.7

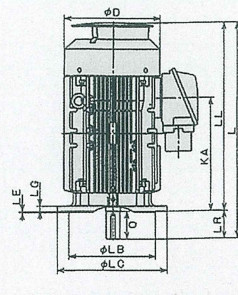
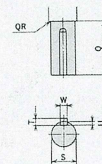


Fig.8

Shaft Dimension



| Dimension in mm      |          |       |                                        |                                                                            |                                      |                                     |                                      |                                         |                                     | Approx Weight (kg)                  |                                     |                                     | Approx Packing Dimension (cm)                                            |
|----------------------|----------|-------|----------------------------------------|----------------------------------------------------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|-----------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------------------------------------------|
| LL                   | KD       | KL    | LR                                     | S                                                                          | W                                    | U                                   | T                                    | Q                                       | QR                                  | 2 Pole                              | 4 Pole                              | 6 Pole                              | H x W x L                                                                |
| 230                  | PF 3/4   | 148   | 30                                     | 14 <sup>+0.008</sup> / <sub>-0.003</sub>                                   | 5                                    | 3                                   | 5                                    | 30                                      | 1                                   | 10.5                                | 9                                   | —                                   | 32 x 25 x 28                                                             |
| 247                  | PF 3/4   | 156   | 40                                     | 19 <sup>+0.009</sup> / <sub>-0.004</sub>                                   | 6                                    | 3.5                                 | 6                                    | 40                                      | 0.3                                 | 15.5                                | 14.4                                | 17.5                                | 34 x 30 x 32                                                             |
| 277                  | PF 3/4   | 168   | 50                                     | 24 <sup>+0.009</sup> / <sub>-0.004</sub>                                   | 8                                    | 4                                   | 7                                    | 50                                      | 0.3                                 | 17 <sup>17</sup> / <sub>18</sub>    | 18                                  | 17                                  | 40 x 30 x 33                                                             |
| 300                  | PF 1     | 176   | 60                                     | 28 <sup>+0.009</sup> / <sub>-0.004</sub>                                   | 8                                    | 4                                   | 7                                    | 60                                      | 0.5                                 | —                                   | 24                                  | 25                                  | 41 x 35 x 37                                                             |
| 316                  | PF 1     | 166.5 | 60                                     | 28 <sup>+0.009</sup> / <sub>-0.004</sub>                                   | 8                                    | 4                                   | 7                                    | 60                                      | 0.5                                 | 30                                  | 32                                  | 32                                  | 47 x 35 x 37                                                             |
| 351.5                | PF 1 1/4 | 197   | 80                                     | 38 <sup>+0.018</sup> / <sub>+0.002</sub>                                   | 10                                   | 5                                   | 8                                    | 80                                      | 0.5                                 | 43 <sup>43</sup> / <sub>48</sub>    | 44                                  | 45                                  | 55 x 41 x 43                                                             |
| 389.5                | PF 1 1/4 | 197   | 80                                     | 38 <sup>+0.018</sup> / <sub>+0.002</sub>                                   | 10                                   | 5                                   | 8                                    | 80                                      | 0.5                                 | —                                   | 52                                  | 57                                  | 59 x 41 x 43                                                             |
| 489                  | PF 1 1/2 | 259.5 | 110                                    | 42 <sup>+0.018</sup> / <sub>+0.002</sub>                                   | 12                                   | 5                                   | 8                                    | 110                                     | 1.0                                 | 83 <sup>83</sup> / <sub>89</sub>    | 85                                  | 82                                  | 70 x 42 x 52                                                             |
| 489                  | PF 1 1/2 | 259.5 | 110                                    | 42 <sup>+0.018</sup> / <sub>+0.002</sub>                                   | 12                                   | 5                                   | 8                                    | 110                                     | 1.0                                 | 90                                  | 90                                  | 96                                  | 70 x 42 x 52                                                             |
| 564                  | PF 2     | 282.5 | 110                                    | 48 <sup>+0.018</sup> / <sub>+0.002</sub>                                   | 14                                   | 5.5                                 | 9                                    | 110                                     | 1.0                                 | 130                                 | 130 <sup>130</sup> / <sub>140</sub> | 140                                 | 80 x 50 x 56                                                             |
| 637                  | PF 2 1/2 | 317.5 | 110                                    | 55 <sup>+0.030</sup> / <sub>+0.011</sub>                                   | 16                                   | 6                                   | 10                                   | 110                                     | 1.5                                 | 140                                 | 165                                 | 160 <sup>160</sup> / <sub>170</sub> | 87 x 50 x 59                                                             |
| 680                  | PF 2 1/2 | 341.5 | (110) <sup>(55)</sup> / <sub>140</sub> | (55) <sup>(55)</sup> / <sub>60</sub> <sup>+0.030</sup> / <sub>+0.011</sub> | (16) <sup>(16)</sup> / <sub>18</sub> | (6) <sup>(6)</sup> / <sub>7</sub>   | (10) <sup>(10)</sup> / <sub>11</sub> | (110) <sup>(110)</sup> / <sub>140</sub> | (—) <sup>(—)</sup> / <sub>1.5</sub> | 210 <sup>210</sup> / <sub>220</sub> | 220 <sup>220</sup> / <sub>240</sub> | 230 <sup>230</sup> / <sub>250</sub> | (90 x 53 x 64) <sup>(90 x 53 x 64)</sup> / <sub>93 x 53 x 64</sub>       |
| 716.5                | PF 2 1/2 | 341.5 | (110) <sup>(55)</sup> / <sub>140</sub> | (55) <sup>(55)</sup> / <sub>65</sub> <sup>+0.030</sup> / <sub>+0.011</sub> | (16) <sup>(16)</sup> / <sub>18</sub> | (6) <sup>(6)</sup> / <sub>7</sub>   | (10) <sup>(10)</sup> / <sub>11</sub> | (110) <sup>(110)</sup> / <sub>140</sub> | (—) <sup>(—)</sup> / <sub>2.5</sub> | 245 <sup>245</sup> / <sub>270</sub> | 270 <sup>270</sup> / <sub>275</sub> | 275                                 | (93 x 65 x 68) <sup>(93 x 65 x 68)</sup> / <sub>96 x 65 x 68</sub>       |
| 799                  | PF 2 1/2 | 485   | (110) <sup>(55)</sup> / <sub>140</sub> | (55) <sup>(55)</sup> / <sub>75</sub> <sup>+0.030</sup> / <sub>+0.011</sub> | (16) <sup>(16)</sup> / <sub>20</sub> | (6) <sup>(6)</sup> / <sub>7.5</sub> | (10) <sup>(10)</sup> / <sub>12</sub> | (110) <sup>(110)</sup> / <sub>140</sub> | —                                   | 470 <sup>470</sup> / <sub>490</sub> | 490 <sup>490</sup> / <sub>540</sub> | 490 <sup>490</sup> / <sub>550</sub> | (103 x 71 x 91) <sup>(103 x 71 x 91)</sup> / <sub>106 x 71 x 91</sub>    |
| (902) <sup>898</sup> | PF 3     | 515   | (110) <sup>(55)</sup> / <sub>170</sub> | (55) <sup>(55)</sup> / <sub>85</sub> <sup>+0.030</sup> / <sub>+0.013</sub> | (16) <sup>(16)</sup> / <sub>22</sub> | (6) <sup>(6)</sup> / <sub>9</sub>   | (10) <sup>(10)</sup> / <sub>14</sub> | (110) <sup>(110)</sup> / <sub>170</sub> | —                                   | 660 <sup>660</sup> / <sub>680</sub> | 675 <sup>675</sup> / <sub>730</sub> | 680 <sup>680</sup> / <sub>750</sub> | (113 x 81 x 100) <sup>(113 x 81 x 100)</sup> / <sub>119 x 81 x 100</sub> |
| 1058                 | PF 3     | 550   | 170                                    | 95 <sup>+0.035</sup> / <sub>+0.013</sub>                                   | 25                                   | 9                                   | 14                                   | 170                                     | —                                   | —                                   | —                                   | 980                                 | 135 x 96 x 110                                                           |



# Characteristics and Performance of Three Phase Motor

1. The figures are reference data. If you need guaranteed performance data, please contact (Sales agent)
2. Only torque (full-load, starting, maximum, accelerating) and starting current are actual measurement value. Other data are equivalent circuit measures.
3. Not only current but also other characteristics may be changed under different voltage specifications. Please contact (Sales agent), if required any clarification.

**2 pole**

**50Hz**

| Rated Output |      | Volt | Hz | Rated Speed<br>(min <sup>-1</sup> ) | Torque |       |     | Current |      |      |       | Efficiency |      |      | Power Factor |      |      | Moment of Inertia J<br>(kg - m <sup>2</sup> ) |
|--------------|------|------|----|-------------------------------------|--------|-------|-----|---------|------|------|-------|------------|------|------|--------------|------|------|-----------------------------------------------|
|              |      |      |    |                                     | Rated  | Start | Max | 50%     | 75%  | 100% | Start | 50%        | 75%  | 100% | 50%          | 75%  | 100% |                                               |
| HP           | kW   |      |    |                                     | (Nm)   | (%)   | (%) | (A)     | (A)  | (A)  | (A)   | (%)        | (%)  | (%)  | (%)          | (%)  | (%)  |                                               |
| 1/2          | 0.4  | 220  | 50 | 2910                                | 1.34   | 265   | 295 | 1.3     | 1.5  | 1.8  | 11.0  | 68.0       | 72.5 | 73.5 | 61.5         | 74.5 | 83.5 | 0.000675                                      |
|              |      | 380  |    | 2910                                | 1.34   | 265   | 295 | 0.73    | 0.84 | 1.0  | 6.5   | 68.0       | 72.5 | 73.5 | 61.5         | 74.5 | 83.5 |                                               |
|              |      | 415  |    | 2920                                | 1.33   | 320   | 350 | 0.82    | 0.90 | 1.0  | 7.0   | 63.0       | 69.0 | 71.5 | 54.0         | 67.0 | 76.5 |                                               |
| 1            | 0.75 | 220  | 50 | 2900                                | 2.51   | 210   | 275 | 1.9     | 2.4  | 3.0  | 19.0  | 76.0       | 78.0 | 77.5 | 67.0         | 79.5 | 86.0 | 0.000973                                      |
|              |      | 380  |    | 2900                                | 2.51   | 210   | 275 | 1.1     | 1.4  | 1.7  | 11.0  | 76.0       | 78.0 | 77.5 | 67.0         | 79.5 | 86.0 |                                               |
|              |      | 415  |    | 2900                                | 2.49   | 255   | 335 | 1.3     | 1.5  | 1.7  | 12.0  | 71.5       | 76.0 | 77.0 | 58.0         | 71.0 | 79.5 |                                               |
| 2            | 1.5  | 220  | 50 | 2900                                | 5.03   | 220   | 260 | 3.3     | 4.3  | 5.4  | 33.0  | 80.5       | 81.5 | 80.5 | 73.5         | 84.0 | 89.5 | 0.00170                                       |
|              |      | 380  |    | 2900                                | 5.03   | 220   | 260 | 1.9     | 2.5  | 3.1  | 19.0  | 80.5       | 81.5 | 80.5 | 73.5         | 84.0 | 89.5 |                                               |
|              |      | 415  |    | 2900                                | 5.05   | 265   | 310 | 2.1     | 2.5  | 3.0  | 21.0  | 78.0       | 81.0 | 81.0 | 64.0         | 76.5 | 84.0 |                                               |
| 3            | 2.2  | 220  | 50 | 2860                                | 7.41   | 300   | 290 | 5.0     | 6.3  | 8.0  | 61.0  | 83.5       | 84.0 | 83.0 | 70.0         | 82.0 | 87.5 | 0.00190                                       |
|              |      | 380  |    | 2860                                | 7.41   | 300   | 290 | 2.9     | 3.6  | 4.6  | 35.0  | 83.5       | 84.0 | 83.0 | 70.0         | 82.0 | 87.5 |                                               |
|              |      | 415  |    | 2870                                | 7.34   | 370   | 355 | 3.5     | 4.0  | 4.8  | 39.0  | 79.5       | 82.0 | 82.0 | 55.5         | 69.5 | 78.0 |                                               |
| 5            | 3.7  | 220  | 50 | 2860                                | 12.4   | 270   | 300 | 7.1     | 9.7  | 12.5 | 90.0  | 84.0       | 85.0 | 84.5 | 81.5         | 88.5 | 91.5 | 0.00520                                       |
|              |      | 380  |    | 2860                                | 12.4   | 270   | 300 | 4.1     | 5.6  | 7.2  | 52.0  | 84.0       | 85.0 | 84.5 | 81.5         | 88.5 | 91.5 |                                               |
|              |      | 415  |    | 2890                                | 12.7   | 335   | 375 | 4.5     | 5.7  | 6.9  | 58.0  | 82.0       | 84.0 | 84.5 | 69.5         | 80.0 | 86.0 |                                               |
| 7.5          | 5.5  | 380  | 50 | 2890                                | 17.9   | 250   | 300 | 5.9     | 8.1  | 10.7 | 76.0  | 87.5       | 88.5 | 88.5 | 81.0         | 87.0 | 89.5 | 0.00920                                       |
|              |      | 415  |    | 2900                                | 17.8   | 310   | 380 | 6.4     | 8.1  | 10.7 | 85.0  | 86.0       | 88.0 | 88.5 | 70.0         | 80.0 | 85.0 |                                               |
| 10           | 7.5  | 380  | 50 | 2900                                | 24.3   | 240   | 275 | 7.7     | 10.7 | 14.0 | 105.0 | 88.5       | 90.0 | 89.5 | 83.5         | 89.0 | 90.5 | 0.0111                                        |
|              |      | 415  |    | 2910                                | 24.2   | 300   | 345 | 8.2     | 10.7 | 13.7 | 120.0 | 87.5       | 89.5 | 89.5 | 73.0         | 82.0 | 86.5 |                                               |
| 15           | 11   | 380  | 50 | 2900                                | 35.7   | 260   | 295 | 11.7    | 16.0 | 21   | 150.0 | 88.5       | 90.0 | 90.0 | 80.5         | 87.0 | 89.5 | 0.0193                                        |
|              |      | 415  |    | 2910                                | 35.6   | 320   | 365 | 13.2    | 16.6 | 21   | 165.0 | 87.0       | 89.0 | 89.5 | 66.5         | 77.5 | 83.0 |                                               |
| 20           | 15   | 380  | 50 | 2900                                | 49.0   | 300   | 325 | 15.8    | 21.6 | 28   | 210.0 | 90.5       | 91.0 | 90.5 | 80.0         | 87.0 | 89.5 | 0.0234                                        |
|              |      | 415  |    | 2910                                | 48.8   | 375   | 410 | 17.9    | 22.5 | 28   | 235.0 | 89.0       | 90.5 | 90.5 | 65.5         | 77.0 | 82.5 |                                               |
| 25           | 18.5 | 380  | 50 | 2910                                | 59.9   | 300   | 320 | 19.0    | 26.2 | 34   | 260.0 | 90.5       | 91.5 | 91.5 | 81.5         | 88.0 | 90.5 | 0.0264                                        |
|              |      | 415  |    | 2930                                | 59.8   | 375   | 395 | 21.5    | 27.2 | 34   | 290.0 | 89.0       | 91.0 | 91.0 | 67.0         | 78.0 | 83.5 |                                               |
| 30           | 22   | 380  | 50 | 2920                                | 71.0   | 280   | 330 | 23.5    | 31.8 | 41   | 320.0 | 89.5       | 91.0 | 91.0 | 79.5         | 86.5 | 89.5 | 0.0537                                        |
|              |      | 415  |    | 2920                                | 70.8   | 340   | 405 | 26.6    | 33.1 | 41   | 350.0 | 87.0       | 89.5 | 90.5 | 66.0         | 77.0 | 83.0 |                                               |
| 40           | 30   | 380  | 50 | 2920                                | 97.6   | 245   | 280 | 30.0    | 42.0 | 55   | 385.0 | 89.0       | 90.0 | 89.5 | 85.5         | 90.5 | 92.0 | 0.0613                                        |
|              |      | 415  |    | 2930                                | 97.3   | 290   | 335 | 33.2    | 42.9 | 54   | 420.0 | 87.5       | 89.5 | 89.5 | 72.0         | 81.5 | 86.0 |                                               |
| 50           | 37   | 380  | 50 | 2930                                | 120    | 230   | 230 | 37.3    | 52.4 | 69   | 445.0 | 88.5       | 90.0 | 90.5 | 85.0         | 89.0 | 90.0 | 0.111                                         |
|              |      | 415  |    | 2940                                | 120    | 230   | 280 | 40.7    | 53.1 | 67   | 490.0 | 87.5       | 90.0 | 90.5 | 72.0         | 81.0 | 84.5 |                                               |
| 60           | 45   | 380  | 50 | 2920                                | 146    | 250   | 245 | 45.3    | 63.5 | 84   | 575.0 | 88.5       | 90.0 | 90.5 | 85.0         | 89.5 | 90.5 | 0.120                                         |
|              |      | 415  |    | 2930                                | 146    | 305   | 300 | 49.1    | 64.0 | 81   | 635.0 | 88.0       | 90.0 | 90.5 | 72.5         | 81.5 | 85.5 |                                               |
| 75           | 55   | 380  | 50 | 2920                                | 178    | 275   | 270 | 53.8    | 76.0 | 100  | 730.0 | 90.5       | 92.0 | 91.5 | 85.5         | 90.0 | 91.0 | 0.140                                         |
|              |      | 415  |    | 2940                                | 178    | 340   | 340 | 58.6    | 76.8 | 98   | 805.0 | 90.0       | 91.5 | 91.5 | 72.5         | 81.5 | 85.5 |                                               |



| Rated Output |      | Volt | Hz | Rated Speed<br>(min <sup>-1</sup> ) | Torque |       |     | Current |       |      |       | Efficiency |      |      | Power Factor |      |      | Moment of Inertia J<br>(kg - m <sup>2</sup> ) |
|--------------|------|------|----|-------------------------------------|--------|-------|-----|---------|-------|------|-------|------------|------|------|--------------|------|------|-----------------------------------------------|
|              |      |      |    |                                     | Rated  | Start | Max | 50%     | 75%   | 100% | Start | 50%        | 75%  | 100% | 50%          | 75%  | 100% |                                               |
| HP           | kW   |      |    |                                     | (Nm)   | (%)   | (%) | (A)     | (A)   | (A)  | (A)   | (%)        | (%)  | (%)  | (%)          | (%)  | (%)  |                                               |
| 1/2          | 0.4  | 220  | 50 | 1410                                | 2.77   | 245   | 260 | 1.4     | 1.6   | 1.9  | 8.0   | 70.0       | 73.0 | 72.5 | 55.5         | 69.5 | 79.0 | 0.000973                                      |
|              |      | 380  |    | 1410                                | 2.77   | 245   | 260 | 0.78    | 0.90  | 1.1  | 4.5   | 70.0       | 73.0 | 72.5 | 55.5         | 69.5 | 79.0 |                                               |
|              |      | 415  |    | 1425                                | 2.72   | 300   | 320 | 0.88    | 1.0   | 1.1  | 5.0   | 65.5       | 70.5 | 72.0 | 48.0         | 61.0 | 71.0 |                                               |
| 1            | 0.75 | 220  | 50 | 1410                                | 5.10   | 220   | 265 | 1.9     | 2.4   | 3.0  | 15.0  | 79.0       | 80.0 | 78.0 | 64.5         | 76.5 | 83.0 | 0.000213                                      |
|              |      | 380  |    | 1410                                | 5.10   | 220   | 265 | 1.1     | 1.4   | 1.7  | 8.5   | 79.0       | 80.0 | 78.0 | 64.5         | 76.5 | 83.0 |                                               |
|              |      | 415  |    | 1425                                | 5.03   | 270   | 330 | 1.2     | 1.4   | 1.7  | 9.5   | 76.5       | 79.0 | 78.5 | 57.0         | 70.0 | 78.0 |                                               |
| 2            | 1.5  | 220  | 50 | 1420                                | 10.3   | 225   | 250 | 4.0     | 4.9   | 6.1  | 31.0  | 79.5       | 80.5 | 78.0 | 61.5         | 74.5 | 82.0 | 0.00330                                       |
|              |      | 380  |    | 1420                                | 10.3   | 225   | 250 | 2.3     | 2.9   | 3.5  | 18.0  | 79.5       | 80.5 | 78.0 | 61.5         | 74.5 | 82.0 |                                               |
|              |      | 415  |    | 1435                                | 10.2   | 275   | 305 | 2.6     | 3.0   | 3.5  | 20.0  | 76.5       | 79.0 | 78.5 | 51.5         | 65.5 | 74.5 |                                               |
| 3            | 2.2  | 220  | 50 | 1430                                | 15.1   | 230   | 250 | 5.5     | 6.9   | 8.5  | 48.0  | 82.5       | 82.5 | 80.5 | 64.0         | 76.5 | 83.0 | 0.00570                                       |
|              |      | 380  |    | 1430                                | 15.1   | 230   | 250 | 3.2     | 4.0   | 4.9  | 28.0  | 82.5       | 82.5 | 80.5 | 64.0         | 76.5 | 83.0 |                                               |
|              |      | 415  |    | 1440                                | 14.9   | 280   | 310 | 3.6     | 4.2   | 4.8  | 31.0  | 80.0       | 82.0 | 81.0 | 54.0         | 67.5 | 76.0 |                                               |
| 5            | 3.7  | 220  | 50 | 1410                                | 25.4   | 220   | 240 | 8.4     | 10.8  | 13.9 | 80.0  | 84.5       | 84.0 | 81.5 | 69.0         | 80.0 | 85.5 | 0.0110                                        |
|              |      | 380  |    | 1410                                | 25.4   | 220   | 240 | 4.8     | 6.3   | 8.0  | 46.0  | 84.5       | 84.0 | 81.5 | 69.0         | 80.0 | 85.5 |                                               |
|              |      | 415  |    | 1430                                | 25.1   | 270   | 300 | 5.5     | 6.6   | 8.0  | 52.0  | 81.5       | 83.0 | 82.0 | 57.0         | 70.5 | 78.5 |                                               |
| 7.5          | 5.5  | 380  | 50 | 1435                                | 36.1   | 240   | 290 | 6.7     | 8.8   | 11.5 | 67.0  | 87.5       | 88.0 | 87.0 | 70.5         | 81.0 | 86.0 | 0.0171                                        |
|              |      | 415  |    | 1440                                | 35.9   | 285   | 345 | 7.5     | 9.1   | 11.5 | 73.0  | 85.5       | 87.0 | 87.0 | 59.5         | 72.5 | 80.0 |                                               |
| 10           | 7.5  | 380  | 50 | 1430                                | 49.1   | 275   | 295 | 9.0     | 11.8  | 15.5 | 98.0  | 88.5       | 89.0 | 88.0 | 71.5         | 82.0 | 86.5 | 0.0214                                        |
|              |      | 415  |    | 1440                                | 48.9   | 335   | 365 | 9.9     | 12.1  | 15.5 | 105.0 | 86.5       | 88.0 | 88.0 | 61.0         | 73.5 | 80.5 |                                               |
| 15           | 11   | 380  | 50 | 1440                                | 71.8   | 240   | 265 | 12.9    | 17.1  | 22   | 135.0 | 88.5       | 89.0 | 88.0 | 73.0         | 82.0 | 86.0 | 0.0345                                        |
|              |      | 415  |    | 1450                                | 71.5   | 285   | 315 | 14.6    | 17.9  | 22   | 145.0 | 86.0       | 88.0 | 88.0 | 61.0         | 73.0 | 79.5 |                                               |
| 20           | 15   | 380  | 50 | 1450                                | 98.3   | 260   | 295 | 17.2    | 22.8  | 29   | 195.0 | 90.5       | 90.5 | 89.5 | 73.5         | 82.5 | 86.5 | 0.0446                                        |
|              |      | 415  |    | 1450                                | 97.8   | 315   | 355 | 19.3    | 23.7  | 29   | 215.0 | 88.0       | 89.5 | 89.0 | 61.5         | 74.0 | 80.5 |                                               |
| 25           | 18.5 | 380  | 50 | 1455                                | 121    | 245   | 265 | 21.5    | 28.4  | 37   | 240.0 | 89.0       | 90.0 | 89.5 | 73.5         | 82.5 | 86.5 | 0.0876                                        |
|              |      | 415  |    | 1455                                | 120    | 295   | 320 | 25.0    | 30.3  | 37   | 265.0 | 86.5       | 88.5 | 89.0 | 59.5         | 72.0 | 78.5 |                                               |
| 30           | 22   | 380  | 50 | 1455                                | 143    | 275   | 300 | 24.9    | 33.2  | 43   | 305.0 | 90.0       | 91.0 | 90.5 | 74.5         | 83.0 | 86.5 | 0.101                                         |
|              |      | 415  |    | 1460                                | 142    | 335   | 370 | 27.9    | 34.5  | 43   | 340.0 | 88.0       | 90.0 | 90.5 | 62.0         | 74.0 | 80.0 |                                               |
| 40           | 30   | 380  | 50 | 1460                                | 196    | 275   | 310 | 33.1    | 44.5  | 58   | 420.0 | 90.5       | 91.0 | 90.5 | 76.0         | 84.5 | 87.5 | 0.127                                         |
|              |      | 415  |    | 1460                                | 195    | 340   | 385 | 36.9    | 46.0  | 57   | 465.0 | 89.5       | 90.5 | 90.5 | 63.5         | 75.0 | 81.0 |                                               |
| 50           | 37   | 380  | 50 | 1450                                | 240    | 245   | 270 | 40.8    | 55.0  | 72   | 470.0 | 90.5       | 91.5 | 91.0 | 76.0         | 84.0 | 86.5 | 0.208                                         |
|              |      | 415  |    | 1460                                | 239    | 300   | 335 | 44.6    | 56.1  | 70   | 520.0 | 89.5       | 91.0 | 91.0 | 64.5         | 75.5 | 81.0 |                                               |
| 60           | 45   | 380  | 50 | 1450                                | 292    | 235   | 265 | 48.5    | 66.0  | 86   | 570.0 | 91.0       | 92.0 | 91.5 | 77.0         | 84.5 | 87.0 | 0.230                                         |
|              |      | 415  |    | 1465                                | 292    | 285   | 330 | 53.0    | 67.1  | 84   | 630.0 | 90.0       | 91.5 | 91.5 | 65.5         | 76.5 | 81.5 |                                               |
| 75           | 55   | 380  | 50 | 1455                                | 356    | 280   | 275 | 60.2    | 81.1  | 105  | 735.0 | 92.0       | 93.0 | 92.5 | 75.0         | 83.5 | 86.5 | 0.280                                         |
|              |      | 415  |    | 1460                                | 355    | 340   | 340 | 70.1    | 86.3  | 107  | 810.0 | 90.5       | 92.0 | 92.0 | 60.0         | 72.0 | 78.5 |                                               |
| 100          | 75   | 380  | 50 | 1470                                | 486    | 295   | 300 | 72.7    | 102.3 | 135  | 1124  | 92.0       | 93.0 | 93.0 | 85.5         | 90.0 | 91.5 | 1.00                                          |
|              |      | 415  |    | 1475                                | 484    | 365   | 375 | 72.6    | 97.9  | 130  | 1248  | 91.5       | 92.5 | 93.0 | 78.5         | 86.0 | 89.0 |                                               |
| 120          | 90   | 380  | 50 | 1470                                | 579    | 355   | 405 | 86.3    | 121.3 | 160  | 1547  | 93.5       | 94.5 | 94.5 | 85.0         | 89.5 | 91.0 | 1.25                                          |
|              |      | 415  |    | 1475                                | 578    | 440   | 505 | 86.3    | 116.3 | 150  | 1720  | 92.5       | 94.0 | 94.0 | 78.0         | 86.0 | 89.0 |                                               |
| 150          | 110  | 380  | 50 | 1475                                | 712    | 345   | 305 | 105.2   | 148.8 | 200  | 1548  | 93.0       | 94.0 | 93.5 | 85.0         | 89.5 | 91.0 | 1.98                                          |
|              |      | 415  |    | 1480                                | 710    | 430   | 380 | 104.4   | 141.9 | 185  | 1710  | 92.5       | 93.5 | 94.0 | 79.0         | 86.0 | 89.0 |                                               |
| 175          | 132  | 380  | 50 | 1475                                | 855    | 385   | 345 | 125.9   | 177.6 | 240  | 2002  | 93.5       | 94.0 | 94.0 | 85.0         | 90.0 | 91.5 | 2.30                                          |
|              |      | 415  |    | 1480                                | 852    | 480   | 410 | 123.8   | 168.4 | 220  | 2213  | 93.5       | 94.0 | 94.5 | 79.5         | 86.5 | 89.5 |                                               |



**6 pole****50Hz**

| Rated Output |      | Volt | Hz | Rated Speed<br>(min <sup>-1</sup> ) | Torque        |              |            | Current    |            |             |              | Efficiency |            |             | Power Factor |            |             | Moment of Inertia J<br>(kg - m <sup>2</sup> ) |
|--------------|------|------|----|-------------------------------------|---------------|--------------|------------|------------|------------|-------------|--------------|------------|------------|-------------|--------------|------------|-------------|-----------------------------------------------|
|              |      |      |    |                                     | Rated<br>(Nm) | Start<br>(%) | Max<br>(%) | 50%<br>(A) | 75%<br>(A) | 100%<br>(A) | Start<br>(A) | 50%<br>(%) | 75%<br>(%) | 100%<br>(%) | 50%<br>(%)   | 75%<br>(%) | 100%<br>(%) |                                               |
| HP           | kW   |      |    |                                     |               |              |            |            |            |             |              |            |            |             |              |            |             |                                               |
| 1/2          | 0.4  | 220  | 50 | 940                                 | 4.13          | 225          | 270        | 1.6        | 1.8        | 2.1         | 9.0          | 66.5       | 70.5       | 70.5        | 49.0         | 62.5       | 72.5        | 0.00215                                       |
|              |      | 380  |    | 940                                 | 4.13          | 225          | 270        | 0.93       | 1.0        | 1.2         | 5.0          | 66.5       | 70.5       | 70.5        | 49.0         | 62.5       | 72.5        |                                               |
|              |      | 415  |    | 950                                 | 4.06          | 280          | 330        | 1.0        | 1.1        | 1.2         | 5.5          | 63.5       | 69.0       | 70.5        | 43.5         | 56.0       | 66.0        |                                               |
| 1            | 0.75 | 220  | 50 | 930                                 | 7.97          | 220          | 240        | 2.9        | 3.2        | 3.8         | 15.0         | 68.5       | 71.0       | 69.5        | 50.5         | 64.0       | 73.5        | 0.00460                                       |
|              |      | 380  |    | 930                                 | 7.97          | 220          | 240        | 1.7        | 1.9        | 2.2         | 8.5          | 68.5       | 71.0       | 69.5        | 50.5         | 64.0       | 73.5        |                                               |
|              |      | 415  |    | 940                                 | 7.97          | 260          | 285        | 1.9        | 2.0        | 2.3         | 9.5          | 64.0       | 69.0       | 69.5        | 43.5         | 56.0       | 66.0        |                                               |
| 2            | 1.5  | 220  | 50 | 930                                 | 15.4          | 210          | 240        | 4.6        | 5.5        | 6.6         | 32.0         | 76.5       | 77.5       | 74.5        | 56.0         | 69.5       | 77.0        | 0.00870                                       |
|              |      | 380  |    | 930                                 | 15.4          | 210          | 240        | 2.7        | 3.2        | 3.8         | 18.0         | 76.5       | 77.5       | 74.5        | 56.0         | 69.5       | 77.0        |                                               |
|              |      | 415  |    | 930                                 | 15.4          | 250          | 285        | 3.0        | 3.4        | 3.9         | 19.0         | 71.5       | 74.5       | 73.5        | 49.0         | 62.5       | 71.5        |                                               |
| 3            | 2.2  | 220  | 50 | 940                                 | 22.5          | 260          | 270        | 6.2        | 7.4        | 9.4         | 52.0         | 80.0       | 81.5       | 80.0        | 58.5         | 72.0       | 79.5        | 0.0132                                        |
|              |      | 380  |    | 940                                 | 22.5          | 260          | 270        | 3.6        | 4.3        | 5.4         | 30.0         | 80.0       | 81.5       | 80.0        | 58.5         | 72.0       | 79.5        |                                               |
|              |      | 415  |    | 950                                 | 22.2          | 325          | 340        | 4.0        | 4.5        | 5.4         | 33.0         | 77.0       | 80.0       | 80.0        | 50.0         | 63.5       | 72.5        |                                               |
| 5            | 3.7  | 220  | 5  | 930                                 | 38.2          | 210          | 255        | 8.9        | 11.4       | 14.5        | 80.0         | 85.0       | 84.5       | 82.0        | 64.5         | 76.0       | 81.0        | 0.0256                                        |
|              |      | 380  |    | 930                                 | 38.2          | 210          | 255        | 5.1        | 6.6        | 8.4         | 46.0         | 85.0       | 84.5       | 82.0        | 64.5         | 76.0       | 81.0        |                                               |
|              |      | 415  |    | 940                                 | 38.5          | 265          | 320        | 5.6        | 6.7        | 8.2         | 52.0         | 83.0       | 84.0       | 83.0        | 55.0         | 68.0       | 75.5        |                                               |
| 7.5          | 5.5  | 380  | 50 | 940                                 | 54.9          | 265          | 285        | 7.6        | 9.7        | 12.7        | 71.0         | 88.0       | 88.0       | 86.5        | 62.5         | 73.5       | 78.5        | 0.0343                                        |
|              |      | 415  |    | 950                                 | 54.5          | 315          | 340        | 8.6        | 10.2       | 12.6        | 77.0         | 85.0       | 87.0       | 86.5        | 52.5         | 65.0       | 72.0        |                                               |
| 10           | 7.5  | 380  | 50 | 960                                 | 73.2          | 245          | 340        | 10.3       | 12.8       | 16.5        | 115.0        | 87.0       | 88.0       | 87.0        | 63.5         | 76.0       | 82.5        | 0.0551                                        |
|              |      | 415  |    | 960                                 | 72.9          | 305          | 425        | 12.1       | 14.0       | 17.0        | 125.0        | 83.0       | 85.5       | 86.0        | 51.5         | 65.5       | 74.0        |                                               |
| 15           | 11   | 380  | 50 | 960                                 | 108           | 250          | 345        | 13.7       | 17.6       | 23          | 160.0        | 89.0       | 89.0       | 88.0        | 68.5         | 80.0       | 85.0        | 0.0727                                        |
|              |      | 415  |    | 960                                 | 107           | 310          | 430        | 15.3       | 18.4       | 23          | 175.0        | 86.5       | 88.0       | 88.0        | 57.5         | 71.0       | 78.5        |                                               |
| 20           | 15   | 380  | 50 | 965                                 | 146           | 235          | 265        | 18.3       | 23.9       | 31          | 190.0        | 90.5       | 90.5       | 90.0        | 69.0         | 79.0       | 83.0        | 0.140                                         |
|              |      | 415  |    | 965                                 | 145           | 285          | 315        | 20.8       | 25.1       | 31          | 205.0        | 87.0       | 89.0       | 89.0        | 57.5         | 70.0       | 76.5        |                                               |
| 25           | 18.5 | 380  | 50 | 965                                 | 181           | 240          | 265        | 22.1       | 29.0       | 38          | 220.0        | 89.5       | 90.0       | 89.5        | 71.0         | 80.5       | 84.5        | 0.164                                         |
|              |      | 415  |    | 965                                 | 180           | 295          | 325        | 24.6       | 30.1       | 37          | 245.0        | 87.0       | 89.0       | 89.0        | 60.0         | 72.0       | 78.5        |                                               |
| 30           | 22   | 380  | 50 | 965                                 | 214           | 265          | 295        | 26.4       | 34.5       | 45          | 280.0        | 90.0       | 90.5       | 90.0        | 70.5         | 80.0       | 84.5        | 0.190                                         |
|              |      | 415  |    | 965                                 | 213           | 325          | 370        | 29.9       | 36.2       | 44          | 310.0        | 87.5       | 89.5       | 89.5        | 58.5         | 71.0       | 77.5        |                                               |
| 40           | 30   | 380  | 50 | 965                                 | 291           | 225          | 280        | 36.2       | 47.1       | 61          | 380.0        | 90.5       | 91.5       | 91.0        | 69.5         | 79.5       | 84.0        | 0.333                                         |
|              |      | 415  |    | 970                                 | 291           | 275          | 345        | 41.3       | 49.7       | 61          | 420.0        | 88.5       | 90.5       | 90.5        | 57.0         | 69.5       | 76.5        |                                               |
| 50           | 37   | 380  | 50 | 970                                 | 360           | 230          | 275        | 43.8       | 57.5       | 74          | 455.0        | 91.5       | 92.0       | 91.5        | 70.0         | 80.0       | 84.0        | 0.382                                         |
|              |      | 415  |    | 970                                 | 359           | 285          | 340        | 49.0       | 59.7       | 74          | 505.0        | 90.0       | 91.0       | 91.0        | 58.5         | 71.0       | 77.5        |                                               |
| 60           | 45   | 380  | 50 | 970                                 | 438           | 250          | 275        | 50.8       | 67.8       | 88          | 535.0        | 92.0       | 92.0       | 91.0        | 73.5         | 82.5       | 86.0        | 0.430                                         |
|              |      | 415  |    | 975                                 | 437           | 300          | 330        | 57.8       | 71.1       | 88          | 590.0        | 90.0       | 91.0       | 91.0        | 60.0         | 72.5       | 79.0        |                                               |
| 75           | 55   | 380  | 50 | 975                                 | 533           | 255          | 265        | 58.7       | 80.1       | 105         | 695.0        | 93.0       | 93.0       | 92.5        | 76.5         | 84.0       | 86.5        | 0.880                                         |
|              |      | 415  |    | 975                                 | 532           | 310          | 325        | 62.4       | 79.9       | 105         | 770.0        | 92.0       | 93.0       | 92.5        | 66.5         | 77.0       | 82.0        |                                               |



# 2 pole

60Hz

| Rated  |      | Poles | Volt | Hz | Rated   | Torque |       |     | Current |      |      |       | Efficiency |      |      | Power Factor |      |      |
|--------|------|-------|------|----|---------|--------|-------|-----|---------|------|------|-------|------------|------|------|--------------|------|------|
| Output |      |       |      |    | Speed   | Rated  | Start | Max | 50%     | 75%  | 100% | Start | 50%        | 75%  | 100% | 50%          | 75%  | 100% |
| HP     | kW   |       |      |    | (min-1) | (Nm)   | (%)   | (%) | (A)     | (A)  | (A)  | (A)   | (%)        | (%)  | (%)  | (%)          | (%)  | (%)  |
| 1/2    | 0.4  | 2     | 220  | 60 | 3480    | 1.10   | 245   | 320 | 1.1     | 1.3  | 1.6  | 10.0  | 71.5       | 75.0 | 75.0 | 69.5         | 81.5 | 88.0 |
|        |      |       | 380  |    | 3480    | 1.10   | 245   | 320 | 0.61    | 0.75 | 0.90 | 5.8   | 71.5       | 75.0 | 75.0 | 69.5         | 81.5 | 88.0 |
|        |      |       | 440  |    | 3500    | 1.09   | 330   | 380 | 0.67    | 0.76 | 0.88 | 6.8   | 67.0       | 73.0 | 75.0 | 58.0         | 71.0 | 79.5 |
| 1      | 0.75 | 2     | 220  | 60 | 3470    | 2.07   | 190   | 245 | 1.7     | 2.3  | 2.8  | 16.5  | 77.0       | 79.0 | 78.0 | 77.0         | 86.0 | 90.0 |
|        |      |       | 380  |    | 3470    | 2.07   | 190   | 245 | 0.96    | 1.3  | 1.6  | 9.5   | 77.0       | 79.0 | 78.0 | 77.0         | 86.0 | 90.0 |
|        |      |       | 440  |    | 3490    | 2.05   | 265   | 340 | 1.0     | 1.2  | 1.5  | 11.5  | 74.5       | 78.5 | 79.0 | 65.0         | 77.0 | 84.0 |
| 2      | 1.5  | 2     | 220  | 60 | 3470    | 4.13   | 200   | 240 | 2.9     | 4.0  | 5.4  | 31    | 80.0       | 81.5 | 80.0 | 83.0         | 90.0 | 93.0 |
|        |      |       | 380  |    | 3470    | 4.13   | 200   | 240 | 1.7     | 2.3  | 3.1  | 18.0  | 80.0       | 81.5 | 80.0 | 83.0         | 90.0 | 93.0 |
|        |      |       | 440  |    | 3490    | 4.11   | 275   | 325 | 1.8     | 2.2  | 2.7  | 21    | 79.0       | 81.5 | 82.0 | 71.5         | 82.0 | 87.5 |
| 3      | 2.2  | 2     | 220  | 60 | 3430    | 6.13   | 260   | 240 | 4.2     | 5.7  | 7.6  | 54    | 84.0       | 84.5 | 83.0 | 82.5         | 90.0 | 92.5 |
|        |      |       | 380  |    | 3430    | 6.13   | 260   | 240 | 2.4     | 3.3  | 4.4  | 31    | 84.0       | 84.5 | 83.0 | 82.5         | 90.0 | 92.5 |
|        |      |       | 440  |    | 3460    | 6.08   | 365   | 340 | 2.5     | 3.2  | 3.9  | 37    | 83.0       | 85.0 | 84.5 | 69.5         | 81.0 | 86.5 |
| 5      | 3.7  | 2     | 220  | 60 | 3420    | 10.3   | 220   | 260 | 6.4     | 9.2  | 12.3 | 83    | 83.5       | 84.5 | 83.5 | 90.5         | 93.5 | 94.0 |
|        |      |       | 380  |    | 3420    | 10.3   | 220   | 260 | 3.7     | 5.3  | 7.1  | 48    | 83.5       | 84.5 | 83.5 | 90.5         | 93.5 | 94.0 |
|        |      |       | 440  |    | 3460    | 10.2   | 315   | 355 | 3.6     | 4.8  | 6.2  | 57    | 83.0       | 85.5 | 85.5 | 82.5         | 89.0 | 91.5 |
| 7.5    | 5.5  | 2     | 380  | 60 | 3480    | 15.1   | 185   | 240 | 5.6     | 7.9  | 10.5 | 65    | 85.0       | 87.0 | 87.0 | 87.5         | 90.5 | 91.0 |
|        |      |       | 440  |    | 3510    | 15.0   | 265   | 340 | 5.3     | 7.1  | 9.2  | 77    | 85.0       | 87.5 | 88.5 | 80.0         | 86.5 | 89.5 |
| 10     | 7.5  | 2     | 380  | 60 | 3480    | 20.6   | 200   | 235 | 7.4     | 10.6 | 14.0 | 90    | 86.5       | 88.5 | 88.5 | 88.5         | 91.5 | 91.5 |
|        |      |       | 440  |    | 3510    | 20.4   | 290   | 335 | 6.9     | 9.4  | 12.1 | 107   | 86.5       | 88.5 | 89.5 | 82.5         | 88.5 | 90.5 |
| 15     | 11   | 2     | 380  | 60 | 3490    | 30.1   | 225   | 245 | 10.7    | 15.2 | 20.0 | 128   | 87.5       | 89.0 | 89.0 | 90.0         | 92.5 | 92.5 |
|        |      |       | 440  |    | 3520    | 29.9   | 320   | 350 | 10.4    | 14.0 | 17.9 | 152   | 86.0       | 89.0 | 89.5 | 80.5         | 87.5 | 90.0 |
| 20     | 15   | 2     | 380  | 60 | 3490    | 41.1   | 260   | 275 | 14.2    | 20.4 | 27.3 | 178   | 89.0       | 90.5 | 90.0 | 90.0         | 92.5 | 93.0 |
|        |      |       | 440  |    | 3520    | 40.7   | 370   | 390 | 13.8    | 18.7 | 24.1 | 212   | 88.0       | 90.0 | 90.5 | 81.0         | 87.5 | 90.0 |
| 25     | 18.5 | 2     | 380  | 60 | 3490    | 50.6   | 255   | 255 | 17.2    | 24.8 | 33.1 | 224   | 90.0       | 91.0 | 91.0 | 91.0         | 93.5 | 93.5 |
|        |      |       | 440  |    | 3520    | 50.2   | 365   | 365 | 16.6    | 22.7 | 29.2 | 266   | 89.0       | 91.0 | 91.5 | 82.0         | 88.5 | 91.0 |



# 4 pole

60Hz

| Rated  |      | Poles | Volt | Hz | Rated                | Torque |       |     | Current |      |      |       | Efficiency |      |      | Power Factor |      |      | Moment of Inertia J |
|--------|------|-------|------|----|----------------------|--------|-------|-----|---------|------|------|-------|------------|------|------|--------------|------|------|---------------------|
| Output |      |       |      |    | Speed                | Rated  | Start | Max | 50%     | 75%  | 100% | Start | 50%        | 75%  | 100% | 50%          | 75%  | 100% |                     |
| HP     | kW   |       |      |    | (min <sup>-1</sup> ) | (Nm)   | (%)   | (%) | (A)     | (A)  | (A)  | (A)   | (%)        | (%)  | (%)  | (%)          | (%)  | (%)  |                     |
| 1/2    | 0.4  | 4     | 220  | 60 | 1690                 | 2.26   | 225   | 255 | 1.1     | 1.4  | 1.7  | 7.3   | 75.0       | 76.5 | 75.0 | 62.5         | 75.5 | 83.5 | 0.000973            |
|        |      |       | 380  |    | 1690                 | 2.26   | 225   | 255 | 0.65    | 0.79 | 0.98 | 4.2   | 75.0       | 76.5 | 75.0 | 62.5         | 75.5 | 83.5 |                     |
|        |      |       | 440  |    | 1710                 | 2.24   | 310   | 355 | 0.74    | 0.83 | 0.98 | 4.9   | 70.5       | 75.0 | 76.0 | 50.0         | 63.5 | 73.0 |                     |
| 1      | 0.75 | 4     | 220  | 60 | 1700                 | 4.22   | 195   | 260 | 1.7     | 2.3  | 2.9  | 13.7  | 81.0       | 81.0 | 78.0 | 70.5         | 81.0 | 85.5 | 0.002130            |
|        |      |       | 380  |    | 1700                 | 4.22   | 195   | 260 | 1.0     | 1.3  | 1.7  | 7.9   | 81.0       | 81.0 | 78.0 | 70.5         | 81.0 | 85.5 |                     |
|        |      |       | 440  |    | 1710                 | 4.19   | 280   | 370 | 1.0     | 1.3  | 1.5  | 9.5   | 79.0       | 81.5 | 81.0 | 59.5         | 72.5 | 79.5 |                     |
| 2      | 1.5  | 4     | 220  | 60 | 1710                 | 8.38   | 190   | 210 | 3.5     | 4.5  | 5.9  | 29    | 82.5       | 82.0 | 79.5 | 70.5         | 81.0 | 85.5 | 0.00330             |
|        |      |       | 380  |    | 1710                 | 8.38   | 190   | 210 | 2.0     | 2.6  | 3.4  | 16.5  | 82.5       | 82.0 | 79.5 | 70.5         | 81.0 | 85.5 |                     |
|        |      |       | 440  |    | 1730                 | 8.28   | 265   | 300 | 2.1     | 2.5  | 3.0  | 20.0  | 80.5       | 82.5 | 82.0 | 58.0         | 71.5 | 79.0 |                     |
| 3      | 2.2  | 4     | 220  | 60 | 1710                 | 12.3   | 190   | 225 | 4.7     | 6.2  | 8.1  | 43    | 84.0       | 83.5 | 81.0 | 75.0         | 84.0 | 87.5 | 0.00570             |
|        |      |       | 380  |    | 1710                 | 12.3   | 190   | 225 | 2.7     | 3.6  | 4.7  | 25    | 84.0       | 83.5 | 81.0 | 75.0         | 84.0 | 87.5 |                     |
|        |      |       | 440  |    | 1730                 | 12.2   | 270   | 320 | 2.8     | 3.5  | 4.3  | 29    | 82.0       | 84.0 | 83.5 | 62.5         | 75.0 | 81.5 |                     |
| 5      | 3.7  | 4     | 220  | 60 | 1700                 | 20.8   | 185   | 215 | 7.1     | 10.0 | 13.5 | 71    | 86.5       | 85.5 | 82.0 | 78.5         | 86.0 | 88.0 | 0.01100             |
|        |      |       | 380  |    | 1700                 | 20.8   | 185   | 215 | 4.1     | 5.8  | 7.8  | 41    | 86.5       | 85.5 | 82.0 | 78.5         | 86.0 | 88.0 |                     |
|        |      |       | 440  |    | 1730                 | 20.4   | 265   | 310 | 4.3     | 5.4  | 6.8  | 49    | 85.0       | 86.0 | 85.0 | 66.5         | 78.0 | 83.5 |                     |
| 7.5    | 5.5  | 4     | 380  | 60 | 1720                 | 30.6   | 200   | 245 | 5.9     | 8.1  | 10.7 | 60    | 89.0       | 89.0 | 87.5 | 79.0         | 86.5 | 89.0 | 0.01710             |
|        |      |       | 440  |    | 1740                 | 30.2   | 270   | 330 | 6.1     | 7.7  | 9.6  | 70    | 88.0       | 89.0 | 89.0 | 68.0         | 79.0 | 84.5 |                     |
| 10     | 7.5  | 4     | 380  | 60 | 1720                 | 41.7   | 230   | 260 | 7.9     | 10.9 | 14.4 | 86    | 89.5       | 89.5 | 88.5 | 80.5         | 87.5 | 89.5 | 0.01110             |
|        |      |       | 440  |    | 1740                 | 41.2   | 325   | 360 | 7.9     | 10.2 | 12.8 | 101   | 88.5       | 89.5 | 89.5 | 70.0         | 81.0 | 86.0 |                     |
| 15     | 11   | 4     | 380  | 60 | 1730                 | 60.8   | 200   | 220 | 11.1    | 15.7 | 20.9 | 116   | 90.0       | 90.0 | 89.0 | 83.5         | 88.5 | 90.0 | 0.03450             |
|        |      |       | 440  |    | 1750                 | 60.1   | 265   | 300 | 11.2    | 14.7 | 18.7 | 135   | 89.0       | 90.0 | 90.0 | 72.0         | 81.5 | 86.0 |                     |
| 20     | 15   | 4     | 380  | 60 | 1740                 | 82.4   | 220   | 250 | 14.9    | 21.1 | 28.1 | 167   | 91.5       | 91.0 | 90.0 | 84.0         | 89.0 | 90.5 | 0.04460             |
|        |      |       | 440  |    | 1750                 | 81.9   | 295   | 335 | 14.9    | 19.6 | 24.9 | 193   | 90.5       | 91.5 | 91.0 | 73.0         | 82.5 | 86.5 |                     |

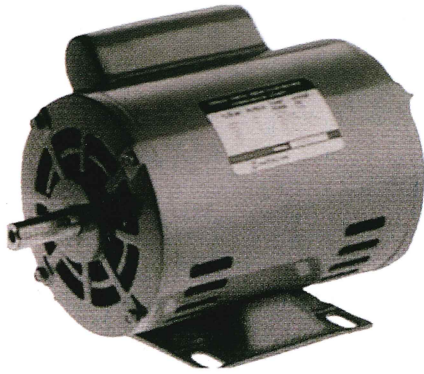


**6 pole****60Hz**

| Rated  |      | Poles | Volt | Hz | Rated                | Torque |       |     | Current |      |      |       | Efficiency |      |      | Power Factor |      |      | Moment of Inertia J |
|--------|------|-------|------|----|----------------------|--------|-------|-----|---------|------|------|-------|------------|------|------|--------------|------|------|---------------------|
| Output |      |       |      |    | Speed                | Rated  | Start | Max | 50%     | 75%  | 100% | Start | 50%        | 75%  | 100% | 50%          | 75%  | 100% |                     |
| HP     | kW   |       |      |    | (min <sup>-1</sup> ) | (Nm)   | (%)   | (%) | (A)     | (A)  | (A)  | (A)   | (%)        | (%)  | (%)  | (%)          | (%)  | (%)  |                     |
| 1/2    | 0.4  | 6     | 220  | 60 | 1130                 | 3.38   | 195   | 250 | 1.4     | 1.6  | 1.9  | 7.8   | 71.5       | 74.0 | 72.5 | 54.0         | 67.5 | 76.5 | 0.002150            |
|        |      |       | 380  |    | 1130                 | 3.38   | 195   | 250 | 0.78    | 0.91 | 1.1  | 4.5   | 71.5       | 74.0 | 72.5 | 54.0         | 67.5 |      |                     |
|        |      |       | 440  |    | 1140                 | 3.35   | 275   | 355 | 0.87    | 0.95 | 1.1  | 5.4   | 67.5       | 72.5 | 74.0 | 44.5         | 57.0 | 66.5 |                     |
| 1      | 0.75 | 6     | 220  | 60 | 1120                 | 6.40   | 180   | 215 | 2.4     | 2.9  | 3.6  | 13.7  | 73.0       | 74.0 | 71.5 | 56.5         | 69.5 | 77.5 | 0.004600            |
|        |      |       | 380  |    | 1120                 | 6.40   | 180   | 215 | 1.4     | 1.7  | 2.1  | 7.9   | 73.0       | 74.0 | 71.5 | 56.5         | 69.5 | 77.5 |                     |
|        |      |       | 440  |    | 1140                 | 6.29   | 240   | 290 | 1.6     | 1.7  | 2.0  | 9.1   | 70.0       | 73.5 | 74.0 | 45.5         | 58.5 | 68.0 |                     |
| 2      | 1.5  | 6     | 220  | 60 | 1110                 | 12.9   | 180   | 210 | 3.8     | 4.8  | 6.4  | 28    | 80.0       | 79.5 | 75.5 | 64.5         | 76.0 | 81.5 | 0.00870             |
|        |      |       | 380  |    | 1110                 | 12.9   | 180   | 210 | 2.2     | 2.8  | 3.7  | 16.0  | 80.0       | 79.5 | 75.5 | 64.5         | 76.0 | 81.5 |                     |
|        |      |       | 440  |    | 1130                 | 12.7   | 240   | 280 | 2.4     | 2.8  | 3.4  | 19.0  | 77.5       | 79.5 | 79.0 | 52.5         | 66.0 | 74.0 |                     |
| 3      | 2.2  | 6     | 220  | 60 | 1120                 | 18.8   | 220   | 280 | 5.2     | 6.8  | 8.5  | 47    | 83.0       | 83.5 | 81.0 | 66.5         | 78.0 | 83.5 | 0.01320             |
|        |      |       | 380  |    | 1120                 | 18.8   | 220   | 260 | 3.0     | 3.9  | 4.9  | 27    | 83.0       | 83.5 | 81.0 | 66.5         | 78.0 | 83.5 |                     |
|        |      |       | 440  |    | 1140                 | 18.4   | 315   | 375 | 3.3     | 3.8  | 4.6  | 32    | 81.0       | 83.0 | 83.0 | 54.5         | 68.0 | 76.5 |                     |
| 5      | 3.7  | 6     | 380  | 60 | 1100                 | 32.1   | 170   | 210 | 4.5     | 6.1  | 8.1  | 40    | 86.0       | 84.5 | 81.5 | 72.5         | 81.5 | 85.0 | 0.02560             |
|        |      |       | 440  |    | 1130                 | 31.3   | 240   | 300 | 4.6     | 5.8  | 7.2  | 48    | 85.0       | 86.0 | 84.5 | 61.5         | 74.0 | 80.5 |                     |
| 7.5    | 5.5  | 6     | 380  | 60 | 1130                 | 46.5   | 185   | 220 | 6.6     | 8.9  | 11.8 | 61    | 89.0       | 89.0 | 87.0 | 71.5         | 79.5 | 81.5 | 0.03430             |
|        |      |       | 440  |    | 1150                 | 45.7   | 265   | 320 | 6.8     | 8.5  | 10.5 | 72    | 88.0       | 89.0 | 88.5 | 60.0         | 71.5 | 77.5 |                     |
| 10     | 7.5  | 6     | 380  | 60 | 1150                 | 62.3   | 205   | 305 | 8.6     | 11.5 | 14.8 | 98    | 89.0       | 89.5 | 88.0 | 74.0         | 83.5 | 87.5 | 0.05510             |
|        |      |       | 440  |    | 1160                 | 61.8   | 295   | 440 | 9.2     | 11.2 | 13.7 | 117   | 87.5       | 89.0 | 89.0 | 61.0         | 74.0 | 81.0 |                     |
| 15     | 11   | 6     | 380  | 60 | 1150                 | 91.4   | 185   | 280 | 11.9    | 16.2 | 21.2 | 138   | 90.5       | 90.5 | 89.0 | 77.5         | 85.5 | 88.5 | 0.07270             |
|        |      |       | 440  |    | 1160                 | 90.6   | 270   | 405 | 12.3    | 15.4 | 19.2 | 164   | 89.0       | 90.0 | 90.0 | 66.0         | 78.0 | 83.5 |                     |



# DRIP PROOF TYPE SPLIT-PHASE START SINGLE-PHASE MOTORS CAPACITOR START, CAPACITOR START CAPACITOR RUN 1/8 HP ~ 10 HP



Model:

**xxHP or kW + Type-From + xP**

Output

No of pole

## SPECIFICATIONS

| ITEM                       |               | SPECIFICATION                                                                        |       |                  |
|----------------------------|---------------|--------------------------------------------------------------------------------------|-------|------------------|
| STANDARD                   |               | JIS C4203, 4034, JEC-2137-2000                                                       |       |                  |
| RATING                     |               | CONTINUOUS [S1]                                                                      |       |                  |
| INSULATION CLASS           |               | E TYPE                                                                               |       |                  |
| ENCLOSURES TYPE PROTECTION |               | ENCLOSURES                                                                           |       | TYPE             |
|                            |               | OPEN                                                                                 | DRIP  | EFOU-KT, KR, KQ  |
|                            |               | TYPE                                                                                 | PROOF | EFOUP-KT, KR, KQ |
| PROTECTION                 |               | IP22                                                                                 |       |                  |
| VOLTAGE, FREQUENCY         |               | 220V 50Hz                                                                            |       |                  |
| TYPE OF CABLE              |               | Made from high temperature resistance plastic (end of pole conduct electric current) |       |                  |
| NUMBER OF CABLE            |               | 4 WIRES (1/4-1/3 HP-KT, -KR, 2-10 HP-KQ)<br>3 WIRES (1/2-1.5 HP-KR, -KQ)             |       |                  |
| COLOUR                     |               | Rigail gray (MUNSELL 8.9Y5.1/0.3)                                                    |       |                  |
| TRANSMISSION               |               | DIRECT COUPLING OR BELT DRIVE                                                        |       |                  |
| ROTATION                   |               | CW (VIEW FROM MOTOR DRIVE END)                                                       |       |                  |
| ENVIRON-<br>MENT           | TEMPERATURE   | -20°C ~ 40°C                                                                         |       |                  |
|                            | HUMIDITY      | Max 90% RH                                                                           |       |                  |
|                            | ALTITUDE      | Max 1,000 m                                                                          |       |                  |
|                            | ESTABLISHMENT | IN DOOR                                                                              |       |                  |
| ATMOSPHERE                 |               | NO CORROSIVE GAS, NO EXPLOSIVE GAS, NO STEAM,<br>NO DEW, LITTLE DUST                 |       |                  |

## DIMENSIONS (in mm)

| Type-From | Output<br>(HP) | Fig.<br>No | Ins.<br>Class | Dimension in mm |       |       |       |       |     |    |       |                                  |      |      |     |     |      |       |    |                                        |    |     |   | Weight<br>(kg) |    |     |     |
|-----------|----------------|------------|---------------|-----------------|-------|-------|-------|-------|-----|----|-------|----------------------------------|------|------|-----|-----|------|-------|----|----------------------------------------|----|-----|---|----------------|----|-----|-----|
|           |                |            |               | L               | R     | A     | B     | D     | KL  | J  | H     | C                                | F    | E    | N   | M   | G    | Z     | XB | S                                      | W  | U   | T |                | Q  | QK  | QR  |
| EFOU-KT   | 1/8            | 1          | E             | 195.5           | 120   | 76    | -     | 131   | -   | -  | 137   | 71 <sup>0</sup> <sub>-0.5</sub>  | 45   | 56   | 110 | 150 | 3.2  | 7x26  | 45 | 14 <sup>0</sup> <sub>-0.001</sub>      | -  | 1   | - | 30             | 27 | -   | 5.0 |
| EFOU-KT   | 1/4            | 1          | E             | 205             | 120   | 85    | -     | 131   | -   | -  | 137   | 71 <sup>0</sup> <sub>-0.5</sub>  | 45   | 56   | 110 | 150 | 3.2  | 7x26  | 45 | 14 <sup>0</sup> <sub>-0.001</sub>      | -  | 1   | - | 30             | 27 | -   | 6.4 |
| EFOU-KT   | 1/3            | 1          | E             | 215             | 120   | 95    | -     | 131   | -   | -  | 137   | 71 <sup>0</sup> <sub>-0.5</sub>  | 45   | 56   | 110 | 150 | 3.2  | 7x26  | 45 | 14 <sup>0</sup> <sub>-0.001</sub>      | -  | 1   | - | 30             | 27 | -   | 7.4 |
| EFOUP-KT  | 1/2            | 2          | E             | 256             | 140   | 116   | 97    | 145   | -   | -  | 153   | 80 <sup>0</sup> <sub>-0.5</sub>  | 50   | 62.5 | 125 | 160 | 3.2  | 10x25 | 50 | 16 <sup>+0.008</sup> <sub>-0.003</sub> | 5  | 3   | 5 | 40             | -  | 0.3 | 12  |
| EFOU-KR   | 1/8            | 3          | E             | 205.5           | 120   | 86    | -     | 131   | 80  | -  | 137   | 71 <sup>0</sup> <sub>-0.5</sub>  | 45   | 56   | 110 | 150 | 3.2  | 7x26  | 45 | 14 <sup>0</sup> <sub>-0.001</sub>      | -  | 1   | - | 30             | 27 | -   | 6.0 |
| EFOU-KR   | 1/4            | 3          | E             | 215.5           | 120   | 96    | -     | 131   | 85  | -  | 137   | 71 <sup>0</sup> <sub>-0.5</sub>  | 45   | 56   | 110 | 150 | 3.2  | 7x26  | 45 | 14 <sup>0</sup> <sub>-0.001</sub>      | -  | 1   | - | 30             | 27 | -   | 7.2 |
| EFOU-KR   | 2/5            | 3          | E             | 225.5           | 120   | 106   | -     | 131   | 85  | -  | 137   | 71 <sup>0</sup> <sub>-0.5</sub>  | 45   | 56   | 110 | 150 | 3.2  | 7x26  | 45 | 14 <sup>0</sup> <sub>-0.001</sub>      | -  | 1   | - | 30             | 27 | -   | 8.2 |
| EFOU-KR   | 1/3            | 3          | E             | 235.5           | 120   | 116   | -     | 131   | 85  | -  | 137   | 71 <sup>0</sup> <sub>-0.5</sub>  | 45   | 56   | 110 | 150 | 3.2  | 7x26  | 45 | 14 <sup>0</sup> <sub>-0.001</sub>      | -  | 1   | - | 30             | 27 | -   | 9.2 |
| EFOUP-KR  | 1/2            | 4          | E             | 256             | 140   | 116   | 97    | 144.5 | 79  | 35 | 169.5 | 80 <sup>0</sup> <sub>-0.5</sub>  | 50   | 62.5 | 125 | 160 | 3.2  | 10x25 | 50 | 16 <sup>+0.008</sup> <sub>-0.003</sub> | 5  | 3   | 5 | 40             | -  | 0.3 | 12  |
| EFOUP-KR  | 1              | 4          | E             | 274.5           | 158.5 | 116   | 115.5 | 162   | 89  | 40 | 192   | 90 <sup>0</sup> <sub>-0.5</sub>  | 62.5 | 70   | 155 | 175 | 40   | 10x25 | 56 | 19 <sup>+0.009</sup> <sub>-0.004</sub> | 6  | 3.5 | 6 | 40             | -  | 0.3 | 14  |
| EFOUP-KQ  | 1.5            | 5          | E             | 289             | 158.5 | 130.5 | 115.5 | 162   | 96  | 40 | 217   | 90 <sup>0</sup> <sub>-0.5</sub>  | 62.5 | 70   | 155 | 175 | 40   | 10x25 | 56 | 19 <sup>+0.009</sup> <sub>-0.004</sub> | 6  | 3.5 | 6 | 40             | -  | 0.3 | 18  |
| EFOUP-KQ  | 2              | 6          | B             | 397             | 193   | 204   | 129   | 208   | 174 | 45 | 247   | 100 <sup>0</sup> <sub>-0.5</sub> | 70   | 80   | 175 | 195 | 12.5 | 12    | 63 | 28 <sup>+0.009</sup> <sub>-0.004</sub> | 8  | 4   | 7 | 60             | -  | 0.5 | 32  |
| EFOUP-KQ  | 3              | 6          | B             | 411             | 200   | 211   | 136   | 233   | 187 | 45 | 265   | 112 <sup>0</sup> <sub>-0.5</sub> | 70   | 95   | 175 | 224 | 14   | 12    | 70 | 28 <sup>+0.009</sup> <sub>-0.004</sub> | 8  | 4   | 7 | 60             | -  | 0.5 | 39  |
| EFOUP-KQ  | 5              | 7          | B             | 496             | 258   | 238   | 173   | 269   | 236 | 45 | 263   | 132 <sup>0</sup> <sub>-0.5</sub> | 89   | 108  | 212 | 250 | 16   | 12    | 89 | 38 <sup>+0.018</sup> <sub>-0.002</sub> | 10 | 5   | 8 | 80             | -  | 0.5 | 75  |
| EFOUP-KQ  | 7.5            | 7          | B             | 496             | 258   | 238   | 173   | 269   | 236 | 45 | 263   | 132 <sup>0</sup> <sub>-0.5</sub> | 89   | 108  | 212 | 250 | 16   | 12    | 89 | 38 <sup>+0.018</sup> <sub>-0.002</sub> | 10 | 5   | 8 | 80             | -  | 0.5 | 82  |
| EFOUP-KQ  | 10             | 7          | B             | 496             | 258   | 238   | 173   | 269   | 236 | 45 | 263   | 132 <sup>0</sup> <sub>-0.5</sub> | 89   | 108  | 212 | 250 | 16   | 12    | 89 | 38 <sup>+0.018</sup> <sub>-0.002</sub> | 10 | 5   | 8 | 80             | -  | 0.5 | 82  |



# Shaft Dimension

Fig.1

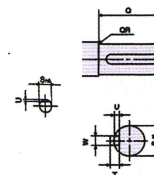
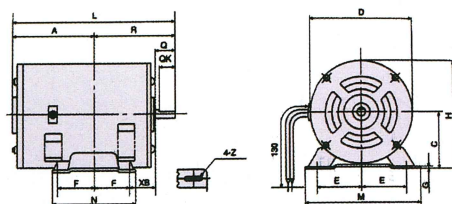


Fig.2

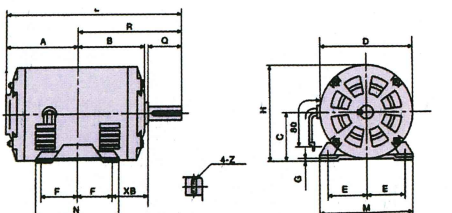
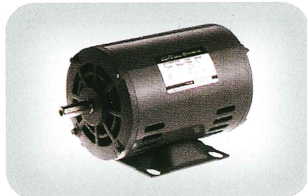


Fig.3

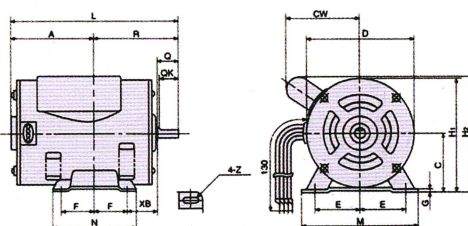


Fig.4

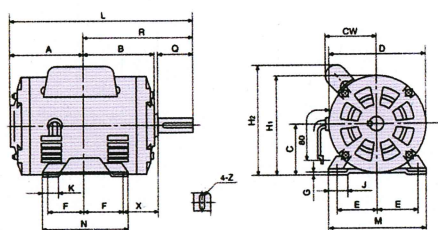


Fig.5

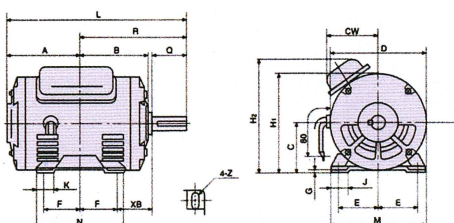
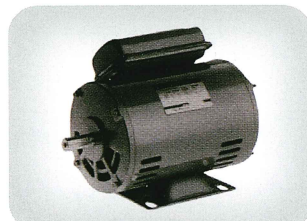


Fig.6

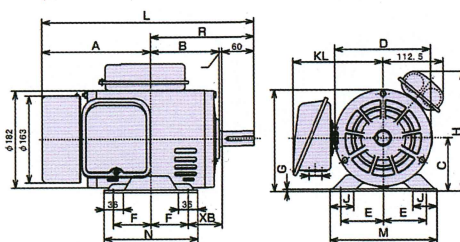
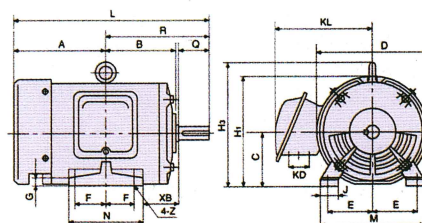
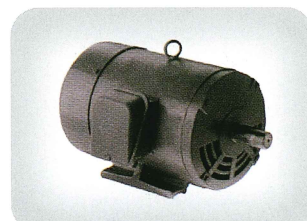


Fig.7





| Type-From | Rated Output |      | INS. Class | Voltage (V) | Frequency (Hz) | Current (A) | Speed (min <sup>-1</sup> ) |
|-----------|--------------|------|------------|-------------|----------------|-------------|----------------------------|
|           | HP           | kW   |            |             |                |             |                            |
| EFOU-KT   | 1/8          | 0.1  | E          | 220         | 50             | 1.4         | 1450                       |
| EFOU-KT   | 1/4          | 0.2  | E          | 220         | 50             | 2.3         | 1450                       |
| EFOU-KT   | 1/3          | 0.25 | E          | 220         | 50             | 2.7         | 1430                       |
| EFOUP-KT  | 1/2          | 0.4  | E          | 220         | 50             | 3.7         | 1400                       |
| EFOU-KR   | 1/8          | 0.1  | E          | 220         | 50             | 2.2         | 1450                       |
| EFOU-KR   | 1/4          | 0.2  | E          | 220         | 50             | 2.2         | 1450                       |
| EFOU-KR   | 2/5          | 0.3  | E          | 220         | 50             | 2.6         | 1440                       |
| EFOU-KR   | 1/3          | 0.25 | E          | 220         | 50             | 2.6         | 1440                       |
| EFOU-KR   | 1/2          | 0.4  | E          | 220         | 50             | 3.4         | 1430                       |
| EFOU-KR   | 1            | 0.75 | E          | 220         | 50             | 6.6         | 1410                       |
| EFOUP-KQ  | 1.5          | 1.1  | B          | 220         | 50             | 10.0        | 1430                       |
| EFOUP-KQ  | 2            | 1.5  | B          | 220         | 50             | 10.0        | 1430                       |
| EFOUP-KQ  | 3            | 2.2  | B          | 220         | 50             | 13.0        | 1440                       |
| EFOUP-KQ  | 5            | 3.7  | B          | 220         | 50             | 26.0        | 1450                       |
| EFOUP-KQ  | 7.5          | 5.5  | B          | 220         | 50             | 33.0        | 1450                       |
| EFOUP-KQ  | 10           | 7.5  | B          | 220         | 50             | 42.0        | 1440                       |

### Unique construction models



Resilient Base Mounting Model



Enclosure Type [ TFEC Type ]

Construction as total enclosure with fan cooled.

- Model : 0.4, 0.55, 0.75kW TFO-KQ 4P



- Model : 0.4kW TFO-KR 4P



# How to order the motors.

Model indication (Example ):

**xxHP (or kW) TFO-K(KK) xP IP55 + Voltage/Hz + Optional Spec.**

Output                      Type                      No of pole

Please specify the model indication upon your inquiry when request.

Example : 3HP (or 2.2kW), 4 pole, Foot Mount, Protection class IP55, Voltage 380V 50Hz

For new installation

3HP (or 2.2kW) TFO-K 4P IP55 380V 50Hz

For replacement

3HP (or 2.2kW) TFO-K 4P IP55 380V 50Hz + **MFG No.**

MFG No. (Manufacturing No.) is also need to check specifications

## Model Explanation

Three-Phase



Flange Mounted

V = Vertical shaft  
Y = Horizontal shaft

Totally enclosed with ventilating fan

T = Exterior design      => Totally enclosed  
F = Ventilation System    => Ventilation Fan  
O = Bearing                => Ball bearing, Pin Bearing

Design

Three-phase Motor with Cylindrical Rotor

K = Ordinary Squirrel cage rotor (< 5 HP)  
KK = Special Squirrel cage rotor (> 5 HP)  
A = Outdoor Type (Installation outside of Building)

Single-Phase

E F O U P

Water Proof Design

E = Exterior design      => Air circulation between outside and inside  
F = Ventilation System    => Ventilation Fan  
O = Bearing                => Ball bearing, Pin Bearing  
U = Drip Proof             => Protect splashing water into system  
P = Protection             => Prevent external materials into the system

K Q

Characteristics of starting  
single phase motor

KT = Split phase start  
KR = Capacitor Start  
KQ = Capacitor start, Capacitor Run  
KP = Capacitor run

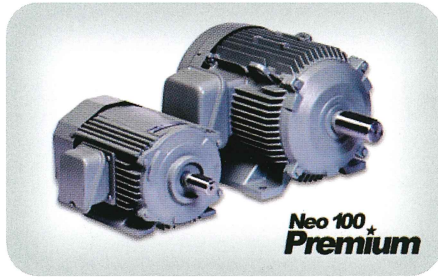


## kW and HP comparable table

| HP | 1    | 2   | 3   | 5   | 7.5 | 10  | 15 | 20 | 25   | 30 | 40 | 50 | 60 | 75 | 100 | 120 | 150 | 175 |
|----|------|-----|-----|-----|-----|-----|----|----|------|----|----|----|----|----|-----|-----|-----|-----|
| kW | 0.75 | 1.5 | 2.2 | 3.7 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 55 | 75  | 90  | 110 | 132 |



## Other Line-up



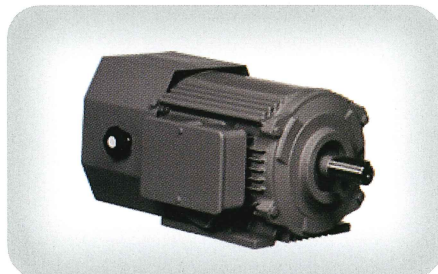
### Premium High-Efficiency Motors

Equivalent to IE3 class



### High-Efficiency Motors

Equivalent to IE2 class

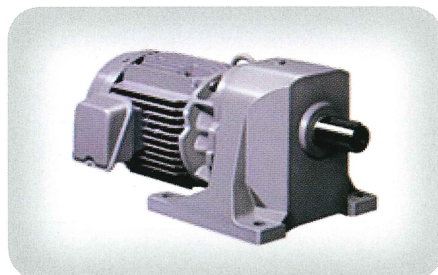


### Brake Motors

On Brake & Off Brake model

Brake model : HBA, FA, NA

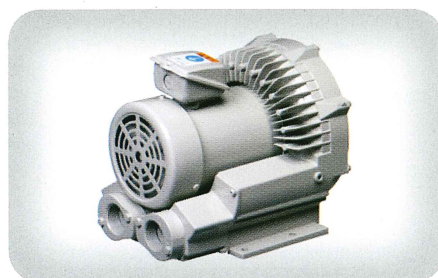
Output : 0.2~30kW (in case 4 pole)



### Gear Motors

GA/GH-series (For General load)

Output : 0.2~11kW 1/5~1/100



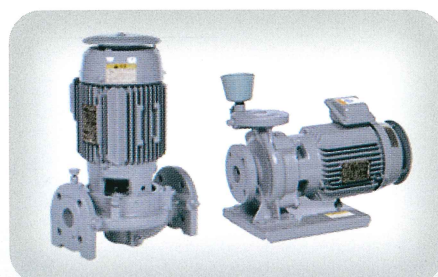
### High-Pressure Blowers

#### Vortex Blower

E-series (Large air flow type)

G-series (High-pressure type)

DN-series (General type)



### Water Pumps

JD Type : Circulation Pumps

JL Type : In-line Pumps

Output : 0.25kW~11kW



# Inverters (For variable speed operation)

## Powerful model

### WJ200 Series

Pursuing the Ideal Compact Inverter



### SJ700 Series

High performance with Many useful Functions and, yet User Friendly



## General Purpose model

### NE-S1 series

อินเวอร์เตอร์รุ่นประหยัด



### X200 Series

Simple, Trip-suppression and Eco-friendly Compact Inverter

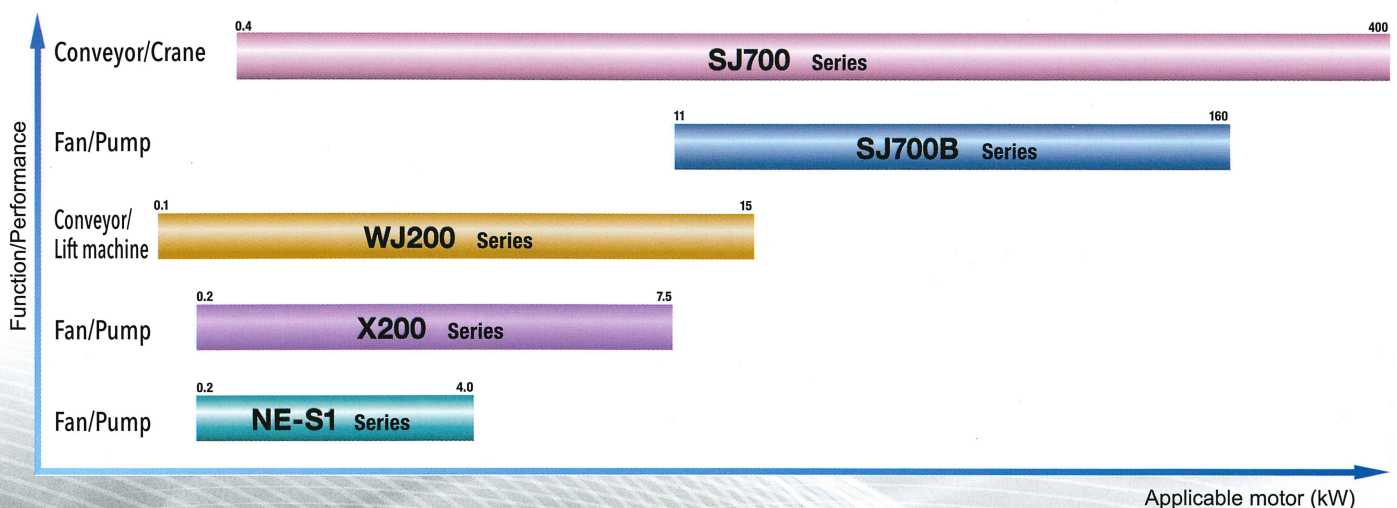


### SJ700B Series

Inverter designed for fans & pumps plus conveyors



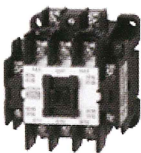
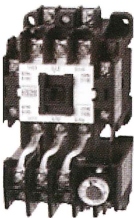
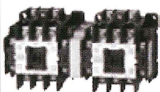
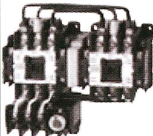
| Model  | kW<br>(HP)               | 0.1<br>(1/8) | 0.2<br>(1/4) | 0.4<br>(1/2) | 0.55<br>(3/4) | 0.75<br>(1) | 1.1<br>(1.5) | 1.5<br>(2) | 2.2<br>(3) | 3<br>(4) | 3.7<br>(5) | 4<br>(5) | 5.5<br>(7.5) | 7.5<br>(10) | 11<br>(15) | 15<br>(20) | 18.5<br>(25) | 22<br>(30) | 30<br>(40) | 37<br>(50) | 45<br>(60) | 55<br>(75) | 75<br>(100) | 90<br>(125) | 110<br>(150) | 132<br>(175) | 150<br>(200) | 160<br>(220) | 185<br>(250) | 220<br>(300) | 315<br>(400) | 400<br>(500) |
|--------|--------------------------|--------------|--------------|--------------|---------------|-------------|--------------|------------|------------|----------|------------|----------|--------------|-------------|------------|------------|--------------|------------|------------|------------|------------|------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| NE-S1  | 1-phase<br>200V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
|        | 3-phase<br>200V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
| WJ200  | 1-phase<br>100V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
|        | 1-phase<br>200V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
|        | 3-phase<br>200V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
|        | 3-phase<br>400V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
| X200*  | 1-/3-phase<br>200V class |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
|        | 3-phase<br>200V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
|        | 3-phase<br>400V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
| SJ700  | 3-phase<br>200V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
|        | 3-phase<br>400V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |
| SJ700B | 3-phase<br>400V class    |              |              |              |               |             |              |            |            |          |            |          |              |             |            |            |              |            |            |            |            |            |             |             |              |              |              |              |              |              |              |              |



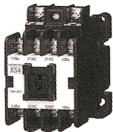
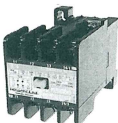


# Switches (Contactors & Breakers)

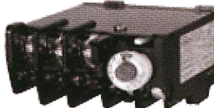
## Electromagnetic Contactors

|                                                                                   |                                                                                   | Electromagnetic Contactors                                                                                                                                 |                                                                                   |                                                                                                                                                             |                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   |                                                                                   | Without Enclosure                                                                                                                                          |                                                                                   | With Enclosure                                                                                                                                              |                                                                                                                                                                                                                                                  |
| Non-reversible Type                                                               |  | HS <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span><br>8 - 50 frame       |  | HS <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -T<br>8 - 50 frame     |  SHS <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -T<br>10 - 50 frame    |
|                                                                                   |                                                                                   | H <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span><br>65C - 800C frame    |                                                                                   | H <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -T<br>65C - 600C frame  |  SH <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -T<br>65C - 600C frame  |
| Reversible Type<br><div>20 - 800C frame<br/>(provided mechanical interlock)</div> |  | HS <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -R<br>10 - 50 frame   |  | HS <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -RT<br>10 - 50 frame   | SHS <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -RT<br>10 - 50 frame                                                                                       |
|                                                                                   |                                                                                   | H <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -R<br>65C - 800C frame |                                                                                   | H <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -RT<br>65C - 600C frame |  SH <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -RT<br>65C - 600C frame |

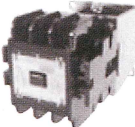
## Contactor Relays

|                                                                                                   |                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>XS4</b><br> | <b>X <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span></b><br><br>3 - 8 contacts (5 types) |
|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

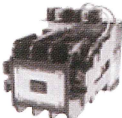
## Thermal Overload Relays

|                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br>12 - 600A (9 types) | <b>TR <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> - <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span></b><br><div>             Electromagnetic Switches<br/>             with Thermal Overload Relay<br/> <b>H <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -T</b><br/> <b>H <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -TK</b><br/>             with 25 Thermal Overload Relay           </div> |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

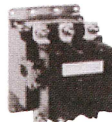
### DC Operated Electromagnetic Relays

|                                                                                                        |                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <br>10 - 800C frame | <b>H <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -G</b> |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|

### Latched Electromagnetic Relays

|                                                                                                        |                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <br>10 - 600C frame | <b>H <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -L</b> |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|

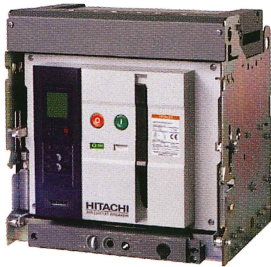
### Heavy Load Electromagnetic Relays

|                                                                                                          |                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <br>10 - 200N frame | <b>H <span style="border: 1px solid black; padding: 0 5px;">  </span> <span style="border: 1px solid black; padding: 0 5px;">  </span> -H</b> |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|

## Fuse-Free Breaker

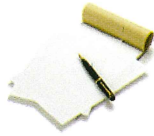
| Standard Breaker                                                                                                                         | Economical Breaker                                                                                                                | High Interrupting Capacity Breaker                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <br>Fundamental<br><b>F series</b><br>30A-4000A Frame | <br>Small<br><b>S series</b><br>30A-800A Frame | <br>Current Limiting<br><b>L series</b><br>50A-800A Frame |

## Air-Circuit Breaker

| AKN, AKS, AKH Series                                                                                    |
|---------------------------------------------------------------------------------------------------------|
| <br>630 - 6,300 AF |



**Memo**





# Technical Managements

## Special Instruction

### [ Inspect the machine before use ]

Please inspect the following area before turning on the switch ;

- Inspect if the following area are in ground wiring and insulation wiring,
- Inspect preventive apparatus and control circuit if they are working properly.
- Is the value of insulation resistance less than 1MΩ or not.
- Inspect if machine installation (direct belt) is correctly done.

### [ Precaution during use ]

- Should be careful in loading capacity and frequency in turning on the machine.  
Machine should not be on for a long period of time.
- If the motor rotates in a wrong direction, in case of three-phase motor, swap the two wires. In case of single-phase motor, re-wiring following the connection circuit.
- Voltage Amp should be within a correct limitation.
  - Is voltage amp correct as indicated in the instruction manual ?
  - Is there any balance in voltage amp for three-phase line ?
  - Is the electrical distributed power higher than the indicated limitation ? It should be adjusted to an appropriate loading capacity.
  - Inspect to make sure there is no vibration sound and abnormal heating.

## Outdoor Installation

- Use a motor that has a totally enclosed with cooling fan and can be placed outside a building. The motor can be installed outside because it can prevent any water droplets in between core structures. The terminal box should have water protection and seal that can prevent water coming into lead wire connection. Insulated wires can tolerate humidity and seal that can prevent water seeping into lead wire connection.
- You can connect wires in steel tubed connection on the side (For wire connection of motor outside the building, you should follow the instructional pictures in preventing rain from iron pipe seeping into the terminal box).
- General type of totally enclosed motor with cooling fan is IP44 class. If installing in high dust area, you can use IP54 class. In case having water injection into a machine, you can use IP55 class.

## Maintenance

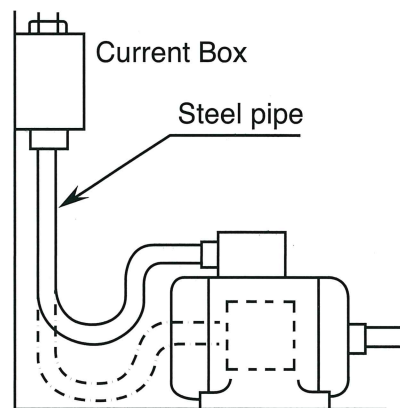
### [ Daily basis ]

- Surrounding environment :  
Inspect the temperature around the entire machine, humidity, dust, gas and ventilation system.
- Working essentials :  
Inspect the electric distribution (loading capacity), frequency and voltage amp.
- Loading condition and machine connection :  
Inspect the tension of connecting belt.
- Condition around machine connection area :  
Vibration and sound for making sure if it's working properly.

### [ Periodic basis ]

- Should be inspected  
Bearings, insulating stator (no less than 1MΩ, looseness of any bolt and nut, colors, etc. Including inspection of motor condition if it's working correctly at least once a year.

### Installation Example



**Hitachi Asia, Ltd.**  
**Hitachi Industrial Technology (Thailand), Ltd.**

**For furthermore information, please contact to nearest sales representative.**

**Version No. 032016**