



# HEIDENHAIN



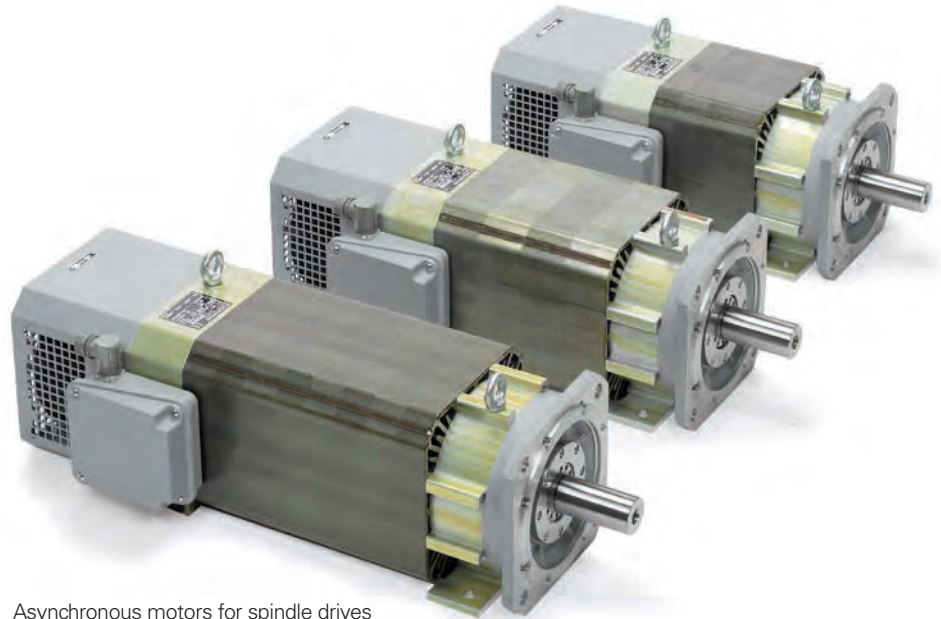
## HEIDENHAIN Motors

for Axis and Spindle Drives

**Information for the  
Machine Tool Builder**

### Motors for axis and spindle drives

HEIDENHAIN supplies motors for axis and spindle drives as accessories to its controls with integrated inverter. This brochure provides an overview of all the available motors and contains technical data and mating dimensions. For commissioning, please request the *Motors* Technical Manual.



Asynchronous motors for spindle drives



Synchronous motors for feed drives

### Intended use

The products described in this brochure

- may be used only for NC controlled machine tools
- should be operated only with controls and inverters from HEIDENHAIN. Consult with HEIDENHAIN before using other controls or inverters
- must be used only in an industrial setting, for commercial applications, or in research institutions
- may be operated only in accordance with the product requirements (specifications, environmental data, safety instructions, etc.)

For the use of the devices as part of a safety function, the machine manufacturer must ensure that the end product meets all requirements of the Machinery Directive (2006/42/EC).

### Improper use

The devices are not intended for applications in areas where a failure would result in considerable risk to humans or the environment. Usage in potentially explosive atmospheres is prohibited.

### Expendable parts

HEIDENHAIN motors contain components that are subject to wear, depending on the application and handling. These include in particular the following parts:

- Bearings
- Brakes
- Shaft sealing rings
- Fans

*This brochure supersedes all previous editions, which thereby become invalid. The basis for ordering from HEIDENHAIN is always the brochure edition valid when the order is made.*

*Standards (ISO, EN, etc.) apply only where explicitly stated in this brochure.*

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# Synchronous motors

## QSY overview

### General technical information

Synchronous motors from HEIDENHAIN fulfill all requirements of a numerically controlled machine tool. Some special characteristics include

- an excellent running smoothness,
- an appropriate mass moment of inertia,
- a very good ratio of the rated torque to the stall torque,
- and a low torque ripple.

When used in conjunction with Gen 3 drives, motors must be operated only with a dc-link voltage of 650 V.

### Specifications

The specifications and characteristic curves apply to motors mounted without thermal insulation. The temperature of the winding may differ from the maximum permissible ambient temperature of 40 °C by a maximum of 100 K. If the motor is mounted so that it is thermally insulated, the motor torque must be reduced in order to avoid thermal overloading. For motors with ECN 1313 or EQN 1325 absolute rotary encoders, the rated torque is reduced by 10 %.

### Speed measurement

Synchronous motors from HEIDENHAIN operate with sinusoidal commutation. An integrated rotary encoder from HEIDENHAIN measures the rotor position and shaft speed. The following versions are available (see *Specifications*):

- ERN 1387 incremental encoder with  $\sim 1 V_{PP}$  interface,  
or
- ECN 1313 absolute singleturn rotary encoder with EnDat2.2/01 interface (only one motor revolution can be evaluated),  
or
- EQN 1325 absolute multiturn rotary encoder with EnDat2.2/01 interface

### Mechanical service life

The service life of the bearings depends on the shaft load and the average shaft speed (see the *Motors Technical Manual*).

For QSY motors, the nominal bearing service life—which depends on the specific motor and applies for a certain maximum shaft load at an average shaft speed—is 30 000 hours.

### EcoDyn motors

Motors of the EcoDyn series are characterized by reduced current consumption together with higher rated torque and a max. permissible rated speed of 3000 rpm (QSY 260: 2000 rpm). The following controls are required in order to drive the motors in EcoDyn mode:

- iTNC 530
- TNC 640
- TNC 620
- MANUALplus 620
- CNC PILOT 640

For all other controls, the rated speed is 2000 rpm.

### Electronic ID label

The synchronous motors with ECN 1313 or EQN 1325 feature an electronic ID label to make commissioning and diagnosis easier. The information, such as motor designation, ID number or serial number, stored in this ID label can be read and displayed by the internal diagnostic function DriveDiag of HSCI controls. Thus, the control automatically recognizes the motor type every time it is switched on.



QSY 116 E



QSY 155 B

### Functional safety

All current QSY motor variants described here feature a fault exclusion against loosening of the mechanical connection between the encoder and the motor. This prevents any unintended loosening of the rotor and stator coupling.

You can receive information on the safety parameters of the motors or the encoders installed in it (e.g. MTF values, data on fault exclusion) upon request.

### Installation altitude

HEIDENHAIN motors may be installed up to an altitude of 1000 m above sea level. For installation at altitudes above 1000 m, additional cooling measures are required.

### Thermal specifications

Natural cooling  
Temperature monitoring with KTY 84-130 thermistor in the stator winding  
Thermal class F

### Mechanical parameters

*Design* IM B5 (mounting via flange) as per EN 60034-7

#### *Mounting the motor*

The following screws are recommended for mounting the motor:

QSY 96	M6
QSY 116	M8
QSY 130	M8
QSY 155	M10
QSY 190	M12
QSY 260	M16

*Flange:* dimensions as per DIN EN 50347 and IEC 60072-1

*Protection* as per DIN EN 60529

- Motor: IP65
- Shaft exit: IP64

#### *Suitability with regard to gear drive*

Only for enclosed gear drives. The shaft is suitable only for dry connection.

#### *Vibration severity*

Level A as per IEC 60034-14

#### *Radial runout, concentricity, and axial runout*

Tolerance N as per IEC 60072-1 (DIN 42955)

#### *Shaft end*

Cylindrical without keyway as per IEC 60072-1 with center hole and thread  
Shaft with keyway and feather key as per DIN 6885-1 (upon request)

- QSY 96: A 6 x 6 x 32
- QSY 116: A 8 x 7 x 40
- QSY 130: A 8 x 7 x 40
- QSY 155: A 10 x 8 x 50
- QSY 190: A 10 x 8 x 70
- QSY 260: A 14 x 9 x 70

The motors with feather key are flush feather-key balanced as per ISO 21940-32.  
Bearings free of maintenance  
Holding brake optionally with low backlash  $\leq 1^\circ$



QSY 190 EcoDyn



QSY 96 G

# Synchronous motors

## Used with 1xx inverter systems

Synchronous motors	Stall torque	Stall current	Rated speed	Recommended inverters <sup>2)</sup>				Page
				1-axis module	2-axis module	Compact inverters/axis		
						UR 2xxD UE 2xxB	UE 1xx	
<b>QSY 96A</b>	1.5 Nm	1.5 A	4500 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	<b>8</b>
<b>QSY 96G</b>	5.2 Nm	5.2 A	4500 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	
<b>QSY 116C</b>	5.2 Nm	3.3 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	<b>10</b>
<b>QSY 116E</b>	7.2 Nm	4.8 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	4	
<b>QSY 116J</b>	10.0 Nm	6.8 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	4	
<b>QSY 116J EcoDyn</b>	10.0 Nm	5.0 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	4	
<b>QSY 130C EcoDyn</b>	6.0 Nm	3.0 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	<b>12</b>
<b>QSY 130E EcoDyn</b>	9.0 Nm	4.5 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	
<b>QSY 155B</b>	13.0 Nm	9.1 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	<b>14</b>
<b>QSY 155C</b>	17.7 Nm	11.8 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	
<b>QSY 155D</b>	21.6 Nm	14.6 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	
<b>QSY 155F</b>	26.1 Nm	18.0 A	3000 rpm	UM 112 D	UM 122 D	4 <sup>1)</sup>	–	
<b>QSY 155B EcoDyn</b>	13.0 Nm	6.5 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	–	<b>16</b>
<b>QSY 155C EcoDyn</b>	17.7 Nm	8.5 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	
<b>QSY 155D EcoDyn</b>	21.6 Nm	10.6 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	
<b>QSY 155F EcoDyn</b>	26.1 Nm	12.8 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	
<b>QSY 190C EcoDyn</b>	28.0 Nm	14.0 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	<b>18</b>
<b>QSY 190D EcoDyn</b>	38.0 Nm	18.1 A	3000 rpm	UM 112 D	UM 122 D	4 <sup>1)</sup>	–	
<b>QSY 190F EcoDyn</b>	47.6 Nm	22.7 A	3000 rpm	UM 112 D	UM 122 D	4 <sup>1)</sup>	–	
<b>QSY 190K EcoDyn</b>	62.5 Nm	29.8 A	3000 rpm	UM 113 D	–	–	–	
<b>QSY 260B EcoDyn</b>	85.0 Nm	31.0 A	2000 rpm	UM 114 D	–	–	–	<b>20</b>
<b>QSY 260C EcoDyn</b>	120 Nm	43.5 A	2000 rpm	UM 115 D	–	–	–	

<sup>1)</sup> Only UE 242B, UR 242D

<sup>2)</sup> The maximum acceleration of the motor might not be achievable with the recommended inverters. If necessary, a more powerful power module must be selected.



## Used with Gen 3 drives

Synchronous motors	Stall torque	Stall current	Rated speed	Recommended inverters <sup>1)</sup>		Page
				1-axis module	2-axis module	
<b>QSY 96A</b>	1.5 Nm	1.5 A	4500 rpm	UM 310	UM 320	<b>8</b>
<b>QSY 96G</b>	5.2 Nm	5.2 A	4500 rpm	UM 310	UM 320	
<b>QSY 116C</b>	5.2 Nm	3.3 A	3000 rpm	UM 310	UM 320	<b>10</b>
<b>QSY 116E</b>	72 Nm	4.8 A	3000 rpm	UM 310	UM 320	
<b>QSY 116J</b>	10.0 Nm	6.8 A	3000 rpm	UM 310	UM 320	
<b>QSY 116J EcoDyn</b>	10.0 Nm	5.0 A	3000 rpm	UM 310	UM 320	
<b>QSY 130C EcoDyn</b>	6.0 Nm	3.0 A	3000 rpm	UM 310	UM 320	<b>12</b>
<b>QSY 130E EcoDyn</b>	9.0 Nm	4.5 A	3000 rpm	UM 310	UM 320	
<b>QSY 155B</b>	13.0 Nm	9.1 A	3000 rpm	UM 310	UM 320	<b>14</b>
<b>QSY 155C</b>	17.7 Nm	11.8 A	3000 rpm	UM 311	UM 321	
<b>QSY 155D</b>	21.6 Nm	14.6 A	3000 rpm	UM 311	UM 321	
<b>QSY 155F</b>	26.1 Nm	18.0 A	3000 rpm	UM 312	UM 322	
<b>QSY 155B EcoDyn</b>	13.0 Nm	6.5 A	3000 rpm	UM 310	UM 320	<b>16</b>
<b>QSY 155C EcoDyn</b>	17.7 Nm	8.5 A	3000 rpm	UM 310	UM 320	
<b>QSY 155D EcoDyn</b>	21.6 Nm	10.6 A	3000 rpm	UM 311	UM 321	
<b>QSY 155F EcoDyn</b>	26.1 Nm	12.8 A	3000 rpm	UM 311	UM 321	
<b>QSY 190C EcoDyn</b>	28.0 Nm	14.0 A	3000 rpm	UM 311	UM 321	<b>18</b>
<b>QSY 190D EcoDyn</b>	38.0 Nm	18.1 A	3000 rpm	UM 312	UM 322	
<b>QSY 190F EcoDyn</b>	47.6 Nm	22.7 A	3000 rpm	UM 312	UM 322	
<b>QSY 190K EcoDyn</b>	62.5 Nm	29.8 A	3000 rpm	UM 313	–	
<b>QSY 260B EcoDyn</b>	85.0 Nm	31.0 A	2000 rpm	UM 313	–	<b>20</b>
<b>QSY 260C EcoDyn</b>	120 Nm	43.5 A	2000 rpm	UM 313	–	

<sup>1)</sup> The maximum acceleration of the motor might not be achievable with the recommended inverters. If necessary, a more powerful power module must be selected.

# Synchronous motors

## QSY 96 series

Feed motors with 3 pole pairs

- Stall torque 1.5 Nm and 5.2 Nm
- Choice of incremental or absolute rotary encoder

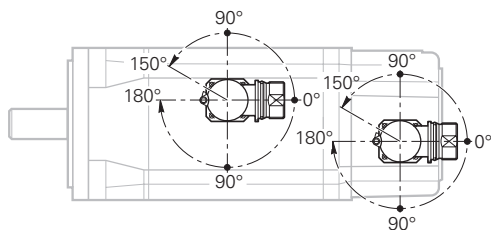


Motor	QSY 96A		QSY 96G	
Rated voltage $U_N$	310 V/308 V		291 V/290 V	
Rated power output $P_N$	0.5 kW/0.45 kW		1.4 kW/1.3 kW	
Rated speed $n_N$	4500 rpm			
Rated torque $M_N^{1)}$	1.05 Nm/0.95 Nm		3.0 Nm/2.7 Nm at 4500 rpm	
Rated current $I_N^{1)}$	1.1 A/1.0 A		3.3 A/3.0 A	
Stall torque $M_0^{1)}$	1.5 Nm		5.2 Nm	
Stall current $I_0^{1)}$	1.5 A		5.2 A	
Max. speed $n_{max}$	6000 rpm			
Max. torque $M_{max}^{2)}$	5.5 Nm		22 Nm	
Max. current $I_{max}^{2)}$	6.3 A		25.4 A	
Mass $m$	3.6 kg	4.5 kg	7.2 kg	8.1 kg
Rotor inertia $J$	1.8 kg·cm <sup>2</sup>	2.1 kg·cm <sup>2</sup>	6.3 kg·cm <sup>2</sup>	6.6 kg·cm <sup>2</sup>
<b>Brake</b> Rated voltage $U_{Br}$ Rated current $I_{Br}$ Holding torque $M_{Br}$	<b>Without</b> – – –	<b>With</b> DC 24 V 0.5 A 5.0 Nm	<b>Without</b> – – –	<b>With</b> DC 24 V 0.5 A 5.0 Nm
<b>ID</b> For motor with ERN 1387 For motor with ECN 1313 For motor with EQN 1325	344512-0C 344512-8C 344512-5C	344512-0D 344512-8D 344512-5D	339875-0C 339875-8C 339875-5C	339875-0D 339875-8D 339875-5D

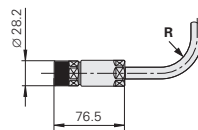
<sup>1)</sup> At 100 K      <sup>2)</sup> Max. 200 ms

*Italics: data for motors with ECN 1313 or EQN 1325 (rated torque reduced by 10 %)*

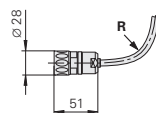
### Rotatable connections



### Power connector



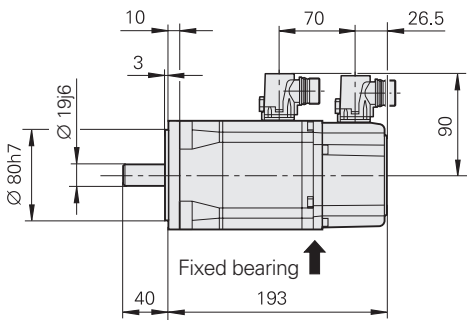
### Encoder connector



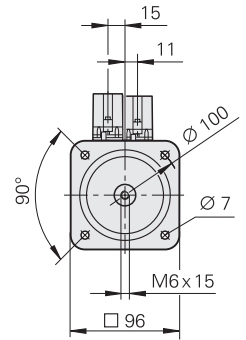
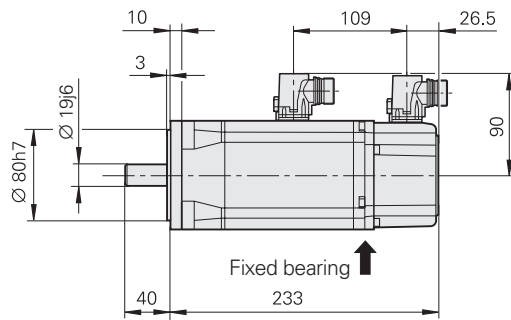
For **R** see page 25



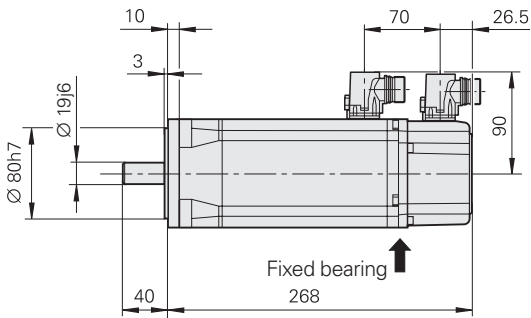
**QSY 96A** Without brake



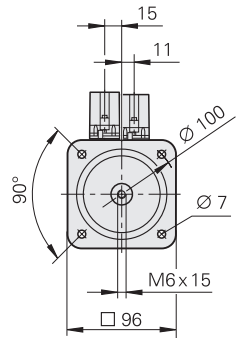
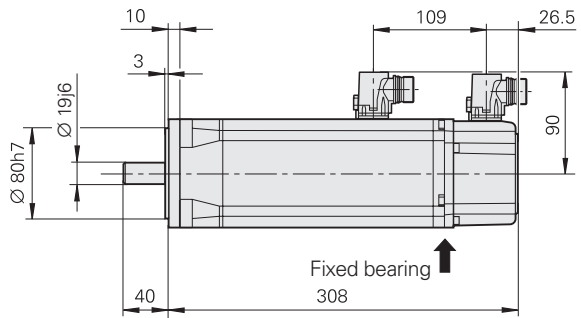
With brake



**QSY 96G** Without brake



With brake



mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 $\leq 6$  mm:  $\pm 0.2$  mm

# Synchronous motors

## QSY 116 series

Feed motors with 3 pole pairs

- Stall torque 5.2 Nm to 10 Nm
- Choice of incremental or absolute rotary encoder

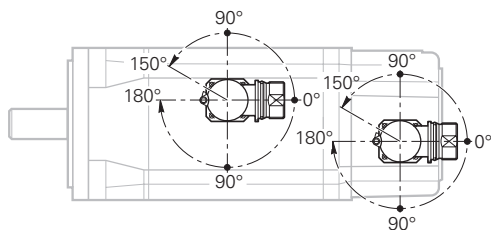


Motor	QSY 116C		QSY 116E		QSY 116J		QSY 116J EcoDyn	
Rated voltage $U_N$	315 V/311 V		302 V/299 V		290 V/288 V		408 V/405 V	
Rated power output $P_N$	1.45 kW/1.30 kW		1.85 kW/1.67 kW		2.42 kW/2.18 kW		2.64 kW/2.38 kW	
Rated speed $n_N$	3000 rpm						3000 rpm <sup>3)</sup>	
Rated torque $M_N$ <sup>1)</sup>	4.6 Nm/4.1 Nm		5.9 Nm/5.3 Nm		7.7 Nm/6.9 Nm		8.4 Nm/7.6 Nm	
Rated current $I_N$ <sup>1)</sup>	3.3 A/3.0 A		4.1 A/3.7 A		5.4 A/4.8 A		4.3 A/3.9 A	
Stall torque $M_0$ <sup>1)</sup>	5.2 Nm		7.2 Nm		10.0 Nm		10.0 Nm	
Stall current $I_0$ <sup>1)</sup>	3.3 A		4.8 A		6.8 A		5.0 A	
Max. speed $n_{max}$	5400 rpm						4200 rpm <sup>3)</sup>	
Max. torque $M_{max}$ <sup>2)</sup>	16 Nm		25 Nm		41 Nm		41 Nm	
Max. current $I_{max}$ <sup>2)</sup>	12.7 A		19.0 A		32.6 A		23.0 A	
Mass $m$	6.9 kg	7.8 kg	8.6 kg	9.5 kg	12.0 kg	13.3 kg	12.0 kg	13.3 kg
Rotor inertia $J$	7.5 kg·cm <sup>2</sup>	7.9 kg·cm <sup>2</sup>	9.9 kg·cm <sup>2</sup>	10.3 kg·cm <sup>2</sup>	15.0 kg·cm <sup>2</sup>	15.4 kg·cm <sup>2</sup>	15.0 kg·cm <sup>2</sup>	15.4 kg·cm <sup>2</sup>
<b>Brake</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>
Rated voltage $U_{Br}$	–	DC 24 V	–	DC 24 V	–	DC 24 V	–	DC 24 V
Rated current $I_{Br}$	–	0.6 A	–	0.6 A	–	0.85 A	–	0.85 A
Holding torque $M_{Br}$	–	13.5 Nm	–	13.5 Nm	–	13.5 Nm	–	13.5 Nm
<b>ID</b>								
For motor with ERN 1387	339876-0C	339876-0D	339877-0C	339877-0D	339878-0C	339878-0D	339878-1C	339878-1D
For motor with ECN 1313	339876-8C	339876-8D	339877-8C	339877-8D	–	–	339878-8C	339878-8D
For motor with EQN 1325	339876-5C	339876-5D	339877-5C	339877-5D	339878-5C	339878-5D	339878-6C	339878-6D

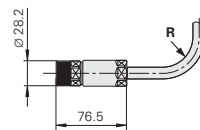
1) At 100 K      2) Max. 200 ms      3) In EcoDyn mode

*Italics: data for motors with ECN 1313 or EQN 1325 (rated torque reduced by 10 %)*

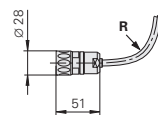
### Rotatable connections



### Power connector

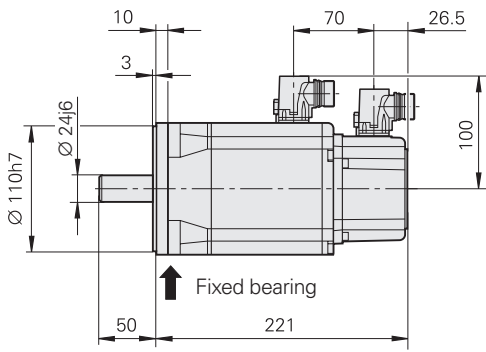


### Encoder connector

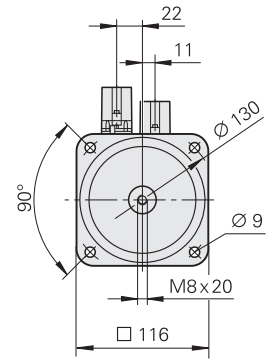
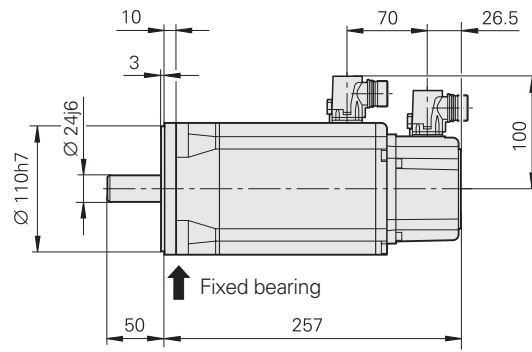


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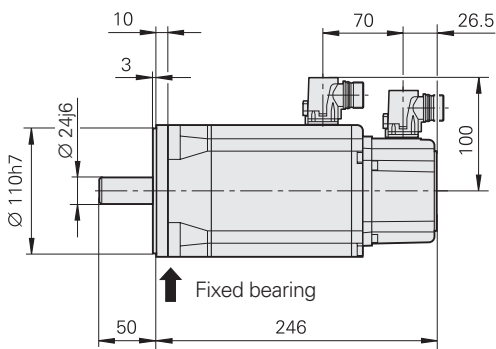
**QSY 116C** Without brake



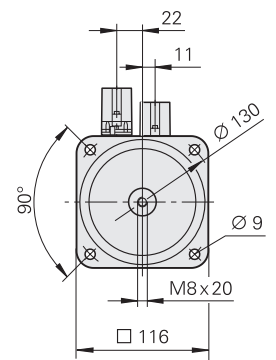
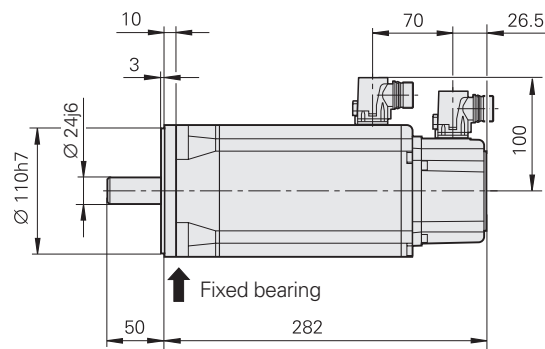
With brake



**QSY 116E** Without brake

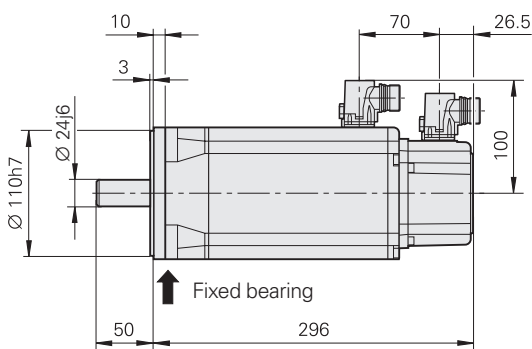


With brake

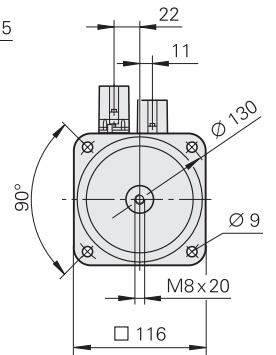
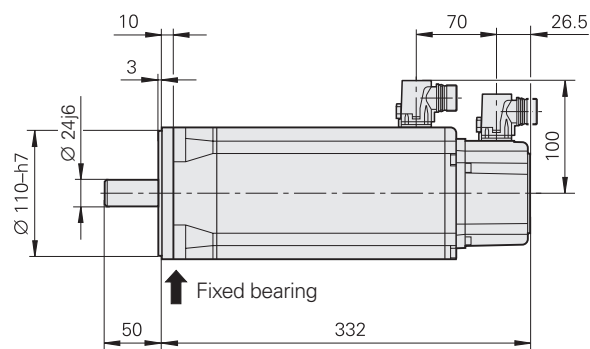



**QSY 116J**

**QSY 116J EcoDyn** Without brake



With brake



mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 ≤ 6 mm: ±0.2 mm

# Synchronous motors

## QSY 130 EcoDyn series

Feed motors with 4 pole pairs

- Stall torque 6 Nm and 9 Nm
- Choice of incremental or absolute rotary encoder

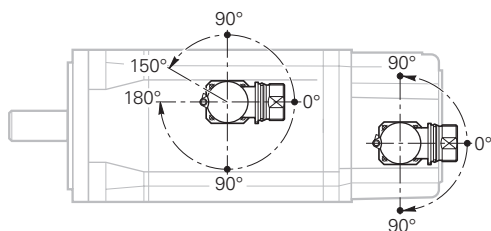


Motor	QSY 130C EcoDyn		QSY 130E EcoDyn	
Rated voltage $U_N$	415 V/411 V		407 V/403 V	
Rated power output $P_N$	1.6 kW/1.5 kW		2.3 kW/2.1 kW	
Rated speed $n_N$	3000 rpm (in EcoDyn mode)			
Rated torque $M_N^{1)}$	5.2 Nm/4.7 Nm		7.4 Nm/6.7 Nm	
Rated current $I_N^{1)}$	2.7 A/2.4 A		3.8 A/3.4 A	
Stall torque $M_0^{1)}$	6.0 Nm		9.0 Nm	
Stall current $I_0^{1)}$	3.0 A		4.5 A	
Max. speed $n_{max}$	4200 rpm (in EcoDyn mode)			
Max. torque $M_{max}^{2)}$	16 Nm		23 Nm	
Max. current $I_{max}^{2)}$	8.6 A		12.7 A	
Mass $m$	7.9 kg	8.8 kg	9.7 kg	10.6 kg
Rotor inertia $J$	16.0 kg·cm <sup>2</sup>	16.4 kg·cm <sup>2</sup>	21.0 kg·cm <sup>2</sup>	21.4 kg·cm <sup>2</sup>
<b>Brake</b> Rated voltage $U_{Br}$ Rated current $I_{Br}$ Holding torque $M_{Br}$	<b>Without</b> – – –	<b>With</b> DC 24 V 0.6 A 13.5 Nm	<b>Without</b> – – –	<b>With</b> DC 24 V 0.6 A 13.5 Nm
<b>ID</b> For motor with ERN 1387 For motor with ECN 1313 For motor with EQN 1325	389053-1C 389053-8C 389053-6C	389053-1D 389053-8D 389053-6D	388422-1C 388422-8C 388422-6C	388422-1D 388422-8D 388422-6D

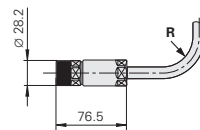
<sup>1)</sup> At 100 K      <sup>2)</sup> Max. 200 ms

*Italics: data for motors with ECN 1313 or EQN 1325 (rated torque reduced by 10 %)*

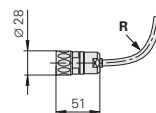
### Rotatable connections



### Power connector

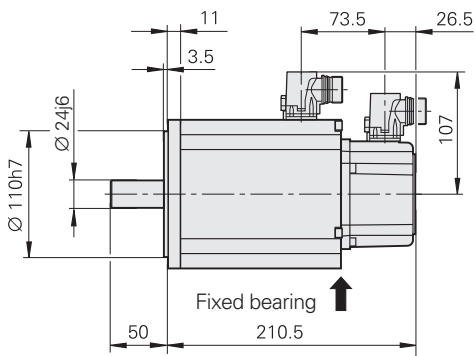


### Encoder connector

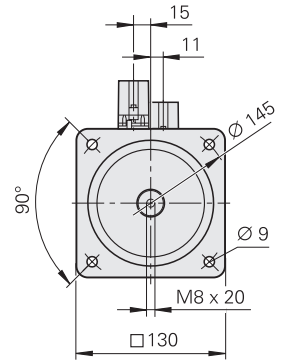
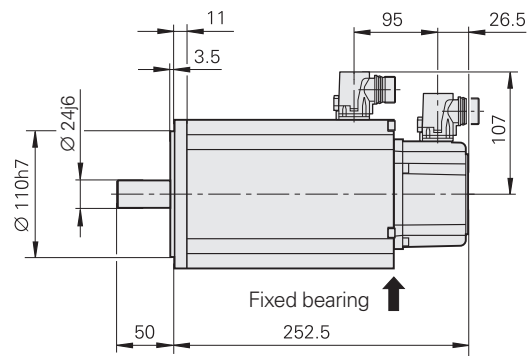


For **R** see page 25

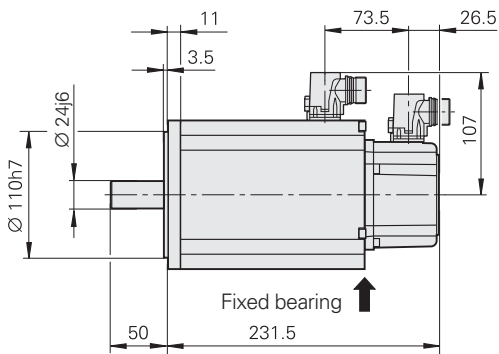
**QSY 130C** Without brake



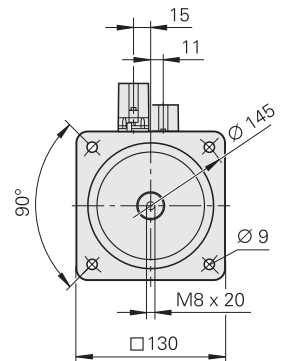
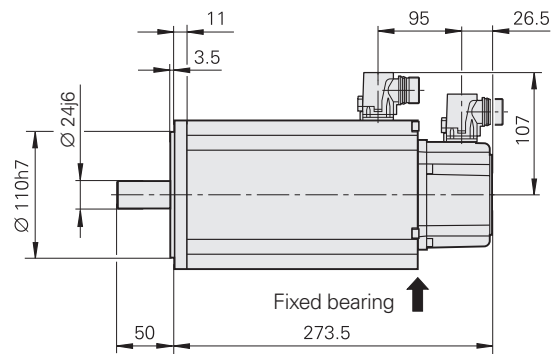
With brake




**QSY 130E** Without brake



With brake



mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 ≤ 6 mm: ±0.2 mm

# Synchronous motors

## QSY 155 series

Feed motors with 4 pole pairs

- Stall torque 13 Nm to 26.1 Nm
- Choice of incremental or absolute rotary encoder

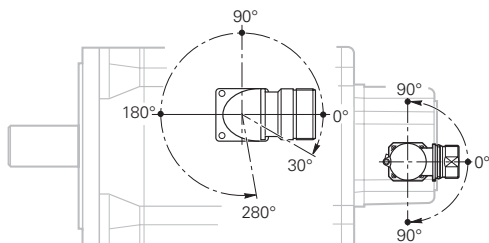


Motor	QSY 155 B		QSY 155 C		QSY 155 D		QSY 155 F	
Rated voltage $U_N$	298 V/295 V		294 V/291 V		293 V/291 V		289 V/287 V	
Rated power output $P_N$	2.9 kW/2.6 kW		3.9 kW/3.5 kW		4.6 kW/4.1 kW		5.2 kW/4.7 kW	
Rated speed $n_N$	3000 rpm							
Rated torque $M_N$ <sup>1)</sup>	9.2 Nm/8.3 Nm		12.5 Nm/11.3 Nm		14.8 Nm/13.3 Nm		16.7 Nm/15.0 Nm	
Rated current $I_N$ <sup>1)</sup>	6.9 A/6.2 A		8.7 A/7.8 A		10.6 A/9.5 A		12.0 A/10.8 A	
Stall torque $M_0$ <sup>1)</sup>	13.0 Nm		17.7 Nm		21.6 Nm		26.1 Nm	
Stall current $I_0$ <sup>1)</sup>	9.1 A		11.8 A		14.6 A		18.0 A	
Max. speed $n_{max}$	5000 rpm							
Max. torque $M_{max}$ <sup>2)</sup>	39 Nm		52 Nm		64 Nm		90 Nm	
Max. current $I_{max}$ <sup>2)</sup>	29.7 A		38.9 A		49.5 A		68.6 A	
Mass $m$	15.0 kg	18.0 kg	17.5 kg	20.5 kg	20.0 kg	23.0 kg	25.0 kg	28.0 kg
Rotor inertia $J$	33 kg·cm <sup>2</sup>	35 kg·cm <sup>2</sup>	43 kg·cm <sup>2</sup>	45 kg·cm <sup>2</sup>	54 kg·cm <sup>2</sup>	56 kg·cm <sup>2</sup>	75 kg·cm <sup>2</sup>	77 kg·cm <sup>2</sup>
<b>Brake</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>
Rated voltage $U_{Br}$	–	DC 24 V	–	DC 24 V	–	DC 24 V	–	DC 24 V
Rated current $I_{Br}$	–	1.04 A	–	1.04 A	–	1.04 A	–	1.04 A
Holding torque $M_{Br}$	–	40 Nm	–	40 Nm	–	40 Nm	–	40 Nm
<b>ID</b>								
For motor with ERN 1387	339880-0C	339880-0D	365308-0C	365308-0D	339881-0C	339881-0D	339882-0C	339882-0D
For motor with EQN 1325	339880-5C	339880-5D	365308-5C	365308-5D	339881-5C	339881-5D	339882-5C	339882-5D

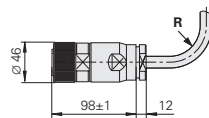
<sup>1)</sup> At 100 K      <sup>2)</sup> Max. 200 ms

*Italics: data for motors with EQN 1325 (rated torque reduced by 10 %)*

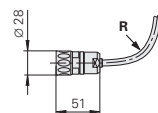
### Rotatable connections



### Power connector



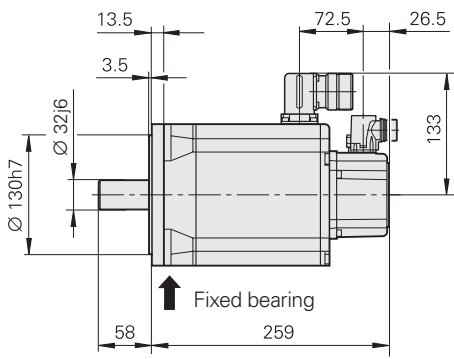
### Encoder connector



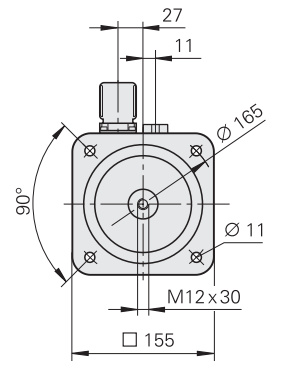
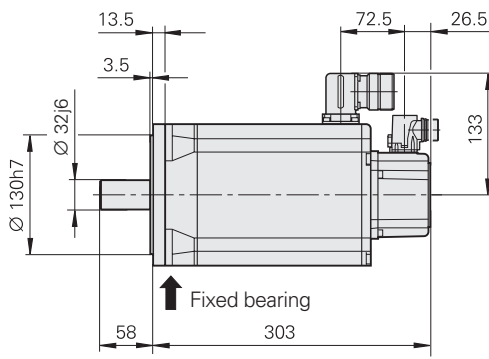
For **R** see page 25



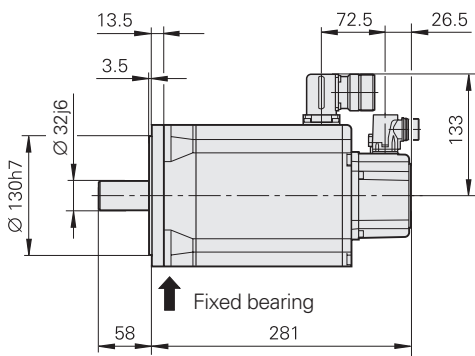
**QSY 155B** Without brake



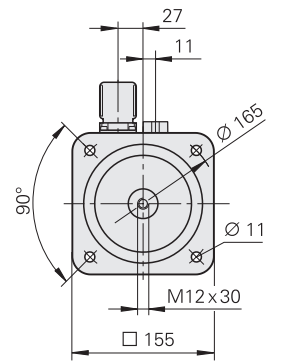
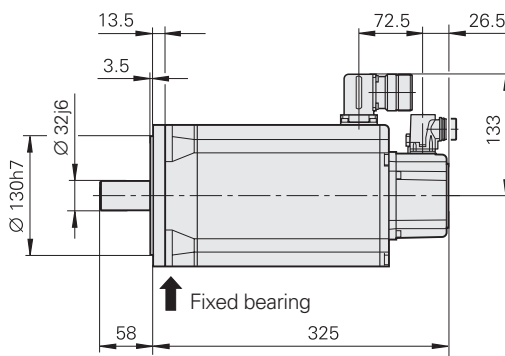
With brake



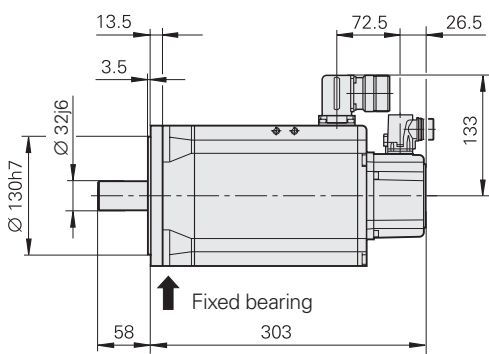
**QSY 155C** Without brake



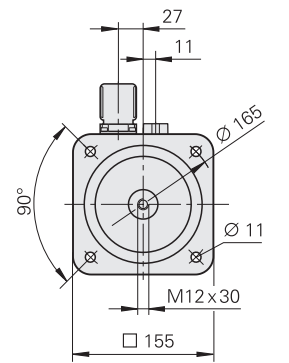
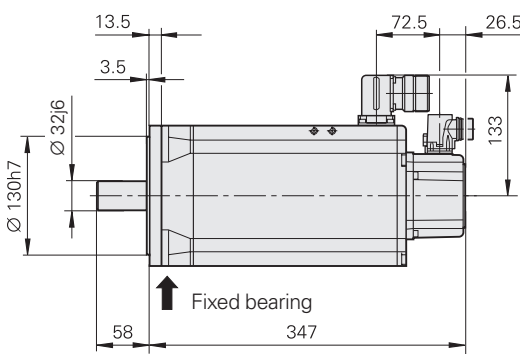
With brake



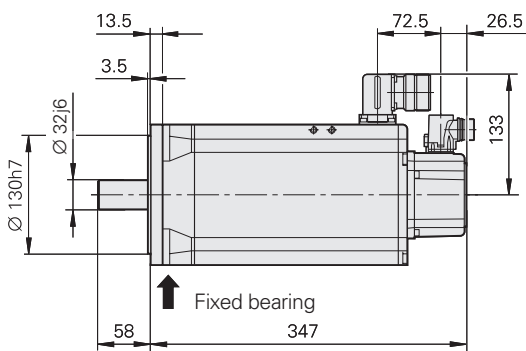
**QSY 155D** Without brake



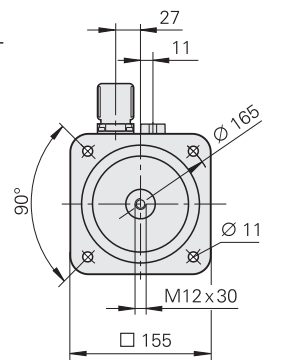
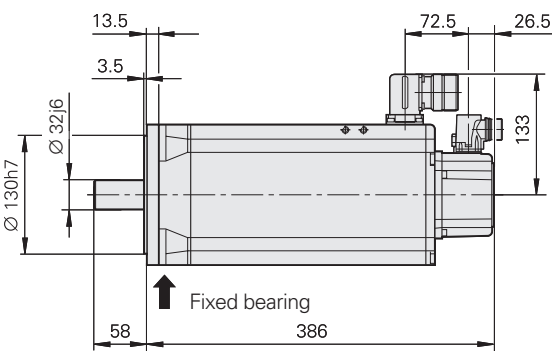
With brake




**QSY 155F** Without brake



With brake



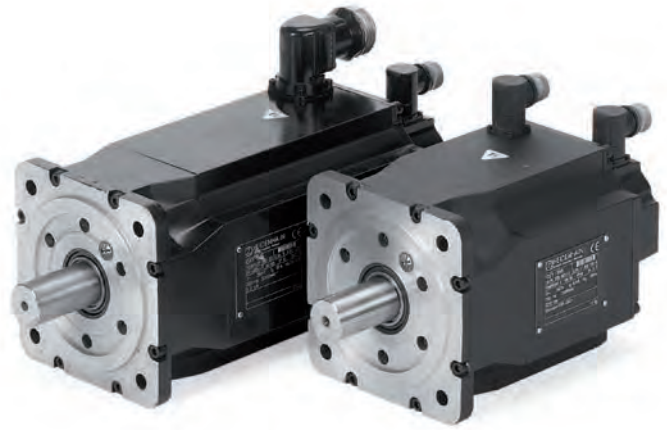
mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 $\leq 6 \text{ mm}; \pm 0.2 \text{ mm}$

# Synchronous motors

## QSY 155 EcoDyn series

Feed motors with 4 pole pairs

- Stall torque 13 Nm to 26.1 Nm
- Choice of incremental or absolute rotary encoder

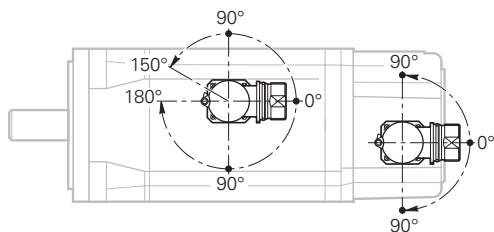


Motor	QSY 155B EcoDyn		QSY 155C EcoDyn		QSY 155D EcoDyn		QSY 155F EcoDyn	
Rated voltage $U_N$	417 V/412 V		420 V/415 V		412 V/407 V		399 V/397 V	
Rated power output $P_N$	3.5 kW/3.1 kW		5.0 kW/4.5 kW		5.7 kW/5.1 kW		6.0 kW/5.4 kW	
Rated speed $n_N$	3000 rpm (in EcoDyn mode)							
Rated torque $M_N^{1)}$	11.0 Nm/9.9 Nm		16.0 Nm/14.4 Nm		18.1 Nm/16.3 Nm		19.2 Nm/17.3 Nm	
Rated current $I_N^{1)}$	5.6 A/5.0 A		8.2 A/7.4 A		9.1 A/8.2 A		9.8 A/8.8 A	
Stall torque $M_0^{1)}$	13.0 Nm		17.7 Nm		21.6 Nm		26.1 Nm	
Stall current $I_0^{1)}$	6.5 A		8.5 A		10.6 A		12.8 A	
Max. speed $n_{max}$	4200 rpm (in EcoDyn mode)							
Max. torque $M_{max}^{2)}$	39 Nm		52 Nm		64 Nm		90 Nm	
Max. current $I_{max}^{2)}$	21.2 A		27.6 A		35.0 A		49.5 A	
Mass $m$	15.0 kg	18.0 kg	17.5 kg	20.5 kg	20.0 kg	23.0 kg	25.0 kg	28.0 kg
Rotor inertia $J$	33 kg·cm <sup>2</sup>	35 kg·cm <sup>2</sup>	43 kg·cm <sup>2</sup>	45 kg·cm <sup>2</sup>	54 kg·cm <sup>2</sup>	56 kg·cm <sup>2</sup>	75 kg·cm <sup>2</sup>	77 kg·cm <sup>2</sup>
<b>Brake</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>
Rated voltage $U_{Br}$	–	DC 24 V	–	DC 24 V	–	DC 24 V	–	DC 24 V
Rated current $I_{Br}$	–	1.04 A	–	1.04 A	–	1.04 A	–	1.04 A
Holding torque $M_{Br}$	–	40 Nm	–	40 Nm	–	40 Nm	–	40 Nm
<b>ID</b>								
For motor with ERN 1387	339880-1C	339880-1D	365308-1C	365308-1D	339881-1C	339881-1D	339882-1C	339882-1D
For motor with ECN 1313	339880-8C	339880-8D	365308-8C	365308-8D	339881-8C	339881-8D	339882-8C	339882-8D
For motor with EQN 1325	339880-6C	339880-6D	365308-6C	365308-6D	339881-6C	339881-6D	339882-6C	339882-6D

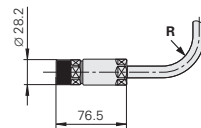
<sup>1)</sup> At 100 K      <sup>2)</sup> Max. 200 ms

*Italics: data for motors with ECN 1313 or EQN 1325 (rated torque reduced by 10 %)*

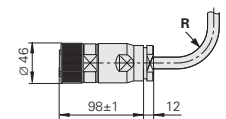
### Rotatable connections



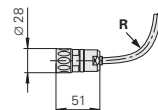
### Power connector for QSY 155B/C/D EcoDyn



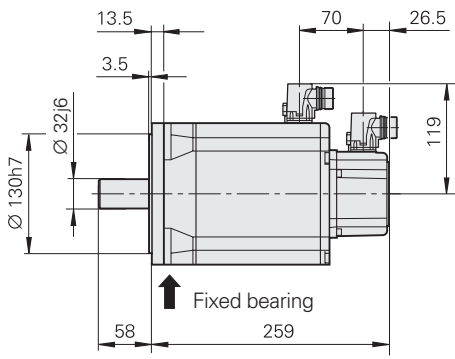
### Power connector for QSY 155F EcoDyn



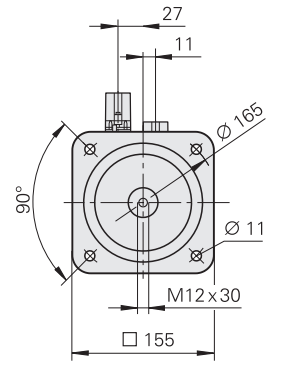
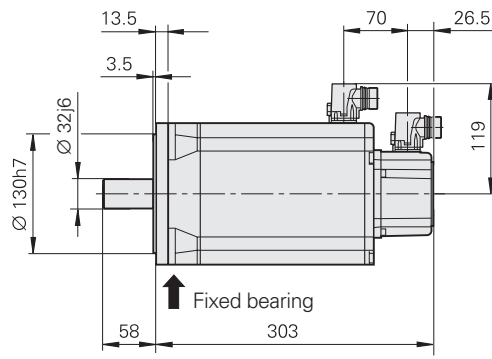
### Encoder connector



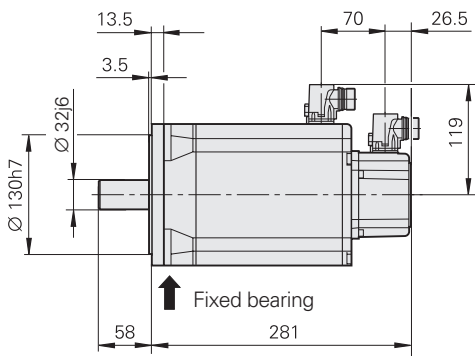
**QSY 155B EcoDyn** Without brake



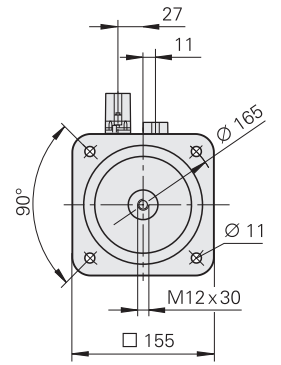
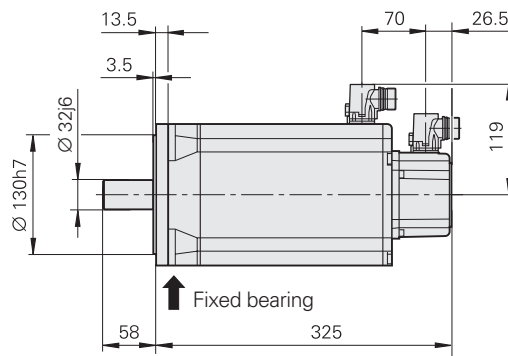
With brake



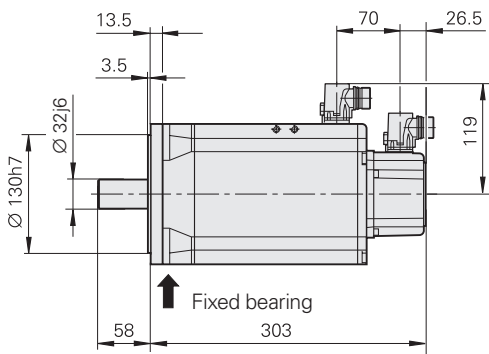
**QSY 155C EcoDyn** Without brake



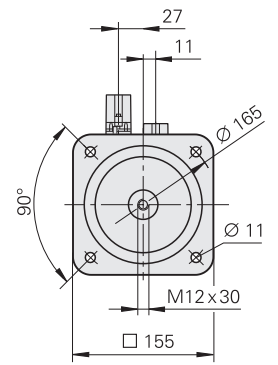
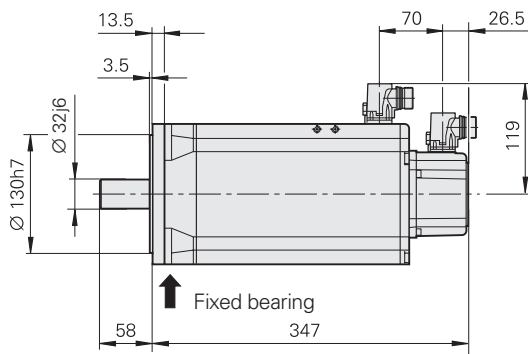
With brake



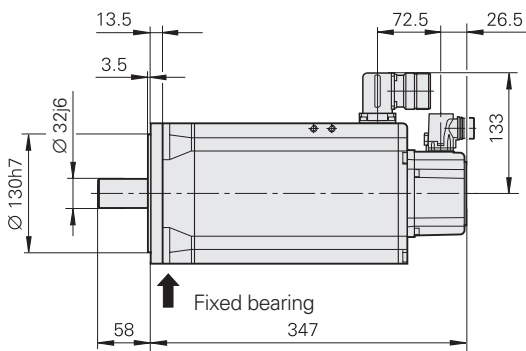
**QSY 155D EcoDyn** Without brake



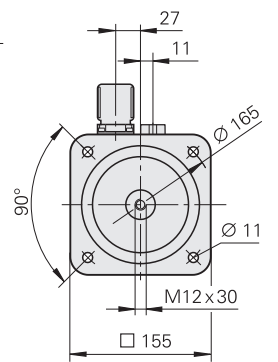
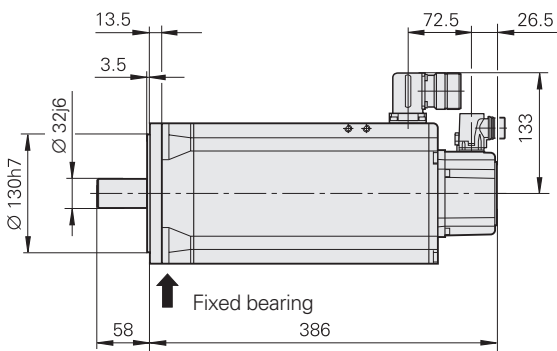
With brake




**QSY 155F EcoDyn** Without brake



With brake



mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 ≤ 6 mm: ±0.2 mm

# Synchronous motors

## QSY 190 EcoDyn series

Feed motors with 4 pole pairs

- Stall torque 28 Nm to 62.5 Nm
- Choice of incremental or absolute rotary encoder

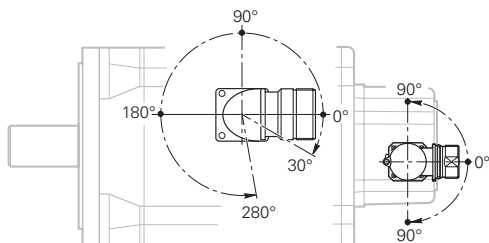


Motor	QSY 190C EcoDyn		QSY 190D EcoDyn		QSY 190F EcoDyn		QSY 190K EcoDyn	
<b>Rated voltage <math>U_N</math></b>	427 V/420 V		421 V/412 V		408 V/404 V		399 V/396 V	
<b>Rated power output <math>P_N</math></b>	7.2 kW/6.5 kW		9.6 kW/8.6 kW		9.9 kW/8.9 kW		12.2 kW/11.0 kW	
<b>Rated speed <math>n_N</math></b>	3000 rpm (in EcoDyn mode)							
<b>Rated torque <math>M_N^{1)}</math></b>	23.0 Nm/20.7 Nm		30.6 Nm/27.5 Nm		31.5 Nm/28.4 Nm		39.0 Nm/35.1 Nm	
<b>Rated current <math>I_N^{1)}</math></b>	11.8 A/10.6 A		14.4 A/13.0 A		15.0 A/13.5 A		20.2 A/18.2 A	
<b>Stall torque <math>M_0^{1)}</math></b>	28.0 Nm		38.0 Nm		47.6 Nm		62.5 Nm	
<b>Stall current <math>I_0^{1)}</math></b>	14.0 A		18.1 A		22.7 A		29.8 A	
<b>Max. speed <math>n_{max}</math></b>	3900 rpm (in EcoDyn mode)							
<b>Max. torque <math>M_{max}^{2)}</math></b>	85 Nm		107 Nm		150 Nm		240 Nm	
<b>Max. current <math>I_{max}^{2)}</math></b>	50.2 A		62.9 A		88.4 A		134.3 A	
<b>Mass m</b>	29.0 kg	37.0 kg	33.5 kg	41.5 kg	42.5 kg	50.5 kg	61 kg	69.0 kg
<b>Rotor inertia J</b>	106 kg·cm <sup>2</sup>	115 kg·cm <sup>2</sup>	133 kg·cm <sup>2</sup>	142 kg·cm <sup>2</sup>	190 kg·cm <sup>2</sup>	199 kg·cm <sup>2</sup>	290 kg·cm <sup>2</sup>	299 kg·cm <sup>2</sup>
<b>Brake</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>
Rated voltage $U_{Br}$	–	DC 24 V	–	DC 24 V	–	DC 24 V	–	DC 24 V
Rated current $I_{Br}$	–	1.38 A	–	1.38 A	–	1.38 A	–	1.38 A
Holding torque $M_{Br}$	–	70 Nm	–	70 Nm	–	70 Nm	–	70 Nm
<b>ID</b>								
For motor with ERN 1387	392023-1C	392023-1D	392024-1C	392024-1D	388244-1C	388244-1D	392025-1C	392025-1D
For motor with ECN 1313	392023-8C	392023-8D	392024-8C	392024-8D	388244-8C	388244-8D	392025-8C	392025-8D
For motor with EQN 1325	392023-6C	392023-6D	392024-6C	392024-6D	388244-6C	388244-6D	392025-6C	392025-6D

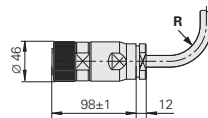
<sup>1)</sup> At 100 K      <sup>2)</sup> Max. 200 ms

*Italics: data for motors with ECN 1313 or EQN 1325 (rated torque reduced by 10 %)*

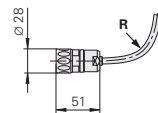
### Rotatable connections



### Power connector

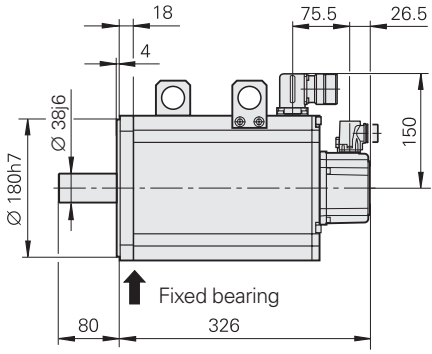


### Encoder connector

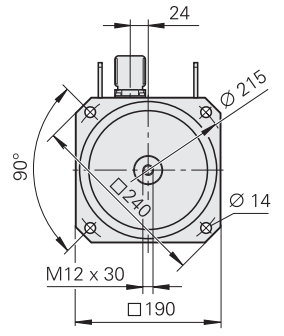
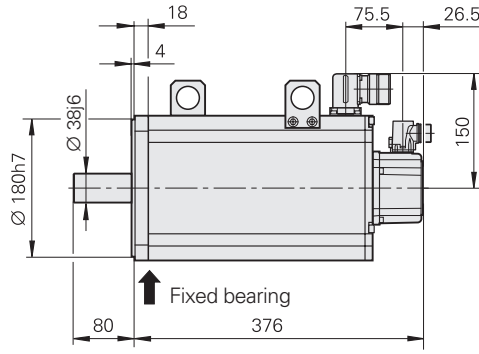


For **R** see page 25

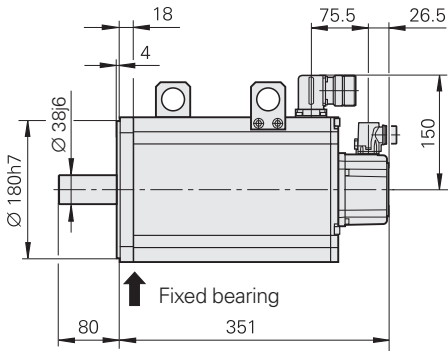
**QSY 190C EcoDyn** Without brake



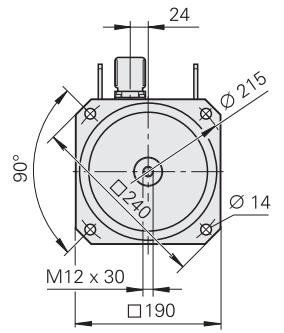
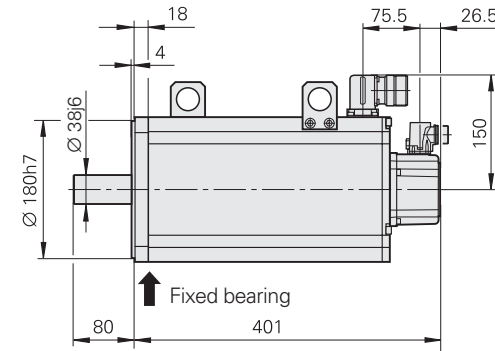
With brake



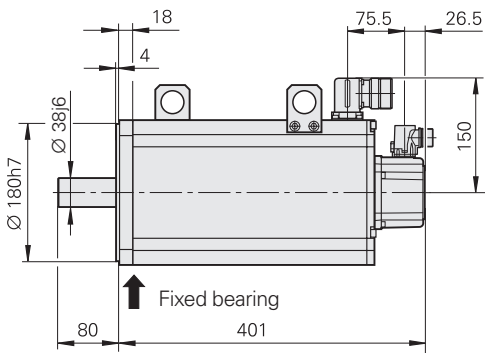
**QSY 190D EcoDyn** Without brake



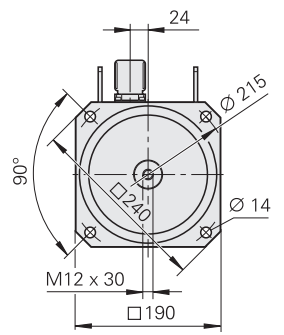
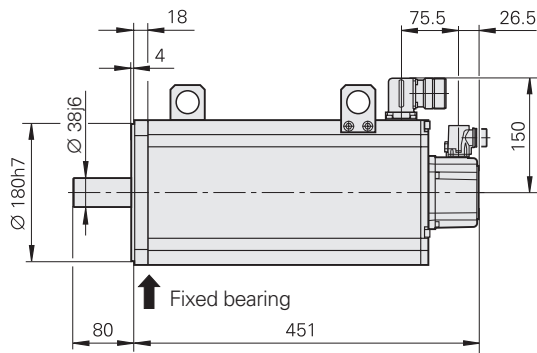
With brake



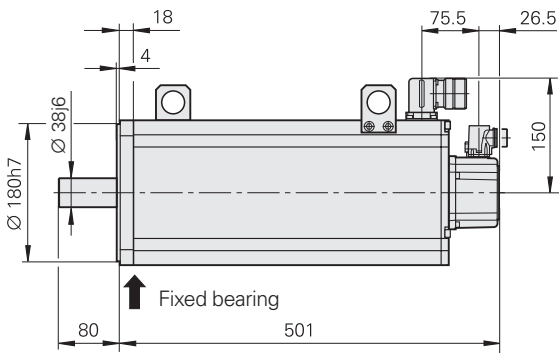
**QSY 190F EcoDyn** Without brake



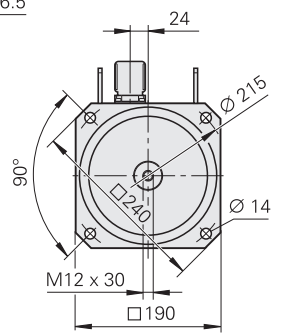
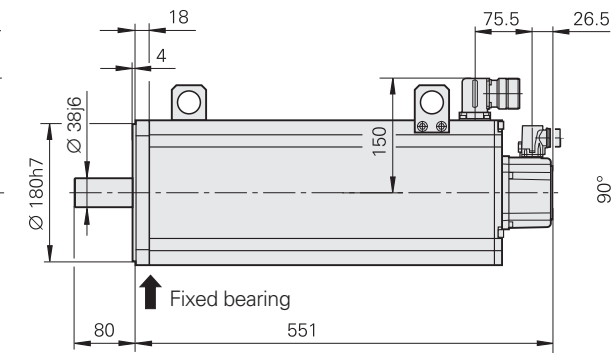
With brake




**QSY 190K EcoDyn** Without brake



With brake



mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 $\leq 6$  mm:  $\pm 0.2$  mm

# Synchronous motors

## QSY 260 EcoDyn series

Feed motors with 4 pole pairs

- Stall torque 85 Nm to 120 Nm
- Choice of incremental or absolute rotary encoder

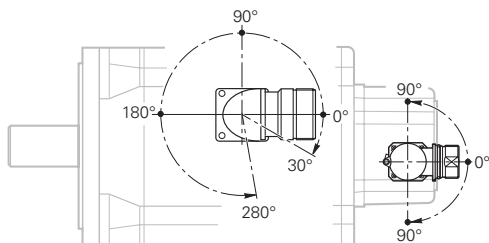


Motor	QSY 260B EcoDyn		QSY 260C EcoDyn	
Rated voltage $U_N$	352 V/350 V		376 V/373 V	
Rated power output $P_N$	12.0 kW/10.8 kW		16.0 kW/14.4 kW	
Rated speed $n_N$	2000 rpm (in EcoDyn mode)			
Rated torque $M_N^{1)}$	57.3 Nm/51.6 Nm		76.4 Nm/68.8 Nm	
Rated current $I_N^{1)}$	21.5 A/19.4 A		28 A/25.2 A	
Stall torque $M_0^{1)}$	85.0 Nm		120.0 Nm	
Stall current $I_0^{1)}$	31.0 A		43.5 A	
Max. speed $n_{max}$	3000 rpm (in EcoDyn mode)			
Max. torque $M_{max}^{2)}$	250 Nm		360 Nm	
Max. current $I_{max}^{2)}$	130.0 A		173.0 A	
Mass $m$	62.0 kg	75.0 kg	74.0 kg	87.0 kg
Rotor inertia $J$	357.0 kg·cm <sup>2</sup>	368.0 kg·cm <sup>2</sup>	538.0 kg·cm <sup>2</sup>	557.0 kg·cm <sup>2</sup>
<b>Brake</b>	<b>Without</b>	<b>With</b>	<b>Without</b>	<b>With</b>
Rated voltage $U_{Br}$	–	DC 24 V	–	DC 24 V
Rated current $I_{Br}$	–	2.05 A	–	2.05 A
Holding torque $M_{Br}$	–	110 Nm	–	125 Nm
<b>ID</b>				
For motor with ERN 1387	1110623-1C	1110623-1D	1100242-1C	1100242-1D
For motor with EQN 1325	1110623-6C	1110623-6D	1100242-6C	1100242-6D

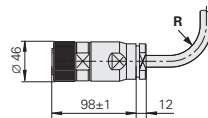
<sup>1)</sup> At 100 K      <sup>2)</sup> Max. 200 ms

*Italics: data for motors with EQN 1325 (rated torque reduced by 10 %)*

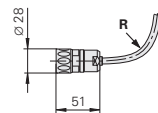
### Rotatable connections



### Power connector



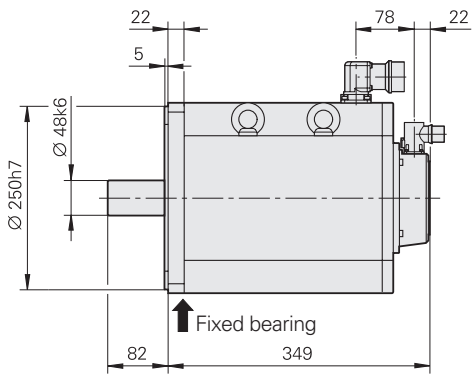
### Encoder connector



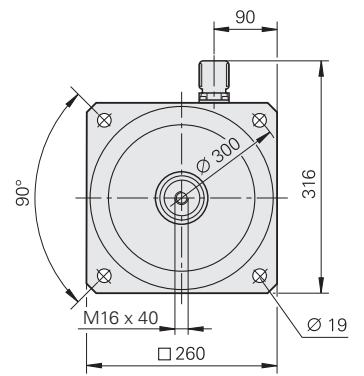
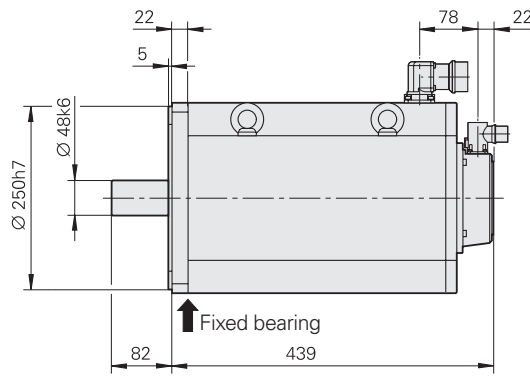
For **R** see page 25



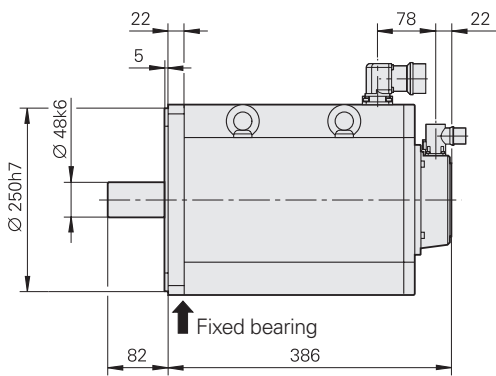
**QSY 260B** Without brake



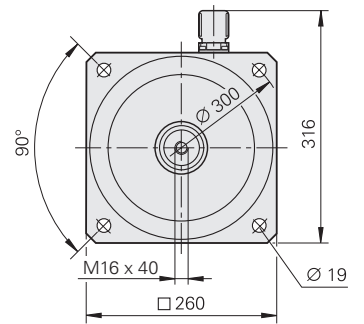
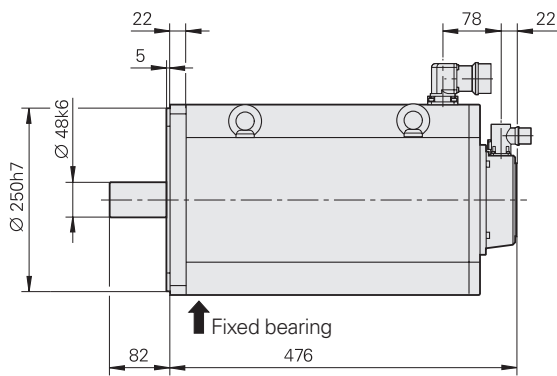
With brake



**QSY 260C** Without brake



With brake



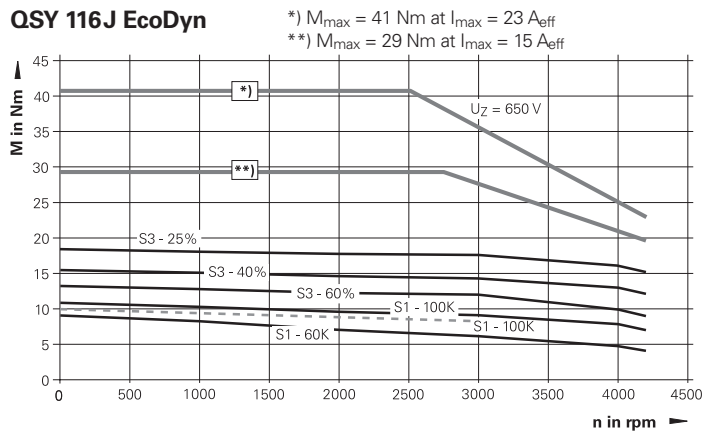
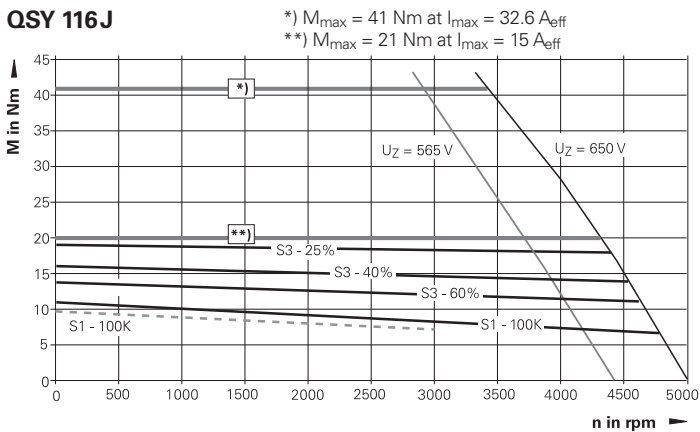
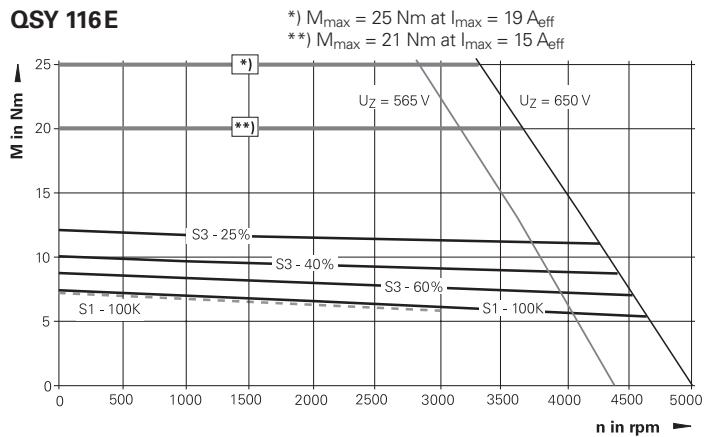
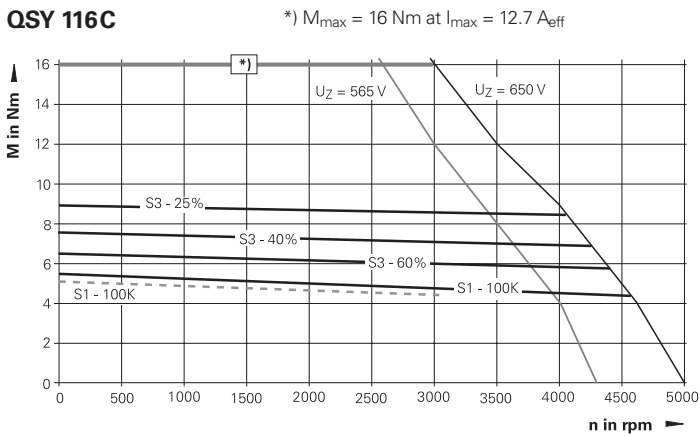
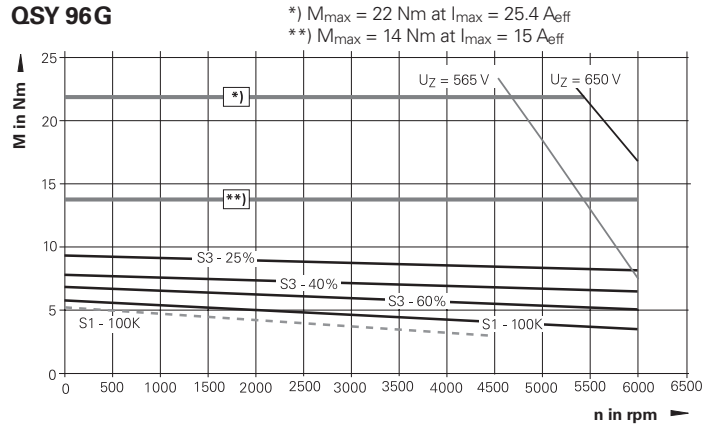
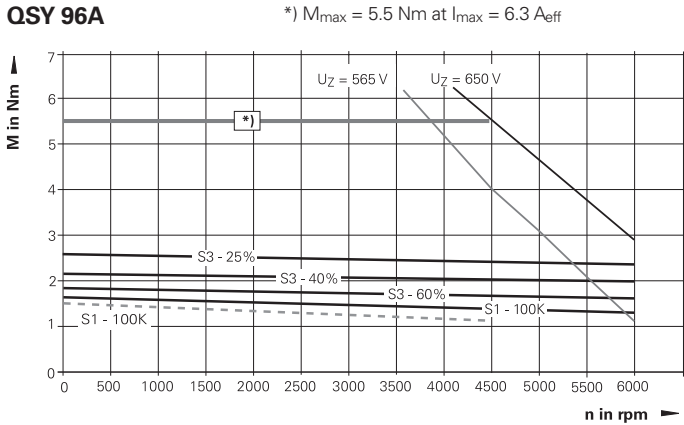
mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 $\leq 6$  mm:  $\pm 0.2$  mm

# Synchronous motors

## Torque characteristics

--- Characteristic curve according to the specifications  
 — Measured characteristic curve of one motor

\*) Characteristic curve at maximum motor current  
 \*\*) Characteristic curve with use of compact inverters

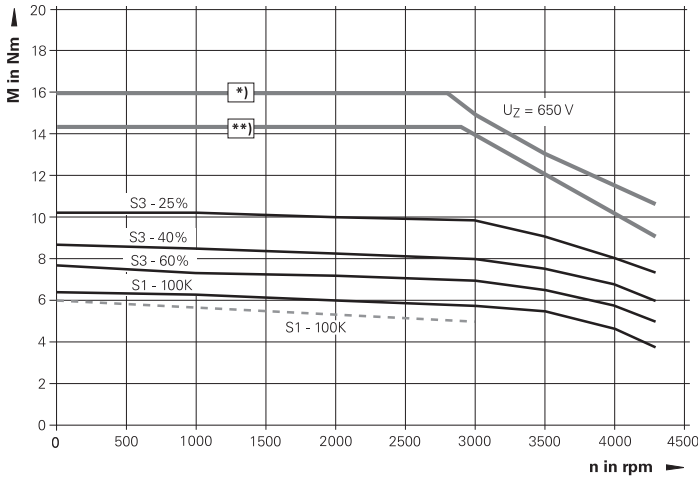


### Notes

- The characteristic curves apply to motors with ERN 1387.
- S3 mode  
 Cycle duration 10 minutes  
 In the rest period the motor must be stopped and disconnected from power.

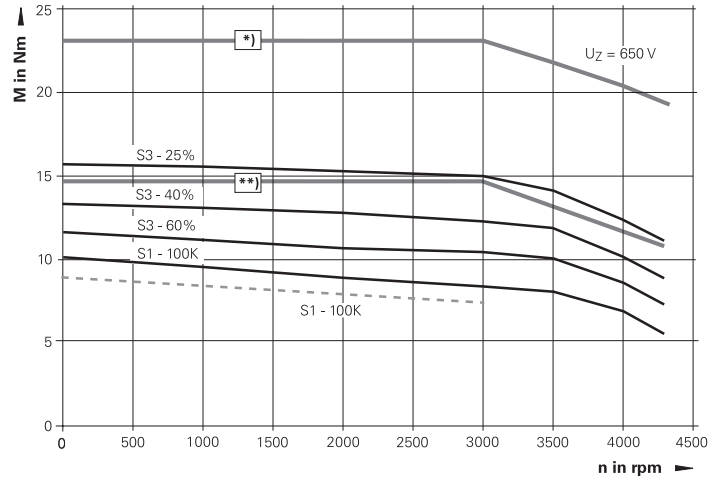
### QSY 130C EcoDyn

\*)  $M_{max} = 16 \text{ Nm}$  at  $I_{max} = 8.6 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 14.5 \text{ Nm}$  at  $I_{max} = 7.5 \text{ A}_{eff}$



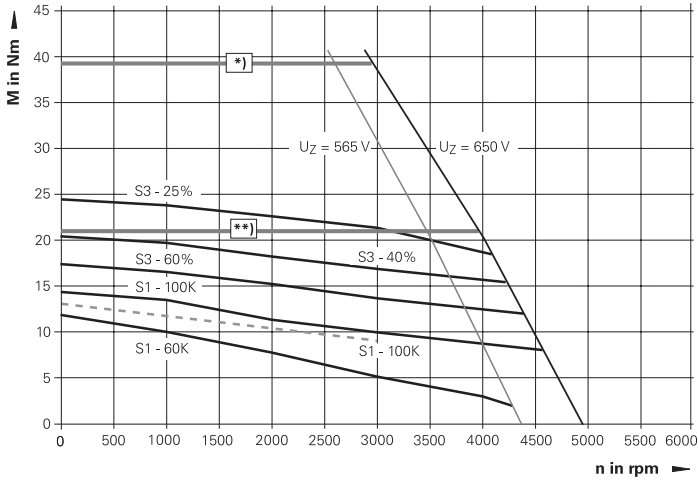
### QSY 130E EcoDyn

\*)  $M_{max} = 23 \text{ Nm}$  at  $I_{max} = 12.7 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 14.5 \text{ Nm}$  at  $I_{max} = 7.5 \text{ A}_{eff}$



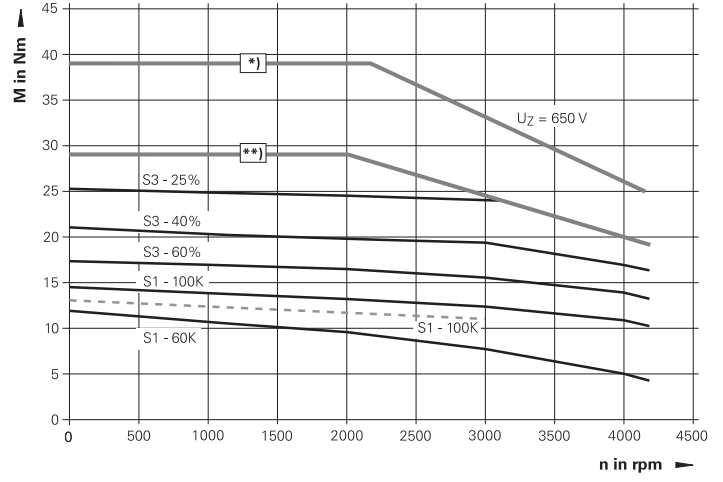
### QSY 155B

\*)  $M_{max} = 39 \text{ Nm}$  at  $I_{max} = 29.7 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 21 \text{ Nm}$  at  $I_{max} = 15 \text{ A}_{eff}$



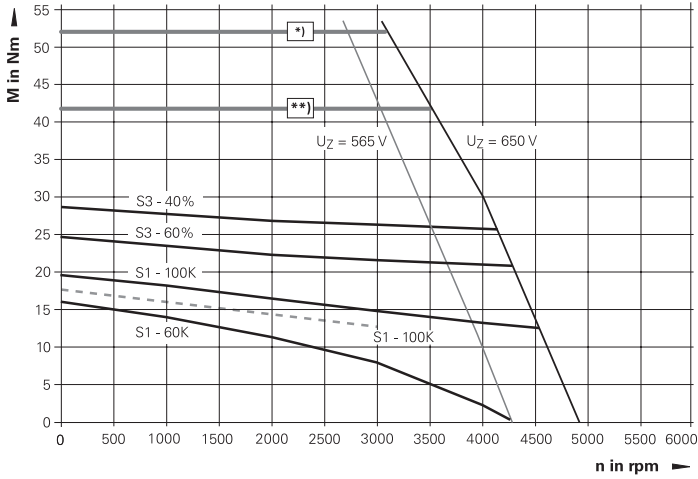
### QSY 155B EcoDyn

\*)  $M_{max} = 39 \text{ Nm}$  at  $I_{max} = 21.2 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 29 \text{ Nm}$  at  $I_{max} = 15 \text{ A}_{eff}$



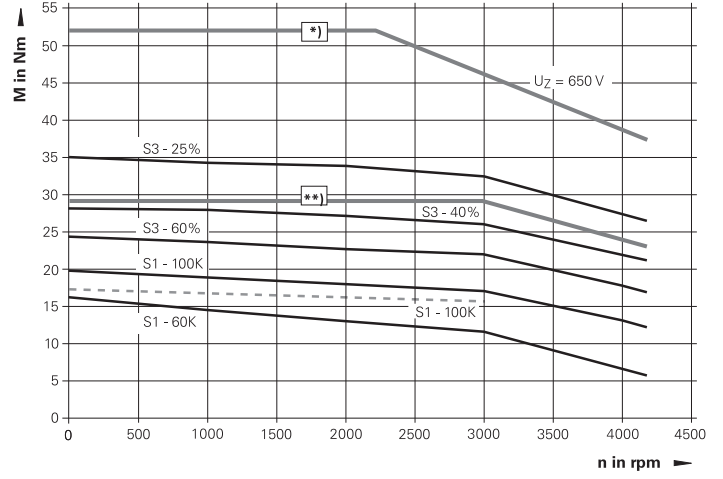
### QSY 155C

\*)  $M_{max} = 52 \text{ Nm}$  at  $I_{max} = 38.9 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 42 \text{ Nm}$  at  $I_{max} = 30 \text{ A}_{eff}$



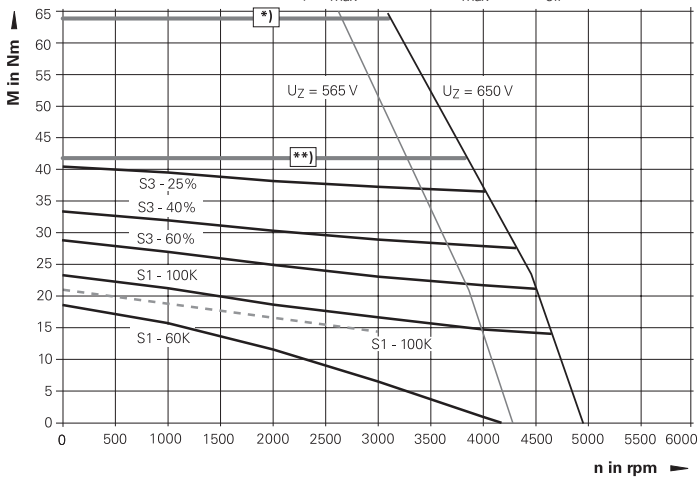
### QSY 155C EcoDyn

\*)  $M_{max} = 52 \text{ Nm}$  at  $I_{max} = 27.6 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 29 \text{ Nm}$  at  $I_{max} = 15 \text{ A}_{eff}$



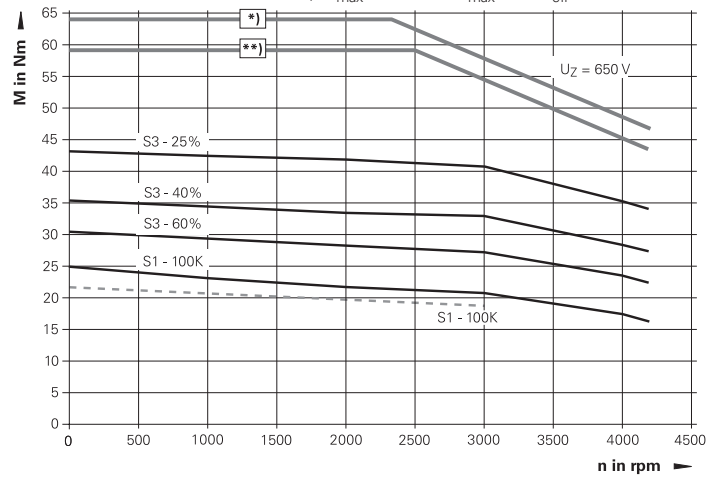
### QSY 155D

\*)  $M_{max} = 64 \text{ Nm}$  at  $I_{max} = 49.5 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 42 \text{ Nm}$  at  $I_{max} = 30 \text{ A}_{eff}$



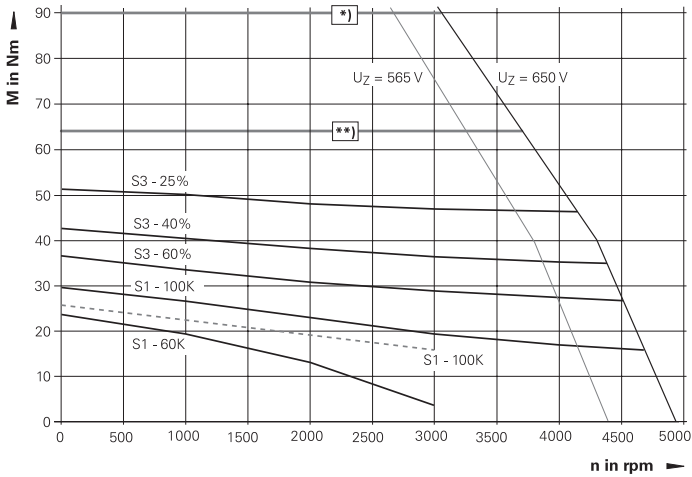
### QSY 155D EcoDyn

\*)  $M_{max} = 64 \text{ Nm}$  at  $I_{max} = 35 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 59 \text{ Nm}$  at  $I_{max} = 30 \text{ A}_{eff}$



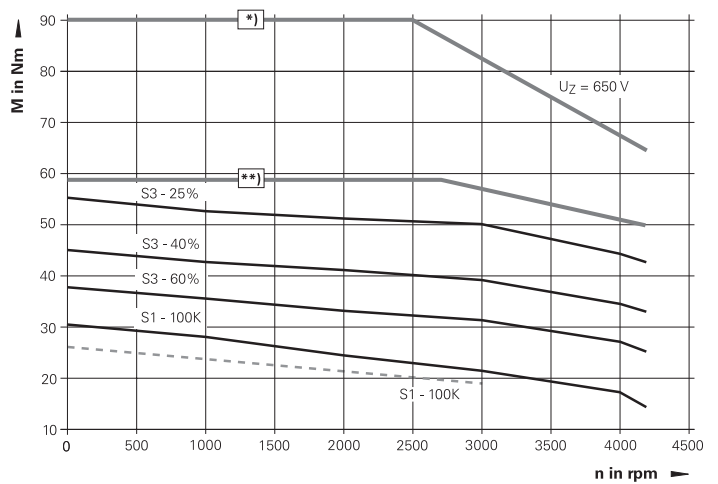
**QSY 155F**

\*)  $M_{max} = 90 \text{ Nm}$  at  $I_{max} = 68.6 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 64 \text{ Nm}$  at  $I_{max} = 46 \text{ A}_{eff}$



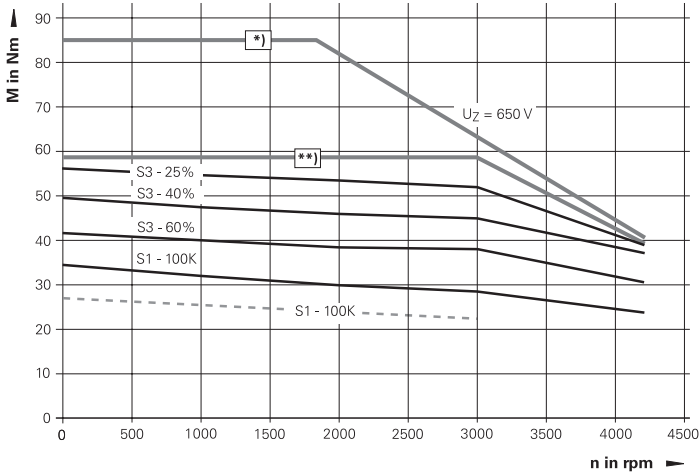
**QSY 155F EcoDyn**

\*)  $M_{max} = 90 \text{ Nm}$  at  $I_{max} = 49.5 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 59 \text{ Nm}$  at  $I_{max} = 30 \text{ A}_{eff}$



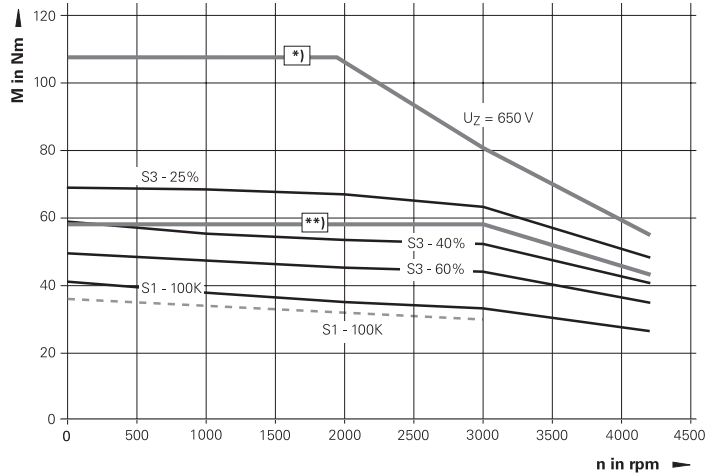
**QSY 190C EcoDyn**

\*)  $M_{max} = 85 \text{ Nm}$  at  $I_{max} = 50.2 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 59 \text{ Nm}$  at  $I_{max} = 30 \text{ A}_{eff}$



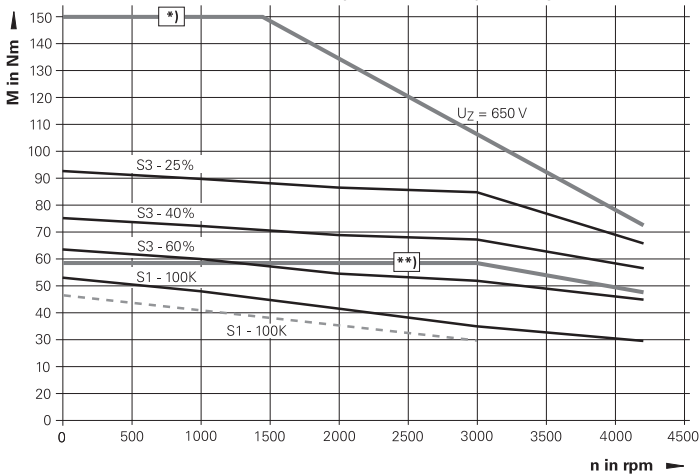
**QSY 190D EcoDyn**

\*)  $M_{max} = 107 \text{ Nm}$  at  $I_{max} = 62.9 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 59 \text{ Nm}$  at  $I_{max} = 30 \text{ A}_{eff}$



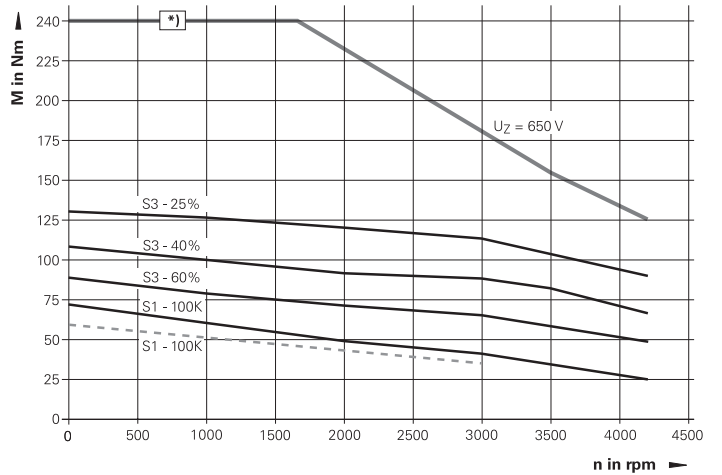
**QSY 190F EcoDyn**

\*)  $M_{max} = 150 \text{ Nm}$  at  $I_{max} = 88.4 \text{ A}_{eff}$   
 \*\*)  $M_{max} = 59 \text{ Nm}$  at  $I_{max} = 30 \text{ A}_{eff}$



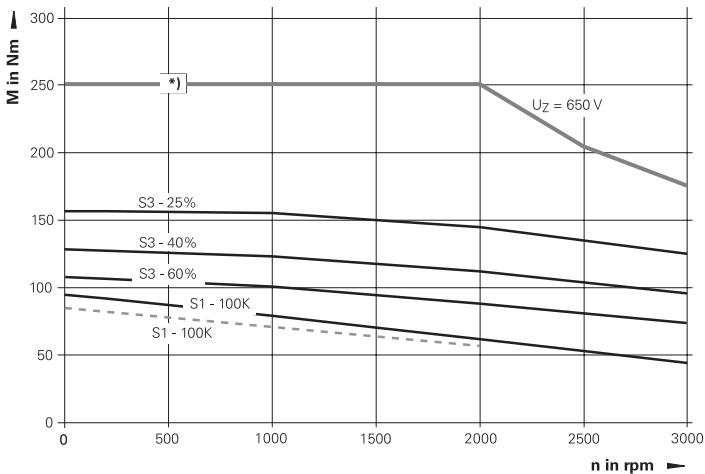
**QSY 190K EcoDyn**

\*)  $M_{max} = 240 \text{ Nm}$  at  $I_{max} = 134.3 \text{ A}_{eff}$



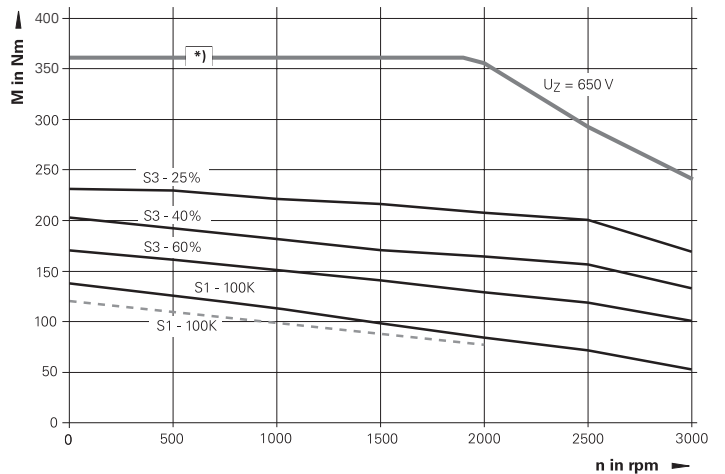
**QSY 260B EcoDyn**

\*)  $M_{max} = 250 \text{ Nm}$  at  $I_{max} = 130 \text{ A}_{eff}$



**QSY 260C EcoDyn**

\*)  $M_{max} = 360 \text{ Nm}$  at  $I_{max} = 173 \text{ A}_{eff}$



# Synchronous motors

## Cables and connectors

### Power cables

Current load at ambient temperature up to 40 °C

	Cable with one connector <sup>1)</sup> ID	Connector ID	Cable only ID	Bend radius R for frequent flexing	Cable type	Diameter
<b>Current load up to 13.8 A</b>						
<b>QSY 96</b> <b>QSY 116</b> <b>QSY 130</b> <b>QSY 155 B EcoDyn</b> <b>QSY 155 C EcoDyn</b> <b>QSY 155 D EcoDyn</b>	352960-xx <i>575796-xx</i>	325165-02	818792-xx <i>1214270-xx</i>	≥ 65 mm ≥ 105 mm	PUR [4 x 1.5 mm <sup>2</sup> + (2 x 1.0 mm <sup>2</sup> )]	13.0 mm <i>13.5 mm</i>
<b>QSY 155 B</b> <b>QSY 155 C</b> <b>QSY 155 F EcoDyn</b>	352962-xx <i>690131-xx</i>	333090-02				
<b>Current load up to 26.0 A</b>						
<b>QSY 155 D</b> <b>QSY 155 F</b> <b>QSY 190 C EcoDyn</b> <b>QSY 190 D EcoDyn</b> <b>QSY 190 F EcoDyn</b>	352963-xx <i>575797-xx</i>	333090-02	818791-xx <i>1214271-xx</i>	≥ 74 mm ≥ 123 mm	PUR [4 x 4 mm <sup>2</sup> + (2 x 1.0 mm <sup>2</sup> )]	14.8 mm <i>15.8 mm</i>
<b>Current load up to 32.8 A</b>						
<b>QSY 190 K EcoDyn</b> <b>QSY 260 B EcoDyn</b>	393570-xx <i>690141-xx</i>	333090-03	818790-xx <i>1214272-xx</i>	≥ 82 mm ≥ 132 mm	PUR [4 x 6 mm <sup>2</sup> + (2 x 1.0 mm <sup>2</sup> )]	16.4 mm <i>17.0 mm</i>
<b>Current load up to 45.8 A</b>						
<b>QSY 260 C EcoDyn</b>	1119325-xx <i>1214663-xx</i>	333090-03	1214269-xx <i>1213905-xx</i>	≥ 104 mm ≥ 177 mm	PUR [4 x 10 mm <sup>2</sup> + (2 x 1.0 mm <sup>2</sup> )] <i>PUR [4 x 10 mm<sup>2</sup> + (2 x 1.5 mm<sup>2</sup>)]</i>	20.8 mm <i>23.5 mm</i>

<sup>1)</sup> Toroidal cores need to be used for cable lengths greater than 15 m (see page 50)

<sup>2)</sup> Available only in the cable lengths 100 m, 150 m, and 200 m

*Italics*: shielded power cable

### Encoder cable

	Cable length <sup>1)</sup>	Cable complete with connectors ID	Line drop compensator ID	Extension cable ID	Bend radius R for frequent flexing
<b>QSY with ECN 1313 or EQN 1325</b>	< 60 m	336376-xx	–	340302-xx (as required)	≥ 100 mm
<b>QSY synchronous motor with ERN 1387</b>	< 30 m	289440-xx	–	336847-xx (as required)	≥ 100 mm
	30 m to 60 m	289440-xx	370226-01	336847-xx	

<sup>1)</sup> Max. total cable length: 60 m

# Asynchronous motors

## QAN overview

### General technical information

#### Specifications

The specifications and characteristic curves apply to motors mounted without thermal insulation. The maximum temperature divergence from the maximum permissible ambient temperature or coolant temperature of 40 °C is 105 K. If the motor is mounted so that it is thermally insulated, the motor torque must be reduced in order to avoid thermal overloading.

When used in conjunction with Gen 3 drives, motors must be operated only with a dc-link voltage of 650 V.

#### Shaft bearing

HEIDENHAIN asynchronous motors are equipped with maintenance-free bearings. The shaft bearing on **solid-shaft motors** can be selected as either a standard bearing or a spindle bearing. The version with a spindle bearing can withstand greater radial forces and permits higher spindle speeds. Motors with a spindle bearing exhibit a slightly larger overall length.

The **hollow-shaft motors** are generally equipped with a spindle bearing.

#### Shaft end

HEIDENHAIN QAN asynchronous motors have a cylindrical shaft end according to DIN EN 50347 and IEC 60072-1. The solid-shaft motors have a centering hole in accordance with DIN 332-DS.

The QAN asynchronous solid-shaft motors can be selected in two shaft versions:

- **Plain shaft end:** This version without a keyway is the standard shaft for all asynchronous motors with a spindle bearing.
- **Shaft end with a keyway:** Asynchronous motors with a keyway are **half-key balanced** and come with a key as per DIN 6885-1:

*QAN 200:* AS 10 x 8 x 70

*QAN 260:* AS 12 x 8 x 90

*QAN 320:* AS 16 x 10 x 90

The version with a keyway is the standard shaft for all asynchronous motors with a standard bearing.

- **Shaft end with a double keyway:**  
*QAN 360:* AS 12 x 8 x 96 (2x)

#### Mechanical service life

The service life of the bearings depends on the shaft load and the average shaft speed.

For QAN motors, the rated bearing service life is 10 000 hours, which is motor-specific and applies to a certain maximum shaft load at an average speed.

#### Speed measurement

The shaft speed is measured by an integrated HEIDENHAIN rotary encoder:

- ERN 1381 with 1024 lines, for solid-shaft motors
- ERM 2480 with 600 lines, for motors with hollow shaft
- 

#### Please note:

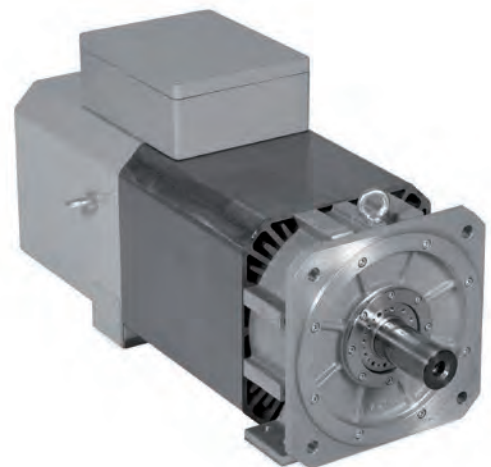
**Until mid-2014**, the asynchronous motors delivered with a keyway were **full-key balanced**. The current motors are **half-key balanced**. These motors are uniquely identified by their ID number, which always ends in -xH (e.g., 374328-0H)



QAN 200 UH



QAN 260 UH



QAN 320 M



### Precision balancing

QAN asynchronous motors from HEIDENHAIN can still be balanced at a later time.

### Hollow-shaft motors

The QAN 200UH, QAN 260xH, and QAN 360UHW hollow-shaft motors are suitable for direct mounting on mechanical spindles. The hollow shaft permits you to convey coolant to tools with inner cooling.

The coolant is introduced at the rear of the motor through a rotating union (e.g. from Deublin, order no.: 1109-020-188). The shaft end is designed for this.

### Installation altitude

HEIDENHAIN motors may be installed up to an altitude of 1000 m above sea level. For installation at altitudes above 1000 m, additional cooling measures are required.

### Functional safety

None of the current QAN motor variants described in this brochure feature fault exclusion against the loosening of the mechanical connection between the encoder and the motor.

Safety-related parameters for the motors or the encoders used within them are available upon request (e.g., MTTF values, data for fault exclusion).

### Thermal parameters

Cooling method:

QAN 200-320: air-cooled  
(internal fan)

QAN 360: water-cooled

Temperature monitoring with KTY 84-130 thermistor in the stator winding

Thermal class F

### Mechanical parameters

*QAN 200-320 design:*

IM B35 (flange/base mounting) as per EN 60034-7

*QAN 360 design:*

IM B5, IM V1

*Mounting the motor*

The following screws are recommended for mounting the motor:

<i>Mounting type:</i>	<i>Flange</i>	<i>Base</i>
QAN 200	M12	M10
QAN 260	M16	M10
QAN 320	M16	M12
QAN 360	M10	–

*Flange:* dimensions as per DIN EN 50347 and IEC 60072-1

*Protection as per DIN EN 60529*

- Motor: IP54 (QAN 200-320)  
IP43 (QAN 360)
- Shaft end: IP43

*Vibration severity*

Grade SR (external precision balancing possible)  
(IEC 60034-14)



QAN 360



QAN 360 UHW

# Asynchronous motors

## Used with 1xx inverter systems

Asynchronous motors with solid shaft	Rated power	Rated speed	Max. speed		Rated torque	Rated current	Recommended inverters <sup>3)</sup>			Page
			Standard bearing	Spindle bearing			1-axis module	2-axis module	Compact inverter	
<b>QAN 200M</b>	5.5 kW	1500 rpm	9000 rpm	12 000 rpm	35.0 Nm	18.0 A	UM 112 D	UM 122 D	Spindle output	<b>30</b>
<b>QAN 200L</b>	7.5 kW	1500 rpm	9000 rpm	12 000 rpm	47.8 Nm	20.1 A	UM 112 D	UM 122 D	Spindle output	
<b>QAN 200U</b>	10.0 kW	1500 rpm	9000 rpm	12 000 rpm	63.7 Nm	25.0 A	UM 112 D	UM 122 D	Spindle output <sup>1)</sup>	
<b>QAN 260M</b>	15.0 kW	1500 rpm	8000 rpm	10 000 rpm	95.5 Nm	35.0 A	UM 113 D	–	Spindle output <sup>2)</sup>	<b>32</b>
<b>QAN 260L</b>	20.0 kW	1500 rpm	8000 rpm	10 000 rpm	127.3 Nm	46.0 A	UM 113 D	–	–	
<b>QAN 260U</b>	24.0 kW	1500 rpm	8000 rpm	10 000 rpm	152.8 Nm	58.0 A	UM 114 D	–	–	
<b>QAN 320M</b>	32.0 kW	1500 rpm	8000 rpm	10 000 rpm	203.7 Nm	77.5 A	UM 114 D	–	–	<b>34</b>
<b>QAN 320L</b>	40.0 kW	1500 rpm	8000 rpm	10 000 rpm	254.6 Nm	99.0 A	UM 115 D	–	–	

Asynchronous motors with hollow shaft	Rated power	Rated speed	Max. speed		Rated torque	Rated current	Recommended inverters <sup>3)</sup>			Page
			Standard bearing	Spindle bearing			1-axis module	2-axis module	Compact inverter	
<b>QAN 200UH</b>	10.0 kW	1500 rpm	–	12 000 rpm 15 000 rpm	63.7 Nm	25.0 A	UM 112 D	UM 122 D	Spindle output <sup>1)</sup>	<b>36</b>
<b>QAN 260MH</b>	15.0 kW	1500 rpm	–	12 000 rpm	96.0 Nm	35.0 A	UM 113 D	–	Spindle output <sup>2)</sup>	
<b>QAN 260LH</b>	20.0 kW	1500 rpm	–	12 000 rpm	128.0 Nm	46.0 A	UM 113 D	–	–	<b>38</b>
<b>QAN 260UH</b>	22.0 kW	1500 rpm	–	10 000 rpm 12 000 rpm	140.0 Nm	54.0 A	UM 113 D <sup>1)</sup> UM 114 D	–	–	
<b>QAN 360UHW</b>	43.2 kW	Star connection: 450 rpm Delta connection: 780 rpm	–	7000 rpm	Star connection: 917 Nm Delta connection: 529 Nm	Star connection: 113 A Delta connection: 124 A	UM 115 D	–	–	<b>40</b>

<sup>1)</sup> Only UE 24xB, UR 24x

<sup>2)</sup> Only UR 24x

<sup>3)</sup> The maximum acceleration of the motor might not be achievable with the recommended inverters. If necessary, a more powerful power module must be selected.

## Used with Gen 3 drives

Asynchronous motors with solid shaft	Rated power	Rated speed	Max. speed		Rated torque	Rated current	Recommended inverters <sup>1)</sup>		Page
			Standard bearing	Spindle bearing			1-axis module	2-axis module	
<b>QAN 200M</b>	5.5 kW	1500 rpm	9000 rpm	12 000 rpm	35.0 Nm	18.0 A	UM 311	UM 321	<b>30</b>
<b>QAN 200L</b>	7.5 kW	1500 rpm	9000 rpm	12 000 rpm	47.8 Nm	20.1 A	UM 311	UM 321	
<b>QAN 200U</b>	10.0 kW	1500 rpm	9000 rpm	12 000 rpm	63.7 Nm	25.0 A	UM 312	UM 322	
<b>QAN 260M</b>	15.0 kW	1500 rpm	8000 rpm	10 000 rpm	95.5 Nm	35.0 A	UM 312	UM 322	<b>32</b>
<b>QAN 260L</b>	20.0 kW	1500 rpm	8000 rpm	10 000 rpm	127.3 Nm	46.0 A	UM 313	–	
<b>QAN 260U</b>	24.0 kW	1500 rpm	8000 rpm	10 000 rpm	152.8 Nm	58.0 A	UM 313	–	
<b>QAN 320M</b>	32.0 kW	1500 rpm	8000 rpm	10 000 rpm	203.7 Nm	77.5 A	UM 314	–	<b>34</b>
<b>QAN 320L</b>	40.0 kW	1500 rpm	8000 rpm	10 000 rpm	254.6 Nm	99.0 A	UM 315	–	

Asynchronous motors with hollow shaft	Rated power	Rated speed	Max. speed		Rated torque	Rated current	Recommended inverters <sup>1)</sup>		Page
			Standard bearing	Spindle bearing			1-axis module	2-axis module	
<b>QAN 200UH</b>	10.0 kW	1500 rpm	–	12 000 rpm 15 000 rpm	63.7 Nm	25.0 A	UM 312	UM 322	<b>36</b>
<b>QAN 260MH</b>	15.0 kW	1500 rpm	–	12 000 rpm	96.0 Nm	35.0 A	UM 312	UM 322	<b>38</b>
<b>QAN 260LH</b>	20.0 kW	1500 rpm	–	12 000 rpm	128.0 Nm	46.0 A	UM 313	–	
<b>QAN 260UH</b>	22.0 kW	1500 rpm	–	10 000 rpm 12 000 rpm	140.0 Nm	54.0 A	UM 313 UM 313	–	
<b>QAN 360UHW</b>	43.2 kW	Star connection: 450 rpm Delta connection: 780 rpm	–	7000 rpm	Star connection: 917 Nm Delta connection: 529 Nm	Star connection: 113 A Delta connection: 124 A	UM 315	–	<b>40</b>

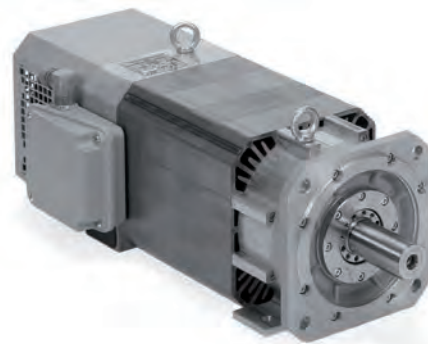
<sup>1)</sup> The maximum acceleration of the motor might not be achievable with the recommended inverters. If necessary, a more powerful power module must be selected.

# Asynchronous motors with solid shaft

## QAN 200 series

Spindle motors with 2 pole pairs

- Rated power output 5.5 kW to 10 kW
- Choice of standard or spindle bearing

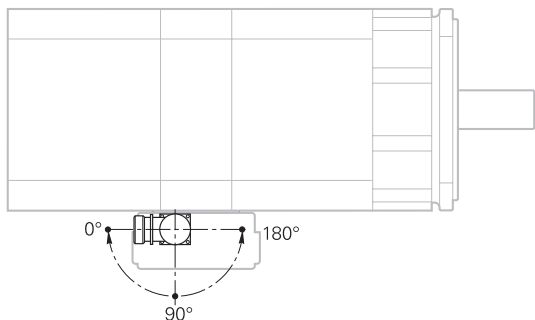


Motor	QAN 200M	QAN 200L	QAN 200U			
Rated voltage $U_N$	250 V	305 V	330 V			
Rated power output $P_N$	5.5 kW	7.5 kW	10.0 kW			
Rated speed $n_N$	1500 rpm					
Rated torque $M_N$ (105 K)	35.0 Nm	47.8 Nm	63.7 Nm			
Rated current $I_N$ (105 K)	18.0 A	20.1 A	25.0 A			
Efficiency	0.85					
Max. shaft speed $n_{max}$ <sup>1)</sup> Standard bearing Spindle bearing	9000 rpm 12000 rpm	9000 rpm 12000 rpm				
Max. current $I_{max}$	33 A	36 A	44 A			
Mass $m$	51 kg	68 kg	83 kg			
Rotor inertia $J$	245 kg·cm <sup>2</sup>	353 kg·cm <sup>2</sup>	405 kg·cm <sup>2</sup>			
Protection	IP 54					
Fan Rated voltage $U_L$ Rated current $I_L$ Frequency $f_L$	3AC 400 V 0.17 A/0.2 A 50 Hz/60 Hz					
ID Motor with standard bearing Motor with spindle bearing	<b>Plain shaft</b> 374328-03 <b>374328-13</b>	<b>With keyway</b> <b>374328-0H</b> 374328-1H	<b>Plain shaft</b> 374329-03 <b>374329-13</b>	<b>With keyway</b> <b>374329-0H</b> 374329-1H	<b>Plain shaft</b> 374330-03 <b>374330-13</b>	<b>With keyway</b> <b>374330-0H</b> 374330-1H

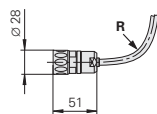
<sup>1)</sup> The maximum shaft speed depends on the application conditions of the motor, such as the shaft load (see the *Motors* technical manual)

**Bold:** standard version

### Rotatable connections



### Encoder connector

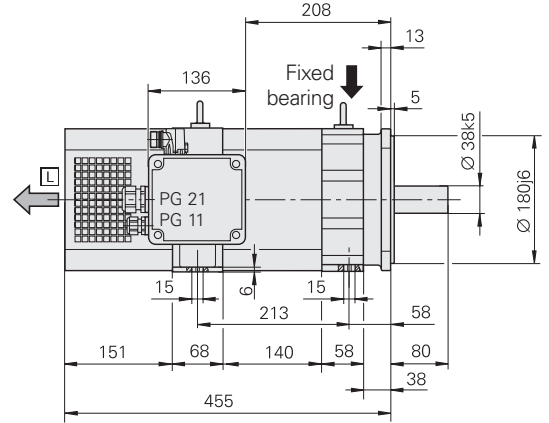
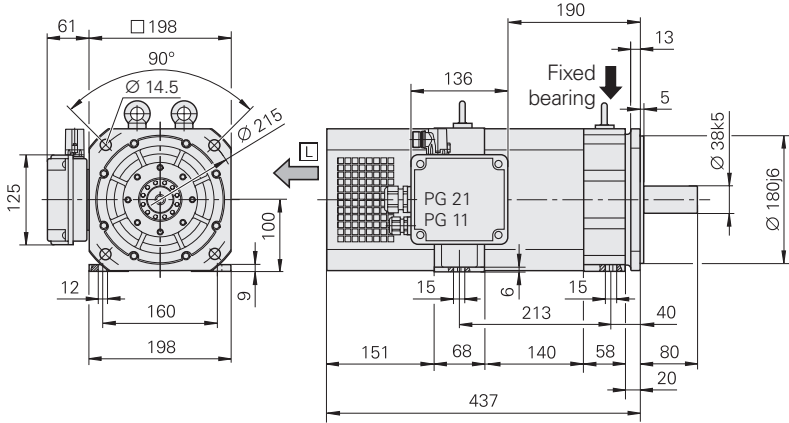


For **R** see page 48

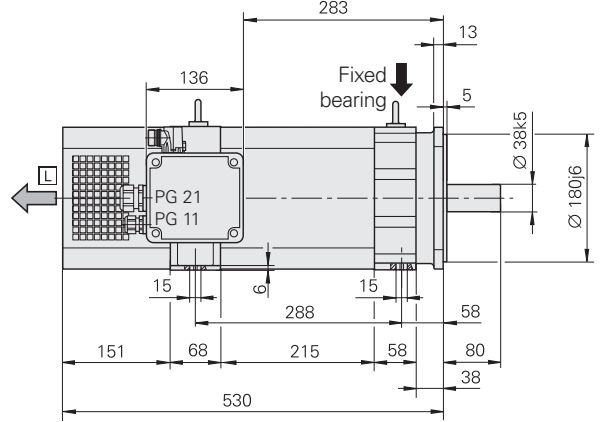
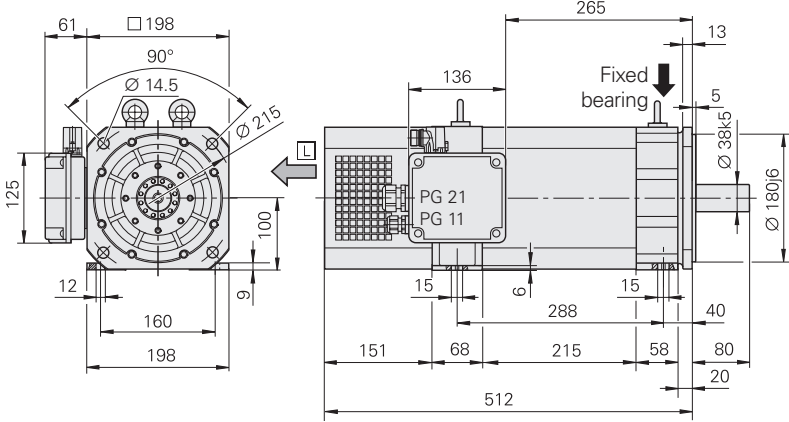
**QAN 200M**

**With standard bearing**

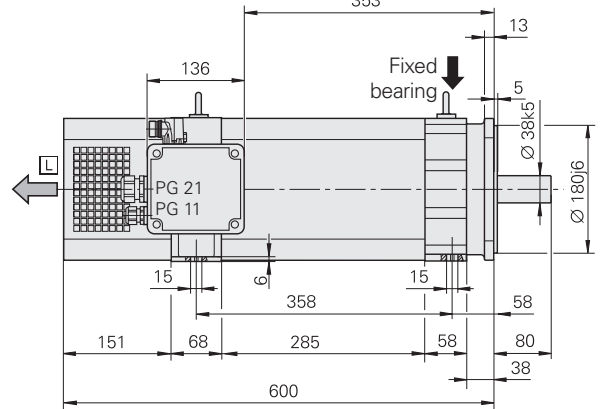
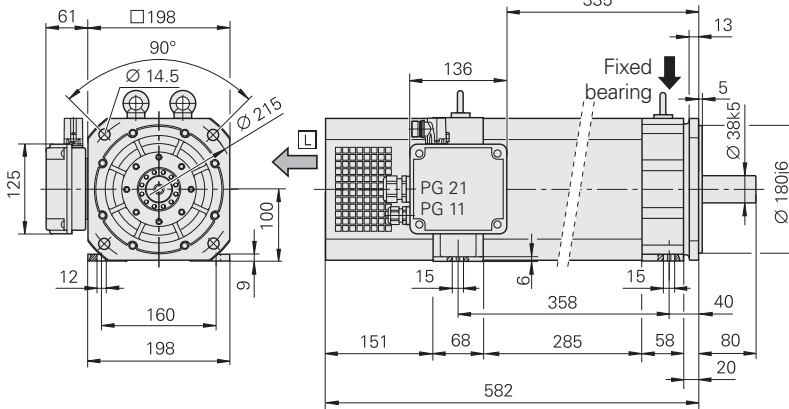
**With spindle bearing**




**QAN 200L**



**QAN 200U**



□ = Air flow  
 PG 11: 5 mm to 10 mm  
 PG 21: 13 mm to 18 mm

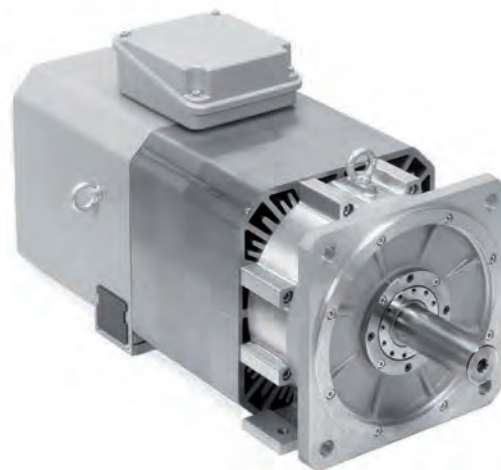
mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 ≤ 6 mm: ±0.2 mm

# Asynchronous motors with solid shaft

## QAN 260 series

Spindle motors with 2 pole pairs

- Rated power output 12 kW to 24 kW
- Choice of standard or spindle bearing



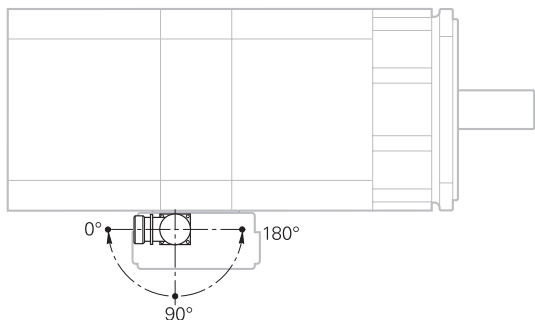
Motor	QAN 260 M		QAN 260 L		QAN 260 U	
Rated voltage $U_N$	348 V		331 V		318 V	
Rated power output $P_N$	15 kW		20 kW		24 kW	
Rated speed $n_N$	1500 rpm					
Rated torque $M_N$ (105 K)	96.0 Nm		128.0 Nm		153.0 Nm	
Rated current $I_N$ (105 K)	35.0 A		46.0 A		58.0 A	
Efficiency	0.85					
Max. shaft speed $n_{max}$ <sup>1)</sup> Standard bearing Spindle bearing*	8000 rpm 10000 rpm or 12000 rpm				8000 rpm 10000 rpm	
Max. current $I_{max}$	70 A		96 A		116 A	
Mass $m$	112 kg		135 kg		158 kg	
Rotor inertia $J$	700 kg·cm <sup>2</sup>		920 kg·cm <sup>2</sup>		1100 kg·cm <sup>2</sup>	
Protection	IP 54					
Fan Rated voltage $U_L$ Rated current $I_L$ Frequency $f_L$	3AC 400 V 0.22 A/0.26 A 50 Hz/60 Hz					
ID  Motor with standard bearing Motor with spindle bearing 10000 rpm 12000 rpm	<b>Solid shaft</b>  510019-63  <b>510019-53</b> <b>510019-73</b>	<b>With keyway</b> <b>510019-4H</b>  510019-5H —	<b>Solid shaft</b>  510020-43  <b>510020-53</b> <b>510020-73</b>	<b>With keyway</b> <b>510020-4H</b>  510020-5H —	<b>Solid shaft</b>  510021-43  <b>510021-53</b> —	<b>With keyway</b> <b>510021-4H</b>  510021-5H —

<sup>1)</sup> The maximum shaft speed depends on the application conditions of the motor, such as the shaft load (see the *Motors* technical manual)

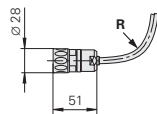
\* Please select when ordering

**Bold:** standard version

### Rotatable connections

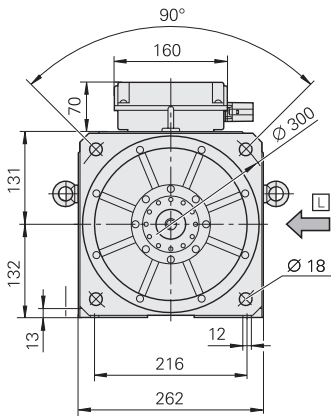


### Encoder connector

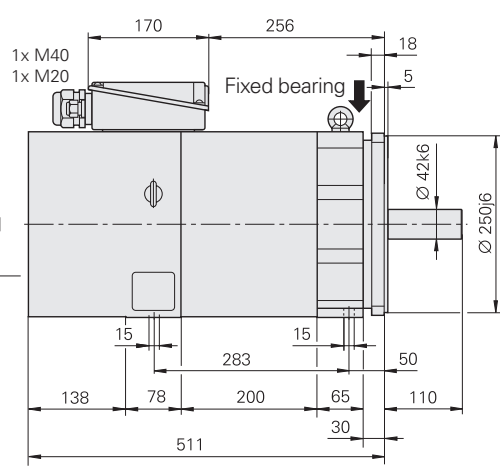


For **R** see page 48

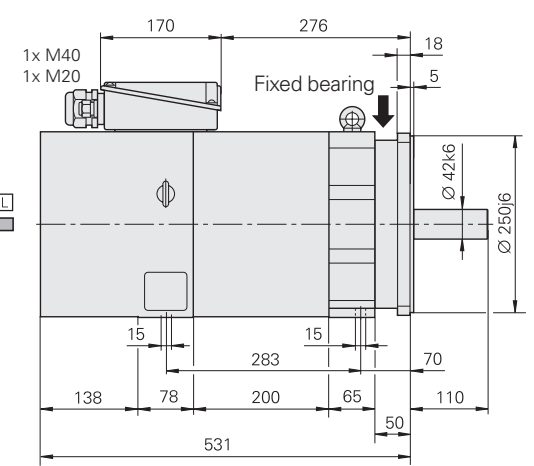
**QAN 260M**



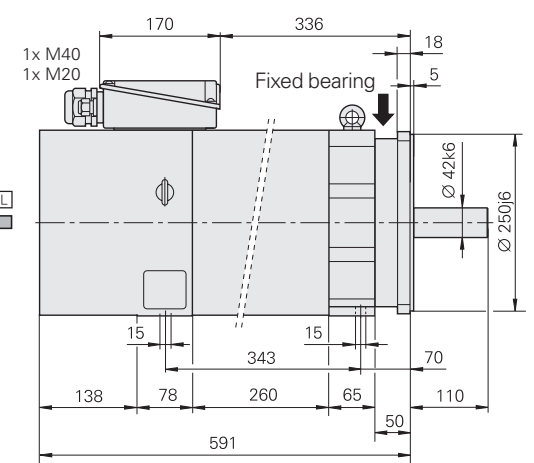
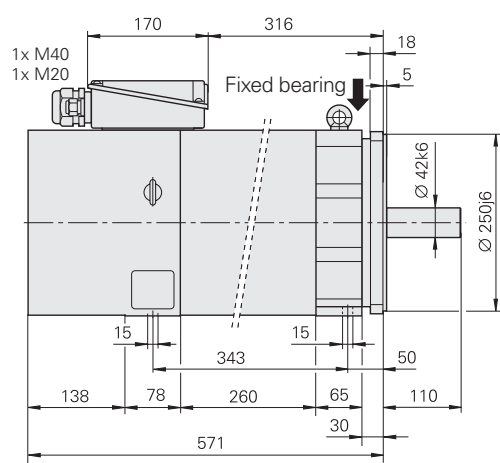
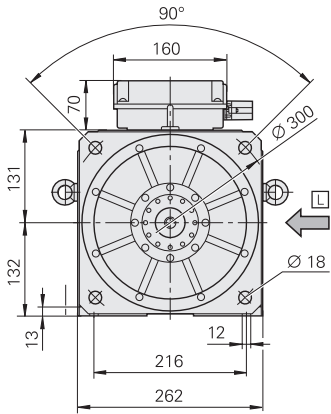
**With standard bearing**



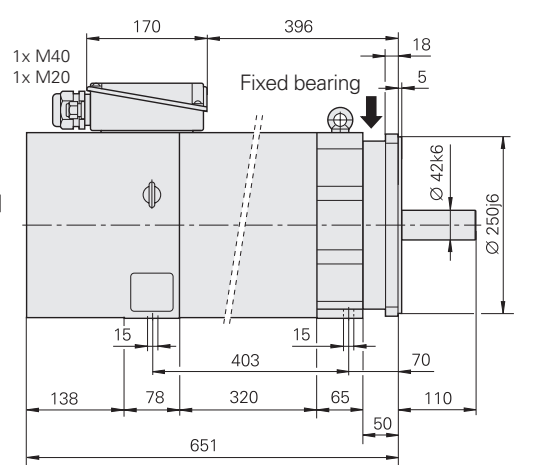
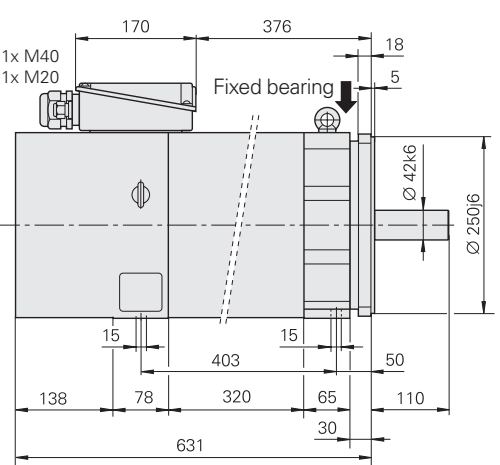
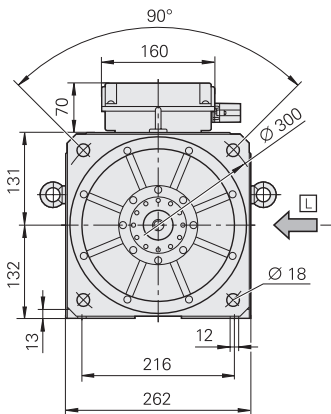
**With spindle bearing**



**QAN 260L**



**QAN 260U**



☐ = Air flow

**QAN 260 M**

M20: 6 mm to 12 mm  
M40: 20 mm to 26 mm

**QAN 260 L/U**

M20: 6 mm to 12 mm  
M40: 22 mm to 32 mm

mm



Tolerancing ISO 8015  
ISO 2768 - m H  
≤ 6 mm: ±0.2 mm



# Asynchronous motors with solid shaft

## QAN 320 series

Spindle motors with 2 pole pairs

- Rated power output 18 kW to 40 kW

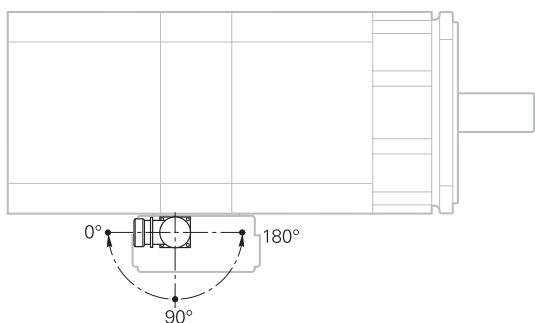


Motor	QAN 320M	QAN 320L		
<b>Rated voltage <math>U_N</math></b>	317 V	315 V		
<b>Rated power output <math>P_N</math></b>	32 kW	40 kW		
<b>Rated speed <math>n_N</math></b>	1500 rpm	1500 rpm		
<b>Rated torque <math>M_N</math> (105 K)</b>	203.7 Nm	254.6 Nm		
<b>Rated current <math>I_N</math> (105 K)</b>	77.5 A	99.0 A		
<b>Efficiency</b>	0.85	0.91		
<b>Max. shaft speed <math>n_{max}</math><sup>1)</sup></b> Standard bearing Spindle bearing	8000 rpm 10000 rpm			
<b>Max. current <math>I_{max}</math></b>	155 A	186 A		
<b>Mass <math>m</math></b>	240 kg	280 kg		
<b>Rotor inertia <math>J</math></b>	1870 kg·cm <sup>2</sup>	2300 kg·cm <sup>2</sup>		
<b>Fan</b> Rated voltage $U_L$ Rated current $I_L$ Frequency $f_L$	3AC 400 V 0.33 A/0.43 A 50 Hz/60 Hz			
<b>ID</b> Motor with standard bearing Motor with spindle bearing	<b>Plain shaft</b> 513302-43 <b>513302-53</b>	<b>With keyway</b> <b>513302-4H</b> 513302-5H	<b>Plain shaft</b> 577484-43 <b>577484-53</b>	<b>With keyway</b> <b>577484-4H</b> 577484-5H

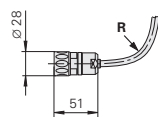
<sup>1)</sup>The maximum shaft speed depends on the application conditions of the motor, such as the shaft load (see the *Motors* technical manual)

**Bold:** standard version

### Rotatable connections



### Encoder connector



For **R** see page 48

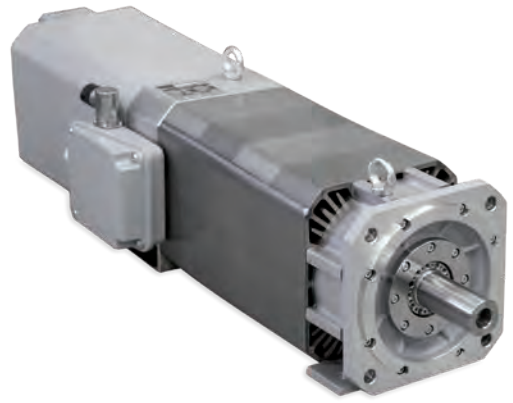


# Asynchronous motors with hollow shaft

## QAN 200 UH

Hollow-shaft spindle motor with 2 pole pairs

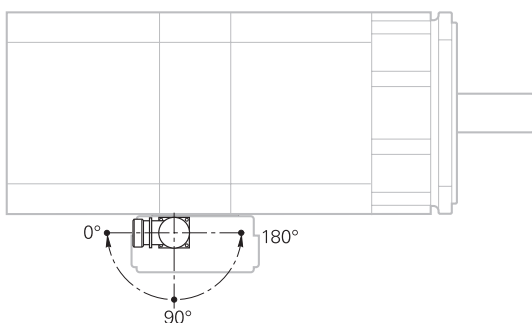
- Rated power output to 10 kW
- With spindle bearing



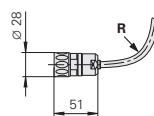
Motor	QAN 200 UH	
Rated voltage $U_N$	330 V	
Rated power output $P_N$	10.0 kW	
Rated speed $n_N$	1500 rpm	
Rated torque $M_N$ (105 K)	63.7 Nm	
Rated current $I_N$ (105 K)	25.0 A	
Efficiency	0.85	
Max. shaft speed $n_{max}^{1)}$ Spindle bearing	12 000 rpm	15 000 rpm
Max. current $I_{max}$	44 A	
Bore hole in shaft	Ø 9 mm	
Mass $m$	91 kg	
Rotor inertia $J$	405 kg·cm <sup>2</sup>	
Protection	IP 54	
<b>Fan</b> Rated voltage $U_L$ Rated current $I_L$ Frequency $f_L$	3AC 400 V 0.17 A/0.2 A 50 Hz/60 Hz	
<b>ID</b> Motor with spindle bearing	536257-18	536257-58

<sup>1)</sup> The maximum shaft speed depends on the application conditions of the motor, such as the shaft load (see the *Motors* technical manual)

### Rotatable connections

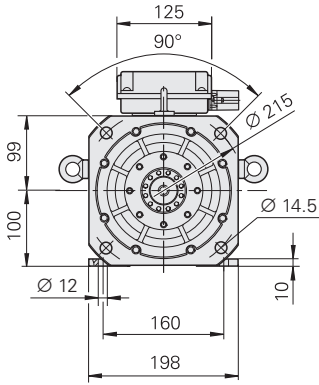


### Encoder connector

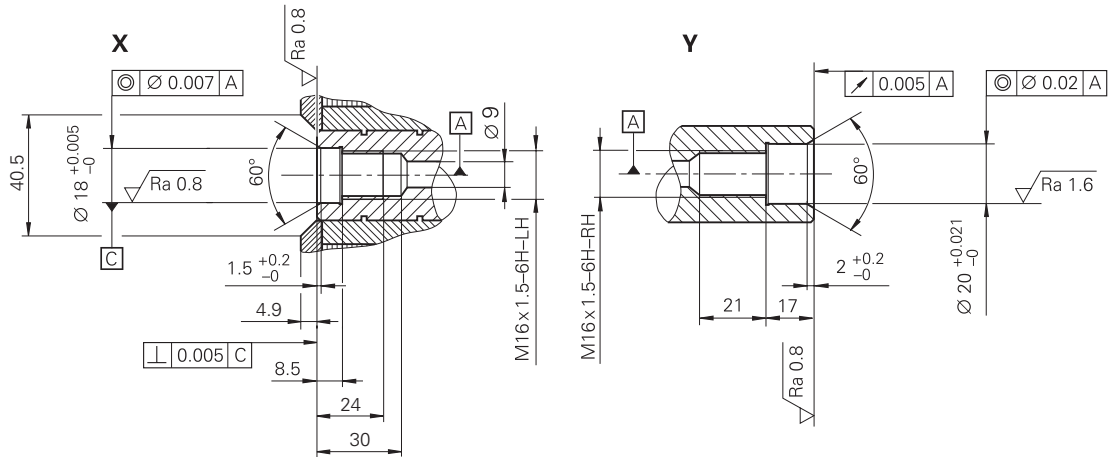
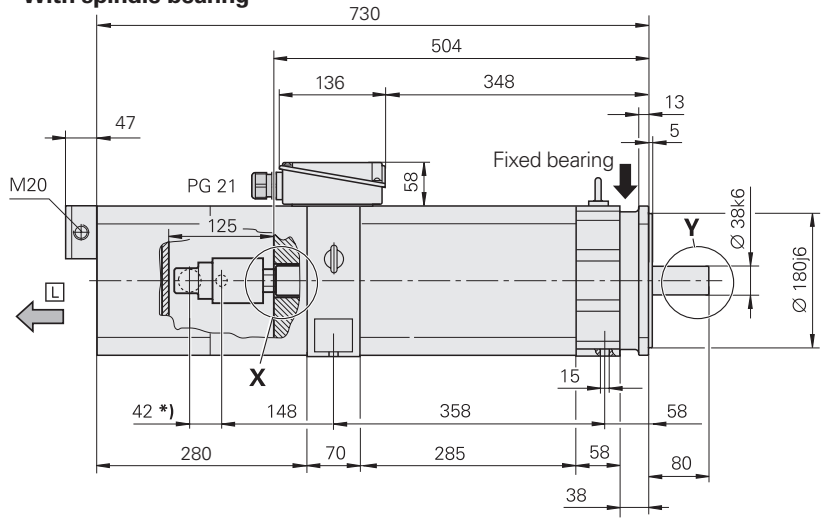


For **R** see page 48

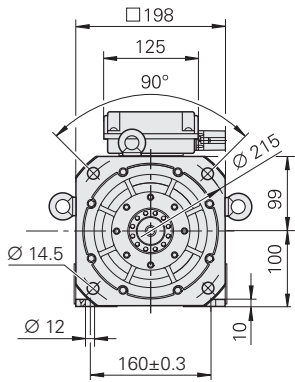
**QAN 200UH 12 000 rpm**



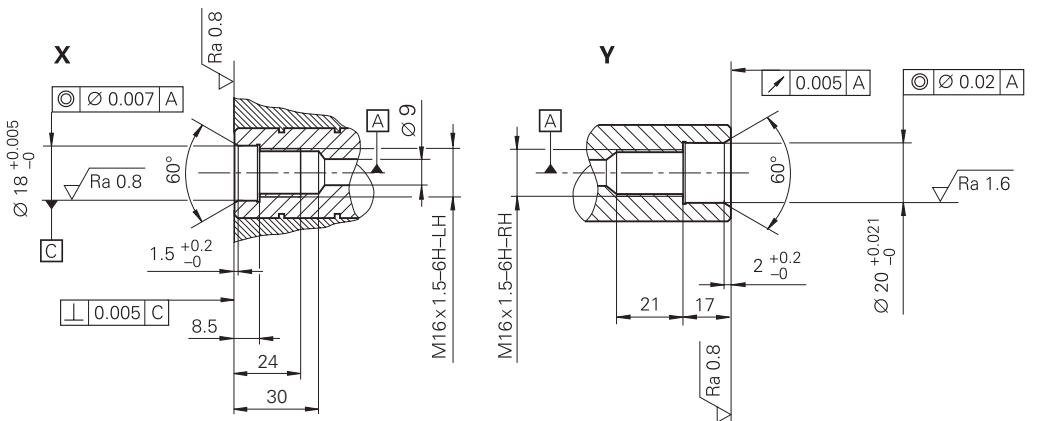
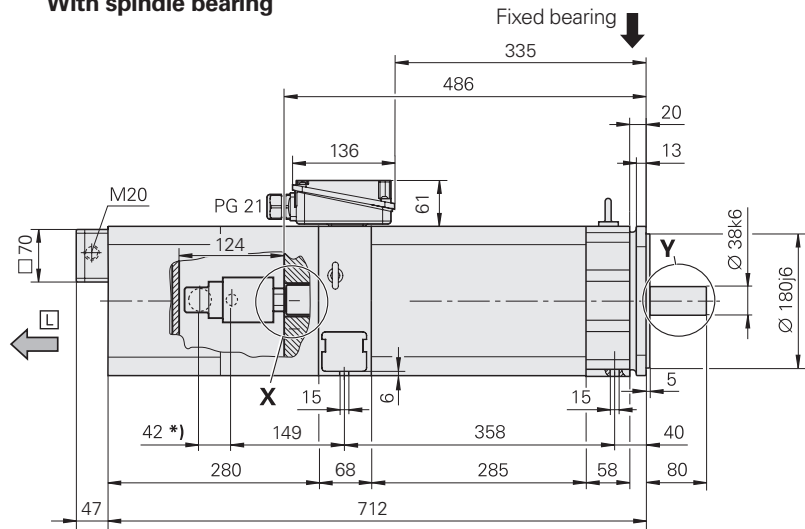
**With spindle bearing**



**QAN 200UH 15 000 rpm**



**With spindle bearing**



☐ = Air flow  
 PG 21: 13 mm to 18 mm  
 M20: 6 mm to 12 mm

\*) = Coolant connection on the right side, e.g. from Deublin 1109-020-188

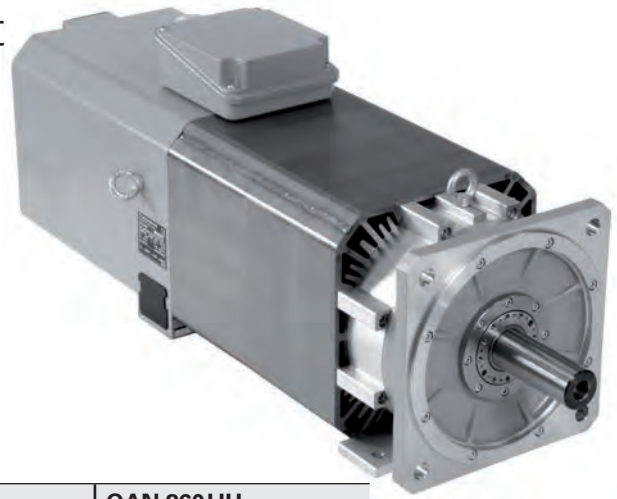
mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 ≤ 6 mm: ±0.2 mm

# Asynchronous motors with hollow shaft

## QAN 260xH series

Hollow-shaft spindle motor with 2 pole pairs

- Rated power output 15 kW to 22 kW
- With spindle bearing

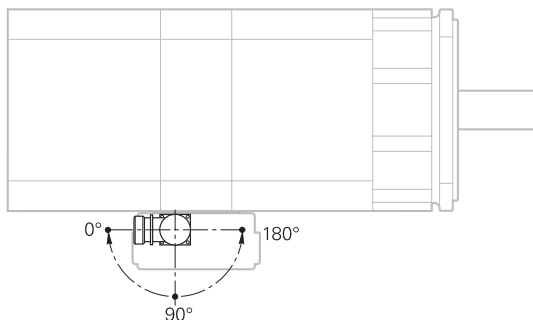


Motor	QAN 260MH	QAN 260LH	QAN 260UH
<b>Rated voltage <math>U_N</math></b>	348 V	331 V	318 V
<b>Rated power output <math>P_N</math></b>	15 kW	20 kW	22 kW
<b>Rated speed <math>n_N</math></b>	1500 rpm		
<b>Rated torque <math>M_N</math> (105 K)</b>	96.0 Nm	128.0 Nm	140.0 Nm
<b>Rated current <math>I_N</math> (105 K)</b>	35.0 A	46.0 A	54.0 A
<b>Efficiency</b>	0.85		
<b>Max. shaft speed <math>n_{max}</math><sup>1)</sup></b> Spindle bearing*	12 000 rpm		10 000 rpm or 12 000 rpm
<b>Max. current <math>I_{max}</math></b>	70 A	96 A	116 A
<b>Mass m</b>	120 kg	143 kg	158 kg
<b>Rotor inertia J</b>	700 kg·cm <sup>2</sup>	920 kg·cm <sup>2</sup>	1100 kg·cm <sup>2</sup>
<b>Protection</b>	IP 54		
<b>Fan</b> Rated voltage $U_L$ Rated current $I_L$ Frequency $f_L$	3AC 400 V 0.22 A/0.26 A 50 Hz/60 Hz		
<b>ID</b> Motor with spindle bearing 10 000 rpm 12 000 rpm	– 642855-73	– 631449-73	536259-53 536259-73

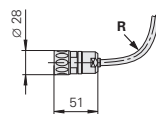
<sup>1)</sup> The maximum shaft speed depends on the application conditions of the motor, such as the shaft load (see the *Motors* technical manual)

\* Please select when ordering

### Rotatable connections

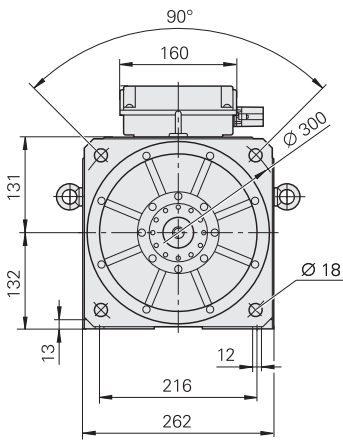


### Encoder connector

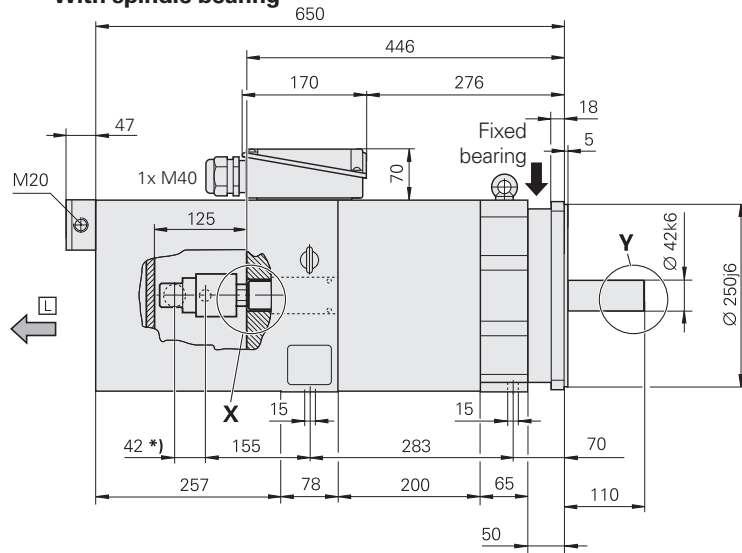


For **R** see page 48

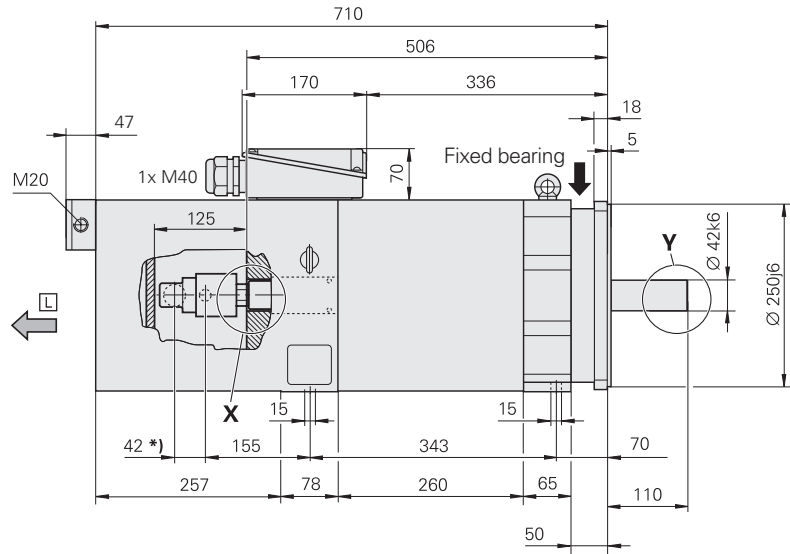
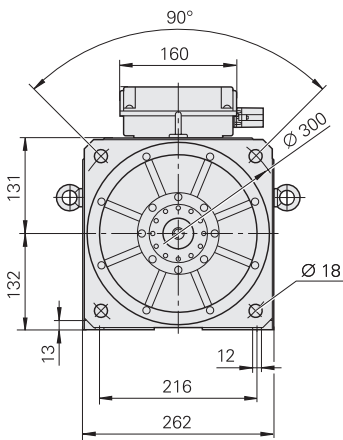
### QAN 260MH



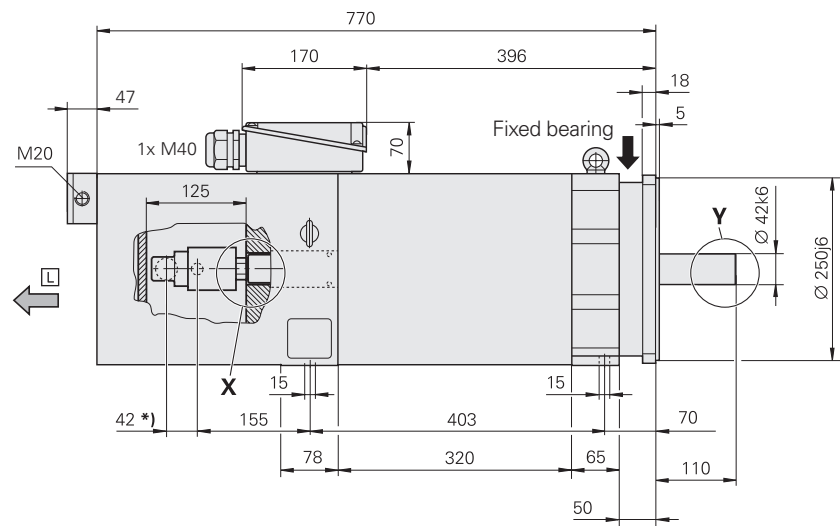
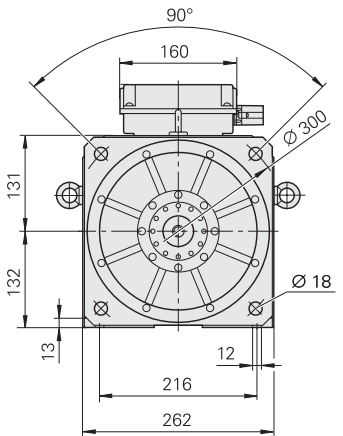
### With spindle bearing



### QAN 260LH



### QAN 260UH



☐ = Air flow

### QAN 260 MH

M20: 6 mm to 12 mm  
M40: 20 mm to 26 mm

### QAN 260 LH/UH

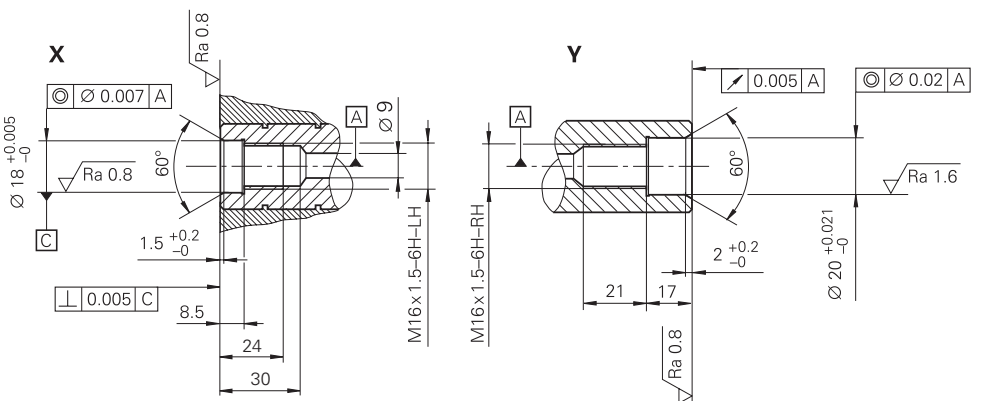
M20: 6 mm to 12 mm  
M40: 22 mm to 32 mm

\*) = Coolant connection on the right side, e.g. from Deublin 1109-020-188

mm



Tolerancing ISO 8015  
ISO 2768 - m H  
≤ 6 mm: ±0.2 mm



# Asynchronous hollow-shaft motors

## QAN 360UHW series

Hollow-shaft spindle motor with four pole pairs

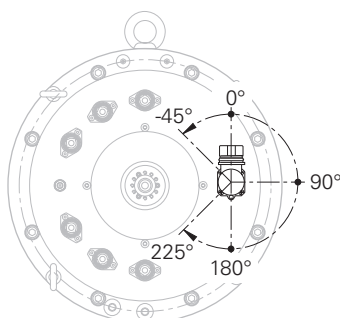
- With spindle bearing
- Water-cooled



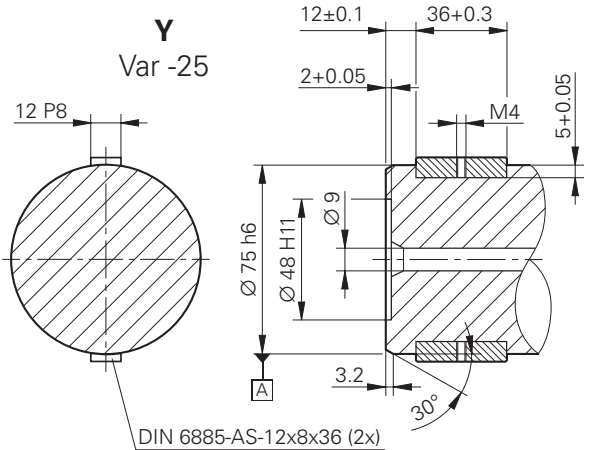
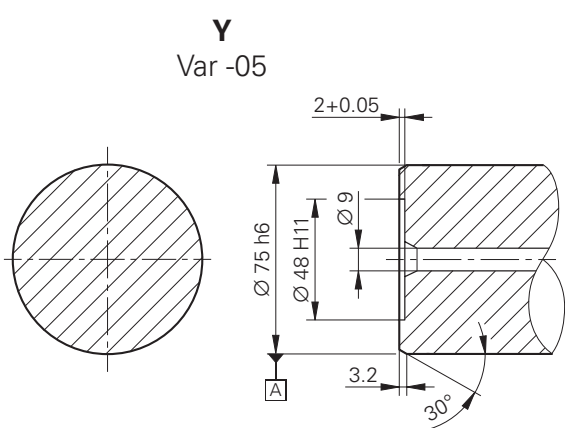
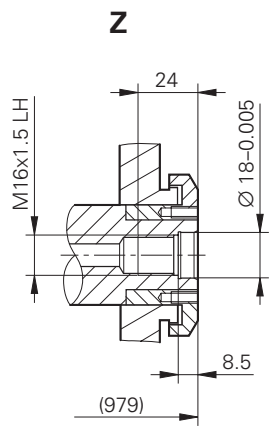
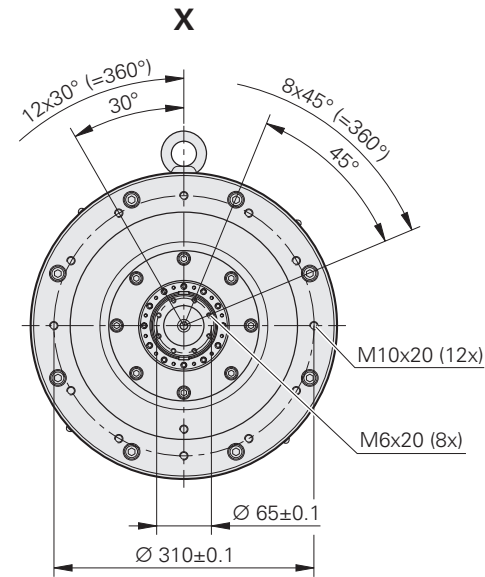
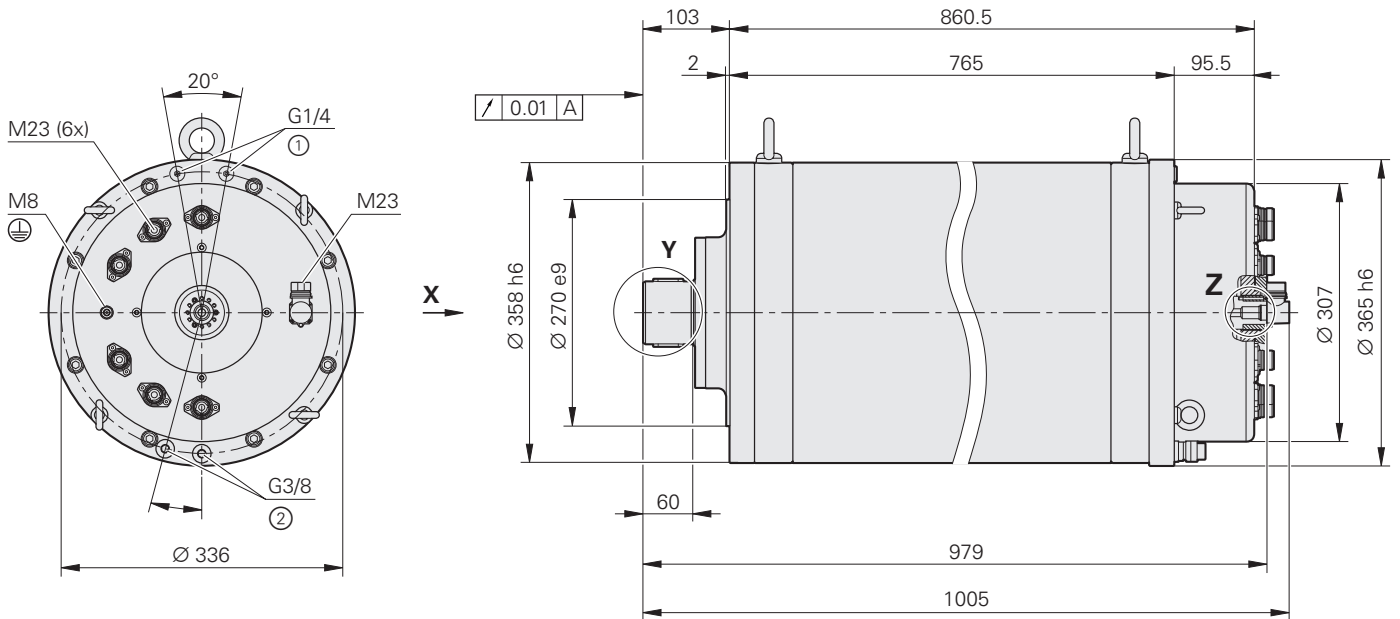
Motor	QAN 360UHW	
	Wye connection	Delta connection
Rated voltage $U_N$	420 V	320 V
Rated power output $P_N$	43.2 kW	
Rated shaft speed $n_N$	450 rpm	780 rpm
Rated torque $M_N$ (105 K)	917 Nm	529 Nm
Rated current $I_N$ (105 K)	113 A	124 A
Efficiency	0.82	0.89
Max. shaft speed $n_{max}$ <sup>1)</sup> Spindle bearing	7000 rpm	
Max. current $I_{max}$	190 A	
Mass $m$	483 kg	
Rotor inertia $J$	5990 kg·cm <sup>2</sup>	
Protection class	IP43	
Mounting direction	Horizontal: IM B5 Vertical: IM V1	
ID with key	641936-25 641936-05	

<sup>1)</sup> The maximum shaft speed depends on the application conditions of the motor, such as the shaft load (see the *Motors* technical manual)

### Rotatable connections







1 = Connection for sealing air  
2 = Connection for coolant

mm  
Tolerancing ISO 8015  
ISO 2768 - m H  
 $\leq 6$  mm:  $\pm 0.2$  mm

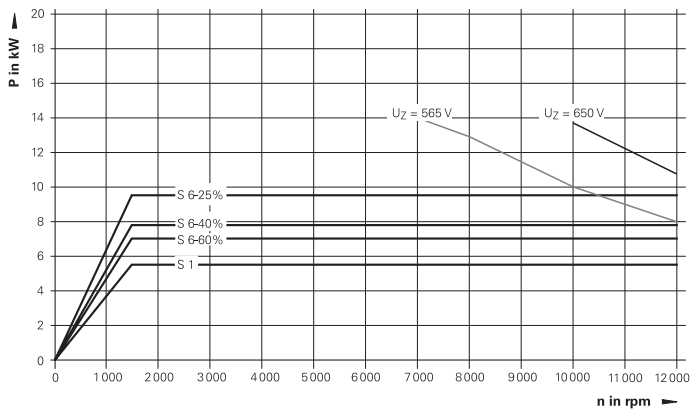
# Asynchronous motors

## Power and torque characteristics

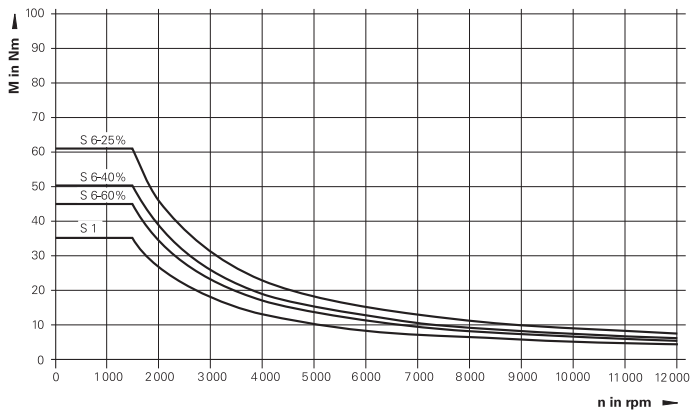
### QAN 200M

Duty cycle	Shaft speed n	Power P	Torque M	Current I
<b>S1</b>	1500 rpm	5.5 kW	35.0 Nm	18.0 A
	6000 rpm	5.5 kW	8.8 Nm	–
	12000 rpm	5.5 kW	4.4 Nm	–
<b>S6-60%</b>	1500 rpm	7.0 kW	44.7 Nm	22.0 A
	6000 rpm	7.0 kW	11.2 Nm	–
	12000 rpm	7.0 kW	5.6 Nm	–
<b>S6-40%</b>	1500 rpm	7.9 kW	50.4 Nm	24.0 A
	6000 rpm	7.9 kW	12.6 Nm	–
	12000 rpm	7.9 kW	6.3 Nm	–
<b>S6-25%</b>	1500 rpm	9.5 kW	60.7 Nm	28.0 A
	6000 rpm	9.5 kW	15.2 Nm	–
	12000 rpm	9.5 kW	7.6 Nm	–

Power characteristic curve



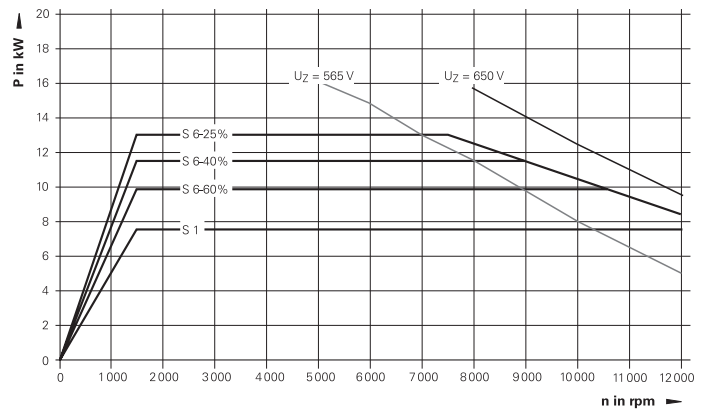
Torque characteristic curve



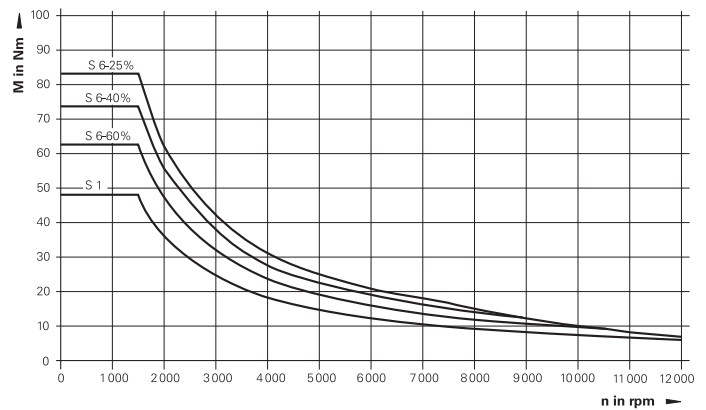
### QAN 200L

Duty cycle	Shaft speed n	Power P	Torque M	Current I
<b>S1</b>	1500 rpm	7.5 kW	47.8 Nm	20.1 A
	6000 rpm	7.5 kW	12.0 Nm	–
	12000 rpm	7.5 kW	6.0 Nm	–
<b>S6-60%</b>	1500 rpm	9.8 kW	62.6 Nm	24.0 A
	10700 rpm	9.8 kW	9.5 Nm	–
	12000 rpm	8.5 kW	6.8 Nm	–
<b>S6-40%</b>	1500 rpm	11.5 kW	73.4 Nm	27.0 A
	9000 rpm	11.5 kW	11.0 Nm	–
	12000 rpm	8.5 kW	6.8 Nm	–
<b>S6-25%</b>	1500 rpm	13.0 kW	83.0 Nm	31.0 A
	7500 rpm	13.0 kW	16.6 Nm	–
	12000 rpm	8.5 kW	6.8 Nm	–

Power characteristic curve



Torque characteristic curve



#### Note

- **S6 mode**

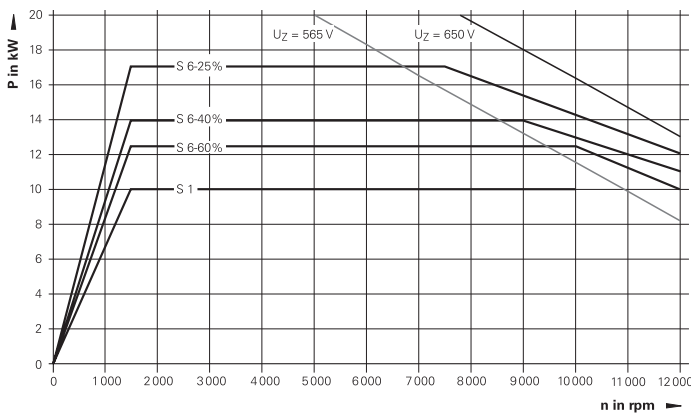
Cycle duration 10 minutes

In the rest period the motor is idle.

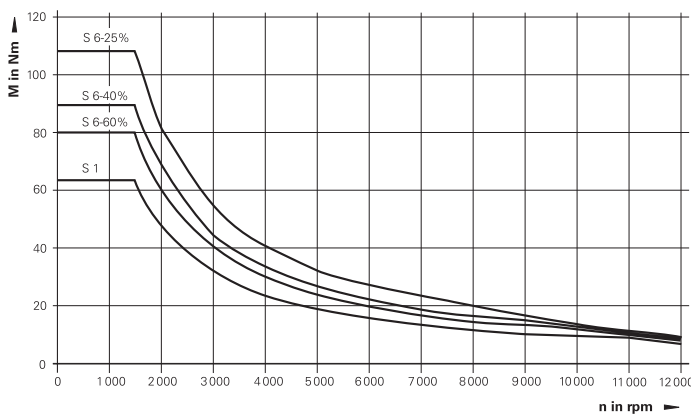
# QAN 200U

Duty cycle	Shaft speed n	Power P	Torque M	Current I
<b>S1</b>	1500 rpm	10.0 kW	63.7 Nm	25.0 A
	10 000 rpm	10.0 kW	9.5 Nm	–
	12 000 rpm	8.0 kW	6.4 Nm	–
<b>S6-60%</b>	1500 rpm	12.5 kW	79.8 Nm	29.0 A
	10 000 rpm	12.5 kW	11.9 Nm	–
	12 000 rpm	10.0 kW	8.0 Nm	–
<b>S6-40%</b>	1500 rpm	14.0 kW	89.4 Nm	32.0 A
	9000 rpm	14.0 kW	14.6 Nm	–
	12 000 rpm	11.0 kW	8.8 Nm	–
<b>S6-25%</b>	1500 rpm	17.0 kW	108.6 Nm	37.0 A
	7500 rpm	17.0 kW	21.7 Nm	–
	12 000 rpm	12.0 kW	9.5 Nm	–

Power characteristic curve



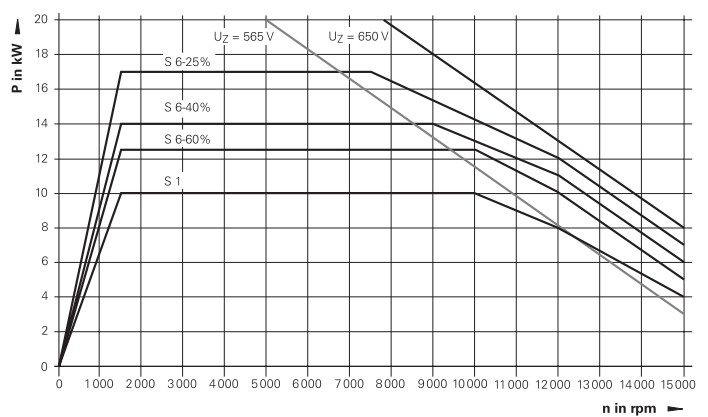
Torque characteristic curve



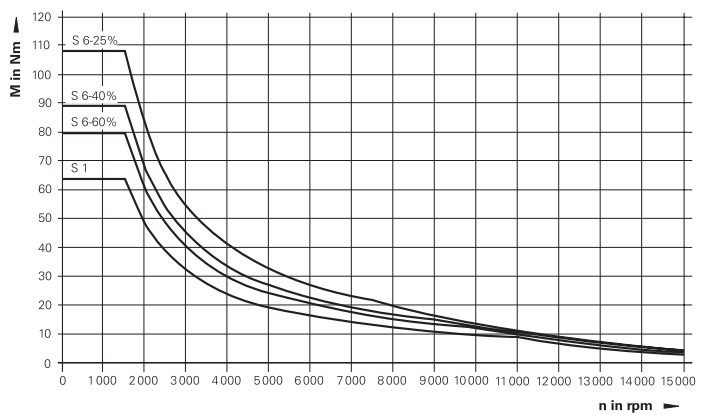
# QAN 200UH

Duty cycle	Shaft speed n	Power P	Torque M	Current I
<b>S1</b>	1500 rpm	10.0 kW	63.7 Nm	25.0 A
	10 000 rpm	10.0 kW	9.5 Nm	–
	12 000 rpm	8.0 kW	6.4 Nm	–
	15 000 rpm	4.0 kW	2.5 Nm	–
<b>S6-60%</b>	1500 rpm	12.5 kW	79.8 Nm	29.0 A
	10 000 rpm	12.5 kW	11.9 Nm	–
	12 000 rpm	10.0 kW	8.0 Nm	–
	15 000 rpm	5.0 kW	3.2 Nm	–
<b>S6-40%</b>	1500 rpm	14.0 kW	89.4 Nm	32.0 A
	9000 rpm	14.0 kW	19.1 Nm	–
	12 000 rpm	11.0 kW	8.8 Nm	–
	15 000 rpm	6.0 kW	3.8 Nm	–
<b>S6-25%</b>	1500 rpm	17.0 kW	108.6 Nm	37.0 A
	7500 rpm	17.0 kW	21.7 Nm	–
	12 000 rpm	12.0 kW	9.5 Nm	–
	15 000 rpm	7.0 kW	4.5 Nm	–

Power characteristic curve



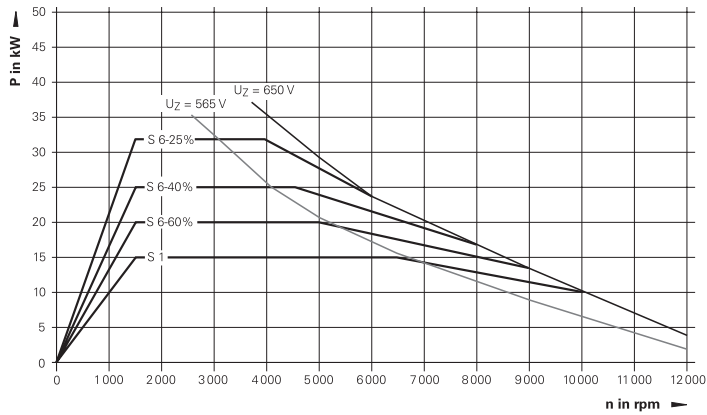
Torque characteristic curve



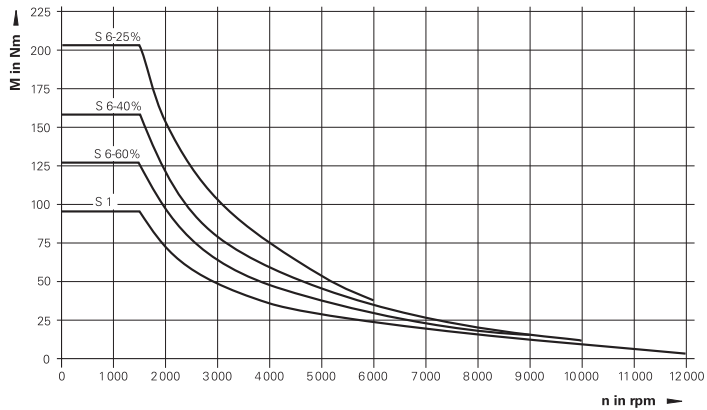
## QAN 260M, QAN 260MH

Duty cycle	Shaft speed n	Power P	Torque M	Current I
<b>S1</b>	1500 rpm	15.0 kW	95.5 Nm	35.0 A
	6500 rpm	15.0 kW	22.0 Nm	–
	10 000 rpm	10.0 kW	9.5 Nm	–
	12 000 rpm	4.0 kW	3.2 Nm	–
<b>S6-60%</b>	1500 rpm	20.0 kW	127.3 Nm	43.3 A
	5000 rpm	20.0 kW	38.2 Nm	–
	9000 rpm	13.5 kW	14.3 Nm	–
<b>S6-40%</b>	1500 rpm	25.0 kW	159.2 Nm	52.3 A
	4500 rpm	25.0 kW	53.1 Nm	–
	8000 rpm	16.8 kW	20.1 Nm	–
<b>S6-25%</b>	1500 rpm	32.0 kW	203.7 Nm	65.0 A
	4000 rpm	32.0 kW	76.4 Nm	–
	6000 rpm	23.7 kW	37.7 Nm	–

Power characteristic curve



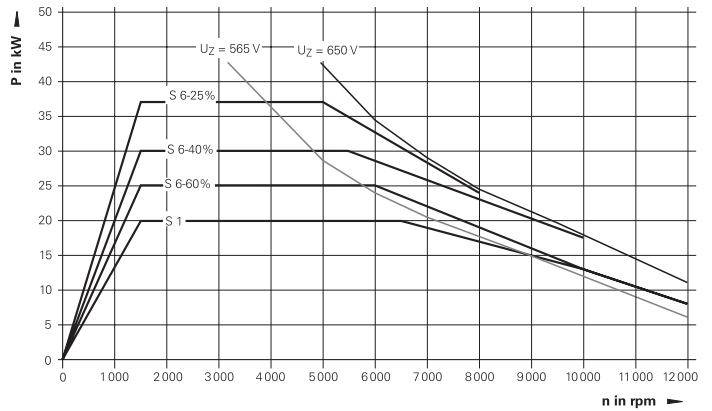
Torque characteristic curve



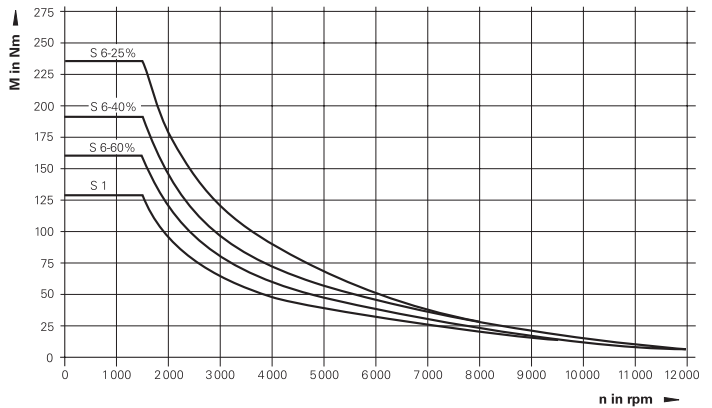
## QAN 260L, QAN 260LH

Duty cycle	Shaft speed n	Power P	Torque M	Current I
<b>S1</b>	1500 rpm	20.0 kW	127.3 Nm	46.0 A
	6500 rpm	20.0 kW	29.4 Nm	–
	10 000 rpm	13.0 kW	12.4 Nm	–
	12 000 rpm	8.0 kW	6.4 Nm	–
<b>S6-60%</b>	1500 rpm	25.0 kW	159.2 Nm	56.0 A
	6000 rpm	25.0 kW	39.4 Nm	–
	10 000 rpm	16.0 kW	15.3 Nm	–
	12 000 rpm	8.0 kW	6.4 Nm	–
<b>S6-40%</b>	1500 rpm	30.0 kW	191.0 Nm	65.0 A
	5500 rpm	30.0 kW	52.1 Nm	–
	10 000 rpm	17.5 kW	16.7 Nm	–
<b>S6-25%</b>	1500 rpm	37.0 kW	235.5 Nm	79.0 A
	5000 rpm	37.0 kW	70.7 Nm	–
	8000 rpm	24.0 kW	28.6 Nm	–

Power characteristic curve



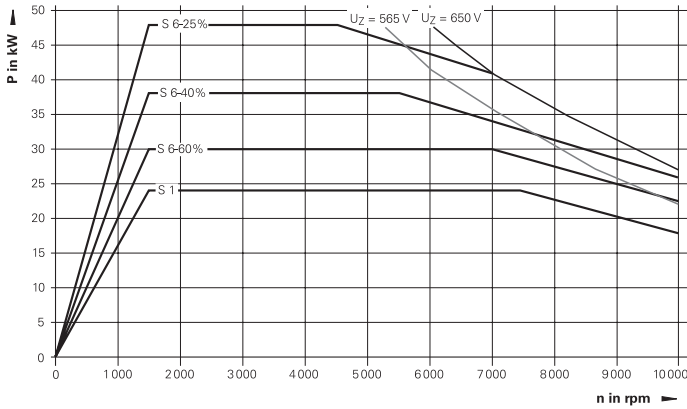
Torque characteristic curve



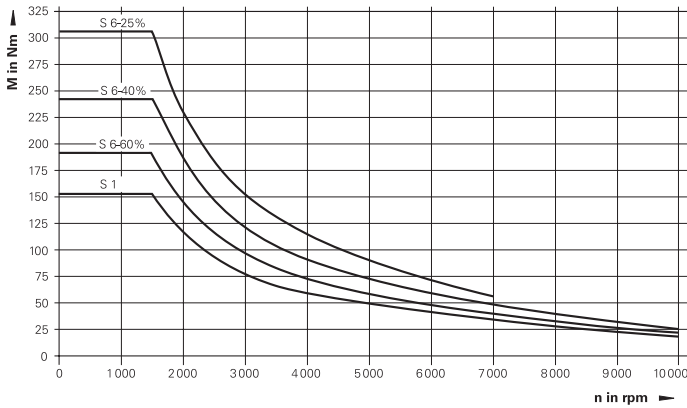
# QAN 260U

Duty cycle	Shaft speed n	Power P	Torque M	Current I
<b>S1</b>	1500 rpm	24.0 kW	152.8 Nm	58.0 A
	7400 rpm	24.0 kW	31.0 Nm	–
	10 000 rpm	18.0 kW	17.2 Nm	–
<b>S6-60%</b>	1500 rpm	30.0 kW	191.0 Nm	67.2 A
	7000 rpm	30.0 kW	40.9 Nm	–
	10 000 rpm	22.5 kW	21.5 Nm	–
<b>S6-40%</b>	1500 rpm	38.0 kW	241.9 Nm	81.8 A
	5500 rpm	38.0 kW	66.0 Nm	–
	10 000 rpm	26.0 kW	24.8 Nm	–
<b>S6-25%</b>	1500 rpm	48.0 kW	305.6 Nm	100.6 A
	4500 rpm	48.0 kW	101.9 Nm	–
	7000 rpm	41.0 kW	55.9 Nm	–

Power characteristic curve



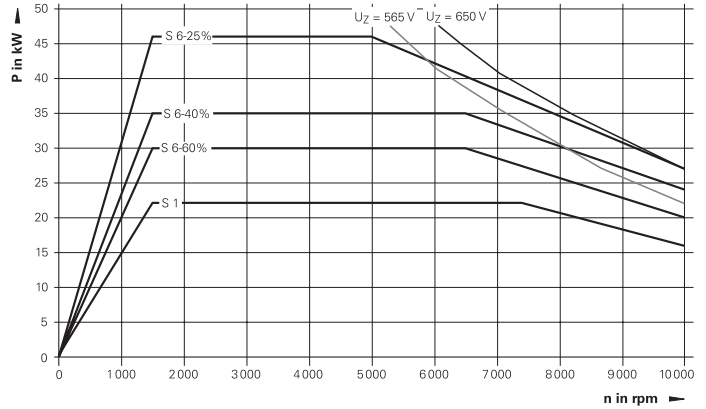
Torque characteristic curve



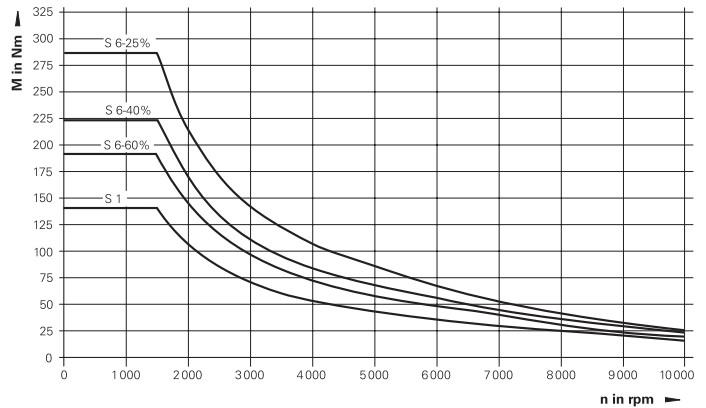
# QAN 260UH

Duty cycle	Shaft speed n	Power P	Torque M	Current I
<b>S1</b>	1500 rpm	22.0 kW	140.1 Nm	54.0 A
	7400 rpm	22.0 kW	28.4 Nm	–
	10 000 rpm	16.0 kW	15.3 Nm	–
<b>S6-60%</b>	1500 rpm	30.0 kW	191.0 Nm	67.0 A
	6500 rpm	30.0 kW	44.1 Nm	–
	10 000 rpm	20.0 kW	19.5 Nm	–
<b>S6-40%</b>	1500 rpm	35.0 kW	222.8 Nm	77.0 A
	6500 rpm	35.0 kW	66.8 Nm	–
	10 000 rpm	24.0 kW	22.9 Nm	–
<b>S6-25%</b>	1500 rpm	46.0 kW	286.5 Nm	97.0 A
	5000 rpm	46.0 kW	85.9 Nm	–
	10 000 rpm	27.0 kW	25.8 Nm	–

Power characteristic curve



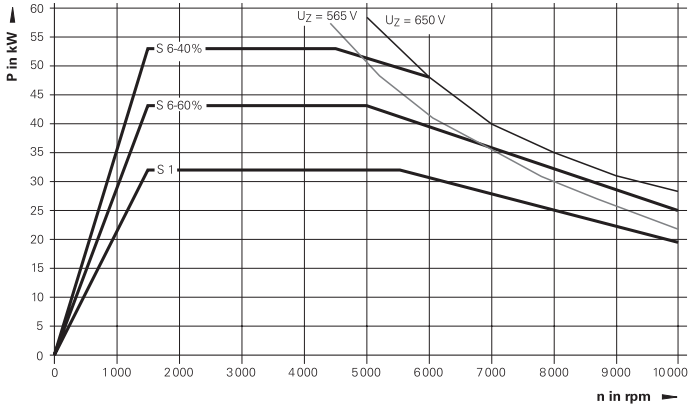
Torque characteristic curve



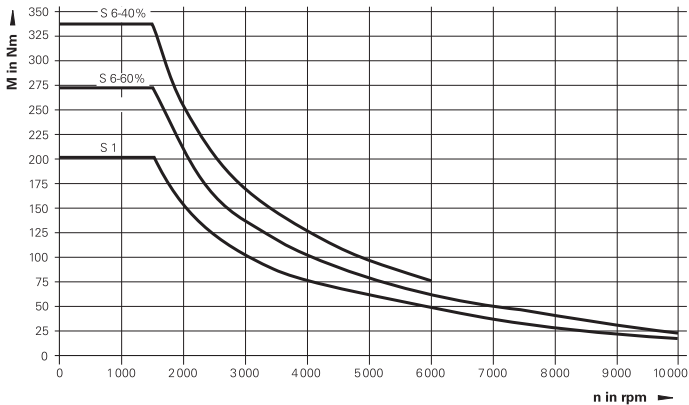
# QAN 320M

Duty cycle	Shaft speed n	Power P	Torque M	Current I
<b>S1</b>	1500 rpm	32.0 kW	203.7 Nm	77.5 A
	5500 rpm	32.0 kW	55.0 Nm	–
	10000 rpm	19.5 kW	18.6 Nm	–
<b>S6-60%</b>	1500 rpm	43.0 kW	273.7 Nm	98.0 A
	5500 rpm	43.0 kW	71.5 Nm	–
	10000 rpm	25.0 kW	23.9 Nm	–
<b>S6-40%</b>	1500 rpm	53.0 kW	337.4 Nm	118.0 A
	5500 rpm	53.0 kW	86.2 Nm	–
	6000 rpm	48.0 kW	76.4 Nm	–

Power characteristic curve



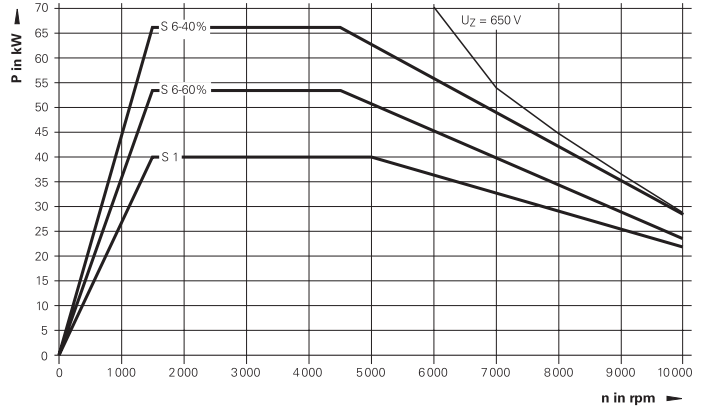
Torque characteristic curve



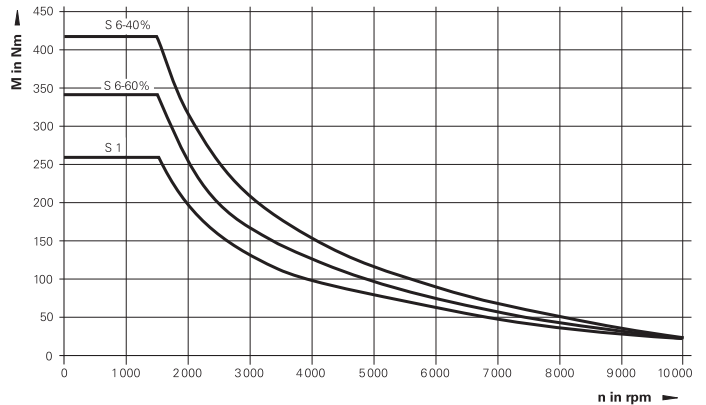
# QAN 320L

Duty cycle	Shaft speed n	Power P	Torque M	Current I
<b>S1</b>	1500 rpm	40.0 kW	254.6 Nm	99.0 A
	5000 rpm	40.0 kW	77.9 Nm	–
	10000 rpm	21.0 kW	21.0 Nm	–
<b>S6-60%</b>	1500 rpm	53.0 kW	337.4 Nm	123.0 A
	4500 rpm	53.0 kW	112.5 Nm	–
	10000 rpm	24.0 kW	22.9 Nm	–
<b>S6-40%</b>	1500 rpm	66.0 kW	420.2 Nm	148.0 A
	4500 rpm	66.0 kW	140.1 Nm	–
	10000 rpm	28.0 kW	26.7 Nm	–

Power characteristic curve



Torque characteristic curve

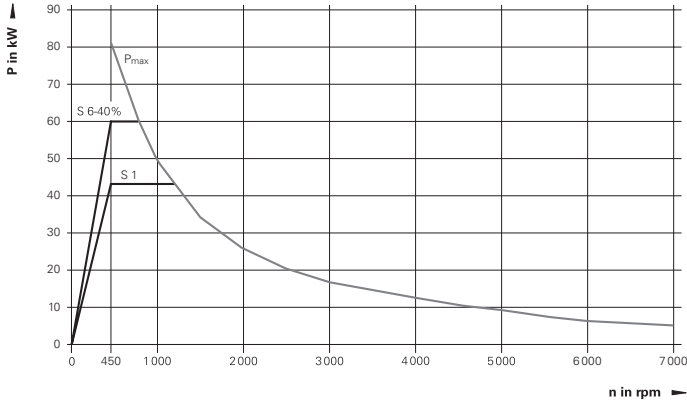


# QAN 360UHW

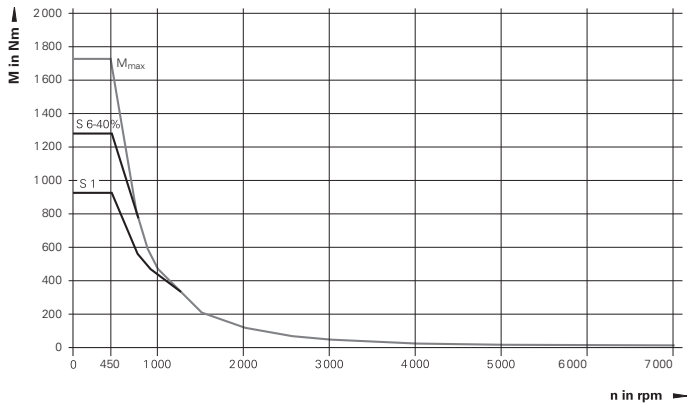
Wye connection

Duty cycle	Shaft speed n	Power P	Torque M	Current I
S1	450 rpm	43.2 kW	917 Nm	113 A
	800 rpm	43.2 kW	515 Nm	–
S6-40%	450 rpm	60 kW	1290 Nm	–
	600 rpm	60 kW	955 Nm	–

Power characteristic curve



Torque characteristic curve

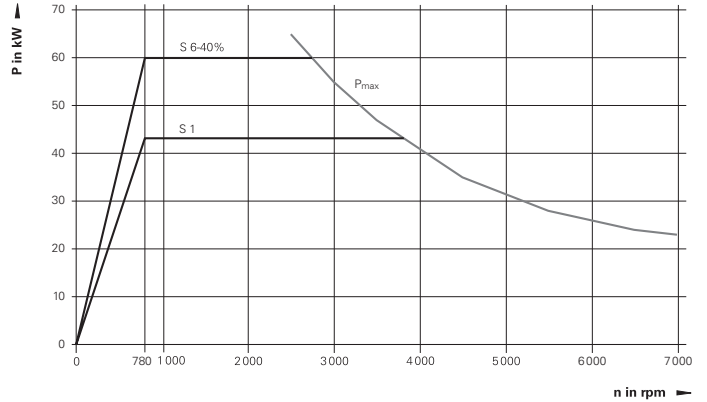


# QAN 360UHW

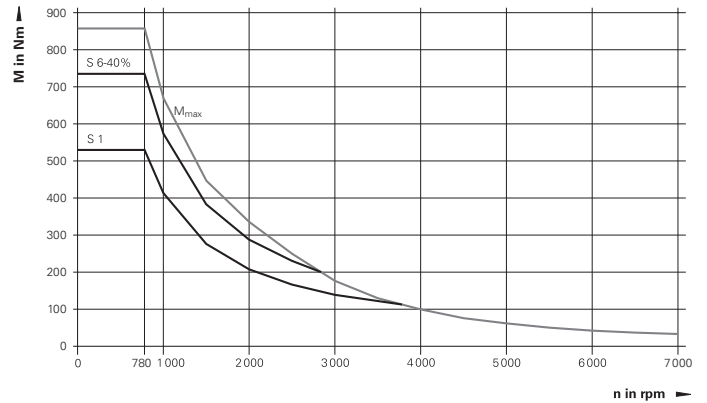
Delta connection

Duty cycle	Shaft speed n	Power P	Torque M	Current I
S1	780 rpm	43.2 kW	529 Nm	124 A
	3500 rpm	43.2 kW	110 Nm	–
S6-40%	780 rpm	60 kW	720 Nm	–
	2500 rpm	60 kW	220 Nm	–

Power characteristic curve



Torque characteristic curve





# Asynchronous motors

## Cables

### Power cables

Current load at ambient temperature up to 40 °C

	Unassembled cable	Bend radius R for frequent flexing	Cable type	Diameter
<b>Current load up to 26 A (installation type B2)</b>				
<b>QAN 200M</b> <b>QAN 200L</b> <b>QAN 200U</b> <b>QAN 200UH</b>	ID 818787-xx <i>ID 1213900-xx</i>	≥ 69 mm ≥ 109 mm	PUR [4 x 4 mm <sup>2</sup> ]	13.8 mm <i>14.5 mm</i>
<b>Current load up to 45.2 A (installation type B2)</b>				
<b>QAN 260M</b> <b>QAN 260MH</b>	ID 818782-xx <i>ID 1213901-xx</i>	≥ 102 mm ≥ 157 mm	PUR [4 x 10 mm <sup>2</sup> ]	20.3 mm <i>20.9 mm</i>
<b>Current load up to 59.9 A (installation type B2)</b>				
<b>QAN 260L</b> <b>QAN 260LH</b> <b>QAN 260U</b> <b>QAN 260UH</b>	ID 818510-xx <i>ID 1213902-xx</i>	≥ 133 mm ≥ 207 mm	PUR [4 x 16 mm <sup>2</sup> ]	26.5 mm <i>27.5 mm</i>
<b>Current load up to 93.8 A (installation type B2)</b>				
<b>QAN 320M</b>	ID 818781-xx <i>ID 1213903-xx</i>	≥ 173 mm ≥ 258 mm	PUR [4 x 35 mm <sup>2</sup> ]	34.5 mm <i>34.3 mm</i>
<b>Current load up to 117.5 A (installation types C and E)</b>				
<b>QAN 320L</b>	ID 818781-xx <i>ID 1213903-xx</i>	≥ 173 mm ≥ 258 mm	PUR [4 x 35 mm <sup>2</sup> ]	34.5 mm <i>34.3 mm</i>
<b>Current load up to 125.7 A (installation types C and E)</b>				
<b>QAN 360UHW</b>	ID 1213903-xx	≥ 258 mm	PUR [4 x 35 mm <sup>2</sup> ]	34.3 mm
<b>Current load up to 124.5 A (installation types C and E)</b>				
<b>QAN 360UHW</b>	ID 696060-03	≥ 111 mm	–	35 mm

*Italics: shielded power cable*



#### Further information:

For detailed information about the electrical connection of the QAN 360UHW, see the Motors *technical manual*.

## Encoder cables

	Cable length	Cable complete with connectors	Line drop compensator	Extension cable	Bend radius R for frequent flexing
<b>All QANs</b>	< 30 m	ID 289440-xx	–	ID 336847-xx (as required)	≥ 100 mm
	> 30 m	ID 289440-xx	ID 370226-01	ID 336847-xx	

## Cables for fans

	Cable only ID	Bend radius R for frequent flexing	Cable type	Diameter
<b>All QANs</b>	ID 818789-xx <i>ID 1213898-xx</i>	≥ 50 mm ≥ <i>82 mm</i>	PUR [4 x 0.75 mm <sup>2</sup> ]	9.9 mm <i>10.9 mm</i>

*Italics*: shielded power cable

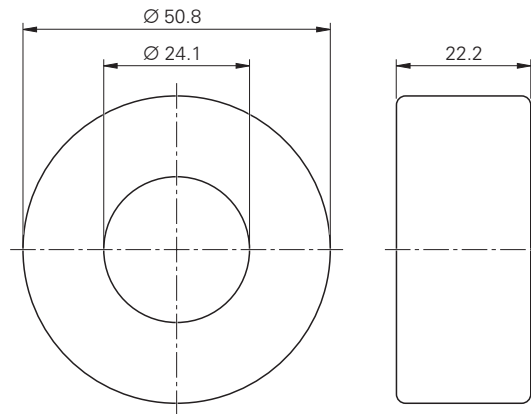
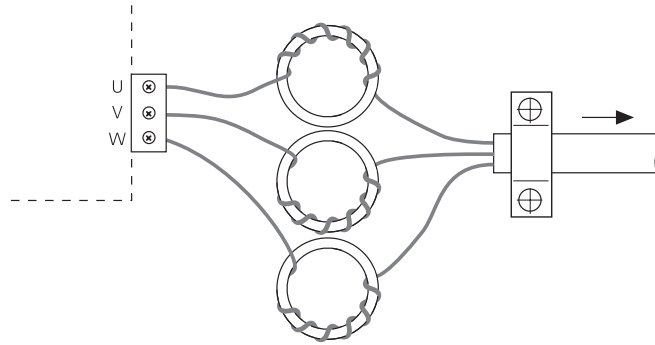
# Accessories

## Toroidal cores

Large line lengths can result in voltage peaks that may damage the motor. For this reason, toroidal cores need to be used with motor lines longer than 15 m. One toroidal core is required per phase. The toroidal cores must be located in close proximity to the inverter (max. 2 m).

### Toroidal core

For motor line > 15 m  
ID 827054-01

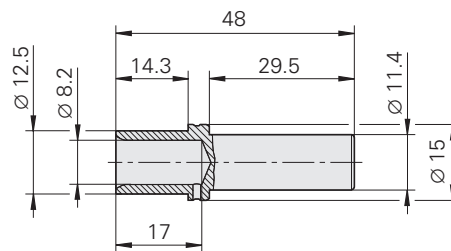


## M23 connector set

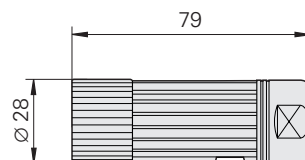
For crimping the 1-pin M23 connector for the motor connection, the connector set contains the following components:

- 6 x connectors
- 6 x female contacts
- 1x mounting instructions

ID 1288941-01



Female contact



Connector

mm  
  
 Tolerancing ISO 8015  
 ISO 2768 - m H  
 $\leq 6 \text{ mm: } \pm 0.2 \text{ mm}$

# Torque motors for direct drives

Besides synchronous and asynchronous motors, HEIDENHAIN offers a comprehensive assortment of standard torque motors. With more than 100 models, almost any requirement can be met.

Overview of the most important features:

- Outside diameter up to 1290 mm
- Large hollow shaft up to 1070 mm
- Maximum rated speed up to 5170 rpm
- Peak torque up to 31 200 Nm
- Very high continuous torque
- Field weakening conformant
- With or without liquid-cooled cage
- Conceived for highly demanding applications

Direct coupling of the load with the rotor eliminates the need for any mechanical transfer elements such as transmissions, toothed belts, or worm gears. The maintenance-free direct drives therefore offer excellent dynamic performance while guaranteeing a long service life.

The torque motors have the advantage of a patented, cogging-free design. This design provides outstanding peak power density in the magnet gap as well as unique thermal efficiency, which is a considerable advantage for precision, which reacts negatively to thermal drift.

Further advantages of torque motors are:

- Patented and proven technology
- Excellent performance
- High quality
- Simple integration
- Wide product range

The torque motors are developed and produced by ETEL—a company of the HEIDENHAIN Group.



Torque motors for direct drives

# HEIDENHAIN

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