



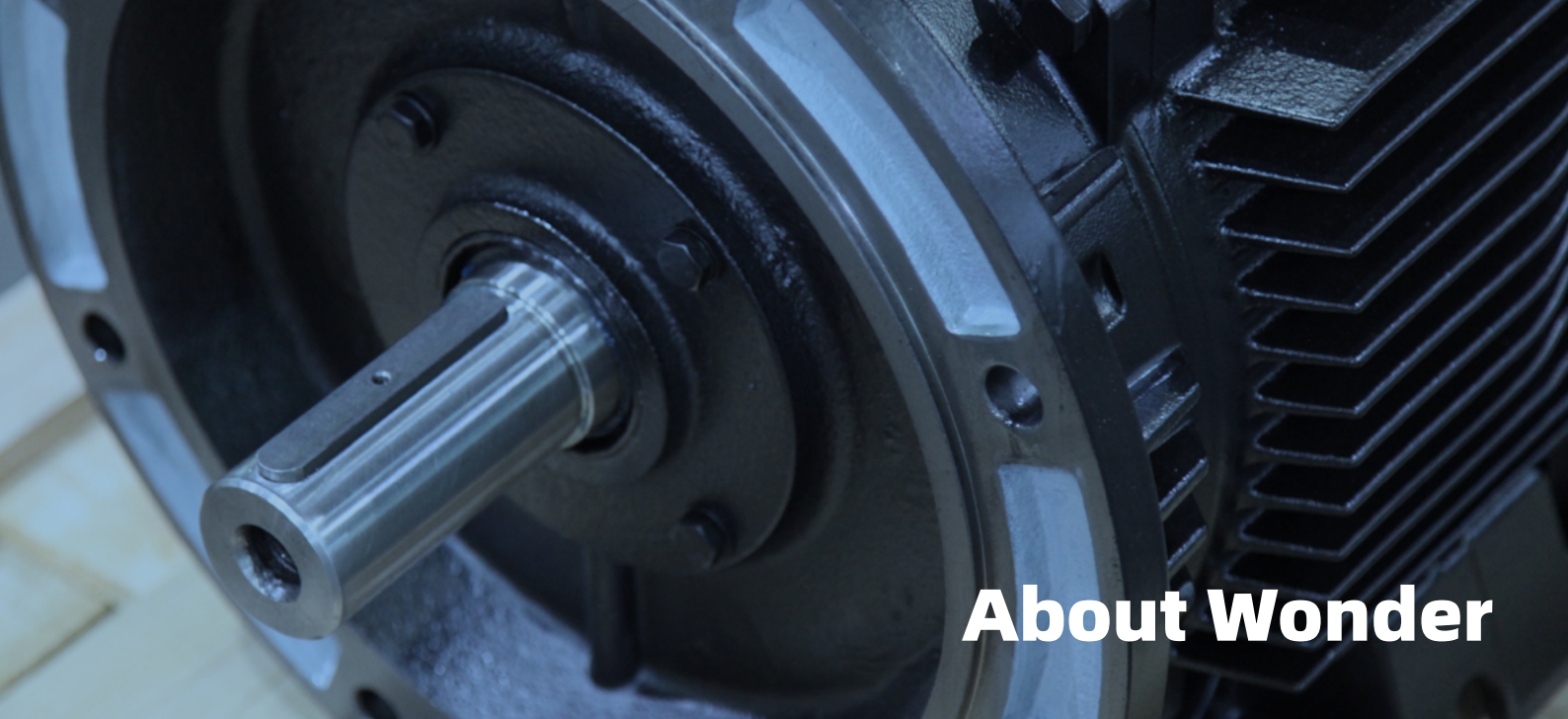
# IE5/IE4 Permanent Magnet Synchronous Motors

## WST Series

- Precise and smart control
- Ultra premium efficiency
- Compact structure and less volume
- Lower temperature rise level
- Ultra stability and credibility

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# About Wonder

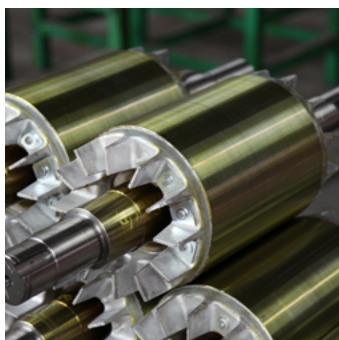
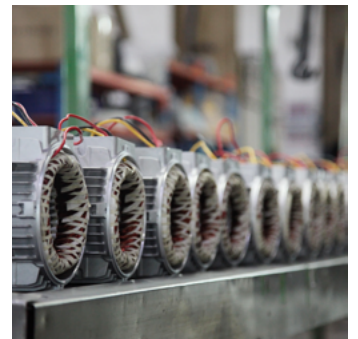
Synchronous motor expert and pioneer of high-efficiency industrial motors, while providing the market with various types of high-performance industrial motors.

Wonder has been certified as a national-level high-tech company, which is recognition of its work in the field of energy conservation.

Wonder owns four major production bases, serving over 50 countries and regions around the world.

Wonder has obtained qualifications such as CE, CCC, UKCA, UL, CSA, SABs, etc. Wonder has gained recognition in major global markets.

Wonder is headquartered in Fuzhou City, Fujian Province, China. With over 40 years of experience in motor manufacturing, we are able to provide power solutions for the majority of industrial applications.



# WST Series

## Permanent Magnet Synchronous Motors (IE5/IE4)



### 1. General information

#### 1.1. Brief

The WST Series permanent magnet synchronous motor is self-developed by Wonder Electric, which achieves energy efficiency levels of IE5 and IE4 according to IEC 60034.

The WST motors are supplied with build-in permanent magnetic steel produced from rare earth PM material (NdFeB) which is with high coercive force and hypertonic magnetic induction force. The motor guarantees high performance while offering higher power density. Even in the case of overload, the motor can also show excellent electrical characteristics.

WST Series features series of advantages such as superior energy-saving effect, low temperature rise, precise and smart control, compact structure, etc. The motors are widely used where speed variation, high efficiency and reduced volume are mandatory.

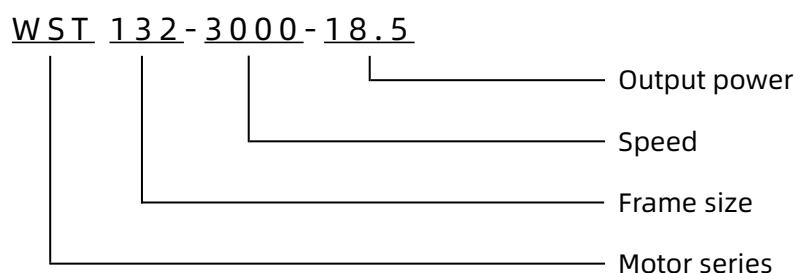
#### 1.2. Standard and qualifications

Wonder products meet the IEC international standards and can also be provided to comply with specific regulations in other countries. Please refer to the table below for the standards that Wonder products are based on.

Wonder has also obtained qualifications of ISO9001, ISO14001 and ISO45001, with the support of the perfect quality management and control system.

| Title                                                                        | DIN / VDE / EN  | IEC standard       | GB standard             |
|------------------------------------------------------------------------------|-----------------|--------------------|-------------------------|
| General regulations for rotating electrical machines                         | DIN EN 60034-1  | IEC 60034-1        | GB 755-2019             |
| Noise for rotating electrical machines                                       | -               | IEC 60034-9        | GB 10069.1              |
| AC induction motors for general use with standardized dimensions and power   | DIN EN 50347    | IEC 60072          | GB/T 4772.1-1999 Part 1 |
| Terminal markings and direction of rotation for rotating electrical machines | DIN VDE 0530    | IEC 60034-8 Part 8 | GB1971-2006             |
| Designation for type of construction, installation and terminal box position | DIN EN 60034-7  | IEC 60034-7        | GB/T 997-2008           |
| IEC standard voltages                                                        | DIN IEC 60038   | IEC 60038          | -                       |
| Cooling methods for rotating electrical machines                             | DIN EN 60034-6  | IEC 60034-6        | GB/T 1993-1993          |
| Mechanical vibrations of rotating electrical machines                        | DIN EN 60034-14 | IEC 60034-14       | GB 10068-2020           |
| Degrees of protection for rotating electrical machines                       | DIN EN 60034-5  | IEC 60034-5        | GB/T 4942.1-2016        |

### 1.3. Explanation of the product code



### 1.4. Nameplate

An example of nameplate is shown below, and the description of the designation is listed in the table:

|                                                                                     |       |           |           |        |          |
|-------------------------------------------------------------------------------------|-------|-----------|-----------|--------|----------|
| <b>WONDER</b>                                                                       |       | PM Motors |           | IE     | CE       |
| TYPE                                                                                |       | No.       |           |        |          |
| kW                                                                                  | Nm    | IN=       | A         | η=     | %        |
| ⊕ S.F.                                                                              | S.F.A | A         | Poles     | ⊕      |          |
| Rated speed                                                                         |       | r/min     | Frequency |        | Hz       |
| Voltage Constant                                                                    |       | Ke=       | Vs        | S1     |          |
| Torque Constant                                                                     |       | Kt =      | Nm/A      | In.Cl. |          |
| BEMF at                                                                             |       | r/min     | KE =      | V      | IP       |
|  |       | T.amb.    |           | °C     | kg       |
| www.wonderfz.com                                                                    |       |           |           |        | IEC60034 |

| Designation on nameplate | Description                   |
|--------------------------|-------------------------------|
| IE+number                | Efficiency level              |
| Type                     | Specification of motor        |
| No.                      | Serial number                 |
| kW                       | Rated output                  |
| Nm                       | Rated torque                  |
| I <sub>N</sub>           | Rated current                 |
| η                        | Efficiency                    |
| S.F.                     | Service factor                |
| S.F.A                    | Current at the service factor |
| r/min                    | Rated speed                   |
| Hz                       | Frequency                     |
| Ke                       | Voltage constant              |
| Kt                       | Torque constant               |
| In.Cl.                   | Insulation class              |
| S1                       | Duty                          |
| BEMF                     | Back Electromotive Force      |
| IP                       | Protection class              |
| T.amb                    | Ambient temperature           |
|                          | Bearing type for DE and NDE   |
| kg                       | Weight                        |
| IEC60034                 | Standard                      |

## 2. Electrical characteristics

### 2.1. Main technical parameters

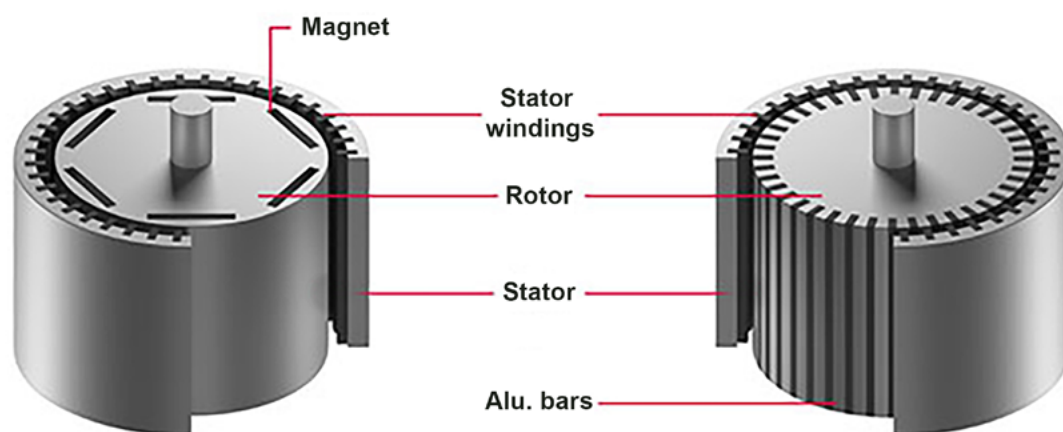
Please refer to the table below for the standard data and options of the WST Series.

| Item                 | Main technical parameters                                                        |                                                                |
|----------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------|
|                      | Standard                                                                         | Options                                                        |
| Frame size           | 71 ~ 315                                                                         |                                                                |
| Output power range   | 0.55 ~ 450kW                                                                     |                                                                |
| Speed                | 1500/1800/3000/3600/4500 r/min                                                   | The speed can be customized within the range 750 ~ 4500 r/min. |
| Voltage range of VFD | 380 ~ 460V (rated voltage 400V)                                                  | 200 ~ 240V (rated voltage 200V)                                |
| Frequency of VFD     | 50/60Hz                                                                          |                                                                |
| Duty                 | S1                                                                               | S2, S3                                                         |
| Efficiency level     | IE5/IE4                                                                          |                                                                |
| Mounting arrangement | B3, B35 and V1 for FS71-FS315<br>B5 for FS71-FS280<br>B34 and B14 for FS71-FS132 |                                                                |
| Insulation class     | F                                                                                | H                                                              |
| Temperature rise     | B ( $\Delta T$ 80K)                                                              |                                                                |
| Protection class     | IP55                                                                             | IP56, IP65, IP66                                               |
| Cooling method       | IC411                                                                            | IC416, IC410                                                   |
| Altitude             | $\leq 1000\text{m}$                                                              | The motor can be customized to operate at high altitude.       |
| Ambient temperature  | -20°C ~ 40°C                                                                     | -40 ~ 60°C                                                     |
| Air humidity         | $\leq 60\%$ at a temperature of 40°C                                             |                                                                |

### 2.2. Comparison of the internal structure of PMSM and IM

**Permanent Magnet Motor**

**Induction Motor**



## 2.3. Characteristics of WST Series

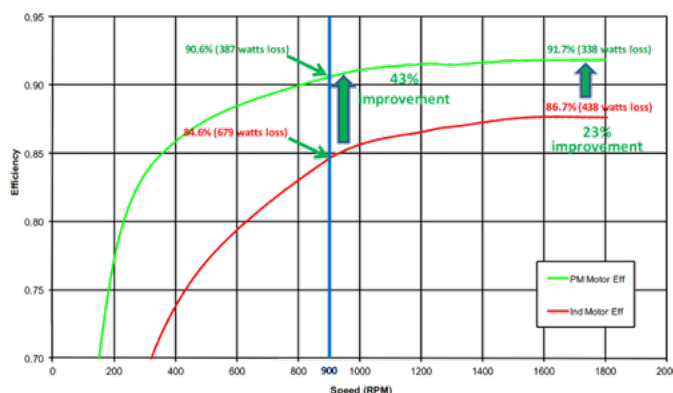
### 2.3.1. Ultra-premium efficiency

PM motors do not require reactive power excitation current, resulting in a higher power factor and exceptional energy-saving capabilities.

Unlike the cast aluminum rotors of traditional asynchronous motors, PM motors utilize rare-earth permanent magnets, minimizing rotor losses and enhancing material efficiency.

PM motors consistently exhibit outstanding electrical performance, regardless of whether operating under full load or partial load conditions.

### Efficiency Curve Comparison of PMSM and IM



(Data based on 2.2kW 1500r/min)

### 2.3.2. Lower temperature rise

Thanks to the electric design that leads to lower stator currents and the rotor without aluminum squirrel cage, the temperature rise of most types of WST Series is around 40-50K, which is obviously lower compared with standard induction motors (normally 60+k).

The sum of these minimised heat contributions remarkably prolongs the lifespan of the motors.

### 2.3.3. High torque density

WST series PM motors use high-performance permanent magnet materials to provide the air gap magnetic field for motor energy conversion. This magnetic field has a significant improvement compared with traditional asynchronous motors, so that permanent magnet synchronous motors have higher starting torque and overload capacity than traditional asynchronous motors.

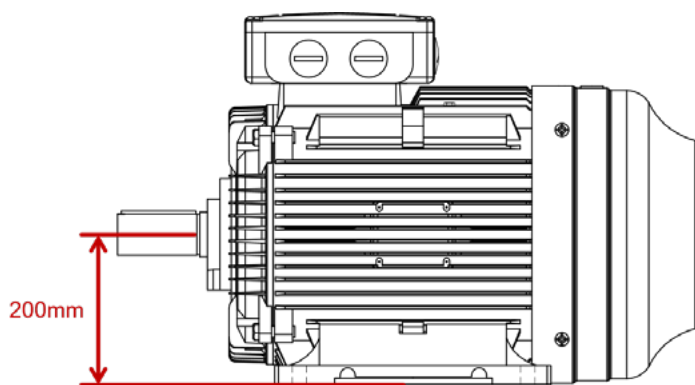


Rotor of PM motor and PM steel

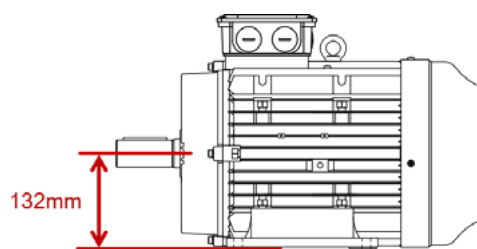
### 2.3.4. High power density

Compared with the same power asynchronous motor, the frame size of WST Series can be significantly reduced. While saving installation space, it greatly improves power density.

The scale graphics below represent the comparison of motor frame size based on same output power and speed (30kW/3000rpm).



Asynchronous induction motor

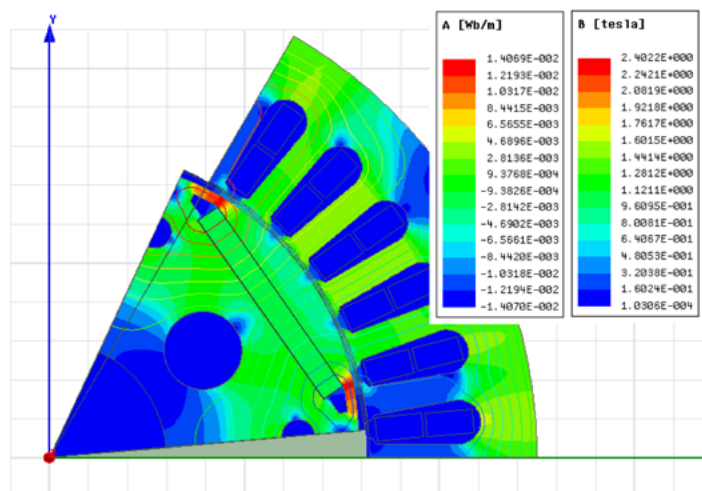


Permanent magnet synchronous motor

### 2.3.5. Precise and smart control

PM motors have electromagnetic coupling between the stator and rotor, and they operate without slip. This allows for precise control and fast response, making them suitable for applications that require high speed and position control accuracy.

PM motors are compatible with a variety of controllers, which can be used to output the torque and speed required by the environment to achieve intelligent control.



High accuracy modeling of PMSM

### 2.3.6. Strong overload capability

The high density of magnetic flux of PM motor brings the outstanding overload capability. WST Series allows 110% overload, when some types can reach 120%. The series can withstand 150% overload for 60 seconds.

### 2.3.8. Open loop control (no encoder needed)

No encoder will reduce the purchasing cost of motor, as well as the maintenance or replacement cost of encoder.

### 2.3.7. Constant torque/power at variable speed

PM motors can operate in constant power or constant torque mode depending on the application requirements.

Constant torque mode is suitable for applications with heavy mechanical load and the need to maintain a stable load, such as cranes, hoists, and fans. In this case, constant torque mode can ensure the stability and consistency of the equipment.

Constant power mode is suitable for applications with light load and the need to control speed and power, such as machine tools, conveyor belts, and injection molding machines. In this case, using constant power mode can improve production efficiency and energy efficiency.

## 2.4. Comparison of electrical features of PMSM and IM

| Features             | WST Series PM motor                                                     | Conventional induction motor                 |
|----------------------|-------------------------------------------------------------------------|----------------------------------------------|
| Efficiency           | Generally higher than induction motor                                   | Lower than PMSM                              |
| Power factor         | High power factor                                                       | Lower than PMSM                              |
| Torque               | High torque                                                             | Lower than PMSM                              |
| Speed range          | Being designed, the speed range can reach 3 times the rated speed.      | Up to 2 times the rated speed                |
| Volume and weight    | Small size, light weight                                                | Big size, heavy weight                       |
| Output power         | Higher power density compared to induction motor                        | IEC standard                                 |
| Speed                | Synchronous and no slip. Fast and precise response.                     | With slip                                    |
| Rotor                | With magnetic steel                                                     | With aluminum squirrel cage                  |
| Temperature rise     | The temp. rise of most types is within the range of 40-50K.             | 60+K                                         |
| Starting mode        | VFD                                                                     | Direct starting/VFD                          |
| Power supply         | Variable-frequency power supply                                         | Power frequency power supply/VF power supply |
| Voltage              | Back EMF                                                                | Power frequency voltage                      |
| Frequency            | According to the rated speed and number of pole pairs: $f = n * p / 60$ | 50Hz/60Hz                                    |
| Pole                 | 6/8                                                                     | 2/4/6/8                                      |
| Connecting type      | Y                                                                       | $\Delta$ / Y                                 |
| Mounting arrangement | Align with IEC standard based on same frame size                        | IEC standard                                 |
| Leads                | Wire diameter is bigger than IM                                         | IEC standard                                 |

## 2.5. Ambient temperatures and high altitudes

Standard motors are designed for operation at a maximum ambient temperature of 40°C and at a maximum altitude of 1000 meters above sea level. If a motor is operated at higher ambient temperatures or altitude, it should be de-rated. Please refer to the below chart of Factor kHT for different site altitudes and/or coolant temperature.

**Factor kHT for different site altitudes and/or coolant temperature**

| Site altitude above sea level | Site altitude above sea level coolant temperature |         |      |      |      |      |
|-------------------------------|---------------------------------------------------|---------|------|------|------|------|
|                               | <30°C                                             | 30~40°C | 45°C | 50°C | 55°C | 60°C |
| 1000m                         | 1.07                                              | 1.00    | 0.96 | 0.92 | 0.87 | 0.82 |
| 1500m                         | 1.04                                              | 0.97    | 0.93 | 0.89 | 0.84 | 0.79 |
| 2000m                         | 1.00                                              | 0.94    | 0.90 | 0.86 | 0.82 | 0.77 |
| 2500m                         | 0.96                                              | 0.90    | 0.86 | 0.83 | 0.78 | 0.74 |
| 3000m                         | 0.92                                              | 0.86    | 0.82 | 0.79 | 0.75 | 0.70 |
| 3500m                         | 0.88                                              | 0.82    | 0.79 | 0.75 | 0.71 | 0.67 |
| 4000m                         | 0.82                                              | 0.77    | 0.74 | 0.71 | 0.67 | 0.63 |

## 2.6. Insulation

Wonder adopts class F insulation with temperature rise B, which is the common requirement amongst industries today and gives Wonder motors a 25°C safety margin.

The application of B-class temperature rise and F-class insulation in motors can enhance their reliability, safety, and voltage withstand capability. It helps prolong the motor's service life and ensures its normal operation.

Thermal class 130 (B)

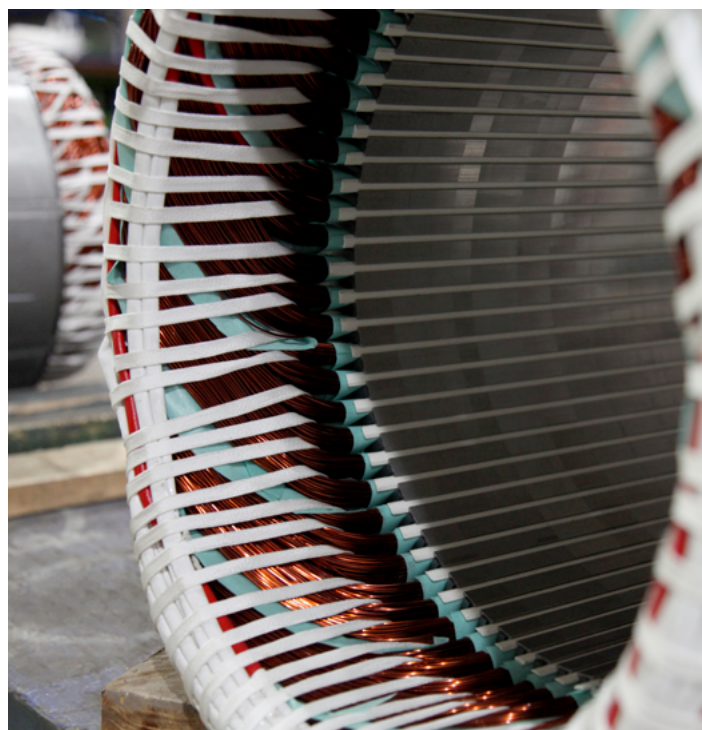
- Nominal ambient temperature 40°C
- Max permissible temperature rise 80K
- Hot spot temperature margin 10K

Thermal class 155 (F)

- Nominal ambient temperature 40°C
- Max permissible temperature rise 105K
- Hot spot temperature margin 10K

Thermal class 180 (H)

- Nominal ambient temperature 40°C
- Max permissible temperature rise 125K
- Hot spot temperature margin 10K



## 2.7. Various applications of WST Series

WST Series has a wide range of application prospects due to their excellent energy-saving performance and electrical properties. In the fields of pumps, fans, air compressors, textile machinery, rubber and plastic machinery, stone machinery, construction machinery, agricultural machinery and so on, PM motors are the ideal choice for equipment upgrades.



## 3. Motor structure conditions

### 3.1. Motor frame

From FS71 to FS132, the motor frame is made of aluminum. From FS160 to FS315, the motor frame is made of cast iron.



Aluminum frame



Cast iron frame

## 3.2. Terminal box

According to the IEC 60034 standard, the terminal box is installed on the top of the drive end. The terminal box is fixed to the motor frame using 4 cross screws or hex screws, all of which complying with the DIN standard. One of the screws is made of brass, while the other three are made of galvanized steel with a grade of 8.8.

An earth terminal must be placed inside the terminal box.

The terminal box can be rotated horizontally by 90°, allowing the outgoing wires to be drawn from various directions.

The auxiliary terminal box is optional.

The dimensions of the cable entry and of the terminal box are listed in the right table:

Dimensions of terminal box

| Frame size | Terminal Box     |                            |                         |
|------------|------------------|----------------------------|-------------------------|
|            | Cable entry (mm) | Auxiliary cable entry (mm) | Overall dimensions (mm) |
| 71         | 2-M20x1.5        | --                         | 103x103x38              |
| 80         | 2-M25x1.5        | --                         | 115x115x51              |
| 90         | 2-M25x1.5        | --                         | 115x115x51              |
| 100        | 2-M25x1.5        | 1-M20x1.5                  | 115x115x51              |
| 112        | 2-M25x1.5        | 1-M20x1.5                  | 115x115x51              |
| 132        | 2-M32x1.5        | 1-M20x1.5                  | 138x138x57              |
| 160        | 2-M40x1.5        | 2-M20x1.5                  | 200x160x80              |
| 180        | 2-M40x1.5        | 2-M20x1.5                  | 200x160x80              |
| 200        | 2-M50x1.5        | 2-M20x1.5                  | 250x200x92              |
| 225        | 2-M50x1.5        | 2-M20x1.5                  | 250x200x92              |
| 250        | 2-M63x1.5        | 2-M20x1.5                  | 340x210x106             |
| 280        | 2-M63x1.5        | 2-M20x1.5                  | 340x210x106             |
| 315        | 2-M63x1.5        | 2-M20x1.5                  | 413x258x165             |

## 3.3. Bearings

Wonder adopts single-row deep-groove ball bearings to standard motors. For some types of FS315 motors, NU roller bearings or angular contact ball bearings are recommended. The types are listed in the right table.

All motors are equipped as standard with an axially locked bearing. General at D-end.

Bearing types

| Frame size | Bearings      |                   |
|------------|---------------|-------------------|
|            | DE            | NDE               |
| 71         | 6202-2Z       | 6202-2Z           |
| 80         | 6204-2Z/C3    | 6203-2Z/C3        |
| 90         | 6205-2Z/C3    | 6204-2Z/C3        |
| 100        | 6306-2Z/C3    | 6205-2Z/C3        |
| 112        | 6306-2Z/C3    | 6205-2Z/C3        |
| 132        | 6308-2Z/C3    | 6206-2Z/C3        |
| 160        | 6309/C3       | 6209/C3           |
| 180        | 6311/C3       | 6211/C3           |
| 200        | 6312/C3       | 6212/C3           |
| 225        | 6313/C3       | 6312/C3           |
| 250        | 6315/C3       | 6313/C3           |
| 280        | 6317/C3       | 6314/C3           |
| 315        | 6319/C3/NU319 | 6319/C3/7319B(V1) |

## 3.4. Lubrication

For frame sizes below 160, the bearings are non-serviceable bearings which do not need regreasing. Please refer to the table below for bearing regreasing intervals in hours and grease volumes at the ambient temperature of 40 °C.

| Frame size | Amount of grease (g) | 2P (for speed: 3000/3600 r/min) |      | 4P (for speed: 1500/1800 r/min) |      |
|------------|----------------------|---------------------------------|------|---------------------------------|------|
|            |                      | B3 B5 B35                       | V1   | B3 B5 B35                       | V1   |
| 160        | 25                   | 5200                            | 2600 | 9000                            | 4500 |
| 180        | 30                   | 3400                            | 1700 | 7000                            | 3500 |
| 200        | 40                   | 3000                            | 1500 | 6400                            | 3200 |
| 225        | 50                   | 2400                            | 1200 | 6200                            | 3100 |
| 250        | 60                   | 2200                            | 1100 | 6000                            | 3000 |
| 280        | 35                   | 2200                            | 1100 | -                               | -    |
|            | 70                   | -                               | -    | 4800                            | 2400 |
| 315        | 35                   | 1400                            | 700  | -                               | -    |
|            | 90                   | -                               | -    | 4200                            | 2100 |

### 3.5. Oil seals

The right table presents the standard types of bearing oil seals per motor size.

Oil seal types

| Frame size | Oil Seal             |        |
|------------|----------------------|--------|
|            | DE                   | NDE    |
| 71         | VA-015 / TC15x25x5   | VA-015 |
| 80         | VA-020 / TC20x30x7   | /      |
| 90         | VA-025 / TC25x37x7   | /      |
| 100        | VA-030 / TC30x42x7   | /      |
| 112        | VA-030 / TC30x42x7   | /      |
| 132        | VA-040 / TC40x58x7   | VA-030 |
| 160        | VA-045 / TC45x60x7   | VA-045 |
| 180        | VA-055 / TC55x70x8   | VA-055 |
| 200        | VA-060 / TC60x80x12  | VA-060 |
| 225        | VA-065 / TC65x90x12  | VA-060 |
| 250        | VA-075 / TC75x90x12  | VA-065 |
| 280        | VA-085 / TC85x100x12 | VA-070 |
| 315        | VA-095 / TC95x120x10 | VA-095 |

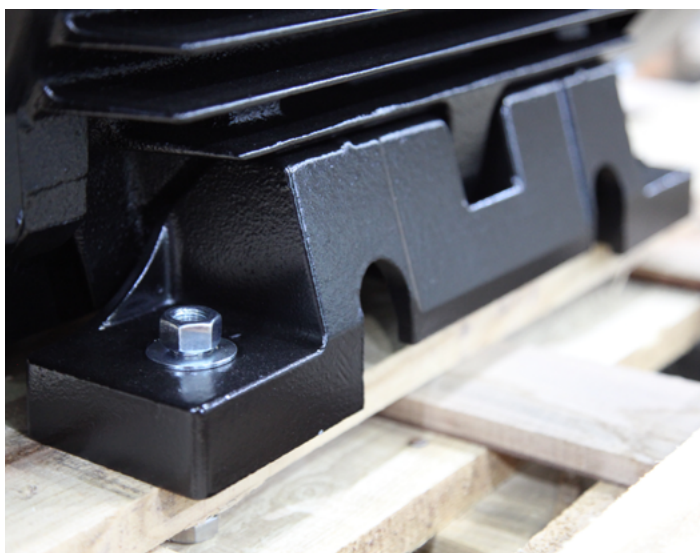
### 3.6. Drain holes

The standard design of Wonder motors includes the use of a drain hole to allow for the drainage of condensated water. The motor protection rating meets IP55.

The drain hole can be located either on the stator frame (for FS160 and above) or on the side of the end shield/flange (for FS71 to FS132), ensuring it is positioned at the lowest point of the motor.

### 3.7. Detachable feet

Wonder motors provide maximum flexibility to customers. All FS80-FS250 motors feature detachable feet that allow for flexible mounting and terminal box location. This design reduces customer modification time and can reduce motor stock.



### 3.8. Surface treatment

The motor parts are all painted, including the interior of the fan cover and the grooves of the B5/B14 flanges. The mounting surfaces of the shaft and flange are not painted but protected with anti-rust oil.

The painting process and thickness make the motor suitable for ISO12944 C2 classification.

The standard colors for Wonder motors are RAL9005 (black) and RAL5015 (blue).

### 3.9. Vibration

Wonder motor meets the requirements of class A vibration based on IEC60034-14 standard.

## 4. Technical specifications

| Type               | Frame size | Rated speed<br>nN<br>(r/min) | Rated power<br>PN<br>(kW) | Rated torque<br>Mn<br>(Nm) | Peak torque<br>Mpk<br>(Nm) | Voltage constant<br>Ke<br>(Vs) | Torque constant<br>Kt<br>(Nm/A) | BEMF at rated<br>EN<br>(V) | Rated current<br>IN<br>(Arms) | Efficiency<br>η(%) | Moment of inertia J<br>(kg m <sup>2</sup> ) | Weight<br>(kg) |
|--------------------|------------|------------------------------|---------------------------|----------------------------|----------------------------|--------------------------------|---------------------------------|----------------------------|-------------------------------|--------------------|---------------------------------------------|----------------|
| 1500r/min 6p 75Hz  |            |                              |                           |                            |                            |                                |                                 |                            |                               |                    |                                             |                |
| WST71-1500-0.55    | 71         | 1500                         | 0.55                      | 3.5                        | 10.5                       | 1.742                          | 3.017                           | 273.5                      | 1.2                           | 86.7               | 0.001                                       | 5.8            |
| WST71-1500-0.75    | 71         | 1500                         | 0.75                      | 4.8                        | 14.4                       | 1.742                          | 3.017                           | 273.5                      | 1.6                           | 88.1               | 0.001                                       | 6.8            |
| WST71-1500-1.1     | 71         | 1500                         | 1.1                       | 7.0                        | 21.0                       | 1.742                          | 3.017                           | 273.5                      | 2.3                           | 89.1               | 0.001                                       | 7.3            |
| WST71-1500-1.5     | 71         | 1500                         | 1.5                       | 9.6                        | 28.8                       | 1.742                          | 3.017                           | 273.5                      | 3.1                           | 89.1               | 0.001                                       | 9.0            |
| WST80-1500-0.55    | 80         | 1500                         | 0.55                      | 3.5                        | 7.0                        | 1.822                          | 3.155                           | 286                        | 1.2                           | 83.9               | 0.001                                       | 10.5           |
| WST80-1500-0.75    | 80         | 1500                         | 0.75                      | 4.8                        | 12.0                       | 1.822                          | 3.155                           | 286                        | 1.6                           | 85.7               | 0.001                                       | 11             |
| WST80-1500-1.1     | 80         | 1500                         | 1.1                       | 7.0                        | 21.0                       | 1.815                          | 3.144                           | 285                        | 2.2                           | 87.2               | 0.002                                       | 12             |
| WST80-1500-1.5     | 80         | 1500                         | 1.5                       | 9.6                        | 28.8                       | 1.815                          | 3.144                           | 285                        | 3.0                           | 88.2               | 0.003                                       | 13             |
| WST80-1500-2.2     | 80         | 1500                         | 2.2                       | 14.0                       | 42                         | 1.822                          | 3.155                           | 286                        | 4.4                           | 89.2               | 0.004                                       | 14.5           |
| WST90-1500-1.5     | 90L        | 1500                         | 1.5                       | 9.6                        | 28.8                       | 1.837                          | 3.180                           | 288                        | 3.0                           | 91.0               | 0.003                                       | 13.1           |
| WST90-1500-2.2     | 90L        | 1500                         | 2.2                       | 14.0                       | 42.0                       | 1.837                          | 3.180                           | 288                        | 4.4                           | 91.6               | 0.004                                       | 14.6           |
| WST90-1500-3.0     | 90L        | 1500                         | 3.0                       | 19.1                       | 57.3                       | 1.837                          | 3.180                           | 288                        | 6.0                           | 92.1               | 0.005                                       | 17.0           |
| WST90-1500-4.0     | 90L        | 1500                         | 4.0                       | 25.5                       | 76.4                       | 1.837                          | 3.180                           | 288                        | 8.0                           | 92.2               | 0.005                                       | 19.0           |
| WST100-1500-2.2    | 100L       | 1500                         | 2.2                       | 14.0                       | 28.0                       | 1.866                          | 3.232                           | 293                        | 4.6                           | 89.5               | 0.005                                       | 17.3           |
| WST100-1500-3.0    | 100L       | 1500                         | 3.0                       | 19.1                       | 38.2                       | 1.841                          | 3.188                           | 289                        | 6.2                           | 90.4               | 0.006                                       | 18.5           |
| WST100-1500-4.0    | 100L       | 1500                         | 4.0                       | 25.5                       | 51.0                       | 1.866                          | 3.232                           | 293                        | 9.1                           | 91.1               | 0.009                                       | 20.9           |
| WST100-1500-5.5    | 100L       | 1500                         | 5.5                       | 35.0                       | 70.0                       | 1.866                          | 3.232                           | 293                        | 11.0                          | 91.9               | 0.012                                       | 24.5           |
| WST100-1500-7.5    | 100L       | 1500                         | 7.5                       | 47.8                       | 95.6                       | 1.847                          | 3.199                           | 290                        | 15.0                          | 92.6               | 0.015                                       | 27.5           |
| WST112-1500-4.0    | 112M       | 1500                         | 4.0                       | 25.5                       | 76.4                       | 1.837                          | 3.180                           | 288                        | 8.0                           | 92.2               | 0.011                                       | 25.0           |
| WST112-1500-5.5    | 112M       | 1500                         | 5.5                       | 35.0                       | 105                        | 1.837                          | 3.180                           | 288                        | 11.0                          | 92.4               | 0.014                                       | 29.0           |
| WST112-1500-7.5    | 112M       | 1500                         | 7.5                       | 47.8                       | 143                        | 1.837                          | 3.180                           | 288                        | 15.0                          | 92.9               | 0.017                                       | 34.0           |
| WST112-1500-11     | 112M       | 1500                         | 11                        | 70.0                       | 210                        | 1.837                          | 3.180                           | 288                        | 22.0                          | 92.9               | 0.019                                       | 36.0           |
| WST132-1500-11     | 132M       | 1500                         | 11                        | 70.0                       | 210                        | 1.887                          | 3.245                           | 294                        | 21.6                          | 94.3               | 0.034                                       | 54.0           |
| WST132-1500-15     | 132M       | 1500                         | 15                        | 95.5                       | 287                        | 1.887                          | 3.245                           | 294                        | 29.4                          | 94.5               | 0.041                                       | 61.0           |
| WST132-1500-18.5   | 132M       | 1500                         | 18.5                      | 118                        | 353                        | 1.887                          | 3.245                           | 294                        | 36.2                          | 94.6               | 0.043                                       | 68.0           |
| WST160-1500-18.5   | 160M       | 1500                         | 18.5                      | 118                        | 283                        | 2.115                          | 3.663                           | 332                        | 33                            | 94.8               | 0.088                                       | 125            |
| WST160-1500-22     | 160M       | 1500                         | 22                        | 140                        | 336                        | 2.115                          | 3.663                           | 331                        | 39.5                          | 94.9               | 0.101                                       | 132            |
| WST160-1500-30     | 160L       | 1500                         | 30                        | 191                        | 420                        | 2.134                          | 3.696                           | 335                        | 53                            | 95.2               | 0.130                                       | 152            |
| WST180-1500-30     | 180M       | 1500                         | 30                        | 191                        | 458                        | 2.166                          | 3.751                           | 340                        | 54                            | 94.9               | 0.136                                       | 155            |
| WST180-1500-37     | 180L       | 1500                         | 37                        | 236                        | 565                        | 2.166                          | 3.751                           | 341                        | 64.5                          | 95.2               | 0.163                                       | 169            |
| WST180-1500-45     | 180L       | 1500                         | 45                        | 287                        | 688                        | 2.166                          | 3.751                           | 343                        | 81                            | 95.4               | 0.197                                       | 184            |
| WST200-1500-45     | 200L       | 1500                         | 45                        | 287                        | 688                        | 2.229                          | 3.861                           | 350                        | 79                            | 95.4               | 0.341                                       | 230            |
| WST200-1500-55     | 200L       | 1500                         | 55                        | 350                        | 840                        | 2.261                          | 3.916                           | 355                        | 94.6                          | 95.7               | 0.398                                       | 245            |
| 1500r/min 8p 100Hz |            |                              |                           |                            |                            |                                |                                 |                            |                               |                    |                                             |                |
| WST225-1500-55     | 225M       | 1500                         | 55                        | 350                        | 840                        | 2.229                          | 3.861                           | 350                        | 98.6                          | 95.7               | 0.576                                       | 311            |
| WST225-1500-75     | 225M       | 1500                         | 75                        | 478                        | 1146                       | 2.261                          | 3.916                           | 355                        | 132                           | 96.0               | 0.752                                       | 376            |
| WST250-1500-75     | 250M       | 1500                         | 75                        | 478                        | 1051                       | 2.216                          | 3.838                           | 348                        | 137                           | 96.0               | 0.678                                       | 426            |
| WST250-1500-90     | 250M       | 1500                         | 90                        | 573                        | 1261                       | 2.267                          | 3.926                           | 356                        | 161                           | 96.2               | 0.790                                       | 467            |
| WST280-1500-110    | 280M       | 1500                         | 110                       | 700                        | 1540                       | 2.248                          | 3.894                           | 353                        | 196.4                         | 96.3               | 2.034                                       | 608            |
| WST280-1500-132    | 280M       | 1500                         | 132                       | 840                        | 1848                       | 2.248                          | 3.894                           | 353                        | 234                           | 96.4               | 2.289                                       | 669            |
| WST280-1500-160    | 280M       | 1500                         | 160                       | 1019                       | 2242                       | 2.261                          | 3.916                           | 355                        | 283                           | 96.6               | 2.641                                       | 736            |
| WST315-1500-110    | 315S       | 1500                         | 110                       | 700                        | 1540                       | 2.242                          | 3.883                           | 352                        | 196                           | 96.3               | 3.785                                       | 863            |
| WST315-1500-132    | 315S       | 1500                         | 132                       | 840                        | 1848                       | 2.255                          | 3.905                           | 354                        | 233                           | 96.6               | 4.369                                       | 920            |
| WST315-1500-160    | 315S       | 1500                         | 160                       | 1019                       | 2242                       | 2.248                          | 3.894                           | 353                        | 284                           | 96.7               | 5.188                                       | 996            |
| WST315-1500-180    | 315M/L     | 1500                         | 180                       | 1146                       | 2521                       | 2.242                          | 3.883                           | 352                        | 321                           | 96.7               | 5.447                                       | 1049           |
| WST315-1500-200    | 315M/L     | 1500                         | 200                       | 1273                       | 2801                       | 2.261                          | 3.916                           | 355                        | 354                           | 96.7               | 5.771                                       | 1078           |
| WST315-1500-220    | 315M/L     | 1500                         | 220                       | 1401                       | 3082                       | 2.261                          | 3.916                           | 355                        | 389                           | 96.8               | 6.096                                       | 1112           |
| WST315-1500-250    | 315M/L     | 1500                         | 250                       | 1592                       | 3502                       | 2.236                          | 3.872                           | 351                        | 447                           | 96.8               | 6.809                                       | 1181           |
| WST315-1500-315    | 315M/L     | 1500                         | 315                       | 2006                       | 4413                       | 2.274                          | 3.938                           | 357                        | 556                           | 97.0               | 7.976                                       | 1306           |

| Type               | Frame size | Rated speed<br>nN<br>(r/min) | Rated power<br>PN<br>(kW) | Rated torque<br>Mn<br>(Nm) | Peak torque<br>Mpk<br>(Nm) | Voltage constant<br>Ke<br>(Vs) | Torque constant<br>Kt<br>(Nm/A) | BEMF at rated<br>EN<br>(V) | Rated current<br>IN<br>(Arms) | Efficiency<br>η(%) | Moment of inertia J<br>(kg m <sup>2</sup> ) | Weight<br>(kg) |
|--------------------|------------|------------------------------|---------------------------|----------------------------|----------------------------|--------------------------------|---------------------------------|----------------------------|-------------------------------|--------------------|---------------------------------------------|----------------|
| 1800r/min 6p 90Hz  |            |                              |                           |                            |                            |                                |                                 |                            |                               |                    |                                             |                |
| WST71-1800-0.55    | 71         | 1800                         | 0.55                      | 2.9                        | 8.8                        | 1.452                          | 2.515                           | 273.5                      | 1.2                           | 87.3               | 0.001                                       | 5.0            |
| WST71-1800-0.75    | 71         | 1800                         | 0.75                      | 4.0                        | 11.9                       | 1.452                          | 2.515                           | 273.5                      | 1.6                           | 88.5               | 0.001                                       | 5.7            |
| WST71-1800-1.1     | 71         | 1800                         | 1.1                       | 5.8                        | 17.5                       | 1.452                          | 2.515                           | 273.5                      | 2.3                           | 89.7               | 0.001                                       | 6.5            |
| WST71-1800-1.5     | 71         | 1800                         | 1.5                       | 8.0                        | 23.9                       | 1.452                          | 2.515                           | 273.5                      | 3.1                           | 90.3               | 0.001                                       | 7.4            |
| WST80-1800-0.55    | 80         | 1800                         | 0.55                      | 2.9                        | 5.8                        | 1.518                          | 2.629                           | 286                        | 1.2                           | 83.9               | 0.001                                       | 10.0           |
| WST80-1800-0.75    | 80         | 1800                         | 0.75                      | 4.0                        | 8.0                        | 1.518                          | 2.629                           | 286                        | 1.6                           | 85.7               | 0.001                                       | 11.0           |
| WST80-1800-1.1     | 80         | 1800                         | 1.1                       | 11.7                       | 35.0                       | 1.513                          | 2.620                           | 285                        | 2.2                           | 87.2               | 0.002                                       | 11.5           |
| WST80-1800-1.5     | 80         | 1800                         | 1.5                       | 8.0                        | 23.9                       | 1.523                          | 2.638                           | 287                        | 3.0                           | 88.2               | 0.002                                       | 12.5           |
| WST80-1800-2.2     | 80         | 1800                         | 2.2                       | 11.7                       | 35.0                       | 1.529                          | 2.648                           | 288                        | 4.4                           | 89.2               | 0.003                                       | 14.0           |
| WST90-1800-1.5     | 90L        | 1800                         | 1.5                       | 8.0                        | 23.9                       | 1.525                          | 2.640                           | 288                        | 3.0                           | 91.2               | 0.003                                       | 10.5           |
| WST90-1800-2.2     | 90L        | 1800                         | 2.2                       | 11.7                       | 35.0                       | 1.525                          | 2.640                           | 288                        | 4.4                           | 91.7               | 0.004                                       | 12.6           |
| WST90-1800-3.0     | 90L        | 1800                         | 3.0                       | 15.9                       | 47.7                       | 1.525                          | 2.640                           | 288                        | 6.0                           | 92.3               | 0.005                                       | 14.7           |
| WST90-1800-4.0     | 90L        | 1800                         | 4.0                       | 21.2                       | 63.7                       | 1.525                          | 2.640                           | 288                        | 8.0                           | 92.4               | 0.005                                       | 17.8           |
| WST100-1800-2.2    | 100L       | 1800                         | 2.2                       | 11.7                       | 23.4                       | 1.550                          | 2.684                           | 292                        | 4.6                           | 89.5               | 0.004                                       | 16.1           |
| WST100-1800-3.0    | 100L       | 1800                         | 3.0                       | 15.9                       | 31.8                       | 1.534                          | 2.657                           | 289                        | 6.2                           | 90.4               | 0.005                                       | 17.3           |
| WST100-1800-4.0    | 100L       | 1800                         | 4.0                       | 21.2                       | 42.4                       | 1.560                          | 2.703                           | 294                        | 8.1                           | 91.1               | 0.007                                       | 19.1           |
| WST100-1800-5.5    | 100L       | 1800                         | 5.5                       | 29.2                       | 58.4                       | 1.529                          | 2.648                           | 288                        | 11.0                          | 91.9               | 0.010                                       | 22.1           |
| WST100-1800-7.5    | 100L       | 1800                         | 7.5                       | 39.8                       | 79.6                       | 1.540                          | 2.666                           | 290                        | 15.0                          | 92.6               | 0.014                                       | 26.3           |
| WST112-1800-4.0    | 112M       | 1800                         | 4.0                       | 21.2                       | 63.7                       | 1.525                          | 2.640                           | 288                        | 8.0                           | 92.0               | 0.011                                       | 25.0           |
| WST112-1800-5.5    | 112M       | 1800                         | 5.5                       | 29.2                       | 87.5                       | 1.525                          | 2.640                           | 288                        | 11.0                          | 92.8               | 0.014                                       | 29.0           |
| WST112-1800-7.5    | 112M       | 1800                         | 7.5                       | 39.8                       | 119                        | 1.525                          | 2.640                           | 288                        | 14.9                          | 93.4               | 0.017                                       | 34.0           |
| WST112-1800-11     | 112M       | 1800                         | 11                        | 58.4                       | 175                        | 1.525                          | 2.640                           | 288                        | 21.6                          | 93.6               | 0.018                                       | 35.0           |
| WST132-1800-11     | 132M       | 1800                         | 11                        | 58.4                       | 175                        | 1.564                          | 2.708                           | 294                        | 21.6                          | 94.3               | 0.034                                       | 54.0           |
| WST132-1800-15     | 132M       | 1800                         | 15                        | 79.6                       | 239                        | 1.564                          | 2.708                           | 294                        | 29.3                          | 94.7               | 0.041                                       | 61.0           |
| WST132-1800-18.5   | 132M       | 1800                         | 18.5                      | 98.1                       | 294                        | 1.564                          | 2.708                           | 294                        | 36.1                          | 94.8               | 0.043                                       | 68.0           |
| WST160-1800-18.5   | 160M       | 1800                         | 18.5                      | 98.0                       | 235                        | 1.762                          | 3.052                           | 332                        | 33.5                          | 94.6               | 0.075                                       | 117            |
| WST160-1800-22     | 160M       | 1800                         | 22                        | 117                        | 281                        | 1.757                          | 3.043                           | 331                        | 39.5                          | 94.9               | 0.088                                       | 124            |
| WST160-1800-30     | 160L       | 1800                         | 30                        | 159                        | 382                        | 1.762                          | 3.052                           | 332                        | 53.5                          | 95.3               | 0.117                                       | 145            |
| WST180-1800-30     | 180M       | 1800                         | 30                        | 159                        | 382                        | 1.805                          | 3.127                           | 340                        | 54                            | 94.9               | 0.136                                       | 155            |
| WST180-1800-37     | 180L       | 1800                         | 37                        | 196                        | 472                        | 1.767                          | 3.061                           | 333                        | 66                            | 95.4               | 0.163                                       | 169            |
| WST180-1800-45     | 180L       | 1800                         | 45                        | 239                        | 574                        | 1.778                          | 3.08                            | 335                        | 81.5                          | 95.6               | 0.197                                       | 184            |
| WST200-1800-45     | 200L       | 1800                         | 45                        | 239                        | 574                        | 1.858                          | 3.218                           | 350                        | 80                            | 95.4               | 0.309                                       | 219            |
| WST200-1800-55     | 200L       | 1800                         | 55                        | 292                        | 701                        | 1.858                          | 3.218                           | 350                        | 98                            | 95.7               | 0.357                                       | 235            |
| 1800r/min 8p 120Hz |            |                              |                           |                            |                            |                                |                                 |                            |                               |                    |                                             |                |
| WST225-1800-55     | 225M       | 1800                         | 55                        | 292                        | 701                        | 1.858                          | 3.218                           | 350                        | 99                            | 95.7               | 0.521                                       | 291            |
| WST225-1800-75     | 225M       | 1800                         | 75                        | 398                        | 955                        | 1.874                          | 3.245                           | 353                        | 134                           | 96.0               | 0.671                                       | 346            |
| WST250-1800-75     | 250M       | 1800                         | 75                        | 398                        | 955                        | 1.847                          | 3.199                           | 348                        | 137                           | 96.0               | 0.678                                       | 426            |
| WST250-1800-90     | 250M       | 1800                         | 90                        | 478                        | 1147                       | 1.847                          | 3.199                           | 348                        | 165                           | 96.2               | 0.774                                       | 461            |
| WST280-1800-110    | 280M       | 1800                         | 110                       | 584                        | 1402                       | 1.884                          | 3.264                           | 355                        | 194                           | 96.3               | 1.744                                       | 565            |
| WST280-1800-132    | 280M       | 1800                         | 132                       | 700                        | 1680                       | 1.874                          | 3.245                           | 353                        | 234                           | 96.4               | 2.034                                       | 608            |
| WST280-1800-160    | 280M       | 1800                         | 160                       | 849                        | 2038                       | 1.879                          | 3.254                           | 354                        | 284                           | 96.6               | 2.353                                       | 681            |
| WST315-1800-110    | 315S       | 1800                         | 110                       | 584                        | 1285                       | 1.884                          | 3.264                           | 355                        | 195                           | 96.3               | 3.266                                       | 810            |
| WST315-1800-132    | 315S       | 1800                         | 132                       | 700                        | 1540                       | 1.874                          | 3.245                           | 353                        | 234                           | 96.4               | 3.720                                       | 854            |
| WST315-1800-160    | 315S       | 1800                         | 160                       | 849                        | 1868                       | 1.879                          | 3.254                           | 354                        | 287                           | 96.6               | 4.369                                       | 921            |
| WST315-1800-180    | 315M/L     | 1800                         | 180                       | 955                        | 2101                       | 1.852                          | 3.208                           | 349                        | 320                           | 96.7               | 4.669                                       | 970            |
| WST315-1800-200    | 315M/L     | 1800                         | 200                       | 1061                       | 2334                       | 1.895                          | 3.282                           | 357                        | 354                           | 96.7               | 4.928                                       | 993            |
| WST315-1800-220    | 315M/L     | 1800                         | 220                       | 1167                       | 2567                       | 1.890                          | 3.273                           | 356                        | 390                           | 96.7               | 5.188                                       | 1020           |
| WST315-1800-250    | 315M/L     | 1800                         | 250                       | 1326                       | 2917                       | 1.890                          | 3.273                           | 356                        | 444                           | 96.7               | 5.836                                       | 1083           |
| WST315-1800-315    | 315M/L     | 1800                         | 315                       | 1671                       | 3676                       | 1.895                          | 3.282                           | 357                        | 560                           | 96.9               | 6.744                                       | 1181           |

| Type               | Frame size | Rated speed<br>nN<br>(r/min) | Rated power<br>PN<br>(kW) | Rated torque<br>Mn<br>(Nm) | Peak torque<br>Mpk<br>(Nm) | Voltage constant<br>Ke<br>(Vs) | Torque constant<br>Kt<br>(Nm/A) | BEMF at rated<br>EN<br>(V) | Rated current<br>IN<br>(Arms) | Efficiency<br>η(%) | Moment of inertia J<br>(kg m <sup>2</sup> ) | Weight<br>(kg) |
|--------------------|------------|------------------------------|---------------------------|----------------------------|----------------------------|--------------------------------|---------------------------------|----------------------------|-------------------------------|--------------------|---------------------------------------------|----------------|
| 3000r/min 6p 150Hz |            |                              |                           |                            |                            |                                |                                 |                            |                               |                    |                                             |                |
| WST71-3000-0.75    | 71         | 3000                         | 0.75                      | 2.4                        | 7.2                        | 0.861                          | 1.491                           | 273.5                      | 1.6                           | 89.1               | 0.000545                                    | 5.0            |
| WST71-3000-1.1     | 71         | 3000                         | 1.1                       | 3.5                        | 10.5                       | 0.861                          | 1.491                           | 273.5                      | 2.3                           | 90.6               | 0.000662                                    | 5.4            |
| WST71-3000-1.5     | 71         | 3000                         | 1.5                       | 4.8                        | 14.3                       | 0.861                          | 1.491                           | 273.5                      | 3.3                           | 91.3               | 0.000837                                    | 6.3            |
| WST71-3000-2.2     | 71         | 3000                         | 2.2                       | 7.0                        | 21.0                       | 0.861                          | 1.491                           | 273.5                      | 4.6                           | 92.0               | 0.00101                                     | 7.0            |
| WST80-3000-0.75    | 80         | 3000                         | 0.75                      | 2.4                        | 7.2                        | 0.914                          | 1.583                           | 287                        | 1.6                           | 83.5               | 0.000824                                    | 10.0           |
| WST80-3000-1.1     | 80         | 3000                         | 1.1                       | 3.5                        | 10.5                       | 0.911                          | 1.578                           | 286                        | 2.3                           | 85.2               | 0.000989                                    | 10.5           |
| WST80-3000-1.5     | 80         | 3000                         | 1.5                       | 4.8                        | 14.3                       | 0.908                          | 1.572                           | 285                        | 3.1                           | 86.5               | 0.001319                                    | 11.0           |
| WST80-3000-2.2     | 80         | 3000                         | 2.2                       | 7.0                        | 21.0                       | 0.908                          | 1.572                           | 285                        | 4.5                           | 88.0               | 0.001978                                    | 12.0           |
| WST80-3000-3.0     | 80         | 3000                         | 3.0                       | 9.6                        | 28.7                       | 0.908                          | 1.572                           | 285                        | 6.0                           | 89.1               | 0.002637                                    | 13.0           |
| WST80-3000-4.0     | 80         | 3000                         | 4.0                       | 12.7                       | 38.2                       | 0.920                          | 1.594                           | 289                        | 8.0                           | 90.0               | 0.003296                                    | 14.0           |
| WST90-3000-2.2     | 90L        | 3000                         | 2.2                       | 7.0                        | 21.0                       | 0.918                          | 1.590                           | 288                        | 4.4                           | 91.5               | 0.002379                                    | 10.5           |
| WST90-3000-3.0     | 90L        | 3000                         | 3.0                       | 9.6                        | 28.7                       | 0.918                          | 1.590                           | 288                        | 6.0                           | 92.1               | 0.00299                                     | 12.6           |
| WST90-3000-4.0     | 90L        | 3000                         | 4.0                       | 12.7                       | 38.2                       | 0.918                          | 1.590                           | 288                        | 8.0                           | 92.5               | 0.003806                                    | 14.7           |
| WST90-3000-5.5     | 90L        | 3000                         | 5.5                       | 17.5                       | 52.5                       | 0.918                          | 1.590                           | 288                        | 11.0                          | 93.0               | 0.004417                                    | 16.8           |
| WST100-3000-3.0    | 100L       | 3000                         | 3.0                       | 9.6                        | 24.0                       | 0.933                          | 1.616                           | 293                        | 6.3                           | 89.1               | 0.003783                                    | 15.5           |
| WST100-3000-4.0    | 100L       | 3000                         | 4.0                       | 12.7                       | 38.2                       | 0.933                          | 1.616                           | 293                        | 8.2                           | 90.0               | 0.005405                                    | 17.3           |
| WST100-3000-5.5    | 100L       | 3000                         | 5.5                       | 17.5                       | 52.5                       | 0.930                          | 1.611                           | 292                        | 11.0                          | 90.9               | 0.007026                                    | 19.1           |
| WST100-3000-7.5    | 100L       | 3000                         | 7.5                       | 23.9                       | 71.6                       | 0.917                          | 1.589                           | 288                        | 15.0                          | 91.7               | 0.009728                                    | 22.1           |
| WST100-3000-11     | 100L       | 3000                         | 11.0                      | 35.0                       | 105.0                      | 0.914                          | 1.583                           | 287                        | 22.0                          | 92.6               | 0.013512                                    | 26.3           |
| WST112-3000-5.5    | 112M       | 3000                         | 5.5                       | 17.5                       | 52.5                       | 0.918                          | 1.590                           | 288                        | 11.0                          | 93.0               | 0.0087839                                   | 22.0           |
| WST112-3000-7.5    | 112M       | 3000                         | 7.5                       | 23.9                       | 71.6                       | 0.918                          | 1.590                           | 288                        | 14.9                          | 93.8               | 0.0112328                                   | 25.0           |
| WST112-3000-11     | 112M       | 3000                         | 11                        | 35.0                       | 105                        | 0.918                          | 1.590                           | 288                        | 21.5                          | 94.4               | 0.0149689                                   | 30.0           |
| WST112-3000-15     | 112M       | 3000                         | 15                        | 47.8                       | 143                        | 0.918                          | 1.590                           | 288                        | 29.1                          | 94.8               | 0.0192107                                   | 36.0           |
| WST132-3000-15     | 132M       | 3000                         | 15                        | 47.8                       | 143                        | 0.936                          | 1.662                           | 294                        | 29.2                          | 94.7               | 0.029118                                    | 54.0           |
| WST132-3000-18.5   | 132M       | 3000                         | 18.5                      | 58.9                       | 177                        | 0.936                          | 1.662                           | 294                        | 36.0                          | 95.0               | 0.0337329                                   | 61.0           |
| WST132-3000-22     | 132M       | 3000                         | 22                        | 70.0                       | 210                        | 0.936                          | 1.662                           | 294                        | 42.6                          | 95.2               | 0.0383478                                   | 68.0           |
| WST132-3000-30     | 132M       | 3000                         | 30                        | 95.4                       | 286                        | 0.936                          | 1.662                           | 294                        | 58.0                          | 95.5               | 0.042822                                    | 75.0           |
| WST160-3000-22     | 160M       | 3000                         | 22                        | 70.0                       | 168                        | 1.061                          | 1.836                           | 333                        | 39.5                          | 94.8               | 0.08770068                                  | 113            |
| WST160-3000-30     | 160M       | 3000                         | 30                        | 96.0                       | 229                        | 1.067                          | 1.848                           | 335                        | 53.0                          | 95.2               | 0.10079122                                  | 120            |
| WST160-3000-37     | 160M       | 3000                         | 37                        | 118                        | 283                        | 1.080                          | 1.870                           | 339                        | 66.0                          | 95.4               | 0.12995566                                  | 129            |
| WST180-3000-37     | 180M       | 3000                         | 37                        | 118                        | 283                        | 13.070                         | 1.853                           | 336                        | 65.5                          | 95.0               | 0.10902183                                  | 143            |
| WST180-3000-45     | 180M       | 3000                         | 45                        | 143                        | 344                        | 13.070                         | 1.853                           | 332                        | 81.0                          | 95.3               | 0.12425742                                  | 151            |
| WST180-3000-55     | 180L       | 3000                         | 55                        | 175                        | 420                        | 1.086                          | 1.881                           | 341                        | 97.0                          | 95.5               | 0.15159726                                  | 164            |
| WST200-3000-55     | 200L       | 3000                         | 55                        | 175                        | 420                        | 1.121                          | 1.942                           | 352                        | 97.0                          | 95.8               | 0.26788241                                  | 203            |
| WST200-3000-75     | 200L       | 3000                         | 75                        | 239                        | 574                        | 1.118                          | 1.936                           | 351                        | 134                           | 96.0               | 0.34105343                                  | 230            |
| 3000r/min 8p 200Hz |            |                              |                           |                            |                            |                                |                                 |                            |                               |                    |                                             |                |
| WST225-3000-75     | 225M       | 3000                         | 75                        | 239                        | 574                        | 1.108                          | 1.920                           | 348                        | 136                           | 96.0               | 0.46708661                                  | 271            |
| WST225-3000-90     | 225M       | 3000                         | 90                        | 287                        | 688                        | 1.099                          | 1.903                           | 345                        | 164                           | 96.2               | 0.52143863                                  | 291            |
| WST225-3000-110    | 225M       | 3000                         | 110                       | 350                        | 840                        | 1.102                          | 1.909                           | 346                        | 198                           | 96.3               | 0.60296667                                  | 321            |
| WST250-3000-110    | 250M       | 3000                         | 110                       | 350                        | 770                        | 1.108                          | 1.920                           | 348                        | 202                           | 96.0               | 0.67788798                                  | 426            |
| WST250-3000-132    | 250M       | 3000                         | 132                       | 420                        | 924                        | 1.108                          | 1.920                           | 348                        | 243                           | 96.2               | 0.82246837                                  | 461            |
| WST280-3000-132    | 280M       | 3000                         | 132                       | 420                        | 924                        | 1.143                          | 1.980                           | 359                        | 233                           | 96.2               | 1.45505647                                  | 510            |
| WST280-3000-160    | 280M       | 3000                         | 160                       | 509                        | 1120                       | 1.131                          | 1.958                           | 355                        | 286                           | 96.4               | 1.67949513                                  | 553            |
| WST280-3000-180    | 280M       | 3000                         | 180                       | 573                        | 1261                       | 1.150                          | 1.991                           | 361                        | 313                           | 96.5               | 1.80774579                                  | 578            |
| WST280-3000-200    | 280M       | 3000                         | 200                       | 637                        | 1402                       | 1.124                          | 1.947                           | 353                        | 360                           | 96.6               | 2.03392831                                  | 608            |
| WST315-3000-132    | 315S       | 3000                         | 132                       | 420                        | 840                        | 1.105                          | 1.914                           | 347                        | 242                           | 96.2               | 2.98312336                                  | 777            |
| WST315-3000-160    | 315S       | 3000                         | 160                       | 509                        | 1018                       | 1.127                          | 1.953                           | 354                        | 289                           | 96.3               | 3.50185667                                  | 830            |
| WST315-3000-180    | 315S       | 3000                         | 180                       | 573                        | 1146                       | 1.118                          | 1.936                           | 351                        | 325                           | 96.3               | 3.69638166                                  | 846            |
| WST315-3000-200    | 315M/L     | 3000                         | 200                       | 637                        | 1401                       | 1.127                          | 1.953                           | 354                        | 358                           | 96.5               | 3.95574831                                  | 894            |
| WST315-3000-220    | 315M/L     | 3000                         | 220                       | 700                        | 1540                       | 1.118                          | 1.936                           | 351                        | 394                           | 96.5               | 4.21511497                                  | 922            |
| WST315-3000-250    | 315M/L     | 3000                         | 250                       | 796                        | 1751                       | 1.118                          | 1.936                           | 351                        | 449                           | 96.5               | 4.53932328                                  | 950            |
| WST315-3000-315    | 315M/L     | 3000                         | 315                       | 1003                       | 2207                       | 1.121                          | 1.942                           | 352                        | 563                           | 96.6               | 5.44710657                                  | 1048           |
| WST315-3000-355    | 315M/L     | 3000                         | 355                       | 1130                       | 2451                       | 1.121                          | 1.942                           | 352                        | 634                           | 96.7               | 6.03068155                                  | 1099           |
| WST315-3000-400    | 315M/L     | 3000                         | 400                       | 1273                       | 2801                       | 1.121                          | 1.942                           | 352                        | 712                           | 96.8               | 6.80878151                                  | 1181           |

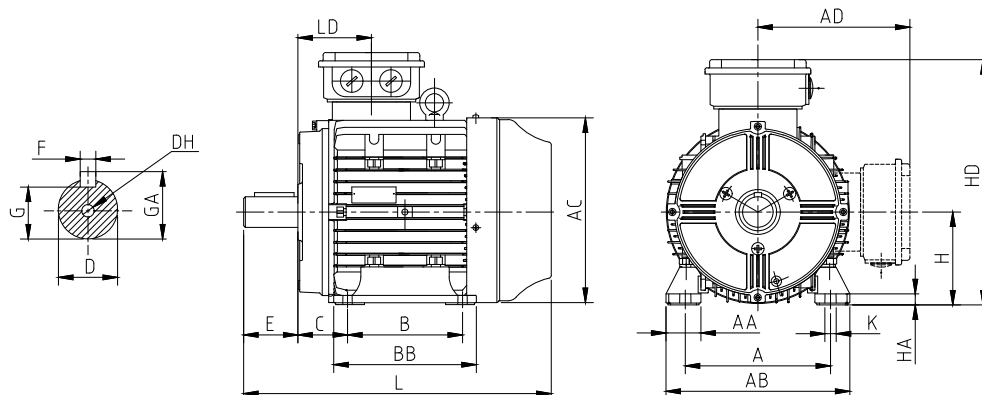
| Type               | Frame size | Rated speed<br>nN<br>(r/min) | Rated power<br>PN<br>(kW) | Rated torque<br>Mn<br>(Nm) | Peak torque<br>Mpk<br>(Nm) | Voltage constant<br>Ke<br>(Vs) | Torque constant<br>Kt<br>(Nm/A) | BEMF at rated<br>EN<br>(V) | Rated current<br>IN<br>(Arms) | Efficiency<br>η(%) | Moment of inertia J<br>(kg m <sup>2</sup> ) | Weight<br>(kg) |
|--------------------|------------|------------------------------|---------------------------|----------------------------|----------------------------|--------------------------------|---------------------------------|----------------------------|-------------------------------|--------------------|---------------------------------------------|----------------|
| 3600r/min 6p 180Hz |            |                              |                           |                            |                            |                                |                                 |                            |                               |                    |                                             |                |
| WST71-3600-0.75    | 71         | 3600                         | 0.75                      | 2.0                        | 6.0                        | 0.732                          | 1.268                           | 273.5                      | 1.6                           | 88.3               | 0.000545                                    | 5.0            |
| WST71-3600-1.1     | 71         | 3600                         | 1.1                       | 2.9                        | 8.8                        | 0.732                          | 1.268                           | 273.5                      | 2.3                           | 89.9               | 0.000662                                    | 5.7            |
| WST71-3600-1.5     | 71         | 3600                         | 1.5                       | 4.0                        | 11.9                       | 0.732                          | 1.268                           | 273.5                      | 3.4                           | 90.9               | 0.000837                                    | 6.3            |
| WST71-3600-2.2     | 71         | 3600                         | 2.2                       | 5.8                        | 17.5                       | 0.732                          | 1.268                           | 273.5                      | 4.5                           | 91.9               | 0.00101                                     | 7.0            |
| WST80-3600-1.1     | 80         | 3600                         | 1.1                       | 2.9                        | 8.8                        | 0.758                          | 1.315                           | 286                        | 2.3                           | 85.2               | 0.000824                                    | 10.0           |
| WST80-3600-1.5     | 80         | 3600                         | 1.5                       | 4.0                        | 11.9                       | 0.754                          | 1.305                           | 284                        | 3.1                           | 86.5               | 0.000989                                    | 10.5           |
| WST80-3600-2.2     | 80         | 3600                         | 2.2                       | 5.8                        | 17.5                       | 0.756                          | 1.310                           | 285                        | 4.5                           | 88.0               | 0.001682                                    | 11.5           |
| WST80-3600-3.0     | 80         | 3600                         | 3.0                       | 8.0                        | 23.9                       | 0.762                          | 1.319                           | 287                        | 6.1                           | 89.1               | 0.002307                                    | 12.5           |
| WST80-3600-4.0     | 80         | 3600                         | 4.0                       | 10.6                       | 31.8                       | 0.756                          | 1.310                           | 285                        | 8.0                           | 90.0               | 0.002637                                    | 13.0           |
| WST90-3600-2.2     | 90L        | 3600                         | 2.2                       | 5.8                        | 17.5                       | 0.766                          | 1.327                           | 288                        | 4.4                           | 91.7               | 0.002379                                    | 10.5           |
| WST90-3600-3.0     | 90L        | 3600                         | 3.0                       | 8.0                        | 23.9                       | 0.766                          | 1.327                           | 288                        | 6.0                           | 92.4               | 0.00299                                     | 12.6           |
| WST90-3600-4.0     | 90L        | 3600                         | 4.0                       | 10.6                       | 31.8                       | 0.766                          | 1.327                           | 288                        | 8.0                           | 92.9               | 0.003806                                    | 14.7           |
| WST90-3600-5.5     | 90L        | 3600                         | 5.5                       | 14.6                       | 43.8                       | 0.766                          | 1.327                           | 288                        | 11.0                          | 93.4               | 0.004417                                    | 16.8           |
| WST100-3600-3.0    | 100L       | 3600                         | 3.0                       | 8.0                        | 20.0                       | 0.780                          | 1.351                           | 294                        | 6.3                           | 89.1               | 0.003243                                    | 15.0           |
| WST100-3600-4.0    | 100L       | 3600                         | 4.0                       | 10.6                       | 31.8                       | 0.772                          | 1.338                           | 291                        | 8.2                           | 90.0               | 0.004324                                    | 16.1           |
| WST100-3600-5.5    | 100L       | 3600                         | 5.5                       | 14.6                       | 43.8                       | 0.770                          | 1.333                           | 290                        | 11.0                          | 90.9               | 0.005945                                    | 17.9           |
| WST100-3600-7.5    | 100L       | 3600                         | 7.5                       | 19.9                       | 59.7                       | 0.764                          | 1.324                           | 288                        | 15.0                          | 91.7               | 0.008107                                    | 20.3           |
| WST100-3600-11     | 100L       | 3600                         | 11.0                      | 29.2                       | 87.5                       | 0.780                          | 1.351                           | 294                        | 22.0                          | 92.6               | 0.01189                                     | 24.5           |
| WST112-3600-5.5    | 112M       | 3600                         | 5.5                       | 14.6                       | 43.8                       | 0.766                          | 1.327                           | 288                        | 11.0                          | 93.0               | 0.0082227                                   | 21.0           |
| WST112-3600-7.5    | 112M       | 3600                         | 7.5                       | 19.9                       | 59.7                       | 0.766                          | 1.327                           | 288                        | 15.0                          | 93.7               | 0.0100623                                   | 24.0           |
| WST112-3600-11     | 112M       | 3600                         | 11                        | 29.2                       | 87.5                       | 0.766                          | 1.327                           | 288                        | 21.3                          | 94.4               | 0.0137428                                   | 30.0           |
| WST112-3600-15     | 112M       | 3600                         | 15                        | 39.8                       | 119                        | 0.766                          | 1.327                           | 288                        | 29.0                          | 94.9               | 0.0185707                                   | 36.0           |
| WST132-3600-15     | 132M       | 3600                         | 15                        | 39.8                       | 119                        | 0.779                          | 1.350                           | 294                        | 29.5                          | 94.1               | 0.0268107                                   | 54.0           |
| WST132-3600-18.5   | 132M       | 3600                         | 18.5                      | 49.4                       | 147                        | 0.779                          | 1.350                           | 294                        | 35.9                          | 94.8               | 0.0314256                                   | 61.0           |
| WST132-3600-22     | 132M       | 3600                         | 22                        | 58.4                       | 175                        | 0.779                          | 1.350                           | 294                        | 42.6                          | 95.0               | 0.0360404                                   | 68.0           |
| WST132-3600-30     | 132M       | 3600                         | 30                        | 79.6                       | 239                        | 0.779                          | 1.350                           | 294                        | 57.9                          | 95.4               | 0.040528                                    | 75.0           |
| WST160-3600-22     | 160M       | 3600                         | 22                        | 58.0                       | 140                        | 0.881                          | 1.526                           | 332                        | 40.0                          | 94.3               | 0.05632                                     | 107            |
| WST160-3600-30     | 160M       | 3600                         | 30                        | 80.0                       | 191                        | 0.881                          | 1.526                           | 332                        | 54.0                          | 94.7               | 0.074611                                    | 117            |
| WST160-3600-37     | 160M       | 3600                         | 37                        | 98.0                       | 235                        | 0.878                          | 1.521                           | 331                        | 67.0                          | 95.0               | 0.090316                                    | 127            |
| WST180-3600-37     | 180M       | 3600                         | 37                        | 98.0                       | 236                        | 0.894                          | 1.549                           | 337                        | 67.0                          | 94.8               | 0.105229                                    | 141            |
| WST180-3600-45     | 180M       | 3600                         | 45                        | 119                        | 287                        | 0.916                          | 1.586                           | 345                        | 80.5                          | 95.0               | 0.120464                                    | 149            |
| WST180-3600-55     | 180L       | 3600                         | 55                        | 146                        | 350                        | 0.899                          | 1.558                           | 339                        | 96.5                          | 95.3               | 0.139443                                    | 159            |
| WST200-3600-55     | 200L       | 3600                         | 55                        | 146                        | 350                        | 0.939                          | 1.627                           | 354                        | 96.5                          | 95.5               | 0.24355583                                  | 193            |
| WST200-3600-75     | 200L       | 3600                         | 75                        | 199                        | 478                        | 0.950                          | 1.646                           | 358                        | 130                           | 95.9               | 0.30853916                                  | 219            |
| 3600r/min 8p 240Hz |            |                              |                           |                            |                            |                                |                                 |                            |                               |                    |                                             |                |
| WST225-3600-75     | 225M       | 3600                         | 75                        | 199                        | 478                        | 0.918                          | 1.590                           | 346                        | 137                           | 95.6               | 0.41273459                                  | 251            |
| WST225-3600-90     | 225M       | 3600                         | 90                        | 239                        | 534                        | 0.924                          | 1.600                           | 348                        | 163                           | 95.9               | 0.46708661                                  | 271            |
| WST225-3600-110    | 225M       | 3600                         | 110                       | 292                        | 701                        | 0.942                          | 1.632                           | 355                        | 195                           | 96.2               | 0.54861465                                  | 301            |
| WST250-3600-110    | 250M       | 3600                         | 110                       | 292                        | 701                        | 0.921                          | 1.595                           | 347                        | 204                           | 96.0               | 0.58150095                                  | 391            |
| WST250-3600-132    | 250M       | 3600                         | 132                       | 350                        | 840                        | 0.924                          | 1.600                           | 348                        | 244                           | 96.2               | 0.66182348                                  | 420            |
| WST280-3600-132    | 280M       | 3600                         | 132                       | 350                        | 840                        | 0.939                          | 1.627                           | 354                        | 238                           | 96.2               | 1.29474315                                  | 480            |
| WST280-3600-160    | 280M       | 3600                         | 160                       | 424                        | 1018                       | 0.934                          | 1.618                           | 352                        | 290                           | 96.3               | 1.48711914                                  | 517            |
| WST280-3600-180    | 280M       | 3600                         | 180                       | 478                        | 1147                       | 0.937                          | 1.623                           | 353                        | 323                           | 96.3               | 1.6153698                                   | 541            |
| WST280-3600-200    | 280M       | 3600                         | 200                       | 531                        | 1274                       | 0.937                          | 1.623                           | 353                        | 354                           | 96.5               | 1.74362046                                  | 565            |
| WST315-3600-132    | 315S       | 3600                         | 132                       | 350                        | 770                        | 0.926                          | 1.604                           | 349                        | 241                           | 96.2               | 2.59407338                                  | 737            |
| WST315-3600-160    | 315S       | 3600                         | 160                       | 424                        | 935                        | 0.921                          | 1.595                           | 347                        | 294                           | 96.3               | 2.98312336                                  | 778            |
| WST315-3600-180    | 315S       | 3600                         | 180                       | 478                        | 1052                       | 0.932                          | 1.613                           | 351                        | 325                           | 96.3               | 3.17764835                                  | 794            |
| WST315-3600-200    | 315M/L     | 3600                         | 200                       | 531                        | 1168                       | 0.937                          | 1.623                           | 353                        | 364                           | 96.5               | 3.37217334                                  | 835            |
| WST315-3600-220    | 315M/L     | 3600                         | 220                       | 584                        | 1285                       | 0.937                          | 1.623                           | 353                        | 395                           | 96.5               | 3.63153999                                  | 863            |
| WST315-3600-250    | 315M/L     | 3600                         | 250                       | 663                        | 1459                       | 0.934                          | 1.618                           | 352                        | 450                           | 96.5               | 3.89090665                                  | 885            |
| WST315-3600-315    | 315M/L     | 3600                         | 315                       | 836                        | 1839                       | 0.926                          | 1.604                           | 349                        | 568                           | 96.6               | 4.61435208                                  | 962            |
| WST315-3600-355    | 315M/L     | 3600                         | 355                       | 942                        | 2043                       | 0.934                          | 1.618                           | 352                        | 632                           | 96.6               | 5.12289826                                  | 1007           |
| WST315-3600-400    | 315M/L     | 3600                         | 400                       | 1061                       | 2334                       | 0.937                          | 1.623                           | 353                        | 712                           | 96.6               | 5.77131489                                  | 1076           |

| Type               | Frame size | Rated speed<br>nN<br>(r/min) | Rated power<br>PN<br>(kW) | Rated torque<br>Mn<br>(Nm) | Peak torque<br>Mpk<br>(Nm) | Voltage constant<br>Ke<br>(Vs) | Torque constant<br>Kt<br>(Nm/A) | BEMF at rated<br>EN<br>(V) | Rated current<br>IN<br>(Arms) | Efficiency<br>η(%) | Moment of inertia J<br>(kg m <sup>2</sup> ) | Weight<br>(kg) |
|--------------------|------------|------------------------------|---------------------------|----------------------------|----------------------------|--------------------------------|---------------------------------|----------------------------|-------------------------------|--------------------|---------------------------------------------|----------------|
| 4500r/min 6p 225Hz |            |                              |                           |                            |                            |                                |                                 |                            |                               |                    |                                             |                |
| WST71-4500-1.1     | 71         | 4500                         | 1.1                       | 2.3                        | 7.0                        | 0.571                          | 0.989                           | 273.5                      | 2.4                           | 89.1               | 0.000487                                    | 5.0            |
| WST71-4500-1.5     | 71         | 4500                         | 1.5                       | 3.2                        | 9.6                        | 0.577                          | 0.999                           | 273.5                      | 3.2                           | 90.6               | 0.000603                                    | 5.7            |
| WST71-4500-2.2     | 71         | 4500                         | 2.2                       | 4.7                        | 14.0                       | 0.585                          | 1.013                           | 273.5                      | 4.6                           | 91.7               | 0.000778                                    | 6.5            |
| WST71-4500-3.0     | 71         | 4500                         | 3.0                       | 6.4                        | 19.1                       | 0.605                          | 1.048                           | 273.5                      | 6.1                           | 92.6               | 0.000953                                    | 7.4            |
| WST90-4500-3.0     | 90L        | 4500                         | 3.0                       | 6.4                        | 19.1                       | 0.623                          | 1.060                           | 288                        | 6.0                           | 91.8               | 0.002583                                    | 10.5           |
| WST90-4500-4.0     | 90L        | 4500                         | 4.0                       | 8.5                        | 25.5                       | 0.623                          | 1.060                           | 288                        | 8.0                           | 92.4               | 0.003194                                    | 12.6           |
| WST90-4500-5.5     | 90L        | 4500                         | 5.5                       | 11.7                       | 35.0                       | 0.623                          | 1.060                           | 288                        | 11.0                          | 93.0               | 0.003806                                    | 14.7           |
| WST90-4500-7.5     | 90L        | 4500                         | 7.5                       | 15.9                       | 47.8                       | 0.623                          | 1.060                           | 288                        | 15.0                          | 93.5               | 0.004417                                    | 17.8           |

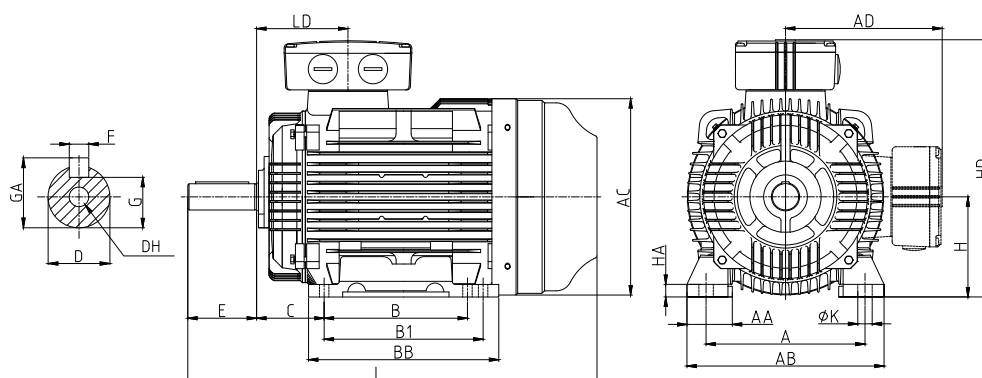
## 5. Overall dimensions

### 5.1. B3 Mounting and overall dimensions

FS71-FS132



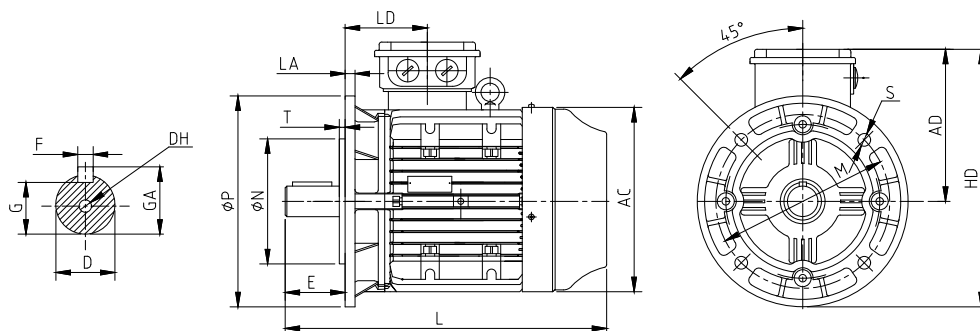
FS160-FS315



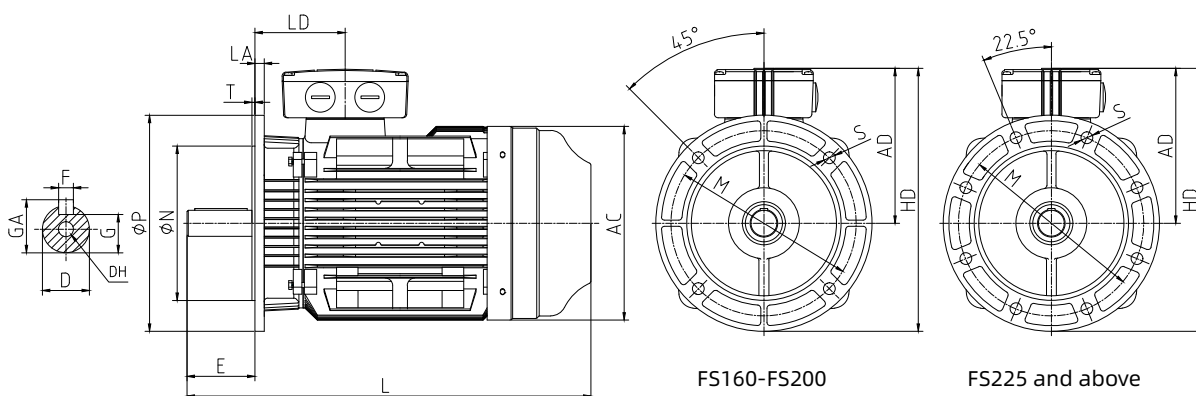
| Frame size | Mounting dimensions (mm) |     |     |     |    |     |    |      |     |    |        |      | Overall dimensions (mm) |     |     |     |    |     |     |     |      |
|------------|--------------------------|-----|-----|-----|----|-----|----|------|-----|----|--------|------|-------------------------|-----|-----|-----|----|-----|-----|-----|------|
|            | A                        | B   | B1  | C   | D  | E   | F  | G    | H   | K  | DH     | GA   | AA                      | AB  | AC  | AD  | HA | HD  | BB  | LD  | L    |
| 71         | 112                      | 90  | /   | 45  | 14 | 30  | 5  | 11   | 71  | 7  | M5×13  | 16   | 27.5                    | 136 | 137 | 107 | 10 | 178 | 110 | 66  | 247  |
| 80         | 125                      | 100 | /   | 50  | 19 | 40  | 6  | 15.5 | 80  | 10 | M6×16  | 21.5 | 32                      | 154 | 157 | 122 | 10 | 202 | 125 | 75  | 296  |
| 90L        | 140                      | 125 | /   | 56  | 24 | 50  | 8  | 20   | 90  | 10 | M8×20  | 27   | 37                      | 180 | 175 | 141 | 10 | 231 | 153 | 87  | 324  |
| 100L       | 160                      | 140 | /   | 63  | 28 | 60  | 8  | 24   | 100 | 12 | M10×22 | 31   | 37                      | 200 | 199 | 157 | 12 | 257 | 170 | 78  | 374  |
| 112M       | 190                      | 140 | /   | 70  | 28 | 60  | 8  | 24   | 112 | 12 | M10×22 | 31   | 47                      | 230 | 222 | 167 | 12 | 279 | 170 | 85  | 381  |
| 132M       | 216                      | 178 | /   | 89  | 38 | 80  | 10 | 33   | 132 | 12 | M12×28 | 41   | 54                      | 264 | 260 | 191 | 15 | 323 | 210 | 129 | 463  |
| 160M       | 254                      | 210 | /   | 108 | 42 | 110 | 12 | 37   | 160 | 15 | M16×36 | 45   | 64                      | 315 | 314 | 244 | 20 | 404 | 260 | 146 | 610  |
| 160L       | 254                      | 254 | /   | 108 | 42 | 110 | 12 | 37   | 160 | 15 | M16×36 | 45   | 64                      | 315 | 314 | 244 | 20 | 404 | 304 | 146 | 654  |
| 180M       | 279                      | 241 | /   | 121 | 48 | 110 | 14 | 42.5 | 180 | 15 | M16×36 | 51.5 | 68                      | 351 | 355 | 264 | 22 | 444 | 311 | 161 | 684  |
| 180L       | 279                      | 279 | /   | 121 | 48 | 110 | 14 | 42.5 | 180 | 15 | M16×36 | 51.5 | 68                      | 351 | 355 | 264 | 22 | 444 | 349 | 161 | 722  |
| 200L       | 318                      | 305 | /   | 133 | 55 | 110 | 16 | 49   | 200 | 19 | M20×42 | 59   | 70                      | 388 | 397 | 296 | 25 | 496 | 369 | 186 | 774  |
| 225M       | 356                      | 311 | /   | 149 | 60 | 140 | 18 | 53   | 225 | 19 | M20×42 | 64   | 79                      | 430 | 445 | 319 | 28 | 544 | 386 | 189 | 846  |
| 250S/M     | 406                      | 311 | 349 | 168 | 65 | 140 | 18 | 58   | 250 | 24 | M20×42 | 69   | 97                      | 484 | 484 | 370 | 32 | 620 | 445 | 208 | 911  |
| 280M       | 457                      | 419 | /   | 190 | 75 | 140 | 20 | 67.5 | 280 | 24 | M20×42 | 79.5 | 85                      | 542 | 546 | 400 | 35 | 680 | 536 | 217 | 1016 |
| 315S       | 508                      | 406 | /   | 216 | 80 | 170 | 22 | 71   | 315 | 28 | M20×46 | 85   | 120                     | 628 | 620 | 502 | 45 | 817 | 570 | 257 | 1231 |
| 315M/L     | 508                      | 457 | 508 | 216 | 80 | 170 | 22 | 71   | 315 | 28 | M20×46 | 85   | 120                     | 628 | 620 | 502 | 45 | 817 | 680 | 257 | 1341 |

## 5.2. B5 Mounting and overall dimensions

FS71-FS132



FS160-FS315



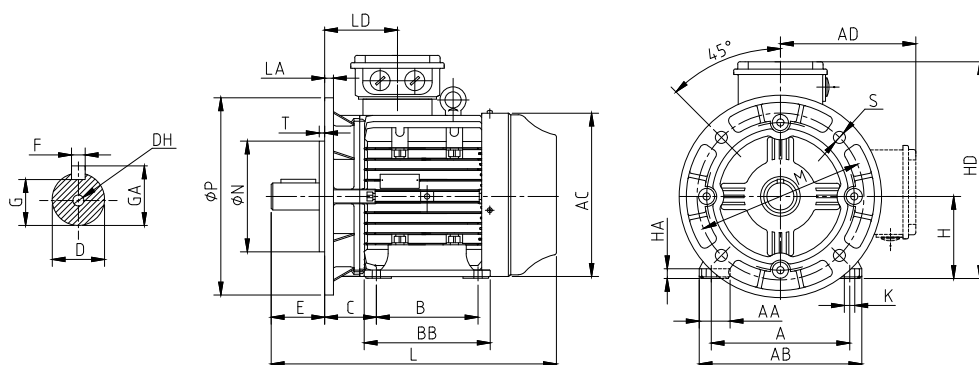
FS160-FS200

FS225 and above

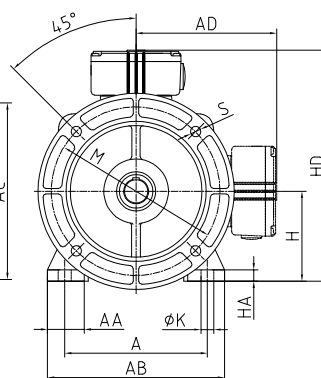
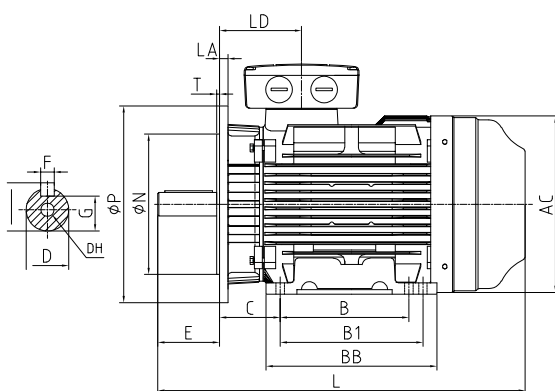
| Frame size | Mounting dimensions (mm) |     |    |      |     |     |     |         |     |        |      | Overall dimensions (mm) |     |     |     |     |      |  |
|------------|--------------------------|-----|----|------|-----|-----|-----|---------|-----|--------|------|-------------------------|-----|-----|-----|-----|------|--|
|            | D                        | E   | F  | G    | M   | N   | P   | S       | T   | DH     | GA   | AC                      | AD  | HD  | LA  | LD  | L    |  |
| 71         | 14                       | 30  | 5  | 11   | 130 | 110 | 160 | 4-Φ10   | 3.5 | M5×13  | 16   | 137                     | 107 | 187 | 9   | 66  | 247  |  |
| 80         | 19                       | 40  | 6  | 15.5 | 165 | 130 | 200 | 4-Φ12   | 3.5 | M6×16  | 21.5 | 157                     | 122 | 222 | 9.5 | 75  | 296  |  |
| 90L        | 24                       | 50  | 8  | 20   | 165 | 130 | 200 | 4-Φ12   | 3.5 | M8×20  | 27   | 175                     | 141 | 241 | 10  | 87  | 324  |  |
| 100L       | 28                       | 60  | 8  | 24   | 215 | 180 | 250 | 4-Φ14.5 | 4   | M10×22 | 31   | 199                     | 157 | 282 | 12  | 78  | 374  |  |
| 112M       | 28                       | 60  | 8  | 24   | 215 | 180 | 250 | 4-Φ14.5 | 4   | M10×22 | 31   | 222                     | 167 | 292 | 12  | 85  | 381  |  |
| 132M       | 38                       | 80  | 10 | 33   | 265 | 230 | 300 | 4-Φ14.5 | 4   | M12×28 | 41   | 260                     | 191 | 341 | 14  | 129 | 463  |  |
| 160M       | 42                       | 110 | 12 | 37   | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 45   | 314                     | 244 | 419 | 15  | 146 | 610  |  |
| 160L       | 42                       | 110 | 12 | 37   | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 45   | 314                     | 244 | 419 | 15  | 146 | 654  |  |
| 180M       | 48                       | 110 | 14 | 42.5 | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 51.5 | 355                     | 264 | 439 | 15  | 161 | 684  |  |
| 180L       | 48                       | 110 | 14 | 42.5 | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 51.5 | 355                     | 264 | 439 | 15  | 161 | 722  |  |
| 200L       | 55                       | 110 | 16 | 49   | 350 | 300 | 400 | 4-Φ19   | 5   | M20×42 | 59   | 397                     | 296 | 496 | 17  | 186 | 774  |  |
| 225M       | 60                       | 140 | 18 | 53   | 400 | 350 | 450 | 8-Φ19   | 5   | M20×42 | 64   | 445                     | 319 | 544 | 20  | 189 | 846  |  |
| 250S,M     | 65                       | 140 | 18 | 58   | 500 | 450 | 550 | 8-Φ19   | 5   | M20×42 | 69   | 484                     | 370 | 645 | 22  | 208 | 911  |  |
| 280M       | 75                       | 140 | 20 | 67.5 | 500 | 450 | 550 | 8-Φ19   | 5   | M20×42 | 79.5 | 546                     | 400 | 675 | 22  | 217 | 1016 |  |

### 5.3. B35 Mounting and overall dimensions

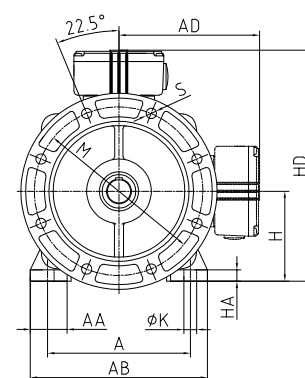
FS71-FS132



FS160-FS315



FS160-FS200

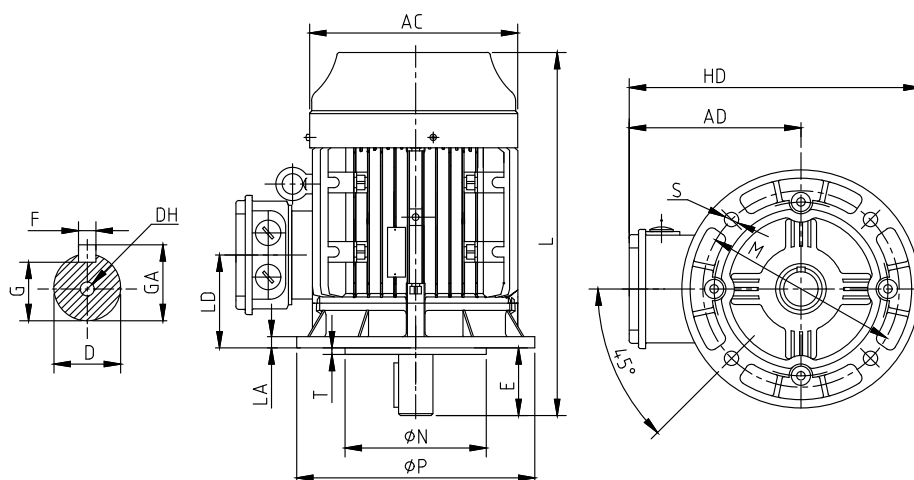


FS225 and above

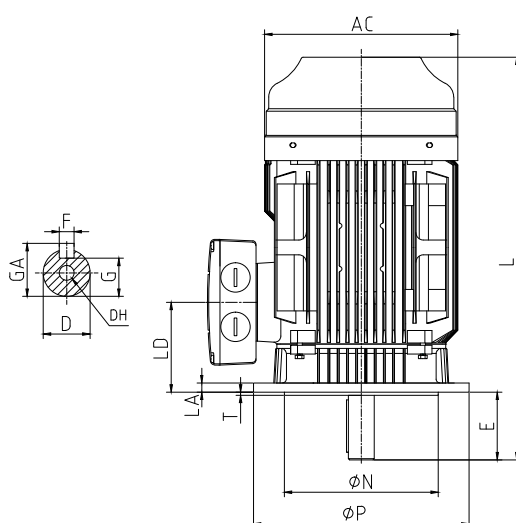
| Frame size | Mounting dimensions (mm) |     |     |     |    |     |    |      |     |    |     |     |     |         |     |        |      | Overall dimensions (mm) |     |     |     |    |     |     |     |     |      |  |
|------------|--------------------------|-----|-----|-----|----|-----|----|------|-----|----|-----|-----|-----|---------|-----|--------|------|-------------------------|-----|-----|-----|----|-----|-----|-----|-----|------|--|
|            | A                        | B   | B1  | C   | D  | E   | F  | G    | H   | K  | M   | N   | P   | S       | T   | DH     | GA   | AA                      | AB  | AC  | AD  | HA | HD  | BB  | LA  | LD  | L    |  |
| 71         | 112                      | 90  | /   | 45  | 14 | 30  | 5  | 11   | 71  | 7  | 130 | 110 | 160 | 4-Φ10   | 3.5 | M5×13  | 16   | 27.5                    | 136 | 137 | 107 | 10 | 178 | 110 | 9   | 66  | 247  |  |
| 80         | 125                      | 100 | /   | 50  | 19 | 40  | 6  | 15.5 | 80  | 10 | 165 | 130 | 200 | 4-Φ12   | 3.5 | M6×16  | 21.5 | 32                      | 154 | 157 | 122 | 10 | 202 | 125 | 9.5 | 75  | 296  |  |
| 90L        | 140                      | 125 | /   | 56  | 24 | 50  | 8  | 20   | 90  | 10 | 165 | 130 | 200 | 4-Φ12   | 3.5 | M8×20  | 27   | 37                      | 180 | 175 | 141 | 10 | 231 | 153 | 10  | 87  | 324  |  |
| 100L       | 160                      | 140 | /   | 63  | 28 | 60  | 8  | 24   | 100 | 12 | 215 | 180 | 250 | 4-Φ14.5 | 4   | M10×22 | 31   | 37                      | 200 | 199 | 157 | 12 | 257 | 170 | 12  | 78  | 374  |  |
| 112M       | 190                      | 140 | /   | 70  | 28 | 60  | 8  | 24   | 112 | 12 | 215 | 180 | 250 | 4-Φ14.5 | 4   | M10×22 | 31   | 47                      | 230 | 222 | 167 | 12 | 279 | 170 | 12  | 85  | 381  |  |
| 132M       | 216                      | 178 | /   | 89  | 38 | 80  | 10 | 33   | 132 | 12 | 265 | 230 | 300 | 4-Φ14.5 | 4   | M12×28 | 41   | 54                      | 264 | 260 | 191 | 15 | 323 | 210 | 14  | 129 | 463  |  |
| 160M       | 254                      | 210 | /   | 108 | 42 | 110 | 12 | 37   | 160 | 15 | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 45   | 64                      | 315 | 314 | 244 | 20 | 404 | 260 | 15  | 146 | 610  |  |
| 160L       | 254                      | 254 | /   | 108 | 42 | 110 | 12 | 37   | 160 | 15 | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 45   | 64                      | 315 | 314 | 244 | 20 | 404 | 304 | 15  | 146 | 654  |  |
| 180M       | 279                      | 241 | /   | 121 | 48 | 110 | 14 | 42.5 | 180 | 15 | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 51.5 | 68                      | 351 | 355 | 264 | 22 | 444 | 311 | 15  | 161 | 684  |  |
| 180L       | 279                      | 279 | /   | 121 | 48 | 110 | 14 | 42.5 | 180 | 15 | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 51.5 | 68                      | 351 | 355 | 264 | 22 | 444 | 349 | 15  | 161 | 722  |  |
| 200L       | 318                      | 305 | /   | 133 | 55 | 110 | 16 | 49   | 200 | 19 | 350 | 300 | 400 | 4-Φ19   | 5   | M20×42 | 59   | 70                      | 388 | 397 | 296 | 25 | 496 | 369 | 17  | 186 | 774  |  |
| 225M       | 356                      | 311 | /   | 149 | 60 | 140 | 18 | 53   | 225 | 19 | 400 | 350 | 450 | 8-Φ19   | 5   | M20×42 | 64   | 79                      | 430 | 445 | 319 | 28 | 544 | 386 | 20  | 189 | 846  |  |
| 250S/M     | 406                      | 311 | 349 | 168 | 65 | 140 | 18 | 58   | 250 | 24 | 500 | 450 | 550 | 8-Φ19   | 5   | M20×42 | 69   | 97                      | 484 | 484 | 370 | 32 | 620 | 445 | 22  | 208 | 911  |  |
| 280M       | 457                      | 419 | /   | 190 | 75 | 140 | 20 | 67.5 | 280 | 24 | 500 | 450 | 550 | 8-Φ19   | 5   | M20×42 | 79.5 | 85                      | 542 | 546 | 400 | 35 | 680 | 536 | 22  | 217 | 1016 |  |
| 315S       | 508                      | 406 | /   | 216 | 80 | 170 | 22 | 71   | 315 | 28 | 600 | 550 | 660 | 8-Φ24   | 6   | M20×46 | 85   | 120                     | 628 | 620 | 502 | 45 | 817 | 570 | 22  | 257 | 1231 |  |
| 315M/L     | 508                      | 457 | 508 | 216 | 80 | 170 | 22 | 71   | 315 | 28 | 600 | 550 | 660 | 8-Φ24   | 6   | M20×46 | 85   | 120                     | 628 | 620 | 502 | 45 | 817 | 680 | 22  | 257 | 1341 |  |

## 5.4. V1 Mounting and overall dimensions

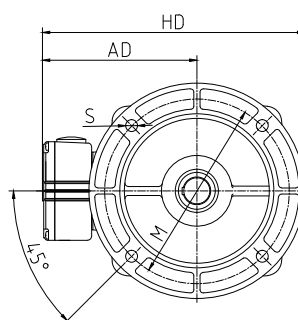
FS71-FS132



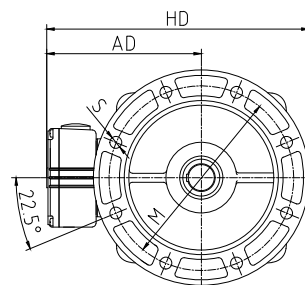
FS160-FS315



FS160-FS200

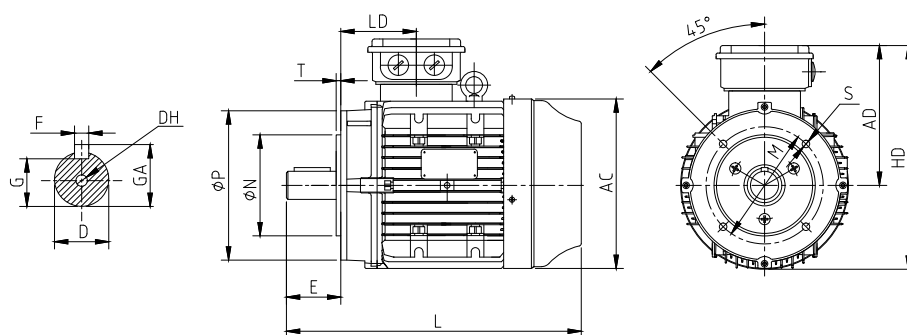


FS225 and above



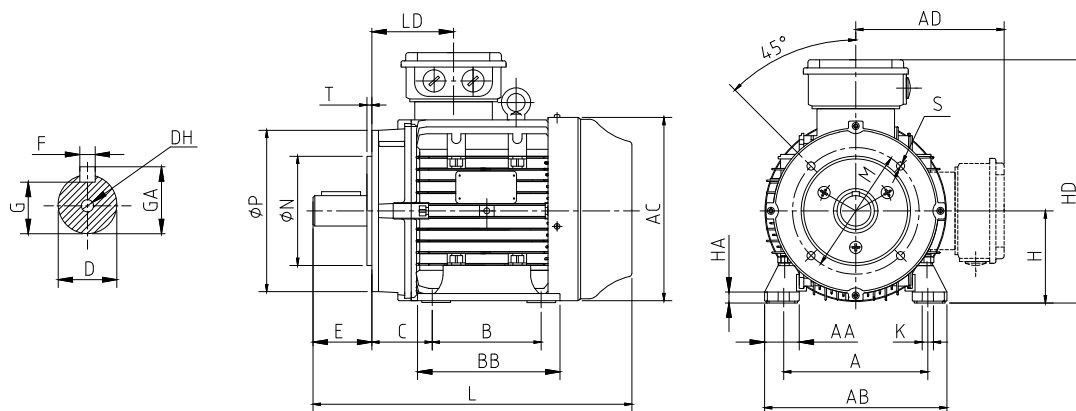
| Frame size | Mounting dimensions (mm) |     |    |      |     |     |     |         |     |        |      | Overall dimensions (mm) |     |     |     |     |      |  |
|------------|--------------------------|-----|----|------|-----|-----|-----|---------|-----|--------|------|-------------------------|-----|-----|-----|-----|------|--|
|            | D                        | E   | F  | G    | M   | N   | P   | S       | T   | DH     | GA   | AC                      | AD  | HD  | LA  | LD  | L    |  |
| 71         | 14                       | 30  | 5  | 11   | 130 | 110 | 160 | 4-Φ10   | 3.5 | M5×13  | 16   | 137                     | 107 | 187 | 9   | 66  | 247  |  |
| 80         | 19                       | 40  | 6  | 15.5 | 165 | 130 | 200 | 4-Φ12   | 3.5 | M6×16  | 21.5 | 157                     | 122 | 222 | 9.5 | 75  | 296  |  |
| 90L        | 24                       | 50  | 8  | 20   | 165 | 130 | 200 | 4-Φ12   | 3.5 | M8×20  | 27   | 175                     | 141 | 241 | 10  | 87  | 324  |  |
| 100L       | 28                       | 60  | 8  | 24   | 215 | 180 | 250 | 4-Φ14.5 | 4   | M10×22 | 31   | 199                     | 157 | 282 | 12  | 78  | 374  |  |
| 112M       | 28                       | 60  | 8  | 24   | 215 | 180 | 250 | 4-Φ14.5 | 4   | M10×22 | 31   | 222                     | 167 | 292 | 12  | 85  | 381  |  |
| 132M       | 38                       | 80  | 10 | 33   | 265 | 230 | 300 | 4-Φ14.5 | 4   | M12×28 | 41   | 260                     | 191 | 341 | 14  | 129 | 463  |  |
| 160M       | 42                       | 110 | 12 | 37   | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 45   | 314                     | 244 | 419 | 15  | 146 | 610  |  |
| 160L       | 42                       | 110 | 12 | 37   | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 45   | 314                     | 244 | 419 | 15  | 146 | 654  |  |
| 180M       | 48                       | 110 | 14 | 42.5 | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 51.5 | 355                     | 264 | 439 | 15  | 161 | 684  |  |
| 180L       | 48                       | 110 | 14 | 42.5 | 300 | 250 | 350 | 4-Φ19   | 5   | M16×36 | 51.5 | 355                     | 264 | 439 | 15  | 161 | 722  |  |
| 200L       | 55                       | 110 | 16 | 49   | 350 | 300 | 400 | 4-Φ19   | 5   | M20×42 | 59   | 397                     | 296 | 496 | 17  | 186 | 774  |  |
| 225M       | 60                       | 140 | 18 | 53   | 400 | 350 | 450 | 8-Φ19   | 5   | M20×42 | 64   | 445                     | 319 | 544 | 20  | 189 | 846  |  |
| 250S/M     | 65                       | 140 | 18 | 58   | 500 | 450 | 550 | 8-Φ19   | 5   | M20×42 | 69   | 484                     | 370 | 645 | 22  | 208 | 911  |  |
| 280M       | 75                       | 140 | 20 | 67.5 | 500 | 450 | 550 | 8-Φ19   | 5   | M20×42 | 79.5 | 546                     | 400 | 675 | 22  | 217 | 1016 |  |
| 315S       | 80                       | 170 | 22 | 71   | 600 | 550 | 660 | 8-Φ24   | 6   | M20×46 | 85   | 620                     | 502 | 832 | 22  | 257 | 1231 |  |
| 315M/L     | 80                       | 170 | 22 | 71   | 600 | 550 | 660 | 8-Φ24   | 6   | M20×46 | 85   | 620                     | 502 | 832 | 22  | 257 | 1341 |  |

## 5.5. B14 Mounting and overall dimensions



| Frame size | Mounting dimensions (mm) |    |    |      |     |     |     |       |     |        |      | Overall dimensions (mm) |     |     |     |     |
|------------|--------------------------|----|----|------|-----|-----|-----|-------|-----|--------|------|-------------------------|-----|-----|-----|-----|
|            | D                        | E  | F  | G    | M   | N   | P   | S     | T   | DH     | GA   | AC                      | AD  | HD  | LD  | L   |
| 71         | 14                       | 30 | 5  | 11   | 85  | 70  | 105 | 4-M6  | 2.5 | M5×13  | 16   | 137                     | 107 | 176 | 66  | 247 |
| 80         | 19                       | 40 | 6  | 15.5 | 100 | 80  | 120 | 4-M6  | 3   | M6×16  | 21.5 | 157                     | 122 | 200 | 75  | 296 |
| 90L        | 24                       | 50 | 8  | 20   | 115 | 95  | 140 | 4-M8  | 3   | M8×20  | 27   | 175                     | 141 | 229 | 87  | 324 |
| 100L       | 28                       | 60 | 8  | 24   | 130 | 110 | 160 | 4-M8  | 3.5 | M10×22 | 31   | 199                     | 157 | 256 | 78  | 374 |
| 112M       | 28                       | 60 | 8  | 24   | 130 | 110 | 160 | 4-M8  | 3.5 | M10×22 | 31   | 222                     | 167 | 278 | 85  | 381 |
| 132M       | 38                       | 80 | 10 | 33   | 165 | 130 | 200 | 4-M10 | 3.5 | M12×28 | 41   | 260                     | 191 | 321 | 129 | 463 |

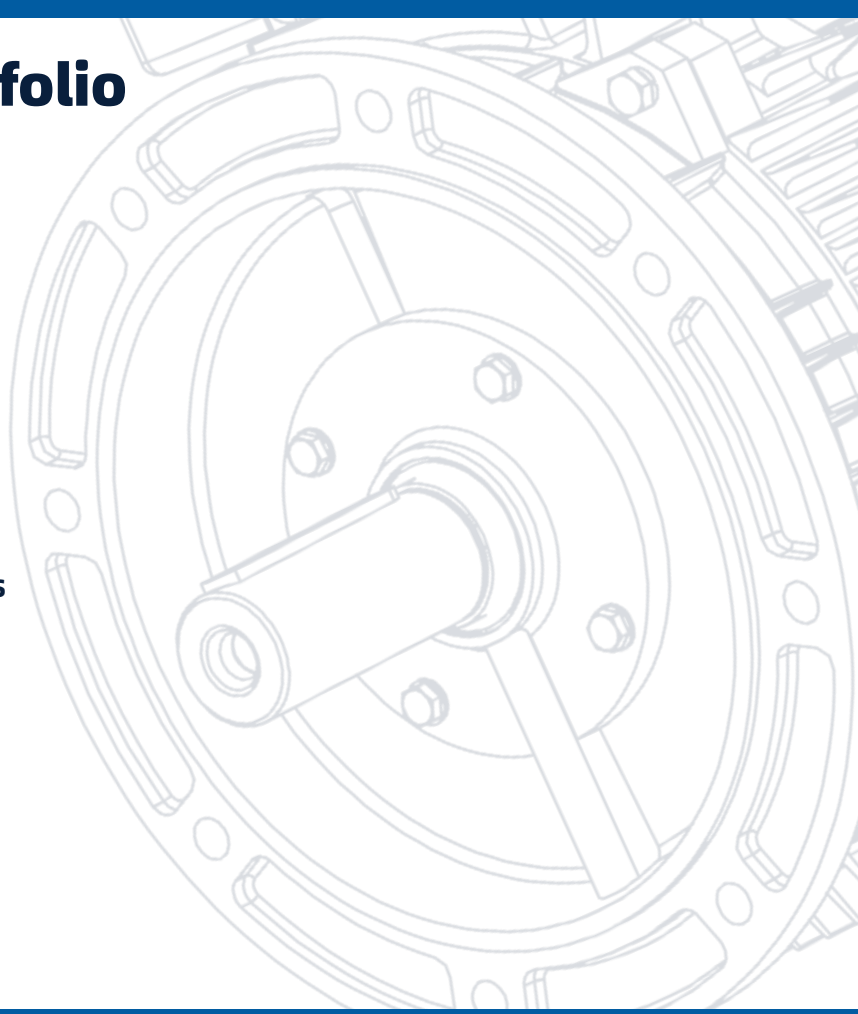
## 5.6. B34 Mounting and overall dimensions



| Frame size | Mounting dimensions (mm) |     |    |    |    |    |      |     |    |     |     |     |       |     |        |      | Overall dimensions (mm) |     |     |     |    |     |     |     |     |  |
|------------|--------------------------|-----|----|----|----|----|------|-----|----|-----|-----|-----|-------|-----|--------|------|-------------------------|-----|-----|-----|----|-----|-----|-----|-----|--|
|            | A                        | B   | C  | D  | E  | F  | G    | H   | K  | M   | N   | P   | S     | T   | DH     | GA   | AA                      | AB  | AC  | AD  | HA | HD  | BB  | LD  | L   |  |
| 71         | 112                      | 90  | 45 | 14 | 30 | 5  | 11   | 71  | 7  | 85  | 70  | 105 | 4-M6  | 2.5 | M5×13  | 16   | 27.5                    | 136 | 137 | 107 | 10 | 178 | 110 | 66  | 247 |  |
| 80         | 125                      | 100 | 50 | 19 | 40 | 6  | 15.5 | 80  | 10 | 100 | 80  | 120 | 4-M6  | 3   | M6×16  | 21.5 | 32                      | 154 | 157 | 122 | 10 | 202 | 125 | 75  | 296 |  |
| 90L        | 140                      | 125 | 56 | 24 | 50 | 8  | 20   | 90  | 10 | 115 | 95  | 140 | 4-M8  | 3   | M8×20  | 27   | 37                      | 180 | 175 | 141 | 10 | 231 | 153 | 87  | 324 |  |
| 100L       | 160                      | 140 | 63 | 28 | 60 | 8  | 24   | 100 | 12 | 130 | 110 | 160 | 4-M8  | 3.5 | M10×22 | 31   | 37                      | 200 | 199 | 157 | 12 | 257 | 170 | 78  | 374 |  |
| 112M       | 190                      | 140 | 70 | 28 | 60 | 8  | 24   | 112 | 12 | 130 | 110 | 160 | 4-M8  | 3.5 | M10×22 | 31   | 47                      | 230 | 222 | 167 | 12 | 279 | 170 | 85  | 381 |  |
| 132M       | 216                      | 178 | 89 | 38 | 80 | 10 | 33   | 132 | 12 | 165 | 130 | 200 | 4-M10 | 3.5 | M12×28 | 41   | 54                      | 264 | 260 | 191 | 15 | 323 | 210 | 129 | 463 |  |



# Wonder Product Portfolio



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- Variable pitch motors
- Motors for secondary water supply system
- Motors for gearbox

## Customized Motors

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