



# HEIDENHAIN



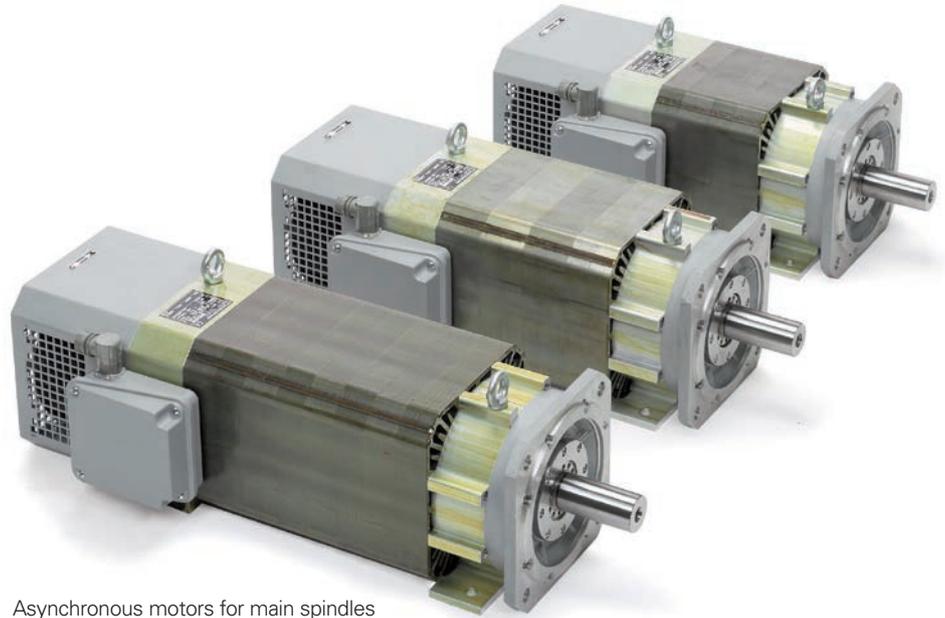
## HEIDENHAIN Motors

For Axis and Spindle Drives

Information for  
Machine Manufacturers

### Motors for feed axes and main spindles

HEIDENHAIN supplies motors for feed axes and main spindles as accessories to its controls with an integrated inverter. This brochure provides an overview of the available motors as well as information about the specifications and mating dimensions. For initial setup, please request the *Motors Technical Manual*.



Asynchronous motors for main spindles



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 (operation with non-HEIDENHAIN controls or inverters requires prior consultation with HEIDENHAIN).
- May 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.)

If the devices are used as a part of a safety function, then the machine manufacturer must ensure that the final product fulfills 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.

### Parts subject to wear

HEIDENHAIN motors contain components that are subject to wear depending on the application and how they are deployed. This especially applies to the following parts:

- Bearings
- Brakes
- Radial shaft seal rings
- Fans
- Electrical insulation system

*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 placed.*

*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 an NC-controlled machine tool. Some special characteristics include

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

### 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 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 monitors the speed: The following versions are available (see *Specifications*):

- ERN 1387 incremental rotary encoder with  $\sim 1 V_{PP}$  interface, or
- EQN 1325 absolute multiturn rotary encoder with EnDat2.2/01 interface or
- EQN 1337 absolute rotary encoder with purely serial EnDat2.2 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 a higher rated torque and a maximum permissible rated speed of 3000 rpm (QSY 260: 2000 rpm). The following controls are required in order to drive the motors in EcoDyn mode:

- TNC7, TNC7 basic
- 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 EQN 1325 rotary encoder feature an electronic ID label that allows for easy commissioning and diagnosis. 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 in this brochure provide a fault exclusion for the loosening of the mechanical connection between the encoder and the motor. This prevents any unintended loosening of the rotor and stator coupling. Safety-related parameters for the motors or the encoders used within them are available upon request (e.g., MTTF values, data for fault exclusion).

### Installation elevation

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

### Thermal parameters

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

### Mechanical parameters

Maintenance-free bearings  
Holding brake optionally with low backlash  $\leq 1^\circ$   
*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 gears

Only for enclosed gears. The shaft is suitable only for dry connection.

#### Vibration severity

Grade 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 machine key as per DIN 6885 (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 machine key are half-key balanced as per ISO 21940-32.



QSY 190 EcoDyn



QSY 96 G

# Synchronous motors

## When 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 2xx D UE 2xx B	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>20</b>
<b>QSY 260B EcoDyn</b>	85.0 Nm	31.0 A	2000 rpm	UM 114 D	–	–	–	
<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.

# When 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	Compact inverters/axis			
						UEC 31x	UEC 32x	UEC 33x	
<b>QSY 96A</b>	1.5 Nm	1.5 A	4500 rpm	UM 310	UM 320	1 to 5	1 to 5	1 to 5	<b>8</b>
<b>QSY 96G</b>	5.2 Nm	5.2 A	4500 rpm	UM 310	UM 320	1 to 5	1 to 5	1 to 5	
<b>QSY 116C</b>	5.2 Nm	3.3 A	3000 rpm	UM 310	UM 320	1 to 5	1 to 5	1 to 5	<b>10</b>
<b>QSY 116E</b>	7.2 Nm	4.8 A	3000 rpm	UM 310	UM 320	1 to 5	1 to 5	1 to 5	
<b>QSY 116J</b>	10.0 Nm	6.8 A	3000 rpm	UM 310	UM 320	1 to 5	1 to 5	1 to 5	
<b>QSY 116J EcoDyn</b>	10.0 Nm	5.0 A	3000 rpm	UM 310	UM 320	1 to 5	1 to 5	1 to 5	
<b>QSY 130C EcoDyn</b>	6.0 Nm	3.0 A	3000 rpm	UM 310	UM 320	1 to 5	1 to 5	1 to 5	<b>12</b>
<b>QSY 130E EcoDyn</b>	9.0 Nm	4.5 A	3000 rpm	UM 310	UM 320	1 to 5	1 to 5	1 to 5	
<b>QSY 155B</b>	13.0 Nm	9.1 A	3000 rpm	UM 310	UM 320	1 to 2	1 to 5	1 to 5	<b>14</b>
<b>QSY 155C</b>	17.7 Nm	11.8 A	3000 rpm	UM 311	UM 321	1 to 2	1 to 2	1 to 5	
<b>QSY 155D</b>	21.6 Nm	14.6 A	3000 rpm	UM 311	UM 321	1 to 2	1 to 2	1 to 5	
<b>QSY 155F</b>	26.1 Nm	18.0 A	3000 rpm	UM 312	UM 322	–	1 to 2	1 to 2	
<b>QSY 155B EcoDyn</b>	13.0 Nm	6.5 A	3000 rpm	UM 310	UM 320	1 to 5	1 to 5	1 to 5	<b>16</b>
<b>QSY 155C EcoDyn</b>	17.7 Nm	8.5 A	3000 rpm	UM 310	UM 320	1 to 2	1 to 5	1 to 5	
<b>QSY 155D EcoDyn</b>	21.6 Nm	10.6 A	3000 rpm	UM 311	UM 321	1 to 2	1 to 2	1 to 5	
<b>QSY 155F EcoDyn</b>	26.1 Nm	12.8 A	3000 rpm	UM 311	UM 321	1 to 2	1 to 2	1 to 5	
<b>QSY 190C EcoDyn</b>	28.0 Nm	14.0 A	3000 rpm	UM 311	UM 321	1 to 2	1 to 2	1 to 5	<b>18</b>
<b>QSY 190D EcoDyn</b>	38.0 Nm	18.1 A	3000 rpm	UM 312	UM 322	–	1 to 2	1 to 2	
<b>QSY 190F EcoDyn</b>	47.6 Nm	22.7 A	3000 rpm	UM 312	UM 322	–	–	1 to 2	
<b>QSY 190K EcoDyn</b>	62.5 Nm	29.8 A	3000 rpm	UM 313	–	–	–	1	
<b>QSY 260B EcoDyn</b>	85.0 Nm	31.0 A	2000 rpm	UM 313	–	–	–	1	<b>20</b>
<b>QSY 260C EcoDyn</b>	120.0 Nm	43.5 A	2000 rpm	UM 313	–	–	–	–	
<b>MSY 155B</b>	12.8 Nm	7.8 A	2500 rpm	UM 310	UM 320	1 to 5	1 to 5	1 to 5	<b>24</b>
<b>MSY 155C</b>	18.2 Nm	10.5 A	2500 rpm	UM 311	UM 321	1 to 2	1 to 5	1 to 5	
<b>MSY 155D</b>	24.1 Nm	13.5 A	2500 rpm	UM 311	UM 321	1 to 2	1 to 2	1 to 5	
<b>MSY 155E</b>	28.9 Nm	15.5 A	2500 rpm	UM 311	UM 321	1 to 2	1 to 2	1 to 5	
<b>MSY 192C</b>	30.3 Nm	13.2 A	2000 rpm	UM 311	UM 321	1 to 2	1 to 2	1 to 2	<b>26</b>
<b>MSY 192D</b>	39.0 Nm	18.3 A	2000 rpm	UM 312	UM 322	–	1 to 2	1 to 2	
<b>MSY 192E</b>	46.0 Nm	20.1 A	2000 rpm	UM 312	UM 322	–	1 to 2	1 to 2	
<b>MSY 192F</b>	54.5 Nm	24.0 A	2000 rpm	UM 312	UM 322	–	–	1 to 2	

<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 three pole pairs

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

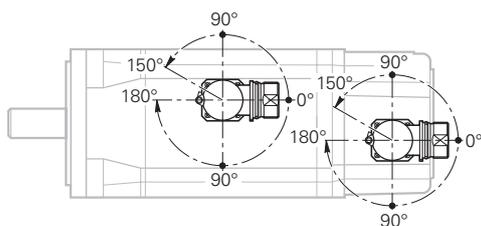


Motor	QSY 96A		QSY 96G	
Rated voltage $U_N$	310 V/308 V		291 V/290 V	
Rated power output $P_N$	0.5 kW/0.45 kW		1.4 kW/1.3 kW	
Rated shaft speed $n_N$	4500 rpm			
Rated torque $M_N^{1)}$	1.05 Nm/0.95 Nm		3.0 Nm/2.7 Nm at 4500 rpm	
Rated current $I_N^{1)}$	1.1 A/1.0 A		3.3 A/3.0 A	
Stall torque $M_0^{1)}$	1.5 Nm		5.2 Nm	
Stall current $I_0^{1)}$	1.5 A		5.2 A	
Maximum 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	
<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>Mass m</b>	3.6 kg	4.5 kg	7.2 kg	8.1 kg
<b>Rotor inertia J</b>	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>ID</b> Motor with ERN 1387 Motor with EQN 1325 Motor with EQN 1337	344512-0C 344512-5C 344512-4C	344512-0D 344512-5D 344512-4D	339875-0C 339875-5C 339875-4C	339875-0D 339875-5D 339875-4D

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

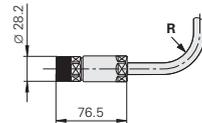
*Italics: data for motors with EQN 1325 (rated torque reduced by 10%)*

### Rotatable connections

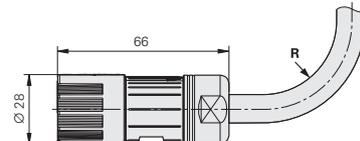


### Power connector

For motors with ERN 1387,  
EQN 1325

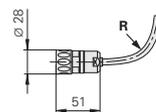


For motor with EQN 1337

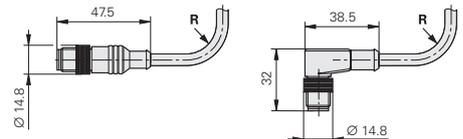


### Encoder connector

For motors with ERN 1387,  
EQN 1325



For motor with EQN 1337



For **R** see page 32



# Synchronous motors

## QSY 116 series

Feed motors with three pole pairs

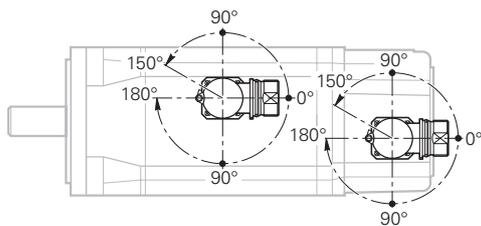
- Stall torque: 5.2 Nm to 10 Nm
- Choice of incremental or absolute rotary encoder



Motor	QSY 116C		QSY 116E		QSY 116J		QSY 116J EcoDyn	
<b>Rated voltage <math>U_N</math></b>	315 V/311 V		302 V/299 V		290 V/288 V		408 V/405 V	
<b>Rated power output <math>P_N</math></b>	1.45 kW/1.30 kW		1.85 kW/1.67 kW		2.42 kW/2.18 kW		2.64 kW/2.38 kW	
<b>Rated speed <math>n_N</math></b>	3000 rpm						3000 rpm <sup>3)</sup>	
<b>Rated torque <math>M_N</math><sup>1)</sup></b>	4.6 Nm/4.1 Nm		5.9 Nm/5.3 Nm		7.7 Nm/6.9 Nm		8.4 Nm/7.6 Nm	
<b>Rated current <math>I_N</math><sup>1)</sup></b>	3.3 A/3.0 A		4.1 A/3.7 A		5.4 A/4.8 A		4.3 A/3.9 A	
<b>Stall torque <math>M_0</math><sup>1)</sup></b>	5.2 Nm		7.2 Nm		10.0 Nm		10.0 Nm	
<b>Stall current <math>I_0</math><sup>1)</sup></b>	3.3 A		4.8 A		6.8 A		5.0 A	
<b>Max. speed <math>n_{max}</math></b>	5400 rpm						4200 rpm <sup>3)</sup>	
<b>Max. torque <math>M_{max}</math><sup>2)</sup></b>	16 Nm		25 Nm		41 Nm		41 Nm	
<b>Max. current <math>I_{max}</math><sup>2)</sup></b>	12.7 A		19.0 A		32.6 A		23.0 A	
<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>Mass m</b>	6.9 kg	7.8 kg	8.6 kg	9.5 kg	12.0 kg	13.3 kg	12.0 kg	13.3 kg
<b>Rotor inertia J</b>	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>ID</b>								
Motor with ERN 1387	339876-0C	339876-0D	339877-0C	339877-0D	339878-0C	339878-0D	339878-1C	339878-1D
Motor with EQN 1325	339876-5C	339876-5D	339877-5C	339877-5D	339878-5C	339878-5D	339878-6C	339878-6D
Motor with EQN 1337	339876-4C	339876-4D	339877-4C	339877-4D	339878-4C	339878-4D	339878-3C	339878-3D

1) At 100 K      2) Max. 200 ms      3) In EcoDyn mode  
*Italics: data for motors with EQN 1325 (rated torque reduced by 10%)*

### Rotatable connections



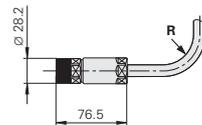
M12 connector for motor-side speed encoder



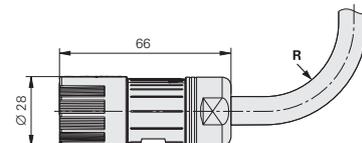
M23 connector for motor-side speed encoder

### Power connector

For motors with ERN 1387, EQN 1325

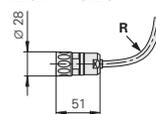


For motor with EQN 1337

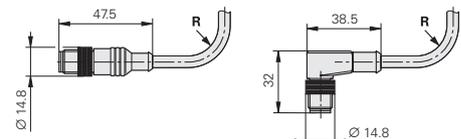


### Encoder connector

For motors with ERN 1387, EQN 1325



For motor with EQN 1337



For **R** see page 32



# Synchronous motors

## QSY 130 EcoDyn series

Feed motors with four pole pairs

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

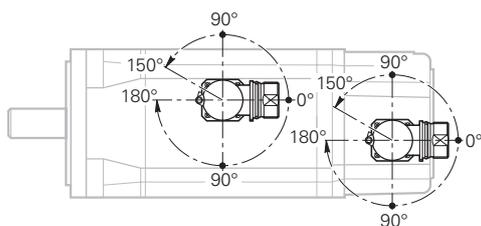


Motor	QSY 130C EcoDyn		QSY 130E EcoDyn	
Rated voltage $U_N$	415 V/411 V		407 V/403 V	
Rated power output $P_N$	1.6 kW/1.5 kW		2.3 kW/2.1 kW	
Rated speed $n_N$	3000 rpm (in EcoDyn mode)			
Rated torque $M_N^{1)}$	5.2 Nm/4.7 Nm		7.4 Nm/6.7 Nm	
Rated current $I_N^{1)}$	2.7 A/2.4 A		3.8 A/3.4 A	
Stall torque $M_0^{1)}$	6 Nm		9 Nm	
Stall current $I_0^{1)}$	3.0 A		4.5 A	
Maximum 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	
<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>Mass m</b>	7.9 kg	8.8 kg	9.7 kg	10.6 kg
<b>Rotor inertia J</b>	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>ID</b> Motor with ERN 1387 Motor with EQN 1325 Motor with EQN 1337	389053-1C 389053-6C 389053-3C	389053-1D 389053-6D 389053-3D	388422-1C 388422-6C 388422-3C	388422-1D 388422-6D 388422-3D

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

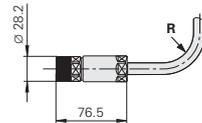
*Italics: data for motors with EQN 1325 (rated torque reduced by 10%)*

### Rotatable connections

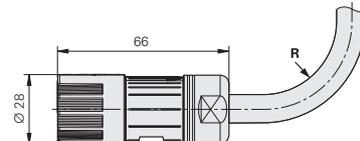


### Power connector

For motors with ERN 1387,  
EQN 1325

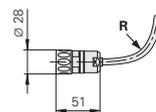


For motor with EQN 1337

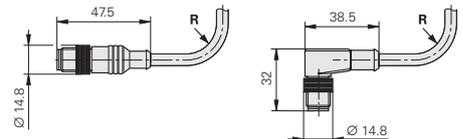


### Encoder connector

For motors with ERN 1387,  
EQN 1325

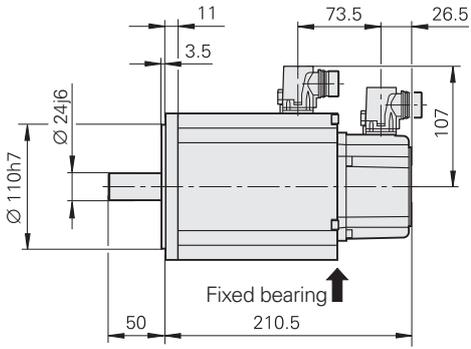


For motor with EQN 1337

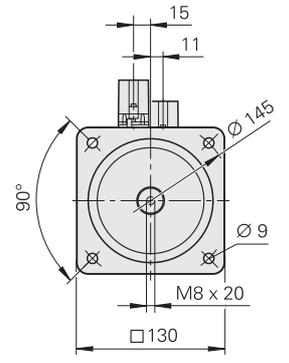
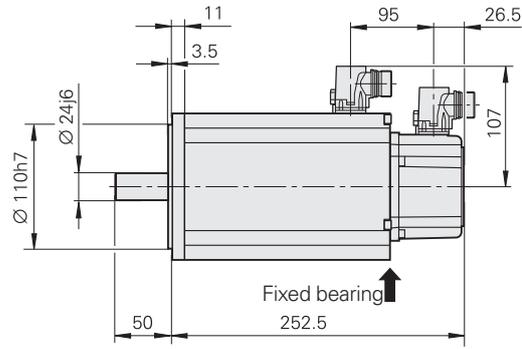


For **R** see page 32

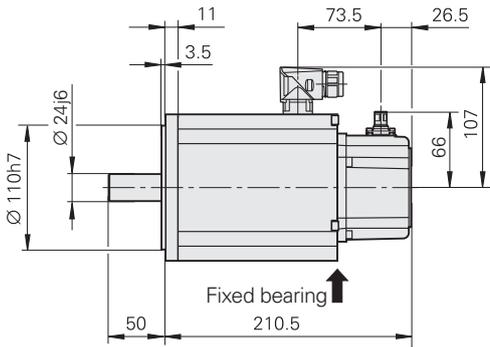
**QSY 130C Without brake**



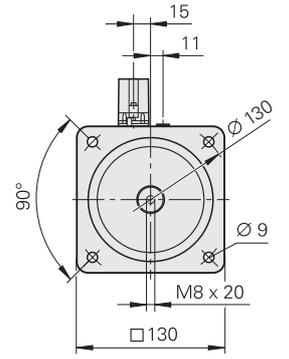
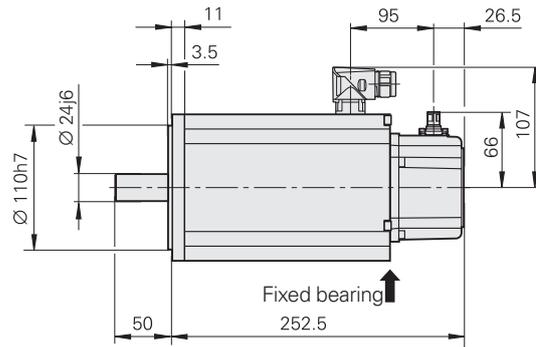
**With brake**



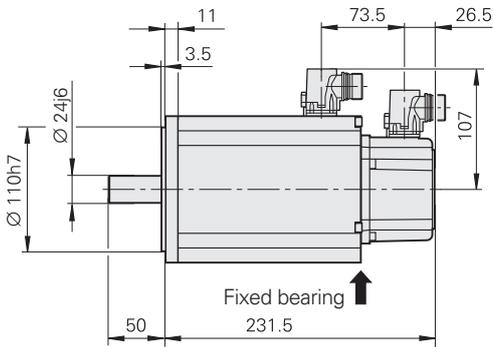
**QSY 130C EcoDyn (with EQN 1337) Without brake**



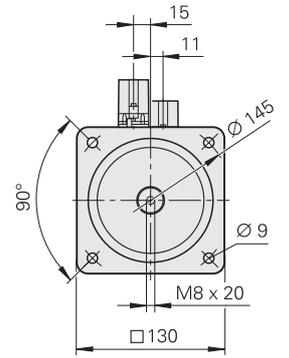
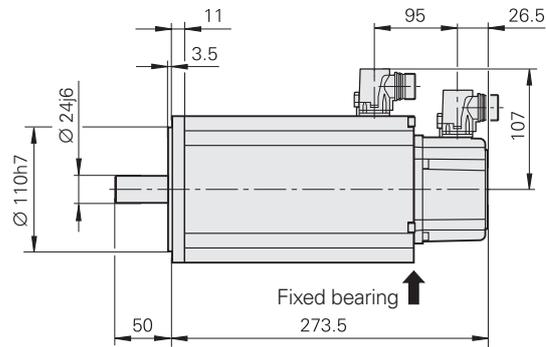
**With brake**



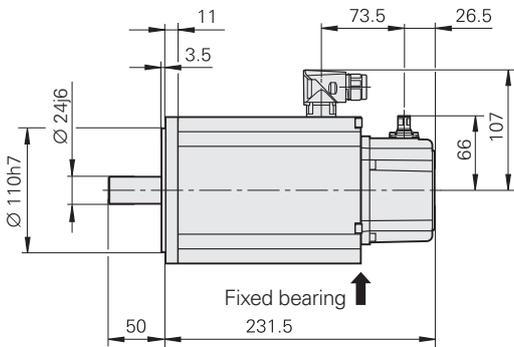
**QSY 130E Without brake**



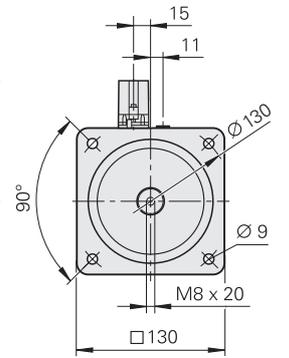
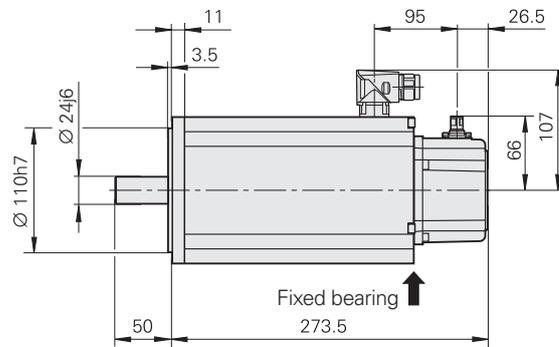
**With brake**



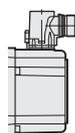
**QSY 130E (with EQN 1337) Without brake**



**With brake**



M12 connector for motor-side speed encoder



M23 connector for motor-side speed encoder

mm  
  
 Tolerancing ISO 8015  
 ISO 2768:1989-mH  
 ≤ 6 mm: ±0.2 mm

# Synchronous motors

## QSY 155 series

Feed motors with four pole pairs

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

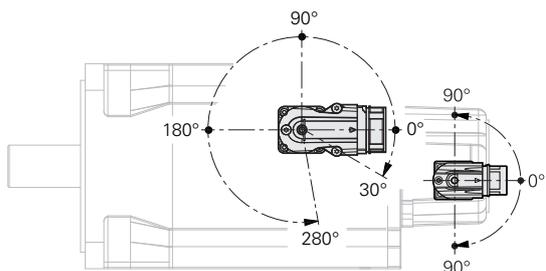


Motor	QSY 155 B		QSY 155 C		QSY 155 D		QSY 155 F	
<b>Rated voltage <math>U_N</math></b>	298 V/295 V		294 V/291 V		293 V/291 V		289 V/287 V	
<b>Rated power output <math>P_N</math></b>	2.9 kW/2.6 kW		3.9 kW/3.5 kW		4.6 kW/4.1 kW		5.2 kW/4.7 kW	
<b>Rated speed <math>n_N</math></b>	3000 rpm							
<b>Rated torque <math>M_N^{1)}</math></b>	9.2 Nm/8.3 Nm		12.5 Nm/11.3 Nm		14.8 Nm/13.3 Nm		16.7 Nm/15.0 Nm	
<b>Rated current <math>I_N^{1)}</math></b>	6.9 A/6.2 A		8.7 A/7.8 A		10.6 A/9.5 A		12.0 A/10.8 A	
<b>Stall torque <math>M_0^{1)}</math></b>	13.0 Nm		17.7 Nm		21.6 Nm		26.1 Nm	
<b>Stall current <math>I_0^{1)}</math></b>	9.1 A		11.8 A		14.6 A		18.0 A	
<b>Maximum speed <math>n_{max}</math></b>	5000 rpm							
<b>Max. torque <math>M_{max}^{2)}</math></b>	39 Nm		52 Nm		64 Nm		90 Nm	
<b>Max. current <math>I_{max}^{2)}</math></b>	29.7 A		38.9 A		49.5 A		68.6 A	
<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						
Rated current $I_{Br}$	–	1.17 A						
Holding torque $M_{Br}$	–	40 Nm						
<b>Mass m</b>	15.0 kg	18.0 kg	17.5 kg	20.5 kg	20.0 kg	23.0 kg	25.0 kg	28.0 kg
<b>Rotor inertia J</b>	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>ID</b>								
Motor with ERN 1387	1378139-03	1378139-04	1378140-03	1378140-04	1378141-03	1378141-04	1378142-03	1378142-04
Motor with EQN 1325	1378139-53	1378139-54	1378140-53	1378140-54	1378141-53	1378141-54	1378142-53	1378142-54
Motor with EQN 1337	1378139-43	1378139-44	1378140-43	1378140-44	1378141-43	1378141-44	1378142-43	1378142-44

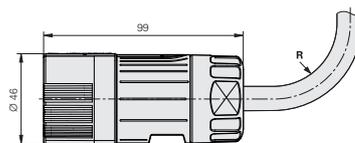
<sup>1)</sup> At 100 K      <sup>2)</sup> Max. 200 ms

*Italics: data for motors with EQN 1325 or EQN 1337 (rated torque reduced by 10%)*

### Rotatable connections

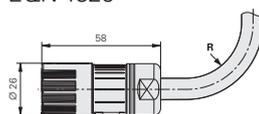


### Power connector

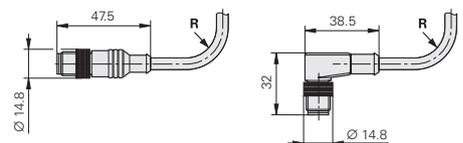


### Encoder connector

For motors with ERN 1387, EQN 1325



For motor with EQN 1337



For **R** see page 32



# Synchronous motors

## QSY 155 EcoDyn series

Feed motors with four pole pairs

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



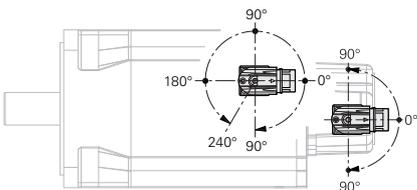
Motor	QSY 155B EcoDyn		QSY 155C EcoDyn		QSY 155D EcoDyn		QSY 155F EcoDyn	
<b>Rated voltage <math>U_N</math></b>	417 V/412 V		420 V/415 V		412 V/407 V		399 V/397 V	
<b>Rated power output <math>P_N</math></b>	3.5 kW/3.1 kW		5.0 kW/4.5 kW		5.7 kW/5.1 kW		6.0 kW/5.4 kW	
<b>Rated speed <math>n_N</math></b>	3000 rpm (in EcoDyn mode)							
<b>Rated torque <math>M_N^{1)}</math></b>	11.0 Nm/9.9 Nm		16.0 Nm/14.4 Nm		18.1 Nm/16.3 Nm		19.2 Nm/17.3 Nm	
<b>Rated current <math>I_N^{1)}</math></b>	5.6 A/5.0 A		8.2 A/7.4 A		9.1 A/8.2 A		9.8 A/8.8 A	
<b>Stall torque <math>M_0^{1)}</math></b>	13.0 Nm		17.7 Nm		21.6 Nm		26.1 Nm	
<b>Stall current <math>I_0^{1)}</math></b>	6.5 A		8.5 A		10.6 A		12.8 A	
<b>Maximum speed <math>n_{max}</math></b>	4200 rpm (in EcoDyn mode)							
<b>Max. torque <math>M_{max}^{2)}</math></b>	39 Nm		52 Nm		64 Nm		90 Nm	
<b>Max. current <math>I_{max}^{2)}</math></b>	21.2 A		27.6 A		35.0 A		49.5 A	
<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 $I_{Br}$	–	1.17 A	–	1.17 A	–	1.17 A	–	1.17 A
Holding torque $M_{Br}$	–	40 Nm	–	40 Nm	–	40 Nm	–	40 Nm
<b>Mass m</b>	15.0 kg	18.0 kg	17.5 kg	20.5 kg	20.0 kg	23.0 kg	25.0 kg	28.0 kg
<b>Rotor inertia J</b>	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>ID</b>								
Motor with ERN 1387	1378139-13	1378139-14	1378140-13	1378140-14	1378141-13	1378141-14	1378142-13	1378142-14
Motor with EQN 1325	1378139-63	1378139-64	1378140-63	1378140-64	1378141-63	1378141-64	1378142-63	1378142-64
Motor with EQN 1337	1378139-33	1378139-34	1378140-33	1378140-34	1378141-33	1378141-34	1378142-33	1378142-34

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

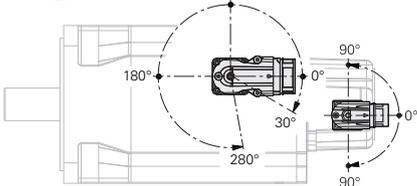
*Italics: data for motors with EQN 1325 or EQN 1337 (rated torque reduced by 10%)*

### Rotatable connections

For QSY 155 B/C/D

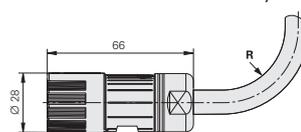


For QSY 155 F

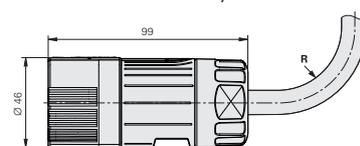


### Power connector

For QSY 155 B/C/D EcoDyn

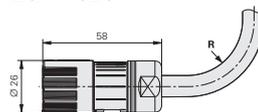


For QSY 155 F EcoDyn

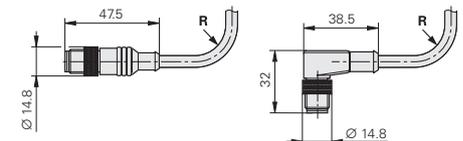


### Encoder connector

For motors with ERN 1387, EQN 1325

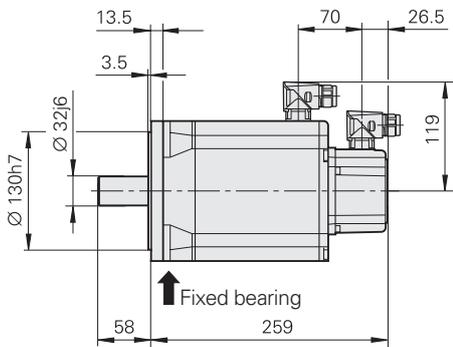


For motor with EQN 1337

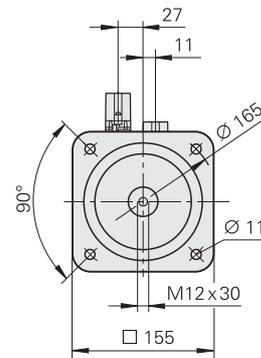
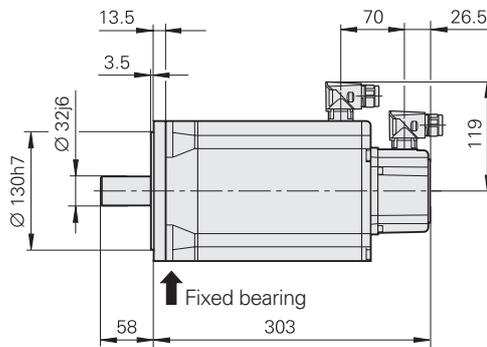


For **R** see page 32

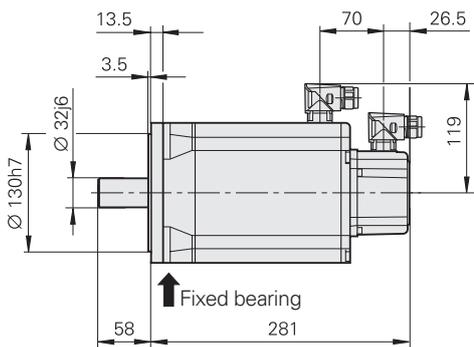
**QSY 155B EcoDyn** Without brake



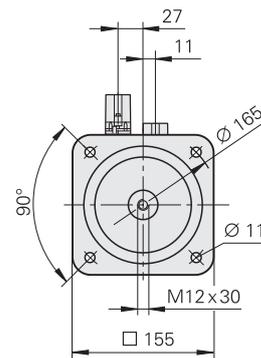
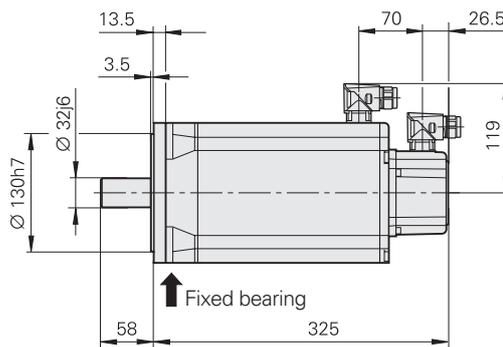
With brake



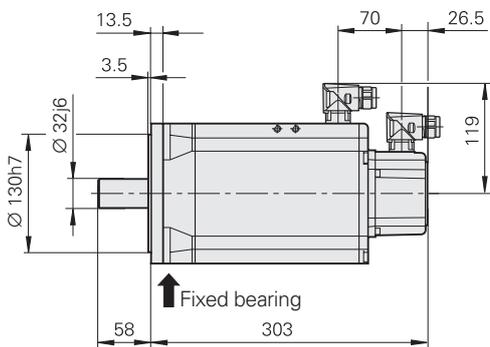
**QSY 155C EcoDyn** Without brake



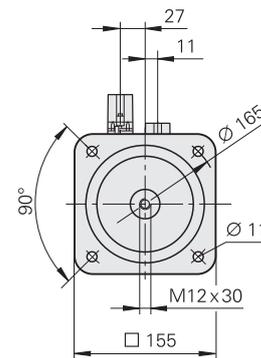
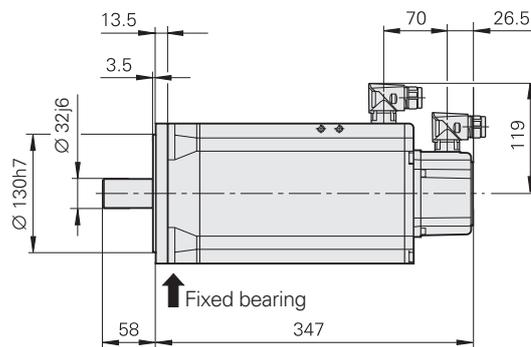
With brake



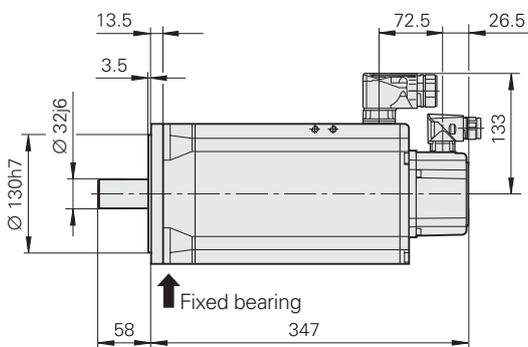
**QSY 155D EcoDyn** Without brake



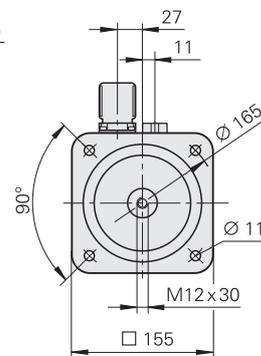
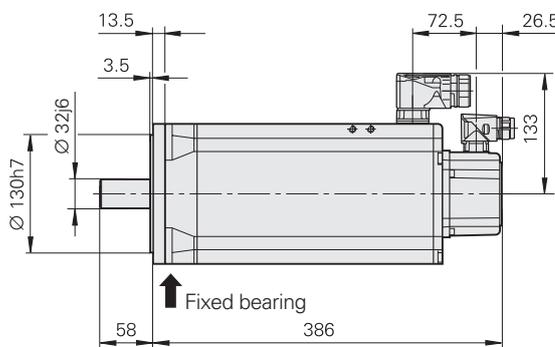
With brake



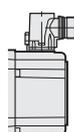
**QSY 155F EcoDyn** Without brake



With brake



M12 connector for motor-side speed encoder



M23 connector for motor-side speed encoder

mm  
  
 Tolerancing ISO 8015  
 ISO 2768:1989-mH  
 ≤ 6 mm: ±0.2 mm

# Synchronous motors

## QSY 190 EcoDyn series

Feed motors with four pole pairs

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

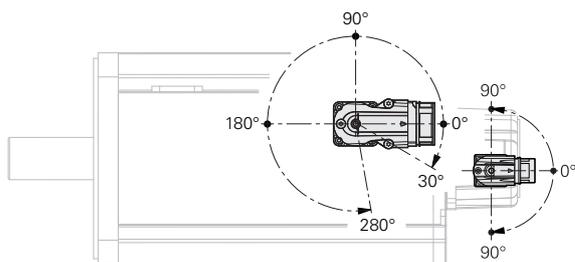


Motor	QSY 190C EcoDyn		QSY 190D EcoDyn		QSY 190F EcoDyn		QSY 190K EcoDyn	
<b>Rated voltage <math>U_N</math></b>	427 V/420 V		421 V/412 V		408 V/404 V		399 V/396 V	
<b>Rated power output <math>P_N</math></b>	7.2 kW/6.5 kW		9.6 kW/8.6 kW		9.9 kW/8.9 kW		12.2 kW/11.0 kW	
<b>Rated speed <math>n_N</math></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>Maximum 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>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>Mass m</b>	29.0 kg	37.0 kg	33.5 kg	41.5 kg	42.5 kg	50.5 kg	61.0 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>ID</b>								
Motor with ERN 1387	1378156-13	1378156-14	1378157-13	1378157-14	1378158-13	1378158-14	1378159-13	1378159-14
Motor with EQN 1325	1378156-63	1378156-64	1378157-63	1378157-64	1378158-63	1378158-64	1378159-63	1378159-64
Motor with EQN 1337	1378156-33	1378156-34	1378157-33	1378157-34	1378158-33	1378158-34	1378159-33	1378159-34

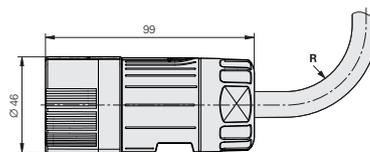
<sup>1)</sup> At 100 K      <sup>2)</sup> Max. 200 ms

*Italics: data for motors with EQN 1325 or EQN 1337 (rated torque reduced by 10%)*

### Rotatable connections

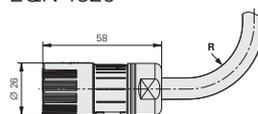


### Power connector



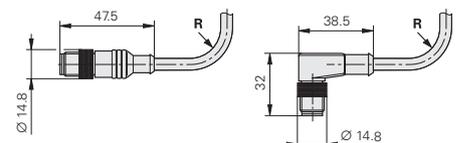
### Encoder connector

For motors with ERN 1387, EQN 1325



For **R** see page 32

For motor with EQN 1337





# Synchronous motors

## QSY 260 EcoDyn series

Feed motors with four pole pairs

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

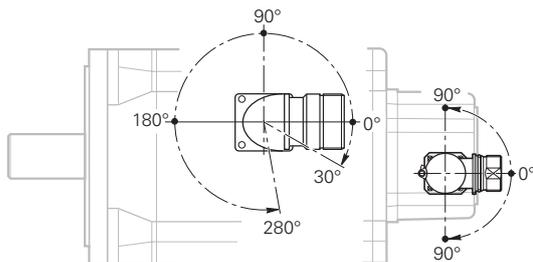


Motor	QSY 260B EcoDyn		QSY 260C EcoDyn	
<b>Rated voltage <math>U_N</math></b>	352 V/350 V		376 V/373 V	
<b>Rated power output <math>P_N</math></b>	12.0 kW/10.8 kW		16.0 kW/14.4 kW	
<b>Rated speed <math>n_N</math></b>	2000 rpm (in EcoDyn mode)			
<b>Rated torque <math>M_N^{1)}</math></b>	57.3 Nm/51.6 Nm		76.4 Nm/68.8 Nm	
<b>Rated current <math>I_N^{1)}</math></b>	21.5 A/19.4 A		28 A/25.2 A	
<b>Stall torque <math>M_0^{1)}</math></b>	85 Nm		120 Nm	
<b>Stall current <math>I_0^{1)}</math></b>	31.0 A		43.5 A	
<b>Maximum speed <math>n_{max}</math></b>	3000 rpm (in EcoDyn mode)			
<b>Max. torque <math>M_{max}^{2)}</math></b>	250 Nm		360 Nm	
<b>Max. current <math>I_{max}^{2)}</math></b>	130 A		173 A	
<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>Mass m</b>	62 kg	75 kg	74 kg	87 kg
<b>Rotor inertia J</b>	357 kg·cm <sup>2</sup>	368 kg·cm <sup>2</sup>	538 kg·cm <sup>2</sup>	557 kg·cm <sup>2</sup>
<b>ID</b>				
Motor with ERN 1387	1110623-1C	1110623-1D	1100242-1C	1100242-1D
Motor with EQN 1325	1110623-6C	1110623-6D	1100242-6C	1100242-6D
Motor with EQN 1337	1110623-3C	1110623-3D	1100242-3C	1100242-3D

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

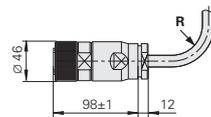
*Italics: data for motors with EQN 1325 (rated torque reduced by 10%)*

### Rotatable connections



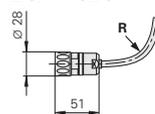
### Power connector

For motors with ERN 1387, EQN 1325



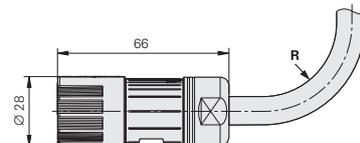
### Encoder connector

For motors with ERN 1387, EQN 1325

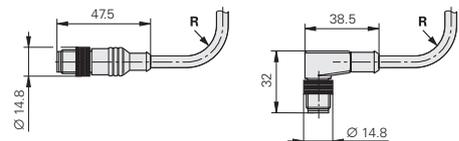


For **R** see page 32

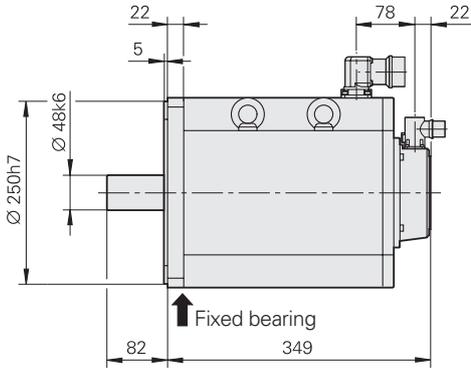
For motor with EQN 1337



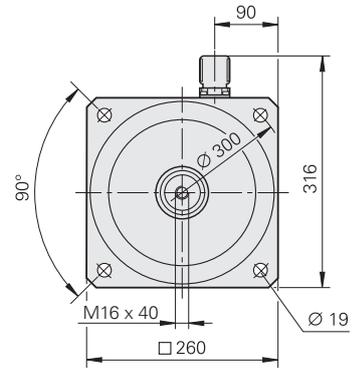
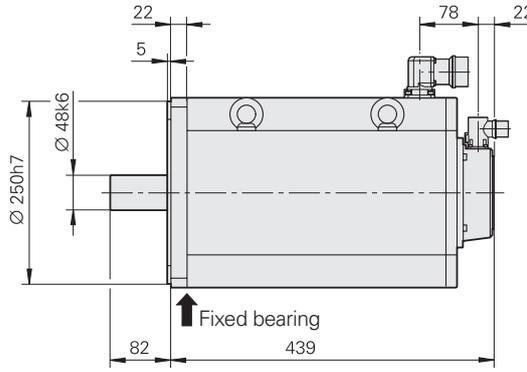
For motor with EQN 1337



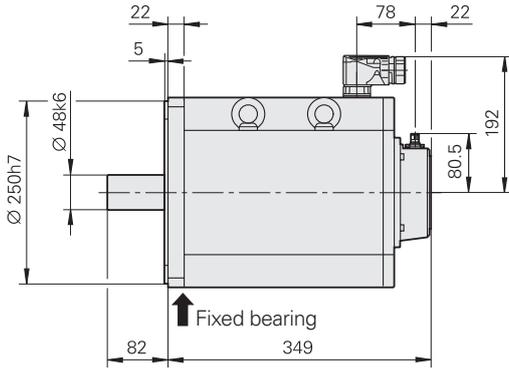
**QSY 260B Without brake**



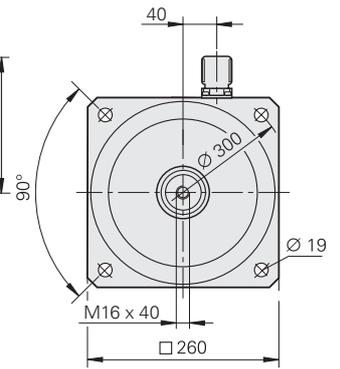
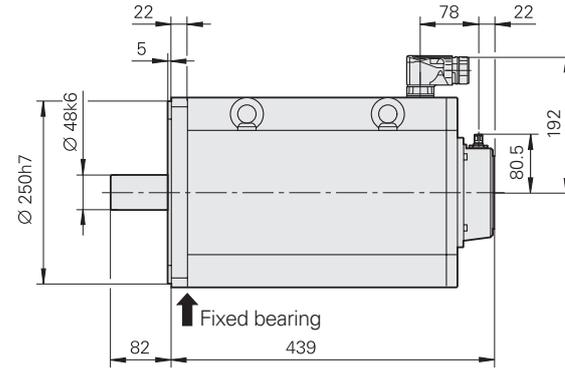
**With brake**



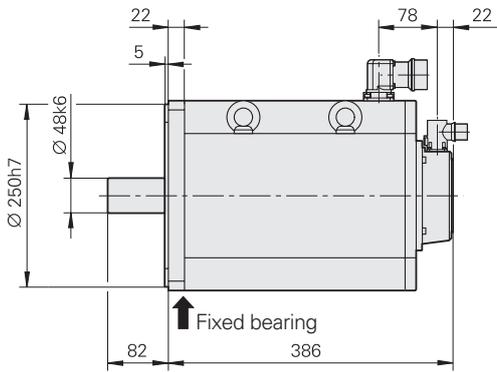
**QSY 260B EcoDyn (with EQN 1337) Without brake**



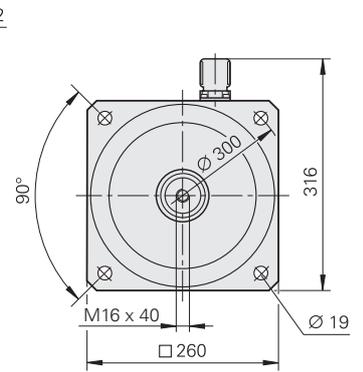
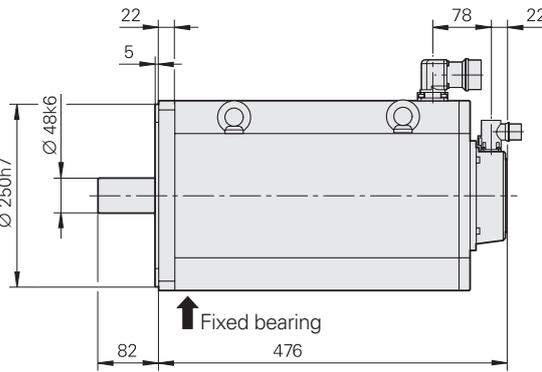
**With brake**



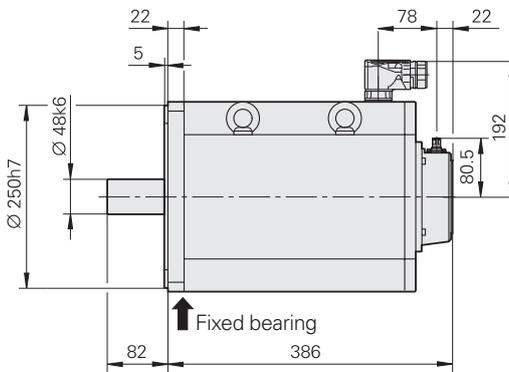
**QSY 260C Without brake**



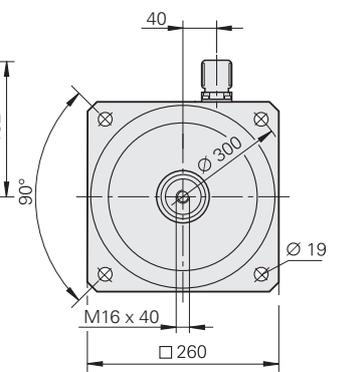
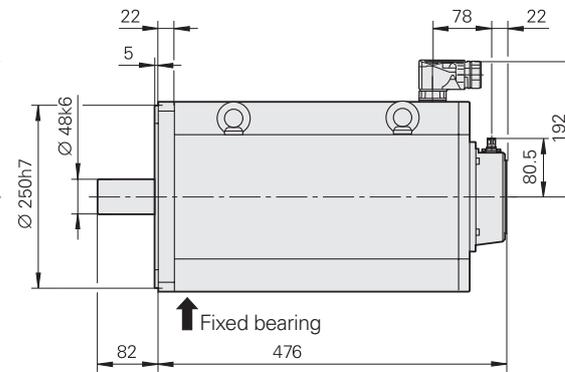
**With brake**



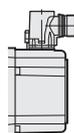
**QSY 260C EcoDyn (with EQN 1337) Without brake**



**With brake**



M12 connector for motor-side speed encoder



M23 connector for motor-side speed encoder

mm  
 Tolerancing ISO 8015  
 ISO 2768:1989-mH  
 ≤ 6 mm: ±0.2 mm

# Synchronous motors

## MSY overview

### General technical information

HEIDENHAIN MSY servomotors are compact synchronous motors with high dynamic performance for use in machine tools. Thanks to their robust control properties, their excellent speed stability and the moment of inertia perfectly adapted to the application, they are particularly well suited for medium to high-performance feed drives and auxiliary axes. The MSY servomotors have the following characteristics:

- Short and compact design
- Good speed stability
- Plug-and-play functionality
- High-precision fit brake

### Specifications

The permissible operating range of the MSY motor is limited by thermal, mechanical and electromagnetic factors. The values for the motor characteristics and motor specifications apply to an ambient temperature of up to 40 °C.

### Speed measurement

Synchronous motors from HEIDENHAIN operate with sinusoidal commutation. An integrated rotary encoder from HEIDENHAIN measures the rotor position and monitors the speed:

- ECI 1323 inductive absolute rotary encoder (singleturn) with functional safety and the EnDat 2.2 interface
- EQI 1335 inductive absolute rotary encoder (multiturn) with functional safety and the EnDat 2.2 interface

### Electronic ID label

MSY motors are equipped with the EnDat interface and have electronic ID labels. These enable the control to automatically identify the motor. The information stored in this ID label, such as the motor designation, ID number or serial number, can be read and displayed by the internal TNCdiag diagnostic function of the HSCI controls.

### Mechanical service life

HEIDENHAIN motors contain components that are subject to wear, depending on the application and handling. This especially applies to the following parts:

- Bearings
- Brakes
- Radial shaft seal rings

Depending on the usage conditions of the motors, suitable maintenance intervals should be scheduled.

The expected nominal bearing life is 25 000 hours.



MSY 155 B



MSY 155 E

### Functional safety

The rotary encoders used in the motors feature functional safety and are, in principle, therefore suitable for use in safety-related applications. All motors of the MSY series have a fault exclusion feature that prevents 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).

### Installation elevation

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

### Thermal parameters

The motors are self-cooled, and temperature monitoring of the MSY is performed via a thermal motor model in the HEIDENHAIN control calculated during operation. MSY motors meet the requirements of thermal class F as per DIN EN 60034-1.

### Mechanical parameters

Maintenance-free bearings  
Holding brake optionally with low backlash  $\leq 1^\circ$

The MSY series motors have a mounting flange in accordance with IEC 60072-1. The HEIDENHAIN MSY synchronous motors exist in the configurations IM B5, IM V1 and IM V3 in accordance with DIN EN 60034-7.

#### Mounting the motor

The following screws are recommended for mounting the motor:

MSY 155	M10
MSY 192	M12

#### Protection as per DIN EN 60529

The MSY motors feature an IP rating of IP64 at their shaft outlet, and an IP65 rating for the entire rest of the motor.

#### Vibration severity

MSY motors conform to vibration severity grade A in accordance with EN 60034-14:2008. This is adhered to up to the nominal speed.

*Radial runout, concentricity and axial runout*  
With respect to the flange and shaft precision, MSY motors comply with CEI IEC 72-1:1991-02.

#### Shaft end

The motors have cylindrical shaft ends with front-face center holes according to DIN 332-2. Optionally, the shaft end is available with a keyway. Shaft with keyway and machine key as per DIN 6885-1 (upon request)

- MSY 155 A 10x8x45
- MSY 192 A 10x8x50

The motors with machine key are half-key balanced as per ISO 21940-32.



MSY 192F

# Synchronous motors

## MSY 155 series

Feed motors with four pole pairs

- Stall torque: 12.8 Nm to 28.9 Nm
- With HEIDENHAIN inductive absolute rotary encoders (singleturn or multiturn) and the purely serial EnDat 2.2 interface

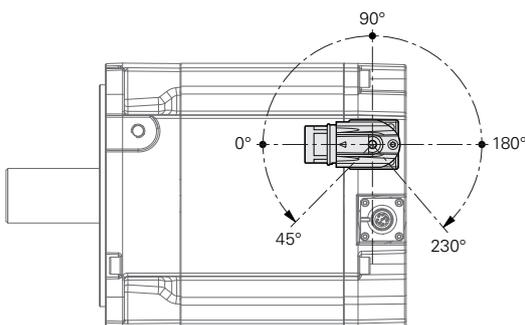


Motor	MSY 155 B		MSY 155 C		MSY 155 D		MSY 155 E	
Rated voltage $U_N$	299 V		296 V		298 V		305 V	
Rated power output $P_N$	3.0 kW		3.8 kW		4.5 kW		4.7 kW	
Rated speed $n_N$	2500 rpm							
Rated torque $M_N^{1)}$	11.4 Nm		14.6 Nm		17.1 Nm		18.0 Nm	
Rated current $I_N^{1)}$	7.2 A		8.8 A		9.9 A		10.0 A	
Stall torque $M_0^{1)}$	12.8 Nm		18.2 Nm		24.1 Nm		28.9 Nm	
Stall current $I_0^{1)}$	7.8 A		10.5 A		13.5 A		15.5 A	
Maximum speed $n_{max}$	5000 rpm							
Max. torque $M_{max}^{2)}$	38 Nm		53 Nm		67 Nm		84 Nm	
Max. current $I_{max}^{2)}$	24.4 A		30.9 A		36.9 A		44.5 A	
<b>Brake</b> Rated voltage $U_{Br}$ Rated current $I_{Br}$ Holding torque $M_{Br}$	<b>Without</b> – – –	<b>With</b> DC 24 V 1.17 A 30 Nm						
Mass $m$	12 kg	15 kg	15 kg	18 kg	18 kg	20 kg	20 kg	23 kg
Rotor inertia $J$	21 kg·cm <sup>2</sup>	23 kg·cm <sup>2</sup>	30 kg·cm <sup>2</sup>	32 kg·cm <sup>2</sup>	39 kg·cm <sup>2</sup>	42 kg·cm <sup>2</sup>	48 kg·cm <sup>2</sup>	51 kg·cm <sup>2</sup>
<b>ID</b> Motor with ECI 1323 (singleturn) Motor with EQI 1335 (multiturn)	1361801-01 1361801-11	1361802-01 1361802-11	1361803-01 1361803-11	1361804-01 1361804-11	1361805-01 1361805-11	1361806-01 1361806-11	1361807-01 1361807-11	1361808-01 1361808-11

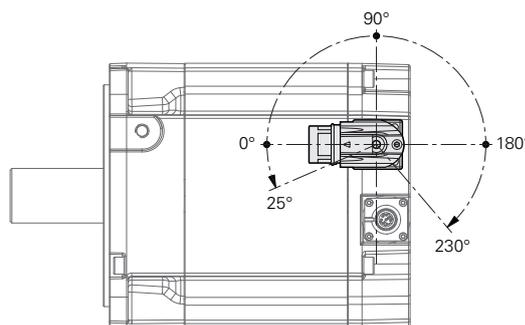
<sup>1)</sup> At 100 K

<sup>2)</sup> Max. 200 ms

### Rotatable connections

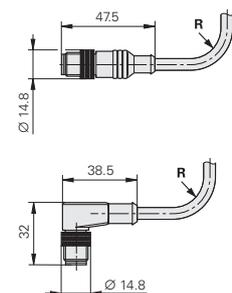


Straight encoder cable

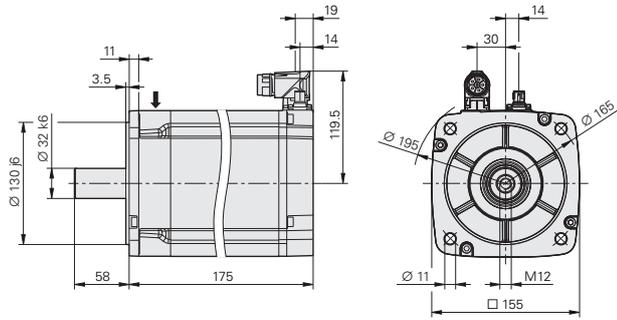


Angled encoder cable (optional)

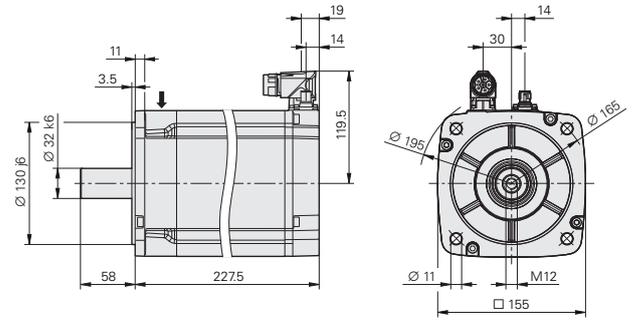
### Encoder connector



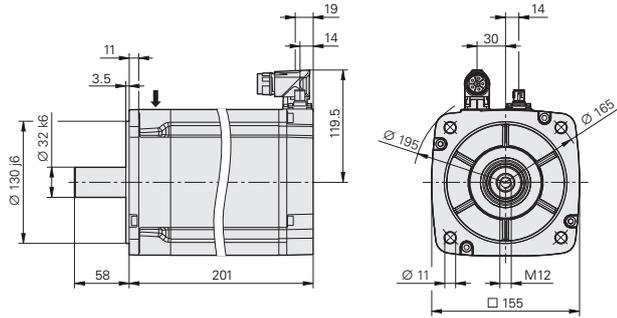
**MSY 155B** Without brake



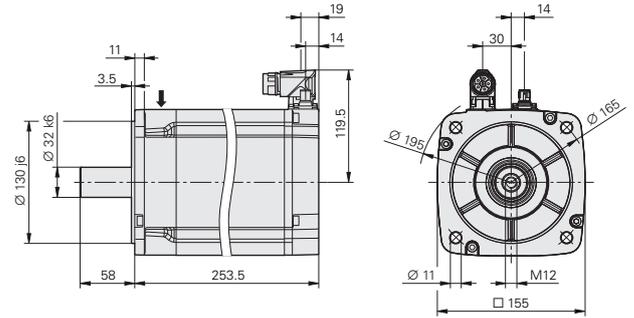
With brake



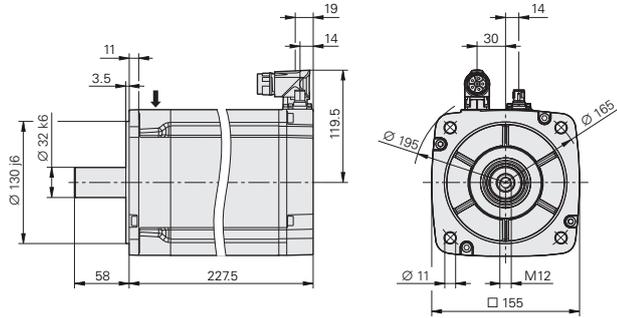
**MSY 155C** Without brake



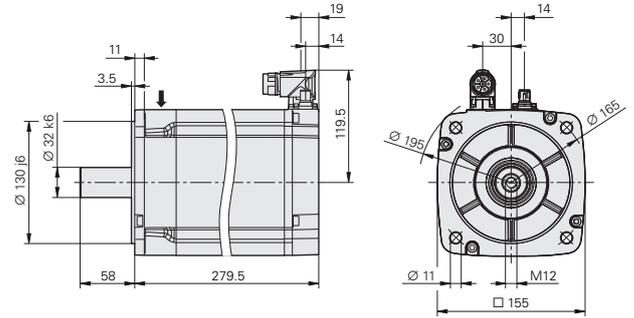
With brake



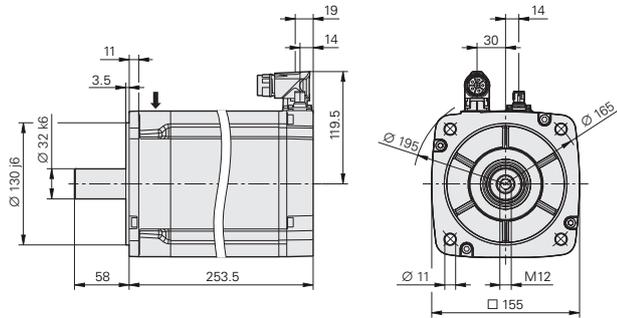
**MSY 155D** Without brake



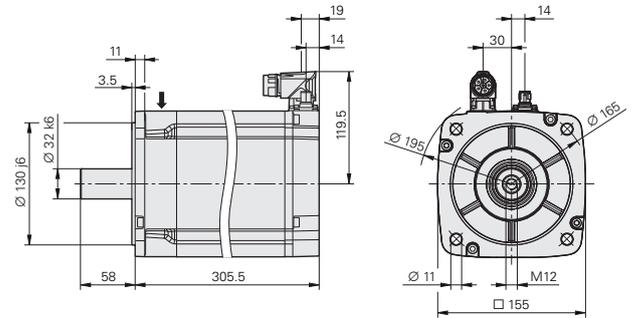
With brake



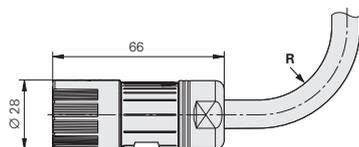
**MSY 155E** Without brake



With brake



**Power connector**



mm  
  
 Tolerancing ISO 8015  
 ISO 2768:1989-mH  
 ≤ 6 mm: ±0.2 mm

# Synchronous motors

## MSY 192 series

Feed motors with four pole pairs

- Stall torque: 30.3 Nm to 54.5 Nm
- With HEIDENHAIN inductive absolute rotary encoders (singleturn or multiturn) and the purely serial EnDat 2.2 interface



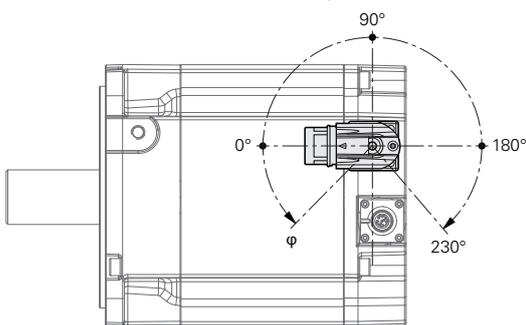
Motor	MSY 192 C		MSY 192 D		MSY 192 E		MSY 192 F	
Rated voltage $U_N$	308 V		280 V		293 V		289 V	
Rated power output $P_N$	5.3 kW		6.5 kW		6.6 kW		7.0 kW	
Rated speed $n_N$	2000 rpm							
Rated torque $M_N^{1)}$	25.4 Nm		30.9 Nm		31.4 Nm		33.2 Nm	
Rated current $I_N^{1)}$	11.5 A		13.6 A		14.4 A		15.3 A	
Stall torque $M_0^{1)}$	30.3 Nm		39.0 Nm		46.0 Nm		54.5 Nm	
Stall current $I_0^{1)}$	13.2 A		18.3 A		20.1 A		24.0 A	
Maximum speed $n_{max}$	5000 rpm							
Max. torque $M_{max}^{2)}$	96 Nm		134 Nm		162 Nm		194 Nm	
Max. current $I_{max}^{2)}$	42.7 A		63.8 A		71.1 A		85.4 A	
<b>Brake</b> Rated voltage $U_{Br}$ Rated current $I_{Br}$ Holding torque $M_{Br}$	<b>Without</b> – – –	<b>With</b> DC 24 V 1.36 A 42 Nm	<b>Without</b> – – –	<b>With</b> DC 24 V 1.36 A 42 Nm	<b>Without</b> – – –	<b>With</b> DC 24 V 1.36 A 70 Nm	<b>Without</b> – – –	<b>With</b> DC 24 V 1.36 A 70 Nm
Mass $m$	24 kg	29 kg	29 kg	34 kg	34 kg	42 kg	39 kg	47 kg
Rotor inertia $J$	82 kg·cm <sup>2</sup>	86 kg·cm <sup>2</sup>	108 kg·cm <sup>2</sup>	112 kg·cm <sup>2</sup>	133 kg·cm <sup>2</sup>	138 kg·cm <sup>2</sup>	159 kg·cm <sup>2</sup>	164 kg·cm <sup>2</sup>
<b>ID</b> Motor with ECI 1323 (singleturn) Motor with EQI 1335 (multiturn)	1366801-01 1366801-11	1366802-01 1366802-11	1366803-01 1366803-11	1366804-01 1366804-11	1366805-01 1366805-11	1366806-01 1366806-11	1366807-01 1366807-11	1366808-01 1366808-11

<sup>1)</sup> At 100 K

<sup>2)</sup> Max. 200 ms

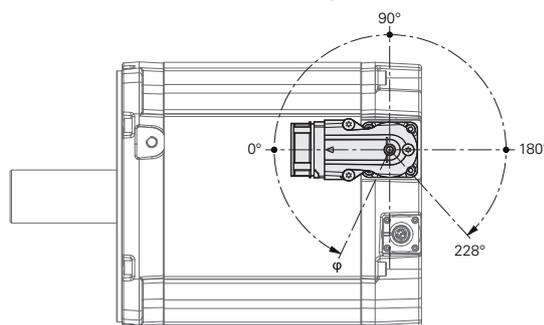
### Rotatable connections

For M23 connector (MSY 192 C, MSY 192 D)



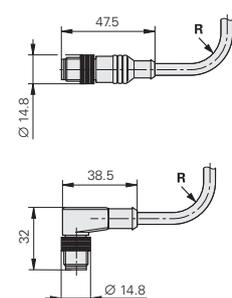
Straight encoder cable ( $\varphi = 45^\circ$ )  
Optional: Angled encoder cable ( $\varphi = 25^\circ$ )

For M40 connector (MSY 192 E, MSY 192 F)

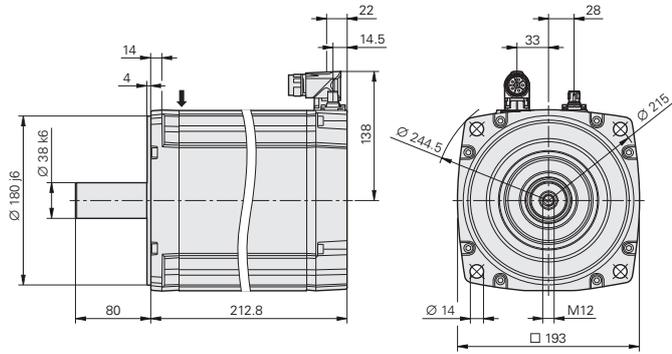


Straight encoder cable ( $\varphi = 65^\circ$ )  
Optional: Angled encoder cable ( $\varphi = 30^\circ$ )

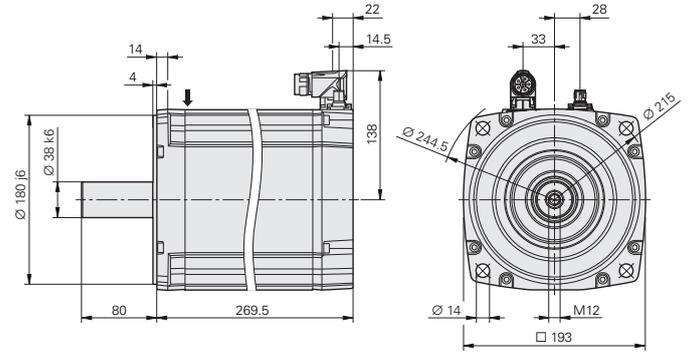
### Encoder connector



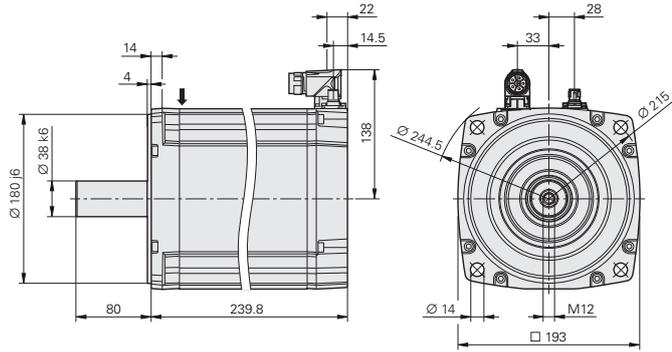
**MSY 192C** Without brake



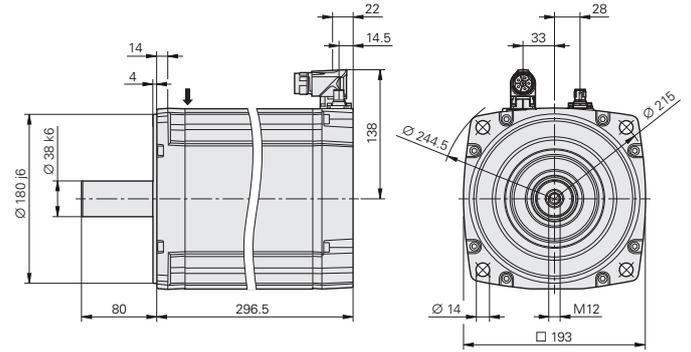
With brake



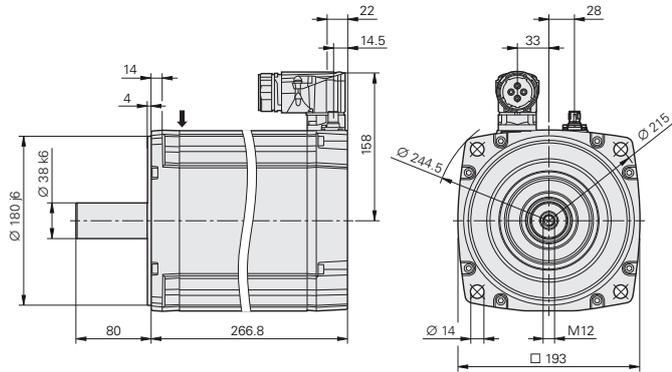
**MSY 192D** Without brake



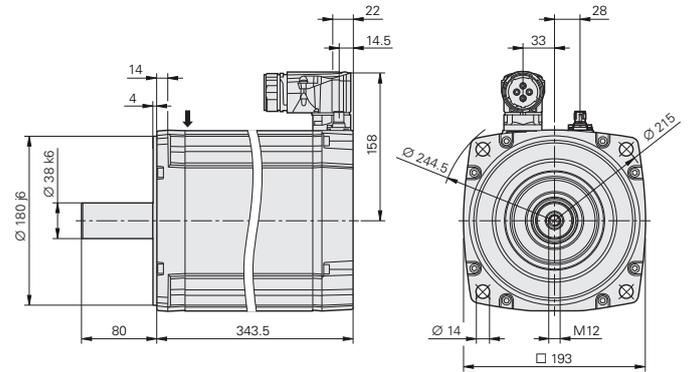
With brake



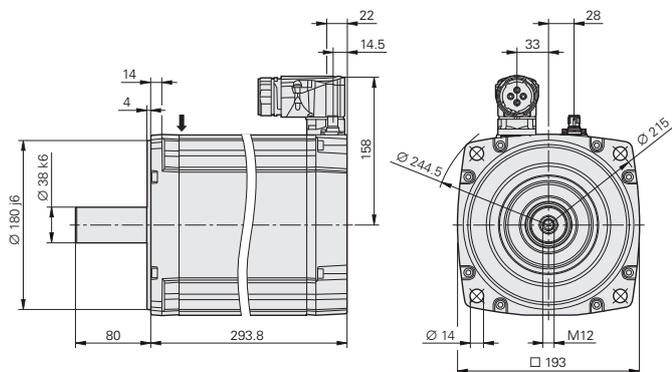
**MSY 192E** Without brake



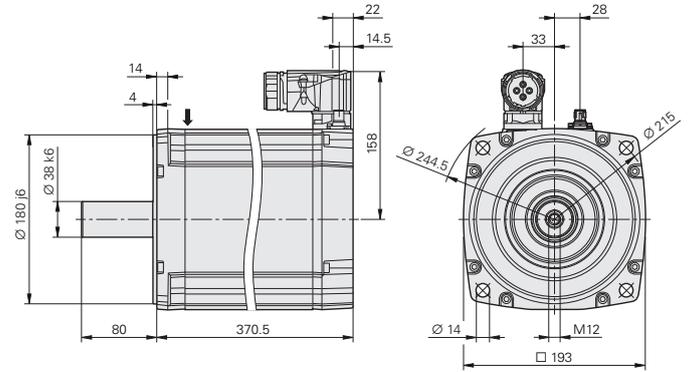
With brake



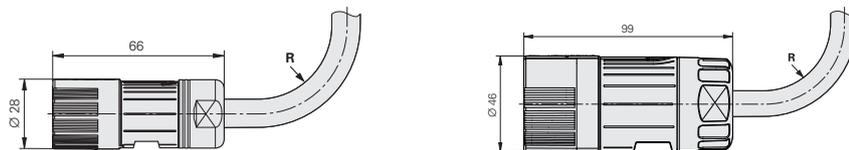
**MSY 192F** Without brake



With brake



**Power connector**



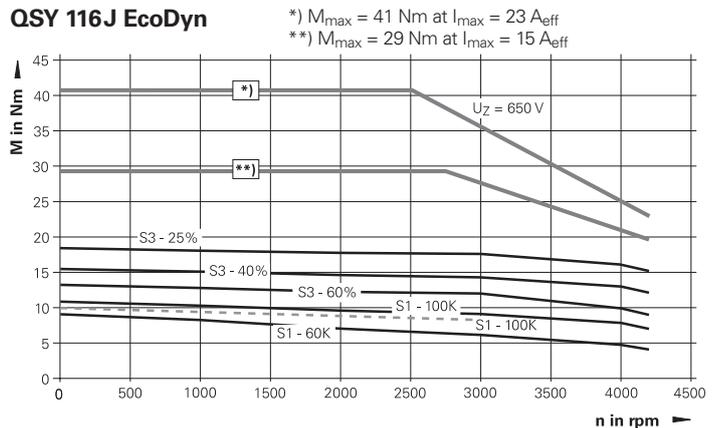
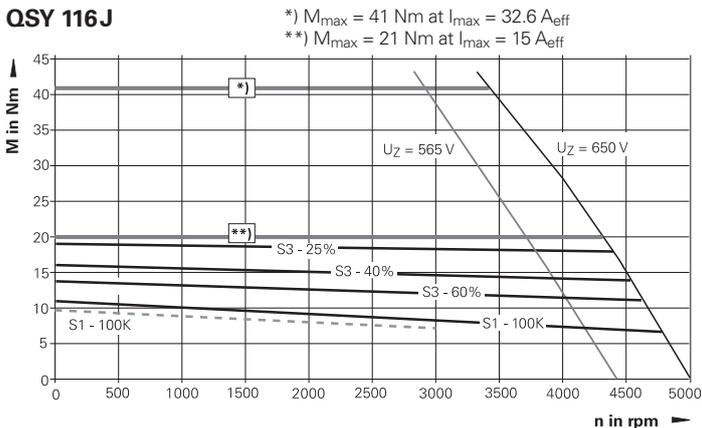
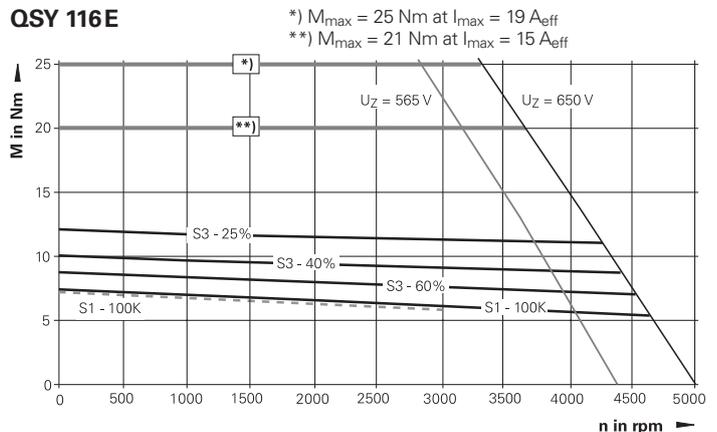
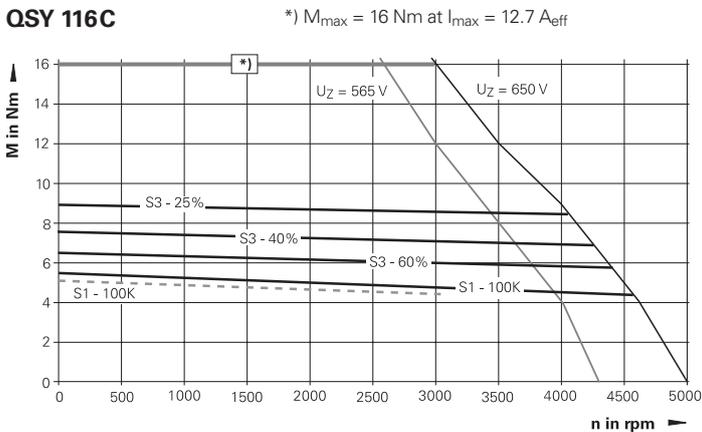
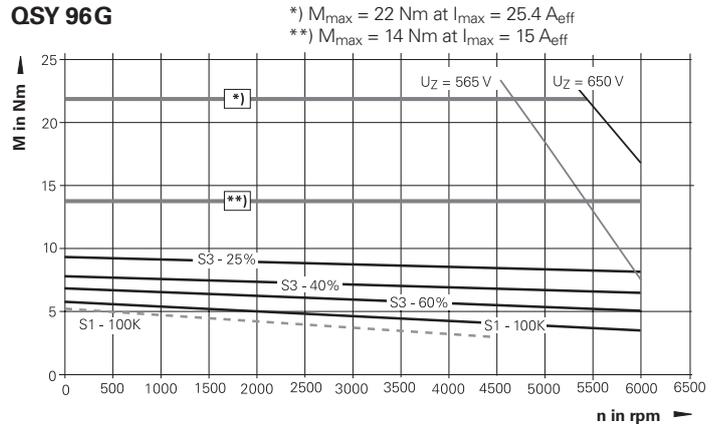
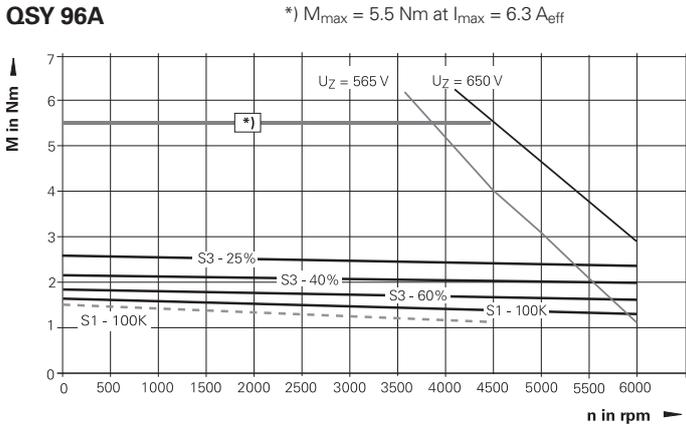
mm  
  
 Tolerancing ISO 8015  
 ISO 2768:1989-mH  
 ≤ 6 mm: ±0.2 mm

# Synchronous motors

## Torque characteristic curves

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

\*) Characteristic curve at maximum motor current (QSY)  
 \*\*) Characteristic curve during the use of compact inverters (QSY)



### Notes (valid for QSY)

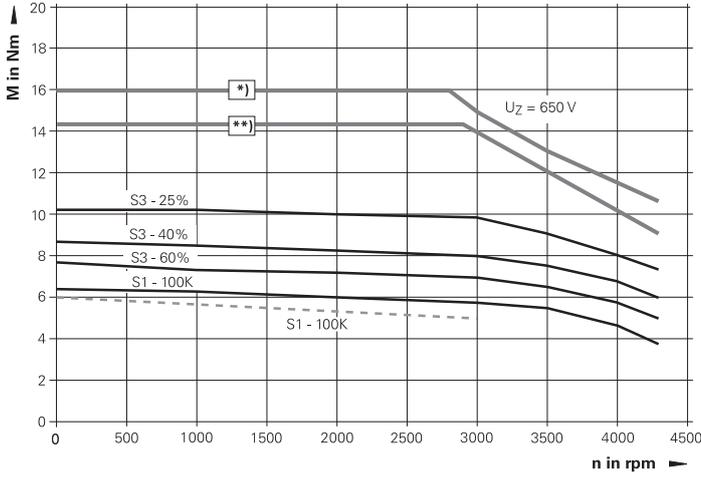
- The characteristic curves apply to motors with the ERN 1387.

### • S3 mode

Cycle duration: 10 minutes  
 During the rest period, the motor must be stopped and disconnected from power.

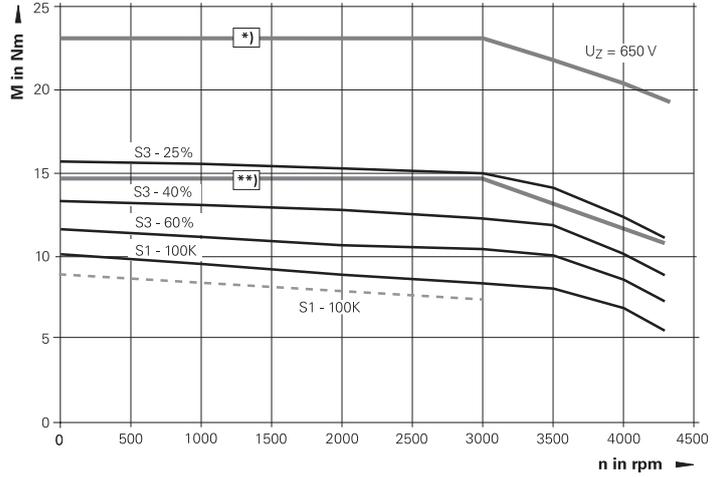
### QSY 130C EcoDyn

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



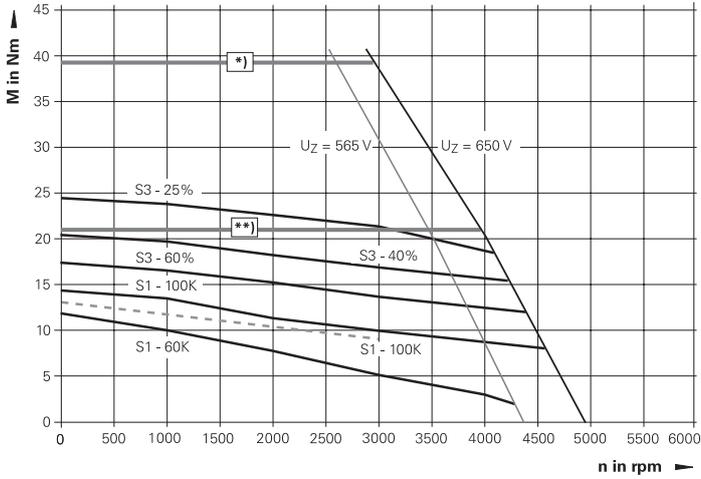
### QSY 130E EcoDyn

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



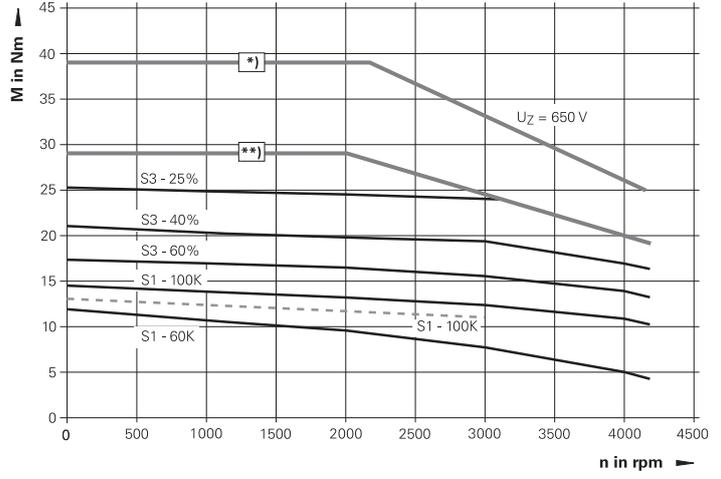
### QSY 155B

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



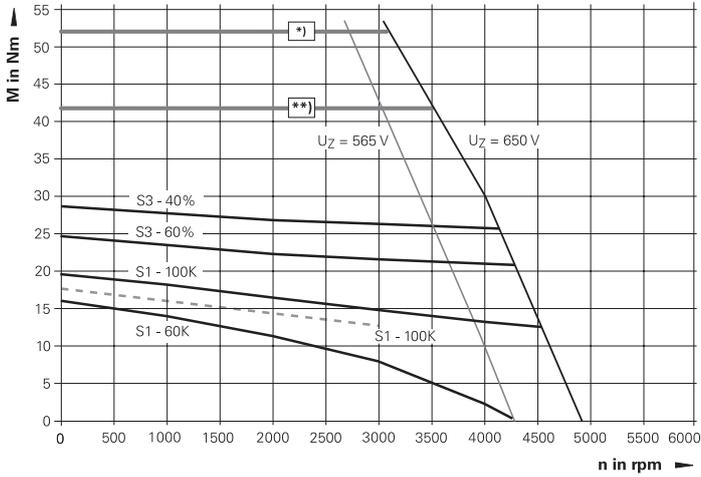
### QSY 155B EcoDyn

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



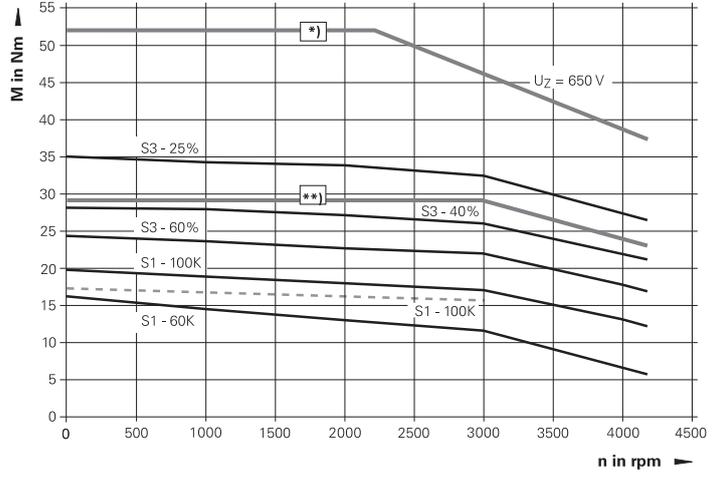
### QSY 155C

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



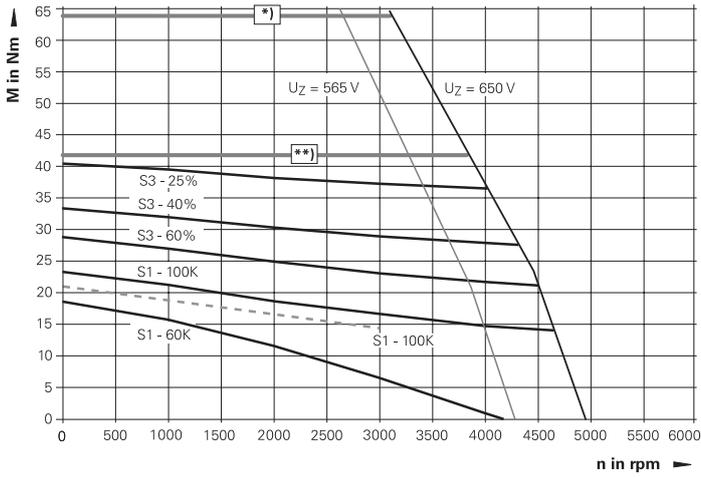
### QSY 155C EcoDyn

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



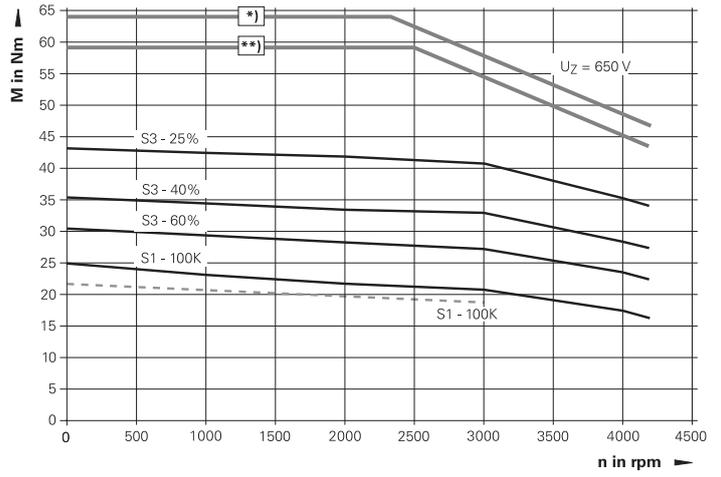
### QSY 155D

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



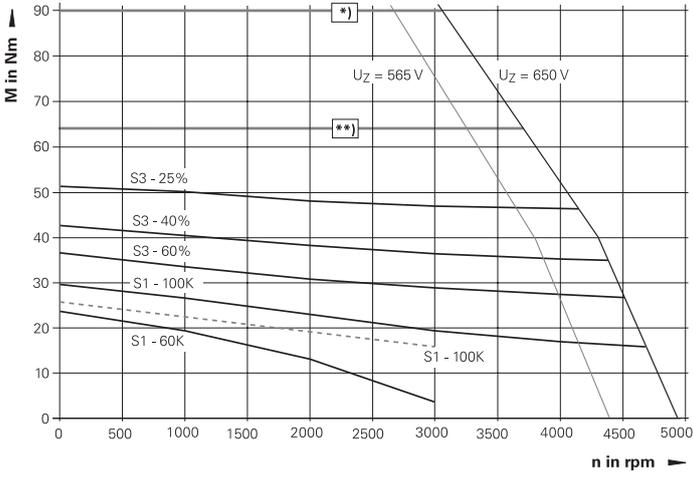
### QSY 155D EcoDyn

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



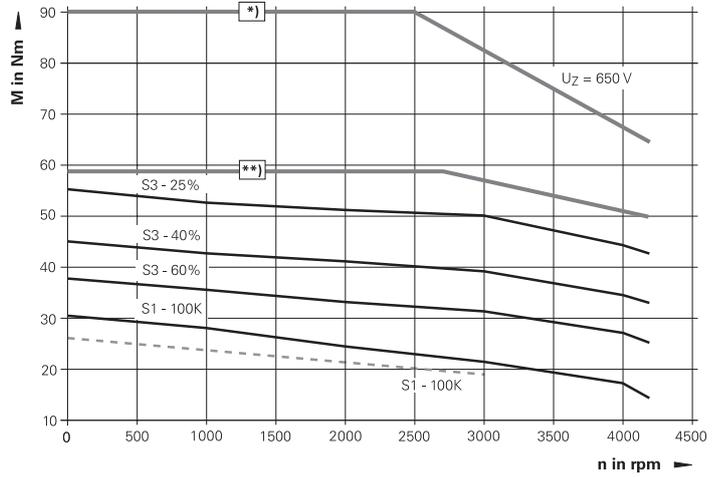
**QSY 155F**

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



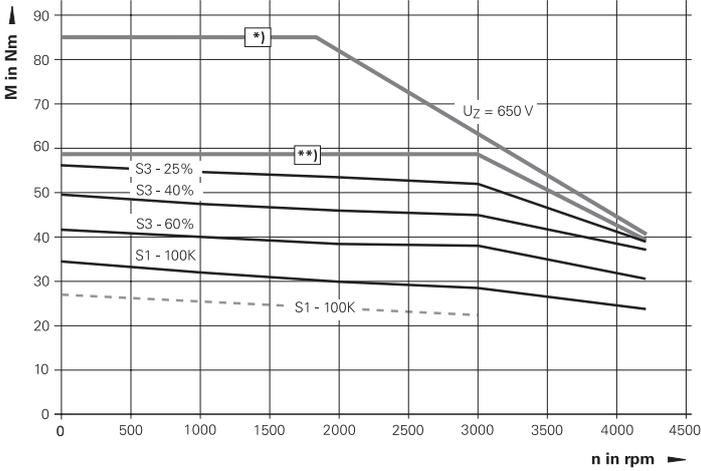
**QSY 155F EcoDyn**

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



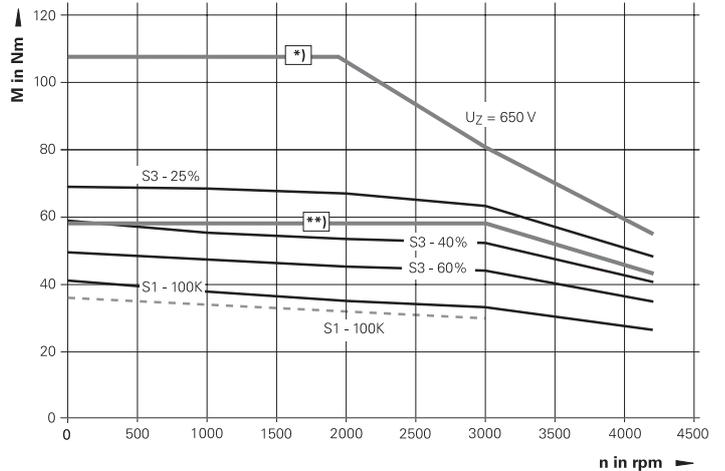
**QSY 190C EcoDyn**

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



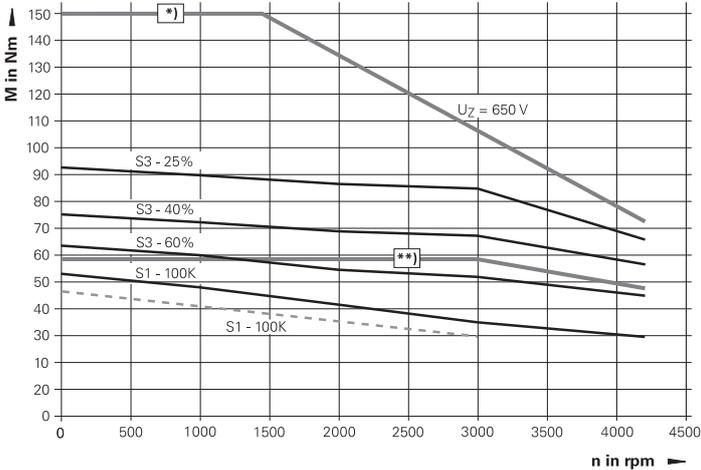
**QSY 190D EcoDyn**

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



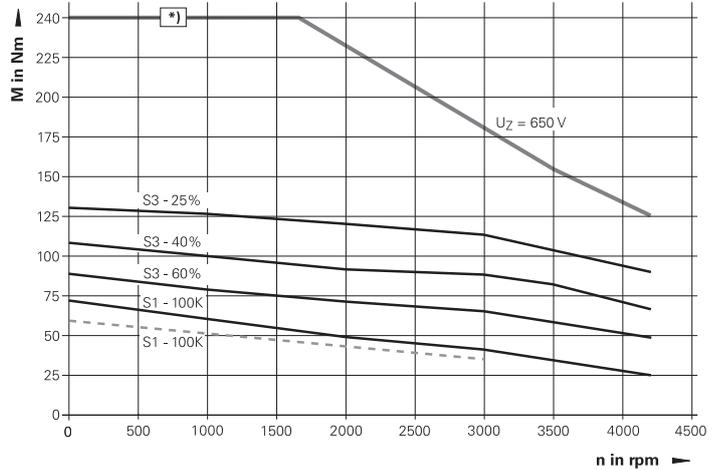
**QSY 190F EcoDyn**

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



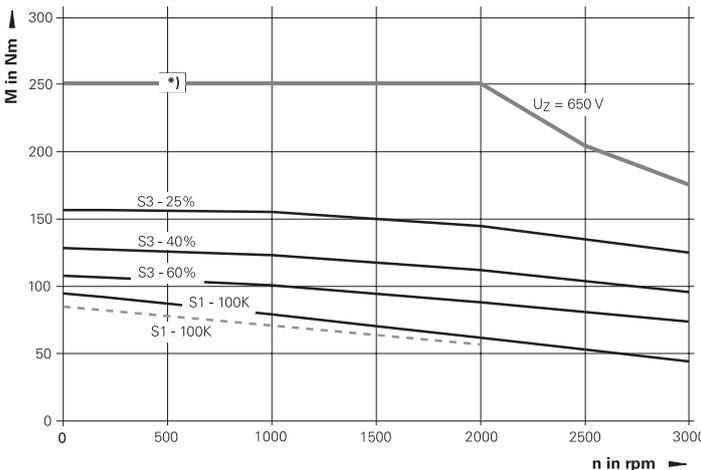
**QSY 190K EcoDyn**

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



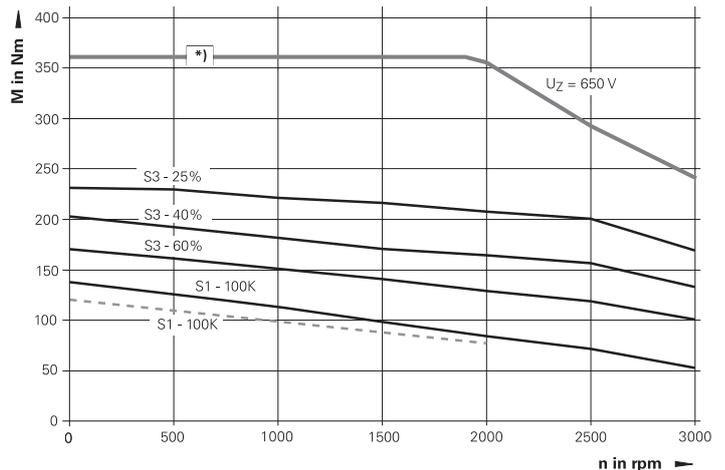
**QSY 260B EcoDyn**

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

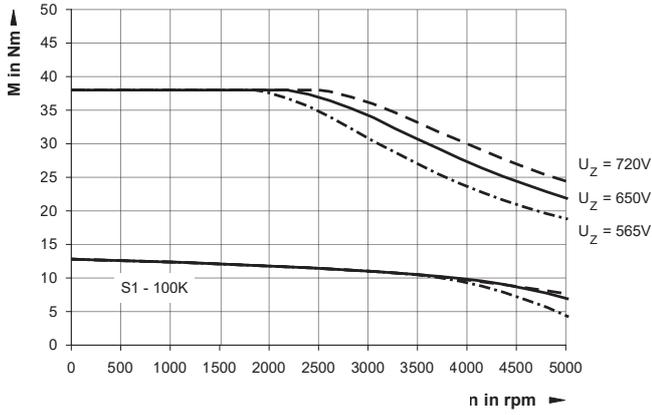


**QSY 260C EcoDyn**

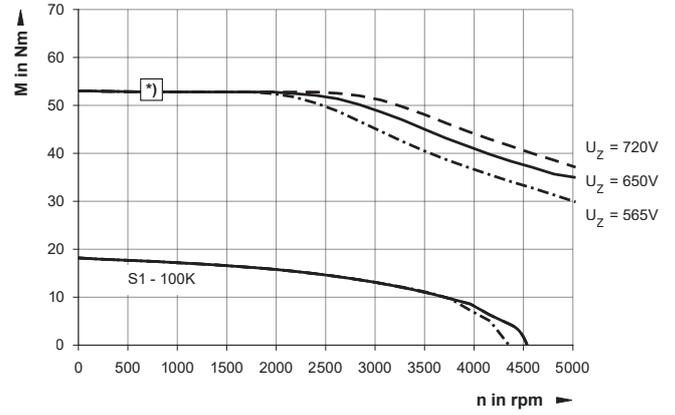
\*)  $M_{max} = 360 \text{ Nm}$  at  $I_{max} = 173 \text{ A}_{eff}$



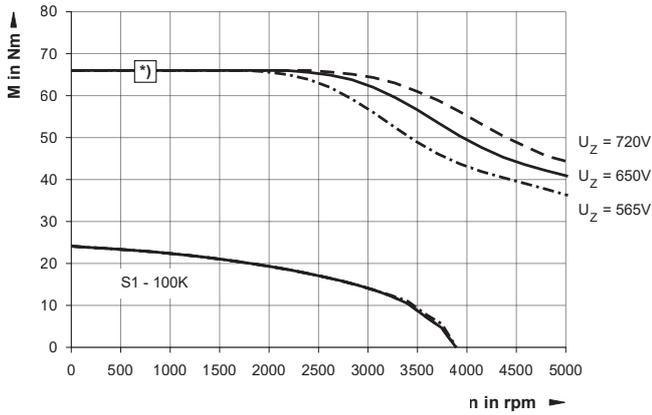
**MSY 155B** \*) Characteristic curve at maximum motor current (for MSY)



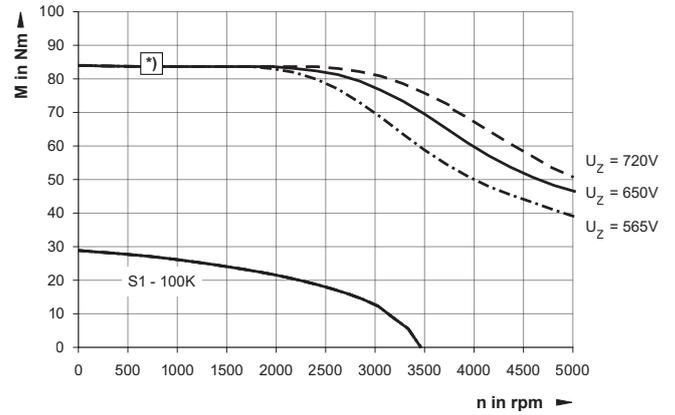
**MSY 155C** \*) Characteristic curve at maximum motor current (for MSY)



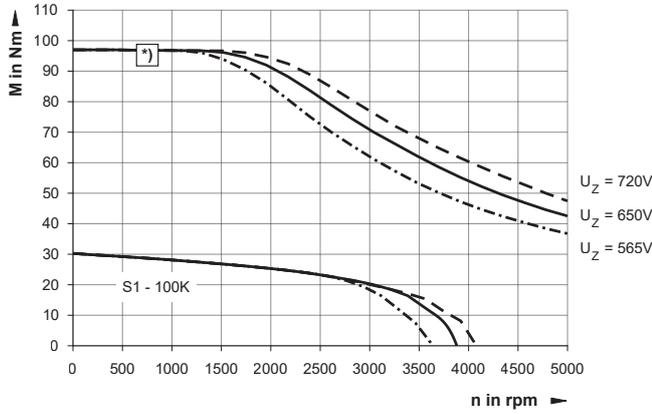
**MSY 155D** \*) Characteristic curve at maximum motor current (for MSY)



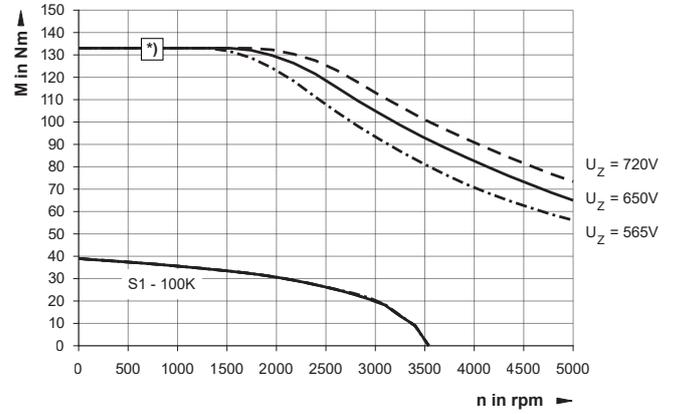
**MSY 155E** \*) Characteristic curve at maximum motor current (for MSY)



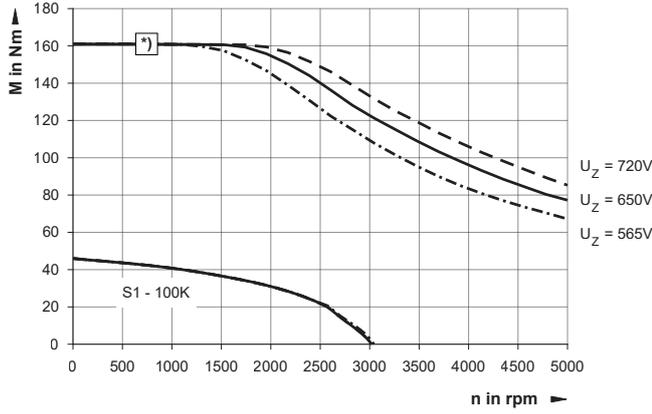
**MSY 192C** \*) Characteristic curve at maximum motor current (for MSY)



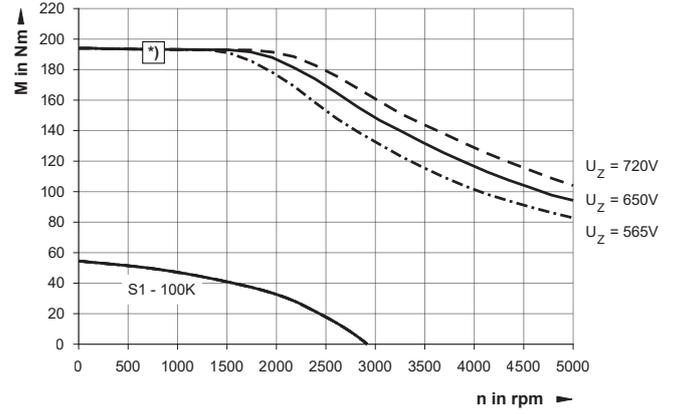
**MSY 192D** \*) Characteristic curve at maximum motor current (for MSY)



**MSY 192E** \*) Characteristic curve at maximum motor current (for MSY)



**MSY 192F** \*) Characteristic curve at maximum motor current (for MSY)



# Synchronous motors

## Cables and connectors

### Power cables

Current load at ambient temperature of up to 40 °C

	<b>Cable with one connector</b> ID	<b>Connector</b> ID	<b>Cable only</b> ID	<b>Bend radius</b>	<b>Cable type</b>	<b>Diameter</b>
<b>Current load of up to 13.8 A</b>						
<b>QSY 96</b> <b>QSY 116</b> <b>QSY 130</b>	<i>575796-xx</i>	325165-02	<i>1214270-xx</i>	$\geq 105 \text{ mm}$	PUR [4 x 1.5 mm <sup>2</sup> + (2 x 1.0 mm <sup>2</sup> )]	14.0 mm
<b>QSY 96</b> (with EnDat 2.2) <b>QSY 116</b> (with EnDat 2.2) <b>QSY 130</b> (with EnDat 2.2) <b>QSY 155 B EcoDyn</b> <b>QSY 155 C EcoDyn</b> <b>QSY 155 D EcoDyn</b> <b>MSY 155 B</b> <b>MSY 155 C</b>	<i>1363300-xx</i>	1290178-04				
<b>QSY 155 B</b> <b>QSY 155 C</b> <b>QSY 155 F EcoDyn</b>	<i>1363327-xx</i>	1361070-03				
<b>Current load of up to 26.0 A</b>						
<b>MSY 155 D</b> <b>MSY 155 E</b> <b>MSY 192 C</b> <b>MSY 192 D</b>	<i>1382095-xx</i>	1290178-05	<i>1214271-xx</i>	$\geq 119 \text{ mm}$	PUR [4 x 4 mm <sup>2</sup> + (2 x 1.0 mm <sup>2</sup> )]	15.8 mm
<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> <b>MSY 192 E</b>	<i>1363337-xx</i>	1361070-03				
<b>Current load of up to 32.8 A</b>						
<b>QSY 190 K EcoDyn</b> <b>QSY 260 B EcoDyn</b> (with EnDat 2.2) <b>MSY 192 F</b>	<i>1363342-xx</i>	1361070-04	<i>1214272-xx</i>	$\geq 130 \text{ mm}$	PUR [4 x 6 mm <sup>2</sup> + (2 x 1.0 mm <sup>2</sup> )]	17.2 mm
<b>QSY 260 B EcoDyn</b>	<i>690141-xx</i>	333090-03				
<b>Current load of up to 45.8 A</b>						
<b>QSY 260 C EcoDyn</b>	<i>1214663-xx</i>	333090-03	<i>1213905-xx</i>	$\geq 177 \text{ mm}$	PUR [4 x 10 mm <sup>2</sup> + (2 x 1.5 mm <sup>2</sup> )]	23.5 mm
<b>QSY 260 C EcoDyn</b> (with EnDat 2.2)	<i>1363347-xx</i>	1361070-04				

*Italics*: shielded power cable

## Encoder cables

	Cable length	Cable complete with connectors ID	Line drop compensator ID	Extension cable ID	Bend radius R for frequent flexing
<b>QSY 96</b> <b>QSY 116</b> <b>QSY 130</b> <b>QSY 260</b> (with EQN 1325)	< 60 m	336376-xx	–	340302-xx (as needed)	≥ 100 mm
		QSY 155 QSY 190 (with EQN 1325)		1356892-xx	
<b>QSY 96</b> <b>QSY 116</b> <b>QSY 130</b> <b>QSY 260</b> (with ERN 1387)	< 30 m	289440-xx	–	336847-xx (as needed)	
		QSY 155 QSY 190 (with ERN 1387)		1356866-xx	
<b>QSY 96</b> <b>QSY 116</b> <b>QSY 130</b> <b>QSY 260</b> (with ERN 1387)	30 m to 60 m	289440-xx	370226-01	336847-xx	
		QSY 155 QSY 190 (with ERN 1387)	1356866-xx	370226-02	
<b>MSY with ExI 13xx</b> and <b>QSY with EQN 1337</b>	< 55 m <sup>1)</sup>	1133104-xx (D-sub 25) 1423949-xx (D-sub 25, angled)	–	1036386-xx (angled) 1036372-xx (straight)	≥ 75 mm
	< 100 m	1245639-xx (Mini IO) 1423954-xx (Mini IO, angled)			

<sup>1)</sup> < 100 m in conjunction with 1313166-01 and Gen 3

# Asynchronous motors

## QAN overview

### General technical information

#### Specifications

The specifications and characteristic curves apply to motors mounted without thermal insulation. The maximum permissible 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 feature 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 UHW:* 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 nominal bearing service life—which depends on the specific motor and applies for a certain maximum shaft load at an average shaft speed—is 10 000 hours.

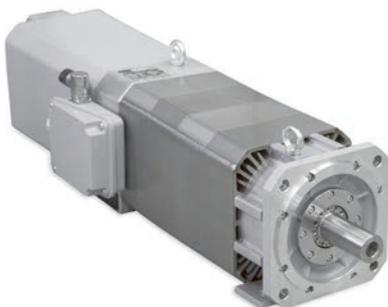
#### Speed measurement

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. Their hollow shaft permits the conveyance of coolant to internally cooled tools.

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

### Installation elevation

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

### Functional safety

None of the current QAN motor variants described in this brochure feature fault exclusion for 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 360UHW: 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 UHW 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 360UHW	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 360UHW)
- Shaft end: IP43

*Vibration severity*

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



**QAN 360 UHW**

# Asynchronous motors

## When used with 1xx inverter systems

Asynchronous motors with solid shaft	Rated power	Rated speed	Maximum 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>38</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>40</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>42</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	Maximum 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>44</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>46</b>
<b>QAN 260LH</b>	20.0 kW	1500 rpm	–	12 000 rpm	128.0 Nm	46.0 A	UM 113 D	–	–	
<b>QAN 260UH</b>	22.0 kW	1500 rpm	–	10 000 rpm 12 000 rpm	140.0 Nm	54.0 A	UM 113D <sup>1)</sup> UM 114 D	–	–	
<b>QAN 360UHW</b>	43.2 kW	Wye connection: 450 rpm Delta connection: 780 rpm	–	7000 rpm	Wye connection: 917 Nm Delta connection: 529 Nm	Wye connection: 113 A Delta connection: 124 A	UM 115 D	–	–	<b>48</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.

## When used with Gen 3 drives

Asynchronous motors with solid shaft	Rated power	Rated speed	Maximum speed		Rated torque	Rated current	Recommended inverters <sup>1)</sup>					Page
			Standard bearing	Spindle bearing			1-axis module	2-axis module	Compact inverters/axis			
									UEC 31x	UEC 32x	UEC 33x	
<b>QAN 200M</b>	5.5 kW	1500 rpm	9000 rpm	12 000 rpm	35.0 Nm	18.0 A	UM 311	UM 321	1 to 2	1 to 2	1 to 5	<b>33</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	1 to 2	1 to 2	1 to 5	
<b>QAN 200U</b>	10.0 kW	1500 rpm	9000 rpm	12 000 rpm	63.7 Nm	25.0 A	UM 312	UM 322	–	1 to 2	1 to 2	
<b>QAN 260M</b>	15.0 kW	1500 rpm	8000 rpm	10 000 rpm	95.5 Nm	35.0 A	UM 312	UM 322	–	–	1 to 2	<b>40</b>
<b>QAN 260L</b>	20.0 kW	1500 rpm	8000 rpm	10 000 rpm	127.3 Nm	46.0 A	UM 313	–	–	–	1	
<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>42</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	Maximum 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>44</b>
<b>QAN 260MH</b>	15.0 kW	1500 rpm	–	12 000 rpm	96.0 Nm	35.0 A	UM 312	UM 322	<b>46</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	Wye connection: 450 rpm Delta connection: 780 rpm	–	7000 rpm	Wye connection: 917 Nm Delta connection: 529 Nm	Wye connection: 113 A Delta connection: 124 A	UM 315	–	<b>48</b>

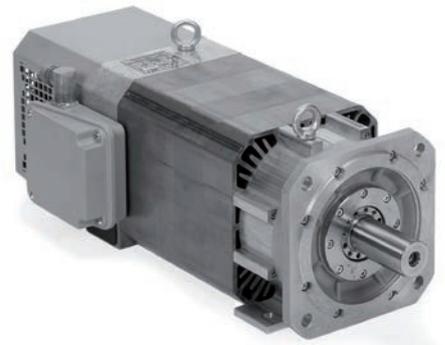
<sup>1)</sup> The maximum acceleration of the motor might not be achievable with the recommended inverters. If necessary, a more powerful power module must be selected.

# Asynchronous motors with solid shaft

## QAN 200 series

### Spindle motors with two pole pairs

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

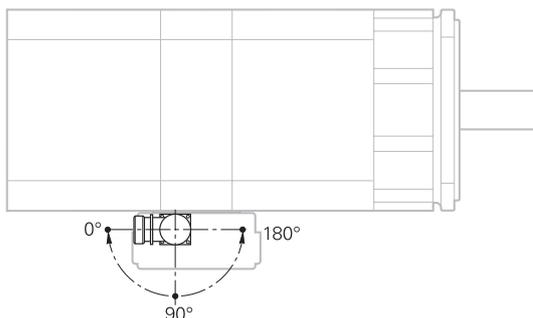


Motor	QAN 200M	QAN 200L	QAN 200U			
<b>Rated voltage <math>U_N</math></b>	250 V	305 V	330 V			
<b>Rated power output <math>P_N</math></b>	5.5 kW	7.5 kW	10.0 kW			
<b>Rated speed <math>n_N</math></b>	1500 rpm					
<b>Rated torque <math>M_N</math> (105 K)</b>	35.0 Nm	47.8 Nm	63.7 Nm			
<b>Rated current <math>I_N</math> (105 K)</b>	18.0 A	20.1 A	25.0 A			
<b>Efficiency</b>	0.85					
<b>Maximum speed <math>n_{max}</math><sup>1)</sup></b> Standard bearing Spindle bearing	9000 rpm 12000 rpm	9000 rpm 12000 rpm				
<b>Max. current <math>I_{max}</math></b>	33 A	36 A	44 A			
<b>Mass <math>m</math></b>	51 kg	68 kg	83 kg			
<b>Rotor inertia <math>J</math></b>	245 kg·cm <sup>2</sup>	353 kg·cm <sup>2</sup>	405 kg·cm <sup>2</sup>			
<b>Protection</b>	IP54					
<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 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

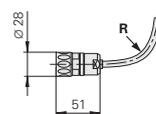
<sup>1)</sup> The maximum shaft speed depends on the application conditions of the motor, such as the shaft load (see the *Motors* Technical Manual)

**Bold:** standard version

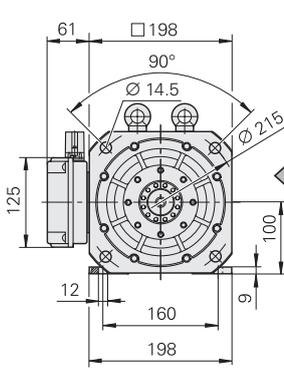
### Rotatable connections



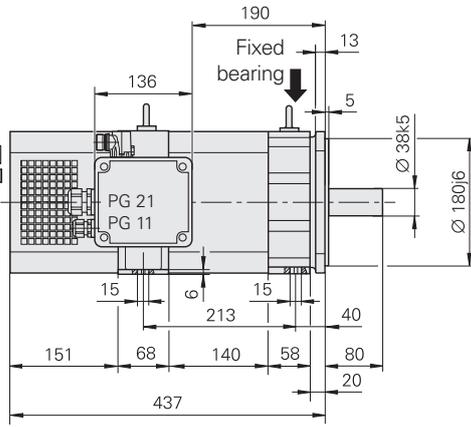
### Encoder connector



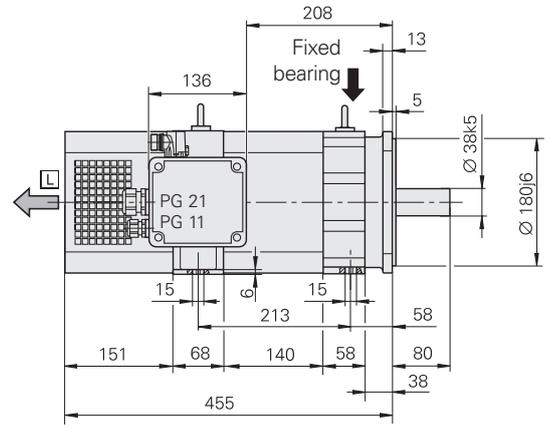
**QAN 200M**



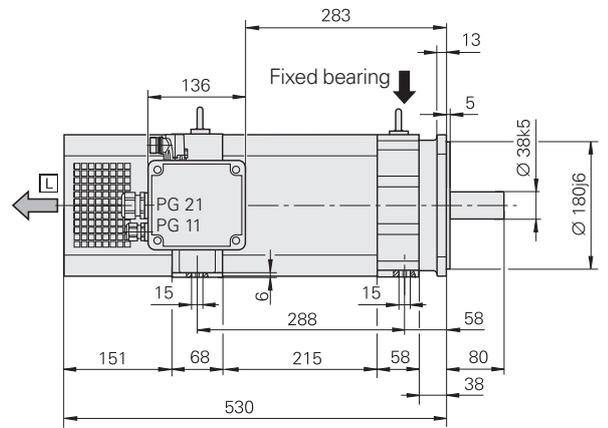
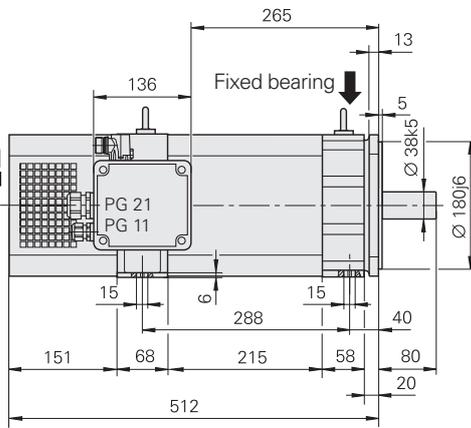
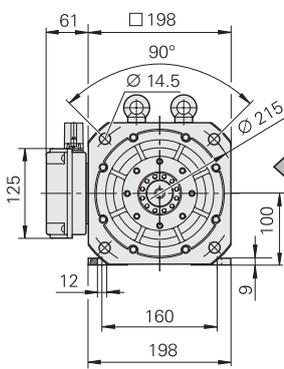
**With standard bearing**



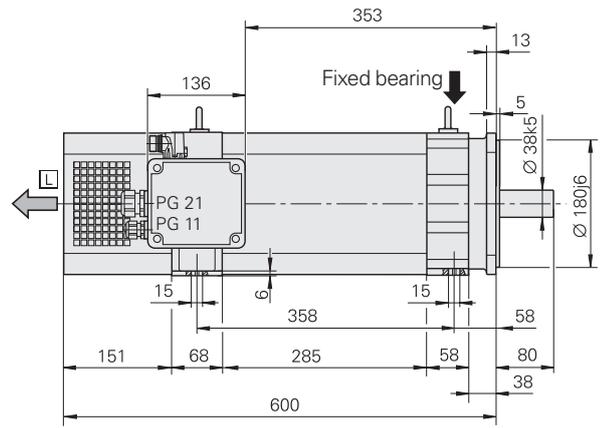
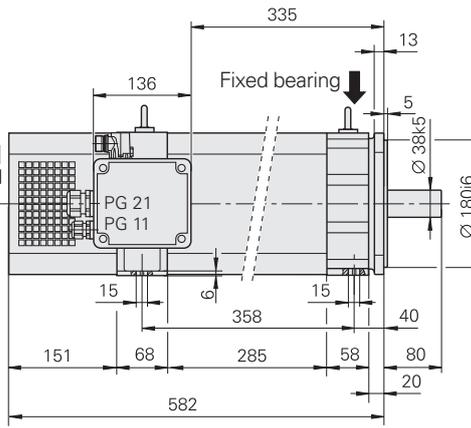
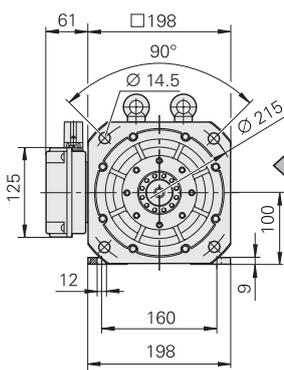
**With spindle bearing**



**QAN 200L**



**QAN 200U**



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

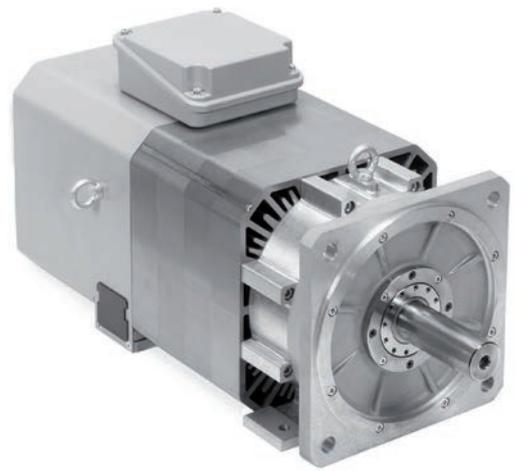
mm  
  
 Tolerancing ISO 8015  
 ISO 2768:1989-mH  
 ≤ 6 mm: ±0.2 mm

# Asynchronous motors with solid shaft

## QAN 260 series

Spindle motors with two pole pairs

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



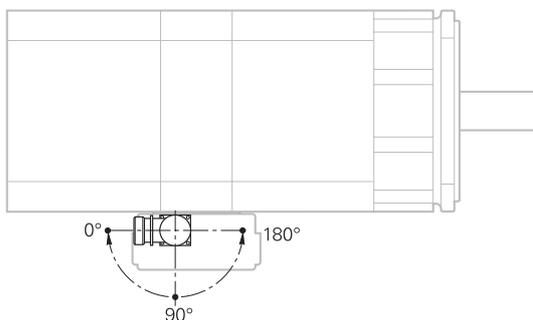
Motor	QAN 260 M	QAN 260 L	QAN 260 U			
<b>Rated voltage <math>U_N</math></b>	348 V	331 V	318 V			
<b>Rated power output <math>P_N</math></b>	15 kW	20 kW	24 kW			
<b>Rated speed <math>n_N</math></b>	1500 rpm					
<b>Rated torque <math>M_N</math> (105 K)</b>	96 Nm	128 Nm	153 Nm			
<b>Rated current <math>I_N</math> (105 K)</b>	35 A	46 A	58 A			
<b>Efficiency</b>	0.85					
<b>Maximum speed <math>n_{max}</math><sup>1)</sup></b> Standard bearing Spindle bearing*	8000 rpm 10000 rpm or 12000 rpm		8000 rpm 10000 rpm			
<b>Max. current <math>I_{max}</math></b>	70 A	96 A	116 A			
<b>Mass m</b>	112 kg	135 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>	IP54					
<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 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)

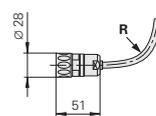
\* Please select when ordering

**Bold:** standard version

### Rotatable connections

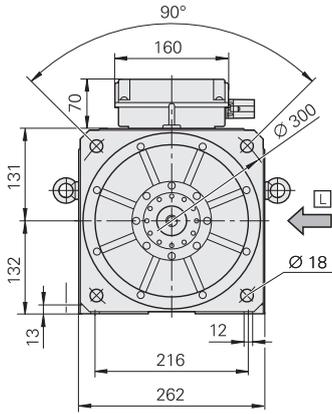


### Encoder connector

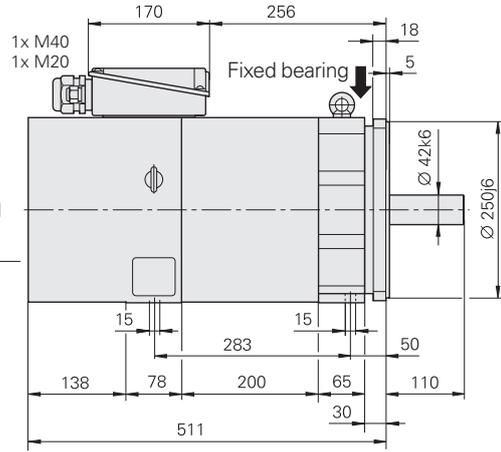


For **R** see page 56

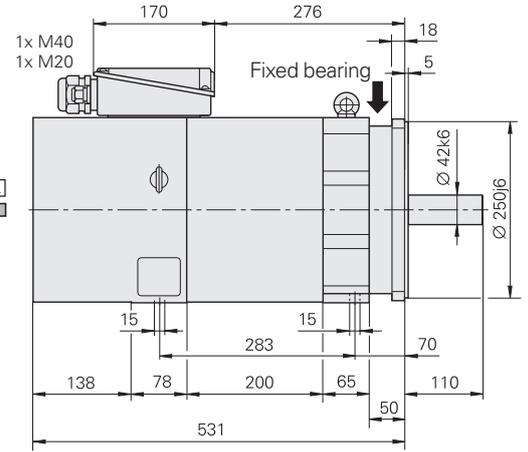
**QAN 260M**



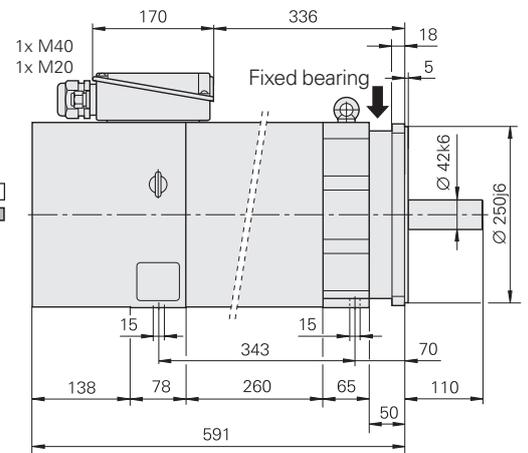
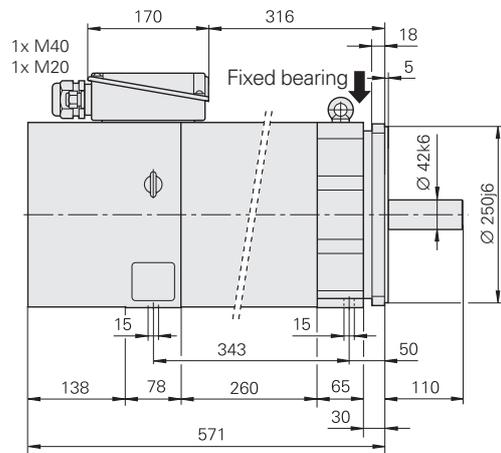
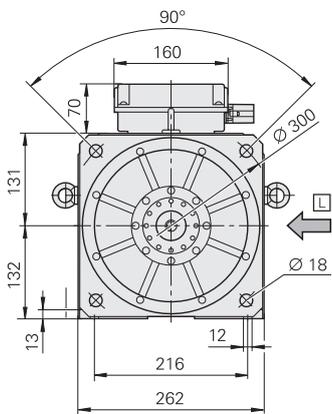
**With standard bearing**



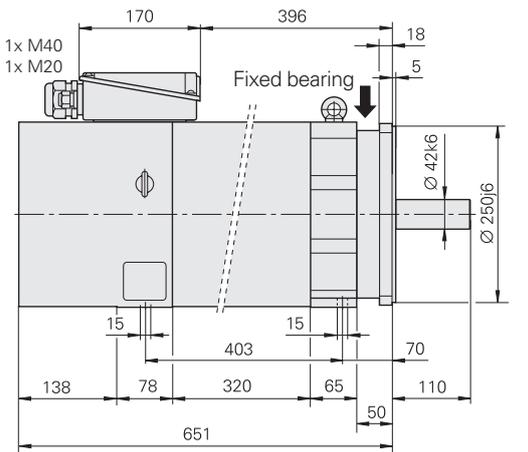
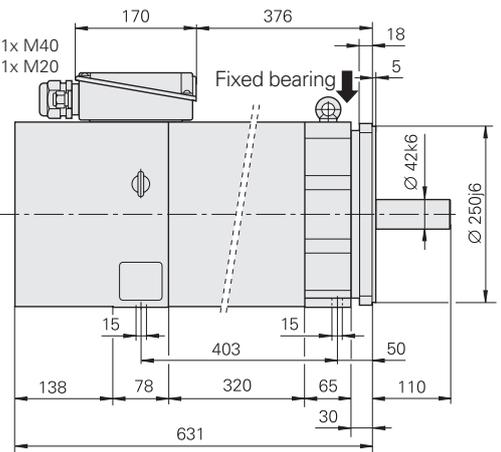
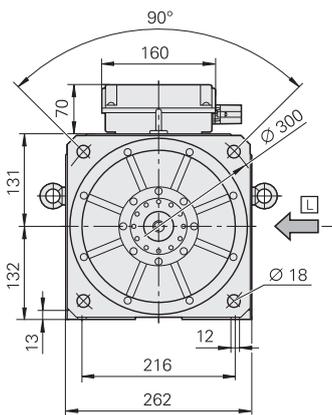
**With spindle bearing**



**QAN 260L**



**QAN 260U**



☐ = Air flow

**QAN 260M**

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

**QAN 260L/U**

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

mm  
  
 Tolerancing ISO 8015  
 ISO 2768:1989-mH  
 ≤ 6 mm: ±0.2 mm

# Asynchronous motors with solid shaft

## QAN 320 series

Spindle motors with two pole pairs

- Rated power output: 18 kW to 40 kW

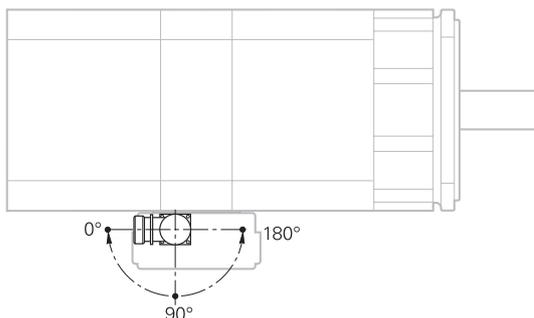


Motor	QAN 320M	QAN 320L		
<b>Rated voltage <math>U_N</math></b>	317 V	315 V		
<b>Rated power output <math>P_N</math></b>	32 kW	40 kW		
<b>Rated speed <math>n_N</math></b>	1500 rpm	1500 rpm		
<b>Rated torque <math>M_N</math> (105 K)</b>	203.7 Nm	254.6 Nm		
<b>Rated current <math>I_N</math> (105 K)</b>	77.5 A	99.0 A		
<b>Efficiency</b>	0.85	0.91		
<b>Maximum 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 0.38 A/0.48 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

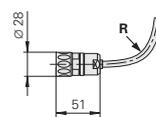
<sup>1)</sup> The maximum shaft speed depends on the application conditions of the motor, such as the shaft load (see the *Motors Technical Manual*)

**Bold:** standard version

### Rotatable connections



### Encoder connector



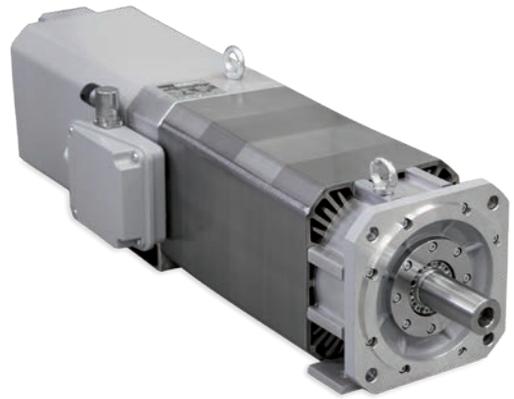


# Asynchronous motors with hollow shaft

## QAN 200UH

Hollow-shaft spindle motor with two pole pairs

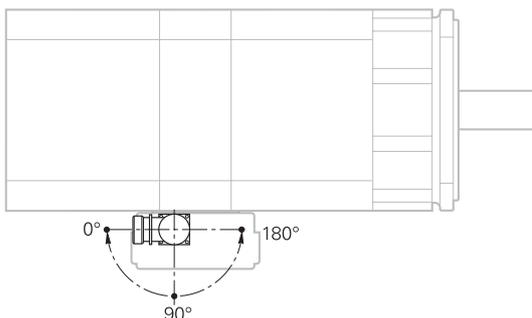
- Rated power output: up to 10 kW
- With spindle bearing



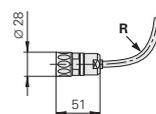
Motor	QAN 200UH	
Rated voltage $U_N$	330 V	
Rated power output $P_N$	10 kW	
Rated speed $n_N$	1500 rpm	
Rated torque $M_N$ (105 K)	63.7 Nm	
Rated current $I_N$ (105 K)	25 A	
Efficiency	0.85	
Maximum speed $n_{max}^{1)}$ Spindle bearing	12 000 rpm	15 000 rpm
Max. current $I_{max}$	44 A	
Hollow shaft bore	Ø 9 mm	
Mass $m$	91 kg	
Rotor inertia $J$	405 kg·cm <sup>2</sup>	
Protection	IP54	
<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)

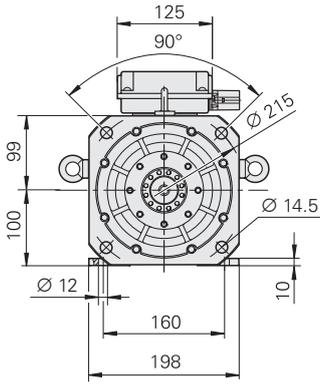
### Rotatable connections



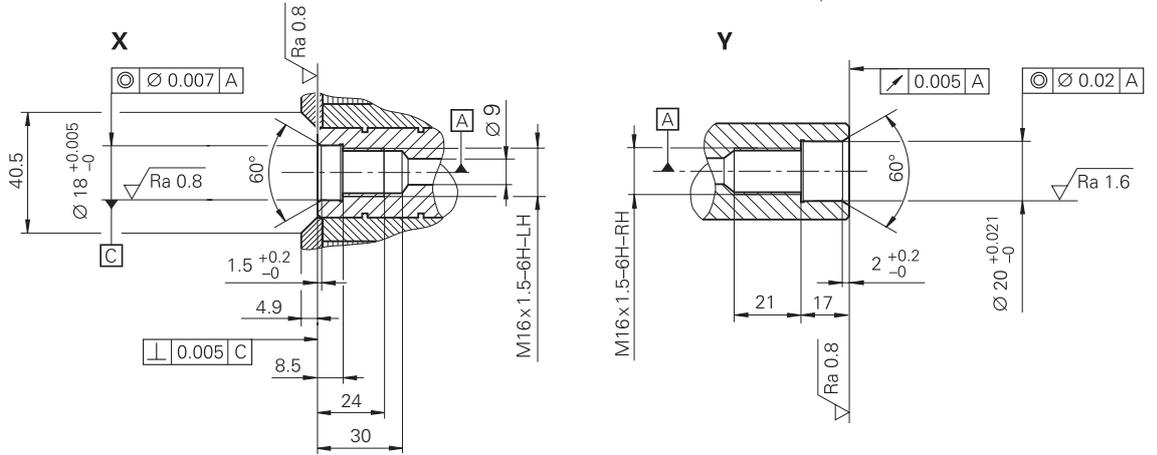
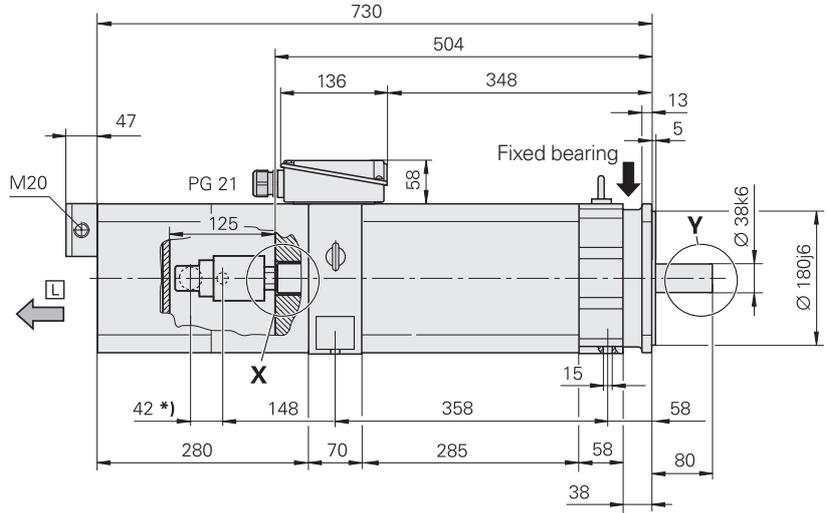
### Encoder connector



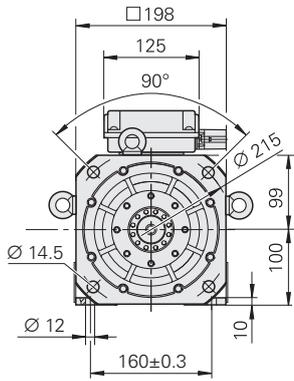
**QAN 200UH 12 000 rpm**



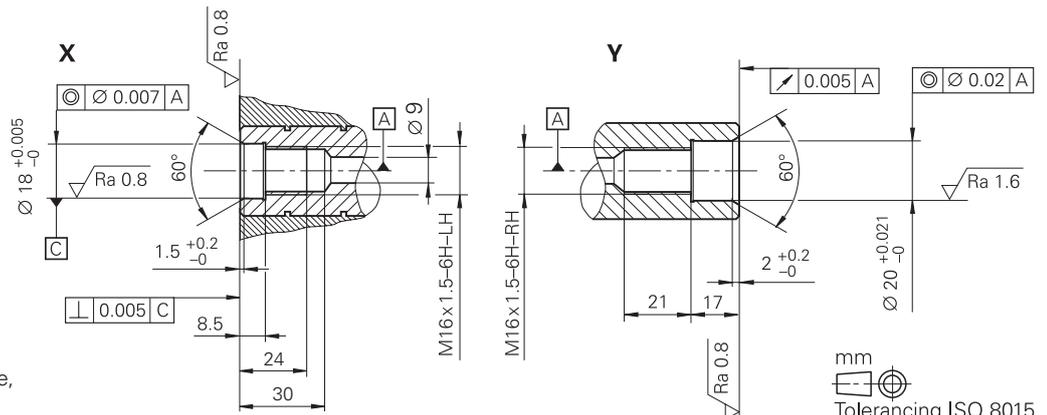
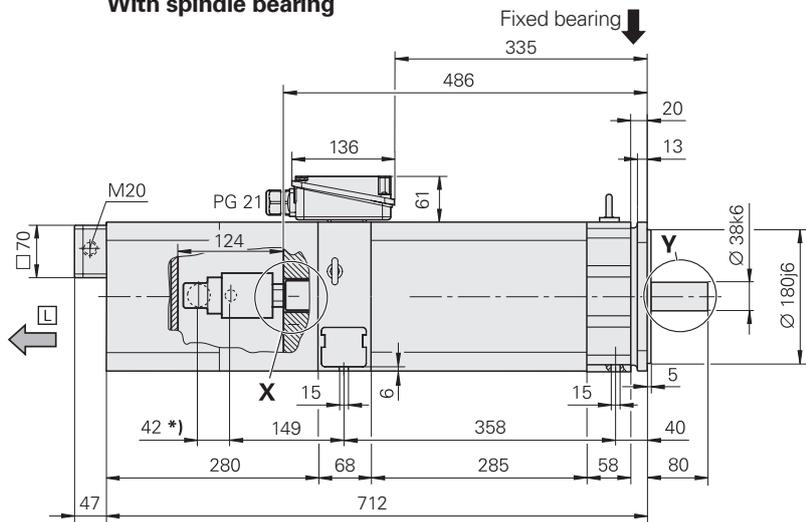
**With spindle bearing**



**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 2768:1989-mH  
 ≤ 6 mm: ±0.2 mm

# Asynchronous motors with hollow shaft

## QAN 260xH series

Hollow-shaft spindle motor with two pole pairs

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

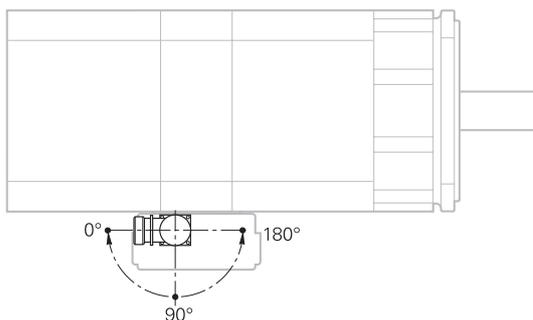


Motor	QAN 260MH	QAN 260LH	QAN 260UH
<b>Rated voltage <math>U_N</math></b>	348 V	331 V	318 V
<b>Rated power output <math>P_N</math></b>	15 kW	20 kW	22 kW
<b>Rated speed <math>n_N</math></b>	1500 rpm		
<b>Rated torque <math>M_N</math> (105 K)</b>	96 Nm	128 Nm	140 Nm
<b>Rated current <math>I_N</math> (105 K)</b>	35 A	46 A	54 A
<b>Efficiency</b>	0.85		
<b>Maximum 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>	IP54		
<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	–	–	536259-53
12 000 rpm	642855-73	631449-73	536259-73

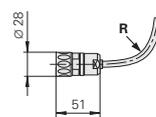
<sup>1)</sup> The maximum shaft speed depends on the application conditions of the motor, such as the shaft load (see the *Motors Technical Manual*)

\* Please select when ordering

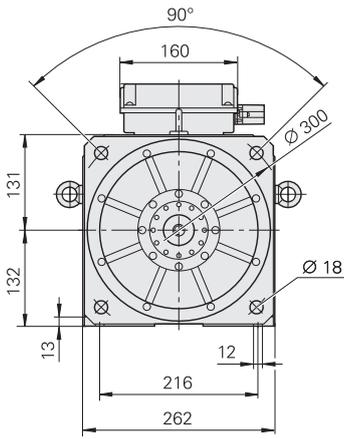
### Rotatable connections



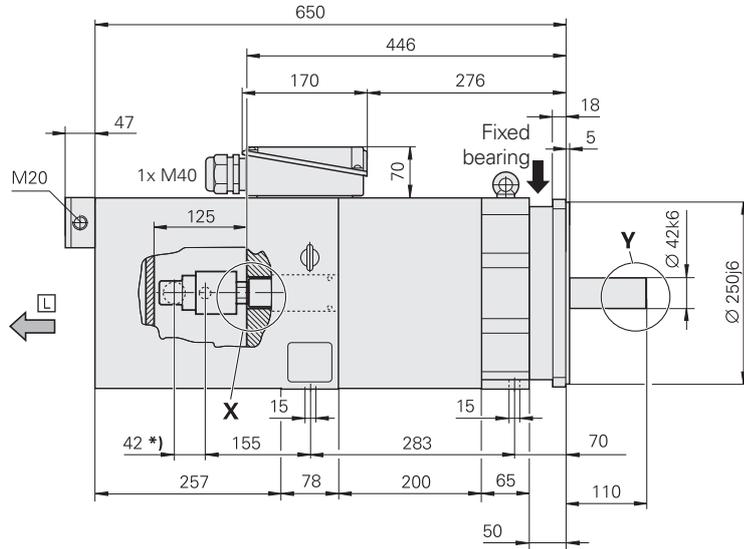
### Encoder connector



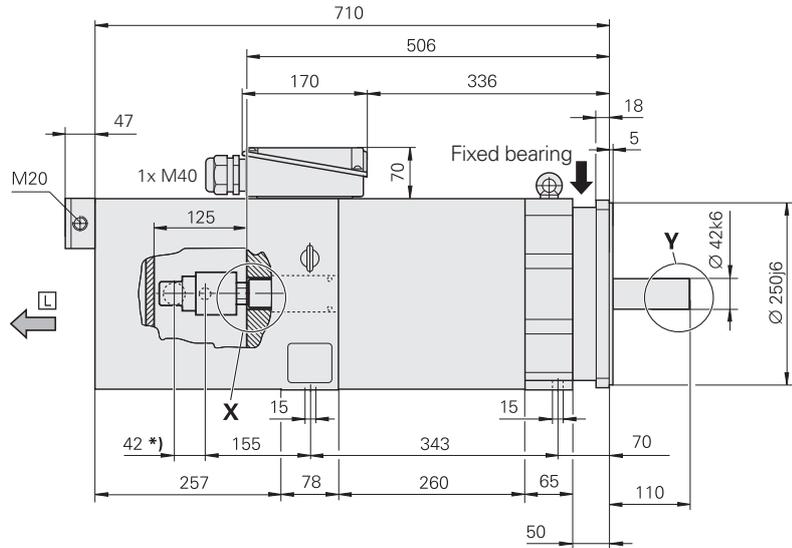
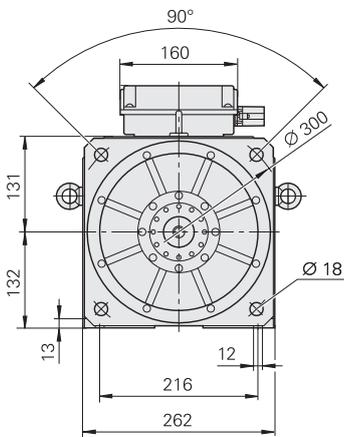
### QAN 260MH



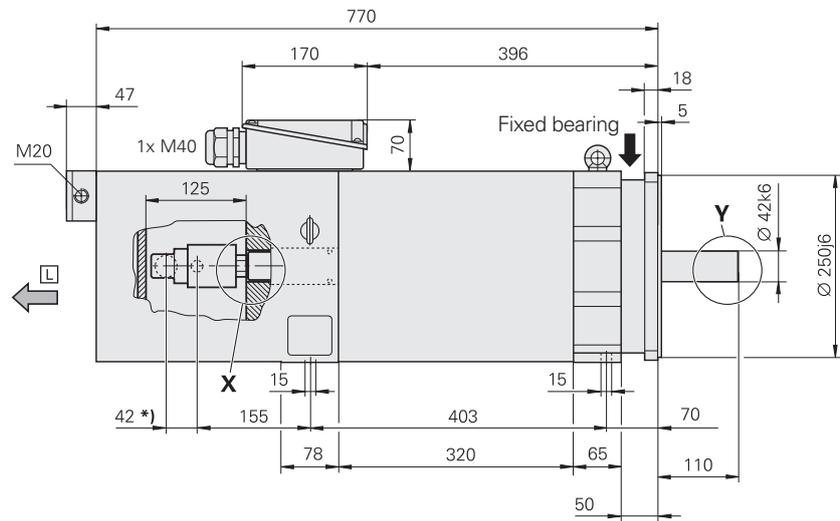
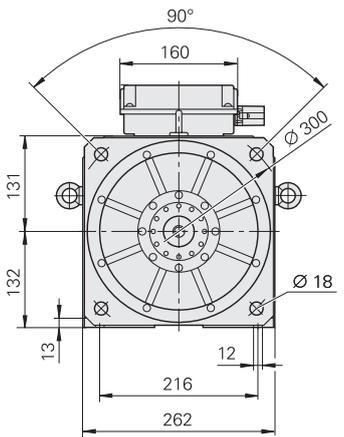
### With spindle bearing



### QAN 260LH



### QAN 260UH



☐ = Air flow

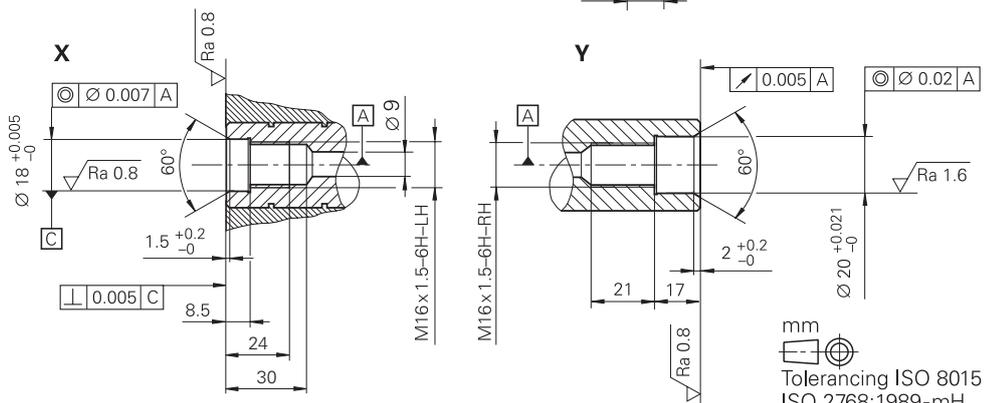
### QAN 260 MH

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 2768:1989-mH  
≤ 6 mm: ±0.2 mm

# Asynchronous hollow-shaft motors

## QAN 360UHW series

Hollow-shaft spindle motor with four pole pairs

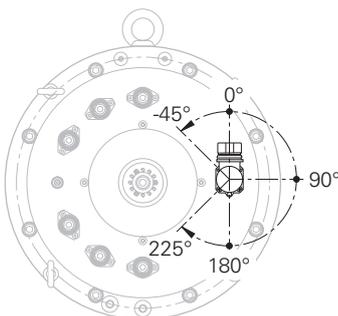
- With spindle bearing
- Water-cooled



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
Maximum 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	IP43	
Mounting direction	Horizontal: IM B5 Vertical: IM V1	
ID with key	641936-26 641936-06	

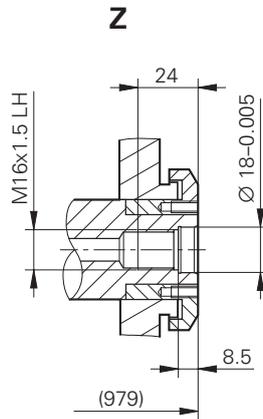
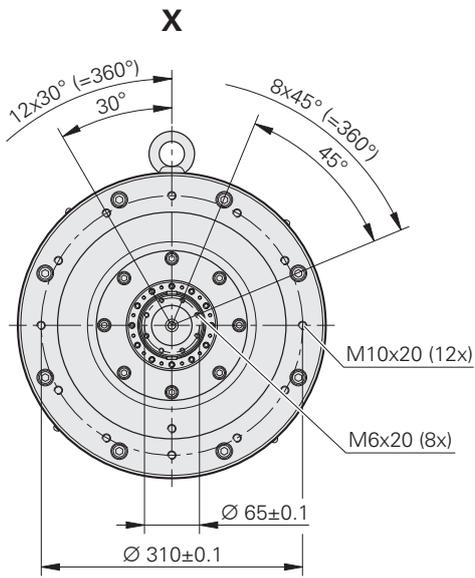
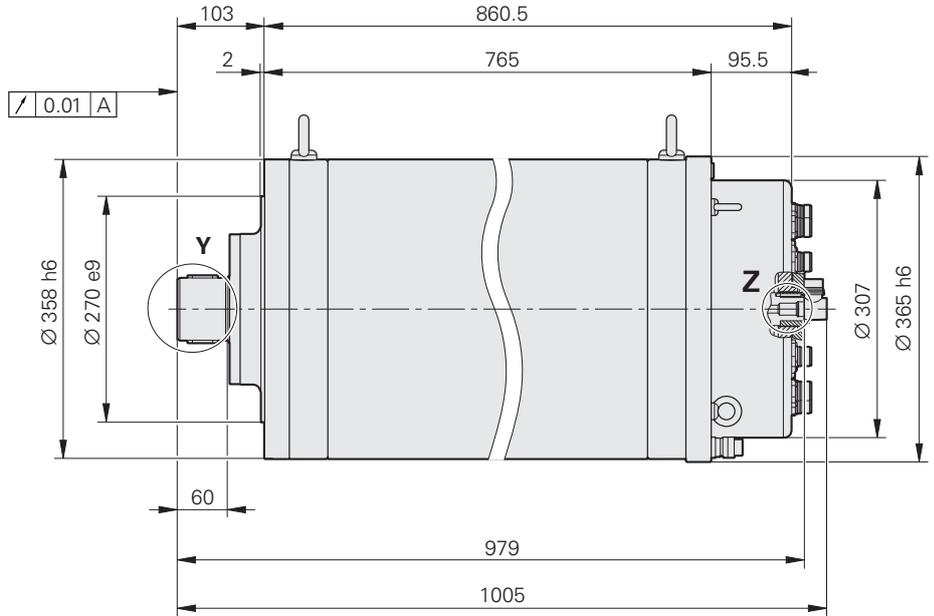
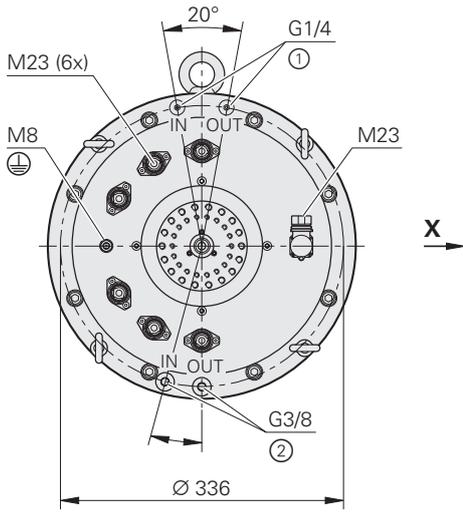
<sup>1)</sup> The maximum shaft speed depends on the application conditions of the motor, such as the shaft load (see the *Motors* Technical Manual)

### Rotatable connections

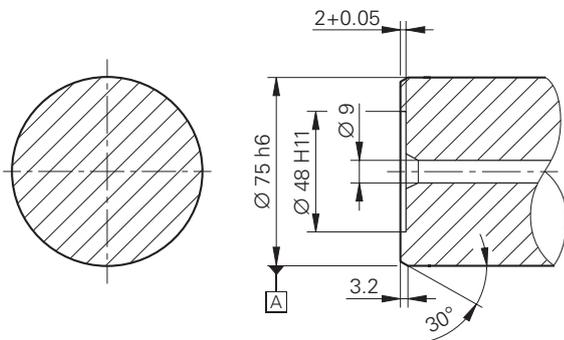


**QAN 360UHW**

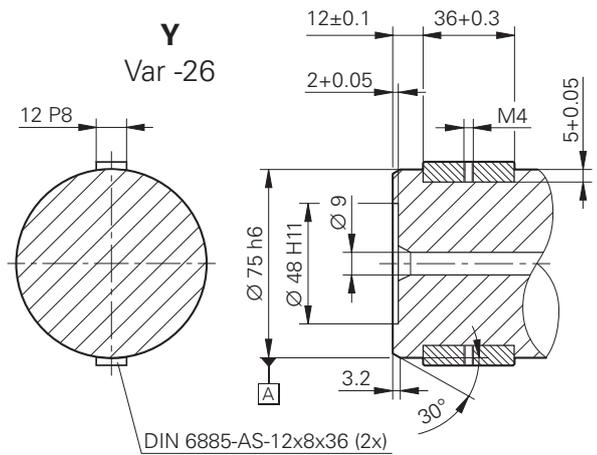
**With spindle bearing**



**Y**  
Var -06



**Y**  
Var -26



1 = Connection for sealing air  
2 = Connection for coolant

mm  
Tolerancing ISO 8015  
ISO 2768:1989-mH  
≤ 6 mm: ±0.2 mm

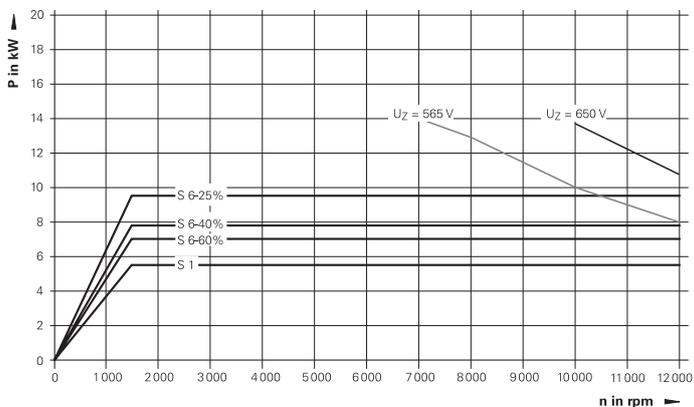
# Asynchronous motors

## Power and torque characteristics

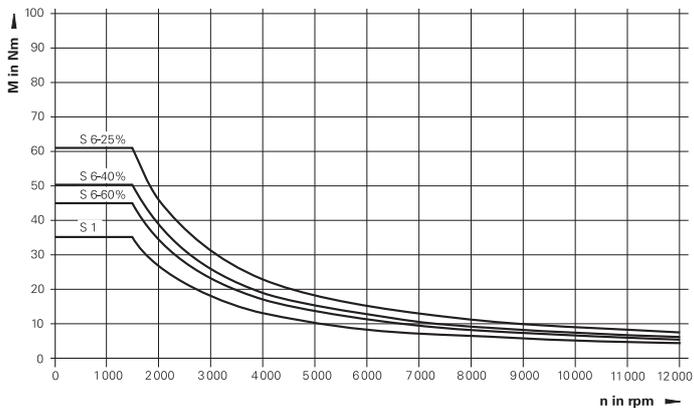
### QAN 200M

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	1 500 rpm	5.5 kW	35.0 Nm	18.0 A
	6 000 rpm	5.5 kW	8.8 Nm	–
	12 000 rpm	5.5 kW	4.4 Nm	–
<b>S6-60%</b>	1 500 rpm	7.0 kW	44.7 Nm	22.0 A
	6 000 rpm	7.0 kW	11.2 Nm	–
	12 000 rpm	7.0 kW	5.6 Nm	–
<b>S6-40%</b>	1 500 rpm	7.9 kW	50.4 Nm	24.0 A
	6 000 rpm	7.9 kW	12.6 Nm	–
	12 000 rpm	7.9 kW	6.3 Nm	–
<b>S6-25%</b>	1 500 rpm	9.5 kW	60.7 Nm	28.0 A
	6 000 rpm	9.5 kW	15.2 Nm	–
	12 000 rpm	9.5 kW	7.6 Nm	–

Power characteristic curve



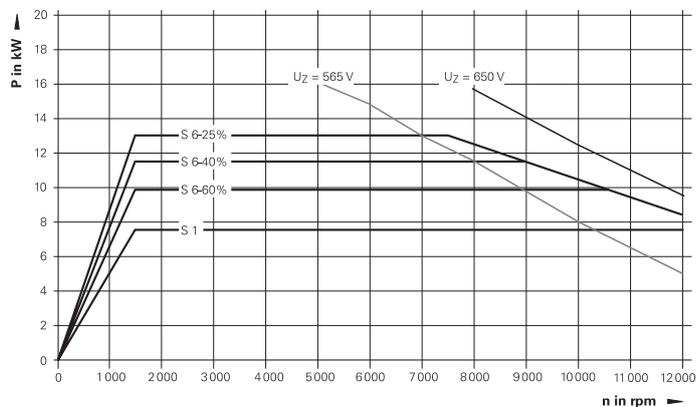
Torque characteristic curve



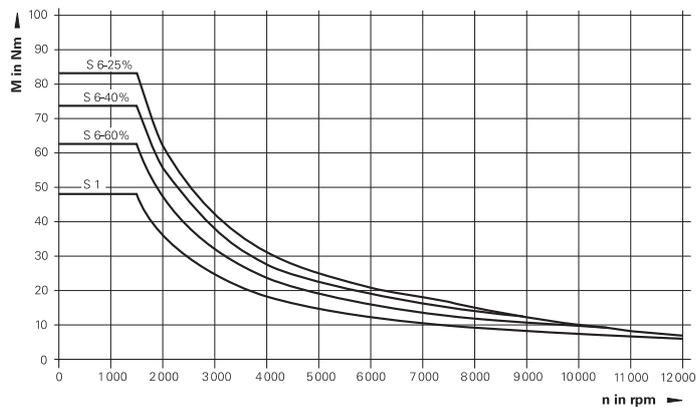
### QAN 200L

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	1 500 rpm	7.5 kW	47.8 Nm	20.1 A
	6 000 rpm	7.5 kW	12.0 Nm	–
	12 000 rpm	7.5 kW	6.0 Nm	–
<b>S6-60%</b>	1 500 rpm	9.8 kW	62.6 Nm	24.0 A
	10 700 rpm	9.8 kW	9.5 Nm	–
	12 000 rpm	8.5 kW	6.8 Nm	–
<b>S6-40%</b>	1 500 rpm	11.5 kW	73.4 Nm	27.0 A
	9 000 rpm	11.5 kW	11.0 Nm	–
	12 000 rpm	8.5 kW	6.8 Nm	–
<b>S6-25%</b>	1 500 rpm	13.0 kW	83.0 Nm	31.0 A
	7 500 rpm	13.0 kW	16.6 Nm	–
	12 000 rpm	8.5 kW	6.8 Nm	–

Power characteristic curve



Torque characteristic curve



#### Note

- **S6 mode**

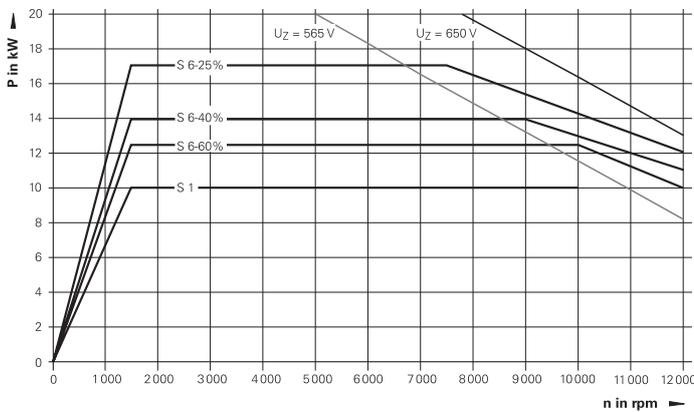
Cycle duration: 10 minutes

During the rest period the motor is idle.

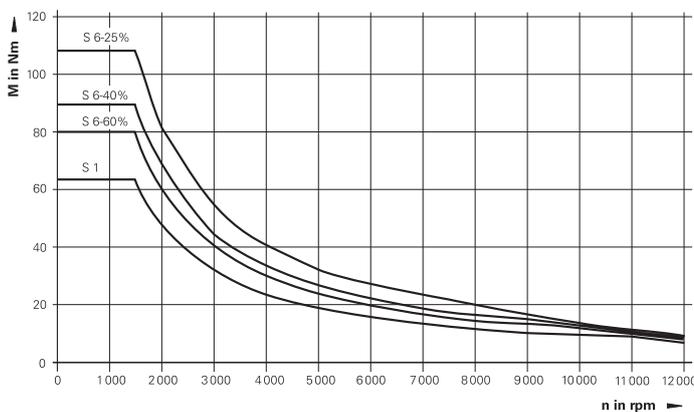
## QAN 200U

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	1 500 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>	1 500 rpm	14.0 kW	89.4 Nm	32.0 A
	9 000 rpm	14.0 kW	14.6 Nm	–
	12 000 rpm	11.0 kW	8.8 Nm	–
<b>S6-25%</b>	1 500 rpm	17.0 kW	108.6 Nm	37.0 A
	7 500 rpm	17.0 kW	21.7 Nm	–
	12 000 rpm	12.0 kW	9.5 Nm	–

Power characteristic curve



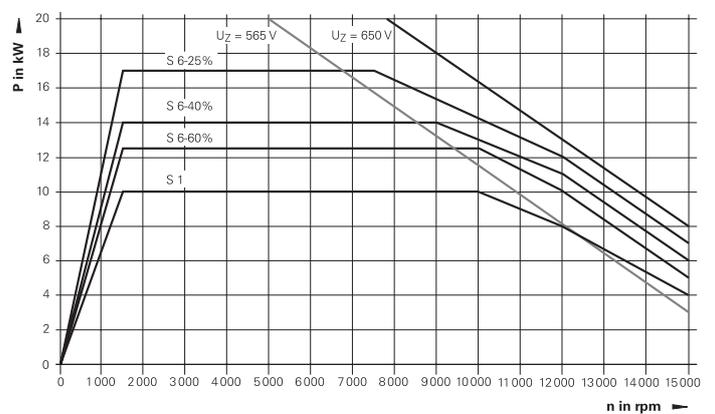
Torque characteristic curve



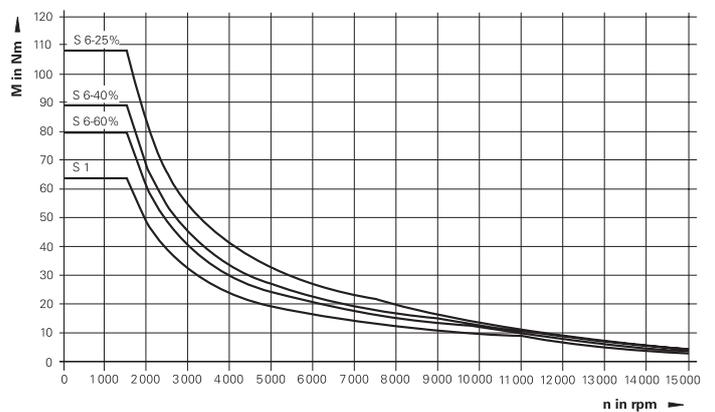
## QAN 200UH

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	1 500 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>	1 500 rpm	14.0 kW	89.4 Nm	32.0 A
	9 000 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>	1 500 rpm	17.0 kW	108.6 Nm	37.0 A
	7 500 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



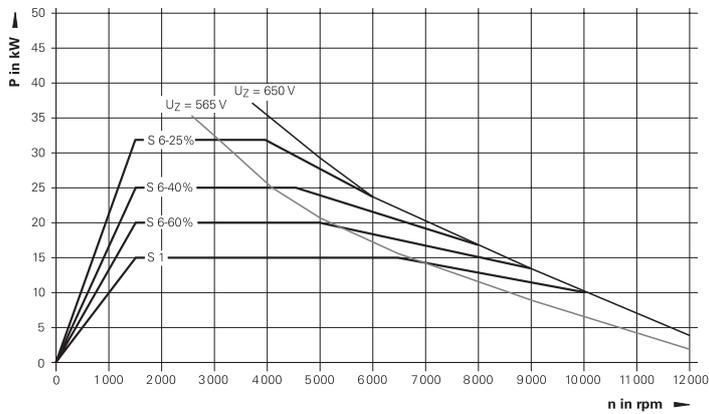
Torque characteristic curve



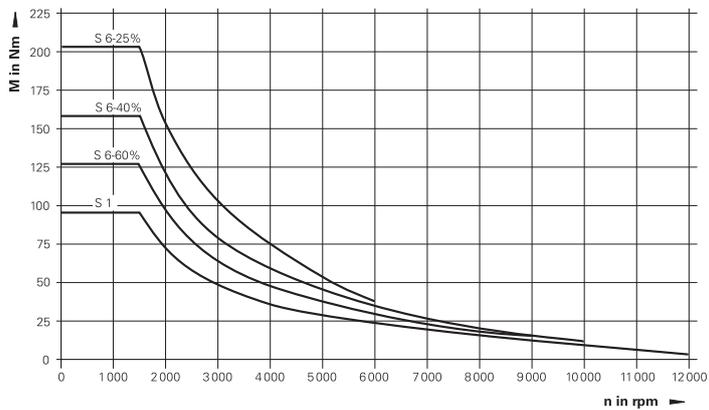
## QAN 260M, QAN 260MH

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	1 500 rpm	15.0 kW	95.5 Nm	35.0 A
	6 500 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>	1 500 rpm	20.0 kW	127.3 Nm	43.3 A
	5 000 rpm	20.0 kW	38.2 Nm	–
	9 000 rpm	13.5 kW	14.3 Nm	–
<b>S6-40%</b>	1 500 rpm	25.0 kW	159.2 Nm	52.3 A
	4 500 rpm	25.0 kW	53.1 Nm	–
	8 000 rpm	16.8 kW	20.1 Nm	–
<b>S6-25%</b>	1 500 rpm	32.0 kW	203.7 Nm	65.0 A
	4 000 rpm	32.0 kW	76.4 Nm	–
	6 000 rpm	23.7 kW	37.7 Nm	–

Power characteristic curve



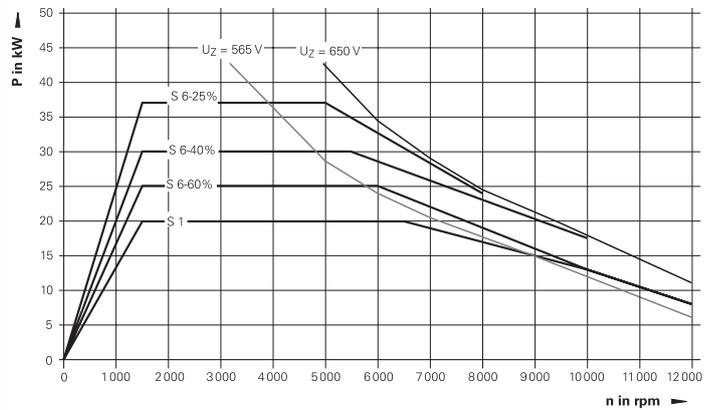
Torque characteristic curve



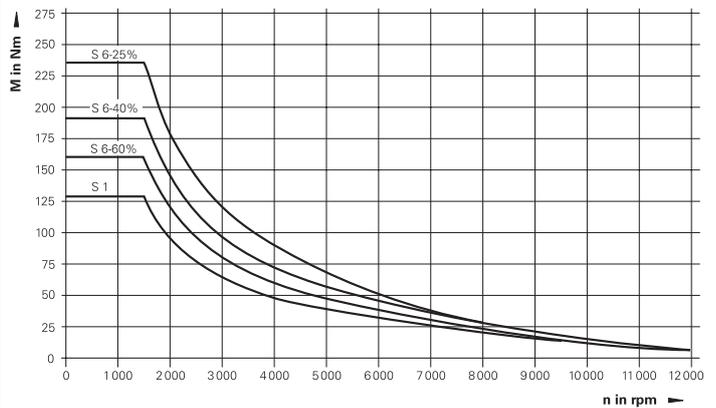
## QAN 260L, QAN 260LH

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	1 500 rpm	20.0 kW	127.3 Nm	46.0 A
	6 500 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>	1 500 rpm	25.0 kW	159.2 Nm	56.0 A
	6 000 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>	1 500 rpm	30.0 kW	191.0 Nm	65.0 A
	5 500 rpm	30.0 kW	52.1 Nm	–
	10 000 rpm	17.5 kW	16.7 Nm	–
<b>S6-25%</b>	1 500 rpm	37.0 kW	235.5 Nm	79.0 A
	5 000 rpm	37.0 kW	70.7 Nm	–
	8 000 rpm	24.0 kW	28.6 Nm	–

Power characteristic curve



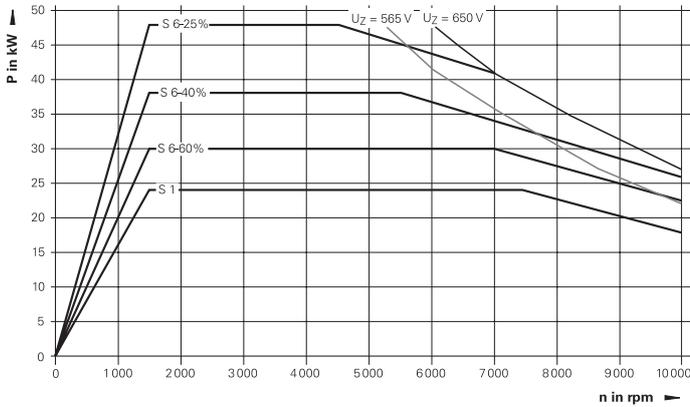
Torque characteristic curve



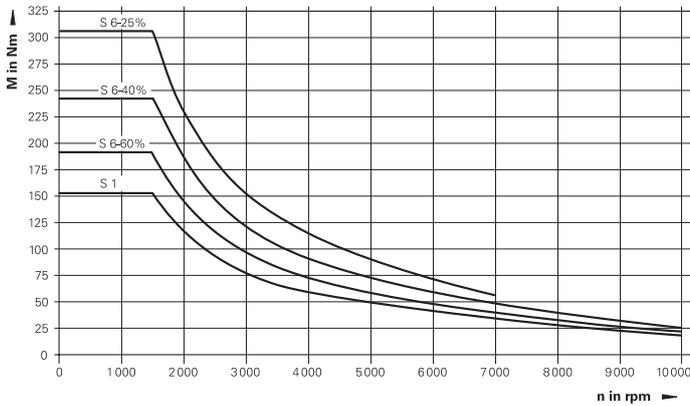
# QAN 260U

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	1 500 rpm	24.0 kW	152.8 Nm	58.0 A
	7 400 rpm	24.0 kW	31.0 Nm	–
	10 000 rpm	18.0 kW	17.2 Nm	–
<b>S6-60%</b>	1 500 rpm	30.0 kW	191.0 Nm	67.2 A
	7 000 rpm	30.0 kW	40.9 Nm	–
	10 000 rpm	22.5 kW	21.5 Nm	–
<b>S6-40%</b>	1 500 rpm	38.0 kW	241.9 Nm	81.8 A
	5 500 rpm	38.0 kW	66.0 Nm	–
	10 000 rpm	26.0 kW	24.8 Nm	–
<b>S6-25%</b>	1 500 rpm	48.0 kW	305.6 Nm	100.6 A
	4 500 rpm	48.0 kW	101.9 Nm	–
	7 000 rpm	41.0 kW	55.9 Nm	–

Power characteristic curve



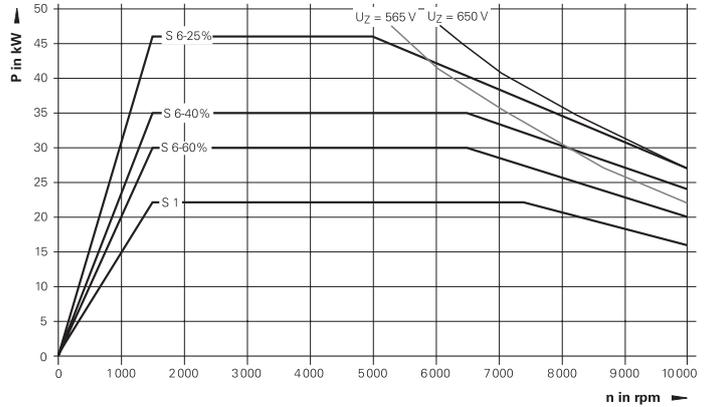
Torque characteristic curve



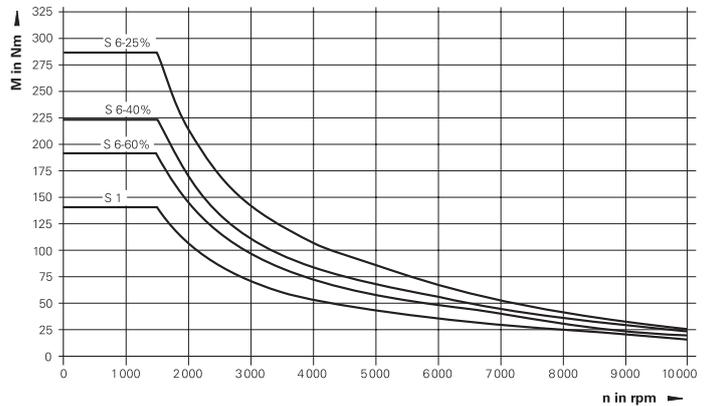
# QAN 260UH

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	1 500 rpm	22.0 kW	140.1 Nm	54.0 A
	7 400 rpm	22.0 kW	28.4 Nm	–
	10 000 rpm	16.0 kW	15.3 Nm	–
<b>S6-60%</b>	1 500 rpm	30.0 kW	191.0 Nm	67.0 A
	6 500 rpm	30.0 kW	44.1 Nm	–
	10 000 rpm	20.0 kW	19.5 Nm	–
<b>S6-40%</b>	1 500 rpm	35.0 kW	222.8 Nm	77.0 A
	6 500 rpm	35.0 kW	66.8 Nm	–
	10 000 rpm	24.0 kW	22.9 Nm	–
<b>S6-25%</b>	1 500 rpm	46.0 kW	286.5 Nm	97.0 A
	5 000 rpm	46.0 kW	85.9 Nm	–
	10 000 rpm	27.0 kW	25.8 Nm	–

Power characteristic curve



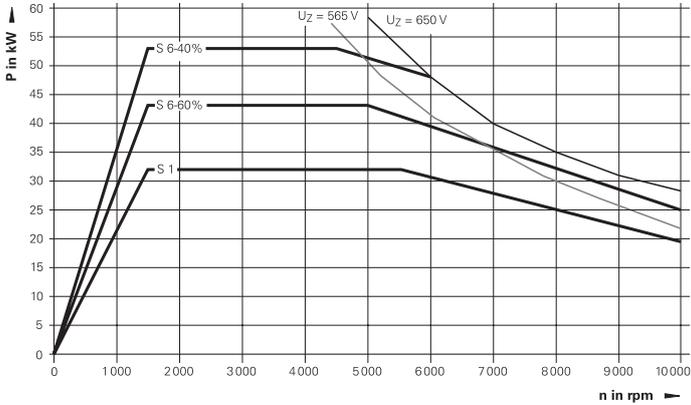
Torque characteristic curve



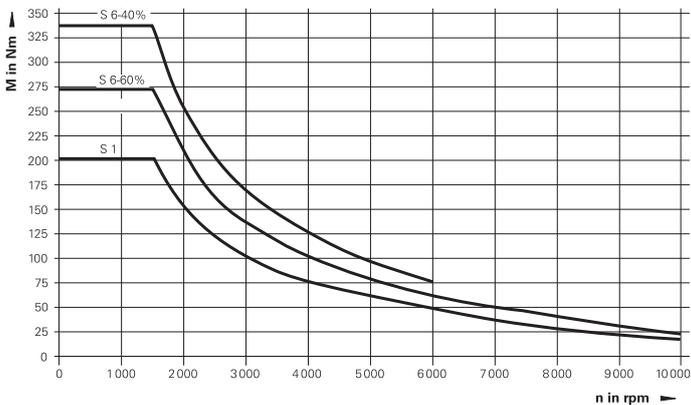
# QAN 320M

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	1 500 rpm	32.0 kW	203.7 Nm	77.5 A
	5 500 rpm	32.0 kW	55.0 Nm	–
	10 000 rpm	19.5 kW	18.6 Nm	–
<b>S6-60%</b>	1 500 rpm	43.0 kW	273.7 Nm	98.0 A
	5 500 rpm	43.0 kW	71.5 Nm	–
	10 000 rpm	25.0 kW	23.9 Nm	–
<b>S6-40%</b>	1 500 rpm	53.0 kW	337.4 Nm	118.0 A
	5 500 rpm	53.0 kW	86.2 Nm	–
	6 000 rpm	48.0 kW	76.4 Nm	–

Power characteristic curve



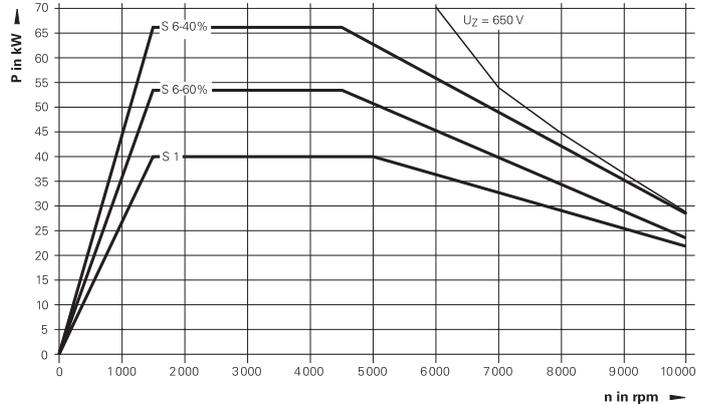
Torque characteristic curve



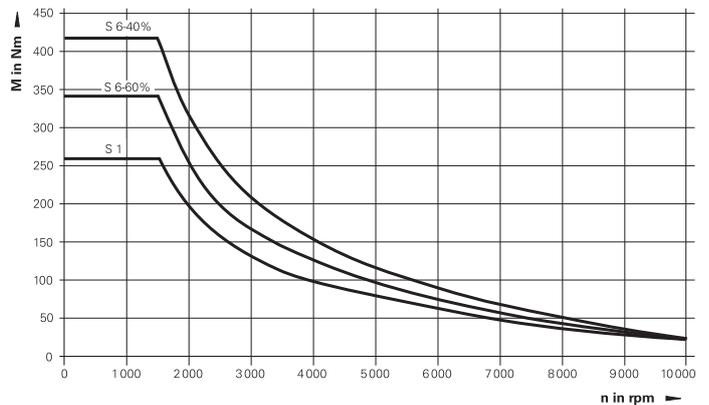
# QAN 320L

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	1 500 rpm	40.0 kW	254.6 Nm	99.0 A
	5 000 rpm	40.0 kW	77.9 Nm	–
	10 000 rpm	21.0 kW	21.0 Nm	–
<b>S6-60%</b>	1 500 rpm	53.0 kW	337.4 Nm	123.0 A
	4 500 rpm	53.0 kW	112.5 Nm	–
	10 000 rpm	24.0 kW	22.9 Nm	–
<b>S6-40%</b>	1 500 rpm	66.0 kW	420.2 Nm	148.0 A
	4 500 rpm	66.0 kW	140.1 Nm	–
	10 000 rpm	28.0 kW	26.7 Nm	–

Power characteristic curve



Torque characteristic curve

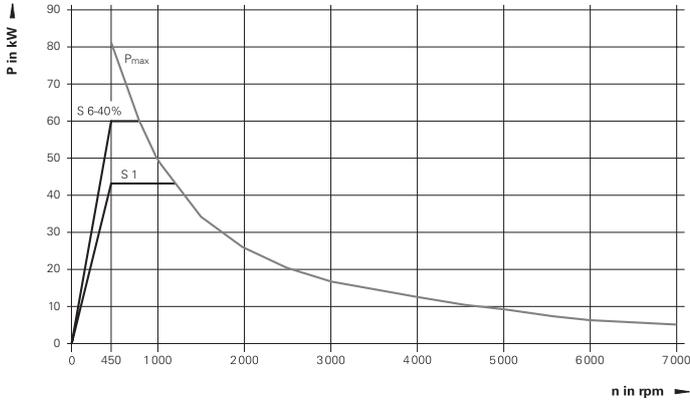


# QAN 360 UHW

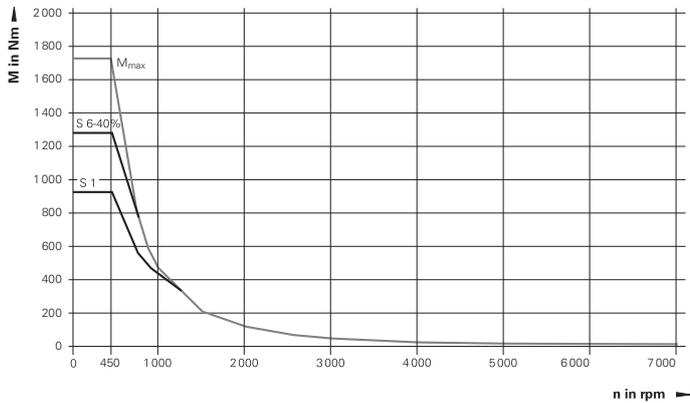
Wye connection

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

Power characteristic curve



Torque characteristic curve

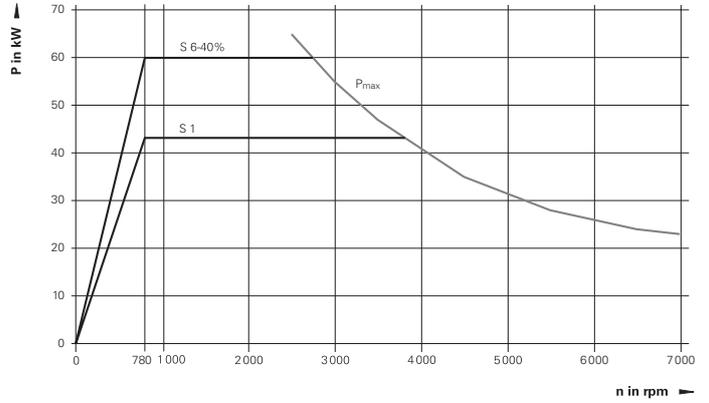


# QAN 360 UHW

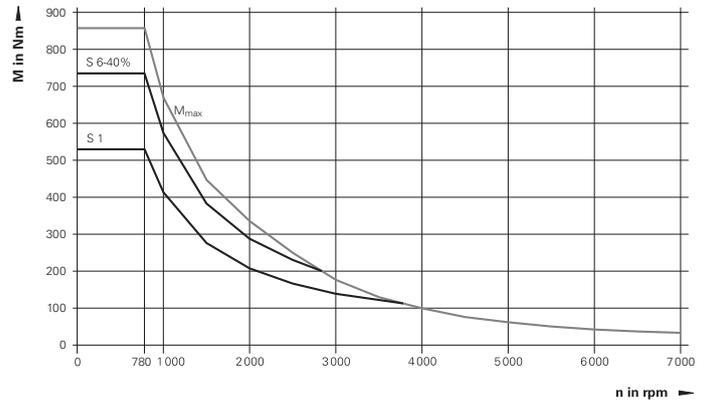
Delta connection

Duty cycle	Speed n	Power P	Torque M	Current I
<b>S1</b>	780 rpm	43.2 kW	529 Nm	124 A
	3500 rpm	43.2 kW	110 Nm	–
<b>S6-40%</b>	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 of up to 40 °C

	Cable without connectors	Bend radius R for frequent flexing	Cable type	Diameter
<b>Current load of 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 of 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 of 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 of 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 of 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 of up to 125.7 A (installation types C and E)</b>				
<b>Cable from inverter to switch box</b>	ID 1213903-xx	≥ 258 mm	PUR [4 x 35 mm <sup>2</sup> ]	34.3 mm
<b>Current load of up to 124.5 A (installation types C and E)</b>				
<b>QAN 360UHW<sup>1)</sup></b>	Recommended power cable: cable without connecting elements, 6 individual wires and each 35 mm <sup>2</sup> (unshielded) from the motor to the switch box			

*Italics:* shielded power cable

<sup>1)</sup> Connector set required (not included in delivery). For more information, see *M23 connector set* under *Accessories*.

#### 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 needed)	≥ 100 mm
	> 30 m	ID 289440-xx	ID 370226-01	ID 336847-xx	

## Cables for fans

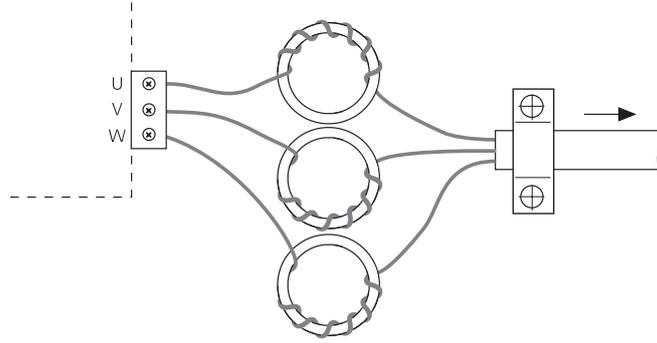
	Cable without connectors	Bend radius R for frequent flexing	Cable type	Diameter
<b>All QANs</b>	ID 818789-xx <i>ID 1213898-xx</i>	≥ 50 mm ≥ <i>82 mm</i>	PUR [4 x 0.75 mm <sup>2</sup> ]	9.9 mm <i>10.9 mm</i>

*Italics: shielded power cable*

# Accessories

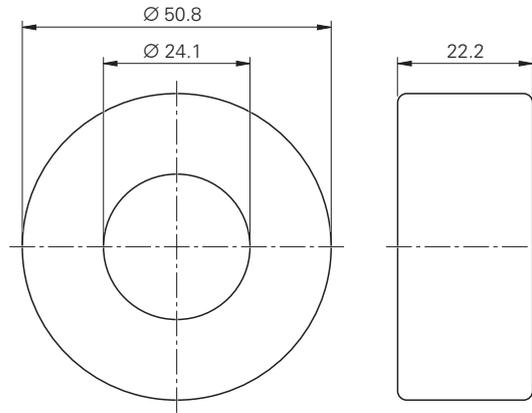
## Toroidal cores

Large line lengths can result in voltage peaks that may damage the motor. For cables longer than 15 m between the motor and the inverter, additional interference suppression measures may be necessary for 1xx inverter systems. 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

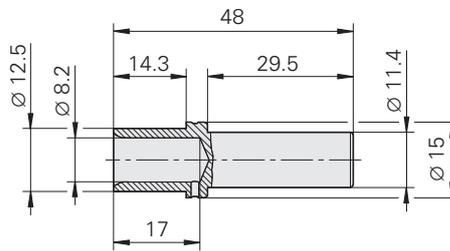


## M23 connector set

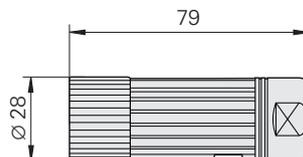
For crimping the 1-pin M23 connector for the motor connection, the connector set contains the following components:

- Six connectors
- Six female contacts
- Mounting Instructions

ID 1288941-01



Female contact



Connector

mm  
  
 Tolerancing ISO 8015  
 ISO 2768:1989-mH  
 ≤ 6 mm: ±0.2 mm

# Direct-drive torque motors

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 of up to 1290 mm
- Large hollow shaft of up to 1070 mm
- Maximum rated speed of up to 5170 rpm
- Peak torque of up to 31 200 Nm
- Very high continuous torque
- Field-weakening compliant
- With or without cage with coolant ducts
- 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-drive motors therefore offer excellent dynamic performance while guaranteeing a long service life.

The torque motors offer 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, thereby constituting a significant advantage with respect to precision that reacts negatively to thermal drift.

Further advantages of torque motors are:

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

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



Direct-drive torque motors



## Further information:

For more information about the torque motors from ETEL, visit [www.etel.ch](http://www.etel.ch)

# HEIDENHAIN

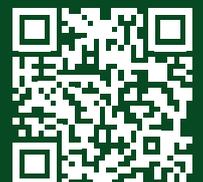
Mastering nanometer accuracy



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