

***F series***

*PARALLEL SHAFT HELICAL GEAR UNITS*

## F Series Parallel shaft helical gear units

Power range: 0.12–200kW

Ratio: 4.3 – 273 (imax: 17978)

Torque: 110–18000 N.m

### Features

- » Modular design makes short turnaround;
- » En-block casting housing and well rigidity structure, high load, stable transmission and low noisy;
- » Fluorine rubber oil seal prevent leakage;
- » Gear with advanced grinding and casting which showed good performance in working;
- » Good value for money and less maintains;

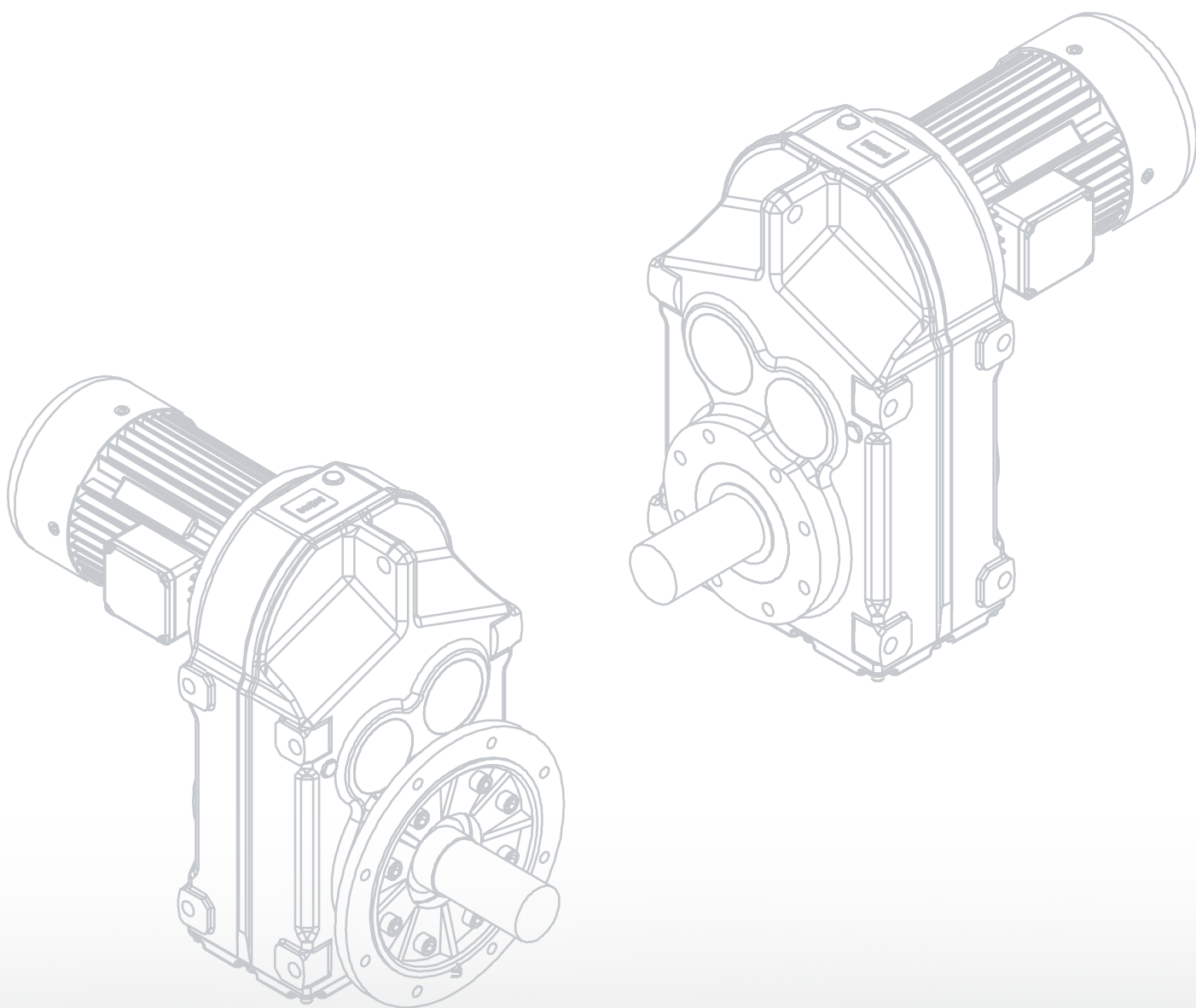
### Part characteristics

- » Housing materials are high strength grey cast iron and nodular cast iron;
- » Gears, pinions and bevel gears are made of high grade alloy with carburize-harden technology. Hardness of teeth surface reaches 58–62 HRC, grinding precision reaching class 5–6 and even 3 if required;
- » Shafts are made of alloy via heat treatment;
- » Standard accessories such a bearings and oil seals are provided by international a national famous brands;
- » Good assembly environment, standardized assembly technology, 100% strict quality assurance inspection and regular type test.

### Main application

- » Harbor & ship building
- » Hoist & transport
- » Electric power & energy
- » Coal & Mining
- » Cement & material
- » Paper industry
- » Chemical & recycling





## Note:

### you must conform to the following instructions!

- » The structure scheme, appearance diagram and other attached diagrams in sample are examples, there is no strict proportion requirement (The unmarked dimension units are mm)
- » The marked weight is average value, it has no constraint force
- » To prevent accidents, all the rotation parts are added with protective covers according to the safety regulations of the nation and region
- » Before debugging, you should carefully read instruction book
- » Gear unit is on running-permission status when delivered, you should add lubrication oil before putting it into running
- » The marked oil quantity in sample is only reference value, actual oil filling quantity should be the same with the mark on oil dipstick
- » Lubrication oil viscosity should be selected according to working situation and application environment temperature of gear units
- » You can only apply lubrication oil of internationally famous brand

## Product function mark



Oil dipstick



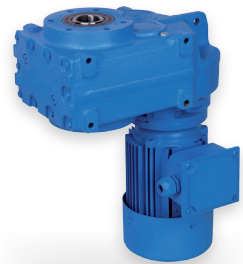
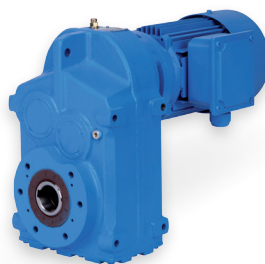
Breather



Oil filler

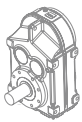


Oil drain



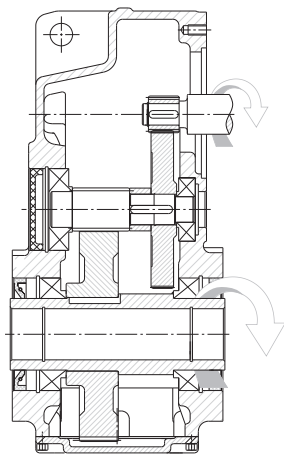
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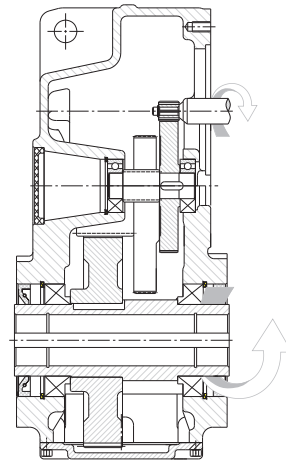


## 1 Sectional Drawings:

F



2-stage



3-stage

## 2 Type Designation

FF 97 A - 25.3 - Y-5.5 +T21 - B51 - 90

### F Series

- F* = Foot-mounted solid shaft with parallel key
- FH* = Foot-mounted hollow shaft with shrink disk
- FW* = Foot-mounted hollow shaft with parallel key
- FN* = Foot-mounted hollow shaft with involute spline
- FF* = Flange-mounted solid shaft with parallel key
- FL* = Flange-mounted hollow shaft with parallel key
- FHL* = Flange-mounted hollow shaft with shrink disk
- FNF* = Flange-mounted hollow shaft with involute spline
- FA* = Torque-arm-mounted hollow shaft with parallel key
- FHA* = Torque-arm-mounted hollow shaft with shrink disk
- FNA* = Torque-arm-mounted hollow shaft with involute spline
- FZ* = Short-flange-mounted hollow shaft with parallel key
- FHZ* = Short-flange-mounted hollow shaft with shrink disk
- FNZ* = Short-flange-mounted hollow shaft with involute spline

### Size

### Output Shaft Direction

- A\B*= Unidirectional output shaft
- S*= Bidirectional output shaft

### Nominal Ratio

### Input Part

- Y*= Motor
- AE*= Input Shaft
- AG*= Connection Flange

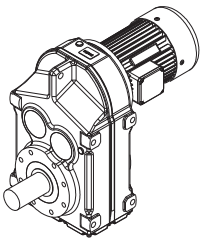
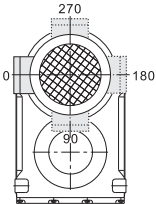
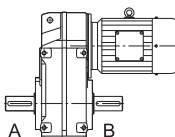
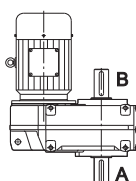
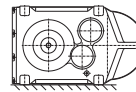
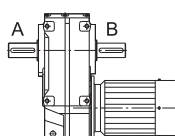
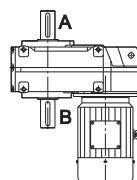
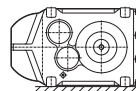
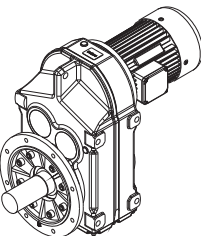
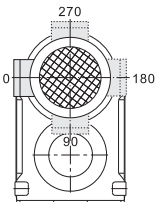
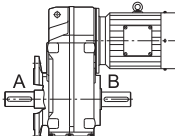
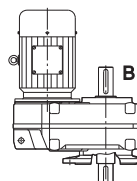
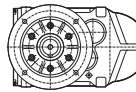
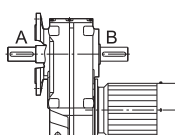
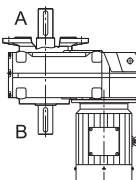
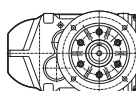
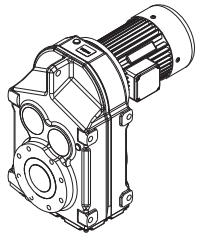
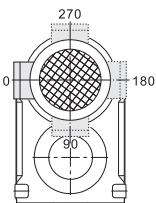
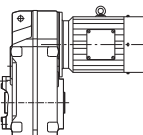
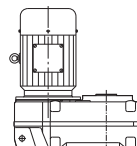
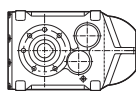
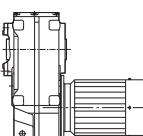
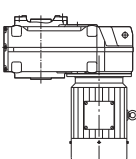
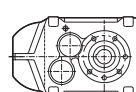
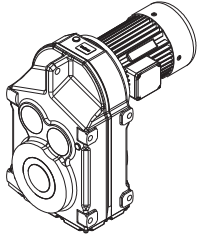
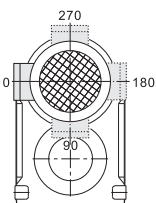
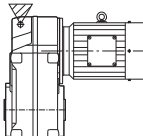
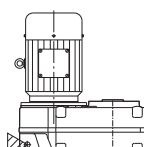
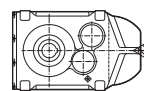
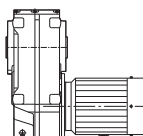
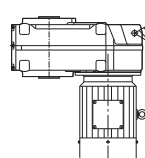
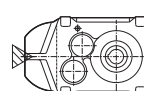
### Accessories and Special Requests

### Mounting Positions

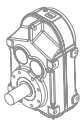
### Positions of Motor Terminal Box

Combi-type Designation: F87A/CRL47-295-Y-1.1+E01-B6-90

### 3 Mounting Positions, Position of Motor Terminal Box and Output Shaft Direction:

|   |   |  |   |  |
|---|---|--|---|--|
|  <p><b>F..FW..FH..FN..</b></p>     |    |  <p><b>B6</b></p>   |  <p><b>V5</b></p>   |  <p><b>B3</b></p>   |
|   |   |  <p><b>B61</b></p>  |  <p><b>V6</b></p>   |  <p><b>B31</b></p>  |
|  <p><b>FF..FL..FHL..FNF..</b></p> |    |  <p><b>B5</b></p>   |  <p><b>V1</b></p>   |  <p><b>B52</b></p>  |
|   |   |  <p><b>B51</b></p> |  <p><b>V3</b></p>  |  <p><b>B53</b></p> |
|  <p><b>FZ..FHZ..FNZ..</b></p>    |  |  <p><b>H1</b></p> |  <p><b>H5</b></p> |  <p><b>H4</b></p> |
|   |   |  <p><b>H2</b></p> |  <p><b>H6</b></p> |  <p><b>H3</b></p> |
|  <p><b>FA..FHA..FNA..</b></p>    |  |  <p><b>H1</b></p> |  <p><b>H5</b></p> |  <p><b>H4</b></p> |
|   |   |  <p><b>H2</b></p> |  <p><b>H6</b></p> |  <p><b>H3</b></p> |

F



#### 4 Type Selection and Example:

| Steps | Specification  | Symbol   | Calculate parameter  |                             |            |            |
|-------|--|--|--|-----------------------------|------------|------------|
| 1     | Driven Machine Factor  | f <sub>1</sub>   | Load Characteristic  | Operating hours per day (h) |            |            |
|       |  |  |  | ≤2                          | 2~10       | 10~24      |
|       |  |  | Uniform  | 1.00(1.00)                  | 1.00(1.25) | 1.25(1.50) |
|       |  |  | Moderate   | 1.00(1.25)                  | 1.25(1.50) | 1.50(1.75) |
|       |  |  | Heavy  | 1.25(1.50)                  | 1.50(1.75) | 1.75(2.00) |
|       |  |  | Note: Apply values in the brackets when starts per hour are 10 times or more.  |                             |            |            |
| 2     | Input Speed  | n <sub>1</sub>   | ≤1800r/min    Consult us if higher speed required.   |                             |            |            |
| 3     | Calculation of the Ratio   | i  | i=n <sub>1</sub> /n <sub>2</sub>   |                             |            |            |
| 4     | Transmission Efficiency  | η  | 2-stage  |                             | 96%        |            |
|       |  |  | 3-stage  |                             | 94%        |            |
| 5     | Calculation of the input power of the gear unit on basis of the torque and power required by the driven machine.   | P <sub>1</sub>   | P <sub>1</sub> =T <sub>2</sub> • n <sub>1</sub> /(9550 • i • η)   or   P <sub>1</sub> =P <sub>2</sub> / η  |                             |            |            |
| 6     | Determination of gear unit type referring to the table of transmission capacity after calculation, For directly-connected motor, require to refer to directly-connected motor power table. | T <sub>2N</sub> 、 P <sub>1N</sub>                                    | T <sub>2N</sub> ≥T <sub>2</sub> • f <sub>1</sub> or   P <sub>1N</sub> ≥P <sub>1</sub> • f <sub>1</sub>   |                             |            |            |
| 7     | Check the radial and axial forces on the shafts.   | F <sub>r1</sub> /F <sub>r2</sub><br>F <sub>a1</sub> /F <sub>a2</sub> | See P17/F.   |                             |            |            |
| 8     | Determination of Lubrication System  |  | Generally Splash Lubrication   |                             |            |            |
| 9     | Determination of Cooling System  |  | Generally Air Cooling  |                             |            |            |
| 10    | Determination of every item included in the Type Designation   |  | For details about Type Designation, see P 2/F.   |                             |            |            |
| 11    | Normal ambient conditions  |  | Ambient temperature -10 to 40℃, ample space, good ventilation, altitude not exceeding 1000m and common plant dust.                                   |                             |            |            |
| 12    | Special ambient conditions   |  | For higher or lower temperature, dusty sites, chemical reaction (acids, alkaline, etc), or open field (sunlight, ice, rain, etc), please consult us! |                             |            |            |

## Example

### 1) Geared motor

#### Known Criteria:

1. The power required by the driven machine  $P_2=2.2\text{kW}$ , speed  $n_2=51\text{r/min}$
2. Common motor: 4-pole, speed  $n_1=1450\text{r/min}$
3. Load characteristics: moderate, working 16 hours/d and starting 6 times/h
4. Mounting mode: flange-mounted, mounting position B52, A direction solid output shaft with parallel key, terminal box position 90

#### Selection Steps:

1. By referring to the table of Load Characteristic, we get the driven machine factor  $f_1=1.75$ .
2. Calculation of the Ratio:  
As  $i=n_1/n_2=1450/51=28.4$ , nominal ratio  $i_N=28.2$  is appropriate.
3. Calculation of the input power and determination of the motor power (transmission efficiency  $\eta=94\%$ ):  
 $P_1=P_2/\eta=2.2/0.94=2.3\text{kW}$ , so 3kW motor is selected.  
Refer to the directly-connected motor power table, it can be directly-connected.
4. Determination of the nominal power of the geared motor  $P_{1N}$ :  
 $P_{1N} \geq P_1 \cdot f_1/\eta=2.2 \times 1.75/0.94=4.1\text{kW}$
5. The type selected:  
**FF67A-28.2-Y-3-B52-90**

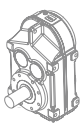
### 2) Gear Unit

#### Known Criteria:

1. The torque required by the driven machine  $T_2=1000\text{N} \cdot \text{m}$  and speed  $n_2=70\text{r/min}$
2. The motor supplied by the users: 4-pole, speed  $n_1=1450\text{r/min}$
3. Load characteristic: moderate, operating 8h/d continuously
4. Mounting mode: shaft input, foot-mounted, Hollow output shaft with parallel key mounting position B51.

#### Selection steps:

1. By referring to the table of Load Characteristic, we get the driven machine factor  $f_1=1.25$ .
2. Calculation of the ratio  $i_N$ :  
As  $i=n_1/n_2=1450/70=20.7$ , nominal ratio  $i_N=21.1$  is appropriate
3. Determination of the nominal torque  $T_{2N}$  and nominal power  $P_{1N}$  of the gear unit (transmission efficiency  $\eta=96\%$ ):  
 $T_{2N} \geq T_2 \cdot f_1=1000 \times 1.25=1250\text{N} \cdot \text{m}$ ;  
 $P_{1N} \geq P_1 \cdot f_1=T_2 \cdot f_1 \cdot n_1/(9550 \cdot i_N \cdot \eta)$   
 $=1000 \times 1.25 \times 1450/(9550 \times 21.1 \times 0.96)$   
 $=9.37\text{kW}$   
In the table of Transmission Capacity, F77 meets the requirements ( $T_{2N}=1500\text{N} \cdot \text{m}$ ,  $P_{1N}=10.6\text{kW}$ )
4. Determination of the input mode:  
As  $P_{1N} \geq P_1=T_2 \cdot n_1/(9550 \cdot i_N \cdot \eta)$   
 $=1000 \times 1450/(9550 \times 21.1 \times 0.96)=7.5\text{kW}$   
and power of the user-supplied motor is specified as 7.5kW, in the table of Dimensions of the AE Input Shaft, AE4 is selected.
5. The type selected:  
**FL77-21.1-AE4-B51**



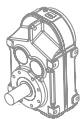
## 5 Transmission Capacity:

F.. (n1=1450r/min)

|                           |                            |                | F..37                    |                 |                         | F..47                    |                 |                         | F..67                    |                 |                         | F..77                    |                 |                         |  |
|---------------------------|----------------------------|----------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--|
| n <sub>1</sub><br>(r/min) | n <sub>2N</sub><br>(r/min) | i <sub>N</sub> | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) |  |
| F                         | 337                        | 4.3            | 110                      | 4.28            | 3.902                   | 173                      | 4.34            | 6.05                    | 305                      | 4.38            | 10.6                    | 470                      | 4.18            | 17.1                    |  |
|                           | 280                        | 5.2            | 120                      | 5.09            | 3.58                    | 191                      | 5.21            | 5.57                    | 330                      | 5.22            | 9.6                     | 555                      | 5.17            | 16.3                    |  |
|                           | 252                        | 5.8            | 125                      | 5.58            | 3.401                   | 191                      | 5.92            | 4.9                     | 355                      | 5.93            | 9.09                    | 605                      | 5.76            | 15.9                    |  |
|                           | 219                        | 6.6            | 140                      | 6.45            | 3.296                   | 200                      | 6.57            | 4.62                    | 385                      | 6.58            | 8.88                    | 670                      | 6.65            | 15.3                    |  |
|                           | 195                        | 7.4            | 145                      | 7.5             | 2.935                   | 225                      | 7.36            | 4.22                    | 410                      | 7.37            | 8.45                    | 720                      | 7.4             | 14.8                    |  |
|                           | 174                        | 8.3            | 170                      | 8.34            | 3.095                   | 230                      | 8.25            | 3.88                    | 440                      | 8.3             | 8.05                    | 765                      | 8.28            | 14                      |  |
|                           | 160                        | 9.1            | 175                      | 8.89            | 2.989                   | 250                      | 9               | 5.34                    | 450                      | 9.04            | 7.56                    | 765                      | 8.84            | 13.1                    |  |
|                           | 134                        | 10.8           | 185                      | 10.58           | 2.655                   | 380                      | 10.8            | 5.62                    | 800                      | 10.8            | 9.42                    | 1180                     | 10.9            | 16.4                    |  |
|                           | 117                        | 12.4           | 200                      | 12.15           | 2.499                   | 400                      | 12.3            | 4.95                    | 800                      | 12.3            | 9.92                    | 1280                     | 12.2            | 16                      |  |
|                           | 105                        | 13.8           | 200                      | 13.39           | 2.268                   | 400                      | 13.6            | 4.46                    | 820                      | 13.6            | 8.91                    | 1420                     | 14.1            | 15.3                    |  |
|                           | 94                         | 15.5           | 200                      | 15.58           | 1.949                   | 400                      | 15.2            | 3.99                    | 820                      | 15.2            | 8.17                    | 1500                     | 15.6            | 14.6                    |  |
|                           | 83                         | 17.4           | 200                      | 17.33           | 1.752                   | 400                      | 17.1            | 3.55                    | 820                      | 17.1            | 7.27                    | 1500                     | 17.5            | 13                      |  |
|                           | 74                         | 19.5           | 200                      | 19.46           | 1.56                    | 400                      | 19.4            | 3.13                    | 820                      | 19.4            | 6.41                    | 1500                     | 19.7            | 11.5                    |  |
|                           | 69                         | 21.1           | 200                      | 20.64           | 1.471                   | 400                      | 21.3            | 2.86                    | 820                      | 21.3            | 5.85                    | 1500                     | 21.4            | 10.6                    |  |
|                           | 57                         | 25.3           | —                        | —               | —                       | 300                      | 25.3            | 1.8                     | 620                      | 25.3            | 3.72                    | 1500                     | 25.5            | 8.93                    |  |
| 1450                      | 51                         | 28.2           | 200                      | 27.79           | 1.093                   | 400                      | 28.1            | 2.16                    | 820                      | 28.4            | 4.39                    | 1500                     | 28.5            | 7.99                    |  |
|                           | 43                         | 34.0           | 200                      | 34.25           | 0.887                   | 400                      | 33.5            | 1.81                    | 820                      | 33.9            | 3.68                    | 1500                     | 34              | 6.7                     |  |
|                           | 38                         | 38.3           | 200                      | 38.23           | 0.794                   | 400                      | 38.5            | 1.58                    | 820                      | 38.4            | 3.24                    | 1500                     | 38.6            | 5.9                     |  |
|                           | 33                         | 43.6           | 200                      | 42.87           | 0.708                   | 400                      | 42.4            | 1.43                    | 820                      | 42.8            | 2.91                    | 1500                     | 42.9            | 5.32                    |  |
|                           | 29.8                       | 48.7           | 200                      | 48.35           | 0.628                   | 400                      | 49.3            | 1.23                    | 820                      | 47.8            | 2.61                    | 1500                     | 48              | 4.75                    |  |
|                           | 26.6                       | 54.5           | 200                      | 54.93           | 0.553                   | 400                      | 54.9            | 1.11                    | 820                      | 53.7            | 2.32                    | 1500                     | 53.9            | 4.22                    |  |
|                           | 24.0                       | 60.5           | 200                      | 60.08           | 0.505                   | 400                      | 59.7            | 1.02                    | 820                      | 59.7            | 2.08                    | 1500                     | 60.4            | 3.77                    |  |
|                           | 21.4                       | 67.8           | 200                      | 67.05           | 0.453                   | 400                      | 68.6            | 0.89                    | 820                      | 67.8            | 1.84                    | 1500                     | 68.6            | 3.32                    |  |
|                           | 18.8                       | 77.0           | 200                      | 75.19           | 0.404                   | 400                      | 75.6            | 0.8                     | 820                      | 75.4            | 1.65                    | 1500                     | 76.2            | 2.99                    |  |
|                           | 16.8                       | 86.1           | 200                      | 84.81           | 0.358                   | 400                      | 88              | 0.69                    | 820                      | 84.2            | 1.48                    | 1500                     | 85.3            | 2.67                    |  |
|                           | 15.0                       | 96.4           | 200                      | 96.35           | 0.315                   | 400                      | 97.8            | 0.62                    | 820                      | 94.7            | 1.31                    | 1500                     | 96              | 2.37                    |  |
|                           | 13.6                       | 107            | 200                      | 103             | 0.295                   | 400                      | 110             | 0.55                    | 820                      | 107             | 1.16                    | 1500                     | 109             | 2.1                     |  |
|                           | 12.3                       | 118            | 200                      | 118.8           | 0.256                   | 400                      | 117             | 0.52                    | 820                      | 118             | 1.06                    | 1500                     | 119             | 1.91                    |  |
|                           | 10.3                       | 141            | 200                      | 138.7           | 0.219                   | 400                      | 141             | 0.43                    | 820                      | 140             | 0.89                    | 1500                     | 142             | 1.61                    |  |
|                           | 9.0                        | 161            |                          |                 |                         | 400                      | 163             | 0.37                    | 820                      | 159             | 0.78                    | 1500                     | 165             | 1.38                    |  |
|                           | 8.4                        | 173            |                          |                 |                         | 400                      | 176             | 0.35                    | 820                      | 170             | 0.73                    | 1500                     | 175             | 1.3                     |  |
|                           | 7.3                        | 198            |                          |                 |                         |                          |                 |                         | 820                      | 197             | 0.63                    | 1500                     | 198             | 1.15                    |  |
|                           | 6.4                        | 227            |                          |                 |                         |                          |                 |                         |                          |                 |                         | 1500                     | 226             | 1.01                    |  |
|                           | 6.0                        | 241            |                          |                 |                         |                          |                 |                         |                          |                 |                         | 1150                     | 244             | 0.72                    |  |
|                           | 5.3                        | 273            |                          |                 |                         |                          |                 |                         |                          |                 |                         |                          |                 |                         |  |

|  | F..87                    |                 |                         | F..97                    |                 |                         | F..107                   |                 |                         | F..127                   |                 |                         | F..157                   |                 |                         |
|--|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|
|  | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) |
|  | 1260                     | 4.41            | 43.4                    | 1690                     | 4.2             | 61                      | 2290                     | 4.2             | 82.8                    | 4150                     | 4.29            | 147                     |                          |                 |                         |
|  | 1510                     | 5.25            | 43.7                    | 2150                     | 5.2             | 62.8                    | 2290                     | 5.2             | 66.9                    | 4900                     | 5.17            | 144                     |                          |                 |                         |
|  | 1530                     | 5.85            | 39.7                    | 2250                     | 5.79            | 59                      | 2290                     | 5.79            | 60.1                    | 4900                     | 5.76            | 129                     |                          |                 |                         |
|  | 1530                     | 6.75            | 34.4                    | 2360                     | 6.68            | 53.6                    | 2290                     | 6.68            | 52.1                    | 6030                     | 6.65            | 138                     |                          |                 |                         |
|  | 1530                     | 7.51            | 30.9                    | 2360                     | 7.43            | 48.2                    | 2730                     | 7.43            | 55.8                    | 6000                     | 7.4             | 123                     |                          |                 |                         |
|  | 1530                     | 8.4             | 27.7                    | 2360                     | 8.32            | 43.1                    | 3090                     | 8.32            | 56.4                    | 7000                     | 8.28            | 128                     |                          |                 |                         |
|  | 2880                     | 9.32            | 46.9                    | 2360                     | 8.9             | 40.3                    | 3090                     | 8.9             | 52.7                    | 9040                     | 9.13            | 150                     | 15000                    | 9.1             | 250.3                   |
|  | 3000                     | 11              | 41.4                    | 4100                     | 11              | 56.5                    | 4000                     | 11              | 55.2                    | 9040                     | 11              | 125                     | 16000                    | 10.94           | 222.1                   |
|  | 3000                     | 12.3            | 37.1                    | 4300                     | 12.3            | 53.2                    | 4540                     | 12.3            | 56.2                    | 10000                    | 12.3            | 124                     | 16000                    | 12.66           | 191.9                   |
|  | 3000                     | 14.2            | 32.2                    | 4300                     | 14.2            | 46.1                    | 5410                     | 14.2            | 58.1                    | 11000                    | 14.2            | 118                     | 17000                    | 14.01           | 184.2                   |
|  | 3000                     | 15.8            | 28.9                    | 4300                     | 15.8            | 41.5                    | 6120                     | 15.8            | 59                      | 11000                    | 15.8            | 106                     | 18000                    | 15.59           | 175.3                   |
|  | 3000                     | 17.6            | 25.9                    | 4300                     | 17.6            | 37                      | 6120                     | 17.6            | 52.7                    | 11000                    | 17.6            | 94.7                    | 18000                    | 17.36           | 157.4                   |
|  | 3000                     | 19.9            | 22.9                    | 4300                     | 19.9            | 32.9                    | 7090                     | 19.9            | 54.2                    | 10800                    | 19.9            | 82.6                    | 17000                    | 19.2            | 134.4                   |
|  | 3000                     | 21.6            | 21.1                    | 4300                     | 21.6            | 30.3                    | 7840                     | 21.6            | 55.2                    | 12000                    | 21.6            | 84.5                    | 18000                    | 21.36           | 127.9                   |
|  | 3000                     | 25.7            | 17.7                    | 4300                     | 25.7            | 25.4                    | 7500                     | 25.7            | 44.3                    | 8500                     | 25.7            | 50.3                    | 15000                    | 25.41           | 89.63                   |
|  | 3000                     | 27.9            | 16.3                    | 4300                     | 28.8            | 22.7                    | 7840                     | 28.8            | 41.3                    | 12000                    | 28.9            | 63.1                    | 18000                    | 28.01           | 97.57                   |
|  | 3000                     | 34.5            | 13.2                    | 4300                     | 34.4            | 19                      | 7400                     | 34.4            | 32.7                    | 12000                    | 34.4            | 52.9                    | 18000                    | 33.76           | 80.95                   |
|  | 3000                     | 38.5            | 11.8                    | 4300                     | 38.4            | 17                      | 7680                     | 38.4            | 30.4                    | 12000                    | 38.9            | 46.8                    | 18000                    | 37.71           | 72.47                   |
|  | 3000                     | 44.3            | 10.3                    | 4300                     | 44.3            | 14.8                    | 7680                     | 44.3            | 26.4                    | 12000                    | 44.8            | 40.6                    | 18000                    | 43.44           | 62.91                   |
|  | 3000                     | 49.3            | 9.24                    | 4300                     | 49.2            | 13.3                    | 7680                     | 49.2            | 23.7                    | 12000                    | 49.7            | 36.7                    | 18000                    | 48.32           | 56.56                   |
|  | 3000                     | 55.1            | 8.26                    | 4300                     | 55              | 11.9                    | 7680                     | 55              | 21.2                    | 12000                    | 55.3            | 33                      | 18000                    | 54.04           | 50.57                   |
|  | 3000                     | 60.8            | 7.49                    | 4300                     | 60.8            | 10.7                    | 7680                     | 60.8            | 19.2                    | 12000                    | 60.3            | 30.2                    | 18000                    | 59.9            | 45.63                   |
|  | 3000                     | 67.9            | 6.71                    | 4300                     | 67.9            | 9.61                    | 7680                     | 67.9            | 17.2                    | 12000                    | 68.2            | 26.7                    | 18000                    | 66.9            | 40.85                   |
|  | 3000                     | 78.3            | 5.82                    | 4300                     | 78.3            | 8.34                    | 7680                     | 78.3            | 14.9                    | 12000                    | 78.5            | 23.2                    | 18000                    | 77.07           | 35.46                   |
|  | 3000                     | 87              | 5.23                    | 4300                     | 87              | 7.5                     | 7680                     | 87              | 13.4                    | 12000                    | 86.9            | 21                      | 18000                    | 85.72           | 31.88                   |
|  | 3000                     | 97.3            | 4.68                    | 4300                     | 97.3            | 6.71                    | 7680                     | 97.3            | 12                      | 12000                    | 96.8            | 18.8                    | 18000                    | 95.88           | 28.5                    |
|  | 3000                     | 110             | 4.15                    | 4300                     | 110             | 5.96                    | 7680                     | 110             | 10.6                    | 12000                    | 108             | 16.8                    | 18000                    | 108             | 25.31                   |
|  | 3000                     | 119             | 3.82                    | 4300                     | 119             | 5.47                    | 7680                     | 119             | 9.77                    | 12000                    | 119             | 15.3                    | 18000                    | 117.5           | 23.26                   |
|  | 3000                     | 142             | 3.21                    | 4300                     | 142             | 4.6                     | 7680                     | 142             | 8.22                    | 12000                    | 141             | 12.9                    | 18000                    | 139.8           | 19.55                   |
|  | 3000                     | 160             | 2.85                    | 4300                     | 160             | 4.08                    | 7680                     | 160             | 7.29                    | 12000                    | 159             | 11.4                    | 18000                    | 157.6           | 17.34                   |
|  | 3000                     | 175             | 2.6                     | 4300                     | 175             | 3.72                    | 7680                     | 175             | 6.65                    | 12000                    | 175             | 10.4                    | 18000                    | 172.7           | 15.83                   |
|  | 3000                     | 193             | 2.36                    | 4300                     | 204             | 3.21                    | 7680                     | 204             | 5.73                    | 12000                    | 203             | 8.99                    | 18000                    | 190.4           | 14.35                   |
|  | 2800                     | 227             | 1.87                    | 4300                     | 227             | 2.88                    | 7680                     | 227             | 5.14                    | 12000                    | 226             | 8.06                    |                          |                 |                         |
|  | 1900                     | 241             | 1.19                    | 4300                     | 241             | 2.71                    | 7680                     | 241             | 4.85                    | 12000                    | 240             | 7.61                    |                          |                 |                         |
|  | 1900                     | 273             | 1.06                    |                          |                 |                         | 7680                     | 275             | 4.25                    | 12000                    | 271             | 6.71                    |                          |                 |                         |

F

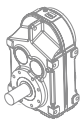


# F.. (n1=1740r/min)

|                           |                            |                | F..37                    |                 |                         | F..47                    |                 |                         | F..67                    |                 |                         | F..77                    |                 |                         |  |
|---------------------------|----------------------------|----------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--|
| n <sub>1</sub><br>(r/min) | n <sub>2N</sub><br>(r/min) | i <sub>N</sub> | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) |  |
| F                         | 405                        | 4.3            | 110                      | 4.28            | 4.68                    | 173                      | 4.34            | 7.26                    | 305                      | 4.38            | 12.72                   | 470                      | 4.18            | 20.52                   |  |
|                           | 335                        | 5.2            | 120                      | 5.09            | 4.30                    | 191                      | 5.21            | 6.68                    | 330                      | 5.22            | 11.52                   | 555                      | 5.17            | 19.56                   |  |
|                           | 300                        | 5.8            | 125                      | 5.58            | 4.08                    | 191                      | 5.92            | 5.88                    | 355                      | 5.93            | 10.91                   | 605                      | 5.76            | 19.08                   |  |
|                           | 264                        | 6.6            | 140                      | 6.45            | 3.96                    | 200                      | 6.57            | 5.54                    | 385                      | 6.58            | 10.66                   | 670                      | 6.65            | 18.36                   |  |
|                           | 235                        | 7.4            | 145                      | 7.5             | 3.52                    | 225                      | 7.36            | 5.06                    | 410                      | 7.37            | 10.14                   | 720                      | 7.4             | 17.76                   |  |
|                           | 210                        | 8.3            | 170                      | 8.34            | 3.71                    | 230                      | 8.25            | 4.66                    | 440                      | 8.3             | 9.66                    | 765                      | 8.28            | 16.80                   |  |
|                           | 191                        | 9.1            | 175                      | 8.89            | 3.59                    | 250                      | 9               | 6.41                    | 450                      | 9.04            | 9.07                    | 765                      | 8.84            | 15.72                   |  |
|                           | 161                        | 10.8           | 185                      | 10.58           | 3.19                    | 380                      | 10.8            | 6.74                    | 800                      | 10.8            | 11.30                   | 1180                     | 10.9            | 19.68                   |  |
|                           | 140                        | 12.4           | 200                      | 12.15           | 3.00                    | 400                      | 12.3            | 5.94                    | 800                      | 12.3            | 11.90                   | 1280                     | 12.2            | 19.20                   |  |
|                           | 126                        | 13.8           | 200                      | 13.39           | 2.72                    | 400                      | 13.6            | 5.35                    | 820                      | 13.6            | 10.69                   | 1420                     | 14.1            | 18.36                   |  |
|                           | 112                        | 15.5           | 200                      | 15.58           | 2.34                    | 400                      | 15.2            | 4.79                    | 820                      | 15.2            | 9.80                    | 1500                     | 15.6            | 17.52                   |  |
|                           | 100                        | 17.4           | 200                      | 17.33           | 2.10                    | 400                      | 17.1            | 4.26                    | 820                      | 17.1            | 8.72                    | 1500                     | 17.5            | 15.60                   |  |
|                           | 89.2                       | 19.5           | 200                      | 19.46           | 1.87                    | 400                      | 19.4            | 3.76                    | 820                      | 19.4            | 7.69                    | 1500                     | 19.7            | 13.80                   |  |
|                           | 82.5                       | 21.1           | 200                      | 20.64           | 1.77                    | 400                      | 21.3            | 3.43                    | 820                      | 21.3            | 7.02                    | 1500                     | 21.4            | 12.72                   |  |
|                           | 68.8                       | 25.3           | —                        | —               | —                       | 300                      | 25.3            | 2.16                    | 620                      | 25.3            | 4.46                    | 1500                     | 25.5            | 10.72                   |  |
| 1740                      | 61.7                       | 28.2           | 200                      | 27.79           | 1.31                    | 400                      | 28.1            | 2.59                    | 820                      | 28.4            | 5.27                    | 1500                     | 28.5            | 9.59                    |  |
|                           | 51.2                       | 34.0           | 200                      | 34.25           | 1.06                    | 400                      | 33.5            | 2.17                    | 820                      | 33.9            | 4.42                    | 1500                     | 34              | 8.04                    |  |
|                           | 45.4                       | 38.3           | 200                      | 38.23           | 0.95                    | 400                      | 38.5            | 1.90                    | 820                      | 38.4            | 3.89                    | 1500                     | 38.6            | 7.08                    |  |
|                           | 39.9                       | 43.6           | 200                      | 42.87           | 0.85                    | 400                      | 42.4            | 1.72                    | 820                      | 42.8            | 3.49                    | 1500                     | 42.9            | 6.38                    |  |
|                           | 35.7                       | 48.7           | 200                      | 48.35           | 0.75                    | 400                      | 49.3            | 1.48                    | 820                      | 47.8            | 3.13                    | 1500                     | 48              | 5.70                    |  |
|                           | 31.9                       | 54.5           | 200                      | 54.93           | 0.66                    | 400                      | 54.9            | 1.33                    | 820                      | 53.7            | 2.78                    | 1500                     | 53.9            | 5.06                    |  |
|                           | 28.8                       | 60.5           | 200                      | 60.08           | 0.61                    | 400                      | 59.7            | 1.22                    | 820                      | 59.7            | 2.50                    | 1500                     | 60.4            | 4.52                    |  |
|                           | 25.7                       | 67.8           | 200                      | 67.05           | 0.54                    | 400                      | 68.6            | 1.07                    | 820                      | 67.8            | 2.21                    | 1500                     | 68.6            | 3.98                    |  |
|                           | 22.6                       | 77.0           | 200                      | 75.19           | 0.48                    | 400                      | 75.6            | 0.96                    | 820                      | 75.4            | 1.98                    | 1500                     | 76.2            | 3.59                    |  |
|                           | 20.2                       | 86.1           | 200                      | 84.81           | 0.43                    | 400                      | 88              | 0.83                    | 820                      | 84.2            | 1.78                    | 1500                     | 85.3            | 3.20                    |  |
|                           | 18.0                       | 96.4           | 200                      | 96.35           | 0.38                    | 400                      | 97.8            | 0.74                    | 820                      | 94.7            | 1.57                    | 1500                     | 96              | 2.84                    |  |
|                           | 16.3                       | 107            | 200                      | 103             | 0.35                    | 400                      | 110             | 0.66                    | 820                      | 107             | 1.39                    | 1500                     | 109             | 2.52                    |  |
|                           | 14.7                       | 118            | 200                      | 118.8           | 0.31                    | 400                      | 117             | 0.62                    | 820                      | 118             | 1.27                    | 1500                     | 119             | 2.29                    |  |
|                           | 12.3                       | 141            | 200                      | 138.7           | 0.26                    | 400                      | 141             | 0.52                    | 820                      | 140             | 1.07                    | 1500                     | 142             | 1.93                    |  |
|                           | 10.8                       | 161            |                          |                 |                         | 400                      | 163             | 0.44                    | 820                      | 159             | 0.94                    | 1500                     | 165             | 1.66                    |  |
|                           | 10.1                       | 173            |                          |                 |                         | 400                      | 176             | 0.42                    | 820                      | 170             | 0.88                    | 1500                     | 175             | 1.56                    |  |
|                           | 8.8                        | 198            |                          |                 |                         |                          |                 |                         | 820                      | 197             | 0.76                    | 1500                     | 198             | 1.38                    |  |
|                           | 7.7                        | 227            |                          |                 |                         |                          |                 |                         |                          |                 |                         | 1500                     | 226             | 1.21                    |  |
|                           | 7.2                        | 241            |                          |                 |                         |                          |                 |                         |                          |                 |                         | 1150                     | 244             | 0.86                    |  |
|                           | 6.4                        | 273            |                          |                 |                         |                          |                 |                         |                          |                 |                         |                          |                 |                         |  |

|  | F..87                    |                 |                         | F..97                    |                 |                         | F..107                   |                 |                         | F..127                   |                 |                         | F..157                   |                 |                         |
|--|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|
|  | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) |
|  | 1260                     | 4.41            | 52.08                   | 1690                     | 4.2             | 73.2                    | 2290                     | 4.2             | 99.4                    | 4150                     | 4.29            | 176.4                   |                          |                 |                         |
|  | 1510                     | 5.25            | 52.44                   | 2150                     | 5.2             | 75.4                    | 2290                     | 5.2             | 80.3                    | 4900                     | 5.17            | 172.8                   |                          |                 |                         |
|  | 1530                     | 5.85            | 47.64                   | 2250                     | 5.79            | 70.8                    | 2290                     | 5.79            | 72.1                    | 4900                     | 5.76            | 154.8                   |                          |                 |                         |
|  | 1530                     | 6.75            | 41.28                   | 2360                     | 6.68            | 64.3                    | 2290                     | 6.68            | 62.5                    | 6030                     | 6.65            | 165.6                   |                          |                 |                         |
|  | 1530                     | 7.51            | 37.08                   | 2360                     | 7.43            | 57.8                    | 2730                     | 7.43            | 67.0                    | 6000                     | 7.4             | 147.6                   |                          |                 |                         |
|  | 1530                     | 8.4             | 33.24                   | 2360                     | 8.32            | 51.7                    | 3090                     | 8.32            | 67.7                    | 7000                     | 8.28            | 153.6                   |                          |                 |                         |
|  | 2880                     | 9.32            | 56.28                   | 2360                     | 8.9             | 48.4                    | 3090                     | 8.9             | 63.2                    | 9040                     | 9.13            | 180.0                   | 15000                    | 9.1             | 300.4                   |
|  | 3000                     | 11              | 49.68                   | 4100                     | 11              | 67.8                    | 4000                     | 11              | 66.2                    | 9040                     | 11              | 150.0                   | 16000                    | 10.94           | 266.5                   |
|  | 3000                     | 12.3            | 44.52                   | 4300                     | 12.3            | 63.8                    | 4540                     | 12.3            | 67.4                    | 10000                    | 12.3            | 148.8                   | 16000                    | 12.66           | 230.3                   |
|  | 3000                     | 14.2            | 38.64                   | 4300                     | 14.2            | 55.3                    | 5410                     | 14.2            | 69.7                    | 11000                    | 14.2            | 141.6                   | 17000                    | 14.01           | 221.0                   |
|  | 3000                     | 15.8            | 34.68                   | 4300                     | 15.8            | 49.8                    | 6120                     | 15.8            | 70.8                    | 11000                    | 15.8            | 127.2                   | 18000                    | 15.59           | 210.4                   |
|  | 3000                     | 17.6            | 31.08                   | 4300                     | 17.6            | 44.4                    | 6120                     | 17.6            | 63.2                    | 11000                    | 17.6            | 113.6                   | 18000                    | 17.36           | 188.9                   |
|  | 3000                     | 19.9            | 27.48                   | 4300                     | 19.9            | 39.5                    | 7090                     | 19.9            | 65.0                    | 10800                    | 19.9            | 99.1                    | 17000                    | 19.2            | 161.3                   |
|  | 3000                     | 21.6            | 25.32                   | 4300                     | 21.6            | 36.4                    | 7840                     | 21.6            | 66.2                    | 12000                    | 21.6            | 101.4                   | 18000                    | 21.36           | 153.5                   |
|  | 3000                     | 25.7            | 21.24                   | 4300                     | 25.7            | 30.5                    | 7500                     | 25.7            | 53.2                    | 8500                     | 25.7            | 60.4                    | 15000                    | 25.41           | 107.6                   |
|  | 3000                     | 27.9            | 19.56                   | 4300                     | 28.8            | 27.2                    | 7840                     | 28.8            | 49.6                    | 12000                    | 28.9            | 75.7                    | 18000                    | 28.01           | 117.1                   |
|  | 3000                     | 34.5            | 15.84                   | 4300                     | 34.4            | 22.8                    | 7400                     | 34.4            | 39.2                    | 12000                    | 34.4            | 63.5                    | 18000                    | 33.76           | 97.1                    |
|  | 3000                     | 38.5            | 14.16                   | 4300                     | 38.4            | 20.4                    | 7680                     | 38.4            | 36.5                    | 12000                    | 38.9            | 56.2                    | 18000                    | 37.71           | 87.0                    |
|  | 3000                     | 44.3            | 12.36                   | 4300                     | 44.3            | 17.8                    | 7680                     | 44.3            | 31.7                    | 12000                    | 44.8            | 48.7                    | 18000                    | 43.44           | 75.5                    |
|  | 3000                     | 49.3            | 11.09                   | 4300                     | 49.2            | 16.0                    | 7680                     | 49.2            | 28.4                    | 12000                    | 49.7            | 44.0                    | 18000                    | 48.32           | 67.9                    |
|  | 3000                     | 55.1            | 9.91                    | 4300                     | 55              | 14.3                    | 7680                     | 55              | 25.4                    | 12000                    | 55.3            | 39.6                    | 18000                    | 54.04           | 60.7                    |
|  | 3000                     | 60.8            | 8.99                    | 4300                     | 60.8            | 12.8                    | 7680                     | 60.8            | 23.0                    | 12000                    | 60.3            | 36.2                    | 18000                    | 59.9            | 54.8                    |
|  | 3000                     | 67.9            | 8.05                    | 4300                     | 67.9            | 11.5                    | 7680                     | 67.9            | 20.6                    | 12000                    | 68.2            | 32.0                    | 18000                    | 66.9            | 49.0                    |
|  | 3000                     | 78.3            | 6.98                    | 4300                     | 78.3            | 10.0                    | 7680                     | 78.3            | 17.9                    | 12000                    | 78.5            | 27.8                    | 18000                    | 77.07           | 42.6                    |
|  | 3000                     | 87              | 6.28                    | 4300                     | 87              | 9.0                     | 7680                     | 87              | 16.1                    | 12000                    | 86.9            | 25.2                    | 18000                    | 85.72           | 38.3                    |
|  | 3000                     | 97.3            | 5.62                    | 4300                     | 97.3            | 8.1                     | 7680                     | 97.3            | 14.4                    | 12000                    | 96.8            | 22.6                    | 18000                    | 95.88           | 34.2                    |
|  | 3000                     | 110             | 4.98                    | 4300                     | 110             | 7.2                     | 7680                     | 110             | 12.7                    | 12000                    | 108             | 20.2                    | 18000                    | 108             | 30.4                    |
|  | 3000                     | 119             | 4.58                    | 4300                     | 119             | 6.6                     | 7680                     | 119             | 11.7                    | 12000                    | 119             | 18.4                    | 18000                    | 117.5           | 27.9                    |
|  | 3000                     | 142             | 3.85                    | 4300                     | 142             | 5.5                     | 7680                     | 142             | 9.9                     | 12000                    | 141             | 15.5                    | 18000                    | 139.8           | 23.5                    |
|  | 3000                     | 160             | 3.42                    | 4300                     | 160             | 4.9                     | 7680                     | 160             | 8.7                     | 12000                    | 159             | 13.7                    | 18000                    | 157.6           | 20.8                    |
|  | 3000                     | 175             | 3.12                    | 4300                     | 175             | 4.5                     | 7680                     | 175             | 8.0                     | 12000                    | 175             | 12.5                    | 18000                    | 172.7           | 19.0                    |
|  | 3000                     | 193             | 2.83                    | 4300                     | 204             | 3.9                     | 7680                     | 204             | 6.9                     | 12000                    | 203             | 10.8                    | 18000                    | 190.4           | 17.2                    |
|  | 2800                     | 227             | 2.24                    | 4300                     | 227             | 3.5                     | 7680                     | 227             | 6.2                     | 12000                    | 226             | 9.7                     |                          |                 |                         |
|  | 1900                     | 241             | 1.43                    | 4300                     | 241             | 3.3                     | 7680                     | 241             | 5.8                     | 12000                    | 240             | 9.1                     |                          |                 |                         |
|  | 1900                     | 273             | 1.27                    |                          |                 |                         | 7680                     | 275             | 5.1                     | 12000                    | 271             | 8.1                     |                          |                 |                         |

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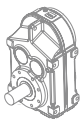
# F../CRL..(n1=1450r/min)

F

|                           |                            |                | F..37/CRL37              |                 |                         | F..47/CRL37              |                 |                         | F..67/CRL37              |                 |                         | F..77/CRL37              |                 |                         |  |
|---------------------------|----------------------------|----------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--|
| n <sub>1</sub><br>(r/min) | n <sub>2N</sub><br>(r/min) | i <sub>N</sub> | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) |  |
| 1450                      | 8.58                       | 169            | 200                      | 164.3           | 0.20                    | 400                      | 165.8           | 0.40                    | 820                      | 165.6           | 0.82                    | 1500                     | 164.7           | 1.5                     |  |
|                           | 7.75                       | 187            | 200                      | 185.3           | 0.18                    | 400                      | 187             | 0.35                    | 820                      | 186.8           | 0.72                    | 1500                     | 155.7           | 1.59                    |  |
|                           | 6.87                       | 211            | 200                      | 210.6           | 0.16                    | 400                      | 212.5           | 0.31                    | 820                      | 212.3           | 0.64                    | 1500                     | 211             | 1.17                    |  |
|                           |                            |                |                          |                 |                         |                          |                 |                         |                          |                 |                         |                          |                 |                         |  |
|                           | 6.20                       | 234            | 200                      | 235.5           | 0.14                    | 400                      | 237             | 0.28                    | 820                      | 236.7           | 0.57                    | 1500                     | 237.8           | 1.04                    |  |
|                           | 5.58                       | 260            | 200                      | 263             | 0.13                    | 400                      | 264.7           | 0.25                    | 820                      | 264.4           | 0.51                    | 1500                     | 265.6           | 0.93                    |  |
|                           | 4.92                       | 295            | 200                      | 294.8           |                         | 400                      | 296.7           | 0.22                    | 820                      | 296.3           | 0.46                    | 1500                     | 297.6           | 0.83                    |  |
|                           | 4.35                       | 333            | 200                      | 335.3           |                         | 400                      | 337.5           | 0.20                    | 820                      | 337             | 0.4                     | 1500                     | 338.5           | 0.73                    |  |
|                           | 3.54                       | 410            | 200                      | 412.9           |                         | 400                      | 415.6           | 0.16                    | 820                      | 415             | 0.33                    | 1500                     | 416.9           | 0.59                    |  |
|                           | 3.13                       | 463            | 200                      | 461.1           |                         | 400                      | 464.1           | 0.14                    | 820                      | 463.5           | 0.29                    | 1500                     | 465.5           | 0.53                    |  |
|                           | 2.78                       | 521            | 200                      | 516.9           |                         | 400                      | 520.2           | 0.13                    | 820                      | 519.6           | 0.26                    | 1500                     | 521.9           | 0.47                    |  |
|                           | 2.51                       | 578            | 200                      | 583             |                         | 400                      | 586.8           |                         | 820                      | 586.1           | 0.23                    | 1500                     | 588.7           | 0.42                    |  |
|                           | 2.23                       | 651            | 200                      | 662.5           |                         | 400                      | 666.9           |                         | 820                      | 666             | 0.2                     | 1500                     | 668.9           | 0.37                    |  |
|                           | 2.00                       | 724            | 200                      | 708.4           |                         | 400                      | 713             |                         | 820                      | 712.1           | 0.19                    | 1500                     | 715.3           | 0.35                    |  |
|                           | 1.82                       | 797            | 200                      | 816.2           |                         | 400                      | 821.5           |                         | 820                      | 820.5           | 0.16                    | 1500                     | 824.1           | 0.3                     |  |
|                           | 1.53                       | 950            | 200                      | 953.1           |                         | 400                      | 959.3           |                         | 820                      | 958.1           | 0.14                    | 1500                     | 962.3           | 0.26                    |  |
|                           | 1.39                       | 1042           | 200                      | 1039            |                         | 400                      | 1046            |                         | 820                      | 1044            | 0.13                    | 1500                     | 1049            | 0.24                    |  |
|                           | 1.14                       | 1268           | 200                      | 1280            |                         | 400                      | 1289            |                         | 820                      | 1287            |                         | 1500                     | 1293            | 0.19                    |  |
|                           | 1.02                       | 1425           | 200                      | 1429            |                         | 400                      | 1438            |                         | 820                      | 1437            |                         | 1500                     | 1443            | 0.17                    |  |
|                           | 0.90                       | 1616           | 200                      | 1602            |                         | 400                      | 1613            |                         | 820                      | 1611            |                         | 1500                     | 1618            | 0.15                    |  |
|                           | 0.80                       | 1823           | 200                      | 1822            |                         | 400                      | 1832            |                         | 820                      | 1832            |                         | 1500                     | 1840            | 0.13                    |  |
|                           | 0.63                       | 2287           | 200                      | 2246            |                         | 400                      | 2257            |                         | 820                      | 2257            |                         | 1500                     | 2267            |                         |  |
|                           | 0.57                       | 2551           | 200                      | 2506            |                         | 400                      | 2519            |                         | 820                      | 2519            |                         | 1500                     | 2531            |                         |  |
|                           | 0.51                       | 2861           | 200                      | 2810            |                         | 400                      | 2840            |                         | 820                      | 2840            |                         | 1500                     | 2876            |                         |  |
|                           | 0.45                       | 3227           | 200                      | 3196            |                         | 400                      | 3229            |                         | 820                      | 3229            |                         | 1500                     | 3271            |                         |  |
|                           | 0.36                       | 4048           | 200                      | 3939            |                         | 400                      | 3980            |                         | 820                      | 3980            |                         | 1500                     | 4031            |                         |  |
|                           | 0.32                       | 4515           | 200                      | 4396            |                         | 400                      | 4442            |                         | 820                      | 4442            |                         | 1500                     | 4499            |                         |  |
|                           | 0.29                       | 5065           | 200                      | 4930            |                         | 400                      | 4982            |                         | 820                      | 4982            |                         | 1500                     | 5046            |                         |  |
|                           | 0.25                       | 5729           | 200                      | 5560            |                         | 400                      | 5619            |                         | 820                      | 5619            |                         | 1500                     | 5691            |                         |  |
|                           | 0.23                       | 6400           | 200                      | 6316            |                         | 400                      | 6383            |                         | 820                      | 6383            |                         | 1500                     | 6465            |                         |  |
|                           | 0.21                       | 7051           | 200                      | 6755            |                         | 400                      | 6826            |                         | 820                      | 6826            |                         | 1500                     | 6914            |                         |  |
|                           | 0.18                       | 8146           | 200                      | 7989            |                         | 400                      | 7854            |                         | 820                      | 7854            |                         | 1500                     | 7962            |                         |  |
|                           | 0.16                       | 9100           | 200                      | 9076            |                         | 400                      | 8923            |                         | 820                      | 8923            |                         | 1500                     | 9045            |                         |  |
|                           | 0.14                       | 10026          | 200                      | 9706            |                         | 400                      | 9542            |                         | 820                      | 9542            |                         | 1500                     | 9673            |                         |  |
|                           | 0.13                       | 11086          | 200                      | 11187           |                         | 400                      | 10998           |                         | 820                      | 10998           |                         | 1500                     | 11149           |                         |  |
|                           | 0.11                       | 13207          | 200                      | 13065           |                         | 400                      | 12844           |                         | 820                      | 12844           |                         | 1500                     | 13020           |                         |  |
|                           | 0.10                       | 15135          |                          |                 |                         |                          |                 |                         |                          |                 |                         |                          |                 |                         |  |
|                           | 0.09                       | 16388          |                          |                 |                         |                          |                 |                         |                          |                 |                         |                          |                 |                         |  |
|                           | 0.08                       | 18509          |                          |                 |                         |                          |                 |                         |                          |                 |                         |                          |                 |                         |  |

|  | F..87/CRL47              |                 |                         | F..97/CRL67              |                 |                         | F..107/CRL77             |                 |                         | F..127/CRL87             |                 |                         | F..157/CRL97             |                 |                         |
|--|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|
|  | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) |
|  | 3000                     | 162             | 3.05                    | 4300                     | 162.6           | 4.36                    | 7680                     | 164.8           | 7.68                    | 12000                    | 167.4           | 11.8                    | 18000                    | 173.7           | 17.1                    |
|  | 3000                     | 188.5           | 2.62                    | 4300                     | 181.7           | 3.9                     | 7680                     | 184.6           | 6.85                    | 12000                    | 186.3           | 10.6                    | 18000                    | 193.3           | 15.3                    |
|  | 3000                     | 209.9           | 2.35                    | 4300                     | 204.3           | 3.47                    | 7680                     | 207.7           | 6.09                    | 12000                    | 208.6           | 9.48                    | 18000                    | 216.5           | 13.7                    |
|  |                          |                 |                         |                          |                 |                         |                          |                 |                         | F..127/CRL77             |                 |                         |                          |                 |                         |
|  | 3000                     | 230.1           | 2.15                    | 4300                     | 234.2           | 3.02                    | 7680                     | 225.8           | 5.6                     | 12000                    | 231.9           | 8.53                    | 18000                    | 228.5           | 13                      |
|  | 3000                     | 264.3           | 1.87                    | 4300                     | 265.7           | 2.67                    | 7680                     | 256.5           | 4.93                    | 12000                    | 263.4           | 7.51                    | 18000                    | 255.3           | 11.6                    |
|  | 3000                     | 290.8           | 1.7                     | 4300                     | 295.3           | 2.4                     | 7680                     | 284.9           | 4.44                    | 12000                    | 292.6           | 6.76                    | 18000                    | 294.1           | 10.1                    |
|  | 3000                     | 336.6           | 1.47                    | 4300                     | 337.5           | 2.1                     | 7680                     | 318.7           | 3.97                    | 12000                    | 327.2           | 6.04                    | 18000                    | 326.9           | 9.07                    |
|  | 3000                     | 401.2           | 1.23                    | 4300                     | 403.2           | 1.76                    | 7680                     | 400.1           | 3.16                    | 12000                    | 410.9           | 4.81                    | 18000                    | 402.7           | 7.36                    |
|  | 3000                     | 460.5           | 1.07                    | 4300                     | 457.3           | 1.55                    | 7680                     | 454.3           | 2.79                    | 12000                    | 466.5           | 4.24                    | 18000                    | 448.7           | 6.61                    |
|  | 3000                     | 507             | 0.97                    | 4300                     | 508.8           | 1.39                    | 7680                     | 504.3           | 2.51                    | 12000                    | 517.9           | 3.82                    | 18000                    | 517.4           | 5.73                    |
|  | 3000                     | 590.1           | 0.84                    | 4300                     | 568.7           | 1.25                    | 7680                     | 564.9           | 2.24                    | 12000                    | 580.1           | 3.41                    | 18000                    | 575.8           | 5.15                    |
|  | 3000                     | 657.1           | 0.75                    | 4300                     | 639.4           | 1.11                    | 7680                     | 635.8           | 1.99                    | 12000                    | 652.9           | 3.03                    | 18000                    | 644.8           | 4.6                     |
|  | 3000                     | 735.9           | 0.67                    | 4300                     | 724.2           | 0.98                    | 7680                     | 719.2           | 1.76                    | 12000                    | 738.5           | 2.68                    | 18000                    | 726.3           | 4.08                    |
|  | 3000                     | 781.3           | 0.63                    | 4300                     | 794.1           | 0.89                    | 7680                     | 787.7           | 1.61                    | 12000                    | 808.9           | 2.44                    | 18000                    | 788.9           | 3.76                    |
|  | 3000                     | 947.1           | 0.52                    | 4300                     | 944.6           | 0.75                    | 7680                     | 937.8           | 1.35                    | 12000                    | 963             | 2.05                    | 18000                    | 939             | 3.16                    |
|  | 3000                     | 1065            | 0.46                    | 4300                     | 1049            | 0.68                    | 7680                     | 1046            | 1.21                    | 12000                    | 1074            | 1.84                    | 18000                    | 1019            | 2.91                    |
|  | 3000                     | 1270            | 0.39                    | 4300                     | 1251            | 0.57                    | 7680                     | 1255            | 1.01                    | 12000                    | 1289            | 1.53                    | 18000                    | 1261            | 2.35                    |
|  | 3000                     | 1458            | 0.34                    | 4300                     | 1437            | 0.49                    | 7680                     | 1425            | 0.89                    | 12000                    | 1463            | 1.35                    | 18000                    | 1404            | 2.11                    |
|  | 3000                     | 1605            | 0.31                    | 4300                     | 1582            | 0.45                    | 7680                     | 1582            | 0.8                     | 12000                    | 1624            | 1.22                    | 18000                    | 1620            | 1.83                    |
|  | 3000                     | 1868            | 0.26                    | 4300                     | 1841            | 0.38                    | 7680                     | 1771            | 0.71                    | 12000                    | 1819            | 1.09                    | 18000                    | 1803            | 1.64                    |
|  | 3000                     | 2334            | 0.21                    | 4300                     | 2296            | 0.31                    | 7680                     | 2255            | 0.56                    | 12000                    | 2316            | 0.85                    | 18000                    | 2273            | 1.3                     |
|  | 3000                     | 2601            | 0.19                    | 4300                     | 2562            | 0.28                    | 7680                     | 2512            | 0.5                     | 12000                    | 2580            | 0.77                    | 18000                    | 2479            | 1.2                     |
|  | 3000                     | 2834            | 0.17                    | 4300                     | 2798            | 0.25                    | 7680                     | 2854            | 0.44                    | 12000                    | 2848            | 0.69                    | 18000                    | 2874            | 1.03                    |
|  | 3000                     | 3299            | 0.15                    | 4300                     | 3256            | 0.22                    | 7680                     | 3196            | 0.4                     | 12000                    | 3189            | 0.62                    | 18000                    | 3198            | 0.93                    |
|  | 3000                     | 4121            | 0.12                    | 4300                     | 4062            | 0.17                    | 7680                     | 4068            | 0.31                    | 12000                    | 4060            | 0.49                    | 18000                    | 4033            | 0.74                    |
|  | 3000                     | 4591            |                         | 4300                     | 4532            | 0.16                    | 7680                     | 4532            | 0.28                    | 12000                    | 4523            | 0.44                    | 18000                    | 4398            | 0.67                    |
|  | 3000                     | 5055            |                         | 4300                     | 4989            | 0.14                    | 7680                     | 5031            | 0.25                    | 12000                    | 5021            | 0.39                    | 18000                    | 5074            | 0.58                    |
|  | 3000                     | 5883            |                         | 4300                     | 5806            | 0.12                    | 7680                     | 5634            | 0.22                    | 12000                    | 5623            | 0.35                    | 18000                    | 5646            | 0.53                    |
|  | 3000                     | 6550            |                         | 4300                     | 6465            |                         | 7680                     | 6320            | 0.2                     | 12000                    | 6307            | 0.31                    | 18000                    | 6321            | 0.47                    |
|  | 3000                     | 7335            |                         | 4300                     | 7240            |                         | 7680                     | 7171            | 0.18                    | 12000                    | 7156            | 0.28                    | 18000                    | 7118            | 0.42                    |
|  | 3000                     | 8431            |                         | 4300                     | 8322            |                         | 7680                     | 8076            | 0.16                    | 12000                    | 7975            | 0.25                    | 18000                    | 8092            | 0.37                    |
|  | 3000                     | 9386            |                         | 4300                     | 9265            |                         | 7680                     | 9058            | 0.14                    | 12000                    | 8945            | 0.22                    | 18000                    | 9060            | 0.33                    |
|  | 3000                     | 10513           |                         | 4300                     | 10376           |                         | 7680                     | 10278           | 0.12                    | 12000                    | 10150           | 0.19                    | 18000                    | 10202           | 0.29                    |
|  | 3000                     | 11165           |                         | 4300                     | 11018           |                         | 7680                     | 11268           |                         | 12000                    | 11127           | 0.18                    | 18000                    | 11084           | 0.27                    |
|  | 3000                     | 13530           |                         | 4300                     | 13355           |                         | 7680                     | 13413           |                         | 12000                    | 13246           | 0.15                    | 18000                    | 13193           | 0.22                    |
|  | 3000                     | 15604           |                         | 4300                     | 15389           |                         | 7680                     | 15226           |                         | 12000                    | 15037           | 0.13                    | 18000                    | 14861           | 0.2                     |
|  | 3000                     | 16850           |                         | 4300                     | 16626           |                         | 7680                     | 16304           |                         | 12000                    | 16101           | 0.12                    | 18000                    | 16300           | 0.18                    |
|  |                          |                 |                         |                          |                 |                         | 7680                     | 18861           |                         | 12000                    | 18626           |                         | 18000                    | 17978           | 0.16                    |

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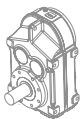


# F../CRL..(n1=1740r/min)

|                           |                            |                | F..37/CRL37              |                 |                         | F..47/CRL37              |                 |                         | F..67/CRL37              |                 |                         | F..77/CRL37              |                 |                         |  |
|---------------------------|----------------------------|----------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--|
| n <sub>1</sub><br>(r/min) | n <sub>2N</sub><br>(r/min) | i <sub>N</sub> | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) |  |
| F                         | 10.30                      | 169            | 200                      | 164.3           | 0.24                    | 400                      | 165.8           | 0.48                    | 820                      | 165.6           | 0.98                    | 1500                     | 164.7           | 1.80                    |  |
|                           | 9.30                       | 187            | 200                      | 185.3           | 0.22                    | 400                      | 187             | 0.42                    | 820                      | 186.8           | 0.86                    | 1500                     | 155.7           | 1.91                    |  |
|                           | 8.24                       | 211            | 200                      | 210.6           | 0.19                    | 400                      | 212.5           | 0.37                    | 820                      | 212.3           | 0.77                    | 1500                     | 211             | 1.40                    |  |
|                           |                            |                |                          |                 |                         |                          |                 |                         |                          |                 |                         |                          |                 |                         |  |
|                           | 7.44                       | 234            | 200                      | 235.5           | 0.17                    | 400                      | 237             | 0.34                    | 820                      | 236.7           | 0.68                    | 1500                     | 237.8           | 1.25                    |  |
|                           | 6.70                       | 260            | 200                      | 263             | 0.16                    | 400                      | 264.7           | 0.30                    | 820                      | 264.4           | 0.61                    | 1500                     | 265.6           | 1.12                    |  |
|                           | 5.90                       | 295            | 200                      | 294.8           | 0.13                    | 400                      | 296.7           | 0.26                    | 820                      | 296.3           | 0.55                    | 1500                     | 297.6           | 1.00                    |  |
|                           | 5.22                       | 333            | 200                      | 335.3           |                         | 400                      | 337.5           | 0.24                    | 820                      | 337             | 0.48                    | 1500                     | 338.5           | 0.88                    |  |
|                           | 4.25                       | 410            | 200                      | 412.9           |                         | 400                      | 415.6           | 0.19                    | 820                      | 415             | 0.40                    | 1500                     | 416.9           | 0.71                    |  |
|                           | 3.76                       | 463            | 200                      | 461.1           |                         | 400                      | 464.1           | 0.17                    | 820                      | 463.5           | 0.35                    | 1500                     | 465.5           | 0.64                    |  |
|                           | 3.34                       | 521            | 200                      | 516.9           |                         | 400                      | 520.2           | 0.16                    | 820                      | 519.6           | 0.31                    | 1500                     | 521.9           | 0.56                    |  |
|                           | 3.01                       | 578            | 200                      | 583             |                         | 400                      | 586.8           | 0.13                    | 820                      | 586.1           | 0.28                    | 1500                     | 588.7           | 0.50                    |  |
|                           | 2.68                       | 651            | 200                      | 662.5           |                         | 400                      | 666.9           |                         | 820                      | 666             | 0.24                    | 1500                     | 668.9           | 0.44                    |  |
|                           | 2.40                       | 724            | 200                      | 708.4           |                         | 400                      | 713             |                         | 820                      | 712.1           | 0.23                    | 1500                     | 715.3           | 0.42                    |  |
|                           | 2.18                       | 797            | 200                      | 816.2           |                         | 400                      | 821.5           |                         | 820                      | 820.5           | 0.19                    | 1500                     | 824.1           | 0.36                    |  |
|                           | 1.84                       | 950            | 200                      | 953.1           |                         | 400                      | 959.3           |                         | 820                      | 958.1           | 0.17                    | 1500                     | 962.3           | 0.31                    |  |
|                           | 1.67                       | 1042           | 200                      | 1039            |                         | 400                      | 1046            |                         | 820                      | 1044            | 0.16                    | 1500                     | 1049            | 0.29                    |  |
|                           | 1.37                       | 1268           | 200                      | 1280            |                         | 400                      | 1289            |                         | 820                      | 1287            | 0.12                    | 1500                     | 1293            | 0.23                    |  |
|                           | 1.22                       | 1425           | 200                      | 1429            |                         | 400                      | 1438            |                         | 820                      | 1437            |                         | 1500                     | 1443            | 0.20                    |  |
|                           | 1.08                       | 1616           | 200                      | 1602            |                         | 400                      | 1613            |                         | 820                      | 1611            |                         | 1500                     | 1618            | 0.18                    |  |
|                           | 0.96                       | 1823           | 200                      | 1822            |                         | 400                      | 1832            |                         | 820                      | 1832            |                         | 1500                     | 1840            | 0.16                    |  |
|                           | 0.76                       | 2287           | 200                      | 2246            |                         | 400                      | 2257            |                         | 820                      | 2257            |                         | 1500                     | 2267            | 0.13                    |  |
|                           | 0.68                       | 2551           | 200                      | 2506            |                         | 400                      | 2519            |                         | 820                      | 2519            |                         | 1500                     | 2531            |                         |  |
|                           | 0.61                       | 2861           | 200                      | 2810            |                         | 400                      | 2840            |                         | 820                      | 2840            |                         | 1500                     | 2876            |                         |  |
|                           | 0.54                       | 3227           | 200                      | 3196            |                         | 400                      | 3229            |                         | 820                      | 3229            |                         | 1500                     | 3271            |                         |  |
|                           | 0.43                       | 4048           | 200                      | 3939            |                         | 400                      | 3980            |                         | 820                      | 3980            |                         | 1500                     | 4031            |                         |  |
|                           | 0.38                       | 4515           | 200                      | 4396            |                         | 400                      | 4442            |                         | 820                      | 4442            |                         | 1500                     | 4499            |                         |  |
|                           | 0.35                       | 5065           | 200                      | 4930            |                         | 400                      | 4982            |                         | 820                      | 4982            |                         | 1500                     | 5046            |                         |  |
|                           | 0.30                       | 5729           | 200                      | 5560            |                         | 400                      | 5619            |                         | 820                      | 5619            |                         | 1500                     | 5691            |                         |  |
|                           | 0.28                       | 6400           | 200                      | 6316            |                         | 400                      | 6383            |                         | 820                      | 6383            |                         | 1500                     | 6465            |                         |  |
|                           | 0.25                       | 7051           | 200                      | 6755            |                         | 400                      | 6826            |                         | 820                      | 6826            |                         | 1500                     | 6914            |                         |  |
|                           | 0.22                       | 8146           | 200                      | 7989            |                         | 400                      | 7854            |                         | 820                      | 7854            |                         | 1500                     | 7962            |                         |  |
|                           | 0.19                       | 9100           | 200                      | 9076            |                         | 400                      | 8923            |                         | 820                      | 8923            |                         | 1500                     | 9045            |                         |  |
|                           | 0.17                       | 10026          | 200                      | 9706            |                         | 400                      | 9542            |                         | 820                      | 9542            |                         | 1500                     | 9673            |                         |  |
|                           | 0.16                       | 11086          | 200                      | 11187           |                         | 400                      | 10998           |                         | 820                      | 10998           |                         | 1500                     | 11149           |                         |  |
|                           | 0.13                       | 13207          | 200                      | 13065           |                         | 400                      | 12844           |                         | 820                      | 12844           |                         | 1500                     | 13020           |                         |  |
|                           | 0.12                       | 15135          |                          |                 |                         |                          |                 |                         |                          |                 |                         |                          |                 |                         |  |
|                           | 0.11                       | 16388          |                          |                 |                         |                          |                 |                         |                          |                 |                         |                          |                 |                         |  |
|                           | 0.10                       | 18509          |                          |                 |                         |                          |                 |                         |                          |                 |                         |                          |                 |                         |  |

|  | F..87/CRL47              |                 |                         | F..97/CRL67              |                 |                         | F..107/CRL77             |                 |                         | F..127/CRL87             |                 |                         | F..157/CRL97             |                 |                         |
|--|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|--------------------------|-----------------|-------------------------|
|  | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) | T <sub>2N</sub><br>(N·m) | i <sub>ex</sub> | P <sub>1N</sub><br>(kW) |
|  | 3000                     | 162             | 3.66                    | 4300                     | 162.6           | 5.23                    | 7680                     | 164.8           | 9.22                    | 12000                    | 167.4           | 14.2                    | 18000                    | 173.7           | 20.5                    |
|  | 3000                     | 188.5           | 3.14                    | 4300                     | 181.7           | 4.68                    | 7680                     | 184.6           | 8.22                    | 12000                    | 186.3           | 12.7                    | 18000                    | 193.3           | 18.4                    |
|  | 3000                     | 209.9           | 2.82                    | 4300                     | 204.3           | 4.16                    | 7680                     | 207.7           | 7.31                    | 12000                    | 208.6           | 11.4                    | 18000                    | 216.5           | 16.4                    |
|  |                          |                 |                         |                          |                 |                         |                          |                 |                         | F..127/CRL77             |                 |                         |                          |                 |                         |
|  | 3000                     | 230.1           | 2.58                    | 4300                     | 234.2           | 3.62                    | 7680                     | 225.8           | 6.72                    | 12000                    | 231.9           | 10.2                    | 18000                    | 228.5           | 15.6                    |
|  | 3000                     | 264.3           | 2.24                    | 4300                     | 265.7           | 3.20                    | 7680                     | 256.5           | 5.92                    | 12000                    | 263.4           | 9.01                    | 18000                    | 255.3           | 13.9                    |
|  | 3000                     | 290.8           | 2.04                    | 4300                     | 295.3           | 2.88                    | 7680                     | 284.9           | 5.33                    | 12000                    | 292.6           | 8.11                    | 18000                    | 294.1           | 12.1                    |
|  | 3000                     | 336.6           | 1.76                    | 4300                     | 337.5           | 2.52                    | 7680                     | 318.7           | 4.76                    | 12000                    | 327.2           | 7.25                    | 18000                    | 326.9           | 10.9                    |
|  | 3000                     | 401.2           | 1.48                    | 4300                     | 403.2           | 2.11                    | 7680                     | 400.1           | 3.79                    | 12000                    | 410.9           | 5.77                    | 18000                    | 402.7           | 8.83                    |
|  | 3000                     | 460.5           | 1.28                    | 4300                     | 457.3           | 1.86                    | 7680                     | 454.3           | 3.35                    | 12000                    | 466.5           | 5.09                    | 18000                    | 448.7           | 7.93                    |
|  | 3000                     | 507             | 1.16                    | 4300                     | 508.8           | 1.67                    | 7680                     | 504.3           | 3.01                    | 12000                    | 517.9           | 4.58                    | 18000                    | 517.4           | 6.88                    |
|  | 3000                     | 590.1           | 1.01                    | 4300                     | 568.7           | 1.50                    | 7680                     | 564.9           | 2.69                    | 12000                    | 580.1           | 4.09                    | 18000                    | 575.8           | 6.18                    |
|  | 3000                     | 657.1           | 0.90                    | 4300                     | 639.4           | 1.33                    | 7680                     | 635.8           | 2.39                    | 12000                    | 652.9           | 3.64                    | 18000                    | 644.8           | 5.52                    |
|  | 3000                     | 735.9           | 0.80                    | 4300                     | 724.2           | 1.18                    | 7680                     | 719.2           | 2.11                    | 12000                    | 738.5           | 3.22                    | 18000                    | 726.3           | 4.90                    |
|  | 3000                     | 781.3           | 0.76                    | 4300                     | 794.1           | 1.07                    | 7680                     | 787.7           | 1.93                    | 12000                    | 808.9           | 2.93                    | 18000                    | 788.9           | 4.51                    |
|  | 3000                     | 947.1           | 0.62                    | 4300                     | 944.6           | 0.90                    | 7680                     | 937.8           | 1.62                    | 12000                    | 963             | 2.46                    | 18000                    | 939             | 3.79                    |
|  | 3000                     | 1065            | 0.55                    | 4300                     | 1049            | 0.82                    | 7680                     | 1046            | 1.45                    | 12000                    | 1074            | 2.21                    | 18000                    | 1019            | 3.49                    |
|  | 3000                     | 1270            | 0.47                    | 4300                     | 1251            | 0.68                    | 7680                     | 1255            | 1.21                    | 12000                    | 1289            | 1.84                    | 18000                    | 1261            | 2.82                    |
|  | 3000                     | 1458            | 0.41                    | 4300                     | 1437            | 0.59                    | 7680                     | 1425            | 1.07                    | 12000                    | 1463            | 1.62                    | 18000                    | 1404            | 2.53                    |
|  | 3000                     | 1605            | 0.37                    | 4300                     | 1582            | 0.54                    | 7680                     | 1582            | 0.96                    | 12000                    | 1624            | 1.46                    | 18000                    | 1620            | 2.20                    |
|  | 3000                     | 1868            | 0.31                    | 4300                     | 1841            | 0.46                    | 7680                     | 1771            | 0.85                    | 12000                    | 1819            | 1.31                    | 18000                    | 1803            | 1.97                    |
|  | 3000                     | 2334            | 0.25                    | 4300                     | 2296            | 0.37                    | 7680                     | 2255            | 0.67                    | 12000                    | 2316            | 1.02                    | 18000                    | 2273            | 1.56                    |
|  | 3000                     | 2601            | 0.23                    | 4300                     | 2562            | 0.34                    | 7680                     | 2512            | 0.60                    | 12000                    | 2580            | 0.92                    | 18000                    | 2479            | 1.44                    |
|  | 3000                     | 2834            | 0.20                    | 4300                     | 2798            | 0.30                    | 7680                     | 2854            | 0.53                    | 12000                    | 2848            | 0.83                    | 18000                    | 2874            | 1.24                    |
|  | 3000                     | 3299            | 0.18                    | 4300                     | 3256            | 0.26                    | 7680                     | 3196            | 0.48                    | 12000                    | 3189            | 0.74                    | 18000                    | 3198            | 1.12                    |
|  | 3000                     | 4121            | 0.14                    | 4300                     | 4062            | 0.20                    | 7680                     | 4068            | 0.37                    | 12000                    | 4060            | 0.59                    | 18000                    | 4033            | 0.89                    |
|  | 3000                     | 4591            | 0.13                    | 4300                     | 4532            | 0.19                    | 7680                     | 4532            | 0.34                    | 12000                    | 4523            | 0.53                    | 18000                    | 4398            | 0.80                    |
|  | 3000                     | 5055            |                         | 4300                     | 4989            | 0.17                    | 7680                     | 5031            | 0.30                    | 12000                    | 5021            | 0.47                    | 18000                    | 5074            | 0.70                    |
|  | 3000                     | 5883            |                         | 4300                     | 5806            | 0.14                    | 7680                     | 5634            | 0.26                    | 12000                    | 5623            | 0.42                    | 18000                    | 5646            | 0.64                    |
|  | 3000                     | 6550            |                         | 4300                     | 6465            | 0.13                    | 7680                     | 6320            | 0.24                    | 12000                    | 6307            | 0.37                    | 18000                    | 6321            | 0.56                    |
|  | 3000                     | 7335            |                         | 4300                     | 7240            |                         | 7680                     | 7171            | 0.22                    | 12000                    | 7156            | 0.34                    | 18000                    | 7118            | 0.50                    |
|  | 3000                     | 8431            |                         | 4300                     | 8322            |                         | 7680                     | 8076            | 0.19                    | 12000                    | 7975            | 0.30                    | 18000                    | 8092            | 0.44                    |
|  | 3000                     | 9386            |                         | 4300                     | 9265            |                         | 7680                     | 9058            | 0.17                    | 12000                    | 8945            | 0.26                    | 18000                    | 9060            | 0.40                    |
|  | 3000                     | 10513           |                         | 4300                     | 10376           |                         | 7680                     | 10278           | 0.14                    | 12000                    | 10150           | 0.23                    | 18000                    | 10202           | 0.35                    |
|  | 3000                     | 11165           |                         | 4300                     | 11018           |                         | 7680                     | 11268           | 0.13                    | 12000                    | 11127           | 0.22                    | 18000                    | 11084           | 0.32                    |
|  | 3000                     | 13530           |                         | 4300                     | 13355           |                         | 7680                     | 13413           |                         | 12000                    | 13246           | 0.18                    | 18000                    | 13193           | 0.26                    |
|  | 3000                     | 15604           |                         | 4300                     | 15389           |                         | 7680                     | 15226           |                         | 12000                    | 15037           | 0.16                    | 18000                    | 14861           | 0.24                    |
|  | 3000                     | 16850           |                         | 4300                     | 16626           |                         | 7680                     | 16304           |                         | 12000                    | 16101           | 0.14                    | 18000                    | 16300           | 0.22                    |
|  |                          |                 |                         |                          |                 |                         | 7680                     | 18861           |                         | 12000                    | 18626           | 0.12                    | 18000                    | 17978           | 0.19                    |

F



6 Directly connected motor power table:

| iN   | P <sub>m</sub><br>(kW) | 0.12 | 0.18 | 0.25 | 0.37 | 0.55 | 0.75 | 1.1 | 1.5 | 2.2 | 3 | 0.12 | 0.18 | 0.25 | 0.37 | 0.55 | 0.75 | 1.1 | 1.5 | 2.2 | 3 |
|------|------------------------|------|------|------|------|------|------|-----|-----|-----|---|------|------|------|------|------|------|-----|-----|-----|---|
| 4.3  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 5.2  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 5.8  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 6.6  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 7.4  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 8.3  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 9.1  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 10.8 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 12.4 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 13.8 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 15.5 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 17.4 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 19.5 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 21.1 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 25.3 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 28.2 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 34   |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 38.3 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 43.6 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 48.7 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 54.5 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 60.5 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 67.8 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 77   |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 86.1 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 96.4 |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 107  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 118  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 141  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 161  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 173  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 198  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 227  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 241  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |
| 273  |                        |      |      |      |      |      |      |     |     |     |   |      |      |      |      |      |      |     |     |     |   |




| iN   | P <sub>m</sub><br>(kW) | 0.12 | 0.18 | 0.25 | 0.37 | 0.55 | 0.75 | 1.1 | 1.5 | 2.2 | 3 | 4 | 5.5 | 0.12 | 0.18 | 0.25 | 0.37 | 0.55 | 0.75 | 1.1 | 1.5 | 2.2 | 3 | 4 | 5.5 | 7.5 | 11 |
|------|------------------------|------|------|------|------|------|------|-----|-----|-----|---|---|-----|------|------|------|------|------|------|-----|-----|-----|---|---|-----|-----|----|
| 4.3  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 5.2  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 5.8  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 6.6  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 7.4  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 8.3  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 9.1  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 10.8 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 12.4 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 13.8 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 15.5 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 17.4 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 19.5 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 21.1 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 25.3 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 28.2 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 34   |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 38.3 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 43.6 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 48.7 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 54.5 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 60.5 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 67.8 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 77   |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 86.1 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 96.4 |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 107  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 118  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 141  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 161  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 173  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 198  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 227  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 241  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |
| 273  |                        |      |      |      |      |      |      |     |     |     |   |   |     |      |      |      |      |      |      |     |     |     |   |   |     |     |    |

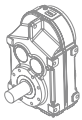
Note: 1. Means permissible directly-connected motor.  
 2. Means permissible directly-connected motor (The motor's power is more than nominal input power of gear unit,  $P_1 > P_{1N}$ ).  
 3. Means unallowed directly-connected motor.  
 4. The selection of motor shall be suitable for driver machine factor and regulations of type selection.  
 5. The motor is 4-pole motor.

| $\frac{P_m}{iN}$<br>(kW) | 0.55 | 0.75 | 1.1 | 1.5 | 2.2 | 3 | 4 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 | 0.75 | 1.1 | 1.5 | 2.2 | 3 | 4 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 |
|--------------------------|------|------|-----|-----|-----|---|---|-----|-----|----|----|------|----|------|-----|-----|-----|---|---|-----|-----|----|----|------|----|----|
| 4.3                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 5.2                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 5.8                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 6.6                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 7.4                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 8.3                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 9.1                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 10.8                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 12.4                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 13.8                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 15.5                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 17.4                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 19.5                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 21.1                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 25.3                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 28.2                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 34                       |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 38.3                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 43.6                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 48.7                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 54.5                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 60.5                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 67.8                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 77                       |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 86.1                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 96.4                     |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 107                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 118                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 141                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 161                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 173                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 198                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 227                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 241                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |
| 273                      |      |      |     |     |     |   |   |     |     |    |    |      |    |      |     |     |     |   |   |     |     |    |    |      |    |    |

F

| $\frac{P_m}{iN}$<br>(kW) | 1.5 | 2.2 | 3 | 4 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 2.2 | 3 | 4 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 55 | 75 | 90 |
|--------------------------|-----|-----|---|---|-----|-----|----|----|------|----|----|----|----|-----|---|---|-----|-----|----|----|------|----|----|----|----|----|----|----|
| 4.3                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 5.2                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 5.8                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 6.6                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 7.4                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 8.3                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 9.1                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 10.8                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 12.4                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 13.8                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 15.5                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 17.4                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 19.5                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 21.1                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 25.3                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 28.2                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 34                       |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 38.3                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 43.6                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 48.7                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 54.5                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 60.5                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 67.8                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 77                       |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 86.1                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 96.4                     |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 107                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 118                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 141                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 161                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 173                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 198                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 227                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 241                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |
| 273                      |     |     |   |   |     |     |    |    |      |    |    |    |    |     |   |   |     |     |    |    |      |    |    |    |    |    |    |    |

- Note: 1.  Means permissible directly-connected motor.  
2.  Means permissible directly-connected motor(The motor's power is more than nominal input power of gear unit,  $P_1 > P_{IN}$ ).  
3.  Means unallowed directly-connected motor.  
4. The selection of motor shall be suitable for driver machine factor and regulations of type selection.  
5. The motor is 4-pole motor.



F

| $iN$<br>$P_m$<br>(kW) | 7.5 | 11 | 15 | 18.5 | 22 | 30 | 37 | 45 | 55 | 75 | 90 | 110 | 132 | 160 |
|-----------------------|-----|----|----|------|----|----|----|----|----|----|----|-----|-----|-----|
| 9.1                   |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 10.8                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 12.4                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 13.8                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 15.5                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 17.4                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 19.5                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 21.1                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 25.3                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 28.2                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 34                    |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 38.3                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 43.6                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 48.7                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 54.5                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 60.5                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 67.8                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 77                    |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 86.1                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 96.4                  |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 107                   |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 118                   |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 141                   |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 161                   |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 173                   |     |    |    |      |    |    |    |    |    |    |    |     |     |     |
| 198                   |     |    |    |      |    |    |    |    |    |    |    |     |     |     |

Note:1. Means permissible directly-connected motor.  
2. Means permissible directly-connected motor(The motor's power is more than nominal input power of gear unit, $P_1 > P_{1N}$ ).  
3. Means unallowed directly-connected motor.  
4.The selection of motor shall be suitable for driver machine factor and regulations of type selection.  
5.The motor is 4-pole motor.

## 7 Permissible Radial Force and Axial Force on Shaft:

### 7.1 Radial Force on Input Shaft (Fr1)(N):

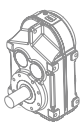
|     | Fr1(N) |       |       |       |       |       |        |        |        |
|-----|--------|-------|-------|-------|-------|-------|--------|--------|--------|
|     | F..37  | F..47 | F..67 | F..77 | F..87 | F..97 | F..107 | F..127 | F..157 |
| AE2 | 803    | 803   | 803   | 803   | 803   | /     | /      | /      | /      |
| AE3 | /      | /     | 1504  | 1504  | 1504  | 1504  | 1504   | /      | /      |
| AE4 | /      | /     | /     | 2188  | 2188  | 2188  | 2188   | 2188   | /      |
| AE5 | /      | /     | /     | /     | 4207  | 4207  | 4207   | 4207   | 4207   |
| AE6 | /      | /     | /     | /     | /     | 5664  | 5664   | 5664   | 5664   |
| AE7 | /      | /     | /     | /     | /     | /     | /      | 9957   | 9957   |
| AE8 | /      | /     | /     | /     | /     | /     | /      | 12546  | 12546  |

F

### 7.2 Radial Force on Output Shaft (Fr2)(N):

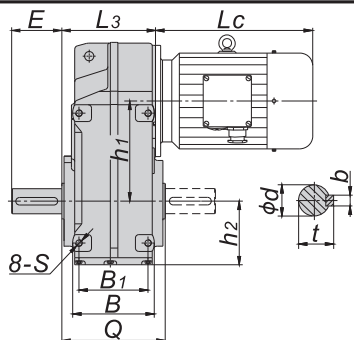
| n <sub>2N</sub><br>(r/min) | Fr2(N) |       |       |       |       |       |        |        |        |
|----------------------------|--------|-------|-------|-------|-------|-------|--------|--------|--------|
|                            | F..37  | F..47 | F..67 | F..77 | F..87 | F..97 | F..107 | F..127 | F..157 |
| 315 ~ 425                  | 1827   | 2079  | 7641  | 9180  | 5382  | 9090  | 11000  | 26550  | \      |
| 280 ~ 315                  | 1908   | 2115  | 7965  | 9630  | 5787  | 9540  | 14000  | 28530  | \      |
| 224 ~ 280                  | 1971   | 2151  | 8280  | 10170 | 6318  | 10080 | 15300  | 28800  | \      |
| 200 ~ 224                  | 2043   | 2223  | 8694  | 10800 | 7011  | 10080 | 18990  | 28980  | \      |
| 180 ~ 200                  | 2115   | 2277  | 9090  | 11250 | 7452  | 10530 | 20880  | 33300  | \      |
| 160 ~ 180                  | 2115   | 2646  | 9810  | 11790 | 8001  | 11520 | 21600  | 32760  | \      |
| 140 ~ 160                  | 2214   | 2925  | 10260 | 12420 | 4545  | 12240 | 22500  | 31500  | 31450  |
| 125 ~ 140                  | 2322   | 3096  | 9270  | 12780 | 4770  | 12240 | 20610  | 30600  | 33150  |
| 112 ~ 125                  | 2475   | 3366  | 9270  | 13410 | 5310  | 9450  | 21870  | 32760  | 37350  |
| 100 ~ 112                  | 2547   | 3555  | 9270  | 14130 | 5733  | 9900  | 22050  | 32760  | 38250  |
| 90 ~ 100                   | 2763   | 3888  | 9270  | 14130 | 6651  | 10710 | 22700  | 33840  | 40410  |
| 80 ~ 90                    | 2862   | 4005  | 9270  | 14130 | 7236  | 11880 | 24300  | 36000  | 42300  |
| 71 ~ 80                    | 3051   | 4293  | 9270  | 14130 | 7956  | 13140 | 25290  | 37800  | 45810  |
| 63 ~ 71                    | 3150   | 4527  | 9270  | 14130 | 8577  | 13500 | 27000  | 37800  | 45900  |
| 56 ~ 63                    | 3519   | 4923  | 9270  | 14130 | 9990  | 15120 | 28980  | 48600  | 55350  |
| 45 ~ 56                    | 3654   | 5247  | 9270  | 14130 | 12510 | 16110 | 30330  | 42750  | 54720  |
| 40 ~ 45                    | 3861   | 5328  | 9270  | 14130 | 13140 | 18270 | 34470  | 47340  | 71370  |
| 35.5 ~ 40                  | 3861   | 5328  | 9270  | 14130 | 13860 | 23400 | 35550  | 49320  | 74070  |
| 31.5 ~ 35.5                | 3861   | 5328  | 9270  | 14130 | 14220 | 21240 | 37800  | 52110  | 79020  |
| 28 ~ 31.5                  | 3861   | 5328  | 9270  | 14130 | 14850 | 23220 | 39150  | 55620  | 83520  |
| 25 ~ 28                    | 3861   | 5328  | 9270  | 14130 | 15930 | 23220 | 41850  | 58770  | 88470  |
| 22.4 ~ 25                  | 3861   | 5328  | 9270  | 14130 | 15120 | 26100 | 43020  | 60660  | 74250  |
| ≤22.4                      | 3861   | 5328  | 9270  | 14130 | 17640 | 26910 | 44820  | 63450  | 78300  |

Note: For lower output speed, apply the largest Fr2 value in each type.

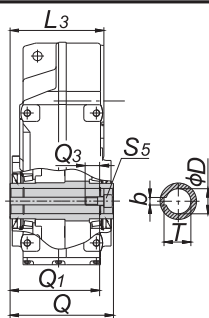


## 8 Mounting and Output Modes and Dimensions:

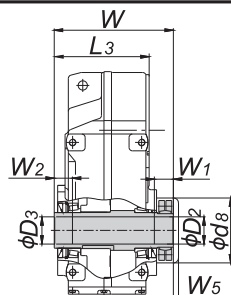
F



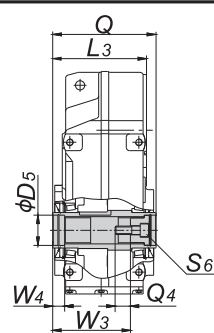
Solid shaft with parallel key  
**F37~F157**



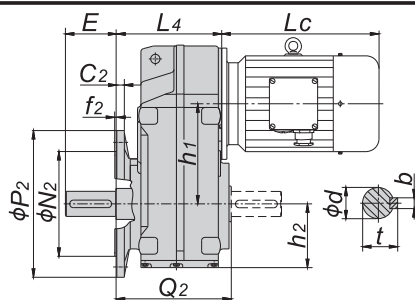
Hollow shaft with parallel key  
**FW37~FW157**



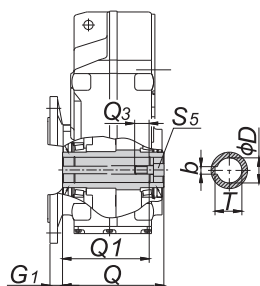
Hollow shaft with shrink disk  
**FH37~FH157**



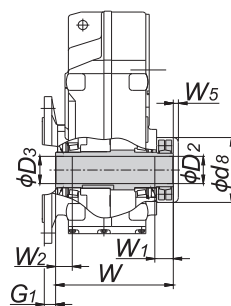
Hollow shaft with involute spline  
**FN37~FN107**



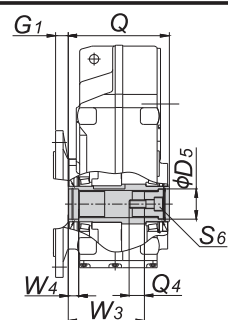
Solid shaft with parallel key  
**FF37~FF157**



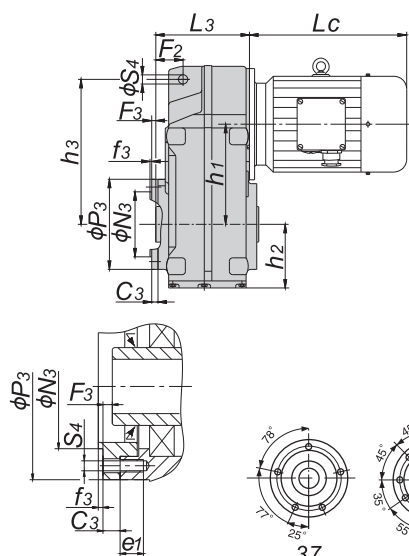
Hollow shaft with parallel key  
**FL37~FL157**



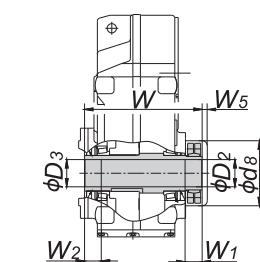
Hollow shaft with shrink disk  
**FHL37~FHL157**



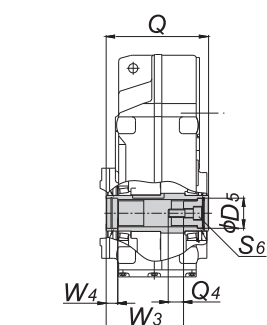
Hollow shaft with involute spline  
**FNF37~FNF107**



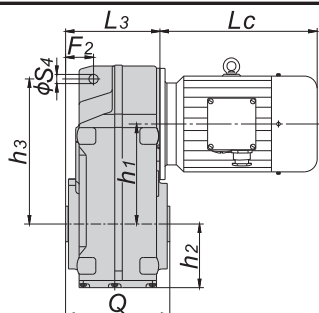
Hollow shaft with parallel key  
**FZ37~FZ157**



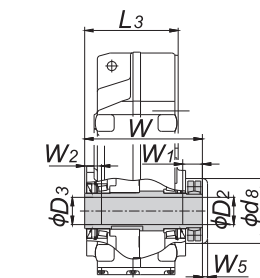
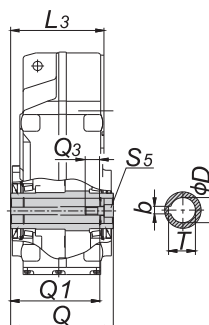
Hollow shaft with shrink disk  
**FHZ37~FHZ157**



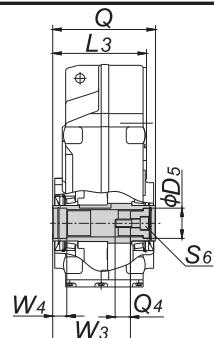
Hollow shaft with involute spline  
**FNZ37~FNZ107**



Hollow shaft with parallel key  
**FA37~FA157**

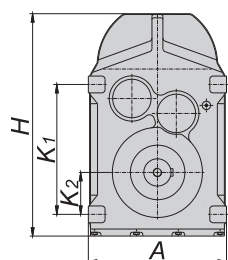


Hollow shaft with shrink disk  
**FHA37~FHA157**

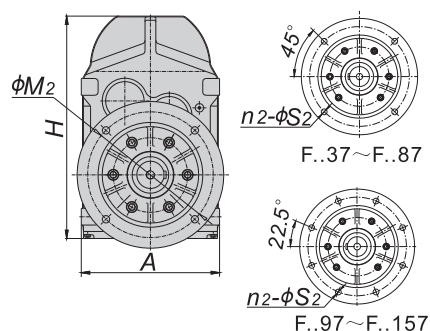


Hollow shaft with involute spline  
**FNA37~FNA107**

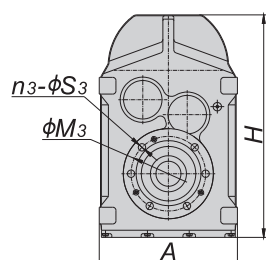
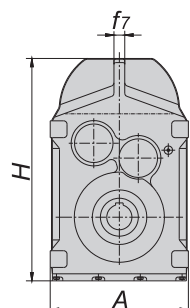
\* For FHL, FHZ, shrink disk should be installed on the opposite side of flange.



Foot-mounted



Flange-mounted


Short-flange  
mounted


Shaft-mounted (Applicable for torque arm mounted)

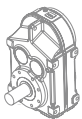
Outline Dimensions

Dimensions of output shaft

| Size        | 37    | 47    | 67    | 77    | 87    | 97    | 107   | 127   | 157   |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| A           | 165   | 180   | 212   | 270   | 330   | 400   | 450   | 530   | 660   |
| B           | 95    | 109   | 135   | 169   | 195   | 240   | 260   | 320   | 364   |
| B1          | 77    | 93    | 112   | 140   | 165   | 205   | 220   | 270   | 310   |
| C2          | 10    | 12    | 15    | 16    | 18    | 22    | 22    | 25    | 28    |
| C3          | 11    | 11    | 12    | 14    | 15    | 18    | 22    | 28    | 58    |
| f2          | 3.5   | 3.5   | 4     | 4     | 5     | 5     | 5     | 5     | 6     |
| f3          | 3     | 3     | 3.5   | 3.5   | 4     | 4     | 4     | 5     | 5     |
| f7          | 12    | 14    | 16    | 20    | 26    | 30    | 36    | 40    | 45    |
| F2          | 31.5  | 32    | 41    | 50    | 62    | 70    | 88    | 112.5 | 150   |
| F3          | 9.5   | 9.5   | 10    | 12    | 13    | 16    | 19.5  | 25.5  | 25    |
| h1          | 112   | 128.1 | 159.5 | 200   | 246.7 | 285   | 332.4 | 382.6 | 447   |
| h2          | 68    | 77    | 97    | 116   | 152   | 178   | 193   | 235   | 286   |
| h3          | 158   | 170   | 218   | 278   | 346   | 395   | 485   | 550   | 660   |
| P3          | 110   | 120   | 155   | 170   | 215   | 260   | 304   | 350   | 400   |
| N3          | 80h7  | 80h7  | 105h7 | 125h7 | 155h7 | 180h7 | 210h7 | 250h7 | 290h7 |
| H           | 244   | 269   | 343   | 420   | 531   | 623   | 715   | 853   | 1024  |
| e1          | 14    | 14    | 20    | 20    | 26    | 26    | 32    | 32    | 36    |
| K1          | 115   | 145   | 190   | 240   | 310   | 350   | 400   | 450   | 540   |
| K2          | 31    | 43    | 60    | 70    | 100   | 120   | 125   | 142   | 170   |
| L3          | 110.5 | 139   | 160   | 192   | 220.5 | 274   | 312   | 367.5 | 443   |
| L4          | 134.5 | 164   | 183   | 229   | 250.5 | 315.5 | 352.5 | 431   | 505   |
| M2          | 130   | 165   | 215   | 265   | 300   | 400   | 400   | 500   | 600   |
| M3          | 94    | 102   | 125   | 142   | 178   | 220   | 260   | 300   | 340   |
| n2          | 4     | 4     | 4     | 4     | 4     | 8     | 8     | 8     | 8     |
| n3          | 5     | 8     | 6     | 8     | 6     | 8     | 8     | 11    | 10    |
| N2          | 110h7 | 130h7 | 180h7 | 230h7 | 250h7 | 350h7 | 350h7 | 450h7 | 550h7 |
| P2          | 160   | 200   | 250   | 300   | 350   | 450   | 450   | 550   | 660   |
| S4          | 14    | 14    | 14    | 22    | 22    | 26    | 26    | 33    | 33    |
| S           | M8    | M10   | M12   | M16   | M16   | M20   | M24   | M30   | M36   |
| S2          | 9     | 11    | 13.5  | 13.5  | 17.5  | 17.5  | 17.5  | 17.5  | 22    |
| S3          | 9     | 9     | 13.5  | 13.5  | 17.5  | 17.5  | 22    | 22    | 26    |
| S4          | M8    | M8    | M12   | M12   | M16   | M16   | M16   | M16   | M18   |
| b           | 8     | 10    | 12    | 14    | 18    | 20    | 25    | 28    | 32    |
| d           | 25k6  | 35k6  | 40k6  | 50k6  | 60m6  | 70m6  | 90m6  | 100m6 | 120m6 |
| D           | 30H7  | 35H7  | 40H7  | 50H7  | 60H7  | 70H7  | 90H7  | 100H7 | 120H7 |
| D2          | 30H7  | 35H7  | 40H7  | 50H7  | 65H7  | 75H7  | 85H7  | 105H7 | 115H7 |
| D3          | 30H7  | 35H7  | 40H7  | 50H7  | 65H7  | 75H7  | 90H7  | 105H7 | 125H7 |
| D5          | 37    | 37    | 42    | 55    | 72    | 72    | 90    | /     | /     |
| d8          | 86    | 86    | 96    | 122   | 150   | 160   | 207   | 252   | 302   |
| E           | 50    | 60    | 80    | 100   | 120   | 140   | 170   | 210   | 210   |
| G1          | 24    | 25    | 23    | 37    | 30    | 41.5  | 40.5  | 51    | 62    |
| Q           | 120   | 150   | 180   | 210   | 240   | 300   | 350   | 410   | 500   |
| Q1          | 105   | 132   | 156   | 183   | 210   | 270   | 313   | 373   | 460   |
| Q2          | 144   | 175   | 204   | 247   | 270   | 341.5 | 391   | 461   | 563   |
| Q3          | 17    | 22    | 29    | 35    | 44    | 43    | 40    | 40    | 40    |
| Q4          | 16    | 18    | 18    | 31    | 36.5  | 36.5  | 36.5  | /     | /     |
| S6          | M10   | M10   | M16   | M16   | M20   | M20   | M20   | /     | /     |
| S5          | M10   | M12   | M16   | M16   | M20   | M20   | M24   | M24   | M24   |
| t           | 28    | 38    | 43    | 53.5  | 64    | 74.5  | 95    | 106   | 127   |
| T           | 33.3  | 38.5  | 43.3  | 53.8  | 64.4  | 74.9  | 95.4  | 106.4 | 127.4 |
| W           | 146   | 177   | 208   | 241   | 281   | 345   | 405   | 485   | 580   |
| W1          | 31    | 32    | 38    | 36    | 41    | 55    | 65    | 85    | 90    |
| W2          | 20    | 20    | 20    | 30    | 40    | 50    | 60    | 70    | 80    |
| W3          | 91    | 118   | 144   | 162   | 182   | 242   | 292   | /     | /     |
| W4          | 18    | 18    | 25    | 23    | 25    | 25    | 26    | /     | /     |
| W5          | 12    | 12    | 12    | 9     | 9     | 11    | 38    | 22    | 33    |
| m*          | 1.25  | 2     | 2     | 2     | 2     | 2     | 3     | /     | /     |
| Z*          | 22    | 16    | 16    | 24    | 31    | 34    | 27    | /     | /     |
| α*          | 30    | 30    | 30    | 30    | 30    | 30    | 30    | /     | /     |
| D6*         | 30    | 35    | 35    | 50    | 65    | 70    | 85    | /     | /     |
| Weight (kg) | 12.6  | 16    | 30    | 50    | 92    | 160   | 240   | 400   | 680   |

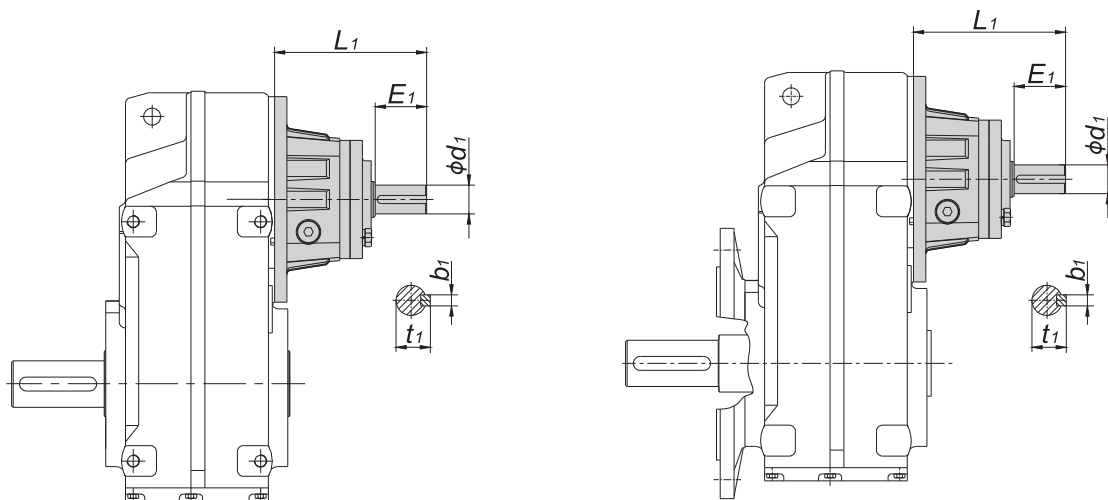
Note: 1) \* Involute spline acc. to DIN 5480 Module M × number of teeth Z × Pressure angle × Major diameter D6 × 9H.

2) \*\* The weight of motor and lubricant is not included.



## 9 Input Part:

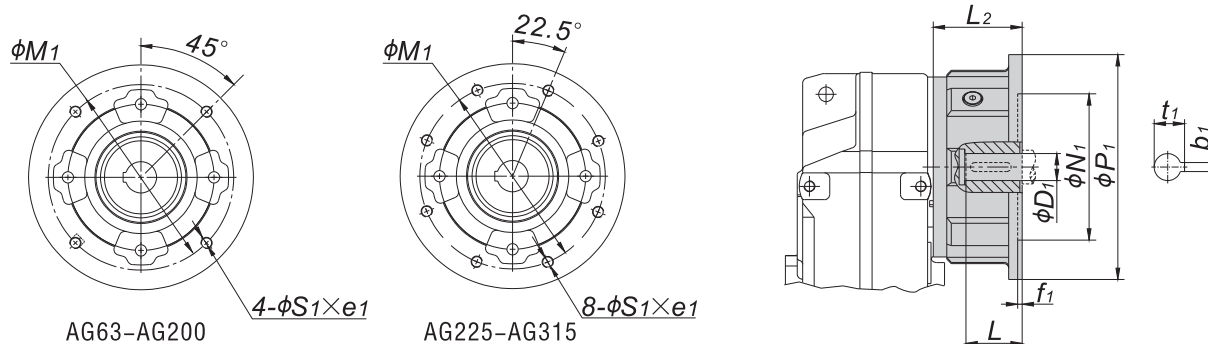
### 9.1 Dimensions of AE Input Shaft:



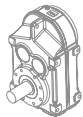
| Size  | Input Shaft | Range of Power | d1   | E1  | L1  | b1 | t1   | Weight (kg) |
|-------|-------------|----------------|------|-----|-----|----|------|-------------|
| 37、47 | AE2         | 0.12~1.1kW     | 19k6 | 40  | 117 | 6  | 21.5 | 3.2         |
| 67    | AE2         | 0.12~1.1kW     | 19k6 | 40  | 119 | 6  | 21.5 | 3.9         |
|       | AE3         | 1.5~5.5kW      | 28k6 | 60  | 175 | 8  | 31   | 7.5         |
| 77    | AE2         | 0.12~1.1kW     | 19k6 | 40  | 111 | 6  | 21.5 | 4.7         |
|       | AE3         | 1.5~5.5kW      | 28k6 | 60  | 165 | 8  | 31   | 8.5         |
|       | AE4         | 7.5~11kW       | 38k6 | 80  | 216 | 10 | 41   | 12.8        |
| 87    | AE2         | 0.12~1.1kW     | 19k6 | 40  | 108 | 6  | 21.5 | 5.9         |
|       | AE3         | 1.5~5.5kW      | 28k6 | 60  | 158 | 8  | 31   | 9.9         |
|       | AE4         | 7.5~11kW       | 38k6 | 80  | 209 | 10 | 41   | 14.5        |
|       | AE5         | 15~22kW        | 42k6 | 110 | 271 | 12 | 45   | 25.4        |
| 97    | AE3         | 1.5~5.5kW      | 28k6 | 60  | 156 | 8  | 31   | 11.9        |
|       | AE4         | 7.5~11kW       | 38k6 | 80  | 203 | 10 | 41   | 17          |
|       | AE5         | 15~22kW        | 42k6 | 110 | 265 | 12 | 45   | 26.6        |
|       | AE6         | 30~45kW        | 48k6 | 110 | 327 | 14 | 51.5 | 51.6        |
| 107   | AE3         | 1.5~5.5kW      | 28k6 | 60  | 146 | 8  | 31   | 13.9        |
|       | AE4         | 7.5~11kW       | 38k6 | 80  | 190 | 10 | 41   | 19.3        |
|       | AE5         | 15~22kW        | 42k6 | 110 | 252 | 12 | 45   | 29.1        |
|       | AE6         | 30~45kW        | 48k6 | 110 | 314 | 14 | 51.5 | 50.8        |
| 127   | AE4         | 7.5~11kW       | 38k6 | 80  | 176 | 10 | 41   | 23.7        |
|       | AE5         | 15~22kW        | 42k6 | 110 | 238 | 12 | 45   | 37.3        |
|       | AE6         | 30~45kW        | 48k6 | 110 | 298 | 14 | 51.5 | 57.2        |
|       | AE7         | 55~90kW        | 55m6 | 110 | 297 | 16 | 59   | 64          |
|       | AE8         | 110~132kW      | 70m6 | 140 | 377 | 20 | 74.5 | 84.4        |
| 157   | AE5         | 15~22kW        | 42k6 | 110 | 228 | 12 | 45   | 48.8        |
|       | AE6         | 30~45kW        | 48k6 | 110 | 280 | 14 | 51.5 | 66          |
|       | AE7         | 55~90kW        | 55m6 | 110 | 279 | 16 | 59   | 73.8        |
|       | AE8         | 110~160kW      | 70m6 | 140 | 361 | 20 | 74.5 | 96          |

\* Range of Power is based on 4-pole motor.

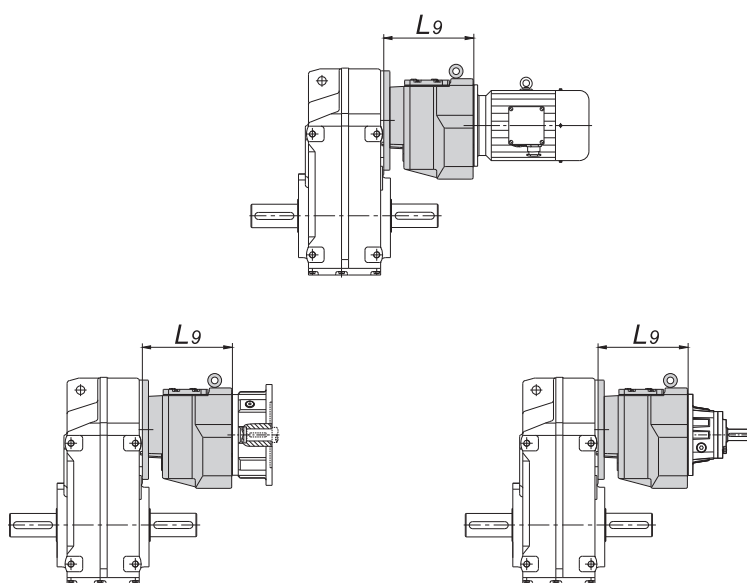
## 9.2 Dimensions of AG Connection Flange:



| Size     | Flange     | e1 | D1   | N1    | M1  | P1  | f1 | b1 | t1   | L   | S1  | L2  | Weight (kg) |
|----------|------------|----|------|-------|-----|-----|----|----|------|-----|-----|-----|-------------|
| 37<br>47 | AG 63      | 14 | 11H7 | 95H7  | 115 | 140 | 4  | 4  | 12.8 | 23  | M8  | 59  | 4.5         |
|          | AG 71      | 14 | 14H7 | 110H7 | 130 | 160 | 4  | 5  | 16.3 | 30  | M8  | 59  | 4.5         |
|          | AG 80      | 18 | 19H7 | 130H7 | 165 | 200 | 4  | 6  | 21.8 | 40  | M10 | 74  | 7.3         |
| 67       | AG 63      | 14 | 11H7 | 95H7  | 115 | 140 | 4  | 4  | 12.8 | 23  | M8  | 61  | 4.6         |
|          | AG 71      | 14 | 14H7 | 110H7 | 130 | 160 | 4  | 5  | 16.3 | 30  | M8  | 61  | 4.6         |
|          | AG 80      | 18 | 19H7 | 130H7 | 165 | 200 | 4  | 6  | 21.8 | 40  | M10 | 76  | 8           |
|          | AG 90      | 18 | 24H7 | 130H7 | 165 | 200 | 4  | 8  | 27.3 | 50  | M10 | 81  | 9.1         |
|          | AG 100\112 | 21 | 28H7 | 180H7 | 215 | 250 | 5  | 8  | 31.3 | 60  | M12 | 96  | 13.1        |
| 77       | AG 71      | 14 | 14H7 | 110H7 | 130 | 160 | 4  | 5  | 12.8 | 30  | M8  | 53  | 5.5         |
|          | AG 80      | 18 | 19H7 | 130H7 | 165 | 200 | 4  | 6  | 21.8 | 40  | M10 | 68  | 9.7         |
|          | AG 90      | 18 | 24H7 | 130H7 | 165 | 200 | 4  | 8  | 27.3 | 50  | M10 | 73  | 10.6        |
|          | AG 100\112 | 21 | 28H7 | 180H7 | 215 | 250 | 5  | 8  | 31.3 | 60  | M12 | 86  | 13.9        |
|          | AG 132     | 21 | 38H7 | 230H7 | 265 | 300 | 5  | 10 | 41.3 | 80  | M12 | 103 | 19.7        |
| 87       | AG 80      | 18 | 19H7 | 130H7 | 165 | 200 | 4  | 6  | 21.8 | 40  | M10 | 65  | 10.2        |
|          | AG 90      | 18 | 24H7 | 130H7 | 165 | 200 | 4  | 8  | 27.3 | 50  | M10 | 70  | 11.1        |
|          | AG 100\112 | 21 | 28H7 | 180H7 | 215 | 250 | 5  | 8  | 31.3 | 60  | M12 | 83  | 15.8        |
|          | AG 132     | 21 | 38H7 | 230H7 | 265 | 300 | 5  | 10 | 41.3 | 80  | M12 | 96  | 22.6        |
|          | AG 160     | 28 | 42H7 | 250H7 | 300 | 350 | 6  | 12 | 45.3 | 110 | M16 | 143 | 37.2        |
| 97       | AG 180     | 28 | 48H7 | 250H7 | 300 | 350 | 6  | 14 | 51.8 | 110 | M16 | 143 | 37.2        |
|          | AG 90      | 18 | 24H7 | 130H7 | 165 | 200 | 4  | 8  | 27.3 | 50  | M10 | 64  | 14.1        |
|          | AG 100\112 | 21 | 28H7 | 180H7 | 215 | 250 | 5  | 8  | 31.3 | 60  | M12 | 78  | 17          |
|          | AG 132     | 21 | 38H7 | 230H7 | 265 | 300 | 5  | 10 | 41.3 | 80  | M12 | 94  | 24.5        |
|          | AG 160     | 28 | 42H7 | 250H7 | 300 | 350 | 6  | 12 | 45.3 | 110 | M16 | 137 | 40.4        |
|          | AG 180     | 28 | 48H7 | 250H7 | 300 | 350 | 6  | 14 | 51.8 | 110 | M16 | 137 | 40.4        |
| 107      | AG 200     | 28 | 55H7 | 300H7 | 350 | 400 | 6  | 16 | 59.3 | 110 | M20 | 167 | 51.9        |
|          | AG 100\112 | 21 | 28H7 | 180H7 | 215 | 250 | 5  | 8  | 31.3 | 60  | M12 | 69  | 19.6        |
|          | AG 132     | 21 | 38H7 | 230H7 | 265 | 300 | 5  | 10 | 41.3 | 80  | M12 | 83  | 25.4        |
|          | AG 160     | 28 | 42H7 | 250H7 | 300 | 350 | 6  | 12 | 45.3 | 110 | M16 | 124 | 43.4        |
|          | AG 180     | 28 | 48H7 | 250H7 | 300 | 350 | 6  | 14 | 51.8 | 110 | M16 | 124 | 43.4        |
|          | AG 200     | 28 | 55H7 | 300H7 | 350 | 400 | 6  | 16 | 59.3 | 110 | M20 | 154 | 52.4        |
| 127      | AG 225     | 28 | 60H7 | 350H7 | 400 | 450 | 6  | 18 | 64.4 | 140 | M16 | 182 | 89          |
|          | AG 132     | 21 | 38H7 | 230H7 | 265 | 300 | 5  | 10 | 41.3 | 80  | M12 | 71  | 33.1        |
|          | AG 160     | 28 | 42H7 | 250H7 | 300 | 350 | 6  | 12 | 45.3 | 110 | M16 | 110 | 50          |
|          | AG 180     | 28 | 48H7 | 250H7 | 300 | 350 | 6  | 14 | 51.8 | 110 | M16 | 110 | 50          |
|          | AG 200     | 28 | 55H7 | 300H7 | 350 | 400 | 6  | 16 | 59.3 | 110 | M20 | 138 | 60.3        |
|          | AG 225     | 28 | 60H7 | 350H7 | 400 | 450 | 6  | 18 | 64.4 | 140 | M16 | 166 | 98.6        |
|          | AG 250     | 28 | 65H7 | 450H7 | 500 | 550 | 7  | 18 | 69.4 | 140 | M16 | 171 | 122.6       |
| 157      | AG 280     | 28 | 75H7 | 450H7 | 500 | 550 | 7  | 20 | 79.9 | 140 | M16 | 171 | 122.6       |
|          | AG 160     | 28 | 42H7 | 250H7 | 300 | 350 | 6  | 12 | 45.3 | 110 | M16 | 100 | 59.7        |
|          | AG 180     | 28 | 48H7 | 250H7 | 300 | 350 | 6  | 14 | 51.8 | 110 | M16 | 100 | 59.7        |
|          | AG 200     | 28 | 55H7 | 300H7 | 350 | 400 | 6  | 16 | 59.3 | 110 | M20 | 120 | 70.72       |
|          | AG 225     | 28 | 60H7 | 350H7 | 400 | 450 | 7  | 18 | 64.4 | 140 | M16 | 148 | 100.9       |
|          | AG 250     | 28 | 65H7 | 450H7 | 500 | 550 | 7  | 18 | 69.4 | 140 | M16 | 153 | 133.8       |
|          | AG 280     | 28 | 75H7 | 450H7 | 500 | 550 | 7  | 20 | 79.9 | 140 | M16 | 153 | 133.8       |
| AG 315   | AG 315     | 35 | 80H7 | 550H7 | 600 | 660 | 7  | 22 | 85.4 | 170 | M20 | 200 | 221.7       |



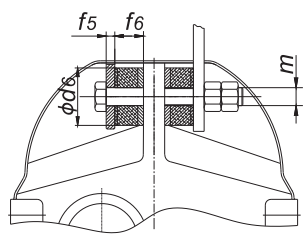
## 10 Combi-type Dimensions :



| Type                       | L9    |
|----------------------------|-------|
| F..37/CRL37                | 181   |
| F..47/CRL37<br>F..67/CRL37 | 183   |
| F..77/CRL37                | 173   |
| F..87/CRL47                | 180   |
| F..97/CRL67                | 225   |
| F..107/CRL77               | 238.5 |
| F..127/CRL77               | 227   |
| F..127/CRL87               | 281   |
| F..157/CRL97               | 322   |

## 11 Accessories:

### 11.1 Torque-arm(Accessory code T21):

|  | Size | 37  | 47  | 67  | 77  | 87  | 97  | 107 | 127 | 157 |
|---|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|   | d6   | 40  | 40  | 40  | 60  | 60  | 80  | 80  | 100 | 120 |
|   | f5   | 5   | 5   | 5   | 10  | 10  | 12  | 12  | 15  | 15  |
|   | f6   | 20  | 20  | 20  | 30  | 30  | 40  | 40  | 60  | 60  |
|   | m    | M12 | M12 | M12 | M20 | M20 | M24 | M24 | M30 | M30 |

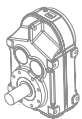
F

### 11.2 Oil:

| Oil level (L)            |              |              |                |              |               |                |
|--------------------------|--------------|--------------|----------------|--------------|---------------|----------------|
| Size \ Mounting position | B5 、 B6 、 H1 | V3 、 V6 、 H6 | B51 、 B61 、 H2 | V1 、 V5 、 H5 | B3 、 B52 、 H4 | B53 、 B31 、 H3 |
| 37                       | 1            | 1.2          | 0.7            | 1.3          | 1             | 1.1            |
| 47                       | 1.6          | 1.9          | 1.1            | 1.9          | 1.5           | 1.7            |
| 67                       | 2.7          | 3.8          | 1.9            | 3.8          | 2.9           | 3.2            |
| 77                       | 5.1          | 7.3          | 4.3            | 8.1          | 6             | 6.3            |
| 87                       | 10.3         | 13.2         | 7.8            | 14.1         | 11            | 11.2           |
| 97                       | 19           | 22.5         | 12.6           | 25.5         | 18.9          | 20.5           |
| 107                      | 25.5         | 32           | 19.5           | 38.5         | 27.5          | 28             |
| 127                      | 41.5         | 56           | 34             | 63           | 46.5          | 49             |
| 157                      | 72           | 105          | 64             | 106          | 87            | 79             |

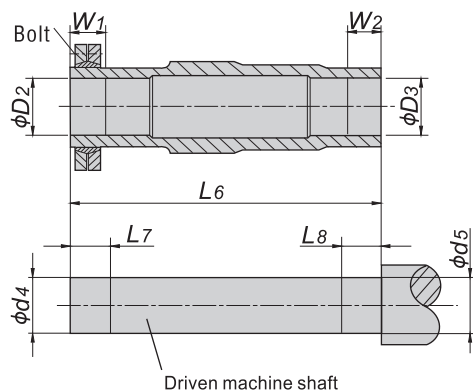
Note: When ambient temperature is  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$ , for F series products, lubricant brand is VG220(ISO viscosity class), accessory code is V22.

11.3 Please refer to page 5/Y motor section for motor accessories.



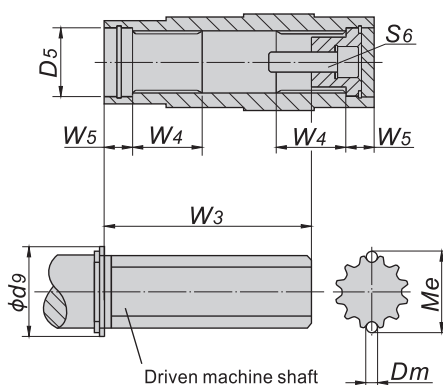
## 12 Recommended dimensions for the driven machine:

### 12.1 Shrink Disk:



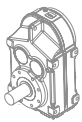
| Size | D2    | D3    | d4    | d5    | L6  | L7  | L8 | W1 | W2 | Model       | Bolt | Weight (kg) |
|------|-------|-------|-------|-------|-----|-----|----|----|----|-------------|------|-------------|
| 37   | 30H7  | 30H7  | 30h6  | 30h6  | 146 | 36  | 25 | 31 | 20 | SP2-44X80   | M6   | 0.6         |
| 47   | 35H7  | 35H7  | 35h6  | 35h6  | 177 | 37  | 25 | 32 | 20 | SP2-44X80   | M6   | 0.6         |
| 67   | 40H7  | 40H7  | 40h6  | 40h6  | 208 | 43  | 25 | 38 | 20 | SP2-50X90   | M6   | 0.8         |
| 77   | 50H7  | 50H7  | 50h6  | 50h6  | 241 | 41  | 35 | 36 | 30 | SP2-62X110  | M6   | 1.3         |
| 87   | 65H7  | 65H7  | 65h6  | 65h6  | 281 | 46  | 45 | 41 | 40 | SP2-80X145  | M8   | 1.9         |
| 97   | 75H7  | 75H7  | 75h6  | 75h6  | 345 | 60  | 55 | 55 | 50 | SP2-90X155  | M8   | 3.3         |
| 107  | 85H7  | 90H7  | 85h6  | 90h6  | 405 | 75  | 70 | 65 | 60 | SP2-110X185 | M10  | 5.9         |
| 127  | 105H7 | 105H7 | 105h6 | 105h6 | 485 | 95  | 80 | 85 | 70 | SP2-140X230 | M12  | 10          |
| 157  | 115H7 | 125H7 | 125h6 | 125h6 | 580 | 100 | 90 | 90 | 80 | SP2-155X263 | M12  | 15          |

### 12.2 Involute Spline:



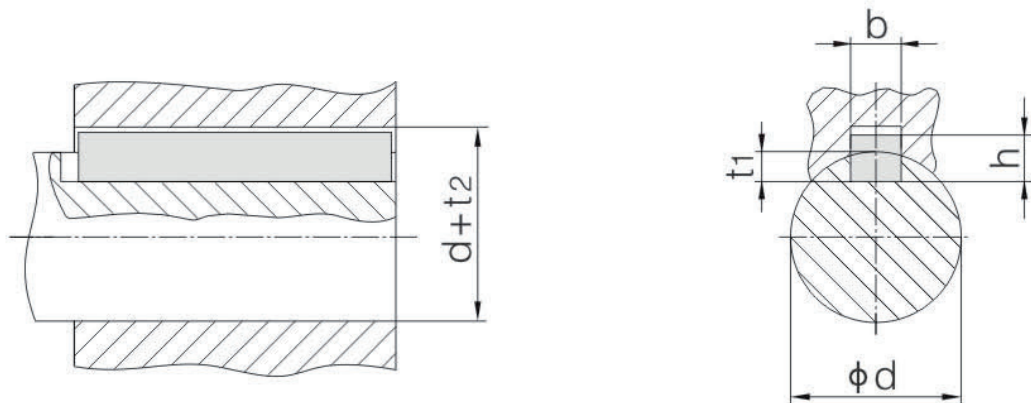
| Size | D5 | Dm   | d9  | Me    | W3  | W4 | W5 | S6     |
|------|----|------|-----|-------|-----|----|----|--------|
| 37   | 37 | 2.75 | 42  | 33.03 | 85  | 25 | 18 | M10X30 |
| 47   | 37 | 4    | 42  | 38.92 | 115 | 32 | 18 | M10X30 |
| 67   | 42 | 4    | 47  | 38.92 | 130 | 42 | 25 | M10X30 |
| 77   | 55 | 4    | 62  | 54.13 | 160 | 52 | 23 | M16X50 |
| 87   | 72 | 4    | 82  | 68.96 | 180 | 62 | 25 | M20X60 |
| 97   | 72 | 4    | 90  | 74.15 | 240 | 72 | 25 | M20X60 |
| 107  | 90 | 6    | 105 | 90.99 | 290 | 89 | 26 | M20X60 |





## 14 Dimension of parallel key and keyway

F



| d             | b  | h  | t <sub>1</sub> | d + t <sub>2</sub> |
|---------------|----|----|----------------|--------------------|
| 8 < d ≤ 10    | 3  | 3  | 1.8            | d + 1.4            |
| 10 < d ≤ 12   | 4  | 4  | 2.5            | d + 1.8            |
| 12 < d ≤ 17   | 5  | 5  | 3              | d + 2.3            |
| 17 < d ≤ 22   | 6  | 6  | 3.5            | d + 2.8            |
| 22 < d ≤ 30   | 8  | 7  | 4              | d + 3.3            |
| 30 < d ≤ 38   | 10 | 8  | 5              | d + 3.3            |
| 38 < d ≤ 44   | 12 | 8  | 5              | d + 3.3            |
| 44 < d ≤ 50   | 14 | 9  | 5.5            | d + 3.8            |
| 50 < d ≤ 58   | 16 | 10 | 6              | d + 4.3            |
| 58 < d ≤ 65   | 18 | 11 | 7              | d + 4.4            |
| 65 < d ≤ 75   | 20 | 12 | 7.5            | d + 4.9            |
| 75 < d ≤ 85   | 22 | 14 | 9              | d + 5.4            |
| 85 < d ≤ 95   | 25 | 14 | 9              | d + 5.4            |
| 95 < d ≤ 110  | 28 | 16 | 10             | d + 6.4            |
| 110 < d ≤ 130 | 32 | 18 | 11             | d + 7.4            |
| 130 < d ≤ 150 | 36 | 20 | 12             | d + 8.4            |
| 150 < d ≤ 170 | 40 | 22 | 13             | d + 9.4            |
| 170 < d ≤ 200 | 45 | 25 | 15             | d + 10.4           |
| 200 < d ≤ 230 | 50 | 28 | 17             | d + 11.4           |
| 230 < d ≤ 260 | 56 | 32 | 20             | d + 12.4           |





F





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