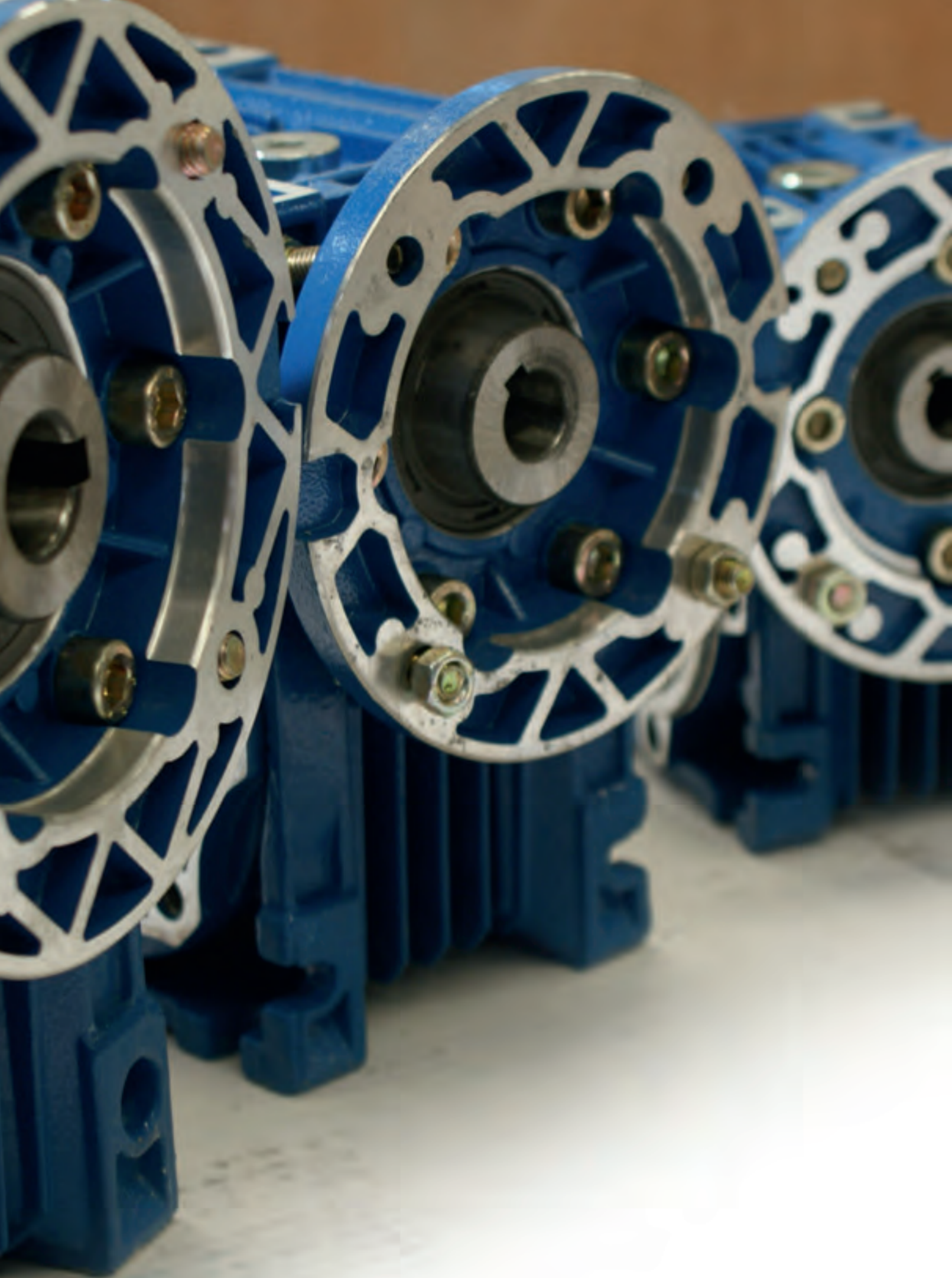


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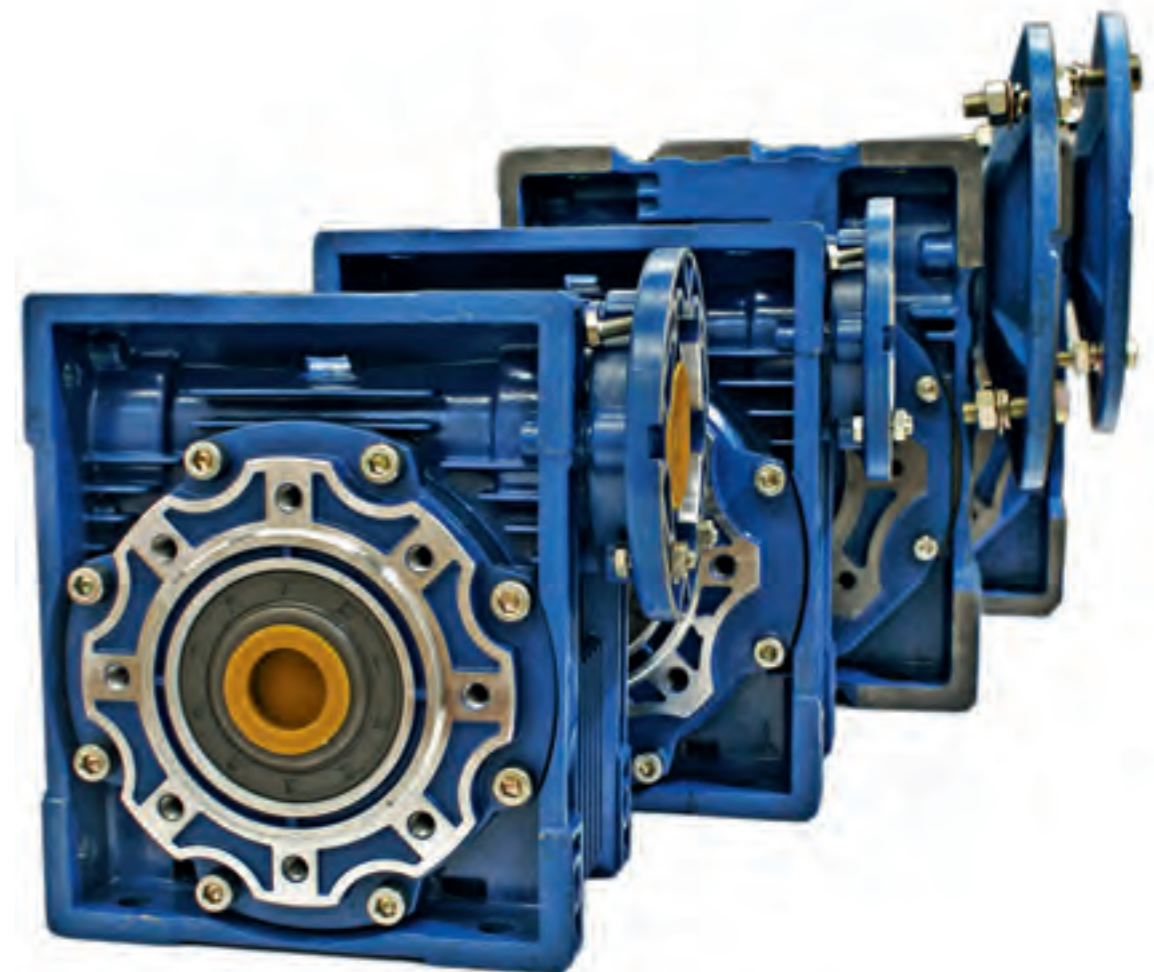
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## Worm Gearboxes



## RD Series worm geared motors

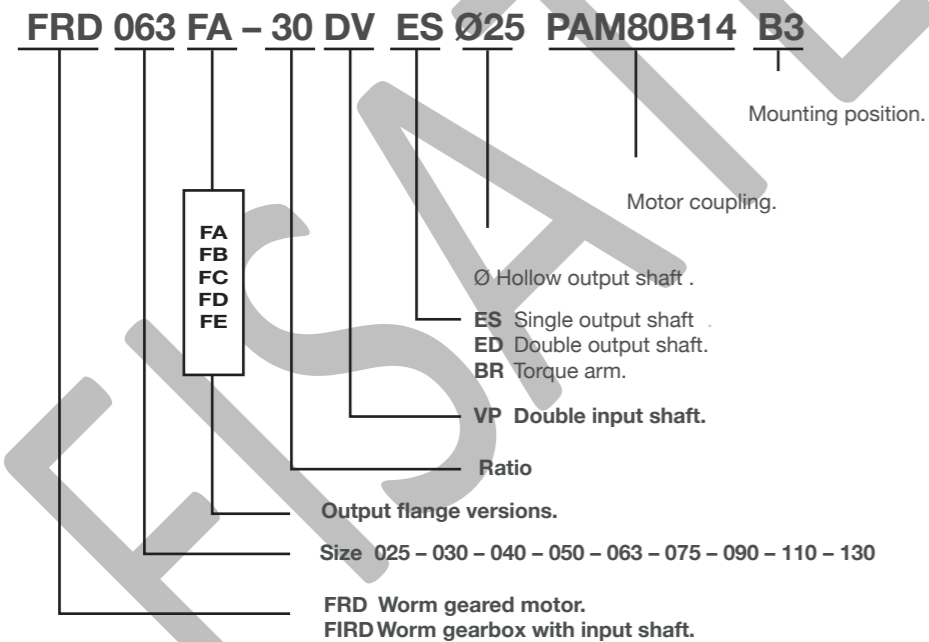
### Brief introduction

Gearboxes type FRD are composed for a worm hardened and ground steel and a wheel made of a bronze alloy.

The FRD serie is composed for 9 sizes with ratios from 1:7.5 up to 1:100, are manufactured in die-cast aluminium frame from 025 to 090 size and in cast iron sizes 110 and 130.

This serie is complemented with 4 sizes of pre-stage helical units PR, and all the accessories for gearboxes: output flanges, single and double output shaft, torque arms and combination kits for combined worm geared motors

### Designation



## Operation & Maintenance

During the installation, the following instructions must be followed:

- Ensure correct alignment between the motor and the gearbox and between the gearbox and the machine.
- Mount the gearbox so that it is not subject to vibrations while operating.
- Note that the components to be installed on the shafts meet the correct tolerances, to avoid the risk of damages or the outer parts of the gearbox.
- If overloads ,shocks, or blocking are expected, safety couplings must be fitted.
- If paint is applied on the gearbox, the outer edges of the oil seals must be protected to prevent the rubber from deterioration and causing oil leaks.
- Clean the surfaces where the gearbox should be fixed and treat with suitable protective substances before assembly to prevent oxidation.
- Check at starting up, that the electrical parts have the necessary protections.
- Check that the information shown in the plate of the motor is correct.

During operation

- The gearboxes are filled with semi-synthetic oil and do not require any maintenance.
- The oil quantity required must be checked depending on the mounting position indicated in the tables.
- If ambient temperatures below  $-18^{\circ}\text{C}$  or above  $40^{\circ}\text{C}$  please contact our technical department.
- During the early stages of service the gearbox temperature may be slightly higher than usual.

## Radial and axial loads

Transmission movement can produce radial or axial loads on shaft ends, it is necessary to be sure that resulting values, in most unfavourable conditions, do not exceed the maximum allowed values. In following table, permissible radial loads Fr1 for input shaft are listed. The permissible axial load is obtained as follows:  $F_{a1} = 0.2 \times Fr1$

| nv<br>Rpm | Fr1 (daN)  |     |     |     |     |     |     |     |
|-----------|------------|-----|-----|-----|-----|-----|-----|-----|
|           | FRD - FIRD |     |     |     |     |     |     |     |
|           | 030        | 040 | 050 | 063 | 075 | 090 | 110 | 130 |
| 1400      | 6          | 22  | 32  | 42  | 50  | 70  | 100 | 160 |
| 900       | 6          | 25  | 35  | 46  | 53  | 80  | 120 | 180 |
| 700       | 7          | 28  | 40  | 50  | 57  | 90  | 130 | 200 |
| 500       | 7          | 31  | 45  | 53  | 60  | 100 | 145 | 220 |

Admissible radial loads Fr2 for output shaft are listed in the next table. The permissible radial load is obtained as follows:  $F_{a2} = 0.2 \times Fr2$ .

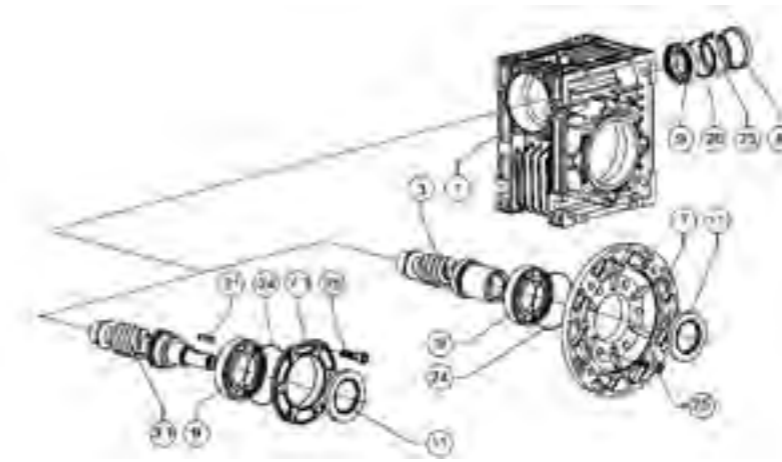
| nl<br>Rpm | Fr2 (daN) |     |     |     |     |     |     |      |
|-----------|-----------|-----|-----|-----|-----|-----|-----|------|
|           | SF - FRD  |     |     |     |     |     |     |      |
|           | 030       | 040 | 050 | 063 | 075 | 090 | 110 | 130  |
| 187       | 65        | 128 | 177 | 233 | 275 | 305 | 386 | 506  |
| 140       | 73        | 141 | 195 | 256 | 301 | 336 | 424 | 556  |
| 94        | 84        | 162 | 224 | 295 | 346 | 384 | 486 | 638  |
| 70        | 91        | 178 | 247 | 325 | 383 | 424 | 536 | 702  |
| 56        | 100       | 194 | 266 | 349 | 414 | 456 | 577 | 756  |
| 47        | 105       | 205 | 284 | 370 | 439 | 486 | 614 | 804  |
| 35        | 115       | 225 | 313 | 408 | 484 | 534 | 677 | 885  |
| 28        | 125       | 244 | 336 | 441 | 520 | 576 | 729 | 954  |
| 24        | 134       | 259 | 357 | 467 | 554 | 612 | 774 | 1015 |
| 18        | 146       | 286 | 394 | 515 | 610 | 674 | 853 | 1117 |
| 14        |           | 308 | 425 | 555 | 656 | 727 | 920 | 1202 |

\* Values shown in the tables are related at loads in the shafts center line.

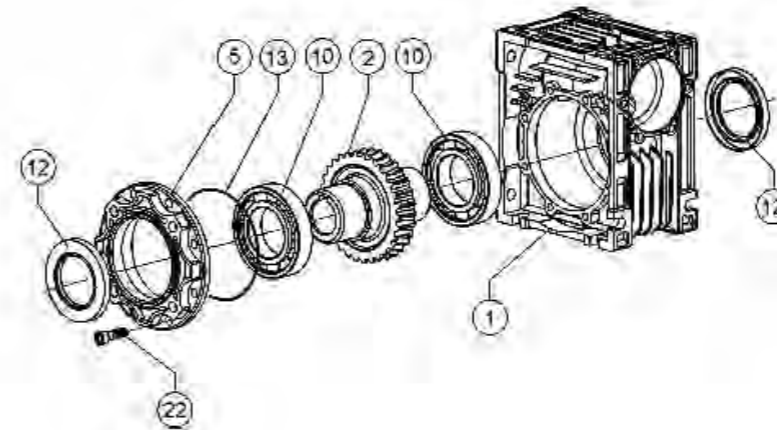
Irreversibility is a characteristic of some worm gear reducers, it can not be operated from the output shaft. For orientation purposes, see the following table.

|     | 7.5 / 1    | 10 / 1 | 15 / 1  | 20 / 1 | 25 / 1       | 30 / 1 | 40 / 1 | 50 / 1 | 60 / 1 | 80 / 1 | 100 / 1 |
|-----|------------|--------|---------|--------|--------------|--------|--------|--------|--------|--------|---------|
| 030 | REVERSIBLE |        | NEUTRAL |        | IRREVERSIBLE |        |        |        |        |        |         |
| 040 | REVERSIBLE |        | NEUTRAL |        | IRREVERSIBLE |        |        |        |        |        |         |
| 050 | REVERSIBLE |        | NEUTRAL |        | IRREVERSIBLE |        |        |        |        |        |         |
| 063 | REVERSIBLE |        | NEUTRAL |        | IRREVERSIBLE |        |        |        |        |        |         |
| 075 | REVERSIBLE |        | NEUTRAL |        | IRREVERSIBLE |        |        |        |        |        |         |
| 090 | REVERSIBLE |        | NEUTRAL |        | IRREVERSIBLE |        |        |        |        |        |         |
| 110 | REVERSIBLE |        | NEUTRAL |        | IRREVERSIBLE |        |        |        |        |        |         |
| 130 | REVERSIBLE |        | NEUTRAL |        | IRREVERSIBLE |        |        |        |        |        |         |

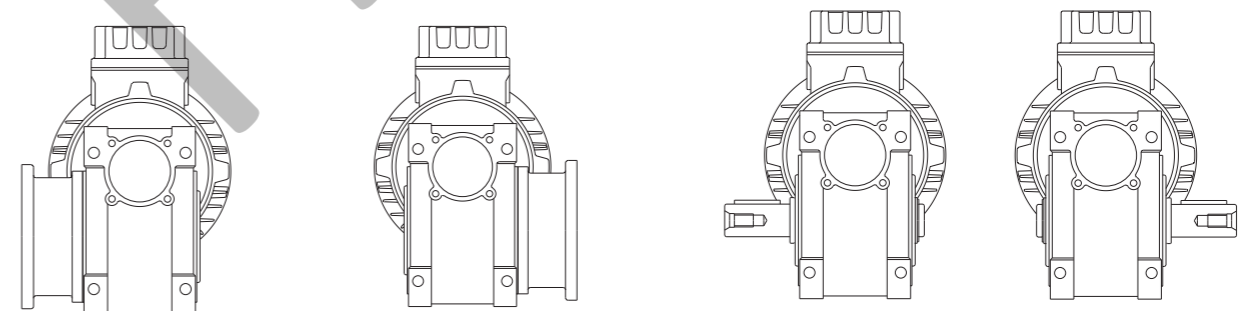
## Spare parts



| N°  | Part               |
|-----|--------------------|
| 1   | Frame              |
| 2   | Wheel              |
| 3   | Worm RD            |
| 3.1 | Worm IRD           |
| 5   | Output shaft cover |
| 7   | Flange PAM         |
| 7.1 | Input cover IRD    |
| 8   | Seal cover         |
| 9   | Bearing            |
| 10  | Bearing            |
| 11  | Oil seal DIN 3760  |
| 12  | Oil seal DIN 3760  |
| 13  | O-Ring             |
| 21  | Key DIN 8885       |
| 22  | Screw DIN 912      |
| 23  | Snap ring DIN 472  |
| 24  | O-Ring             |
| 25  | Screw DIN 912      |
| 26  | Ring DIN 888       |



## Position diagram for output flange and single shaft



STANDARD

OPPOSITE SIDE

STANDARD

OPPOSITE SIDE

### Performance of worm geared motors

| Motor Kw | n2 Rpm        | i             | M2 Nm | f.s.    | Type    |         |         |
|----------|---------------|---------------|-------|---------|---------|---------|---------|
| 0,06     | 4P<br>n1=1400 | 186           | 7.5   | 2.6     | 4.2     | FRD 025 |         |
|          |               | 140           | 10    | 3.4     | 3.5     |         |         |
|          |               | 94            | 15    | 4.9     | 2.5     |         |         |
|          |               | 70            | 20    | 6.1     | 2.0     |         |         |
|          |               | 47            | 30    | 8.2     | 1.6     |         |         |
|          |               | 35            | 40    | 10.2    | 1.3     |         |         |
|          |               | 28            | 50    | 11.3    | 0.9     |         |         |
|          |               | 24            | 60    | 11      | 0.7     |         |         |
|          |               | 24            | 60    | 12.5    | 1.3     |         | FRD 030 |
|          |               | 18            | 80    | 13.5    | 0.9     |         |         |
| 0,09     | 2P<br>n1=2800 | 374           | 7.5   | 2.0     | 3.9     | FRD 025 |         |
|          |               | 280           | 10    | 2.6     | 3.4     |         |         |
|          |               | 186           | 15    | 3.8     | 2.4     |         |         |
|          |               | 140           | 20    | 5.1     | 2.4     |         |         |
|          |               | 94            | 30    | 7.3     | 1.6     |         |         |
|          |               | 70            | 40    | 9.2     | 1.3     |         |         |
|          | 4P<br>n1=1400 | 47            | 30    | 12.3    | 1.1     | FRD 030 |         |
|          |               | 35            | 40    | 13      | 0.9     |         |         |
|          |               | 186           | 7.5   | 3.9     | 4.6     |         |         |
|          |               | 140           | 10    | 5.0     | 3.6     |         |         |
|          |               | 94            | 15    | 7.1     | 2.5     |         |         |
|          |               | 70            | 20    | 9.0     | 2.0     |         |         |
|          | 6P<br>n1=900  | 56            | 25    | 10.4    | 2.8     | FRD 040 |         |
|          |               | 47            | 30    | 12      | 1.1     |         |         |
|          |               | 35            | 40    | 14.5    | 1.2     |         |         |
|          |               | 28            | 50    | 16.9    | 1.0     |         |         |
|          |               | 24            | 60    | 16.9    | 0.9     |         |         |
|          |               | 28            | 50    | 19      | 2.0     |         |         |
| 24       |               | 60            | 21.4  | 1.7     |         |         |         |
| 18       |               | 80            | 25.5  | 1.3     |         |         |         |
| 14       |               | 100           | 28.9  | 1.0     |         |         |         |
| 0,12     |               | 2P<br>n1=2800 | 120   | 7.5     | 5.9     |         | 3.4     |
|          | 11            |               | 80    | 37      | 1.0     | FRD 040 |         |
|          | 9             |               | 100   | 41      | 0.8     |         |         |
|          | 11            |               | 80    | 37      | 1.8     |         |         |
|          | 9             |               | 100   | 42      | 1.3     |         |         |
|          | 373           |               | 7.5   | 2.7     | 3.0     |         | FRD 025 |
|          | 280           | 10            | 3.5   | 2.6     |         |         |         |
|          | 186           | 15            | 5.0   | 1.8     |         |         |         |
|          | 186           | 7.5           | 5.2   | 3.4     | FRD 030 |         |         |
|          | 140           | 10            | 6.7   | 2.7     |         |         |         |
|          | 94            | 15            | 9.5   | 1.9     |         |         |         |
|          | 70            | 20            | 12    | 1.5     |         |         |         |
| 56       | 25            | 13.9          | 1.5   | FRD 040 |         |         |         |
| 47       | 30            | 16            | 1.3   |         |         |         |         |
| 35       | 40            | 17            | 0.9   |         |         |         |         |
| 47       | 30            | 17.2          | 2.6   |         | FRD 050 |         |         |
| 35       | 40            | 21.3          | 1.9   |         |         |         |         |
| 28       | 50            | 25.4          | 1.5   |         |         |         |         |
| 24       | 60            | 28.5          | 1.3   |         |         |         |         |
| 18       | 80            | 34.1          | 1.0   |         |         |         |         |
| 0,18     | 4P<br>n1=1400 | 14            | 100   | 38      |         | 0.8     | FRD 040 |
|          |               | 24            | 60    | 29      | 2.3     |         |         |
|          |               | 18            | 80    | 34.7    | 1.9     |         |         |
|          |               | 14            | 100   | 40.1    | 1.4     |         |         |
|          |               | 120           | 7.5   | 7.9     | 2.5     | FRD 030 |         |
|          |               | 60            | 15    | 14      | 1.4     |         |         |
|          | 15            | 60            | 42    | 1.7     | FRD 050 |         |         |
|          | 11            | 80            | 50    | 1.4     |         |         |         |
|          | 9             | 100           | 56    | 1.0     |         |         |         |
|          | 373           | 7.5           | 8.4   | 3.3     |         |         | FRD 040 |
|          | 280           | 10            | 11    | 2.6     |         |         |         |
|          | 186           | 15            | 16    | 1.9     |         |         |         |
| 186      | 7.5           | 16            | 2.4   | FRD 040 |         |         |         |
| 140      | 10            | 21            | 1.9   |         |         |         |         |
| 94       | 15            | 30            | 1.3   |         |         |         |         |
| 70       | 20            | 39            | 1.0   |         | FRD 050 |         |         |
| 56       | 25            | 47            | 0.8   |         |         |         |         |
| 94       | 15            | 31            | 2.4   |         |         |         |         |
| 70       | 20            | 39            | 1.8   |         |         |         |         |
| 56       | 25            | 47            | 1.5   |         |         |         |         |
| 47       | 30            | 54            | 1.5   |         |         |         |         |
| 35       | 40            | 66            | 1.1   |         |         |         |         |
| 28       | 50            | 73            | 0.9   |         |         |         |         |
| 24       | 60            | 89            | 0.8   |         |         |         |         |

| Motor Kw | n2 Rpm        | i             | M2 Nm | f.s.    | Type    |         |         |
|----------|---------------|---------------|-------|---------|---------|---------|---------|
| 0,06     | 4P<br>n1=1400 | 186           | 7.5   | 2.6     | 4.2     | FRD 025 |         |
|          |               | 140           | 10    | 3.4     | 3.5     |         |         |
|          |               | 94            | 15    | 4.9     | 2.5     |         |         |
|          |               | 70            | 20    | 6.1     | 2.0     |         |         |
|          |               | 47            | 30    | 8.2     | 1.6     |         |         |
|          |               | 35            | 40    | 10.2    | 1.3     |         |         |
|          |               | 28            | 50    | 11.3    | 0.9     |         |         |
|          |               | 24            | 60    | 11      | 0.7     |         |         |
|          |               | 24            | 60    | 12.5    | 1.3     |         | FRD 030 |
|          |               | 18            | 80    | 13.5    | 0.9     |         |         |
| 0,09     | 2P<br>n1=2800 | 374           | 7.5   | 2.0     | 3.9     | FRD 025 |         |
|          |               | 280           | 10    | 2.6     | 3.4     |         |         |
|          |               | 186           | 15    | 3.8     | 2.4     |         |         |
|          |               | 140           | 20    | 5.1     | 2.4     |         |         |
|          |               | 94            | 30    | 7.3     | 1.6     |         |         |
|          |               | 70            | 40    | 9.2     | 1.3     |         |         |
|          | 4P<br>n1=1400 | 47            | 30    | 12.3    | 1.1     | FRD 030 |         |
|          |               | 35            | 40    | 13      | 0.9     |         |         |
|          |               | 186           | 7.5   | 3.9     | 4.6     |         |         |
|          |               | 140           | 10    | 5.0     | 3.6     |         |         |
|          |               | 94            | 15    | 7.1     | 2.5     |         |         |
|          |               | 70            | 20    | 9.0     | 2.0     |         |         |
|          | 6P<br>n1=900  | 56            | 25    | 10.4    | 2.8     | FRD 040 |         |
|          |               | 47            | 30    | 12      | 1.1     |         |         |
|          |               | 35            | 40    | 14.5    | 1.2     |         |         |
|          |               | 28            | 50    | 16.9    | 1.0     |         |         |
|          |               | 24            | 60    | 16.9    | 0.9     |         |         |
|          |               | 28            | 50    | 19      | 2.0     |         |         |
| 24       |               | 60            | 21.4  | 1.7     |         |         |         |
| 18       |               | 80            | 25.5  | 1.3     |         |         |         |
| 14       |               | 100           | 28.9  | 1.0     |         |         |         |
| 0,12     |               | 2P<br>n1=2800 | 120   | 7.5     | 5.9     |         | 3.4     |
|          | 11            |               | 80    | 37      | 1.0     | FRD 040 |         |
|          | 9             |               | 100   | 41      | 0.8     |         |         |
|          | 11            |               | 80    | 37      | 1.8     |         |         |
|          | 9             |               | 100   | 42      | 1.3     |         |         |
|          | 373           |               | 7.5   | 2.7     | 3.0     |         | FRD 025 |
|          | 280           | 10            | 3.5   | 2.6     |         |         |         |
|          | 186           | 15            | 5.0   | 1.8     |         |         |         |
|          | 186           | 7.5           | 5.2   | 3.4     | FRD 030 |         |         |
|          | 140           | 10            | 6.7   | 2.7     |         |         |         |
|          | 94            | 15            | 9.5   | 1.9     |         |         |         |
|          | 70            | 20            | 12    | 1.5     |         |         |         |
| 56       | 25            | 13.9          | 1.5   | FRD 040 |         |         |         |
| 47       | 30            | 16            | 1.3   |         |         |         |         |
| 35       | 40            | 17            | 0.9   |         |         |         |         |
| 47       | 30            | 17.2          | 2.6   |         | FRD 050 |         |         |
| 35       | 40            | 21.3          | 1.9   |         |         |         |         |
| 28       | 50            | 25.4          | 1.5   |         |         |         |         |
| 24       | 60            | 28.5          | 1.3   |         |         |         |         |
| 18       | 80            | 34.7          | 1.9   |         |         |         |         |
| 0,18     | 4P<br>n1=1400 | 14            | 100   | 38      |         | 0.8     | FRD 040 |
|          |               | 24            | 60    | 29      | 2.3     |         |         |
|          |               | 18            | 80    | 34.7    | 1.9     |         |         |
|          |               | 14            | 100   | 40.1    | 1.4     |         |         |
|          |               | 120           | 7.5   | 7.9     | 2.5     | FRD 030 |         |
|          |               | 60            | 15    | 14      | 1.4     |         |         |
|          | 15            | 60            | 42    | 1.7     | FRD 050 |         |         |
|          | 11            | 80            | 50    | 1.4     |         |         |         |
|          | 9             | 100           | 56    | 1.0     |         |         |         |
|          | 373           | 7.5           | 8.4   | 3.3     |         |         | FRD 040 |
|          | 280           | 10            | 11    | 2.6     |         |         |         |
|          | 186           | 15            | 16    | 1.9     |         |         |         |
| 186      | 7.5           | 16            | 2.4   | FRD 040 |         |         |         |
| 140      | 10            | 21            | 1.9   |         |         |         |         |
| 94       | 15            | 30            | 1.3   |         |         |         |         |
| 70       | 20            | 39            | 1.0   |         | FRD 050 |         |         |
| 56       | 25            | 47            | 0.8   |         |         |         |         |
| 94       | 15            | 31            | 2.4   |         |         |         |         |
| 70       | 20            | 39            | 1.8   |         |         |         |         |
| 56       | 25            | 47            | 1.5   |         |         |         |         |
| 47       | 30            | 54            | 1.5   |         |         |         |         |
| 35       | 40            | 66            | 1.1   |         |         |         |         |
| 28       | 50            | 73            | 0.9   |         |         |         |         |
| 24       | 60            | 89            | 0.8   |         |         |         |         |

### Performance of worm geared motors

| Motor Kw      | n2 Rpm        | i            | M2 Nm | f.s.    | Type    |         |         |         |
|---------------|---------------|--------------|-------|---------|---------|---------|---------|---------|
| 0,37          | 4P<br>n1=1400 | 35           | 40    | 70      | 2.1     | FRD 063 |         |         |
|               |               | 28           | 50    | 83      | 1.6     |         |         |         |
|               |               | 24           | 60    | 95      | 1.4     |         |         |         |
|               |               | 18           | 80    | 114     | 1.1     |         |         |         |
|               |               | 14           | 100   | 118     | 0.9     |         |         |         |
|               |               | 24           | 60    | 98      | 2.0     |         |         |         |
|               |               | 18           | 80    | 121     | 1.6     |         | FRD 075 |         |
|               |               | 14           | 100   | 139     | 1.3     |         |         |         |
|               |               | 6P<br>n1=900 | 120   | 7.5     | 25      |         | 3.3     | FRD 050 |
|               |               |              | 15    | 60      | 137     |         | 1.0     | FRD 063 |
| 15            | 60            |              | 144   | 1.5     | FRD 075 |         |         |         |
| 11            | 80            |              | 173   | 1.2     |         |         |         |         |
| 9             | 100           |              | 196   | 1.0     |         |         |         |         |
| 9             | 100           |              | 196   | 1.0     |         |         |         |         |
| 2P<br>n1=2800 | 374           | 7.5          | 13    | 2.2     | FRD 040 |         |         |         |
|               | 280           | 10           | 17    | 1.8     |         |         |         |         |
|               | 186           | 15           | 24    | 1.5     |         |         |         |         |
|               | 186           | 7.5          | 25    | 2.9     |         | FRD 050 |         |         |
|               | 140           | 10           | 32    | 2.2     |         |         |         |         |
|               | 94            | 15           | 46    | 1.6     |         |         |         |         |
| 70            | 20            | 60           | 1.2   |         |         |         |         |         |
| 56            | 25            | 71           | 1.0   |         |         |         |         |         |
| 47            | 30            | 81           | 1.0   | FRD 063 |         |         |         |         |
| 70            | 20            | 60           | 2.2   |         |         |         |         |         |
| 56            | 25            | 72           | 1.8   |         |         |         |         |         |
| 47            | 30            | 80           | 1.9   |         |         |         |         |         |
| 35            | 40            | 104          | 1.4   |         |         |         |         |         |
| 28            | 50            | 123          | 1.1   |         |         |         |         |         |
| 0,55          | 4P<br>n1=1400 | 24           | 60    | 140     | 0.9     | FRD 075 |         |         |
|               |               | 35           | 40    | 108     | 2.0     |         |         |         |
|               |               | 28           | 50    | 129     | 1.6     |         |         |         |
|               |               | 24           | 60    | 146     | 1.4     |         |         |         |
|               |               | 18           | 80    | 180     | 1.1     |         |         |         |
|               |               | 14           | 100   | 206     | 0.9     |         |         |         |
|               | 6P<br>n1=900  | 18           | 80    | 189     | 1.5     | FRD 090 |         |         |
|               |               | 14           | 100   | 221     | 1.2     |         |         |         |
|               |               | 18           | 80    | 201     | 2.4     |         | FRD 110 |         |
|               |               | 14           | 100   | 236     | 1.9     |         |         |         |
|               |               | 120          | 7.5   | 38      | 2.2     |         |         | FRD 050 |
|               |               | 18           | 50    | 187     | 1.2     |         |         | FRD 075 |
| 15            | 60            | 214          | 1.0   | FRD 075 |         |         |         |         |
| 0,75          | 6P<br>n1=900  | 11           | 80    | 275     | 1.1     | FRD 090 |         |         |
|               |               | 9            | 100   | 315     | 0.9     |         | FRD 110 |         |
|               |               | 11           | 80    | 294     | 1.8     |         |         |         |
|               |               | 9            | 100   | 338     | 1.4     |         |         |         |
|               |               | 373          | 7.5   | 17      | 3.0     |         |         | FRD 050 |
|               |               | 280          | 10    | 23      | 2.4     |         |         |         |
|               | 186           | 15           | 33    | 1.7     |         |         |         |         |
|               | 186           | 7.5          | 34    | 2.1     | FRD 050 |         |         |         |
|               | 140           | 10           | 44    | 1.6     |         |         |         |         |
|               | 94            | 15           | 63    | 1.2     |         |         |         |         |
|               | 70            | 20           | 81    | 0.9     |         | FRD 063 |         |         |
|               | 94            | 15           | 63    | 2.2     |         |         |         |         |
| 70            | 20            | 82           | 1.6   |         |         |         |         |         |
| 56            | 25            | 99           | 1.3   |         |         |         |         |         |
| 47            | 30            | 109          | 1.4   |         |         |         |         |         |
| 35            | 40            | 143          | 1.0   | FRD 075 |         |         |         |         |
| 47            | 30            | 116          | 2.0   |         |         |         |         |         |
| 35            | 40            | 147          | 1.4   |         |         |         |         |         |
| 28            | 50            | 176          | 1.2   |         |         |         |         |         |
| 24            | 60            | 200          | 1.0   |         |         |         |         |         |

| Motor Kw | n2 Rpm        | i            | M2 Nm | f.s.    | Type    |         |         |         |
|----------|---------------|--------------|-------|---------|---------|---------|---------|---------|
| 0,75     | 4P<br>n1=1400 | 28           | 50    | 184     | 1.8     | FRD 090 |         |         |
|          |               | 24           | 60    | 212     | 1.5     |         |         |         |
|          |               | 18           | 80    | 257     | 1.1     |         |         |         |
|          |               | 14           | 100   | 270     | 0.9     |         |         |         |
|          |               | 18           | 80    | 274     | 1.8     |         | FRD 110 |         |
|          |               | 14           | 100   | 322     | 1.4     |         |         |         |
|          |               | 6P<br>n1=900 | 120   | 7.5     | 52      |         | 2.9     | FRD 063 |
|          |               |              | 18    | 50      | 271     |         | 1.4     | FRD 090 |
|          |               |              | 15    | 60      | 306     |         | 1.1     | FRD 110 |
|          |               |              | 15    | 60      | 325     |         | 1.9     |         |
| 11       | 80            |              | 401   | 1.3     |         |         |         |         |
| 9        | 100           |              | 462   | 1.1     |         |         |         |         |
| 1,10     | 2P<br>n1=2800 | 374          | 7.5   | 25      | 2.1     | FRD 050 |         |         |
|          |               | 280          | 10    | 33      | 1.6     |         |         |         |
|          |               | 186          | 15    | 48      | 1.2     |         |         |         |
|          |               | 186          | 7.5   | 49      | 2.6     |         | FRD 063 |         |
|          |               | 140          | 10    | 65      | 2.0     |         |         |         |
|          |               | 94           | 15    | 93      | 1.5     |         |         |         |
|          | 70            | 20           | 121   | 1.1     |         |         |         |         |
|          | 56            | 25           | 149   | 0.9     |         |         |         |         |
|          | 47            | 30           | 167   | 1.0     | FRD 075 |         |         |         |
|          | 70            | 20           | 122   | 1.7     |         |         |         |         |
|          | 56            | 25           | 149   | 1.3     |         |         |         |         |
|          | 47            | 30           | 170   | 1.3     |         |         |         |         |
| 35       | 40            | 216          | 1.0   |         |         |         |         |         |
| 35       | 40            | 225          | 1.6   | FRD 090 |         |         |         |         |
| 28       | 50            | 271          | 1.3   |         |         |         |         |         |
| 24       | 60            | 311          | 1.0   |         |         |         |         |         |
| 24       | 60            | 324          | 1.7   |         | FRD 110 |         |         |         |
| 18       | 80            | 410          | 1.2   |         |         |         |         |         |
| 14       | 100           | 460          | 1.0   |         |         |         |         |         |
| 18       | 80            | 408          | 2.1   | FRD 130 |         |         |         |         |
| 14       | 100           | 480          | 1.5   |         |         |         |         |         |
| 14       | 100           | 480          | 1.5   |         |         | FRD 063 |         |         |
| 120      | 7.5           | 76           | 2.0   |         | FRD 110 |         |         |         |
| 18       | 50            | 414          | 1.6   |         | FRD 110 |         |         |         |
| 15       | 60            | 476          | 1.3   |         | FRD 130 |         |         |         |
| 1,50     | 6P<br>n1=900  | 11           | 80    | 588     | 0.9     | FRD 110 |         |         |
|          |               | 9            | 100   | 689     | 1.1     |         | FRD 130 |         |
|          |               | 374          | 7.5   | 35      | 2.7     |         |         | FRD 063 |
|          |               | 280          | 10    | 46      | 2.1     |         |         |         |
|          |               | 186          | 15    | 66      | 1.6     |         |         |         |
|          |               | 186          | 7.5   | 68      | 1.9     |         |         |         |
|          | 140           | 10           | 89    | 1.5     | FRD 075 |         |         |         |
|          | 94            | 15           | 127   | 1.1     |         |         |         |         |
|          | 70            | 20           | 166   | 0.8     |         |         |         |         |
|          | 140           | 10           | 90    | 2.2     |         | FRD 090 |         |         |
|          | 94            | 15           | 130   | 1.5     |         |         |         |         |
|          | 70            | 20           | 167   | 1.3     |         |         |         |         |
| 56       | 25            | 200          | 1.0   |         |         |         |         |         |
| 47       | 30            | 230          | 1.0   |         |         |         |         |         |
| 56       | 25            | 209          | 1.6   | FRD 110 |         |         |         |         |
| 47       | 30            | 236          | 1.7   |         |         |         |         |         |
| 35       | 40            | 306          | 1.2   |         | FRD 130 |         |         |         |
| 28       | 50            | 369          | 0.9   |         |         |         |         |         |
| 24       | 60            | 424          | 0.8   |         |         |         |         |         |
| 28       | 50            | 375          | 1.6   |         |         |         |         |         |
| 24       | 60            | 442          | 1.3   |         |         |         |         |         |
| 18       | 80            | 490          | 0.9   | FRD 110 |         |         |         |         |
| 24       | 60            | 450          | 1.9   | FRD 130 |         |         |         |         |
| 18       | 80            | 547          | 1.5   | FRD 130 |         |         |         |         |
| 14       | 100           | 652          | 1.1   | FRD 130 |         |         |         |         |

## Performance of worm geared motors

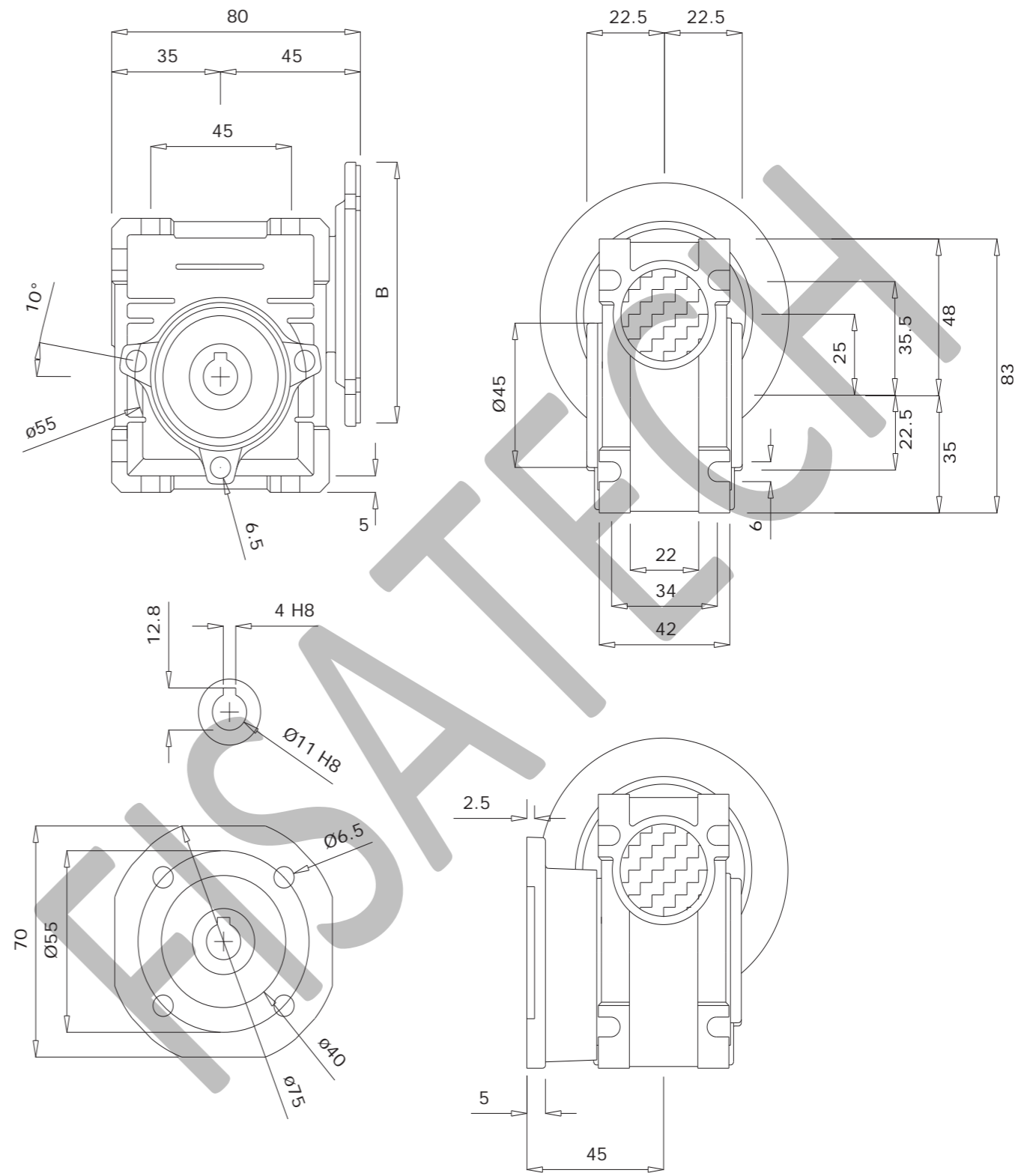
| Motor         |                | n2             | i    | M2  | f.s.    | Type    |         |
|---------------|----------------|----------------|------|-----|---------|---------|---------|
| Kw            | Rpm            | Rpm            |      | Nm  |         |         |         |
| 1,50          | 6P<br>n1= 900  | 120            | 7.5  | 105 | 2.0     | FRD 075 |         |
|               |                | 15             | 60   | 649 | 1.0     | FRD 110 |         |
|               |                | 15             | 60   | 659 | 1.4     |         |         |
|               |                | 11             | 80   | 815 | 1.1     | FRD 130 |         |
| 2,20          | 2P<br>n1= 2800 | 374            | 7.5  | 51  | 1.8     |         |         |
|               |                | 280            | 10   | 67  | 1.5     | FRD 063 |         |
|               |                | 186            | 15   | 97  | 1.1     |         |         |
|               |                | 186            | 7.5  | 100 | 1.8     |         |         |
|               | 2,20           | 4P<br>n1= 1400 | 140  | 10  | 132     | 1.5     | FRD 075 |
|               |                |                | 94   | 15  | 191     | 1.0     |         |
|               |                |                | 70   | 20  | 251     | 1.4     |         |
|               |                |                | 56   | 25  | 307     | 1.1     |         |
|               |                |                | 47   | 30  | 346     | 1.2     |         |
|               |                |                | 70   | 20  | 256     | 2.2     |         |
|               |                |                | 56   | 25  | 316     | 1.9     |         |
|               |                |                | 47   | 30  | 355     | 1.8     |         |
| 6P<br>n1= 900 |                | 35             | 40   | 462 | 1.3     | FRD 110 |         |
|               |                | 28             | 50   | 550 | 1.1     |         |         |
|               |                | 24             | 60   | 648 | 0.9     |         |         |
|               |                | 28             | 50   | 567 | 1.7     |         |         |
| 6P<br>n1= 900 | 24             | 60             | 660  | 1.4 | FRD 130 |         |         |
|               | 18             | 80             | 803  | 1.0 |         |         |         |
|               | 120            | 7.5            | 156  | 2.2 | FRD 075 |         |         |
|               | 18             | 50             | 840  | 1.2 |         |         |         |
| 3,00          | 2P<br>n1=2800  | 15             | 60   | 966 | 1.0     | FRD 130 |         |
|               |                | 373            | 7.5  | 70  | 1.9     | FRD 075 |         |
|               |                | 280            | 10   | 92  | 1.6     |         |         |
|               |                | 374            | 7.5  | 71  | 3.0     | FRD 090 |         |
|               | 3,00           | 4P<br>n1=1400  | 280  | 10  | 92      | 2.6     |         |
|               |                |                | 186  | 7.5 | 138     | 2.1     |         |
|               |                |                | 140  | 10  | 187     | 1.7     |         |
|               |                |                | 94   | 15  | 264     | 1.4     | FRD 090 |
|               |                |                | 70   | 20  | 344     | 1.0     |         |
|               |                |                | 140  | 10  | 182     | 2.6     |         |
|               |                |                | 94   | 15  | 263     | 2.2     |         |
|               |                |                | 70   | 20  | 350     | 1.6     |         |
| 6P<br>n1=900  |                | 56             | 25   | 431 | 1.4     | FRD 110 |         |
|               |                | 47             | 30   | 484 | 1.3     |         |         |
|               |                | 35             | 40   | 462 | 1.0     |         |         |
|               |                | 28             | 50   | 767 | 0.8     |         |         |
| 6P<br>n1=900  | 35             | 40             | 631  | 1.6 |         |         |         |
|               | 28             | 50             | 773  | 1.3 |         |         |         |
|               | 24             | 60             | 884  | 1.0 | FRD 130 |         |         |
|               | 18             | 80             | 1113 | 0.8 |         |         |         |
| 9,20          | 4P<br>n1= 1400 | 120            | 7.5  | 212 | 2.7     | FRD 110 |         |
|               |                | 30             | 30   | 745 | 1.6     |         |         |
|               |                | 22             | 40   | 955 | 1.2     | FRD 130 |         |
|               |                |                |      |     |         |         |         |

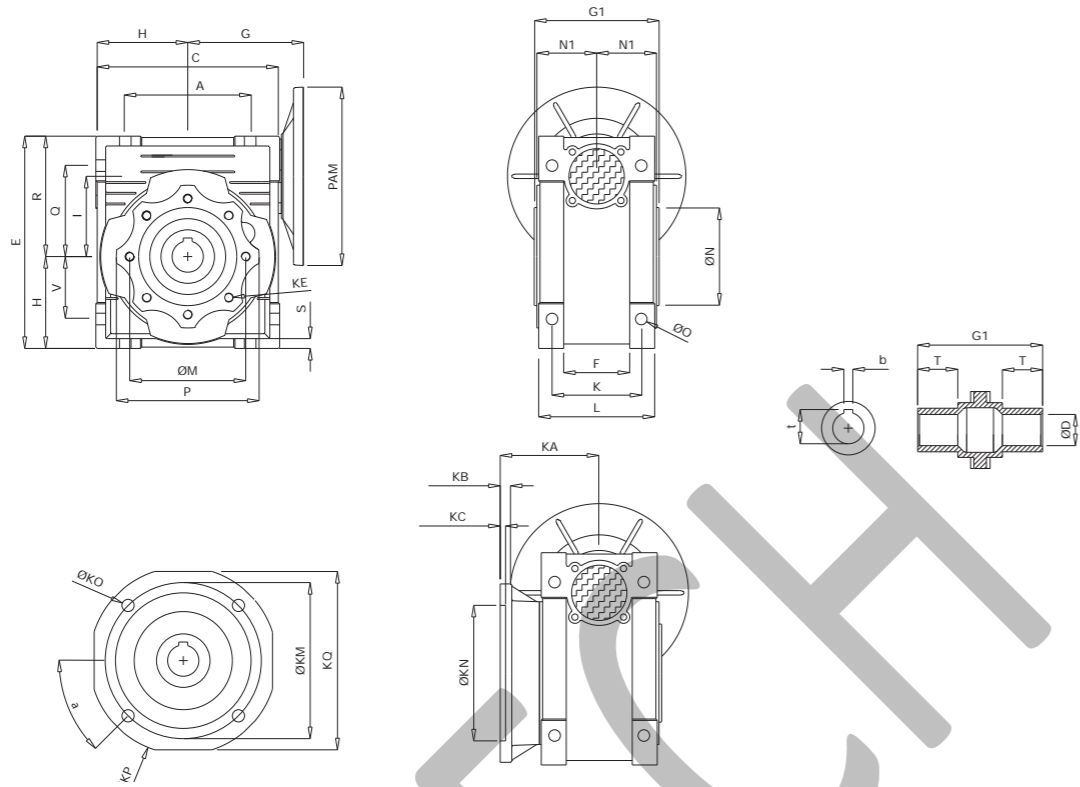
| Motor |                | n2             | i   | M2   | f.s. | Type    |         |
|-------|----------------|----------------|-----|------|------|---------|---------|
| Kw    | Rpm            | Rpm            |     | Nm   |      |         |         |
| 4,00  | 2P<br>n1= 2800 | 374            | 7.5 | 93   | 1.4  | FRD 075 |         |
|       |                | 280            | 10  | 123  | 1.2  |         |         |
|       |                | 374            | 7.5 | 94   | 2.2  | FRD 090 |         |
|       |                | 280            | 10  | 123  | 1.9  |         |         |
| 4,00  | 4P<br>n1= 1400 | 186            | 7.5 | 182  | 1.0  | FRD 075 |         |
|       |                | 140            | 10  | 240  | 0.8  |         |         |
|       |                | 186            | 7.5 | 184  | 1.6  |         |         |
|       |                | 140            | 10  | 243  | 1.3  | FRD 090 |         |
|       |                | 94             | 15  | 352  | 1.0  |         |         |
|       |                | 70             | 20  | 458  | 0.8  |         |         |
|       |                | 186            | 7.5 | 184  | 2.4  |         |         |
|       |                | 140            | 10  | 243  | 2.1  | FRD 110 |         |
|       | 6P<br>n1= 900  | 94             | 15  | 352  | 1.6  |         |         |
|       |                | 70             | 20  | 464  | 1.2  |         |         |
|       |                | 56             | 25  | 573  | 1.0  |         |         |
|       |                | 47             | 30  | 646  | 1.0  |         |         |
| 5,50  | 4P<br>n1= 1400 | 56             | 25  | 572  | 1.6  |         |         |
|       |                | 47             | 30  | 655  | 1.6  | FRD 130 |         |
|       |                | 35             | 40  | 857  | 1.2  |         |         |
|       |                | 28             | 50  | 1023 | 1.0  |         |         |
|       |                | 24             | 60  | 1179 | 0.8  |         |         |
|       |                | 120            | 7.5 | 283  | 2.0  | FRD 110 |         |
|       |                | 45             | 20  | 713  | 1.5  | FRD 130 |         |
|       |                | 36             | 25  | 870  | 1.2  |         |         |
|       | 7,50           | 4P<br>n1= 1400 | 186 | 7.5  | 253  | 1.9     | FRD 110 |
|       |                |                | 140 | 10   | 334  | 1.6     |         |
|       |                |                | 94  | 15   | 484  | 1.2     | FRD 110 |
|       |                |                | 70  | 20   | 638  | 0.9     |         |
| 7,50  | 4P<br>n1= 1400 | 186            | 7.5 | 256  | 3.0  |         |         |
|       |                | 140            | 10  | 334  | 2.5  |         |         |
|       |                | 94             | 15  | 490  | 1.9  |         |         |
|       |                | 70             | 20  | 645  | 1.4  | FRD 130 |         |
|       |                | 56             | 25  | 788  | 1.2  |         |         |
|       |                | 47             | 30  | 900  | 1.2  |         |         |
|       |                | 186            | 7.5 | 345  | 1.4  |         |         |
|       |                | 140            | 10  | 455  | 1.1  | FRD 110 |         |
|       | 9,20           | 4P<br>n1= 1400 | 94  | 15   | 660  | 0.9     |         |
|       |                |                | 186 | 7.5  | 349  | 2.1     |         |
|       |                |                | 140 | 10   | 455  | 1.8     |         |
|       |                |                | 94  | 15   | 667  | 1.4     | FRD 130 |
| 9,20  | 4P<br>n1= 1400 | 70             | 20  | 880  | 1.0  |         |         |
|       |                | 56             | 25  | 1074 | 0.9  |         |         |
|       |                | 47             | 30  | 1228 | 0.8  |         |         |
|       |                | 35             | 40  | 1596 | 0.7  |         |         |
| 9,20  | 4P<br>n1= 1400 | 186            | 7.5 | 428  | 1.8  |         |         |
|       |                | 140            | 10  | 559  | 1.5  |         |         |
|       |                | 94             | 15  | 819  | 1.1  | FRD 130 |         |
|       |                | 70             | 20  | 1079 | 0.8  |         |         |
| 9,20  | 4P<br>n1= 1400 | 56             | 25  | 1318 | 0.7  |         |         |

## Dimensions

FRD 025 Weight without motor 0.7Kg.



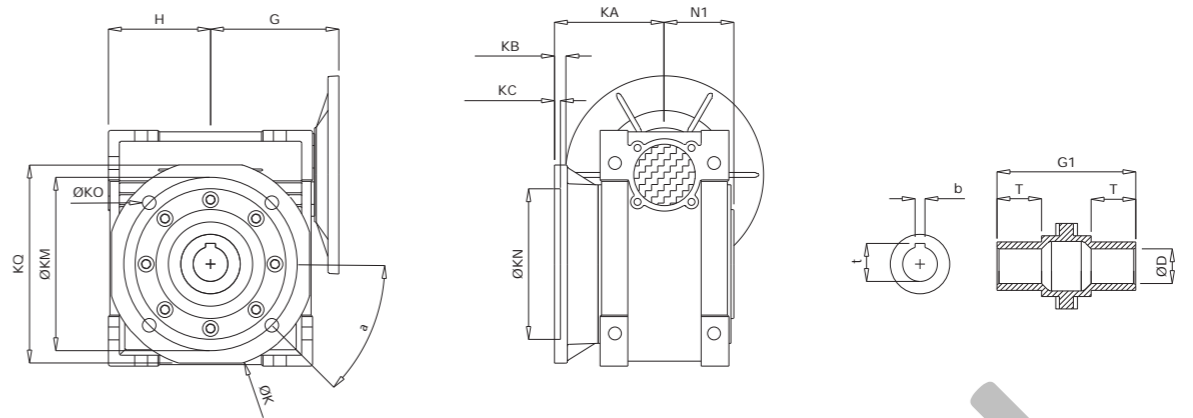
# FRD 030-130



| Size | A   | B  | C     | D (H7)  | E     | F  | G     | G1  | H     | I   | L   | M   | N (h8) | N1   | O   | P   | Q   | R     |
|------|-----|----|-------|---------|-------|----|-------|-----|-------|-----|-----|-----|--------|------|-----|-----|-----|-------|
| 030  | 54  | 20 | 80    | 14      | 97    | 32 | 55    | 63  | 40    | 30  | 56  | 65  | 55     | 29   | 6.5 | 75  | 44  | 57    |
| 040  | 70  | 23 | 100   | 18 (19) | 121.5 | 43 | 70    | 78  | 50    | 40  | 71  | 75  | 60     | 36.5 | 6.5 | 87  | 55  | 71.5  |
| 050  | 80  | 30 | 120   | 25 (24) | 144   | 49 | 80    | 92  | 60    | 50  | 85  | 85  | 70     | 43.5 | 8.5 | 100 | 64  | 84    |
| 063  | 100 | 40 | 144   | 25 (28) | 174   | 67 | 95    | 112 | 72    | 63  | 103 | 95  | 80     | 53   | 8.5 | 110 | 80  | 102   |
| 075  | 120 | 50 | 172   | 28 (35) | 205   | 72 | 112.5 | 120 | 86    | 75  | 112 | 115 | 95     | 57   | 11  | 140 | 93  | 119   |
| 090  | 140 | 50 | 208   | 35 (38) | 238   | 74 | 129.5 | 140 | 103   | 90  | 130 | 130 | 110    | 67   | 13  | 160 | 102 | 135   |
| 110  | 170 | 60 | 252.5 | 42      | 295   | -  | 160   | 155 | 127.5 | 110 | 144 | 165 | 130    | 74   | 14  | 200 | 125 | 167.5 |
| 130  | 200 | 80 | 292.5 | 45      | 335   | -  | 180   | 170 | 147.5 | 130 | 155 | 215 | 180    | 81   | 16  | 250 | 140 | 187.5 |

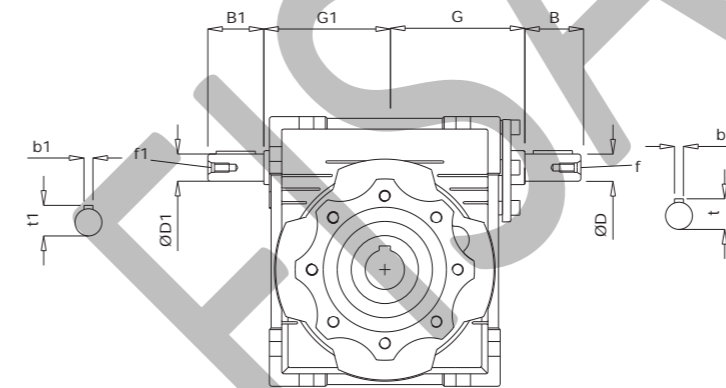
| Size | S   | T  | V   | K   | KA   | KB | KC | KE         | α     | KM  | KN (H8) | KO  | KP  | KQ  | b       | t           | kg  |
|------|-----|----|-----|-----|------|----|----|------------|-------|-----|---------|-----|-----|-----|---------|-------------|-----|
| 030  | 5.5 | 21 | 27  | 44  | 54.5 | 6  | 4  | M6x11 (4)  | 45°   | 68  | 50      | 6.5 | 80  | 70  | 5       | 16.3        | 1.2 |
| 040  | 6.5 | 26 | 35  | 60  | 67   | 7  | 4  | M6x8 (4)   | 45°   | 87  | 60      | 9   | 110 | 95  | 6 (6)   | 20.8 (21.8) | 2.3 |
| 050  | 7   | 30 | 40  | 70  | 90   | 9  | 5  | M8x10 (4)  | 45°   | 90  | 70      | 11  | 125 | 110 | 8 (8)   | 28.3 (27.3) | 3.5 |
| 063  | 8   | 36 | 50  | 85  | 82   | 10 | 6  | M8x14 (8)  | 45°   | 150 | 115     | 11  | 180 | 142 | 8 (8)   | 28.3 (31.3) | 6.2 |
| 075  | 10  | 40 | 60  | 90  | 111  | 13 | 6  | M8x14 (8)  | 45°   | 165 | 130     | 14  | 200 | 170 | 8 (10)  | 31.3 (38.3) | 9   |
| 090  | 11  | 45 | 70  | 100 | 111  | 13 | 6  | M10x18 (8) | 45°   | 175 | 152     | 14  | 210 | 200 | 10 (10) | 38.3 (41.3) | 13  |
| 110  | 14  | 50 | 85  | 115 | 131  | 15 | 6  | M10x18 (8) | 45°   | 230 | 170     | 14  | 280 | 260 | 12      | 45.3        | 35  |
| 130  | 15  | 60 | 100 | 120 | 140  | 15 | 6  | M12x21 (8) | 22.5° | 255 | 180     | 16  | 320 | 290 | 14      | 48.8        | 48  |

## Special output flanges



| Size | D (H7) | G    | G1    | H   | N1    | T    | KA | KB   | KC   | α | KM  | KN (H8) | KO  | KP  | KQ  | b   | t       |             |
|------|--------|------|-------|-----|-------|------|----|------|------|---|-----|---------|-----|-----|-----|-----|---------|-------------|
| 040  | FB     | 18   | 70    | 78  | 50    | 36.5 | 26 | 97   | 7    | 4 | 45° | 87      | 60  | 9   | 110 | 95  | 6       | 20.8        |
|      | FC     | (19) |       |     |       |      |    | 80   | 9    | 5 | 45° | 115     | 95  | 9.5 | 140 | -   | 6 (6)   | (21.8)      |
|      | FD     |      |       |     |       |      |    | 58   | 12   | 5 | 45° | 100     | 80  | 9   | 120 | -   |         |             |
| 050  | FB     | 25   | 80    | 92  | 60    | 43.5 | 30 | 120  | 9    | 5 | 45° | 87      | 70  | 11  | 125 | 110 | 8       | 28.3        |
|      | FC     | (24) |       |     |       |      |    | 89   | 10   | 5 | 45° | 130     | 110 | 9.5 | 160 | -   | 8 (8)   | (27.3)      |
|      | FD     |      |       |     |       |      |    | 72   | 14.5 | 5 | 45° | 115     | 95  | 11  | 140 | -   |         |             |
| 063  | FB     | 25   | 95    | 112 | 72    | 53   | 36 | 112  | 10   | 6 | 45° | 150     | 115 | 11  | 180 | 142 | 8       | 28.3        |
|      | FC     | (28) |       |     |       |      |    | 98   | 10   | 5 | 45° | 165     | 130 | 11  | 200 | -   | 8 (8)   | (31.3)      |
|      | FD     |      |       |     |       |      |    | 107  | 10   | 5 | 45° | 165     | 130 | 11  | 200 | -   |         |             |
|      | FE     |      |       |     |       |      |    | 80.5 | 16.5 | 5 | 45° | 130     | 110 | 11  | 160 | -   |         |             |
| 075  | FB     | 28   | 112.5 | 120 | 86    | 57   | 40 | 90   | 13   | 6 | 45° | 130     | 110 | 11  | 160 | -   | 8 (10)  | 31.3 (38.3) |
| 090  | FB     | 35   | 129.5 | 140 | 103   | 67   | 45 | 122  | 18   | 6 | 45° | 215     | 180 | 14  | 250 | -   | 10 (10) | 38.3 (41.3) |
|      | FC     | (38) |       |     |       |      |    | 110  | 17   | 6 | 45° | 165     | 130 | 11  | 200 | -   |         |             |
|      | FD     |      |       |     |       |      |    | 151  | 13   | 6 | 45° | 175     | 152 | 14  | 210 | 200 |         |             |
| 110  | FB     | 42   | 160   | 155 | 127.5 | 74   | 50 | 130  | 18   | 5 | 45° | 215     | 180 | 15  | 250 | -   | 12      | 45.3        |

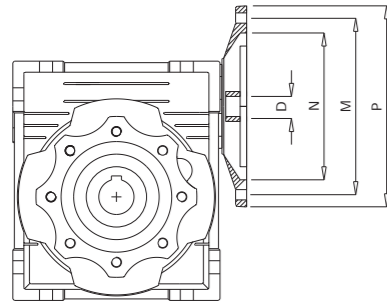
## Single and double input shaft model



| Size | B  | G   | D (j6) | f   | b | t    | B1 | G1  | D1 (j6) | f1  | b1 | t1   |
|------|----|-----|--------|-----|---|------|----|-----|---------|-----|----|------|
| 030  | 20 | 51  | 9      | -   | 3 | 10.2 | 20 | 45  | 9       | -   | 3  | 10.2 |
| 040  | 23 | 60  | 11     | -   | 4 | 12.5 | 23 | 53  | 11      | -   | 4  | 12.5 |
| 050  | 30 | 74  | 14     | M6  | 5 | 16.0 | 30 | 64  | 14      | M6  | 5  | 16.0 |
| 063  | 40 | 90  | 19     | M6  | 6 | 21.5 | 40 | 75  | 19      | M6  | 6  | 21.5 |
| 075  | 50 | 105 | 24     | M8  | 8 | 27.0 | 50 | 90  | 24      | M8  | 8  | 27.0 |
| 090  | 50 | 125 | 24     | M8  | 8 | 27.0 | 50 | 108 | 24      | M8  | 8  | 27.0 |
| 110  | 60 | 142 | 28     | M10 | 8 | 31.0 | 60 | 135 | 28      | M10 | 8  | 31.0 |
| 130  | 80 | 162 | 30     | M10 | 8 | 33.0 | 80 | 155 | 30      | M10 | 8  | 33.0 |

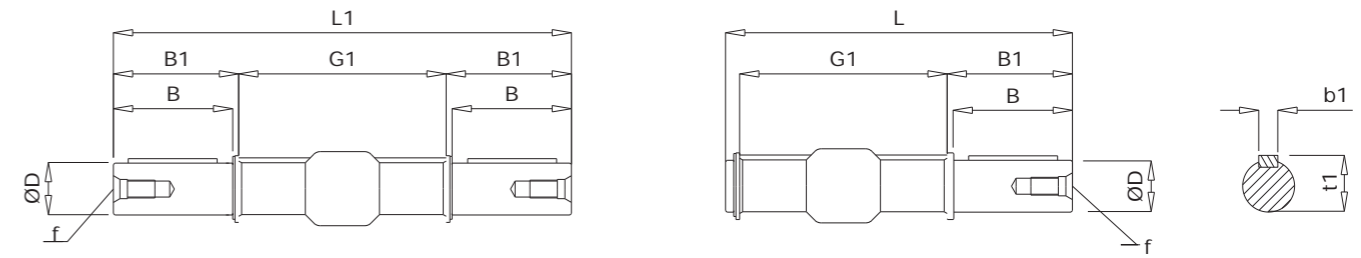


## Motor coupling



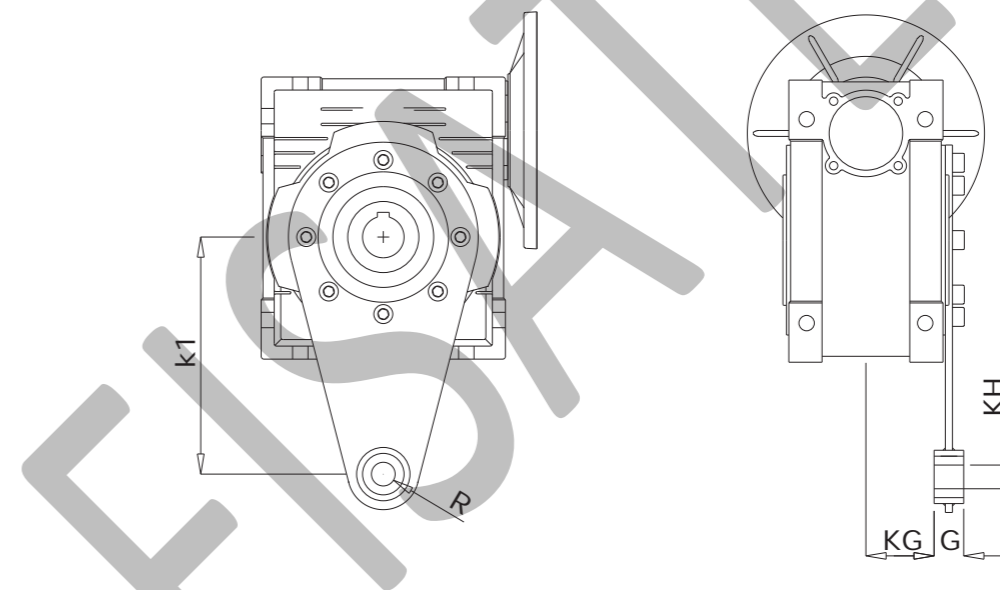
| TYPE    | IEC         | N   | M   | P   | D   |    |    |    |    |    |    |    |    |    |     |
|---------|-------------|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|-----|
|         |             |     |     |     | 7.5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 80 | 100 |
| FRD 025 | 56 B14      | 50  | 65  | 80  | 9   | 9  | 9  | 9  | -  | 9  | 9  | 9  | 9  | -  | -   |
| FRD 030 | 63 B5       | 95  | 115 | 140 | 11  | 11 | 11 | 11 | 11 | 11 | 11 | -  | -  | -  | -   |
|         | 63 B14      | 60  | 75  | 90  | 9   | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | 9  | -   |
|         | 56 B14      | 50  | 65  | 80  | -   | -  | -  | -  | -  | -  | -  | 9  | 9  | 9  | 9   |
| FRD 040 | 71 B5       | 110 | 130 | 160 | 14  | 14 | 14 | 14 | 14 | 14 | 14 | -  | -  | -  | -   |
|         | 71 B14      | 70  | 85  | 105 | 11  | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11  |
|         | 63 B5       | 95  | 115 | 140 | -   | -  | -  | -  | -  | -  | -  | 9  | 9  | 9  | 9   |
| FRD 050 | 80 B5       | 130 | 165 | 200 | 19  | 19 | 19 | 19 | 19 | 19 | -  | -  | -  | -  | -   |
|         | 80 B14      | 80  | 100 | 120 | 14  | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | -   |
|         | 71 B5       | 110 | 130 | 160 | -   | -  | -  | -  | -  | -  | 11 | 11 | 11 | 11 | 11  |
|         | 63 B5       | 95  | 115 | 140 | -   | -  | -  | -  | -  | -  | 11 | 11 | 11 | 11 | 11  |
| FRD 063 | 90 B5       | 130 | 165 | 200 | 24  | 24 | 24 | 24 | 24 | 24 | -  | -  | -  | -  | -   |
|         | 90 B14      | 95  | 115 | 140 | 19  | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | -  | -   |
|         | 80 B5       | 130 | 165 | 200 | -   | -  | -  | -  | -  | -  | 14 | 14 | 14 | 14 | 14  |
|         | 80 B14      | 80  | 100 | 120 | -   | -  | -  | -  | -  | -  | -  | -  | -  | -  | -   |
|         | 71 B5       | 110 | 130 | 160 | -   | -  | -  | -  | -  | -  | -  | 14 | 14 | 14 | 14  |
| FRD 075 | 100/112 B5  | 180 | 215 | 250 | 28  | 28 | 28 | -  | -  | -  | -  | -  | -  | -  | -   |
|         | 100/112 B14 | 110 | 130 | 160 | 24  | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24  |
|         | 90 B5       | 130 | 165 | 200 | -   | -  | -  | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19  |
|         | 90 B14      | 95  | 115 | 140 | -   | -  | -  | -  | -  | -  | -  | -  | -  | -  | -   |
|         | 80 B5       | 130 | 165 | 200 | -   | -  | -  | -  | -  | -  | 14 | 14 | 14 | 14 | 14  |
|         | 80 B14      | 80  | 100 | 120 | -   | -  | -  | -  | -  | -  | -  | -  | -  | -  | -   |
| FRD 090 | 100/112 B5  | 180 | 215 | 250 | 28  | 28 | 28 | 28 | 28 | 28 | -  | -  | -  | -  | -   |
|         | 100/112 B14 | 110 | 130 | 160 | 24  | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24  |
|         | 90 B5       | 130 | 165 | 200 | -   | -  | -  | -  | -  | -  | 19 | 19 | 19 | 19 | 19  |
|         | 90 B14      | 95  | 115 | 140 | -   | -  | -  | -  | -  | -  | -  | -  | -  | -  | -   |
|         | 80 B5       | 130 | 165 | 200 | -   | -  | -  | -  | -  | -  | -  | -  | -  | 19 | 19  |
| FRD 110 | 132 B5      | 230 | 265 | 300 | 38  | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38  |
|         | 100/112 B5  | 180 | 215 | 250 | 28  | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28  |
|         | 90 B5       | 130 | 165 | 200 | -   | -  | -  | -  | 24 | 24 | 24 | 24 | 24 | 24 | 24  |
|         | 80 B5       | 130 | 165 | 200 | -   | -  | -  | -  | -  | -  | -  | -  | -  | 19 | 19  |
| FRD 130 | 132 B5      | 230 | 265 | 300 | 38  | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38  |
|         | 100/112 B5  | 180 | 215 | 250 | -   | -  | -  | -  | 28 | 28 | 28 | 28 | 28 | 28 | 28  |
|         | 90 B5       | 130 | 165 | 200 | -   | -  | -  | -  | -  | -  | -  | -  | -  | 24 | 24  |

## Single and double output shafts



|     | D h6 | B  | B1   | G1  | L   | L1  | f   | b1 | t1   |
|-----|------|----|------|-----|-----|-----|-----|----|------|
| 025 | 11   | 23 | 25.5 | 50  | 81  | 101 | -   | 4  | 12.5 |
| 030 | 14   | 30 | 32.5 | 63  | 102 | 128 | M6  | 5  | 16   |
| 040 | 18   | 40 | 43   | 78  | 128 | 164 | M6  | 6  | 20.5 |
| 050 | 25   | 50 | 53.5 | 92  | 153 | 199 | M10 | 8  | 28   |
| 063 | 25   | 50 | 53.5 | 112 | 173 | 219 | M10 | 8  | 28   |
| 075 | 28   | 60 | 63.5 | 120 | 192 | 247 | M10 | 8  | 31   |
| 090 | 35   | 80 | 84.5 | 140 | 234 | 309 | M12 | 10 | 38   |
| 110 | 42   | 80 | 84.5 | 155 | 249 | 324 | M16 | 12 | 45   |
| 130 | 45   | 80 | 85   | 170 | 265 | 340 | M16 | 14 | 48.5 |

## Torque arms

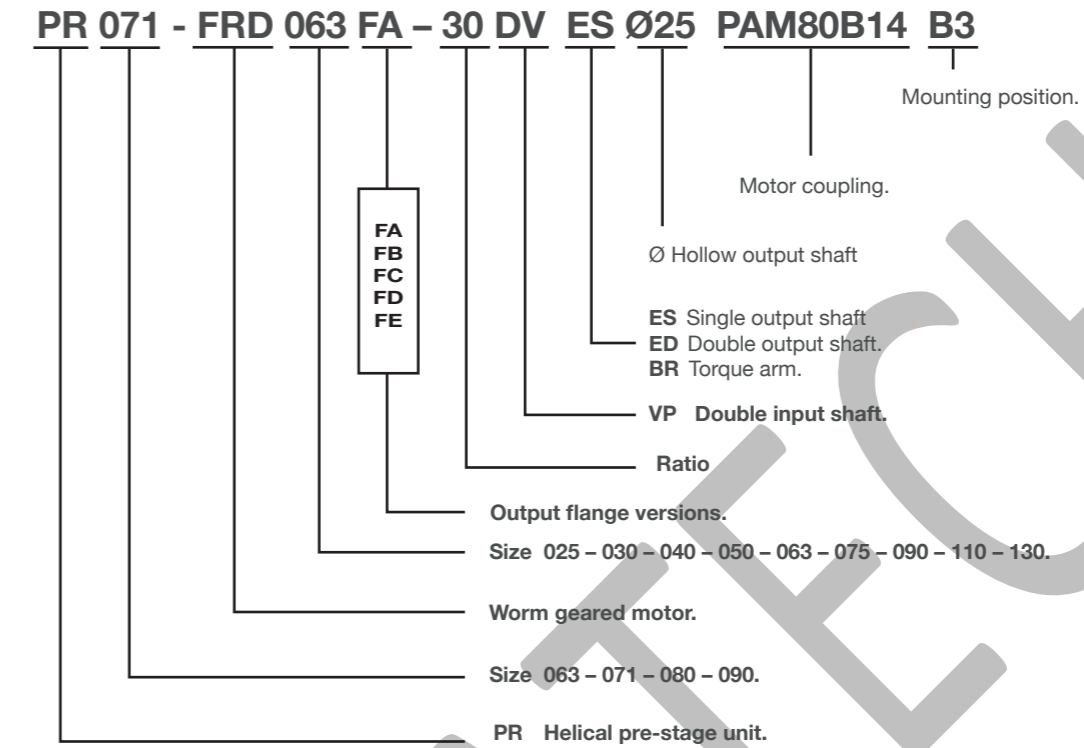


|     | K1  | G  | KG   | KH | R  |
|-----|-----|----|------|----|----|
| 025 | 70  | 14 | 17.5 | 8  | 15 |
| 030 | 85  | 14 | 24   | 8  | 15 |
| 040 | 100 | 14 | 31.5 | 10 | 18 |
| 050 | 100 | 14 | 38.5 | 10 | 18 |
| 063 | 150 | 14 | 49   | 10 | 18 |
| 075 | 200 | 25 | 47.5 | 20 | 30 |
| 090 | 200 | 25 | 57.5 | 20 | 30 |
| 110 | 250 | 30 | 62   | 25 | 35 |
| 130 | 250 | 30 | 69   |    |    |

# Worm Gearboxes with pre-stage helical unit

## PR + FRD Worm geared motors with pre-stage helical unit

### Designation



### PR + FRD Possible combinations

| FRD | i             | 25 | 30 | 40 | 50 | 60 | 80 | 100 |
|-----|---------------|----|----|----|----|----|----|-----|
| 040 | PR 063 i:3    |    |    |    |    |    |    |     |
|     | PR 063 i:3    |    |    |    |    |    |    |     |
| 050 | PR 071 i:3    |    |    |    |    |    |    |     |
|     | PR 071 i:3    |    |    |    |    |    |    |     |
| 063 | PR 080 i:3    |    |    |    |    |    |    |     |
|     | PR 080 i:3    |    |    |    |    |    |    |     |
| 075 | PR 071 i:3    |    |    |    |    |    |    |     |
|     | PR 080 i:3    |    |    |    |    |    |    |     |
| 090 | PR 071 i:3    |    |    |    |    |    |    |     |
|     | PR 080 i:3    |    |    |    |    |    |    |     |
| 110 | PR 090 i:2.42 |    |    |    |    |    |    |     |
|     | PR 080 i:3    |    |    |    |    |    |    |     |
| 130 | PR 090 i:2.42 |    |    |    |    |    |    |     |
|     | PR 080 i:3    |    |    |    |    |    |    |     |



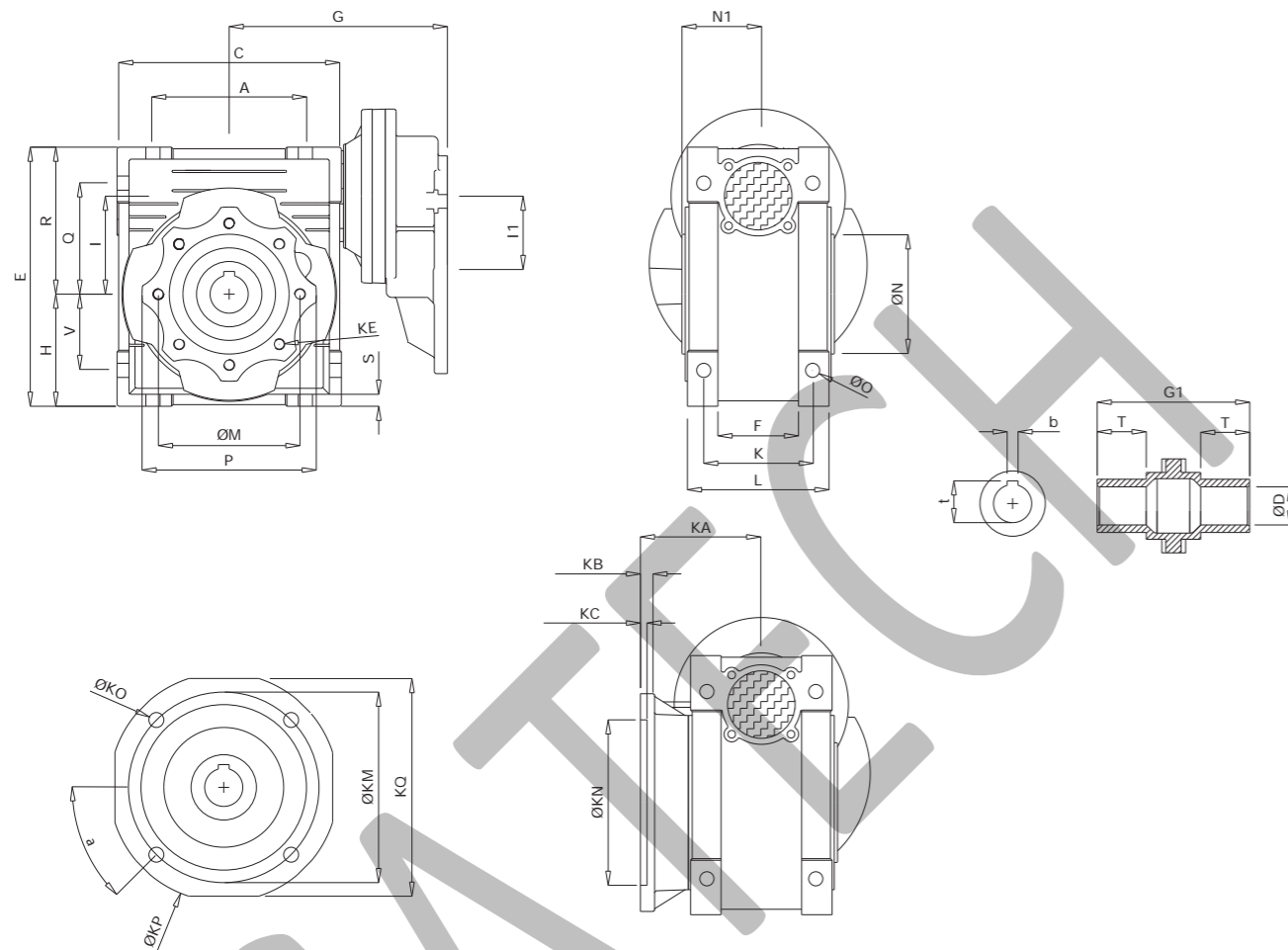
Performance of worm geared motors with pre-stage helical unit

| Motor |               |        |     |       |      | Motor             |               |               |        |     |       |                   |                   |
|-------|---------------|--------|-----|-------|------|-------------------|---------------|---------------|--------|-----|-------|-------------------|-------------------|
| Kw    |               | n2 rpm | i   | M2 Nm | f.s. | Type              | Kw            |               | n2 rpm | i   | M2 Nm | f.s.              | Type              |
| 0.09  | 6P<br>n1=900  | 12     | 75  | 47    | 1.3  | PR 063<br>FRD 040 | 0.25          | 4P<br>n1=1400 | 18.7   | 75  | 88    | 1.0               | PR 071<br>FRD 050 |
|       |               | 10     | 90  | 51    | 1.4  |                   |               |               | 15.6   | 90  | 98    | 1.1               |                   |
|       |               | 7.5    | 120 | 62    | 1.1  |                   |               |               | 11.7   | 120 | 121   | 0.8               |                   |
|       |               | 6.0    | 150 | 72    | 0.8  |                   |               |               | 18.7   | 75  | 91    | 1.8               |                   |
|       |               | 5.0    | 180 | 79    | 0.7  |                   |               |               | 15.6   | 90  | 100   | 2.0               |                   |
|       |               | 6.0    | 150 | 73    | 1.6  |                   |               |               | 11.7   | 120 | 125   | 1.5               |                   |
|       | 4P<br>n1=1400 | 5.0    | 180 | 81    | 1.3  | PR 063<br>FRD 050 |               | 6P<br>n1=900  | 9.3    | 150 | 143   | 1.2               | PR 071<br>FRD 063 |
|       |               | 3.8    | 240 | 94    | 0.9  |                   |               |               | 7.8    | 180 | 163   | 1.0               |                   |
|       |               | 3.0    | 300 | 106   | 0.7  |                   |               |               | 5.8    | 240 | 192   | 0.7               |                   |
|       |               | 3.8    | 240 | 99    | 1.7  |                   |               |               | 4.7    | 300 | 215   | 0.6               |                   |
|       |               | 3.0    | 300 | 109   | 1.4  |                   |               |               | 9.3    | 150 | 151   | 1.7               |                   |
|       |               | 18.7   | 75  | 42    | 1.2  |                   |               |               | 7.8    | 180 | 172   | 1.4               |                   |
| 0.12  | 4P<br>n1=1400 | 15.6   | 90  | 46    | 1.2  | PR 063<br>FRD 040 | 4P<br>n1=1400 | 5.8           | 240    | 201 | 1.1   | PR 071<br>FRD 075 |                   |
|       |               | 11.7   | 120 | 57    | 0.9  |                   |               | 4.7           | 300    | 230 | 0.9   |                   |                   |
|       |               | 9.3    | 150 | 66    | 0.7  |                   |               | 12            | 75     | 135 | 1.6   |                   |                   |
|       |               | 7.8    | 180 | 74    | 0.6  |                   |               | 10            | 90     | 148 | 1.8   |                   |                   |
|       |               | 7.8    | 180 | 75    | 1.1  |                   |               | 7.5           | 120    | 181 | 1.3   |                   |                   |
|       |               | 5.8    | 240 | 88    | 0.8  |                   |               | 6.0           | 150    | 211 | 1.0   |                   |                   |
|       | 6P<br>n1=900  | 4.7    | 300 | 98    | 0.7  | PR 063<br>FRD 050 | 6P<br>n1=900  | 12            | 75     | 139 | 2.4   | PR 071<br>FRD 075 |                   |
|       |               | 5.8    | 240 | 92    | 1.5  |                   |               | 10            | 90     | 155 | 2.5   |                   |                   |
|       |               | 4.7    | 300 | 103   | 1.2  |                   |               | 7.5           | 120    | 191 | 1.9   |                   |                   |
|       |               | 12     | 75  | 62    | 1.0  |                   |               | 6.0           | 150    | 219 | 1.5   |                   |                   |
|       |               | 10     | 90  | 68    | 1.1  |                   |               | 5.0           | 180    | 248 | 1.2   |                   |                   |
|       |               | 7.5    | 120 | 83    | 0.8  |                   |               | 5.0           | 180    | 263 | 1.9   |                   |                   |
| 0.18  | 4P<br>n1=1400 | 12     | 75  | 63    | 1.7  | PR 063<br>FRD 040 | 4P<br>n1=1400 | 3.8           | 240    | 318 | 1.4   | PR 071<br>FRD 090 |                   |
|       |               | 10     | 90  | 70    | 2.1  |                   |               | 3.0           | 300    | 358 | 1.1   |                   |                   |
|       |               | 7.5    | 120 | 84    | 1.5  |                   |               | 18.7          | 75     | 134 | 1.2   |                   |                   |
|       |               | 6.0    | 150 | 97    | 1.2  |                   |               | 15.6          | 90     | 148 | 1.4   |                   |                   |
|       |               | 5.0    | 180 | 108   | 1.0  |                   |               | 11.7          | 120    | 185 | 1.0   |                   |                   |
|       |               | 3.8    | 240 | 125   | 0.7  |                   |               | 9.3           | 150    | 212 | 0.8   |                   |                   |
|       | 6P<br>n1=900  | 6.0    | 150 | 101   | 2.1  | PR 063<br>FRD 050 | 6P<br>n1=900  | 18.7          | 75     | 138 | 1.8   | PR 071<br>FRD 075 |                   |
|       |               | 5.0    | 180 | 112   | 1.8  |                   |               | 15.6          | 90     | 154 | 1.9   |                   |                   |
|       |               | 3.8    | 240 | 131   | 1.3  |                   |               | 11.7          | 120    | 191 | 1.5   |                   |                   |
|       |               | 3.0    | 300 | 145   | 1.0  |                   |               | 9.3           | 150    | 223 | 1.1   |                   |                   |
|       |               | 18.7   | 75  | 64    | 0.8  |                   |               | 7.8           | 180    | 254 | 0.9   |                   |                   |
|       |               | 15.6   | 90  | 70    | 0.8  |                   |               | 7.8           | 180    | 268 | 1.5   |                   |                   |
| 0.25  | 4P<br>n1=1400 | 11.7   | 120 | 85    | 0.6  | PR 063<br>FRD 040 | 4P<br>n1=1400 | 5.8           | 240    | 321 | 1.1   | PR 071<br>FRD 090 |                   |
|       |               | 18.7   | 75  | 64    | 1.4  |                   |               | 4.7           | 300    | 371 | 0.9   |                   |                   |
|       |               | 15.6   | 90  | 71    | 1.5  |                   |               | 12            | 75     | 206 | 1.6   |                   |                   |
|       |               | 11.7   | 120 | 87    | 1.1  |                   |               | 10            | 90     | 230 | 1.7   |                   |                   |
|       |               | 9.3    | 150 | 101   | 0.9  |                   |               | 7.5           | 120    | 283 | 1.3   |                   |                   |
|       |               | 7.8    | 180 | 113   | 0.7  |                   |               | 6.0           | 150    | 324 | 1.0   |                   |                   |
|       | 6P<br>n1=900  | 5.8    | 240 | 133   | 0.6  | PR 063<br>FRD 050 | 6P<br>n1=900  | 6.0           | 150    | 347 | 1.6   | PR 080<br>FRD 075 |                   |
|       |               | 9.3    | 150 | 103   | 1.7  |                   |               | 5.0           | 180    | 389 | 1.3   |                   |                   |
|       |               | 7.8    | 180 | 117   | 1.4  |                   |               | 3.8           | 240    | 471 | 1.0   |                   |                   |
|       |               | 5.8    | 240 | 139   | 1.0  |                   |               | 3.8           | 240    | 509 | 1.5   |                   |                   |
|       |               | 4.7    | 300 | 155   | 0.9  |                   |               | 3.0           | 300    | 577 | 1.2   |                   |                   |
|       |               | 18.7   | 75  | 97    | 2.2  |                   |               | 18.7          | 75     | 205 | 1.2   |                   |                   |
| 0.37  | 4P<br>n1=1400 | 10     | 90  | 107   | 2.4  | PR 063<br>FRD 063 | 4P<br>n1=1400 | 15.6          | 90     | 240 | 2.3   | PR 080<br>FRD 075 |                   |
|       |               | 7.5    | 120 | 131   | 1.8  |                   |               | 11.7          | 120    | 284 | 1.0   |                   |                   |
|       |               | 6.0    | 150 | 152   | 1.4  |                   |               | 9.3           | 150    | 332 | 0.8   |                   |                   |
|       |               | 5.0    | 180 | 168   | 1.2  |                   |               | 15.6          | 90     | 240 | 2.3   |                   |                   |
|       |               | 3.8    | 240 | 197   | 0.9  |                   |               | 11.7          | 120    | 297 | 1.6   |                   |                   |
|       |               | 3.0    | 300 | 218   | 0.7  |                   |               | 9.3           | 150    | 355 | 1.3   |                   |                   |
|       | 6P<br>n1=900  | 5.0    | 180 | 179   | 1.7  | PR 071<br>FRD 063 | 6P<br>n1=900  | 7.8           | 180    | 398 | 1.0   | PR 080<br>FRD 090 |                   |
|       |               | 3.8    | 240 | 211   | 1.2  |                   |               | 5.8           | 240    | 477 | 0.8   |                   |                   |
|       |               | 3.0    | 300 | 235   | 1.0  |                   |               |               |        |     |       |                   |                   |

Performance of worm geared motors with pre-stage helical unit

| Motor |               |        |      |       |      | Motor             |               |               |        |      |       |                   |                   |
|-------|---------------|--------|------|-------|------|-------------------|---------------|---------------|--------|------|-------|-------------------|-------------------|
| Kw    |               | n2 rpm | i    | M2 Nm | f.s. | Type              | Kw            |               | n2 rpm | i    | M2 Nm | f.s.              | Type              |
| 0.55  | 4P<br>n1=1400 | 7.8    | 180  | 425   | 1.7  | PR 080<br>FRD 110 | 0.75          | 4P<br>n1=1400 | 18.7   | 75   | 280   | 0.9               | PR 080<br>FRD 075 |
|       |               | 5.8    | 240  | 513   | 1.2  |                   |               |               | 15.6   | 90   | 313   | 1.0               |                   |
|       |               | 4.7    | 300  | 597   | 1.0  |                   |               |               | 15.6   | 90   | 327   | 1.7               |                   |
|       | 12            | 75     | 306  | 1.1   | 11.7 | 120               |               |               | 405    | 1.2  |       |                   |                   |
|       | 10            | 90     | 341  | 1.1   | 9.3  | 150               |               |               | 483    | 0.9  |       |                   |                   |
|       | 10            | 90     | 357  | 2.0   | 7.8  | 180               |               |               | 543    | 0.7  |       |                   |                   |
|       | 6P<br>n1=900  | 7.5    | 120  | 441   | 1.4  | PR 080<br>FRD 090 |               | 6P<br>n1=900  | 11.7   | 120  | 430   | 1.9               | PR 080<br>FRD 110 |
|       |               | 6.0    | 150  | 516   | 1.1  |                   |               |               | 9.3    | 150  | 506   | 1.6               |                   |
|       |               | 5.0    | 180  | 578   | 0.9  |                   |               |               | 7.8    | 180  | 580   | 1.2               |                   |
|       |               | 7.5    | 120  | 462   | 2.2  |                   |               |               | 5.8    | 240  | 700   | 0.9               |                   |
|       |               | 6.0    | 150  | 552   | 1.8  |                   |               |               | 5.8    | 240  | 712   | 1.4               |                   |
|       |               | 5.0    | 180  | 620   | 1.5  |                   |               |               | 4.7    | 300  | 813   | 1.1               |                   |
| 1.10  | 4P<br>n1=1400 | 3.8    | 240  | 756   | 1.0  | PR 080<br>FRD 130 | 4P<br>n1=1400 | 12.4          | 72.6   | 393  | 2.8   | PR 090<br>FRD 110 |                   |
|       |               | 3.8    | 240  | 756   | 1.6  |                   |               | 9.3           | 96.8   | 508  | 2.0   |                   |                   |
|       |               | 3.0    | 300  | 858   | 1.3  |                   |               | 7.4           | 121    | 607  | 1.6   |                   |                   |
|       |               | 19.3   | 72.6 | 392   | 2.2  |                   |               | 6.2           | 145    | 682  | 1.3   |                   |                   |
|       |               | 14.5   | 96.8 | 508   | 1.6  |                   |               | 4.6           | 193    | 832  | 0.9   |                   |                   |
|       |               | 11.6   | 121  | 599   | 1.3  |                   |               | 12.4          | 72.6   | 399  | 4.4   |                   |                   |
|       | 6P<br>n1=900  | 9.6    | 145  | 686   | 1.0  | PR 090<br>FRD 130 | 6P<br>n1=900  | 9.3           | 96.8   | 508  | 2.0   | PR 090<br>FRD 110 |                   |
|       |               | 7.2    | 193  | 828   | 0.8  |                   |               | 7.4           | 121    | 890  | 1.7   |                   |                   |
|       |               | 19.3   | 72.6 | 398   | 3.5  |                   |               | 6.2           | 145    | 1000 | 1.4   |                   |                   |
|       |               | 14.5   | 96.8 | 508   | 2.6  |                   |               | 4.6           | 193    | 1220 | 1.0   |                   |                   |
|       |               | 11.6   | 121  | 608   | 2.0  |                   |               | 19.3          | 72.6   | 535  | 1.6   |                   |                   |
|       |               | 9.6    | 145  | 686   | 1.6  |                   |               | 14.5          | 96.8   | 693  | 1.2   |                   |                   |
| 1.50  | 4P<br>n1=1400 | 7.2    | 193  | 843   | 1.2  | PR 090<br>FRD 130 | 4P<br>n1=1400 | 11.6          | 121    | 817  | 1.0   | PR 090<br>FRD 110 |                   |
|       |               | 5.8    | 240  | 962   | 0.9  |                   |               | 9.6           | 145    | 936  | 0.8   |                   |                   |
|       |               | 12.4   | 72.6 | 576   | 1.9  |                   |               | 19.3          | 72.6   | 542  | 2.6   |                   |                   |
|       |               | 9.3    | 96.8 | 746   | 1.4  |                   |               | 14.5          | 96.8   | 693  | 1.9   |                   |                   |
|       |               | 7.4    | 121  | 890   | 1.1  |                   |               | 11.6          | 121    | 830  | 1.5   |                   |                   |
|       |               | 6.2    | 145  | 1000  | 0.9  |                   |               | 9.6           | 145    | 936  | 1.1   |                   |                   |
|       | 6P<br>n1=900  | 19.3   | 72.6 | 585   | 3.0  | PR 090<br>FRD 130 | 6P<br>n1=900  | 7.2           | 193    | 1149 | 0.8   | PR 090<br>FRD 110 |                   |
|       |               | 9.3    | 96.8 | 746   | 2.2  |                   |               | 19.3          | 72.6   | 542  | 2.6   |                   |                   |
|       |               | 7.4    | 121  | 890   | 1.7  |                   |               | 14.5          | 96.8   | 693  | 1.9   |                   |                   |
|       |               | 6.2    | 145  | 1000  | 1.4  |                   |               | 11.6          | 121    | 830  | 1.5   |                   |                   |
|       |               | 4.6    | 193  | 1220  | 1.0  |                   |               | 9.6           | 145    | 936  | 1.1   |                   |                   |
|       |               | 19.3   | 72.6 | 535   | 1.6  |                   |               | 7.2           | 193    | 1149 | 0.8   |                   |                   |
| 2.20  | 4P<br>n1=1400 | 14.5   | 96.8 | 693   | 1.2  | PR 090<br>FRD 130 | 4P<br>n1=1400 | 38.6          | 72.6   | 398  | 1.8   | PR 090<br>FRD 110 |                   |
|       |               | 11.6   | 121  | 817   | 1.0  |                   |               | 28.9          | 96.8   | 516  | 1.3   |                   |                   |
|       |               | 9.6    | 145  | 936   | 0.8  |                   |               | 23.1          | 121    | 617  | 1.1   |                   |                   |
|       |               | 19.3   | 72.6 | 542   | 2.6  |                   |               | 38.6          | 72.6   | 409  | 2.9   |                   |                   |
|       |               | 14.5   | 96.8 | 693   | 1.9  |                   |               | 28.9          | 96.8   | 545  | 2.0   |                   |                   |
|       |               | 11.6   | 121  | 830   | 1.5  |                   |               | 23.1          | 121    | 654  | 1.6   |                   |                   |
|       | 6P<br>n1=900  | 9.6    | 145  | 936   | 1.1  | PR 090<br>FRD 130 | 6P<br>n1=900  | 19.3          | 145    | 752  | 1.3   | PR 090<br>FRD 130 |                   |
|       |               | 7.2    | 193  | 1149  | 0.8  |                   |               |               |        |      |       |                   |                   |

## Dimensions



| Size       | A   | C     | D (H7) | E     | F  | G   | G1  | H     | I   | I1 | L   | M   | N (H8) | N1   | O   | P   | Q   | R     |
|------------|-----|-------|--------|-------|----|-----|-----|-------|-----|----|-----|-----|--------|------|-----|-----|-----|-------|
| 063/040    | 70  | 100   | 18     | 121.5 | 43 | 123 | 78  | 50    | 40  | 40 | 71  | 75  | 60     | 36.5 | 6.5 | 87  | 55  | 71.5  |
| 063/050    | 80  | 120   | 25     | 144   | 49 | 133 | 92  | 60    | 50  | 40 | 85  | 85  | 70     | 43.5 | 8.5 | 100 | 64  | 84    |
| 071/050    | 80  | 120   | 25     | 144   | 49 | 143 | 92  | 60    | 50  | 50 | 85  | 85  | 70     | 43.5 | 8.5 | 100 | 64  | 84    |
| 063/063    | 100 | 144   | 25     | 174   | 67 | 148 | 112 | 72    | 63  | 40 | 103 | 95  | 80     | 53   | 8.5 | 110 | 80  | 102   |
| 071/063    | 100 | 144   | 25     | 174   | 67 | 158 | 112 | 72    | 63  | 50 | 103 | 95  | 80     | 53   | 8.5 | 110 | 80  | 102   |
| 071/075    | 120 | 172   | 28     | 205   | 72 | 176 | 120 | 86    | 75  | 50 | 112 | 115 | 95     | 57   | 11  | 140 | 93  | 119   |
| 080/075    | 120 | 172   | 28     | 205   | 72 | 186 | 120 | 86    | 75  | 63 | 112 | 115 | 95     | 57   | 11  | 140 | 93  | 119   |
| 071/090    | 140 | 208   | 35     | 238   | 74 | 193 | 140 | 103   | 90  | 50 | 130 | 130 | 110    | 67   | 13  | 160 | 102 | 135   |
| 080/090    | 140 | 208   | 35     | 238   | 74 | 203 | 140 | 103   | 90  | 63 | 130 | 130 | 110    | 67   | 13  | 160 | 102 | 135   |
| 80(90)/110 | 170 | 252.5 | 42     | 295   | -  | 233 | 155 | 127.5 | 110 | 63 | 144 | 165 | 130    | 74   | 14  | 200 | 125 | 167.5 |
| 80(90)/130 | 200 | 292.5 | 45     | 335   | -  | 253 | 170 | 147.5 | 130 | 63 | 155 | 215 | 180    | 81   | 16  | 250 | 140 | 187.5 |

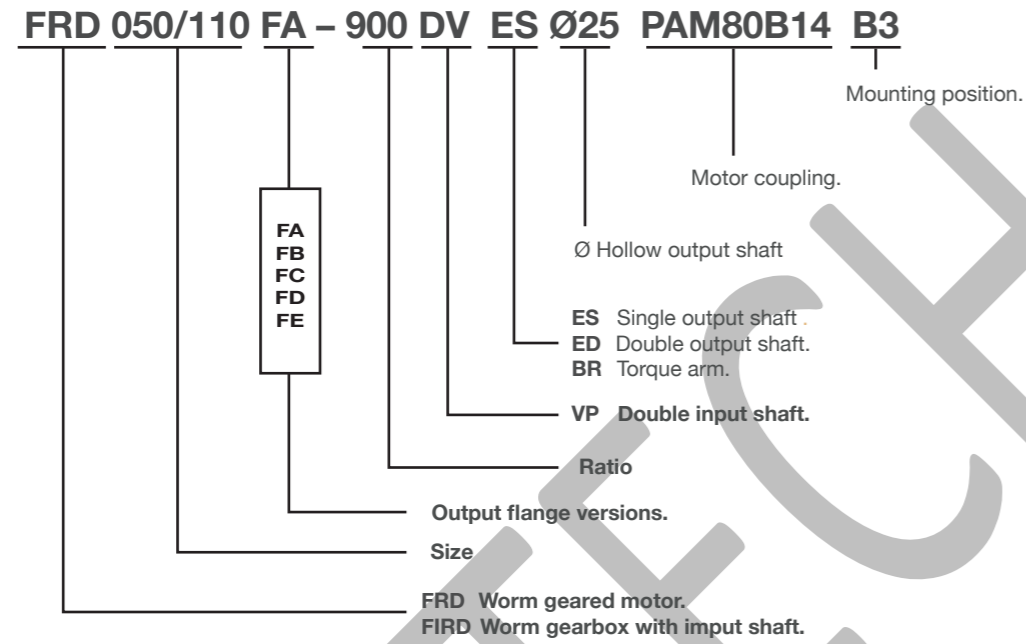
| Size       | S   | T  | V   | K   | KA  | KB | KC | KE           | a   | KM  | KN (H8) | KO | KP  | KQ  | b  | t    | kg   |
|------------|-----|----|-----|-----|-----|----|----|--------------|-----|-----|---------|----|-----|-----|----|------|------|
| 063/040    | 6.5 | 26 | 35  | 60  | 67  | 7  | 4  | M6 x8 (4)    | 45° | 87  | 60      | 9  | 110 | 95  | 6  | 20.8 | 3.9  |
| 063/050    | 7   | 30 | 40  | 70  | 90  | 9  | 5  | M8x10(4)     | 45° | 90  | 70      | 11 | 125 | 110 | 8  | 28.3 | 5.2  |
| 071/050    | 7   | 30 | 40  | 70  | 90  | 9  | 5  | M8x10(4)     | 45° | 90  | 70      | 11 | 125 | 110 | 8  | 28.3 | 5.8  |
| 063/063    | 8   | 36 | 50  | 85  | 82  | 10 | 6  | M8 X 14 (8)  | 45° | 150 | 115     | 11 | 180 | 142 | 8  | 28.3 | 7.9  |
| 071/063    | 8   | 36 | 50  | 85  | 82  | 10 | 6  | M8 X 14 (8)  | 45° | 150 | 115     | 11 | 180 | 142 | 8  | 28.3 | 8.5  |
| 071/075    | 10  | 40 | 60  | 90  | 111 | 13 | 6  | M8 X 14 (8)  | 45° | 165 | 130     | 14 | 200 | 170 | 8  | 31.3 | 11.3 |
| 080/075    | 10  | 40 | 60  | 90  | 111 | 13 | 6  | M8 X 14 (8)  | 45° | 165 | 130     | 14 | 200 | 170 | 8  | 31.3 | 13.1 |
| 071/090    | 11  | 45 | 70  | 100 | 111 | 13 | 6  | M10 X 18 (8) | 45° | 175 | 152     | 14 | 210 | 200 | 10 | 38.3 | 15.3 |
| 080/090    | 11  | 45 | 70  | 100 | 111 | 13 | 6  | M10 X 18 (8) | 45° | 175 | 152     | 14 | 210 | 200 | 10 | 38.3 | 17.3 |
| 80(90)/110 | 14  | 50 | 85  | 115 | 131 | 15 | 6  | M10 X 18 (8) | 45° | 230 | 170     | 14 | 280 | 260 | 12 | 45.3 | 39   |
| 80(90)/130 | 15  | 60 | 100 | 120 | 140 | 15 | 6  | M12 x21 (8)  | 45° | 255 | 180     | 16 | 320 | 290 | 14 | 48.8 | 52.2 |

# Combination worm gearboxes

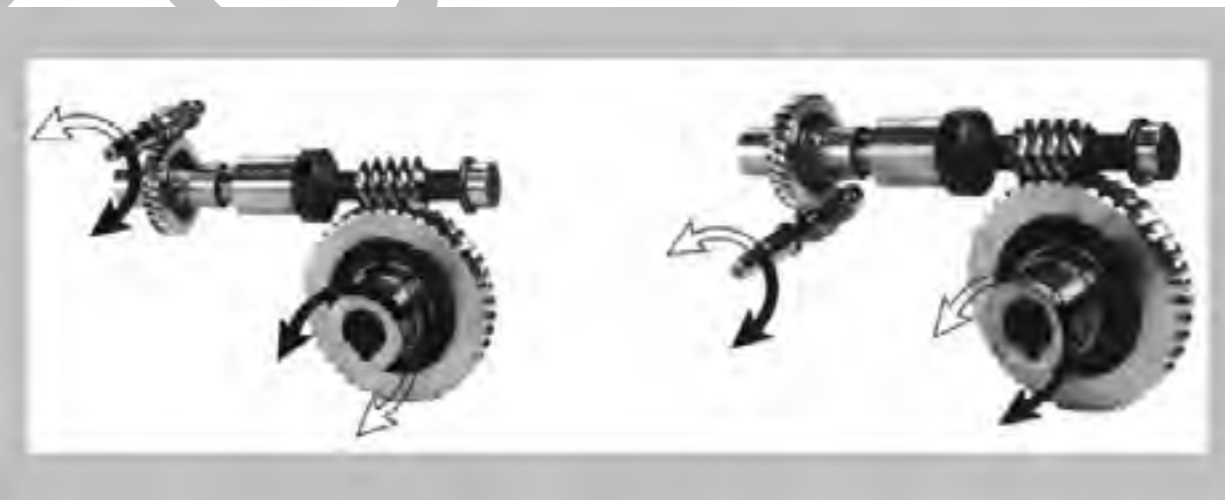


# FRD/FRD Combination worm geared motors

## Designation



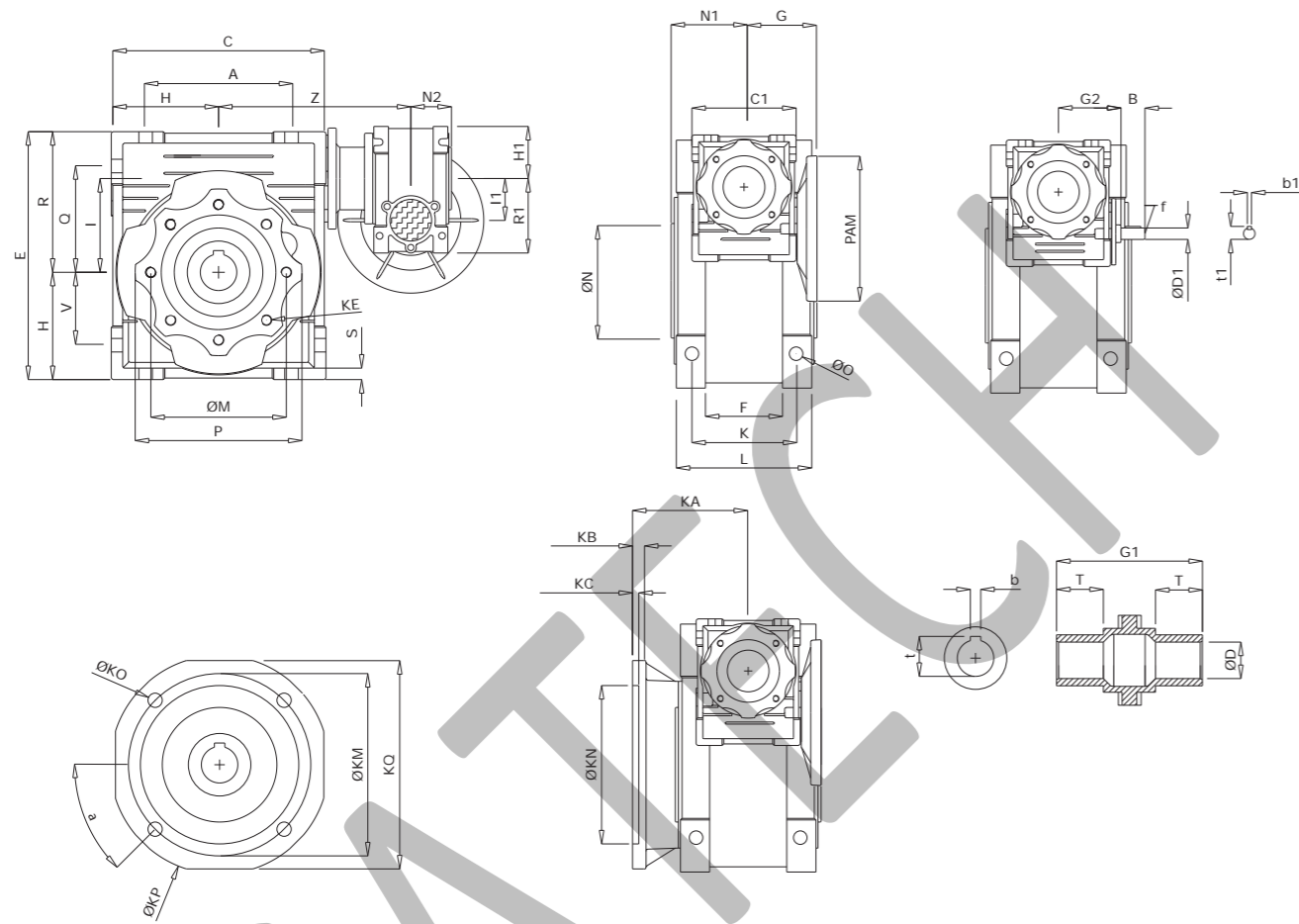
## Direction of rotation



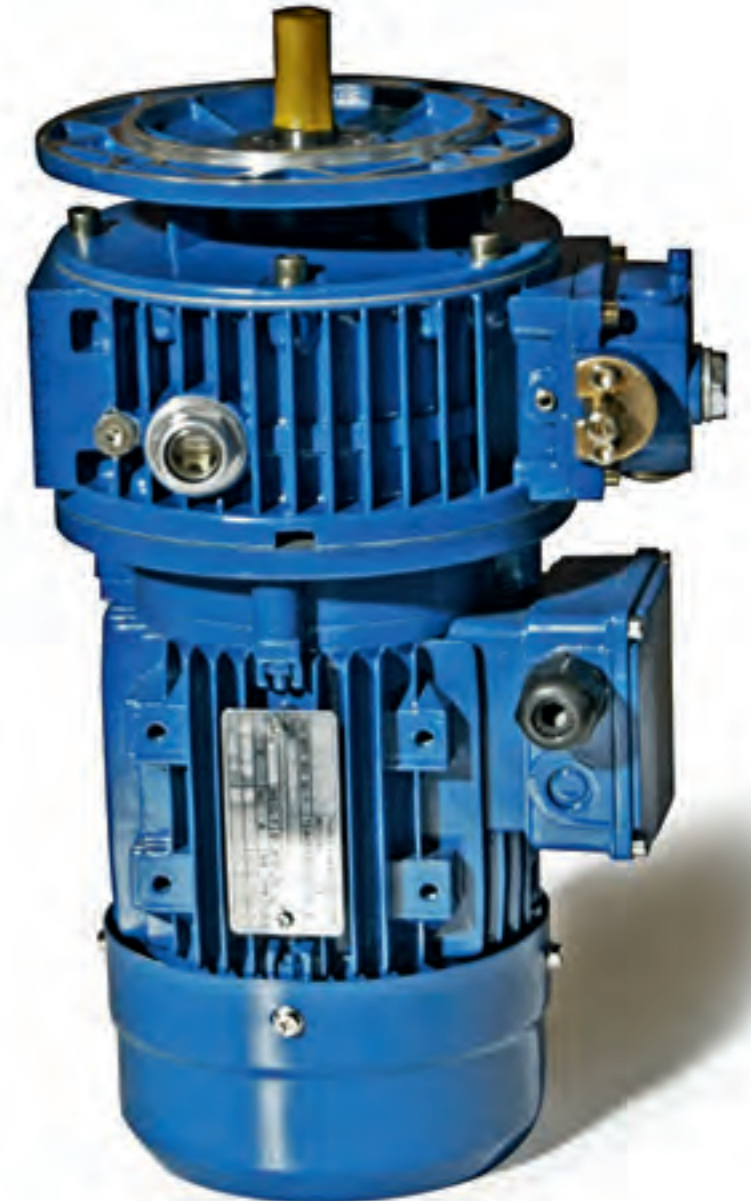
## Performance of combination worm geared motors

| Motor |               | n2 rpm | i    | M2 Nm          | f.s.           | Type           |                |                |                |                |                |
|-------|---------------|--------|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 0.06  | 4P<br>n1=1400 | 4.7    | 300  | 57             | 1.3            | FRD<br>030/040 |                |                |                |                |                |
|       |               | 3.5    | 400  | 70             | 0.9            |                |                |                |                |                |                |
|       |               | 2.8    | 500  | 96             | 0.6            |                |                |                |                |                |                |
|       |               | 2.3    | 600  | 104            | 0.7            |                |                |                |                |                |                |
|       |               | 1.9    | 750  | 121            | 0.6            |                |                |                |                |                |                |
|       |               | 1.6    | 900  | 139            | 0.5            |                |                |                |                |                |                |
|       |               | 1.2    | 1200 | 166            | 0.4            |                |                |                |                |                |                |
|       |               | 0.9    | 1500 | 196            | 0.4            |                |                |                |                |                |                |
|       |               | 0.8    | 1800 | 218            | 0.3            |                |                |                |                |                |                |
|       |               | 0.58   | 2400 | 261            | 0.2            |                |                |                |                |                |                |
|       |               | 0.4    | 3200 | 300            | 0.2            |                |                |                |                |                |                |
|       |               | 1.6    | 900  | 141            | 1.0            |                | FRD<br>030/050 |                |                |                |                |
| 1.2   | 1200          | 169    | 0.7  |                |                |                |                |                |                |                |                |
| 0.93  | 1500          | 199    | 0.7  |                |                |                |                |                |                |                |                |
| 0.78  | 1800          | 222    | 0.7  |                |                |                |                |                |                |                |                |
| 0.6   | 2400          | 266    | 0.5  |                |                |                |                |                |                |                |                |
| 0.5   | 3000          | 307    | 0.4  |                |                |                |                |                |                |                |                |
| 0.35  | 4000          | 288    | 0.3  |                |                |                |                |                |                |                |                |
| 0.29  | 4800          | 311    | 0.3  |                |                |                |                |                |                |                |                |
| 0.93  | 1500          | 204    | 1.1  | FRD<br>030/063 |                |                |                |                |                |                |                |
| 0.78  | 1800          | 225    | 0.9  |                |                |                |                |                |                |                |                |
| 0.58  | 2400          | 276    | 0.8  |                |                |                |                |                |                |                |                |
| 0.47  | 3000          | 319    | 0.7  |                |                |                |                |                |                |                |                |
| 0.35  | 4000          | 306    | 0.6  |                |                |                |                |                |                |                |                |
| 0.28  | 5000          | 360    | 0.4  |                |                |                |                |                |                |                |                |
| 0.58  | 2400          | 330    | 1.1  |                | FRD<br>040/075 |                |                |                |                |                |                |
| 0.47  | 3000          | 377    | 0.8  |                |                |                |                |                |                |                |                |
| 0.35  | 4000          | 355    | 0.7  |                |                |                |                |                |                |                |                |
| 0.28  | 5000          | 419    | 0.5  |                |                |                |                |                |                |                |                |
| 0.47  | 3000          | 406    | 1.4  |                |                | FRD<br>040/090 |                |                |                |                |                |
| 0.35  | 4000          | 365    | 1.3  |                |                |                |                |                |                |                |                |
| 0.28  | 5000          | 431    | 1.0  |                |                |                |                |                |                |                |                |
| 4.7   | 300           | 88     | 0.8  | FRD<br>030/040 |                |                |                |                |                |                |                |
| 3.5   | 400           | 65     | 0.7  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 107    | 1.2  |                |                |                | FRD<br>030/050 |                |                |                |                |
| 2.8   | 500           | 123    | 1.0  |                |                |                |                |                |                |                |                |
| 2.3   | 600           | 159    | 0.9  |                |                |                |                |                |                |                |                |
| 1.9   | 750           | 185    | 0.8  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 212    | 0.7  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 200    | 1.0  |                | FRD<br>030/063 |                |                |                |                |                |                |
| 1.2   | 1200          | 263    | 0.9  |                |                |                |                |                |                |                |                |
| 0.93  | 1500          | 305    | 0.7  |                |                |                |                |                |                |                |                |
| 0.93  | 1500          | 360    | 1.1  |                |                | FRD<br>040/075 |                |                |                |                |                |
| 0.78  | 1800          | 404    | 1.0  |                |                |                |                |                |                |                |                |
| 0.58  | 2400          | 496    | 0.7  |                |                |                |                |                |                |                |                |
| 0.47  | 3000          | 609    | 0.9  | FRD<br>040/090 |                |                |                |                |                |                |                |
| 0.35  | 4000          | 548    | 0.8  |                |                |                |                |                |                |                |                |
| 4.7   | 300           | 119    | 1.2  |                |                |                | FRD<br>030/050 |                |                |                |                |
| 3.5   | 400           | 142    | 0.9  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 164    | 0.7  |                |                |                |                | FRD<br>030/063 |                |                |                |
| 2.8   | 500           | 171    | 1.3  |                |                |                |                |                |                |                |                |
| 2.3   | 600           | 208    | 1.1  |                |                |                |                |                |                |                |                |
| 1.9   | 750           | 241    | 0.9  |                | FRD<br>040/075 |                |                |                |                |                |                |
| 1.6   | 900           | 325    | 1.2  |                |                |                |                |                |                |                |                |
| 1.2   | 1200          | 399    | 0.9  |                |                |                |                |                |                |                |                |
| 0.78  | 1800          | 547    | 0.9  |                |                | FRD<br>040/090 |                |                |                |                |                |
| 0.58  | 2400          | 695    | 0.9  |                |                |                |                |                |                |                |                |
| 0.47  | 3000          | 884    | 1.1  | FRD<br>050/110 |                |                |                |                |                |                |                |
| 0.35  | 4000          | 784    | 1.0  |                |                |                |                |                |                |                |                |
| 0.28  | 5000          | 928    | 0.8  |                |                |                |                |                |                |                |                |
| 0.18  | 4P<br>n1=1400 | 3.5    | 400  |                |                |                | 222            |                | 1.0            | FRD<br>030/063 |                |
|       |               | 2.8    | 500  |                |                |                | 257            | 0.8            |                |                |                |
|       |               | 2.3    | 600  |                |                |                | 362            | 1.1            | FRD<br>040/075 |                |                |
|       |               | 1.9    | 750  |                |                |                | 435            | 0.9            |                |                |                |
|       |               | 1.6    | 900  |                | 487            |                | 0.8            |                |                |                |                |
|       |               | 1.2    | 1200 |                | 629            |                | 1.0            | FRD<br>040/090 |                |                |                |
|       |               | 0.93   | 1500 |                | 735            |                | 0.8            |                |                |                |                |
|       |               | 0.78   | 1800 |                | 861            | 1.3            | FRD<br>050/110 |                |                |                |                |
|       |               | 0.58   | 2400 |                | 1113           | 0.9            |                |                |                |                |                |
|       |               | 3.5    | 400  | 336            | 1.1            | FRD<br>040/075 |                |                |                |                |                |
|       |               | 2.8    | 500  | 384            | 0.8            |                |                |                |                |                |                |
|       |               | 2.3    | 600  | 512            | 1.2            |                |                |                |                |                | FRD<br>040/090 |
| 1.9   | 750           | 598    | 0.9  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 667    | 0.8  |                |                |                |                |                |                |                |                |
| 1.2   | 1200          | 943    | 1.1  | FRD<br>050/110 |                |                |                |                |                |                |                |
| 0.93  | 1500          | 1064   | 1.0  |                |                |                |                |                |                |                |                |
| 0.78  | 1800          | 1195   | 0.9  |                | FRD<br>063/130 |                |                |                |                |                |                |
| 0.58  | 2400          | 1624   | 1.0  |                |                |                |                |                |                |                |                |
| 0.47  | 3000          | 1935   | 0.8  |                |                |                |                |                |                |                |                |
| 0.35  | 4000          | 2046   | 0.6  |                |                |                |                |                |                |                |                |
| 0.28  | 5000          | 2430   | 0.5  |                |                |                | FRD<br>040/075 |                |                |                |                |
| 4.7   | 300           | 405    | 1.0  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 498    | 0.7  |                |                | FRD<br>040/090 |                |                |                |                |                |
| 4.7   | 300           | 402    | 1.5  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 523    | 1.2  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 611    | 0.9  |                |                |                |                | FRD<br>050/110 |                |                |                |
| 2.3   | 600           | 757    | 0.8  |                |                |                |                |                |                |                |                |
| 1.9   | 750           | 950    | 1.2  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 1079   | 1.0  | FRD<br>063/130 |                |                |                |                |                |                |                |
| 1.2   | 1200          | 1396   | 0.7  |                |                |                |                |                |                |                |                |
| 0.93  | 1500          | 1674   | 1.1  |                | FRD<br>050/110 |                |                |                |                |                |                |
| 0.78  | 1800          | 1887   | 0.9  |                |                |                |                |                |                |                |                |
| 4.7   | 300           | 639    | 1.7  |                |                |                | FRD<br>050/110 |                |                |                |                |
| 3.5   | 400           | 826    | 1.2  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 984    | 1.0  |                |                | FRD<br>063/130 |                |                |                |                |                |
| 2.3   | 600           | 1181   | 0.9  |                |                |                |                |                |                |                |                |
| 1.9   | 750           | 1411   | 0.8  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 996    | 1.6  |                |                |                |                | FRD<br>050/110 |                |                |                |
| 1.9   | 750           | 1471   | 1.2  |                |                |                |                |                |                |                |                |
| 1.2   | 1200          | 2132   | 0.8  |                |                |                |                |                | FRD<br>063/130 |                |                |
| 4.7   | 300           | 871    | 1.3  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 1126   | 0.9  | FRD<br>050/110 |                |                |                |                |                |                |                |
| 2.8   | 500           | 1358   | 1.1  |                |                |                |                |                |                |                |                |
| 2.3   | 600           | 1631   | 1.0  |                | FRD<br>063/130 |                |                |                |                |                |                |
| 1.9   | 750           | 2005   | 0.9  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 2283   | 0.8  |                |                |                | FRD<br>050/110 |                |                |                |                |
| 4.7   | 300           | 1312   | 1.3  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 1671   | 1.0  |                |                | FRD<br>063/130 |                |                |                |                |                |
| 2.8   | 500           | 1991   | 0.8  |                |                |                |                |                |                | FRD<br>050/110 |                |
| 4.7   | 300           | 1789   | 1.0  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 2279   | 0.7  |                |                |                |                |                |                |                |                |
| 0.25  | 4P<br>n1=1400 | 3.5    | 400  |                |                |                |                | 222            | 1.0            |                | FRD<br>030/063 |
|       |               | 2.8    | 500  |                |                |                |                | 257            | 0.8            |                |                |
|       |               | 2.3    | 600  | 362            |                |                |                | 1.1            | FRD<br>040/075 |                |                |
|       |               | 1.9    | 750  | 435            |                |                |                | 0.9            |                |                |                |
|       |               | 1.6    | 900  | 487            | 0.8            |                |                |                |                |                |                |
|       |               | 1.2    | 1200 | 629            | 1.0            |                |                | FRD<br>040/090 |                |                |                |
|       |               | 0.93   | 1500 | 735            | 0.8            |                |                |                |                |                |                |
|       |               | 0.78   | 1800 | 861            | 1.3            |                | FRD<br>050/110 |                |                |                |                |
|       |               | 0.58   | 2400 | 1113           | 0.9            |                |                |                |                |                |                |
|       |               | 3.5    | 400  | 336            | 1.1            | FRD<br>040/075 |                |                |                |                |                |
|       |               | 2.8    | 500  | 384            | 0.8            |                |                |                |                |                |                |
|       |               | 2.3    | 600  | 512            | 1.2            |                |                |                |                | FRD<br>040/090 |                |
| 1.9   | 750           | 598    | 0.9  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 667    | 0.8  |                |                |                |                |                |                |                |                |
| 1.2   | 1200          | 943    | 1.1  | FRD<br>050/110 |                |                |                |                |                |                |                |
| 0.93  | 1500          | 1064   | 1.0  |                |                |                |                |                |                |                |                |
| 0.78  | 1800          | 1195   | 0.9  |                | FRD<br>063/130 |                |                |                |                |                |                |
| 0.58  | 2400          | 1624   | 1.0  |                |                |                |                |                |                |                |                |
| 0.47  | 3000          | 1935   | 0.8  |                |                |                |                |                |                |                |                |
| 0.35  | 4000          | 2046   | 0.6  |                |                |                |                |                |                |                |                |
| 0.28  | 5000          | 2430   | 0.5  |                |                |                | FRD<br>040/075 |                |                |                |                |
| 4.7   | 300           | 405    | 1.0  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 498    | 0.7  |                |                | FRD<br>040/090 |                |                |                |                |                |
| 4.7   | 300           | 402    | 1.5  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 523    | 1.2  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 611    | 0.9  |                |                |                |                | FRD<br>050/110 |                |                |                |
| 2.3   | 600           | 757    | 0.8  |                |                |                |                |                |                |                |                |
| 1.9   | 750           | 950    | 1.2  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 1079   | 1.0  | FRD<br>063/130 |                |                |                |                |                |                |                |
| 1.2   | 1200          | 1396   | 0.7  |                |                |                |                |                |                |                |                |
| 0.93  | 1500          | 1674   | 1.1  |                | FRD<br>050/110 |                |                |                |                |                |                |
| 0.78  | 1800          | 1887   | 0.9  |                |                |                |                |                |                |                |                |
| 4.7   | 300           | 639    | 1.7  |                |                |                | FRD<br>050/110 |                |                |                |                |
| 3.5   | 400           | 826    | 1.2  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 984    | 1.0  |                |                | FRD<br>063/130 |                |                |                |                |                |
| 2.3   | 600           | 1181   | 0.9  |                |                |                |                |                |                |                |                |
| 1.9   | 750           | 1411   | 0.8  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 996    | 1.6  |                |                |                |                | FRD<br>050/110 |                |                |                |
| 1.9   | 750           | 1471   | 1.2  |                |                |                |                |                |                |                |                |
| 1.2   | 1200          | 2132   | 0.8  |                |                |                |                |                | FRD<br>063/130 |                |                |
| 4.7   | 300           | 871    | 1.3  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 1126   | 0.9  | FRD<br>050/110 |                |                |                |                |                |                |                |
| 2.8   | 500           | 1358   | 1.1  |                |                |                |                |                |                |                |                |
| 2.3   | 600           | 1631   | 1.0  |                | FRD<br>063/130 |                |                |                |                |                |                |
| 1.9   | 750           | 2005   | 0.9  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 2283   | 0.8  |                |                |                | FRD<br>050/110 |                |                |                |                |
| 4.7   | 300           | 1312   | 1.3  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 1671   | 1.0  |                |                | FRD<br>063/130 |                |                |                |                |                |
| 2.8   | 500           | 1991   | 0.8  |                |                |                |                |                |                | FRD<br>050/110 |                |
| 4.7   | 300           | 1789   | 1.0  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 2279   | 0.7  |                |                |                |                |                |                |                |                |
| 0.37  | 4P<br>n1=1400 | 3.5    | 400  |                |                |                |                | 222            | 1.0            |                | FRD<br>030/063 |
|       |               | 2.8    | 500  |                |                |                |                | 257            | 0.8            |                |                |
|       |               | 2.3    | 600  | 362            |                |                |                | 1.1            | FRD<br>040/075 |                |                |
|       |               | 1.9    | 750  | 435            |                |                |                | 0.9            |                |                |                |
|       |               | 1.6    | 900  | 487            | 0.8            |                |                |                |                |                |                |
|       |               | 1.2    | 1200 | 629            | 1.0            |                |                | FRD<br>040/090 |                |                |                |
|       |               | 0.93   | 1500 | 735            | 0.8            |                |                |                |                |                |                |
|       |               | 0.78   | 1800 | 861            | 1.3            |                | FRD<br>050/110 |                |                |                |                |
|       |               | 0.58   | 2400 | 1113           | 0.9            |                |                |                |                |                |                |
|       |               | 3.5    | 400  | 336            | 1.1            | FRD<br>040/075 |                |                |                |                |                |
|       |               | 2.8    | 500  | 384            | 0.8            |                |                |                |                |                |                |
|       |               | 2.3    | 600  | 512            | 1.2            |                |                |                |                | FRD<br>040/090 |                |
| 1.9   | 750           | 598    | 0.9  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 667    | 0.8  |                |                |                |                |                |                |                |                |
| 1.2   | 1200          | 943    | 1.1  | FRD<br>050/110 |                |                |                |                |                |                |                |
| 0.93  | 1500          | 1064   | 1.0  |                |                |                |                |                |                |                |                |
| 0.78  | 1800          | 1195   | 0.9  |                | FRD<br>063/130 |                |                |                |                |                |                |
| 0.58  | 2400          | 1624   | 1.0  |                |                |                |                |                |                |                |                |
| 0.47  | 3000          | 1935   | 0.8  |                |                |                |                |                |                |                |                |
| 0.35  | 4000          | 2046   | 0.6  |                |                |                |                |                |                |                |                |
| 0.28  | 5000          | 2430   | 0.5  |                |                |                | FRD<br>040/075 |                |                |                |                |
| 4.7   | 300           | 405    | 1.0  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 498    | 0.7  |                |                | FRD<br>040/090 |                |                |                |                |                |
| 4.7   | 300           | 402    | 1.5  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 523    | 1.2  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 611    | 0.9  |                |                |                |                | FRD<br>050/110 |                |                |                |
| 2.3   | 600           | 757    | 0.8  |                |                |                |                |                |                |                |                |
| 1.9   | 750           | 950    | 1.2  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 1079   | 1.0  | FRD<br>063/130 |                |                |                |                |                |                |                |
| 1.2   | 1200          | 1396   | 0.7  |                |                |                |                |                |                |                |                |
| 0.93  | 1500          | 1674   | 1.1  |                | FRD<br>050/110 |                |                |                |                |                |                |
| 0.78  | 1800          | 1887   | 0.9  |                |                |                |                |                |                |                |                |
| 4.7   | 300           | 639    | 1.7  |                |                |                | FRD<br>050/110 |                |                |                |                |
| 3.5   | 400           | 826    | 1.2  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 984    | 1.0  |                |                | FRD<br>063/130 |                |                |                |                |                |
| 2.3   | 600           | 1181   | 0.9  |                |                |                |                |                |                |                |                |
| 1.9   | 750           | 1411   | 0.8  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 996    | 1.6  |                |                |                |                | FRD<br>050/110 |                |                |                |
| 1.9   | 750           | 1471   | 1.2  |                |                |                |                |                |                |                |                |
| 1.2   | 1200          | 2132   | 0.8  |                |                |                |                |                | FRD<br>063/130 |                |                |
| 4.7   | 300           | 871    | 1.3  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 1126   | 0.9  | FRD<br>050/110 |                |                |                |                |                |                |                |
| 2.8   | 500           | 1358   | 1.1  |                |                |                |                |                |                |                |                |
| 2.3   | 600           | 1631   | 1.0  |                | FRD<br>063/130 |                |                |                |                |                |                |
| 1.9   | 750           | 2005   | 0.9  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 2283   | 0.8  |                |                |                | FRD<br>050/110 |                |                |                |                |
| 4.7   | 300           | 1312   | 1.3  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 1671   | 1.0  |                |                | FRD<br>063/130 |                |                |                |                |                |
| 2.8   | 500           | 1991   | 0.8  |                |                |                |                |                |                | FRD<br>050/110 |                |
| 4.7   | 300           | 1789   | 1.0  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 2279   | 0.7  |                |                |                |                |                |                |                |                |
| 0.55  | 6P<br>n1=900  | 3.5    | 400  |                |                |                |                | 222            | 1.0            |                | FRD<br>030/063 |
|       |               | 2.8    | 500  |                |                |                |                | 257            | 0.8            |                |                |
|       |               | 2.3    | 600  | 362            |                |                |                | 1.1            | FRD<br>040/075 |                |                |
|       |               | 1.9    | 750  | 435            |                |                |                | 0.9            |                |                |                |
|       |               | 1.6    | 900  | 487            | 0.8            |                |                |                |                |                |                |
|       |               | 1.2    | 1200 | 629            | 1.0            |                |                | FRD<br>040/090 |                |                |                |
|       |               | 0.93   | 1500 | 735            | 0.8            |                |                |                |                |                |                |
|       |               | 0.78   | 1800 | 861            | 1.3            |                | FRD<br>050/110 |                |                |                |                |
|       |               | 0.58   | 2400 | 1113           | 0.9            |                |                |                |                |                |                |
|       |               | 3.5    | 400  | 336            | 1.1            | FRD<br>040/075 |                |                |                |                |                |
|       |               | 2.8    | 500  | 384            | 0.8            |                |                |                |                |                |                |
|       |               | 2.3    | 600  | 512            | 1.2            |                |                |                |                | FRD<br>040/090 |                |
| 1.9   | 750           | 598    | 0.9  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 667    | 0.8  |                |                |                |                |                |                |                |                |
| 1.2   | 1200          | 943    | 1.1  | FRD<br>050/110 |                |                |                |                |                |                |                |
| 0.93  | 1500          | 1064   | 1.0  |                |                |                |                |                |                |                |                |
| 0.78  | 1800          | 1195   | 0.9  |                | FRD<br>063/130 |                |                |                |                |                |                |
| 0.58  | 2400          | 1624   | 1.0  |                |                |                |                |                |                |                |                |
| 0.47  | 3000          | 1935   | 0.8  |                |                |                |                |                |                |                |                |
| 0.35  | 4000          | 2046   | 0.6  |                |                |                |                |                |                |                |                |
| 0.28  | 5000          | 2430   | 0.5  |                |                |                | FRD<br>040/075 |                |                |                |                |
| 4.7   | 300           | 405    | 1.0  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 498    | 0.7  |                |                | FRD<br>040/090 |                |                |                |                |                |
| 4.7   | 300           | 402    | 1.5  |                |                |                |                |                |                |                |                |
| 3.5   | 400           | 523    | 1.2  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 611    | 0.9  |                |                |                |                | FRD<br>050/110 |                |                |                |
| 2.3   | 600           | 757    | 0.8  |                |                |                |                |                |                |                |                |
| 1.9   | 750           | 950    | 1.2  |                |                |                |                |                |                |                |                |
| 1.6   | 900           | 1079   | 1.0  | FRD<br>063/130 |                |                |                |                |                |                |                |
| 1.2   | 1200          | 1396   | 0.7  |                |                |                |                |                |                |                |                |
| 0.93  | 1500          | 1674   | 1.1  |                | FRD<br>050/110 |                |                |                |                |                |                |
| 0.78  | 1800          | 1887   | 0.9  |                |                |                |                |                |                |                |                |
| 4.7   | 300           | 639    | 1.7  |                |                |                | FRD<br>050/110 |                |                |                |                |
| 3.5   | 400           | 826    | 1.2  |                |                |                |                |                |                |                |                |
| 2.8   | 500           | 984</  |      |                |                |                |                |                |                |                |                |

## Dimensions



# Stepless speed motor-variators



| Size    | A   | B  | C     | C1  | D (H7) | D1 (j6) | E     | F  | G  | G1  | G2 | H     | H1 | I   | I1 | L   | M   | N (H8) | N1   | N2   | O   | P   | Q   | R     |
|---------|-----|----|-------|-----|--------|---------|-------|----|----|-----|----|-------|----|-----|----|-----|-----|--------|------|------|-----|-----|-----|-------|
| 030/040 | 70  | 20 | 100   | 80  | 18     | 9       | 121.5 | 43 | 55 | 78  | 51 | 50    | 40 | 40  | 30 | 71  | 75  | 60     | 36.5 | 29   | 6.5 | 87  | 55  | 71.5  |
| 030/050 | 80  | 20 | 120   | 80  | 25     | 9       | 144   | 49 | 55 | 92  | 51 | 60    | 40 | 50  | 30 | 85  | 85  | 70     | 43.5 | 29   | 8.5 | 100 | 64  | 84    |
| 030/063 | 100 | 20 | 144   | 80  | 25     | 9       | 174   | 67 | 55 | 112 | 51 | 72    | 40 | 63  | 30 | 103 | 95  | 80     | 53   | 29   | 8.5 | 110 | 80  | 102   |
| 040/075 | 120 | 23 | 172   | 100 | 28     | 11      | 205   | 72 | 70 | 120 | 60 | 86    | 50 | 75  | 40 | 112 | 115 | 95     | 57   | 36.5 | 11  | 140 | 93  | 119   |
| 040/090 | 140 | 23 | 208   | 100 | 35     | 11      | 238   | 74 | 70 | 140 | 60 | 103   | 50 | 90  | 40 | 130 | 130 | 110    | 67   | 36.5 | 13  | 160 | 102 | 135   |
| 050/110 | 170 | 30 | 252.5 | 120 | 42     | 14      | 295   | -  | 80 | 155 | 74 | 127.5 | 60 | 110 | 50 | 144 | 165 | 130    | 74   | 43.5 | 14  | 200 | 125 | 167.5 |
| 063/130 | 200 | 40 | 292.5 | 144 | 45     | 19      | 335   | -  | 95 | 170 | 90 | 147.5 | 72 | 130 | 63 | 155 | 215 | 180    | 81   | 53   | 16  | 250 | 140 | 187.5 |

| Size    | R1   | S   | T  | V   | Z   | K   | KA  | KB | KC | KE           | a   | KM  | KN (H8) | KO | KP  | KQ  | b  | b1 | f  | t    | t1   | kg   |
|---------|------|-----|----|-----|-----|-----|-----|----|----|--------------|-----|-----|---------|----|-----|-----|----|----|----|------|------|------|
| 030/040 | 57   | 6.5 | 26 | 35  | 120 | 60  | 67  | 7  | 4  | M6x8(4)      | 45° | 87  | 60      | 9  | 110 | 95  | 6  | 3  | -  | 20.8 | 10.2 | 3.9  |
| 030/050 | 57   | 7   | 30 | 40  | 130 | 70  | 90  | 9  | 5  | M8x10(4)     | 45° | 90  | 70      | 11 | 125 | 110 | 8  | 3  | -  | 28.3 | 10.2 | 5.0  |
| 030/063 | 57   | 8   | 36 | 50  | 145 | 85  | 82  | 10 | 6  | M8 X 14 (8)  | 45° | 150 | 115     | 11 | 180 | 142 | 8  | 3  | -  | 28.3 | 10.2 | 7.8  |
| 040/075 | 71.5 | 10  | 40 | 60  | 165 | 90  | 111 | 13 | 6  | M8 X 14 (8)  | 45° | 165 | 130     | 14 | 200 | 170 | 8  | 4  | -  | 31.3 | 12.5 | 12.0 |
| 040/090 | 71.5 | 11  | 45 | 70  | 182 | 100 | 111 | 13 | 6  | M10 X 18 (8) | 45° | 175 | 152     | 14 | 210 | 200 | 10 | 4  | -  | 38.3 | 12.5 | 16.0 |
| 050/110 | 84   | 14  | 50 | 85  | 225 | 115 | 131 | 15 | 6  | M10 X 18 (8) | 45° | 230 | 170     | 14 | 280 | 260 | 12 | 5  | M6 | 45.3 | 16.0 | 39.2 |
| 063/130 | 102  | 15  | 60 | 100 | 245 | 120 | 140 | 15 | 6  | M12x21(8)    | 45° | 255 | 180     | 16 | 320 | 290 | 14 | 6  | M6 | 48.8 | 21.5 | 55.0 |

## SV Series stepless speed motor-variators

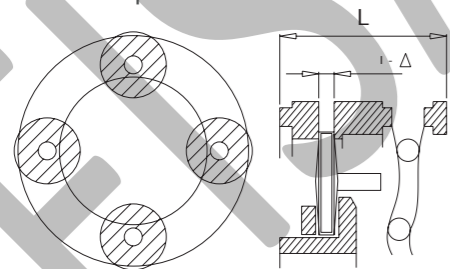
### Brief Introduction

The SV series stepless speed motor-variators and motor-variators with gearbox are widely used for all kinds of industries such as foodstuffs, ceramics, packing, chemicals, textile, machine tools, assembly lines and in general, in all types of automatic lines requiring speed regulations. Its main features are as follows:

- High accuracy in the regulation range: up to 0,5-1 rotation.
- Large range of speed: The ratio is between 1:1,4 to 1:7
- Resistant and durability.
- Smooth operation, stability in performance and low noise.
- Conveniently sized to ensure long life even in continuous service at full load.
- Ease of installation and adjustment, thanks its coaxial and compact structure.
- Made with a high quality aluminium alloy up to the size 1,50, and the rest in cast iron.
- Increased torque at low speed up to twice the nominal.

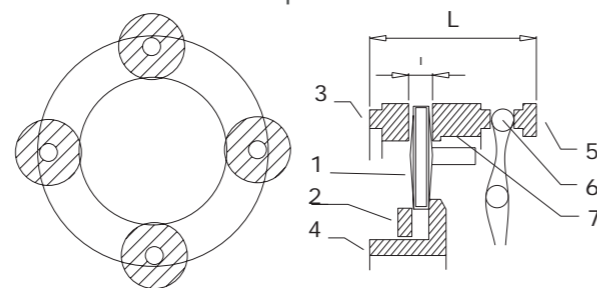
### Structure & principle

At the maximum speed



1. Conical planet disk.
2. Friction bearings.
3. Planet carrier.
4. Sun races.
5. Belleville springs.

At the minimum speed

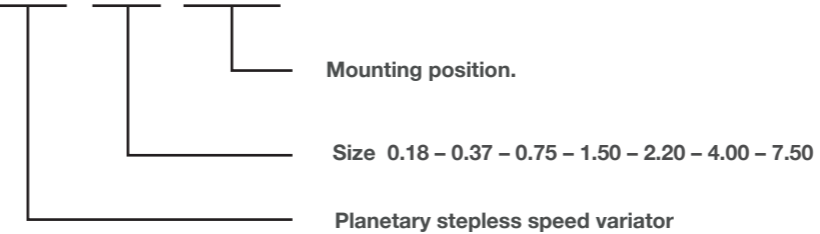


6. Fixed annulus race.
7. Adjustable annulus race.
8. Ball ring.
9. Cam ring.
10. Control screw.

### Designation

#### Basic Model

SV 0.75 B5.00



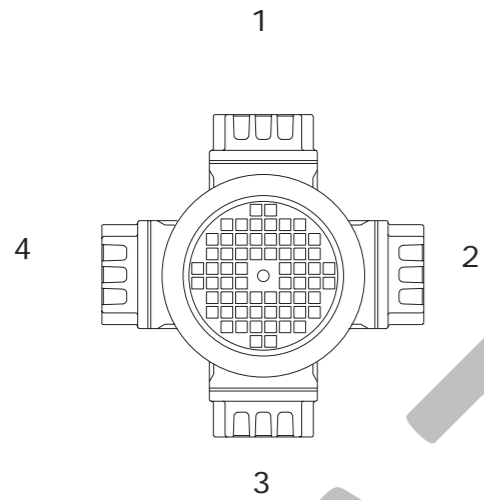
### Operation & Maintenance

During installation and operation of the speed variators, the following instructions should be respected:

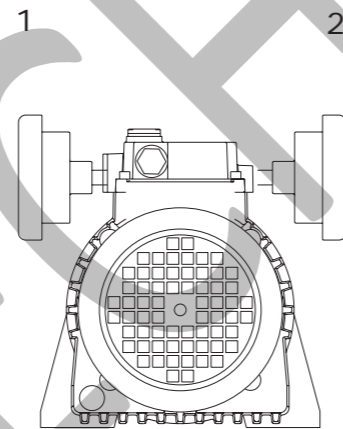
- Ensure the correct alignment between the motor shaft and the coupling of the speed variator. The installation error should be no more than the tolerance value of the coupling.
- When the output shaft is installed with the coupling or belt wheel, they should be pressed into the screw hole on shaft end, or assembled by heating. Never hit the output shaft.
- The mechanical stepless speed variator should not be used in applications where overloading or running-blockage may occur.
- Speed regulation should be effected while the speed variator is running. Do not turn the hand wheel of speed regulation when the machine is stopped.
- The limit screws of speed regulation on two ends under the operating box are well adjusted. Please do not touch them.
- This set is not suited to work in the environment above 40°C, especially no more than 45°C. If a 4-pole motor is used for the speed variator, the temperature under running-in (empty running) is 40 – 50°C higher than normal working environment. After running-in up to 60 – 80 hours, the temperature will decrease gradually. Then, the temperature will be about 20°C higher than environment and will remain stable.

- The high temperature at the beginning do not damage any components of the speed variator and do not affect its service life.
- The lubricating oil is used specially for speed variators. The reference is: ISO VG 32. Please check the lubricant level before use.
- The speed variators are filled with lubricating oil to work during the first 2.000 hours. After this time, the lubricating oil should be replaced and changed every 5.000h.
- The oil level inside the speed variator should be kept at two-third of the peephole. Users should regularly check the level. It is strictly forbidden to operate it with a low level of lubricant. The air screw nut on the operating box is screwed in order to avoid oil leakages during transport. It should be loosened when it starts to work. It is strictly forbidden to use before loosen it.

Standard position 1

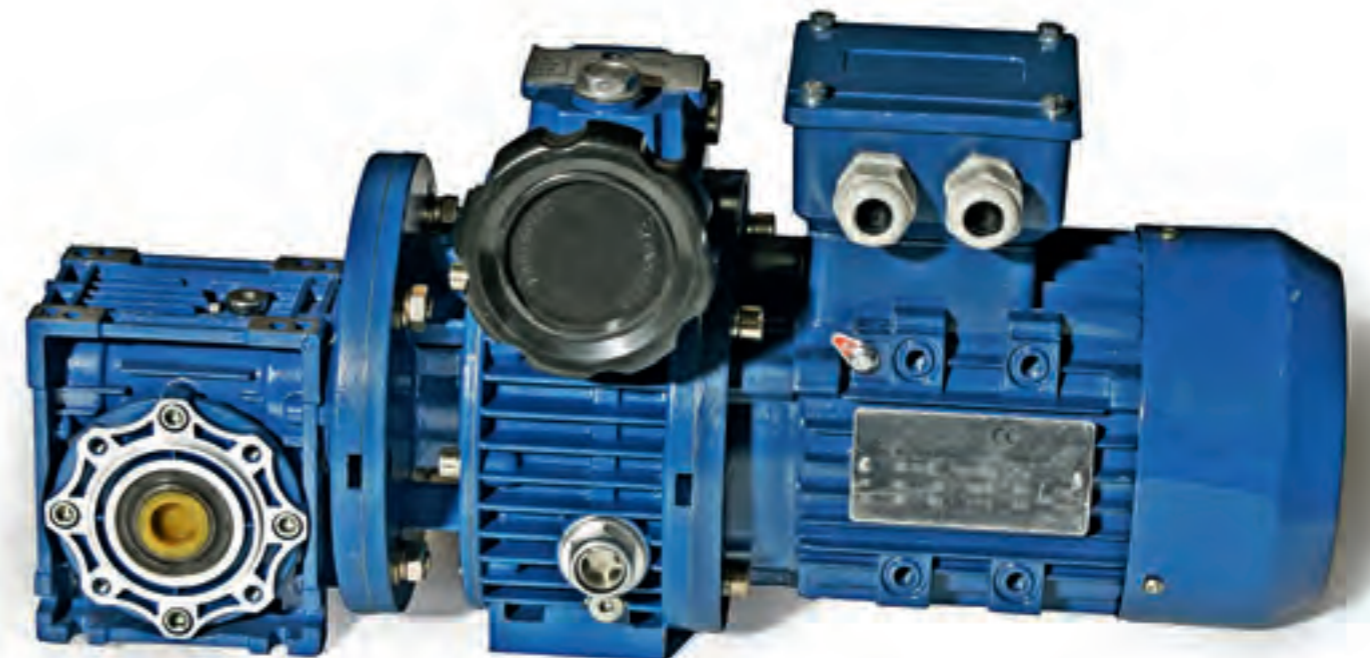


Motor terminal box position diagram



Hand wheel position diagram

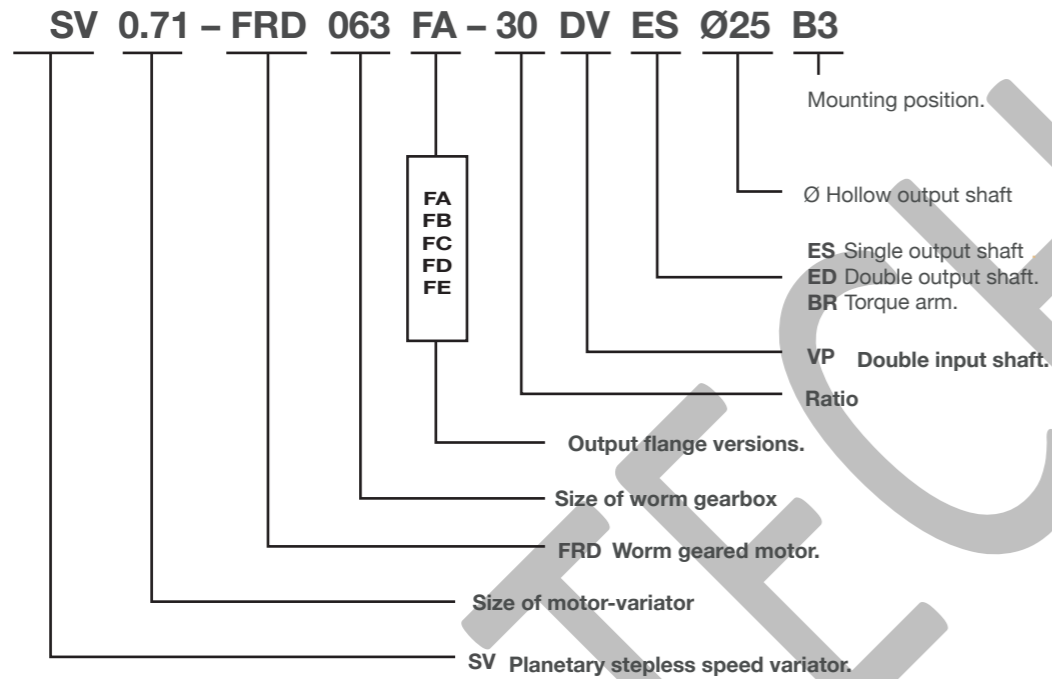
# Motor Variators & Worm Gearboxes





# SV + FRD Motovariator & worm gearboxes

## Designation



## SV + FRD Possible combinations

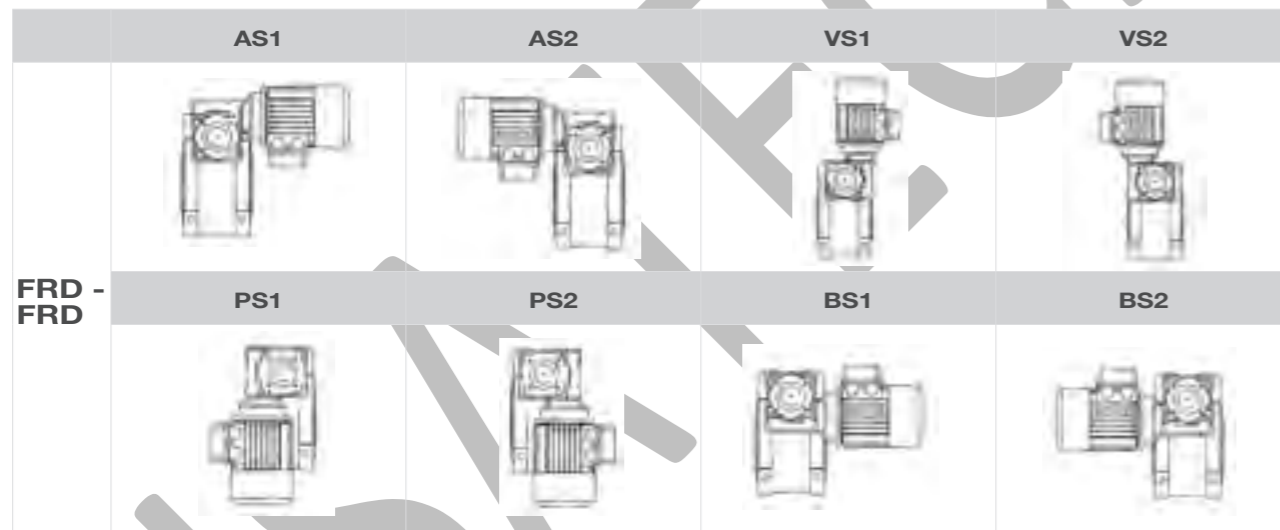
| FRD         | 40        | 50       | 63       | 75       | 90       | 110      | 130      |
|-------------|-----------|----------|----------|----------|----------|----------|----------|
| <b>SV</b>   | Ratios    |          |          |          |          |          |          |
| <b>0.18</b> | 7.5 - 100 | 40 - 100 |          |          |          |          |          |
| <b>0.37</b> |           | 7.5 - 80 | 40 - 100 | 50 - 100 |          |          |          |
| <b>0.75</b> |           | 7.5 - 30 | 7.5 - 60 | 20 - 100 | 40 - 100 | 80 - 100 |          |
| <b>1.5</b>  |           |          | 7.5 - 30 | 7.5 - 40 | 7.5 - 60 | 25 - 100 | 80 - 100 |
| <b>2.2</b>  |           |          |          | 7.5 - 15 | 7.5 - 30 | 7.5 - 60 | 25 - 100 |
| <b>4.0</b>  |           |          |          |          | 7.5 - 30 | 7.5 - 60 | 25 - 100 |

## Performance of motor-variators & worm gearboxes

| Motor    |               |         |          |         | Motor                  |      |               |          |     |          |                        |
|----------|---------------|---------|----------|---------|------------------------|------|---------------|----------|-----|----------|------------------------|
| Kw       |               | n2 rpm  | i        | M2 Nm   | Type                   | Kw   |               | n2 rpm   | i   | M2 Nm    | Type                   |
| 0.18     | 4P<br>n1=1400 | 117~23  | 7.5      | 9~18    | SV 018<br>+<br>FRD 040 | 1.10 | 4P<br>n1=1400 | 133~27   | 7.5 | 59~111   | SV 1.5<br>+<br>FRD 075 |
|          |               | 88~17   | 10       | 12~23   |                        |      |               | 100~20   | 10  | 77~144   |                        |
|          |               | 59~11   | 15       | 17~32   |                        |      |               | 67~13    | 15  | 110~203  |                        |
|          |               | 44~8.5  | 20       | 22~40   |                        |      |               | 50~10    | 20  | 142~258  |                        |
|          |               | 35~6.8  | 25       | 27~47   |                        |      |               | 40~8     | 25  | 172~308  |                        |
|          |               | 29~5.7  | 30       | 30~51   |                        |      |               | 33~6.7   | 30  | 195~340  |                        |
|          |               | 22~4.3  | 40       | 37~62   |                        |      |               | 25~5     | 40  | 245~360  |                        |
|          |               | 18~3.4  | 50       | 22~40   |                        |      |               | 100~20   | 10  | 78~146   |                        |
|          |               | 22~4.3  | 40       | 38~63   |                        |      |               | 67~13    | 15  | 113~208  |                        |
|          |               | 18~3.4  | 50       | 44~73   |                        |      |               | 50~10    | 20  | 146~266  |                        |
| 15~2.8   | 60            | 50~80   | 40~8     | 25      | 177~320                |      |               |          |     |          |                        |
| 11~2.1   | 80            | 59~82   | 33~6.7   | 30      | 202~356                |      |               |          |     |          |                        |
| 8.8~1.7  | 100           | 66~79   | 25~5     | 40      | 256~442                |      |               |          |     |          |                        |
| 0.37     | 4P<br>n1=1400 | 133~27  | 7.5      | 19~36   | SV 037<br>+<br>FRD 050 | 1.10 | 4P<br>n1=1400 | 20~4     | 50  | 304~517  | SV 1.5<br>+<br>FRD 090 |
|          |               | 100~20  | 10       | 25~47   |                        |      |               | 20~4     | 50  | 320~550  |                        |
|          |               | 67~13   | 15       | 36~65   |                        |      |               | 17~3.3   | 60  | 368~625  |                        |
|          |               | 50~10   | 20       | 46~82   |                        |      |               | 12.5~2.5 | 80  | 455~754  |                        |
|          |               | 40~8    | 25       | 55~97   |                        |      |               | 10~2     | 100 | 522~710  |                        |
|          |               | 33~6.7  | 30       | 61~107  |                        |      |               | 17~3.3   | 60  | 373~623  |                        |
|          |               | 25~5    | 40       | 76~124  |                        |      |               | 12.5~2.5 | 80  | 460~749  |                        |
|          |               | 20~4    | 50       | 89~120  |                        |      |               | 10~2     | 100 | 531~868  |                        |
|          |               | 25~5    | 40       | 79~134  |                        |      |               | 133~27   | 7.5 | 78~148   |                        |
|          |               | 20~4    | 50       | 92~155  |                        |      |               | 100~20   | 10  | 102~192  |                        |
| 17~3.3   | 60            | 104~173 | 67~13    | 15      | 147~270                |      |               |          |     |          |                        |
| 12.5~2.5 | 80            | 125~173 | 50~10    | 20      | 190~344                |      |               |          |     |          |                        |
| 10~2     | 100           | 139~173 | 40~8     | 25      | 229~330                |      |               |          |     |          |                        |
| 0.55     | 4P<br>n1=1400 | 133~27  | 7.5      | 26~49   | SV 037<br>+<br>FRD 063 | 1.50 | 4P<br>n1=1400 | 33~6.7   | 30  | 260~390  | SV 1.5<br>+<br>FRD 075 |
|          |               | 100~20  | 10       | 34~63   |                        |      |               | 133~27   | 7.5 | 77~150   |                        |
|          |               | 67~13   | 15       | 48~88   |                        |      |               | 100~20   | 10  | 104~195  |                        |
|          |               | 50~10   | 20       | 62~112  |                        |      |               | 67~13    | 15  | 150~277  |                        |
|          |               | 40~8    | 25       | 75~133  |                        |      |               | 50~10    | 20  | 194~355  |                        |
|          |               | 33~6.7  | 30       | 81~146  |                        |      |               | 40~8     | 25  | 236~427  |                        |
|          |               | 25~5    | 40       | 105~179 |                        |      |               | 33~6.7   | 30  | 270~474  |                        |
|          |               | 20~4    | 50       | 123~207 |                        |      |               | 25~5     | 40  | 341~589  |                        |
|          |               | 20~4    | 50       | 129~216 |                        |      |               | 20~4     | 50  | 406~560  |                        |
|          |               | 17~3.3  | 60       | 146~242 |                        |      |               | 17~3.3   | 60  | 490~833  |                        |
| 12.5~2.5 | 80            | 176~250 | 12.5~2.5 | 80      | 614~999                |      |               |          |     |          |                        |
| 10~2     | 100           | 218~350 | 10~2     | 100     | 696~1100               |      |               |          |     |          |                        |
| 0.75     | 4P<br>n1=1400 | 133~27  | 7.5      | 39~73   | SV 075<br>+<br>FRD 063 | 2.20 | 4P<br>n1=1400 | 133~27   | 7.5 | 120~226  | SV 1.5<br>+<br>FRD 130 |
|          |               | 100~20  | 10       | 51~94   |                        |      |               | 100~20   | 10  | 157~294  |                        |
|          |               | 67~13   | 15       | 72~132  |                        |      |               | 67~13    | 15  | 228~418  |                        |
|          |               | 50~10   | 20       | 92~168  |                        |      |               | 50~10    | 20  | 298~549  |                        |
|          |               | 40~8    | 25       | 112~199 |                        |      |               | 40~8     | 25  | 346~664  |                        |
|          |               | 33~6.7  | 30       | 126~219 |                        |      |               | 33~6.7   | 30  | 413~717  |                        |
|          |               | 25~5    | 40       | 156~232 |                        |      |               | 25~5     | 40  | 533~931  |                        |
|          |               | 20~4    | 50       | 185~310 |                        |      |               | 25~5     | 40  | 542~932  |                        |
|          |               | 20~4    | 50       | 192~320 |                        |      |               | 20~4     | 50  | 648~1097 |                        |
|          |               | 17~3.3  | 60       | 219~300 |                        |      |               | 17~3.3   | 60  | 746~1246 |                        |
| 17~3.3   | 60            | 230~389 | 12.5~2.5 | 80      | 921~1499               |      |               |          |     |          |                        |
| 12.5~2.5 | 80            | 265~428 | 10~2     | 100     | 1040~1100              |      |               |          |     |          |                        |
| 10~2     | 100           | 303~410 |          |         |                        |      |               |          |     |          |                        |
| 12.5~2.5 | 80            | 302~503 |          |         |                        |      |               |          |     |          |                        |
| 10~2     | 100           | 348~575 |          |         |                        |      |               |          |     |          |                        |



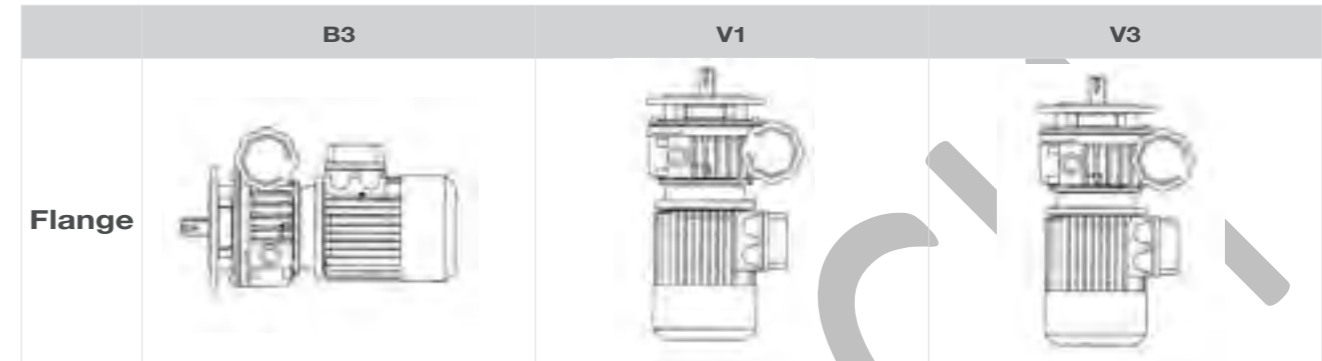
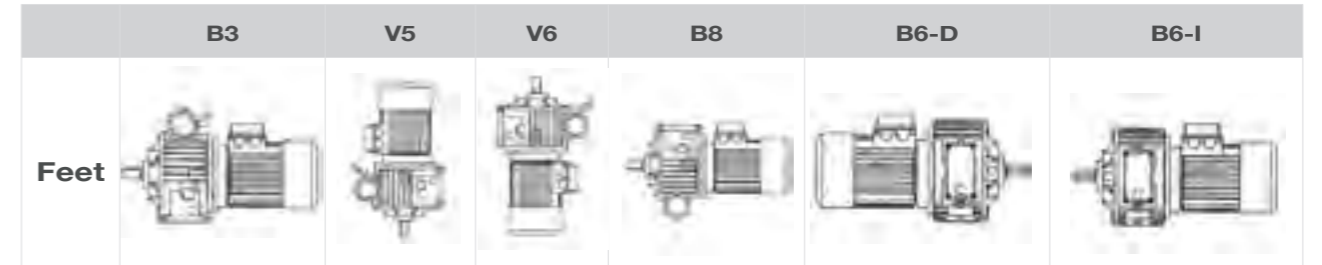
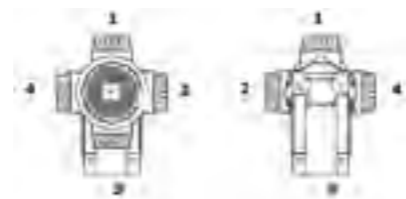
## Mounting Positions



Output Flange



Position Terminal Box



## Lubrication

### Lubricant table

|           | SV Speed Variators  | FRD Worm-gear speed reducers |                   |                   |                   | Helical Units     |
|-----------|---------------------|------------------------------|-------------------|-------------------|-------------------|-------------------|
|           |                     | FRD 025-090                  | FRD 110-130       |                   |                   |                   |
| Lubricant | Synthetic           | Synthetic                    | Synthetic         | Mineral           | Mineral           | Synthetic         |
| Temp °C   | -25°C ~ +40°C       | -25°C ~ +50°C                | -25°C ~ +40°C     | -5°C ~ +40°C      | -15°C ~ +25°C     | -25°C ~ +50°C     |
| ISO       | VG 32               | VG 320                       | VG 320            | VG 460            | VG 220            | VG 320            |
| IP        | A.T.F. DEXRON FLUID | TELIUM VSF                   | MELLANA OIL 320   | MELLANA OIL 460   | MELLANA OIL 220   | TELIUM VSF        |
| SHELL     | A.T.F. DEXRON       | TIVELA OIL SC320             | OMALA OIL 320     | OMALA OIL 460     | OMALA OIL 220     | TIVELA OIL SC320  |
| AGIP      | A.T.F. DEXRON       | BLASIA S320                  | BLASIA 320        | BLASIA 460        | BLASIA 220        | BLASIA S320       |
| ESSO      | A.T.F. DEXRON       | S 220                        | S 220             | SPARTAN EP 460    | SPARTAN EP 220    | S 220             |
| MOBIL     | A.T.F. 220          | GLYGOYLE 30                  | MOBIL GEAR 320    | MOBIL GEAR 634    | MOBIL GEAR 630    | GLYGOYLE 30       |
| CASTROL   | TQ DEXRON II        | ALPHASYN PG 320              | ALPHASYN PG 320   | ALPHA MAX 460     | ALPHA MAX 220     | ALPHASYN PG 320   |
| BP        | AUTRAN DX           | ENERGOL SG-XP 320            | ENERGOL SG-XP 320 | ENERGOL SG-XP 460 | ENERGOL SG-XP 220 | ENERGOL SG-XP 320 |

### Oil volume

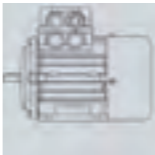
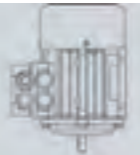

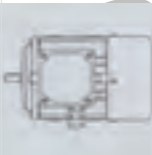


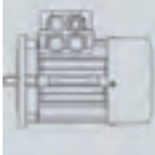
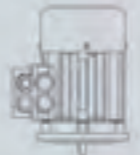
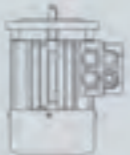
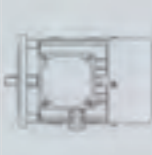
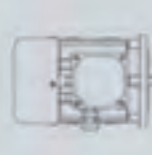
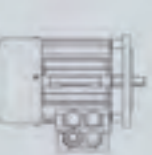
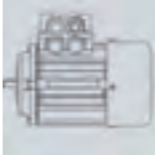
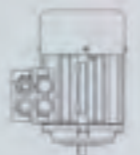









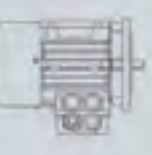
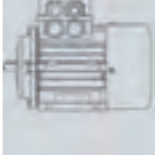
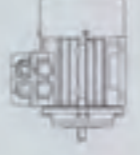


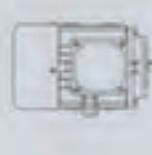
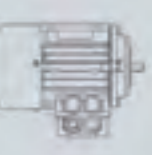




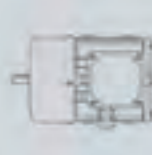
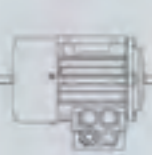
| FRD  |      |      |      |      |      |      |     |     |     |
|------|------|------|------|------|------|------|-----|-----|-----|
| Size | 025  | 030  | 040  | 050  | 063  | 075  | 090 | 110 | 130 |
| L    | 0.02 | 0.04 | 0.08 | 0.15 | 0.3  | 0.55 | 1   | 3   | 4.5 |
| SV   |      |      |      |      |      |      |     |     |     |
| Size | 0.18 | 0.37 | 0.75 | 1.50 | 2.20 | 4.00 |     |     |     |
| L    | 0.13 | 0.15 | 0.33 | 0.80 | 1.20 | 1.20 |     |     |     |

# Electric Motors

## Performances

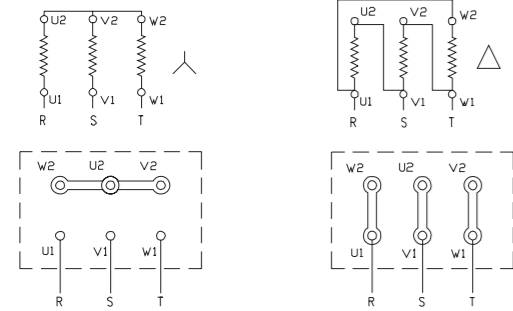
The DIN standard IEC 34-7, Code I (or II code in parentheses) classifies the various models of Electrical Machines.

The motors can be supplied with some of the various models that are detailed below:

|                                  | IM B3 (IM 1001)   | IMV5 (IM 1011)  | IMV6 (IM 1031)  | IM B6 (IM 1051)  | IM B7 (IM 1061)  | IM B8 (IM 1071)  |
|----------------------------------|---|---|---|--|--|--|
| <b>B3 Motors</b>                 |                        |                        |                        |               |               |               |
| <b>B5 Motors</b>                 | IM B5 (IM 3001)<br>    | IM V1 (IM 3011)<br>    | IM V3 (IM 3031)<br>    | IM 3051<br>   | IM 3061<br>   | IM 3071<br>   |
| <b>B14 Motors</b>                | IM B14 (IM 3601)<br> | IM V18 (IM 3611)<br> | IM V19 (IM 3631)<br> | IM 3651<br> | IM 3661<br> | IM 3671<br> |
| <b>B3/B5 Motors</b>              | IM B35 (IM 2001)<br> | IM V15 (IM 2011)<br> | IM V36 (IM 2031)<br> | IM 2051<br> | IM 2061<br> | IM 2071<br> |
| <b>B3/B14 Motors</b>             | IM B34 (IM 2101)<br> | IM 2111<br>          | IM 2131<br>          | IM 2151<br> | IM 2161<br> | IM 2171<br> |
| <b>B3 with pro-longued shaft</b> | IM 1002<br>          | IM 1012<br>          | IM 1032<br>          | IM 1052<br> | IM 1062<br> | IM 1072<br> |

# Connections

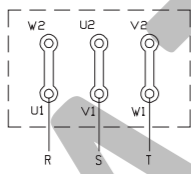
## Three-phase motor Supply voltage 230/400V Direct start



400V three phase connected drawing

230V three phase connected drawing

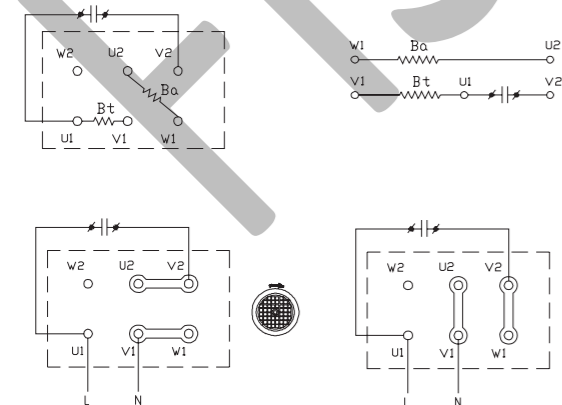
## Three-phase motor Supply voltage 400V Direct start



400V three phase connected drawing

Starting options  $\Delta/\Delta$  400V

## Single phase motor, two sens of rotation Single tension



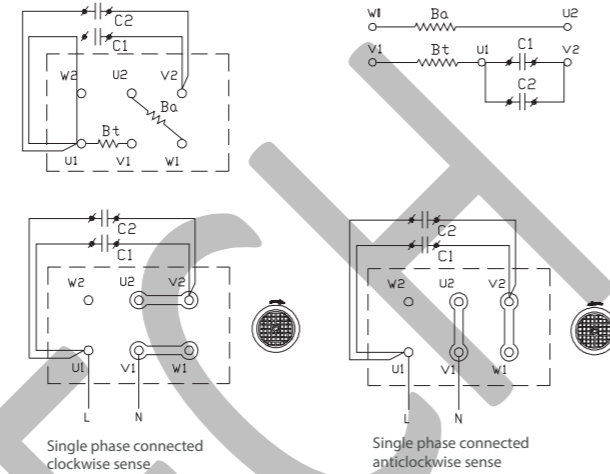
Single phase connected clockwise sense

Single phase connected anticlockwise sense

## Single phase motor, two sens of rotation

### Single tension

High starting torque motors, by bending the nominal capacity of the capacitor during the startup, you get a ratio MA/MN of about 1,5 till 2.



Single phase connected clockwise sense

Single phase connected anticlockwise sense

# Technical features

## 2P/3000rpm three phase motors technical tables

| Motor size   | Nominal Power<br>Pn kW | Nominal speed<br>Wn rpm | Nominal intensity<br>In A | Nominal torque<br>Mn Nm | Power factor<br>FP Cos F | Nominal performance<br>N % | Starting int.<br>Nominal int.<br>Ia/In 1/1 | Nominal starting torque<br>Ma/Mn 1/1 | Maximum torque<br>Nominal torque<br>Mm/Mn 1/1 | Moment of inertia<br>J Kgm2 | Motor weight<br>Kg | Sound pressure<br>dB |
|--|------------------------|-------------------------|---------------------------|-------------------------|--------------------------|----------------------------|--|--------------------------------------|---|-----------------------------|--------------------|----------------------|
| <b>Nominal voltage 400V (Y) or 400V (Δ) • 50Hz</b> |                        |                         |                           |                         |                          |                            |  |                                      |   |                             |                    |                      |
| 56   | 0,09                   | 2830                    | 0,29                      | 0,30                    | 0,65                     | 67,0                       | 4,52                                       | 3,67                                 | 3,23  | 0,00012                     | 3,1                | 48                   |
| 56   | 0,12                   | 2740                    | 0,34                      | 0,42                    | 0,77                     | 66,0                       | 3,85                                       | 2,62                                 | 2,31  | 0,00012                     | 3,1                | 48                   |
| 63   | 0,18                   | 2700                    | 0,75                      | 0,64                    | 0,75                     | 55,0                       | 3,00                                       | 2,61                                 | 2,34  | 0,00020                     | 3,8                | 50                   |
| 63   | 0,25                   | 2810                    | 0,94                      | 0,86                    | 0,67                     | 57,0                       | 4,34                                       | 4,19                                 | 3,57  | 0,00029                     | 4,5                | 50                   |
| 71   | 0,37                   | 2800                    | 1,11                      | 1,27                    | 0,77                     | 62,0                       | 4,41                                       | 2,76                                 | 2,54  | 0,00043                     | 5,7                | 57                   |
| 71   | 0,55                   | 2810                    | 1,47                      | 1,92                    | 0,77                     | 71,0                       | 3,80                                       | 1,88                                 | 2,67  | 0,00057                     | 5,9                | 58                   |
| 80   | 0,75                   | 2790                    | 1,93                      | 2,57                    | 0,79                     | 69,0                       | 4,42                                       | 2,98                                 | 2,32  | 0,00102                     | 8,1                | 58                   |
| 80   | 1,1                    | 2810                    | 2,77                      | 3,72                    | 0,79                     | 72,0                       | 4,99                                       | 2,87                                 | 2,58  | 0,00128                     | 9,2                | 60                   |
| 90S  | 1,5                    | 2870                    | 3,78                      | 5,02                    | 0,77                     | 75,0                       | 5,83                                       | 3,19                                 | 2,89  | 0,00177                     | 12,4               | 64                   |
| 90L  | 2,2                    | 2870                    | 5,10                      | 7,32                    | 0,79                     | 79,0                       | 6,21                                       | 3,56                                 | 3,29  | 0,00232                     | 14,3               | 64                   |
| 100  | 3                      | 2880                    | 7,03                      | 10,26                   | 0,77                     | 81,9                       | 6,21                                       | 2,98                                 | 3,15  | 0,00351                     | 25,2               | 68                   |
| 112  | 4                      | 2900                    | 8,55                      | 13,19                   | 0,79                     | 86,1                       | 6,65                                       | 3,41                                 | 2,92  | 0,00634                     | 30,9               | 70                   |
| 132S   | 5,5                    | 2910                    | 11,87                     | 18,03                   | 0,88                     | 87,5                       | 6,11                                       | 2,74                                 | 3,10  | 0,01267                     | 39,2               | 76                   |
| 132S   | 7,5                    | 2880                    | 14,81                     | 24,95                   | 0,87                     | 86,9                       | 5,50                                       | 2,03                                 | 2,59  | 0,01640                     | 44,2               | 76                   |
| 132M   | 11                     | 2930                    | 21,05                     | 35,94                   | 0,87                     | 91                         | 7,82                                       | 3,91                                 | 3,42  | 0,02023                     | 58,5               | 76                   |
| 160M   | 15                     | 2940                    | 27,74                     | 48,80                   | 0,87                     | 91,5                       | 7,23                                       | 2,70                                 | 2,98  | 0,05900                     | 101,0              | 78                   |
| 160L   | 18,5                   | 2950                    | 33,29                     | 59,98                   | 0,88                     | 91,5                       | 8,28                                       | 3,15                                 | 2,88  | 0,07012                     | 115,0              | 78                   |
| 180M   | 22                     | 2937                    | 41,00                     | 71,99                   | 0,87                     | 90,0                       | 6,50                                       | 1,80                                 | 2,40  | 0,06500                     | 150,0              | 98                   |
| 200L   | 30                     | 2943                    | 54,60                     | 97,97                   | 0,88                     | 90,1                       | 6,00                                       | 1,3                                  | 2,40  | 0,14700                     | 224,0              | 100                  |
| 200L   | 37                     | 2952                    | 67,50                     | 120,46                  | 0,87                     | 91,0                       | 7,50                                       | 1,60                                 | 2,80  | 0,14700                     | 241,0              | 100                  |
| 225M   | 45                     | 2952                    | 80,40                     | 146,51                  | 0,88                     | 91,8                       | 7,50                                       | 1,80                                 | 2,80  | 0,17700                     | 260,0              | 102                  |
| 250M   | 55                     | 2943                    | 91,50                     | 179,61                  | 0,93                     | 93,0                       | 7,50                                       | 1,40                                 | 2,80  | 0,26000                     | 360,0              | 102                  |
| 280S   | 75                     | 2944                    | 125,00                    | 244,84                  | 0,94                     | 92,3                       | 7,50                                       | 2,00                                 | 3,00  | 0,44000                     | 445,0              | 104                  |
| 280M   | 90                     | 2946                    | 146,70                    | 293,61                  | 0,95                     | 93,2                       | 8,00                                       | 2,20                                 | 3,00  | 0,45000                     | 506,0              | 106                  |
| 315S   | 110                    | 2961                    | 183,60                    | 357,04                  | 0,94                     | 92,0                       | 7,50                                       | 1,80                                 | 2,80  | 0,68700                     | 618,0              | 106                  |
| 315S/M   | 132                    | 2963                    | 216,50                    | 428,16                  | 0,94                     | 94,0                       | 7,50                                       | 1,80                                 | 2,80  | 1,10000                     | 720,0              | 110                  |
| 315M/L   | 160                    | 2973                    | 266,20                    | 517,23                  | 0,92                     | 94,0                       | 6,50                                       | 1,60                                 | 1,90  | 1,10000                     | 915,0              | 110                  |
| 315M/L   | 200                    | 2978                    | 330,50                    | 645,45                  | 0,93                     | 94,0                       | 7,00                                       | 1,60                                 | 1,90  | 1,81300                     | 990,0              | 110                  |

The electrical data shown in tables are orientative only and not binding. Contact our technical department for more accurate information.

### 4P/1500 rpm three phase motors technical tables

| Motor size   | Nominal Power<br>Pn kW | Nominal speed<br>Wn rpm | Nominal intensity<br>In A | Nominal torque<br>Mn Nm | Power factor<br>FP Cos F | Nominal<br>performance<br>N % | Starting int.<br>Nominal int.<br>Ia/In 1/1 | Nominal starting<br>torque<br>Ma/Mn 1/1 | Maximum torque<br>Nominal torque<br>Mm/Mn 1/1 | Moment of inertia<br>J Kgm2 | Motor weight<br>Kg | Sound pressure<br>dB |
|--|------------------------|-------------------------|---------------------------|-------------------------|--------------------------|-------------------------------|--|---|---|-----------------------------|--------------------|----------------------|
| <b>Nominal voltage 400V (Y) or 400V (Δ) • 50Hz</b> |                        |                         |                           |                         |                          |                               |  |   |   |                             |                    |                      |
| 56   | 0,06                   | 1370                    | 0,36                      | 0,43                    | 0,62                     | 40,0                          | 2,25                                       | 2,53                                    | 2,35  | 0,00012                     | 2,6                | 43                   |
| 56   | 0,09                   | 1370                    | 0,42                      | 0,63                    | 0,65                     | 51,0                          | 2,55                                       | 2,59                                    | 2,40  | 0,00014                     | 3,1                | 45                   |
| 63   | 0,12                   | 1320                    | 0,51                      | 0,86                    | 0,70                     | 55,0                          | 2,31                                       | 1,98                                    | 1,95  | 0,00029                     | 3,8                | 47                   |
| 63   | 0,18                   | 1300                    | 0,71                      | 1,36                    | 0,68                     | 54,0                          | 2,21                                       | 1,78                                    | 1,69  | 0,00039                     | 4,2                | 49                   |
| 71   | 0,25                   | 1380                    | 0,93                      | 1,73                    | 0,68                     | 57,0                          | 3,26                                       | 2,45                                    | 2,29  | 0,00097                     | 5,5                | 49                   |
| 71   | 0,37                   | 1360                    | 1,19                      | 2,61                    | 0,74                     | 61,0                          | 3,40                                       | 2,33                                    | 2,05  | 0,00139                     | 6,2                | 50                   |
| 80   | 0,55                   | 1390                    | 1,59                      | 3,76                    | 0,75                     | 66,0                          | 3,60                                       | 1,76                                    | 1,95  | 0,00253                     | 7,8                | 52                   |
| 80   | 0,75                   | 1400                    | 2,16                      | 5,08                    | 0,72                     | 69,0                          | 4,03                                       | 1,65                                    | 1,95  | 0,00321                     | 9,2                | 54                   |
| 90S  | 1,1                    | 1400                    | 2,81                      | 7,47                    | 0,77                     | 74,0                          | 4,33                                       | 2,35                                    | 2,53  | 0,00301                     | 11,4               | 58                   |
| 90L  | 1,5                    | 1420                    | 3,65                      | 10,11                   | 0,74                     | 80,0                          | 5,28                                       | 2,92                                    | 2,85  | 0,00425                     | 14,4               | 60                   |
| 100  | 2,2                    | 1420                    | 5,05                      | 14,73                   | 0,76                     | 81,8                          | 5,57                                       | 2,82                                    | 2,79  | 0,00573                     | 21,4               | 60                   |
| 100  | 3                      | 1410                    | 6,60                      | 20,45                   | 0,79                     | 82,5                          | 5,34                                       | 2,58                                    | 2,57  | 0,00752                     | 23,4               | 60                   |
| 112  | 4                      | 1440                    | 9,39                      | 26,60                   | 0,72                     | 84,7                          | 6,00                                       | 3,13                                    | 3,26  | 0,01510                     | 30,4               | 60                   |
| 132S   | 5,5                    | 1450                    | 12,14                     | 36,51                   | 0,79                     | 85,7                          | 4,92                                       | 2,69                                    | 2,67  | 0,02937                     | 49,2               | 62                   |
| 132M   | 7,5                    | 1450                    | 16,18                     | 49,68                   | 0,79                     | 86,2                          | 5,18                                       | 2,39                                    | 2,82  | 0,03877                     | 54,5               | 65                   |
| 160M   | 11                     | 1450                    | 22,34                     | 73,86                   | 0,84                     | 87,1                          | 4,52                                       | 1,61                                    | 1,98  | 0,08478                     | 93,8               | 68                   |
| 160L   | 15                     | 1450                    | 30,59                     | 98,49                   | 0,81                     | 88,2                          | 4,78                                       | 1,97                                    | 2,31  | 0,11315                     | 102,0              | 69                   |
| 180M   | 18,5                   | 1462                    | 37,50                     | 121,61                  | 0,80                     | 88,9                          | 6,50                                       | 2,40                                    | 3,30  | 0,04000                     | 150,0              | 94                   |
| 180L   | 22                     | 1467                    | 44,40                     | 144,13                  | 0,80                     | 89,3                          | 7,50                                       | 2,40                                    | 3,30  | 0,17000                     | 162,0              | 94                   |
| 200L   | 30                     | 1458                    | 57,00                     | 197,75                  | 0,85                     | 89,4                          | 6,50                                       | 1,80                                    | 2,80  | 0,19700                     | 231,0              | 96                   |
| 225S   | 37                     | 1468                    | 67,80                     | 242,23                  | 0,87                     | 90,5                          | 7,00                                       | 2,00                                    | 2,80  | 0,22000                     | 255,0              | 98                   |
| 225M   | 45                     | 1466                    | 84,50                     | 295,01                  | 0,84                     | 91,5                          | 7,50                                       | 2,00                                    | 3,00  | 0,30000                     | 278,0              | 99                   |
| 250M   | 55                     | 1453                    | 93,60                     | 363,80                  | 0,92                     | 92,4                          | 7,00                                       | 2,00                                    | 2,60  | 0,55000                     | 376,0              | 100                  |
| 280S   | 75                     | 1463                    | 126,00                    | 492,69                  | 0,94                     | 91,4                          | 7,50                                       | 2,00                                    | 3,00  | 0,67500                     | 423,0              | 101                  |
| 280M   | 90                     | 1464                    | 148,80                    | 590,83                  | 0,95                     | 92,4                          | 8,00                                       | 2,00                                    | 3,20  | 1,65000                     | 534,0              | 103                  |
| 315S   | 110                    | 1478                    | 188,10                    | 715,28                  | 0,90                     | 94,1                          | 6,75                                       | 2,20                                    | 2,20  | 2,30000                     | 595,0              | 103                  |
| 315S/M   | 132                    | 1469                    | 226,50                    | 863,60                  | 0,89                     | 94,2                          | 7,00                                       | 2,60                                    | 2,40  | 3,00000                     | 645,0              | 103                  |
| 315M/L   | 160                    | 1485                    | 266,50                    | 1035,51                 | 0,92                     | 94,2                          | 7,50                                       | 1,80                                    | 2,20  | 3,12000                     | 955,0              | 104                  |
| 315M/L   | 200                    | 1485                    | 328,60                    | 1294,39                 | 0,92                     | 95,5                          | 7,50                                       | 1,80                                    | 2,20  | 4,50000                     | 1045,0             | 106                  |

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### 6P/1000 rpm three phase motors technical tables

| Motor size   | Nominal Power<br>Pn kW | Nominal speed<br>Wn rpm | Nominal intensity<br>In A | Nominal torque<br>Mn Nm | Power factor<br>FP Cos F | Nominal<br>performance<br>N % | Starting int.<br>Nominal int.<br>Ia/In 1/1 | Nominal starting<br>torque<br>Ma/Mn 1/1 | Maximum torque<br>Nominal torque<br>Mm/Mn 1/1 | Moment of inertia<br>J Kgm2 | Motor weight<br>Kg | Sound pressure<br>dB |
|--|------------------------|-------------------------|---------------------------|-------------------------|--------------------------|-------------------------------|--|---|---|-----------------------------|--------------------|----------------------|
| <b>Nominal voltage 400V (Y) or 400V (Δ) • 50Hz</b> |                        |                         |                           |                         |                          |                               |  |   |   |                             |                    |                      |
| 63   | 0,09                   | 850                     | 0,70                      | 1,02                    | 0,54                     | 34,0                          | 1,64                                       | 1,88                                    | 1,82  | 0,00039                     | 2,5                | 43                   |
| 63   | 0,12                   | 800                     | 0,73                      | 1,43                    | 0,63                     | 40,0                          | 1,59                                       | 1,43                                    | 1,40  | 0,00051                     | 5,3                | 43                   |
| 71   | 0,18                   | 820                     | 0,79                      | 2,10                    | 0,75                     | 44,0                          | 1,91                                       | 1,39                                    | 1,30  | 0,00106                     | 5,8                | 46                   |
| 71   | 0,25                   | 910                     | 1,02                      | 2,67                    | 0,64                     | 56,0                          | 2,92                                       | 2,50                                    | 1,69  | 0,00138                     | 6,9                | 46                   |
| 80   | 0,37                   | 940                     | 1,21                      | 3,76                    | 0,68                     | 65,0                          | 4,09                                       | 2,79                                    | 1,73  | 0,00321                     | 10,5               | 50                   |
| 80   | 0,55                   | 920                     | 1,69                      | 6,17                    | 0,80                     | 65,0                          | 3,44                                       | 1,74                                    | 1,99  | 0,00411                     | 12,5               | 52                   |
| 90S  | 0,75                   | 920                     | 2,21                      | 7,91                    | 0,71                     | 70,0                          | 3,64                                       | 2,20                                    | 2,18  | 0,00540                     | 13,1               | 56                   |
| 90L  | 1,1                    | 910                     | 2,93                      | 11,47                   | 0,75                     | 72,0                          | 3,53                                       | 1,88                                    | 1,94  | 0,00716                     | 14,3               | 59                   |
| 100  | 1,5                    | 940                     | 3,80                      | 15,39                   | 0,78                     | 74,3                          | 4,21                                       | 1,87                                    | 2,01  | 0,01556                     | 21,5               | 63                   |
| 112  | 2,2                    | 960                     | 5,22                      | 21,98                   | 0,73                     | 84,0                          | 5,29                                       | 2,09                                    | 2,20  | 0,02659                     | 29,3               | 63                   |
| 132S   | 3                      | 960                     | 6,90                      | 29,93                   | 0,75                     | 84,2                          | 5,09                                       | 1,70                                    | 2,56  | 0,03945                     | 38,5               | 64                   |
| 132M   | 4                      | 960                     | 8,70                      | 39,70                   | 0,78                     | 85,5                          | 7,55                                       | 1,90                                    | 2,72  | 0,04156                     | 45,3               | 64                   |
| 132M   | 5,5                    | 955                     | 11,90                     | 55,00                   | 0,78                     | 86,0                          | 6,59                                       | 2,10                                    | 2,70  | 0,04562                     | 53,3               | 65                   |
| 160M   | 7,5                    | 970                     | 15,40                     | 74,00                   | 0,79                     | 89,0                          | 6,59                                       | 2,00                                    | 2,80  | 0,08865                     | 86,0               | 62                   |
| 160L   | 11                     | 970                     | 23,30                     | 109,00                  | 0,78                     | 89,8                          | 6,93                                       | 2,20                                    | 2,90  | 0,10658                     | 99,5               | 62                   |
| 180L   | 15                     | 955                     | 30,90                     | 150,96                  | 0,81                     | 87,0                          | 4,00                                       | 1,40                                    | 1,80  | 0,10000                     | 168,0              | 87                   |
| 200L   | 18,5                   | 971                     | 97,10                     | 183,11                  | 0,83                     | 87,0                          | 5,50                                       | 1,60                                    | 2,60  | 0,38000                     | 226,0              | 88                   |
| 200L   | 22                     | 974                     | 41,00                     | 217,08                  | 0,88                     | 88,6                          | 5,50                                       | 1,60                                    | 2,60  | 0,38000                     | 247,0              | 88                   |
| 225M   | 30                     | 969                     | 58,20                     | 297,55                  | 0,84                     | 88,5                          | 5,75                                       | 2,00                                    | 2,60  | 0,28500                     | 259,0              | 89                   |
| 250M   | 37                     | 973                     | 68,40                     | 365,47                  | 0,87                     | 90,4                          | 6,50                                       | 2,00                                    | 3,00  | 1,00000                     | 315,0              | 91                   |
| 280S   | 45                     | 983                     | 79,70                     | 439,97                  | 0,88                     | 92,6                          | 7,00                                       | 2,20                                    | 3,00  | 1,22500                     | 400,0              | 92                   |
| 280M   | 55                     | 977                     | 94,80                     | 541,04                  | 0,91                     | 92,5                          | 7,00                                       | 2,00                                    | 3,00  | 1,20000                     | 435,0              | 94                   |
| 315S   | 75                     | 980                     | 127,50                    | 735,52                  | 0,91                     | 93,3                          | 7,50                                       | 2,40                                    | 2,80  | 1,74000                     | 530,0              | 96                   |
| 315S/M   | 90                     | 982                     | 152,40                    | 880,83                  | 0,91                     | 93,7                          | 7,50                                       | 2,40                                    | 3,00  | 3,19000                     | 610,0              | 97                   |
| 315S/M   | 110                    | 983                     | 184,60                    | 1075,47                 | 0,92                     | 94,0                          | 7,50                                       | 2,50                                    | 3,50  | 3,50000                     | 710,0              | 98                   |
| 315M/L   | 132                    | 985                     | 219,10                    | 1287,95                 | 0,93                     | 94,0                          | 7,50                                       | 2,00                                    | 2,80  | 5,25000                     | 940,0              | 99                   |
| 315M/L   | 160                    | 986                     | 265,70                    | 1559,57                 | 0,92                     | 95,0                          | 7,50                                       | 2,10                                    | 2,60  | 6,50000                     | 1070,0             | 100                  |

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## 8P/750 rpm three phase motors technical tables

| Motor size   | Nominal Power<br>P <sub>n</sub> kW | Nominal speed<br>rpm | Nominal intensity<br>I <sub>n</sub> A | Nominal torque<br>N <sub>m</sub> | Power factor<br>FP Cos F | Nominal<br>performance<br>N % | Starting int.<br>Nominal int.<br>I <sub>a</sub> /I <sub>n</sub> 1/1 | Nominal starting<br>torque<br>M <sub>a</sub> /M <sub>n</sub> 1/1 | Maximum torque<br>Nominal torque<br>M <sub>m</sub> /M <sub>n</sub> 1/1 | Moment of inertia<br>J Kg <sub>m</sub> <sup>2</sup> | Motor weight<br>Kg | Sound pressure<br>dB |
|--|------------------------------------|----------------------|---------------------------------------|----------------------------------|--------------------------|-------------------------------|---|--|--|---|--------------------|----------------------|
| <b>Nominal voltage 400V (Y) or 400V (Δ) • 50Hz</b> |                                    |                      |                                       |                                  |                          |                               |   |  |  |   |                    |                      |
| 71   | 0,09                               | 690                  | 0,50                                  | 1,30                             | 0,59                     | 46,0                          | 2,00  | 1,50   | 1,80   | 0,0007  | 5,5                | 40                   |
| 71   | 0,12                               | 705                  | 0,63                                  | 1,70                             | 0,57                     | 52,0                          | 2,41  | 1,90   | 2,20   | 0,0009  | 6,5                | 40                   |
| 80   | 0,18                               | 690                  | 0,80                                  | 2,45                             | 0,57                     | 59,0                          | 2,60  | 2,10   | 2,80   | 0,0020  | 9,5                | 45                   |
| 80   | 0,25                               | 670                  | 1,18                                  | 3,70                             | 0,60                     | 53,0                          | 2,40  | 1,70   | 2,00   | 0,0030  | 10,5               | 45                   |
| 90   | 0,37                               | 700                  | 1,60                                  | 5,00                             | 0,56                     | 61,5                          | 2,94  | 1,90   | 2,40   | 0,0032  | 13,0               | 43                   |
| 90   | 0,55                               | 690                  | 2,35                                  | 7,50                             | 0,57                     | 62,9                          | 3,02  | 1,71   | 2,10   | 0,0043  | 16,0               | 43                   |
| 100  | 0,75                               | 700                  | 2,55                                  | 10,00                            | 0,59                     | 72,0                          | 3,50  | 2,10   | 2,70   | 0,0069  | 20,0               | 46                   |
| 100  | 1,1                                | 700                  | 3,35                                  | 15,00                            | 0,64                     | 73,0                          | 3,50  | 2,10   | 2,70   | 0,0082  | 23,0               | 46                   |
| 112  | 1,5                                | 695                  | 4,50                                  | 20,60                            | 0,65                     | 74,5                          | 4,09  | 1,90   | 2,40   | 0,0160  | 28,0               | 52                   |
| 132S   | 2,2                                | 720                  | 5,90                                  | 29,20                            | 0,67                     | 80,5                          | 5,29  | 1,60   | 2,50   | 0,0380  | 46,0               | 56                   |
| 132M   | 3                                  | 720                  | 7,80                                  | 39,80                            | 0,68                     | 82,0                          | 5,50  | 1,80   | 2,50   | 0,0450  | 53,0               | 56                   |
| 160M   | 4                                  | 715                  | 10,00                                 | 54,00                            | 0,69                     | 84,1                          | 5,20  | 2,10   | 2,40   | 0,0720  | 75,0               | 59                   |
| 160M   | 5,5                                | 710                  | 13,40                                 | 74,00                            | 0,70                     | 84,7                          | 5,40  | 2,40   | 2,60   | 0,0910  | 88,0               | 59                   |
| 160L   | 7,5                                | 715                  | 18,10                                 | 100,00                           | 0,70                     | 86,3                          | 5,41  | 2,40   | 2,80   | 0,1310  | 118,0              | 59                   |
| 180L   | 11                                 | 717                  | 26,10                                 | 147,45                           | 0,72                     | 84,5                          | 4,00  | 1,40   | 2,20   | 0,2000  | 165,0              | 82                   |
| 200L   | 15                                 | 732                  | 32,40                                 | 196,94                           | 0,76                     | 88,0                          | 5,00  | 1,80   | 2,80   | 0,3300  | 223,0              | 83                   |
| 225S   | 18,5                               | 732                  | 39,40                                 | 242,90                           | 0,77                     | 88,0                          | 5,00  | 1,80   | 2,80   | 0,4000  | 245,0              | 84                   |
| 225M   | 22                                 | 729                  | 45,10                                 | 290,04                           | 0,79                     | 88,5                          | 5,00  | 1,80   | 2,80   | 0,4700  | 256,0              | 86                   |
| 250M   | 30                                 | 729                  | 62,10                                 | 395,51                           | 0,78                     | 89,0                          | 6,00  | 2,00   | 3,00   | 0,5600  | 282,0              | 88                   |
| 280S   | 37                                 | 729                  | 70,30                                 | 487,79                           | 0,84                     | 91,0                          | 6,00  | 2,00   | 2,80   | 1,6400  | 400,0              | 90                   |
| 280M   | 45                                 | 730                  | 85,50                                 | 592,45                           | 0,84                     | 91,2                          | 6,00  | 2,00   | 3,30   | 1,8300  | 460,0              | 91                   |
| 315S   | 55                                 | 735                  | 101,30                                | 719,18                           | 0,84                     | 92,8                          | 7,50  | 2,20   | 3,00   | 3,0750  | 505,0              | 92                   |
| 315S/M   | 75                                 | 735                  | 139,40                                | 980,70                           | 0,84                     | 93,0                          | 6,50  | 2,00   | 3,00   | 3,4000  | 600,0              | 93                   |
| 315S/M   | 90                                 | 730                  | 163,10                                | 1184,90                          | 0,86                     | 92,6                          | 7,00  | 2,20   | 3,00   | 3,6250  | 704,0              | 94                   |
| 315M/L   | 110                                | 740                  | 198,00                                | 1428,64                          | 0,86                     | 93,2                          | 7,00  | 2,00   | 2,50   | 5,4250  | 940,0              | 96                   |
| 315M/L   | 132                                | 739                  | 231,50                                | 1716,68                          | 0,87                     | 94,6                          | 7,00  | 2,00   | 2,70   | 7,8000  | 1065,0             | 98                   |

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## Dimensions

### three phase motors - Performance B3

| IEC     | a  | b   | c   | d    | e  | fa | f  | gd | ga   |
|---------|----|-----|-----|------|----|----|----|----|------|
| 56      | 9  | 20  | M4  | 10   | 14 | 15 | 3  | 3  | 10,2 |
| 63      | 11 | 23  | M4  | 10   | 14 | 15 | 4  | 4  | 12,5 |
| 71      | 14 | 30  | M5  | 12,5 | 17 | 25 | 5  | 5  | 16   |
| 80      | 19 | 40  | M6  | 16,5 | 21 | 30 | 6  | 6  | 21,5 |
| 90      | 24 | 50  | M8  | 19   | 25 | 35 | 8  | 7  | 27   |
| 100/112 | 28 | 60  | M10 | 22   | 30 | 50 | 8  | 7  | 31   |
| 132     | 38 | 80  | M12 | 32   | 44 | 60 | 10 | 8  | 41   |
| 160     | 42 | 110 | M16 | 30   | 44 | 90 | 12 | 8  | 45   |

|      |     |     |     |    |     |      |     |     |     |     |      |     |     |     |     |      |     |    | Motors with brake |     |
|------|-----|-----|-----|----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|----|-------------------|-----|
| IEC  | A   | B   | C   | D  | E   | F    | HD  | HC  | H   | L   | LB   | M   | Z   | BB  | AB  | K    | AC  | HA | LL                | LLB |
| 56   | 90  | 71  | 36  | 9  | 20  | 21   | 148 | 110 | 56  | 193 | 58,5 | 74  | 74  | 90  | 108 | 6    | 110 | 9  | 235               | 100 |
| 63   | 100 | 80  | 40  | 11 | 23  | 24,5 | 161 | 125 | 63  | 212 | 62,5 | 74  | 74  | 105 | 120 | 7    | 123 | 10 | 260               | 110 |
| 71   | 112 | 90  | 45  | 14 | 30  | 32   | 178 | 139 | 71  | 246 | 76   | 74  | 74  | 108 | 136 | 7    | 136 | 11 | 300               | 130 |
| 80   | 125 | 100 | 50  | 19 | 40  | 31,5 | 202 | 157 | 80  | 275 | 81   | 89  | 89  | 125 | 154 | 9,5  | 156 | 11 | 334               | 140 |
| 90S  | 140 | 100 | 56  | 24 | 50  | 34,5 | 217 | 177 | 90  | 301 | 90   | 89  | 89  | 130 | 174 | 9,5  | 176 | 13 | 361               | 150 |
| 90L  | 140 | 125 | 56  | 24 | 50  | 34,5 | 217 | 177 | 90  | 326 | 90   | 89  | 89  | 155 | 174 | 11,2 | 176 | 13 | 386               | 150 |
| 100  | 160 | 140 | 63  | 28 | 60  | 42,5 | 238 | 196 | 100 | 364 | 97   | 89  | 89  | 175 | 192 | 11,2 | 194 | 14 | 437               | 170 |
| 112  | 190 | 140 | 70  | 28 | 60  | 43   | 262 | 220 | 112 | 388 | 109  | 89  | 89  | 175 | 224 | 11,2 | 218 | 14 | 474               | 190 |
| 132S | 216 | 140 | 89  | 38 | 80  | 51   | 311 | 260 | 132 | 450 | 120  | 104 | 104 | 180 | 260 | 12   | 257 | 16 | 550               | 220 |
| 132M | 216 | 178 | 89  | 38 | 80  | 51   | 311 | 260 | 132 | 488 | 120  | 104 | 104 | 218 | 260 | 12   | 257 | 16 | 588               | 220 |
| 160M | 254 | 210 | 103 | 42 | 110 | 54   | 400 | 315 | 160 | 602 | 135  | 186 | 186 | 264 | 318 | 14   | 310 | 23 | 717               | 250 |
| 160L | 254 | 254 | 103 | 42 | 110 | 54   | 400 | 315 | 160 | 646 | 135  | 186 | 186 | 308 | 318 | 14   | 310 | 23 | 761               | 250 |

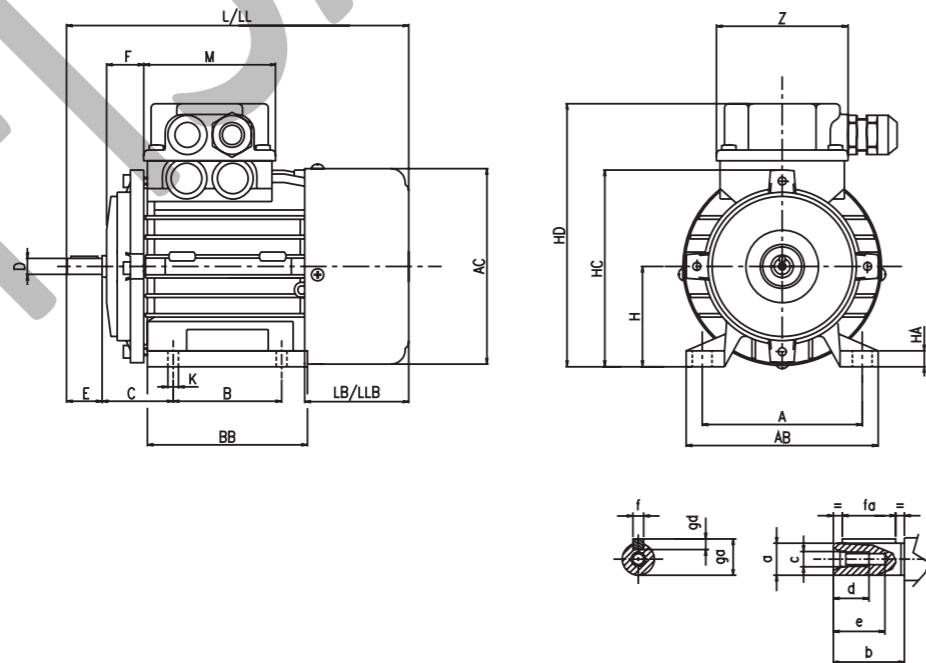
The dimensions shown in tables are orientative only and not binding. Contact our technical department for more accurate information.

# Dimensions

## three phase motors - B3 Form

| IEC    | a  | f  | ga   | A   | B   | C   | D  | E   | HD  | H   | L    | BB  | AB  | K    | HA |
|--------|----|----|------|-----|-----|-----|----|-----|-----|-----|------|-----|-----|------|----|
| 180M   | 48 | 14 | 51,5 | 279 | 279 | 121 | 48 | 110 | 435 | 180 | 700  | 320 | 340 | 14,5 | 20 |
| 180L   | 48 | 14 | 51,5 | 279 | 279 | 121 | 48 | 110 | 435 | 180 | 700  | 320 | 340 | 14,5 | 20 |
| 200L   | 55 | 16 | 59   | 318 | 305 | 133 | 55 | 110 | 496 | 200 | 790  | 370 | 398 | 18,5 | 32 |
| 225S   | 60 | 18 | 64   | 356 | 286 | 149 | 60 | 148 | 520 | 225 | 820  | 370 | 436 | 18,5 | 32 |
| 225M   | 55 | 16 | 59   | 356 | 311 | 149 | 55 | 110 | 520 | 225 | 790  | 370 | 436 | 18,5 | 32 |
| 225M   | 60 | 18 | 64   | 365 | 311 | 149 | 60 | 140 | 520 | 225 | 820  | 370 | 436 | 18,5 | 32 |
| 250M   | 60 | 18 | 64   | 406 | 349 | 168 | 60 | 140 | 590 | 250 | 900  | 420 | 505 | 24   | 32 |
| 250M   | 65 | 18 | 69   | 406 | 349 | 168 | 65 | 140 | 590 | 250 | 900  | 420 | 505 | 24   | 32 |
| 280S   | 65 | 18 | 69   | 457 | 368 | 190 | 65 | 140 | 630 | 280 | 930  | 450 | 550 | 24   | 32 |
| 280S   | 75 | 20 | 79,5 | 457 | 368 | 190 | 75 | 140 | 630 | 280 | 930  | 450 | 550 | 24   | 32 |
| 280M   | 65 | 18 | 69   | 457 | 419 | 190 | 65 | 140 | 630 | 280 | 980  | 500 | 550 | 24   | 32 |
| 280M   | 75 | 20 | 79,5 | 457 | 419 | 190 | 75 | 140 | 630 | 280 | 980  | 500 | 550 | 24   | 32 |
| 315S   | 65 | 18 | 69   | 508 | 406 | 216 | 65 | 140 | 675 | 315 | 983  | 505 | 645 | 28   | 32 |
| 315S   | 80 | 22 | 85   | 508 | 406 | 216 | 80 | 170 | 675 | 315 | 1013 | 505 | 645 | 28   | 32 |
| 315S/M | 65 | 18 | 69   | 508 | 457 | 216 | 65 | 140 | 675 | 315 | 1038 | 560 | 645 | 28   | 32 |
| 315S/M | 80 | 22 | 85   | 508 | 457 | 216 | 80 | 170 | 675 | 315 | 1068 | 560 | 645 | 28   | 32 |
| 315M/L | 65 | 18 | 69   | 508 | 508 | 216 | 65 | 140 | 770 | 315 | 1380 | 620 | 640 | 28   | 40 |
| 315M/L | 80 | 22 | 85   | 508 | 508 | 216 | 80 | 170 | 770 | 315 | 1320 | 620 | 640 | 28   | 40 |

The dimensions shown in tables are orientative only and not binding. Contact our technical department for more accurate information



## three phase motors - B5 Form

| IEC     | a  | b   | c   | d    | e  | fa | f  | gd | ga   |
|---------|----|-----|-----|------|----|----|----|----|------|
| 56      | 9  | 20  | M4  | 10   | 14 | 15 | 3  | 3  | 10,2 |
| 63      | 11 | 23  | M4  | 10   | 14 | 15 | 4  | 4  | 12,5 |
| 71      | 14 | 30  | M5  | 12,5 | 17 | 25 | 5  | 5  | 16   |
| 80      | 19 | 40  | M6  | 16,5 | 21 | 30 | 6  | 6  | 21,5 |
| 90      | 24 | 50  | M8  | 19   | 25 | 35 | 8  | 7  | 27   |
| 100/112 | 28 | 60  | M10 | 22   | 30 | 50 | 8  | 7  | 31   |
| 132     | 38 | 80  | M12 | 32   | 44 | 60 | 10 | 8  | 41   |
| 160     | 42 | 110 | M16 | 30   | 44 | 90 | 12 | 8  | 45   |

|      |     |     |     |    |     |      |    |     |     |     |      |     |     |     |      |      |       |     | Motors with brakes |     |  |
|------|-----|-----|-----|----|-----|------|----|-----|-----|-----|------|-----|-----|-----|------|------|-------|-----|--------------------|-----|--|
| IEC  | N   | M   | P   | D  | E   | O    | S  | Q   | L   | LB  | LC   | X   | Z   | T   | LA   | Y    | AC    | LL  | LLB                | LLC |  |
| 56   | 80  | 100 | 120 | 9  | 20  | 24,5 | 7  | 152 | 193 | 173 | 58,5 | 74  | 74  | 3   | 9    | 91,5 | 110,0 | 235 | 215                | 100 |  |
| 63   | 95  | 115 | 140 | 11 | 23  | 27   | 9  | 168 | 212 | 189 | 62,5 | 74  | 74  | 3   | 10,5 | 98   | 123   | 260 | 237                | 110 |  |
| 71   | 110 | 130 | 160 | 14 | 30  | 35   | 9  | 186 | 246 | 216 | 76   | 74  | 74  | 3,5 | 10   | 105  | 136   | 300 | 270                | 130 |  |
| 80   | 130 | 165 | 200 | 19 | 40  | 34,6 | 12 | 222 | 275 | 235 | 81   | 89  | 89  | 3,5 | 11   | 122  | 156   | 334 | 294                | 140 |  |
| 90S  | 130 | 165 | 200 | 24 | 50  | 38,6 | 12 | 227 | 301 | 251 | 90   | 89  | 89  | 3,5 | 10,5 | 127  | 176   | 361 | 311                | 150 |  |
| 90L  | 130 | 165 | 200 | 24 | 50  | 38,6 | 12 | 227 | 326 | 276 | 90   | 89  | 89  | 3,5 | 10,5 | 127  | 176   | 386 | 336                | 150 |  |
| 100  | 180 | 215 | 250 | 28 | 60  | 44,5 | 14 | 263 | 364 | 304 | 97   | 89  | 89  | 4   | 15,5 | 138  | 194   | 437 | 377                | 170 |  |
| 112  | 180 | 215 | 250 | 28 | 60  | 47,6 | 14 | 275 | 388 | 328 | 104  | 89  | 89  | 4   | 15,5 | 150  | 218   | 474 | 414                | 190 |  |
| 132S | 230 | 265 | 300 | 38 | 80  | 54,5 | 14 | 327 | 450 | 370 | 120  | 104 | 104 | 4   | 20   | 177  | 257   | 550 | 470                | 220 |  |
| 132M | 230 | 265 | 300 | 38 | 80  | 54,5 | 14 | 327 | 488 | 408 | 120  | 104 | 104 | 4   | 20   | 177  | 257   | 588 | 508                | 220 |  |
| 160M | 250 | 300 | 350 | 42 | 110 | 56   | 18 | 415 | 602 | 492 | 135  | 186 | 186 | 5   | 14   | 240  | 310   | 717 | 607                | 250 |  |
| 160L | 250 | 300 | 350 | 42 | 110 | 56   | 18 | 415 | 646 | 536 | 135  | 186 | 186 | 5   | 14   | 240  | 310   | 761 | 651                | 250 |  |

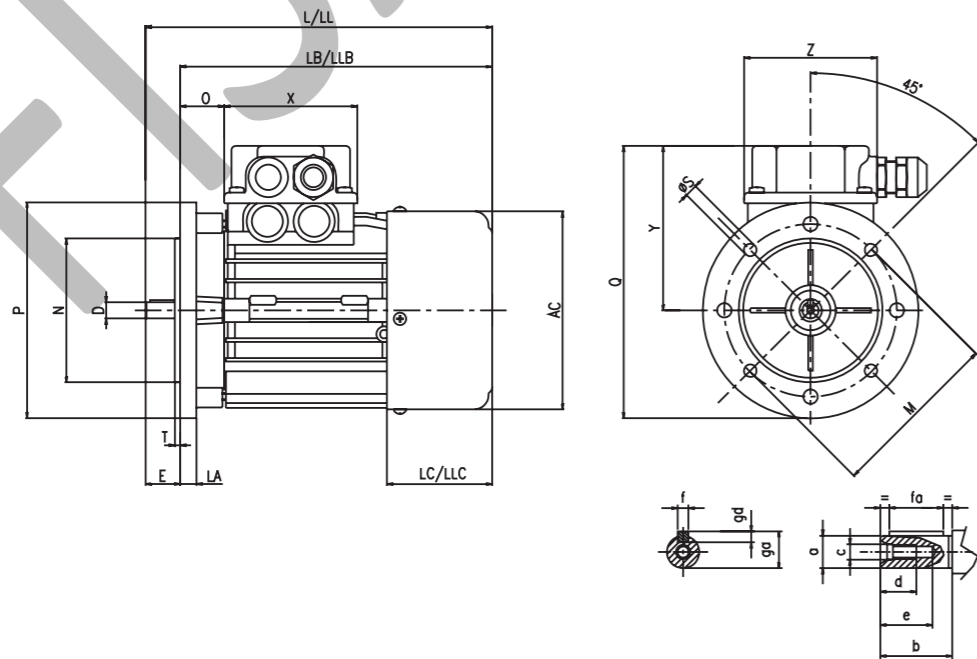
The dimensions shown in tables are orientative only and not binding. Contact our technical department for more accurate information



### Three phase motors - B5 Form

| IEC    | a  | b   | f  | ga   | N   | M   | P   | D  | E   | S    | L    | T |
|--------|----|-----|----|------|-----|-----|-----|----|-----|------|------|---|
| 180M   | 48 | 105 | 14 | 51,5 | 250 | 300 | 350 | 48 | 110 | 18,5 | 625  | 5 |
| 180L   | 48 | 105 | 14 | 51,5 | 250 | 300 | 350 | 48 | 110 | 18,5 | 625  | 5 |
| 200L   | 55 | 105 | 16 | 59   | 300 | 350 | 400 | 55 | 110 | 18,5 | 790  | 5 |
| 225S   | 60 | 135 | 18 | 64   | 350 | 400 | 450 | 60 | 140 | 18,5 | 820  | 5 |
| 225M   | 55 | 105 | 16 | 59   | 350 | 400 | 450 | 55 | 110 | 18,5 | 790  | 5 |
| 225M   | 60 | 135 | 18 | 64   | 350 | 400 | 450 | 60 | 140 | 18,5 | 820  | 5 |
| 250M   | 60 | 135 | 18 | 64   | 450 | 500 | 550 | 60 | 140 | 18,5 | 900  | 5 |
| 250M   | 65 | 135 | 18 | 69   | 450 | 500 | 550 | 65 | 140 | 18,5 | 900  | 5 |
| 280S   | 65 | 135 | 18 | 69   | 450 | 500 | 550 | 65 | 140 | 18,5 | 930  | 5 |
| 280S   | 75 | 135 | 20 | 79,5 | 450 | 500 | 550 | 75 | 140 | 18,5 | 930  | 5 |
| 280M   | 65 | 135 | 18 | 69   | 450 | 500 | 550 | 65 | 140 | 18,5 | 980  | 5 |
| 280M   | 75 | 135 | 20 | 79,5 | 450 | 500 | 550 | 75 | 140 | 18,5 | 980  | 5 |
| 315S   | 65 | 134 | 18 | 69   | 550 | 600 | 660 | 65 | 140 | 24   | 983  | 6 |
| 315S   | 80 | 174 | 22 | 85   | 550 | 600 | 660 | 80 | 170 | 24   | 1013 | 6 |
| 315S/M | 65 | 134 | 18 | 69   | 550 | 600 | 600 | 65 | 140 | 24   | 1038 | 6 |
| 315S/M | 80 | 174 | 22 | 85   | 550 | 600 | 600 | 80 | 170 | 24   | 1068 | 6 |
| 315M/L | 65 | 134 | 18 | 69   | 550 | 600 | 660 | 65 | 140 | 24   | 1280 | 6 |
| 315M/L | 80 | 174 | 22 | 85   | 550 | 600 | 660 | 80 | 170 | 24   | 1320 | 6 |

The dimensions shown in tables are orientative only and not binding. Contact our technical department for more accurate information

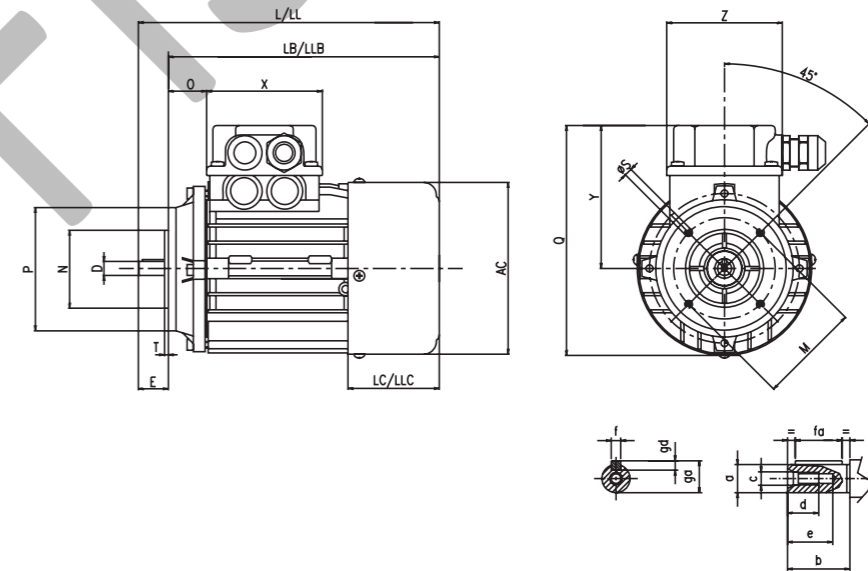


### three phase motors - B14 Form

| IEC     | a  | b   | c   | d    | e  | fa | f  | gd | ga   |
|---------|----|-----|-----|------|----|----|----|----|------|
| 56      | 9  | 20  | M4  | 10   | 14 | 15 | 3  | 3  | 10,2 |
| 63      | 11 | 23  | M4  | 10   | 14 | 15 | 4  | 4  | 12,5 |
| 71      | 14 | 30  | M5  | 12,5 | 17 | 25 | 5  | 5  | 16   |
| 80      | 19 | 40  | M6  | 16,5 | 21 | 30 | 6  | 6  | 21,5 |
| 90      | 24 | 50  | M8  | 19   | 25 | 35 | 8  | 7  | 27   |
| 100/112 | 28 | 60  | M10 | 22   | 30 | 50 | 8  | 7  | 31   |
| 132     | 38 | 80  | M12 | 32   | 44 | 60 | 10 | 8  | 41   |
| 160     | 42 | 110 | M16 | 30   | 44 | 90 | 12 | 8  | 45   |

|      |     |     |     |    |     |      |     |     |     |     |      |     |     |     |      |       | Motors with brake |     |     |
|------|-----|-----|-----|----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|------|-------|-------------------|-----|-----|
| IEC  | N   | M   | P   | D  | E   | O    | S   | Q   | L   | LB  | LC   | X   | Z   | T   | Y    | AC    | LL                | LLB | LLC |
| 56   | 50  | 65  | 80  | 9  | 20  | 24,5 | M5  | 147 | 193 | 173 | 58,5 | 74  | 74  | 2   | 91,5 | 110   | 235               | 215 | 100 |
| 63   | 60  | 75  | 90  | 11 | 23  | 27   | M5  | 159 | 212 | 189 | 62,5 | 74  | 74  | 2   | 98   | 122   | 260               | 237 | 110 |
| 71   | 70  | 85  | 105 | 14 | 30  | 35   | M6  | 173 | 246 | 216 | 76   | 74  | 74  | 2,5 | 105  | 136   | 300               | 270 | 130 |
| 80   | 80  | 100 | 120 | 19 | 40  | 34   | M6  | 199 | 275 | 235 | 81   | 89  | 89  | 3   | 122  | 155,5 | 334               | 294 | 140 |
| 90S  | 95  | 115 | 140 | 24 | 50  | 38   | M8  | 214 | 301 | 251 | 90   | 89  | 89  | 3   | 127  | 176   | 361               | 311 | 150 |
| 90L  | 95  | 115 | 140 | 24 | 50  | 38   | M8  | 214 | 326 | 276 | 90   | 89  | 89  | 3   | 127  | 176   | 386               | 336 | 150 |
| 100  | 110 | 130 | 160 | 28 | 60  | 44,5 | M8  | 235 | 364 | 304 | 97   | 89  | 89  | 3,5 | 138  | 194   | 437               | 377 | 170 |
| 112  | 110 | 130 | 160 | 28 | 60  | 47,5 | M8  | 259 | 388 | 328 | 104  | 89  | 89  | 3,5 | 150  | 218   | 474               | 414 | 190 |
| 132S | 130 | 165 | 200 | 38 | 80  | 55   | M10 | 305 | 450 | 370 | 120  | 104 | 104 | 3,5 | 177  | 257   | 550               | 470 | 220 |
| 132M | 130 | 165 | 200 | 38 | 80  | 55   | M10 | 305 | 488 | 408 | 120  | 104 | 104 | 3,5 | 177  | 257   | 588               | 508 | 220 |
| 160M | 180 | 215 | 252 | 42 | 110 | 55,5 | M12 | 394 | 602 | 492 | 135  | 186 | 186 | 4   | 240  | 310   | 717               | 607 | 250 |
| 160L | 180 | 215 | 252 | 42 | 110 | 55,5 | M12 | 394 | 646 | 536 | 135  | 186 | 186 | 4   | 240  | 310   | 761               | 651 | 250 |

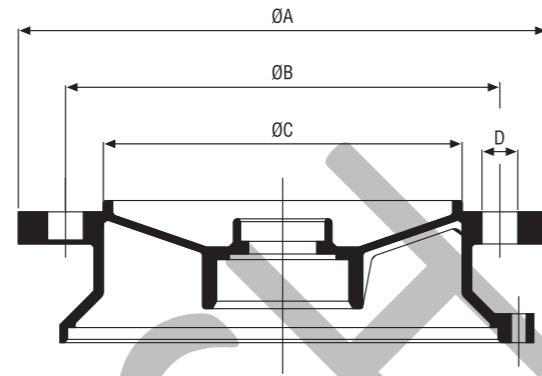
The dimensions shown in tables are orientative only and not binding. Contact our technical department for more accurate information



## Special flange dimensions

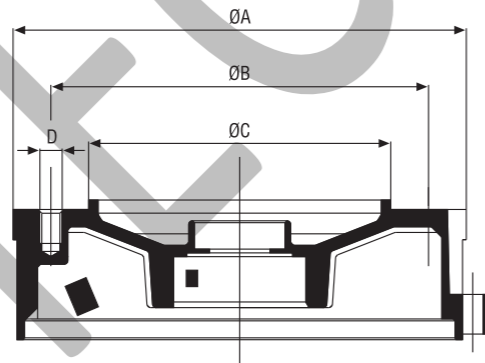
### Reduced B5 flange

| IEC | A   | B   | C   | D    |
|-----|-----|-----|-----|------|
| 71  | 140 | 115 | 95  | 9,5  |
| 80  | 160 | 130 | 110 | 9,5  |
| 90  | 160 | 130 | 110 | 9,5  |
| 100 | 200 | 165 | 130 | 11,5 |
| 112 | 160 | 130 | 110 | 9    |
| 132 | 252 | 215 | 180 | 14   |



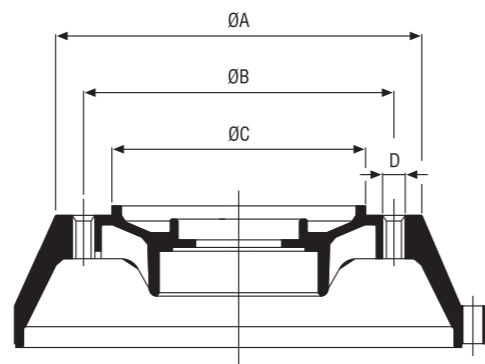
### Increased B14 flange

| IEC | A   | B   | C   | D   |
|-----|-----|-----|-----|-----|
| 63  | 105 | 85  | 70  | M5  |
| 71  | 120 | 100 | 80  | M6  |
| 80  | 140 | 115 | 95  | M8  |
| 90  | 160 | 130 | 110 | M8  |
| 100 | 200 | 165 | 130 | M10 |



### Reduced B14 flange

| IEC | A   | B   | C  | D  |
|-----|-----|-----|----|----|
| 63  | 80  | 65  | 50 | M5 |
| 71  | 90  | 75  | 60 | M6 |
| 80  | 105 | 85  | 70 | M6 |
| 90  | 120 | 100 | 80 | M8 |
| 100 | 140 | 115 | 95 | M8 |
| 112 | 160 | 115 | 95 | M8 |



The dimensions shown in tables are orientative only and not binding. Contact our technical department for more accurate information

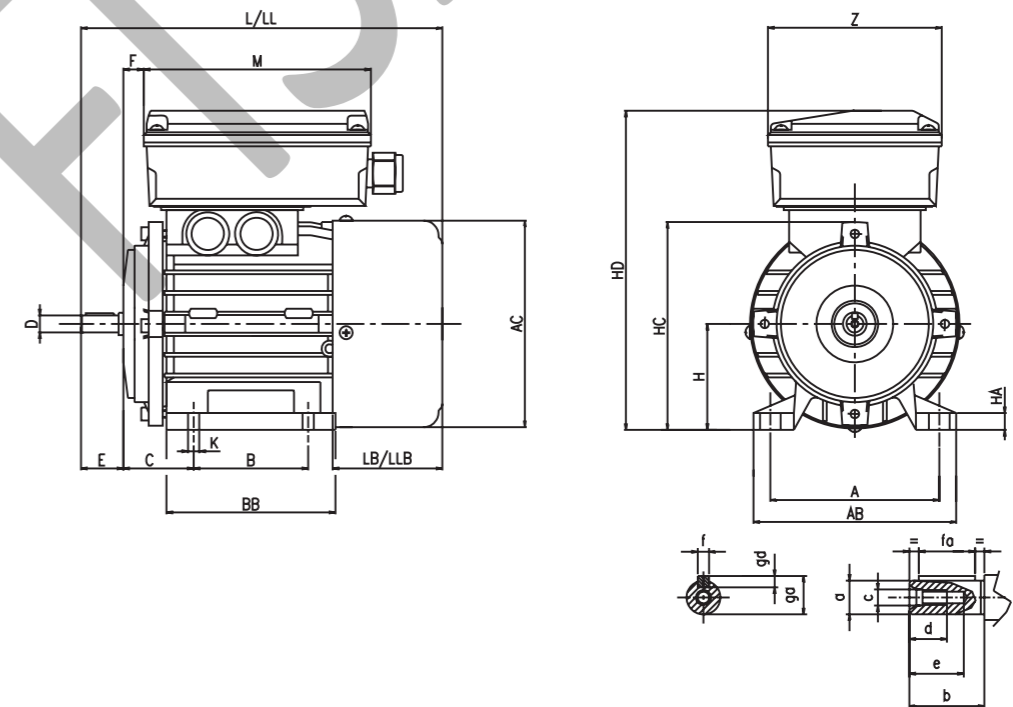
## Dimensions

### Single phase motor - B3 Form

| IEC | a  | b  | c   | d    | e  | fa | f | gd | ga   |
|-----|----|----|-----|------|----|----|---|----|------|
| 56  | 9  | 20 | M4  | 10   | 14 | 15 | 3 | 3  | 10,2 |
| 63  | 11 | 23 | M4  | 10   | 14 | 15 | 4 | 4  | 12,5 |
| 71  | 14 | 30 | M5  | 12,5 | 17 | 25 | 5 | 5  | 16   |
| 80  | 19 | 40 | M6  | 16,5 | 21 | 30 | 6 | 6  | 21,5 |
| 90  | 24 | 50 | M8  | 19   | 25 | 35 | 8 | 7  | 27   |
| 100 | 28 | 60 | M10 | 22   | 30 | 50 | 8 | 7  | 31   |

|     |     |     |    |    |    |      |     |     |     |     |      |     |     |     |     |      |     |    | Motors with brake |     |
|-----|-----|-----|----|----|----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|----|-------------------|-----|
| IEC | A   | B   | C  | D  | E  | F    | HD  | HC  | H   | L   | LB   | M   | Z   | BB  | AB  | K    | AC  | HA | LL                | LLB |
| 56  | 90  | 71  | 36 | 9  | 20 | 11   | 170 | 110 | 56  | 193 | 58,5 | 121 | 93  | 90  | 108 | 6    | 110 | 9  | 235               | 100 |
| 63  | 100 | 80  | 40 | 11 | 23 | 14,5 | 182 | 125 | 63  | 212 | 62,5 | 121 | 93  | 105 | 120 | 7    | 123 | 10 | 260               | 110 |
| 71  | 112 | 90  | 45 | 14 | 30 | 22   | 200 | 139 | 71  | 246 | 76   | 121 | 93  | 108 | 136 | 7    | 136 | 11 | 300               | 130 |
| 80  | 125 | 100 | 50 | 19 | 40 | 15,5 | 232 | 157 | 80  | 275 | 81   | 146 | 120 | 125 | 154 | 9,5  | 156 | 11 | 334               | 140 |
| 90S | 140 | 100 | 56 | 24 | 50 | 20   | 247 | 177 | 90  | 301 | 90   | 146 | 120 | 130 | 174 | 9,5  | 176 | 13 | 361               | 150 |
| 90L | 140 | 125 | 56 | 24 | 50 | 20   | 247 | 177 | 90  | 326 | 90   | 146 | 120 | 155 | 174 | 11,2 | 176 | 13 | 386               | 150 |
| 100 | 160 | 140 | 63 | 28 | 60 | 26,5 | 268 | 196 | 100 | 364 | 97   | 146 | 120 | 175 | 192 | 11,2 | 194 | 14 | 437               | 170 |

The dimensions shown in tables are orientative only and not binding. Contact our technical department for more accurate information



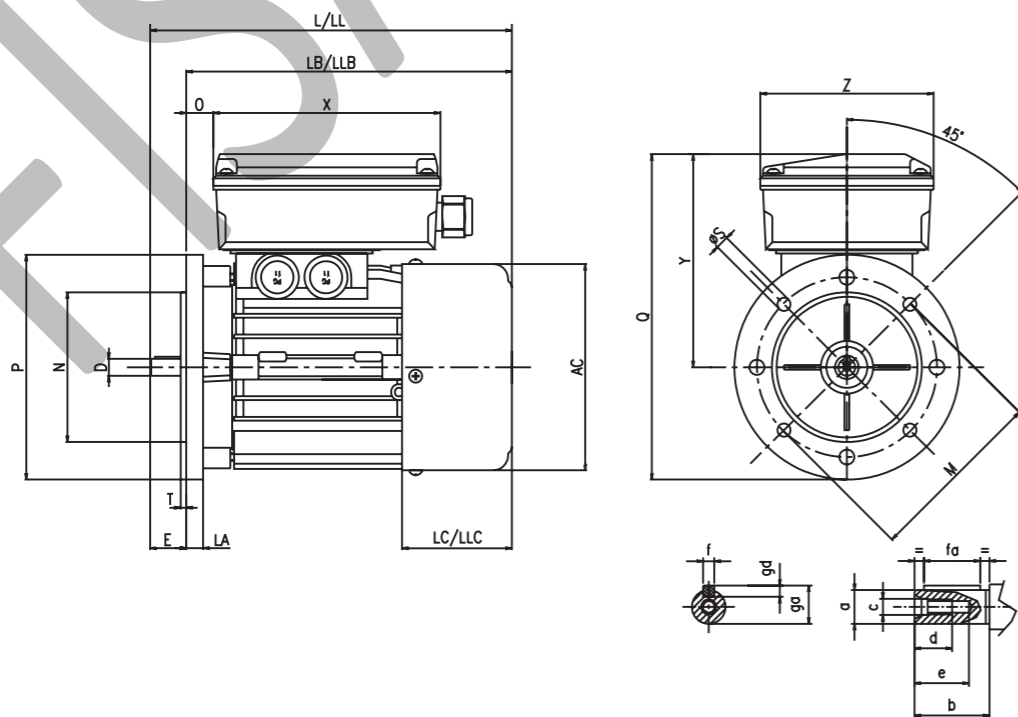
# Dimensions

## Single phase motor - B5 Form

| IEC | a  | b  | c   | d    | e  | fa | f | gd | ga   |
|-----|----|----|-----|------|----|----|---|----|------|
| 56  | 9  | 20 | M4  | 10   | 14 | 15 | 3 | 3  | 10,2 |
| 63  | 11 | 23 | M4  | 10   | 14 | 15 | 4 | 4  | 12,5 |
| 71  | 14 | 30 | M5  | 12,5 | 17 | 25 | 5 | 5  | 16   |
| 80  | 19 | 40 | M6  | 16,5 | 21 | 30 | 6 | 6  | 21,5 |
| 90  | 24 | 50 | M8  | 19   | 25 | 35 | 8 | 7  | 27   |
| 100 | 28 | 60 | M10 | 22   | 30 | 50 | 8 | 7  | 31   |

|     |     |     |     |    |    |      |    |     |     |     |      |     |     |     |      |     | Motors with brake |     |     |     |
|-----|-----|-----|-----|----|----|------|----|-----|-----|-----|------|-----|-----|-----|------|-----|-------------------|-----|-----|-----|
| IEC | N   | M   | P   | D  | E  | O    | S  | Q   | L   | LB  | LC   | X   | Z   | T   | LA   | Y   | AC                | LL  | LLB | LLC |
| 56  | 80  | 100 | 120 | 9  | 20 | 14,5 | 7  | 174 | 193 | 173 | 58,5 | 121 | 93  | 3   | 9    | 114 | 110               | 235 | 215 | 100 |
| 63  | 95  | 115 | 140 | 11 | 23 | 17   | 9  | 189 | 212 | 189 | 62,5 | 121 | 93  | 3   | 10,5 | 119 | 123               | 260 | 237 | 110 |
| 71  | 110 | 130 | 160 | 14 | 30 | 25   | 9  | 208 | 246 | 216 | 76   | 121 | 93  | 3,5 | 10   | 128 | 136               | 300 | 270 | 130 |
| 80  | 130 | 165 | 200 | 19 | 40 | 18,5 | 12 | 252 | 275 | 235 | 81   | 146 | 120 | 3,5 | 11   | 152 | 156               | 334 | 294 | 140 |
| 90S | 130 | 165 | 200 | 24 | 50 | 22,5 | 12 | 257 | 301 | 251 | 90   | 146 | 120 | 3,5 | 10,5 | 157 | 176               | 361 | 311 | 150 |
| 90L | 130 | 165 | 200 | 24 | 50 | 22,5 | 12 | 257 | 326 | 276 | 90   | 146 | 120 | 3,5 | 10,5 | 157 | 176               | 386 | 336 | 150 |
| 100 | 180 | 215 | 250 | 28 | 60 | 28,5 | 14 | 293 | 364 | 304 | 97   | 146 | 120 | 4   | 15,5 | 168 | 194               | 437 | 377 | 170 |

The dimensions shown in tables are orientative only and not binding. Contact our technical department for more accurate information

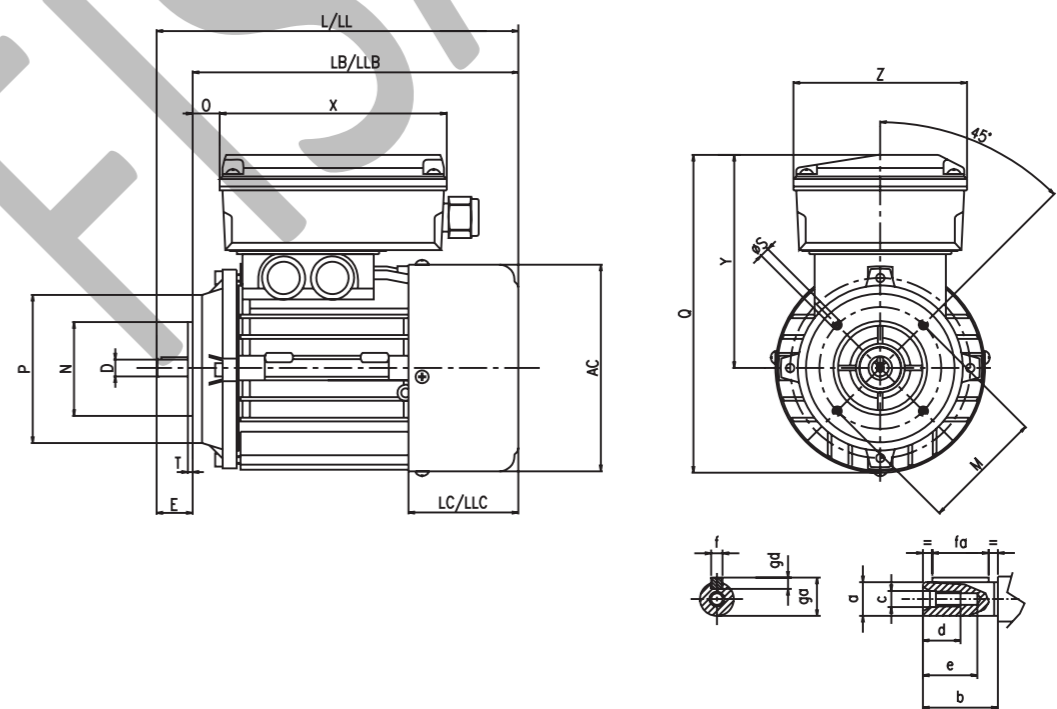


## Single phase motor - B14 Form

| IEC | a  | b  | c   | d    | e  | fa | f | gd | ga   |
|-----|----|----|-----|------|----|----|---|----|------|
| 56  | 9  | 20 | M4  | 10   | 14 | 15 | 3 | 3  | 10,2 |
| 63  | 11 | 23 | M4  | 10   | 14 | 15 | 4 | 4  | 12,5 |
| 71  | 14 | 30 | M5  | 12,5 | 17 | 25 | 5 | 5  | 16   |
| 80  | 19 | 40 | M6  | 16,5 | 21 | 30 | 6 | 6  | 21,5 |
| 90  | 24 | 50 | M8  | 19   | 25 | 35 | 8 | 7  | 27   |
| 100 | 28 | 60 | M10 | 22   | 30 | 50 | 8 | 7  | 31   |

|     |     |     |     |    |    |      |    |     |     |     |      |     |     |     |     |     | Motors with brake |     |     |
|-----|-----|-----|-----|----|----|------|----|-----|-----|-----|------|-----|-----|-----|-----|-----|-------------------|-----|-----|
| IEC | N   | M   | P   | D  | E  | O    | S  | Q   | L   | LB  | LC   | X   | Z   | T   | Y   | AC  | LL                | LLB | LLC |
| 56  | 50  | 65  | 80  | 9  | 20 | 14,5 | M5 | 169 | 193 | 173 | 58,5 | 121 | 93  | 2   | 114 | 110 | 235               | 215 | 100 |
| 63  | 60  | 75  | 90  | 11 | 23 | 17   | M5 | 180 | 212 | 189 | 62,5 | 121 | 93  | 2   | 119 | 123 | 260               | 237 | 110 |
| 71  | 70  | 85  | 105 | 14 | 30 | 25   | M6 | 196 | 246 | 216 | 76   | 121 | 93  | 2,5 | 128 | 136 | 300               | 270 | 130 |
| 80  | 80  | 100 | 120 | 19 | 40 | 18,5 | M6 | 229 | 275 | 235 | 81   | 146 | 120 | 3   | 152 | 156 | 334               | 294 | 140 |
| 90S | 95  | 115 | 140 | 24 | 50 | 22,5 | M8 | 244 | 301 | 251 | 90   | 146 | 120 | 3   | 157 | 176 | 361               | 311 | 150 |
| 90L | 95  | 115 | 140 | 24 | 50 | 22,5 | M8 | 244 | 326 | 275 | 90   | 146 | 120 | 3   | 157 | 176 | 386               | 336 | 150 |
| 100 | 110 | 130 | 160 | 28 | 60 | 28,5 | M8 | 265 | 364 | 304 | 97   | 146 | 120 | 3,5 | 168 | 194 | 437               | 377 | 170 |

The dimensions shown in tables are orientative only and not binding. Contact our technical department for more accurate information



# Standard motor components

|    |                               |
|----|-------------------------------|
| 1  | Seal                          |
| 2  | clamping screw cap and flange |
| 3  | B5 flange                     |
| 4  | Bearing                       |
| 5  | Rotor shaft                   |
| 6  | Wavy washer                   |
| 7  | Motor cover                   |
| 8  | Fan                           |
| 9  | Fan cover                     |
| 10 | Fan conver clamping screw     |
| 11 | Key                           |
| 12 | Connection power strip        |
| 13 | Toothed washer                |
| 14 | Connection cover gasket       |
| 15 | Cap connection clamping screw |
| 16 | Connection cover              |
| 17 | Nut                           |
| 18 | Stator                        |
| 19 | Motor housing                 |

