

HEIDENHAIN



HEIDENHAIN Motors

for Axis and Spindle Drives

**Information for the
Machine Tool Builder**

September 2015



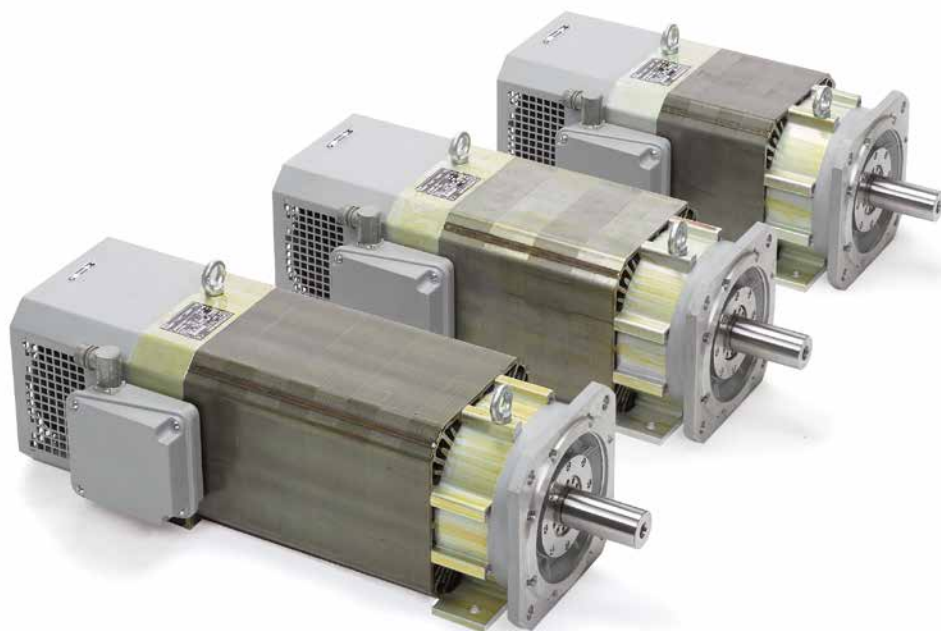
Synchronous motors for feed drives

Motors for axis and spindle drives

HEIDENHAIN supplies motors for axis and spindle drives as accessories to its controls with integrated inverter.

This brochure provides an overview of all the available motors and contains technical data and mating dimensions.

For commissioning, please request the *Inverter Systems and Motors* Technical Manual.



Asynchronous motors for spindles

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

Standards (ISO, EN, etc.) apply only where explicitly stated in the catalog.

Expendable parts

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

- Bearing
- Brakes
- Shaft sealing rings
- Fan

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Synchronous motors

QSY overview

General technical information

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

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

Specifications

The specifications and the 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, it is necessary to reduce the motor torque in order to avoid thermal overloading of the motor.

For motors with ECN 1313 or EQN 1325 absolute rotary encoders, the rated torque is reduced by 10 %.

Speed measurement

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

- ERN 1387 incremental rotary encoder or
- ECN 1313 absolute singleturn rotary encoder (only one motor revolution can be evaluated) or
- EQN 1325 absolute multiturn rotary encoder

Mechanical life

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

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 for QSY motors.

EcoDyn motors

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

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

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

Electronic ID label

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

Mechanical data

Design IM B5 (mounting via flange) according to EN 60 034-7

Mounting of the motor

The following screws are recommended for securing the motor:

QSY 55	M5
QSY 96	M6
QSY 116	M8
QSY 130	M8
QSY 155	M10
QSY 190	M12
QSY 260	M16

Flange: Dimensions as per DIN 42 948 and IEC 72

Protection as per EN 60 529

Motor: IP 65

Shaft exit: IP 64

Suitability with regard to gear drive

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

Vibration severity

Grade N as per IEC 60 034-14

Radial runout, concentricity and axial runout

Tolerance N as per IEC 60 072-1 (DIN 42 955)

Shaft end

Cylindrical **without keyway** as per IEC 72-1 and DIN 748-1 with centering hole as per ISO 866 BS 5 and thread

Upon request:

Shaft **with keyway** and feather key as per DIN 6885-1

- QSY 55: A 3 x 3 x 15
- QSY 96: A 6 x 6 x 32
- QSY 116: A 8 x 7 x 40
- QSY 130: A 8 x 7 x 40
- QSY 155: A 10 x 8 x 50
- QSY 190: A 10 x 8 x 70
- QSY 260: A 14 x 9 x 70

The motors with feather key are flush feather-key balanced as per DIN 6885-1.

Bearings free of maintenance

Holding brake optionally with low backlash $\leq 1^\circ$

Thermal specifications

Natural cooling

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

Thermal class F

Synchronous motors	Stall torque	Stall current	Rated speed	Recommended inverters ²⁾				Page
				1-axis module	2-axis module	Compact inverters/axis		
						UR 2xx D UE 2xx B	UE 1xx	
QSY 55C	0.4 Nm	1.6 A	6000 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	6
QSY 96A	1.5 Nm	1.5 A	4500 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	8
QSY 96G	5.2 Nm	5.2 A	4500 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	
QSY 116C	5.2 Nm	3.3 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	10
QSY 116E	7.2 Nm	4.8 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	4	
QSY 116J	10.0 Nm	6.8 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	4	
QSY 116J EcoDyn	10.0 Nm	5.0 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	4	
QSY 130C EcoDyn	6.0 Nm	3.0 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	12
QSY 130E EcoDyn	9.0 Nm	4.5 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	1 to 4	
QSY 155B	13.0 Nm	9.1 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	14
QSY 155C	17.7 Nm	11.8 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	
QSY 155D	21.6 Nm	14.6 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	
QSY 155F	26.1 Nm	18.0 A	3000 rpm	UM 112 D	UM 122 D	4 ¹⁾	–	
QSY 155B EcoDyn	13.0 Nm	6.5 A	3000 rpm	UM 111 D	UM 121 D	1 to 4	–	16
QSY 155C EcoDyn	17.7 Nm	8.5 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	
QSY 155D EcoDyn	21.6 Nm	10.6 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	
QSY 155F EcoDyn	26.1 Nm	12.8 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	
QSY 190C EcoDyn	28.0 Nm	14.0 A	3000 rpm	UM 111 BD	UM 121 BD	4	–	18
QSY 190D EcoDyn	38.0 Nm	18.1 A	3000 rpm	UM 112 D	UM 122 D	4 ¹⁾	–	
QSY 190F EcoDyn	47.6 Nm	22.7 A	3000 rpm	UM 112 D	UM 122 D	4 ¹⁾	–	
QSY 190K EcoDyn	62.5 Nm	29.8 A	3000 rpm	UM 113 D	–	–	–	
QSY 260B EcoDyn	85.0 Nm	31.0 A	2000 rpm	UM 114 D	–	–	–	20
QSY 260C EcoDyn	120 Nm	43.5 A	2000 rpm	UM 115 D	–	–	–	

¹⁾ Only UE 242B, UR 242D

²⁾ 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 55 series

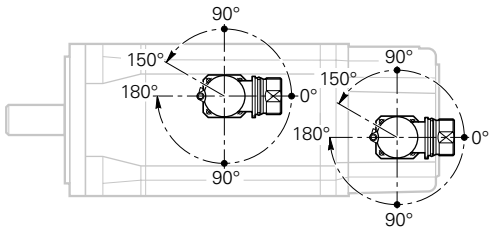
Feed motors with 3 pole pairs
 Stall torque 0.4 Nm
 With incremental rotary encoder



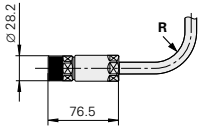
Motor	QSY 55 C	
Rated voltage U_N	110 V	
Rated power output P_N	0.2 kW	
Rated shaft speed n_N	6000 rpm	
Rated torque $M_N^{1)}$	0.33 Nm	
Rated current $I_N^{1)}$	1.4 A	
Stall torque $M_0^{1)}$	0.4 Nm	
Stall current $I_0^{1)}$	1.6 A	
Max. speed n_{max}	8000 rpm	
Max. torque $M_{max}^{2)}$	1.4 Nm	
Max. current $I_{max}^{2)}$	6.15 A	
Mass m	1.4 kg	1.6 kg
Rotor inertia J	0.190 kgcm ²	0.206 kgcm ²
Brake Rated voltage U_{Br} Rated current I_{Br} Holding torque M_{Br}	Without – – –	With 24 V DC 0.3 A 1.0 Nm
ID For motor with ERN 1185	524348-03	524348-04

1) At 100 K 2) Max. 200 ms

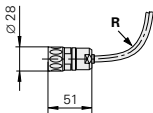
Rotatable connections



Power connector

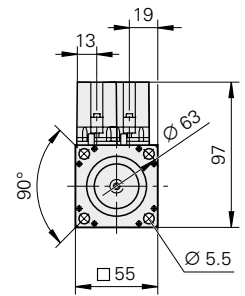
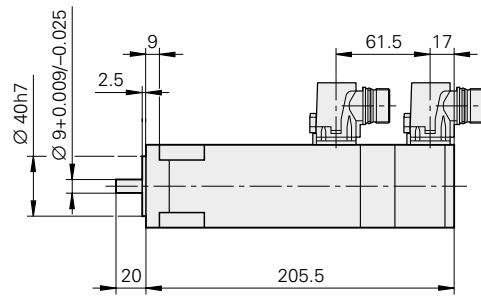
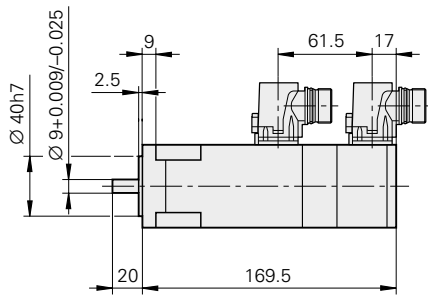


Encoder connector



For R, see page 26

QSY 55C Without brake



mm

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

Synchronous motors

QSY 96 series

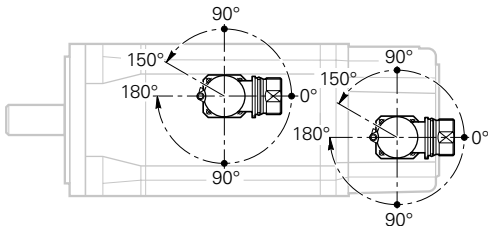
Feed motors with 3 pole pairs
Stall torque 1.5 Nm and 5.2 Nm
Choice of incremental or absolute rotary encoder



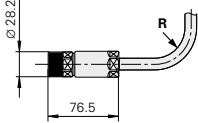
Motor	QSY 96A		QSY 96G	
Rated voltage U _N	310 V/308 V		291 V/290 V	
Rated power output P _N	0.5 kW/0.45 kW		1.4 kW/1.3 kW	
Rated shaft speed n _N	4500 rpm			
Rated torque M _N ¹⁾	1.05 Nm/0.95 Nm		3.0 Nm/2.7 Nm at 4 500 rpm	
Rated current I _N ¹⁾	1.1 A/1.0 A		3.3 A/3.0 A	
Stall torque M ₀ ¹⁾	1.5 Nm		5.2 Nm	
Stall current I ₀ ¹⁾	1.5 A		5.2 A	
Max. speed n _{max}	6000 rpm			
Max. torque M _{max} ²⁾	5.5 Nm		22 Nm	
Max. current I _{max} ²⁾	6.3 A		25.4 A	
Mass m	3.6 kg	4.5 kg	7.2 kg	8.1 kg
Rotor inertia J	1.8 kgcm ²	2.1 kgcm ²	6.3 kgcm ²	6.6 kgcm ²
Brake Rated voltage U _{Br} Rated current I _{Br} Holding torque M _{Br}	Without — — —	With 24 V DC 0.5 A 5.0 Nm	Without — — —	With 24 V DC 0.5 A 5.0 Nm
ID For motor with ERN 1387 For motor with ECN 1313 For motor with EQN 1325	344512-03 344512-83 344512-53	344512-04 344512-84 344512-54	339875-03 339875-83 339875-53	339875-04 339875-84 339875-54

¹⁾ At 100 K ²⁾ Max. 200 ms
In italics: Data for motors with ECN 1313 or EQN 1325 (rated torque reduced by 10 %)

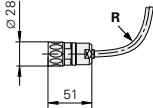
Rotatable connections



Power connector

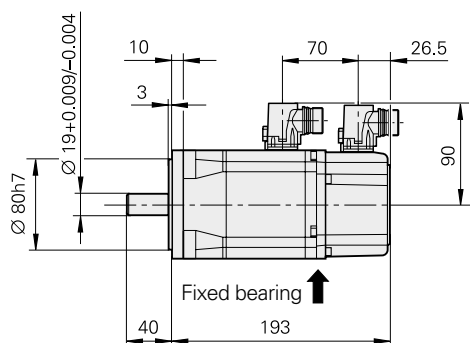


Encoder connector

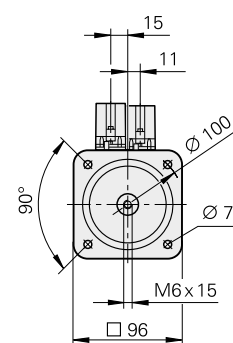
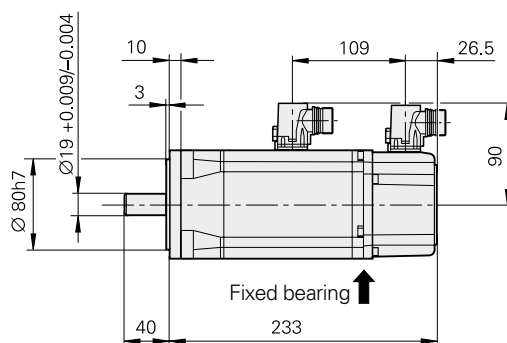


For R, see page 26

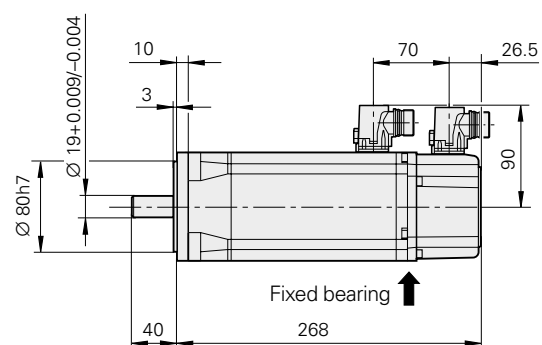
QSY 96A Without brake



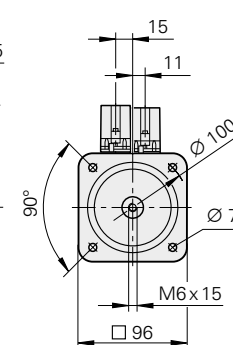
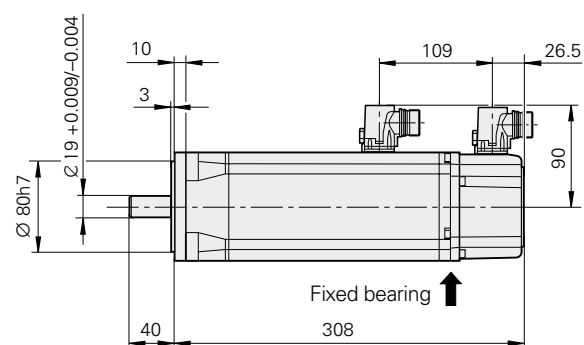
With brake



QSY 96G Without brake



With brake



mm

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

Synchronous motors

QSY 116 series

Feed motors with 3 pole pairs

Stall torque 5.2 Nm to 10 Nm

Choice of incremental or absolute rotary encoder

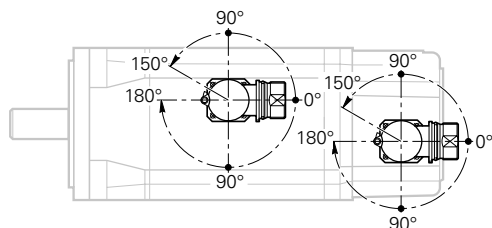


Motor	QSY 116C		QSY 116E		QSY 116J		QSY 116J EcoDyn	
Rated voltage U _N	315 V/311 V		302 V/299 V		290 V/288 V		408 V/405 V	
Rated power output P _N	1.45 kW/1.30 kW		1.85 kW/1.67 kW		2.42 kW/2.18 kW		2.64 kW/2.38 kW	
Rated shaft speed n _N	3000 rpm						3 000 rpm ³⁾	
Rated torque M _N ¹⁾	4.6 Nm/4.1 Nm		5.9 Nm/5.3 Nm		7.7 Nm/6.9 Nm		8.4 Nm/7.6 Nm	
Rated current I _N ¹⁾	3.3 A/3.0 A		4.1 A/3.7 A		5.4 A/4.8 A		4.3 A/3.9 A	
Stall torque M ₀ ¹⁾	5.2 Nm		7.2 Nm		10.0 Nm		10.0 Nm	
Stall current I ₀ ¹⁾	3.3 A		4.8 A		6.8 A		5.0 A	
Max. speed n _{max}	5400 rpm						4 200 rpm ³⁾	
Max. torque M _{max} ²⁾	16 Nm		25 Nm		41 Nm		41 Nm	
Max. current I _{max} ²⁾	12.7 A		19.0 A		32.6 A		23.0 A	
Mass m	6.9 kg	7.8 kg	8.6 kg	9.5 kg	12.0 kg	13.3 kg	12.0 kg	13.3 kg
Rotor inertia J	7.5 kgcm ²	7.9 kgcm ²	9.9 kgcm ²	10.3 kgcm ²	15.0 kgcm ²	15.4 kgcm ²	15.0 kgcm ²	15.4 kgcm ²
Brake Rated voltage U _{Br} Rated current I _{Br} Holding torque M _{Br}	Without – – –	With 24 V DC 0.6 A 13.5 Nm	Without – – –	With 24 V DC 0.6 A 13.5 Nm	Without – – –	With 24 V DC 0.85 A 13.5 Nm	Without – – –	With 24 V DC 0.85 A 13.5 Nm
ID For motor with ERN 1387 For motor with ECN 1313 For motor with EQN 1325	339876-03 339876-83 339876-53	339876-04 339876-84 339876-54	339877-03 339877-83 339877-53	339877-04 339877-84 339877-54	339878-03 – 339878-53	339878-04 – 339878-54	339878-13 339878-83 339878-63	339878-14 339878-84 339878-64

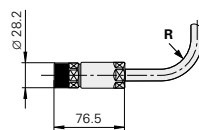
¹⁾ At 100 K ²⁾ Max. 200 ms ³⁾ In EcoDyn mode

In italics: Data for motors with ECN 1313 or EQN 1325 (rated torque reduced by 10 %)

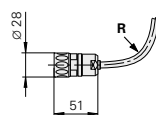
Rotatable connections



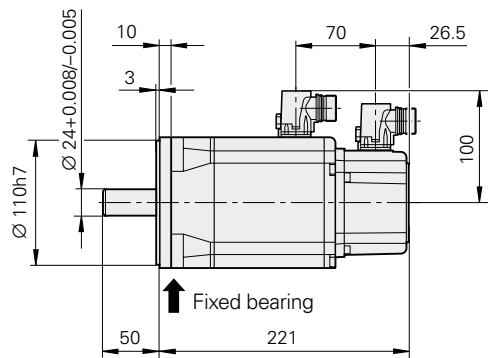
Power connector



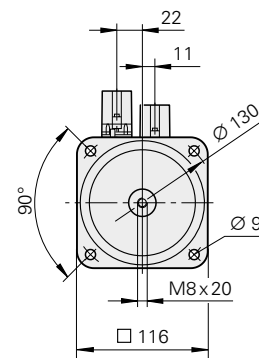
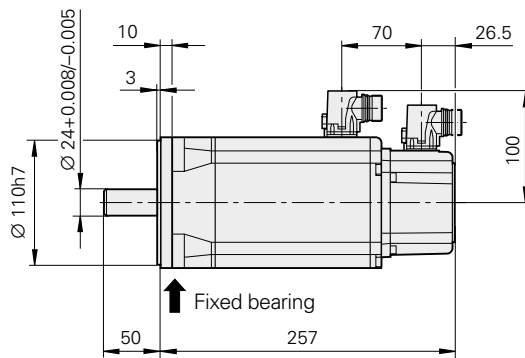
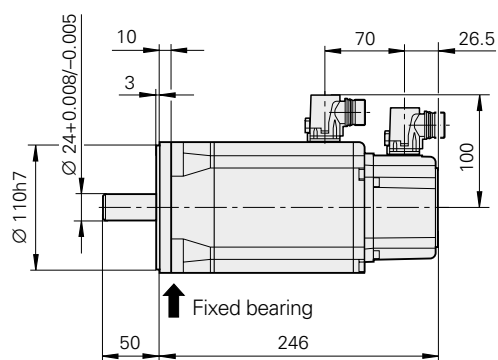
Encoder connector



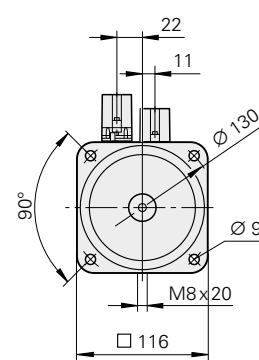
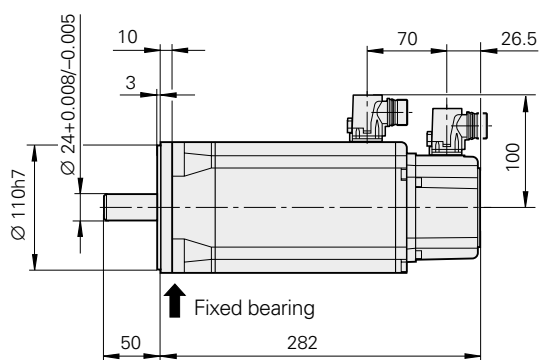
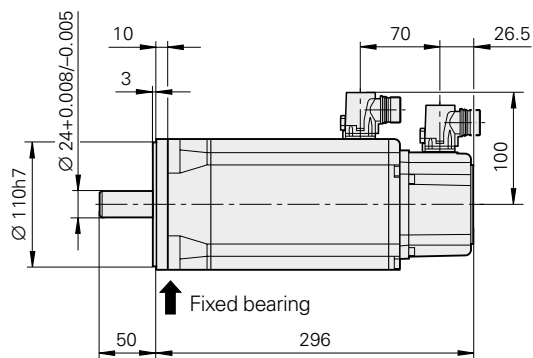
For R, see page 26

QSY 116C Without brake

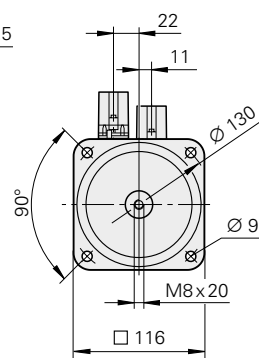
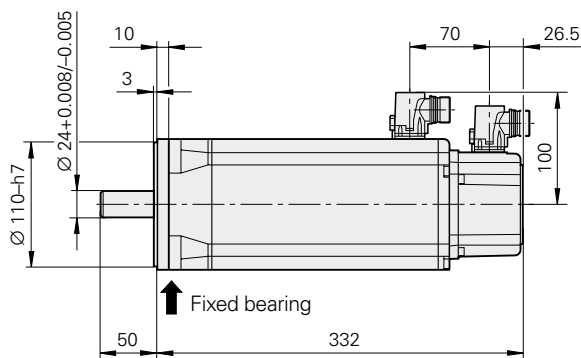
With brake

**QSY 116E** Without brake

With brake

**QSY 116J****QSY 116J EcoDyn** Without brake

With brake



mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ± 0.2 mm

Synchronous motors

QSY 130 EcoDyn series

Feed motors with 4 pole pairs
Stall torque 6 Nm and 9 Nm
Choice of incremental or absolute rotary encoder

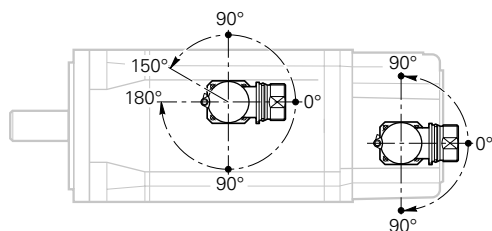


Motor	QSY 130C EcoDyn		QSY 130E EcoDyn	
Rated voltage U _N	415 V/411 V		407 V/403 V	
Rated power output P _N	1.6 kW/1.5 kW		2.3 kW/2.1 kW	
Rated shaft speed n _N	3 000 rpm (in EcoDyn mode)			
Rated torque M _N ¹⁾	5.2 Nm/4.7 Nm		7.4 Nm/6.7 Nm	
Rated current I _N ¹⁾	2.7 A/2.4 A		3.8 A/3.4 A	
Stall torque M ₀ ¹⁾	6.0 Nm		9.0 Nm	
Stall current I ₀ ¹⁾	3.0 A		4.5 A	
Max. speed n _{max}	4 200 rpm (in EcoDyn mode)			
Max. torque M _{max} ²⁾	16 Nm		23 Nm	
Max. current I _{max} ²⁾	8.6 A		12.7 A	
Mass m	7.9 kg	8.8 kg	9.7 kg	10.6 kg
Rotor inertia J	16.0 kgcm ²	16.4 kgcm ²	21.0 kgcm ²	21.4 kgcm ²
Brake Rated voltage U _{Br} Rated current I _{Br} Holding torque M _{Br}	Without — — —	With 24 V DC 0.6 A 13.5 Nm	Without — — —	With 24 V DC 0.6 A 13.5 Nm
ID For motor with ERN 1387 For motor with ECN 1313 For motor with EQN 1325	389053-13 389053-83 389053-63	389053-14 389053-84 389053-64	388422-13 388422-83 388422-63	388422-14 388422-84 388422-64

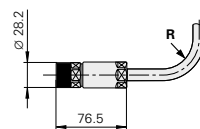
¹⁾ At 100 K ²⁾ Max. 200 ms

In italics: Data for motors with ECN 1313 or EQN 1325 (rated torque reduced by 10 %)

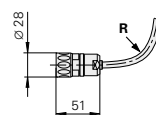
Rotatable connections



Power connector

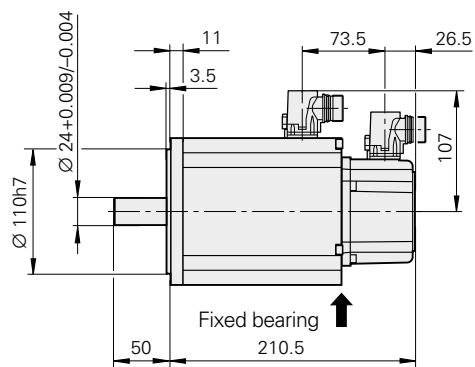


Encoder connector

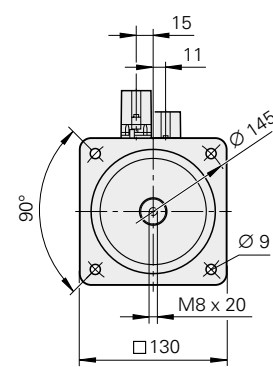
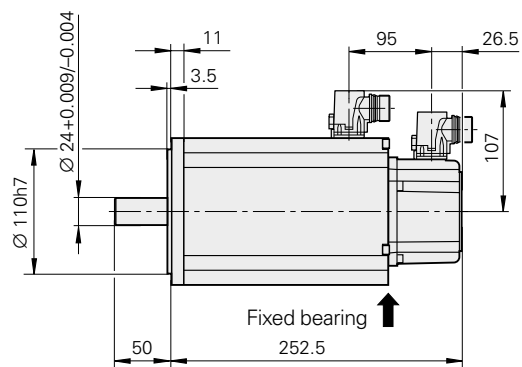


For R, see page 26

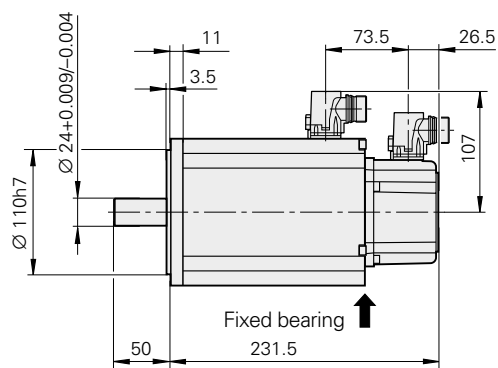
QSY 130C Without brake



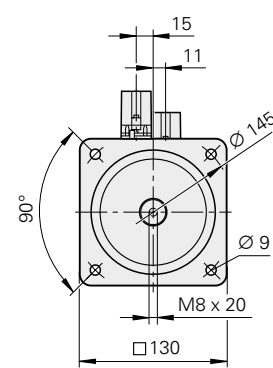
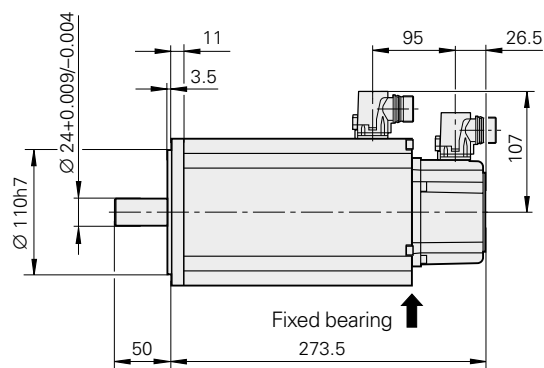
With brake



QSY 130E Without brake



With brake



mm

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

Synchronous motors

QSY 155 series

Feed motors with 4 pole pairs

Stall torque 13 Nm to 26.1 Nm

Choice of incremental or absolute rotary encoder

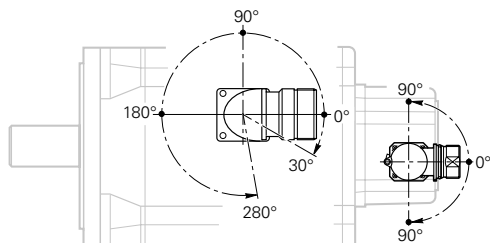


Motor	QSY 155B		QSY 155C		QSY 155D		QSY 155F	
Rated voltage U _N	298 V/295 V		294 V/291 V		293 V/291 V		289 V/287 V	
Rated power output P _N	2.9 kW/2.6 kW		3.9 kW/3.5 kW		4.6 kW/4.1 kW		5.2 kW/4.7 kW	
Rated shaft speed n _N	3000 rpm							
Rated torque M _N ¹⁾	9.2 Nm/8.3 Nm		12.5 Nm/11.3 Nm		14.8 Nm/13.3 Nm		16.7 Nm/15.0 Nm	
Rated current I _N ¹⁾	6.9 A/6.2 A		8.7 A/7.8 A		10.6 A/9.5 A		12.0 A/10.8 A	
Stall torque M ₀ ¹⁾	13.0 Nm		17.7 Nm		21.6 Nm		26.1 Nm	
Stall current I ₀ ¹⁾	9.1 A		11.8 A		14.6 A		18.0 A	
Max. speed n _{max}	5000 rpm							
Max. torque M _{max} ²⁾	39 Nm		52 Nm		64 Nm		90 Nm	
Max. current I _{max} ²⁾	29.7 A		38.9 A		49.5 A		68.6 A	
Mass m	15.0 kg	18.0 kg	17.5 kg	20.5 kg	20.0 kg	23.0 kg	25.0 kg	28.0 kg
Rotor inertia J	33 kgcm ²	35 kgcm ²	43 kgcm ²	45 kgcm ²	54 kgcm ²	56 kgcm ²	75 kgcm ²	77 kgcm ²
Brake Rated voltage U _{Br} Rated current I _{Br} Holding torque M _{Br}	Without – – –	With 24 V DC 1.04 A 40 Nm	Without – – –	With 24 V DC 1.04 A 40 Nm	Without – – –	With 24 V DC 1.04 A 40 Nm	Without – – –	With 24 V DC 1.04 A 40 Nm
ID For motor with ERN 1387 For motor with EQN 1325	339880-03 339880-53	339880-04 339880-54	365308-03 365308-53	365308-04 365308-54	339881-03 339881-53	339881-04 339881-54	339882-03 339882-53	339882-04 339882-54

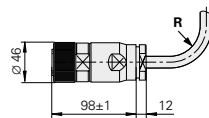
¹⁾ At 100 K ²⁾ Max. 200 ms

In italics: Data for motors with EQN 1325 (rated torque reduced by 10 %)

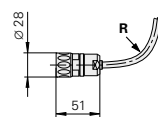
Rotatable connections



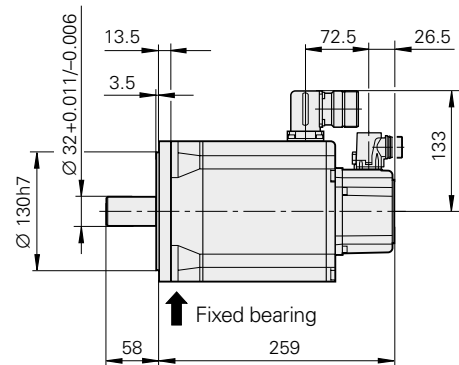
Power connector



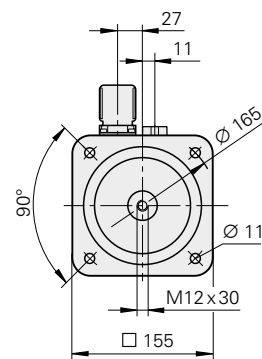
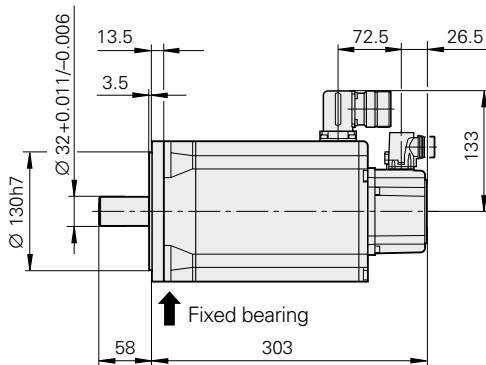
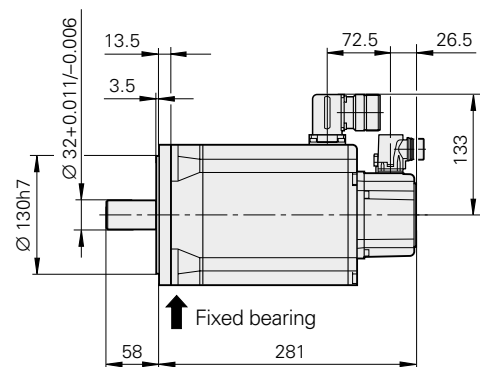
Encoder connector



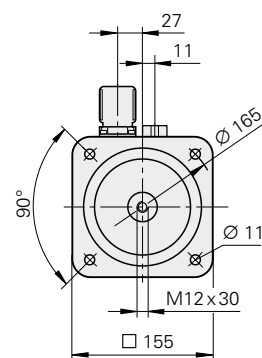
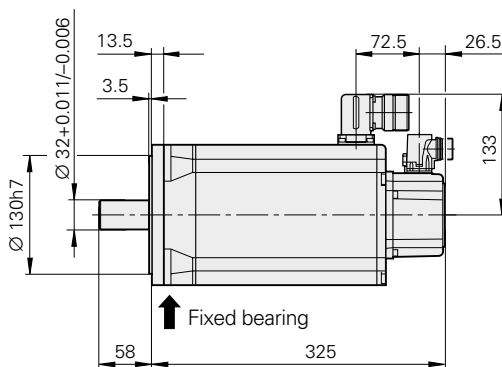
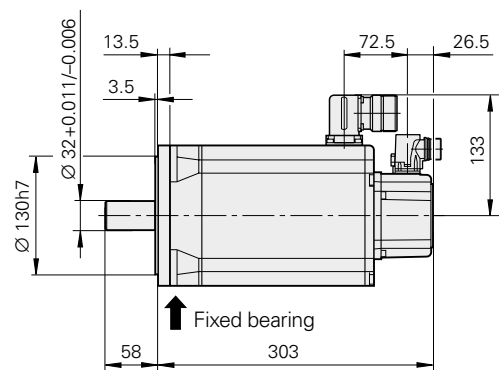
For R, see page 26

QSY 155B Without brake

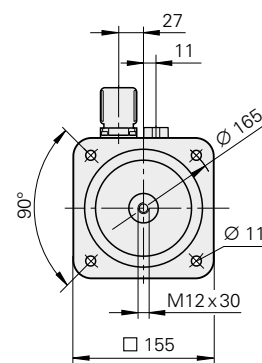
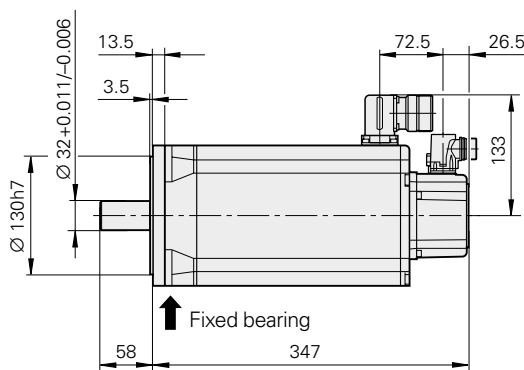
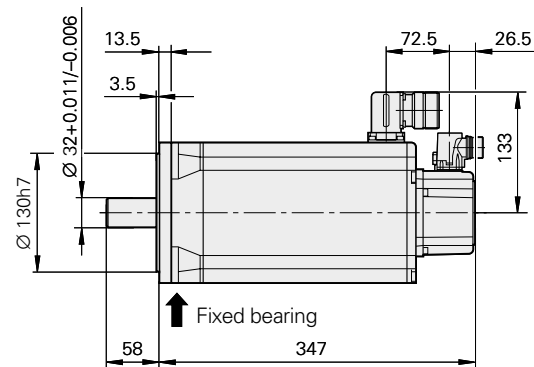
With brake

**QSY 155C** Without brake

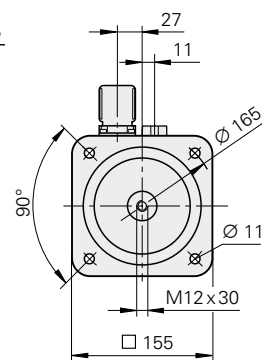
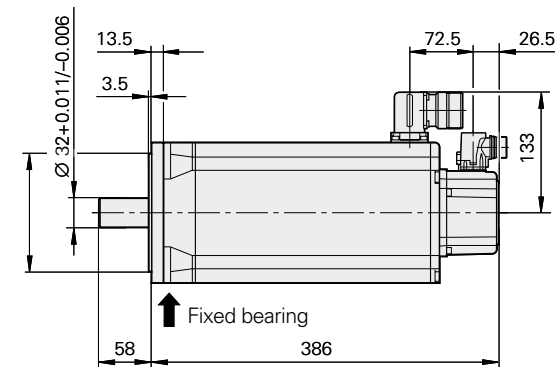
With brake

**QSY 155D** Without brake

With brake

**QSY 155F** Without brake

With brake



mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ± 0.2 mm

Synchronous motors

QSY 155 EcoDyn series

Feed motors with 4 pole pairs
Stall torque 13 Nm to 26.1 Nm
Choice of incremental or absolute rotary encoder

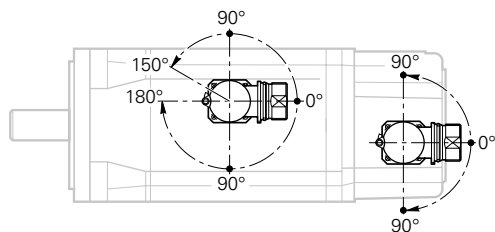


Motor	QSY 155B EcoDyn		QSY 155C EcoDyn		QSY 155D EcoDyn		QSY 155F EcoDyn	
Rated voltage U _N	417 V/412 V		420 V/415 V		412 V/407 V		399 V/397 V	
Rated power output P _N	3.5 kW/3.1 kW		5.0 kW/4.5 kW		5.7 kW/5.1 kW		6.0 kW/5.4 kW	
Rated shaft speed n _N	3 000 rpm (in EcoDyn mode)							
Rated torque M _N ¹⁾	11.0 Nm/9.9 Nm		16.0 Nm/14.4 Nm		18.1 Nm/16.3 Nm		19.2 Nm/17.3 Nm	
Rated current I _N ¹⁾	5.6 A/5.0 A		8.2 A/7.4 A		9.1 A/8.2 A		9.8 A/8.8 A	
Stall torque M ₀ ¹⁾	13.0 Nm		17.7 Nm		21.6 Nm		26.1 Nm	
Stall current I ₀ ¹⁾	6.5 A		8.5 A		10.6 A		12.8 A	
Max. speed n _{max}	4 200 rpm (in EcoDyn mode)							
Max. torque M _{max} ²⁾	39 Nm		52 Nm		64 Nm		90 Nm	
Max. current I _{max} ²⁾	21.2 A		27.6 A		35.0 A		49.5 A	
Mass m	15.0 kg	18.0 kg	17.5 kg	20.5 kg	20.0 kg	23.0 kg	25.0 kg	28.0 kg
Rotor inertia J	33 kgcm ²	35 kgcm ²	43 kgcm ²	45 kgcm ²	54 kgcm ²	56 kgcm ²	75 kgcm ²	77 kgcm ²
Brake Rated voltage U _{Br} Rated current I _{Br} Holding torque M _{Br}	Without – – –	With 24 V DC 1.04 A 40 Nm	Without – – –	With 24 V DC 1.04 A 40 Nm	Without – – –	With 24 V DC 1.04 A 40 Nm	Without – – –	With 24 V DC 1.04 A 40 Nm
ID For motor with ERN 1387 For motor with ECN 1313 For motor with EQN 1325	339880-13 339880-83 339880-63	339880-14 339880-84 339880-64	365308-13 365308-83 365308-63	365308-14 365308-84 365308-64	339881-13 339881-83 339881-63	339881-14 339881-84 339881-64	339882-13 339882-83 339882-63	339882-14 339882-84 339882-64

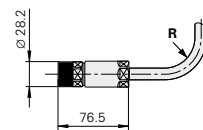
¹⁾ At 100 K ²⁾ Max. 200 ms

In italics: Data for motors with ECN 1313 or EQN 1325 (rated torque reduced by 10 %)

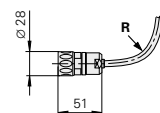
Rotatable connections



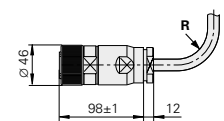
Power connector for QSY 155B/C/D EcoDyn



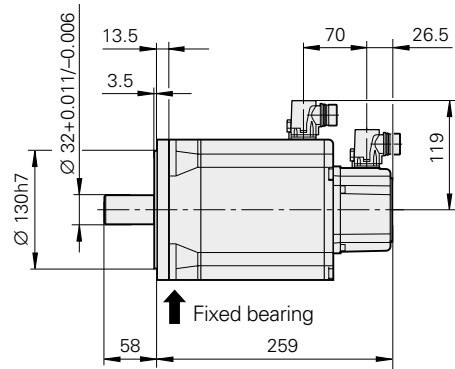
Encoder connector



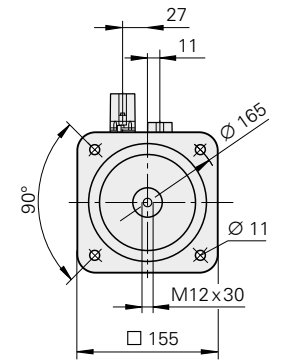
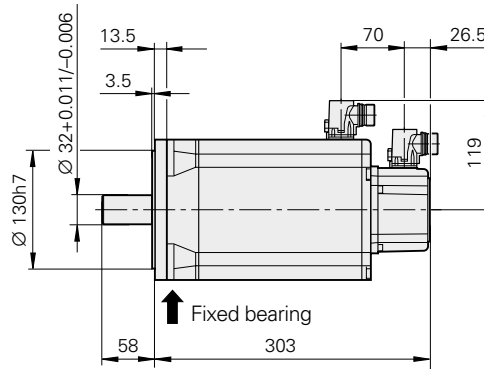
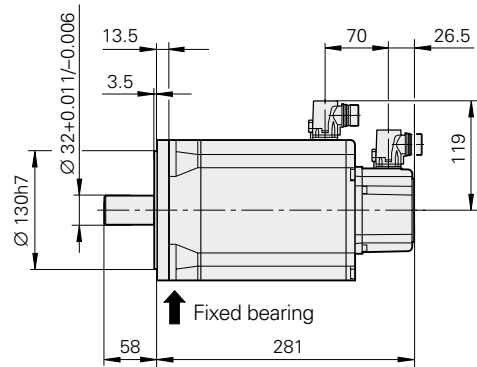
Power connector for QSY 155F EcoDyn



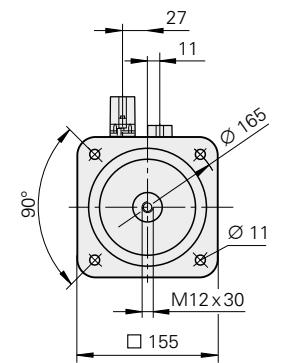
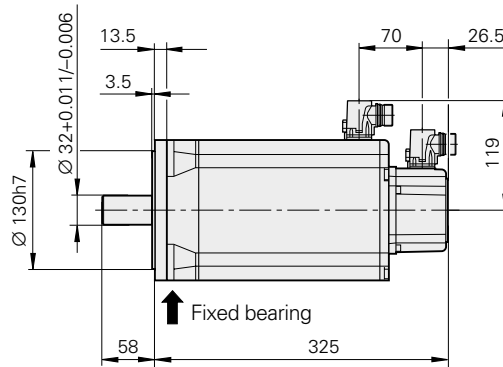
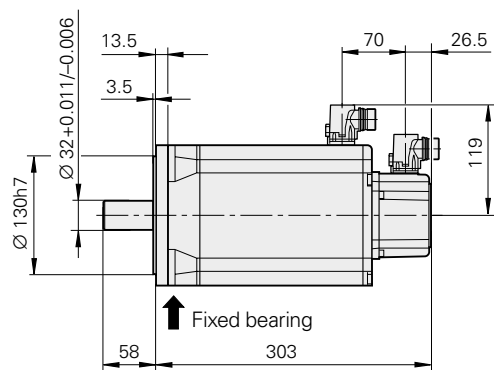
For R, see page 26

QSY 155B EcoDyn Without brake

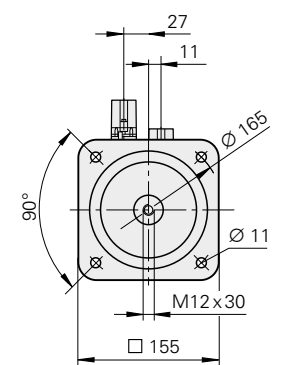
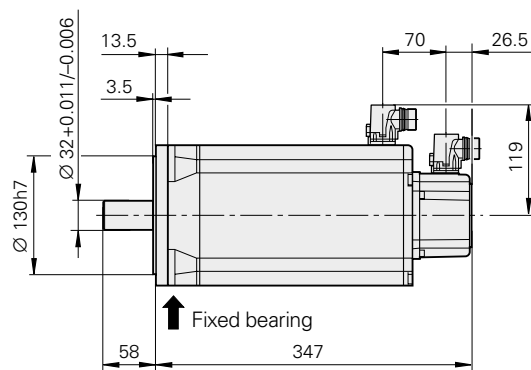
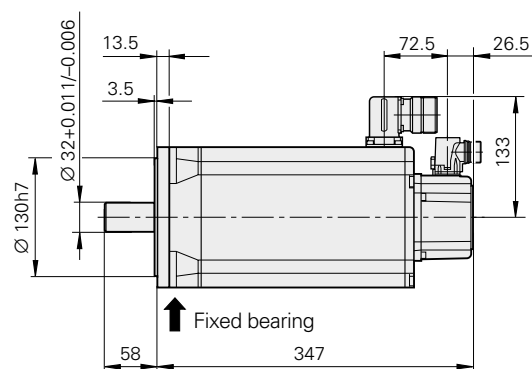
With brake

**QSY 155C EcoDyn** Without brake

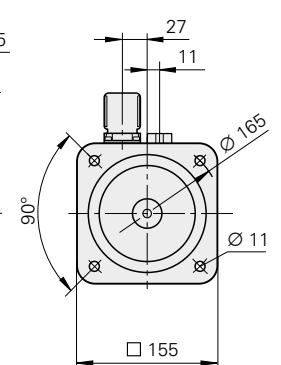
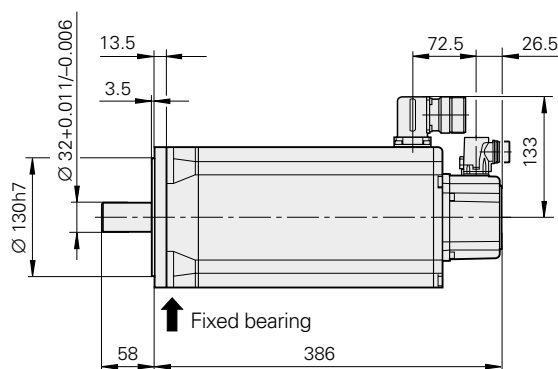
With brake

**QSY 155D EcoDyn** Without brake

With brake

**QSY 155F EcoDyn** Without brake

With brake



mm

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

Synchronous motors

QSY 190 EcoDyn series

Feed motors with 4 pole pairs
Stall torque 28 Nm to 62.5 Nm
Choice of incremental or absolute rotary encoder

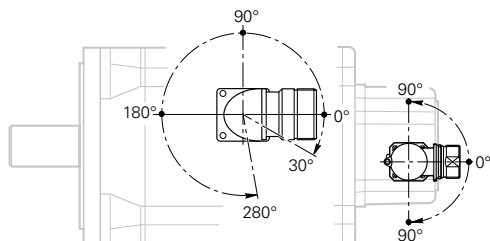


Motor	QSY 190C EcoDyn		QSY 190D EcoDyn		QSY 190F EcoDyn		QSY 190K EcoDyn	
Rated voltage U_N	427 V/420 V		421 V/412 V		408 V/404 V		399 V/396 V	
Rated power output P_N	7.2 kW/6.5 kW		9.6 kW/8.6 kW		9.9 kW/8.9 kW		12.2 kW/11.0 kW	
Rated shaft speed n_N	3 000 rpm (in EcoDyn mode)							
Rated torque M_N¹⁾	23.0 Nm/20.7 Nm		30.6 Nm/27.5 Nm		31.5 Nm/28.4 Nm		39.0 Nm/35.1 Nm	
Rated current I_N¹⁾	11.8 A/10.6 A		14.4 A/13.0 A		15.0 A/13.5 A		20.2 A/18.2 A	
Stall torque M₀¹⁾	28.0 Nm		38.0 Nm		47.6 Nm		62.5 Nm	
Stall current I₀¹⁾	14.0 A		18.1 A		22.7 A		29.8 A	
Max. speed n_{max}	3 900 rpm (in EcoDyn mode)							
Max. torque M_{max}²⁾	85 Nm		107 Nm		150 Nm		240 Nm	
Max. current I_{max}²⁾	50.2 A		62.9 A		88.4 A		134.3 A	
Mass m	29.0 kg	37.0 kg	33.5 kg	41.5 kg	42.5 kg	50.5 kg	61 kg	69.0 kg
Rotor inertia J	106 kgcm ²	115 kgcm ²	133 kgcm ²	142 kgcm ²	190 kgcm ²	199 kgcm ²	290 kgcm ²	299 kgcm ²
Brake Rated voltage U _{Br} Rated current I _{Br} Holding torque M _{Br}	Without – – –	With 24 V DC 1.38 A 70 Nm	Without – – –	With 24 V DC 1.38 A 70 Nm	Without – – –	With 24 V DC 1.38 A 70 Nm	Without – – –	With 24 V DC 1.38 A 70 Nm
ID For motor with ERN 1387 For motor with ECN 1313 For motor with EQN 1325	392023-13 392023-83 392023-63	392023-14 392023-84 392023-64	392024-13 392024-83 392024-63	392024-14 392024-84 392024-64	388244-13 388244-83 388244-63	388244-14 388244-84 388244-64	392025-13 392025-83 392025-63	392025-14 392025-84 392025-64

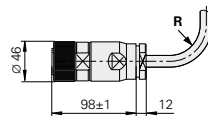
¹⁾ At 100 K ²⁾ Max. 200 ms

In italics: Data for motors with ECN 1313 or EQN 1325 (rated torque reduced by 10 %)

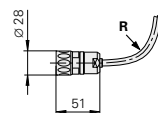
Rotatable connections



Power connector

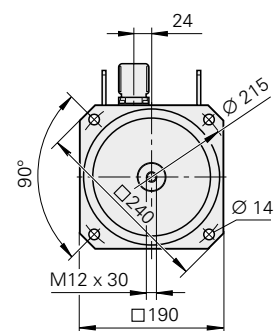
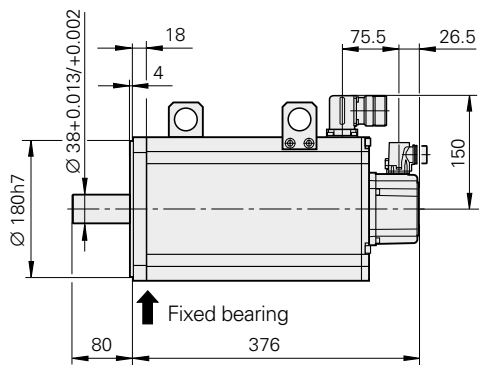


Encoder connector

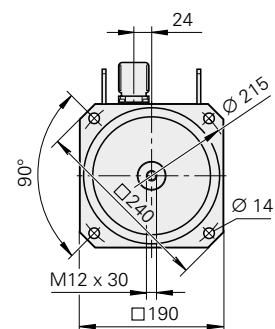
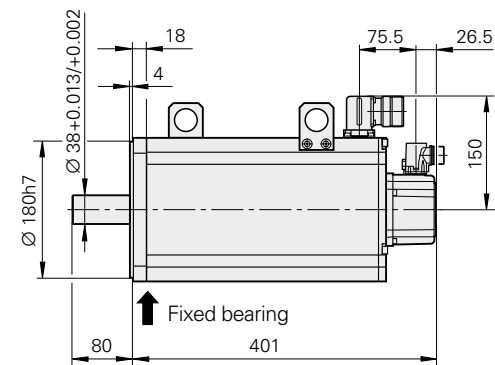


For R, see page 26

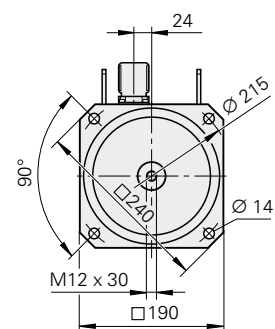
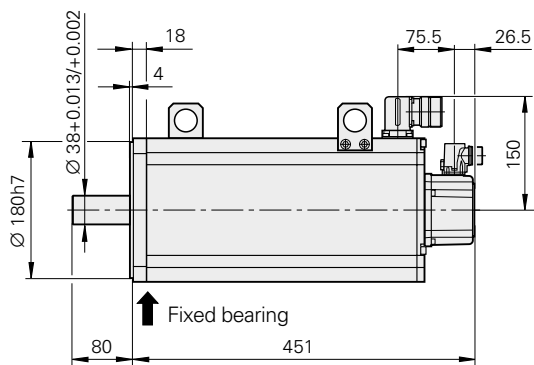
With brake



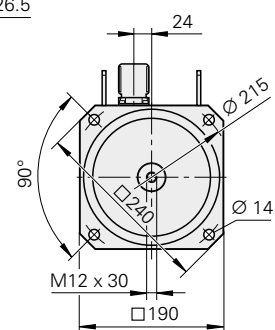
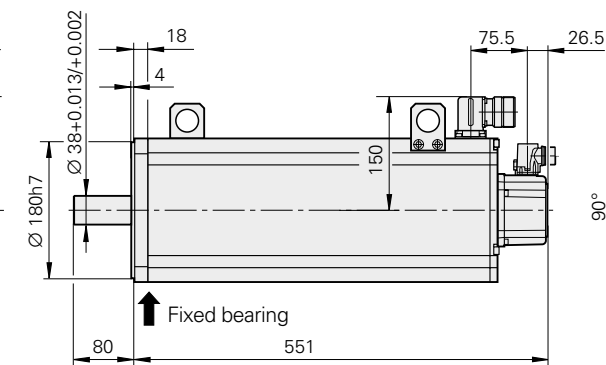
With brake



With brake



With brake



mm

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

Synchronous motors

QSY 260 EcoDyn series

Feed motors with 4 pole pairs
Stall torque 85 Nm to 120 Nm
Choice of incremental or absolute rotary encoder

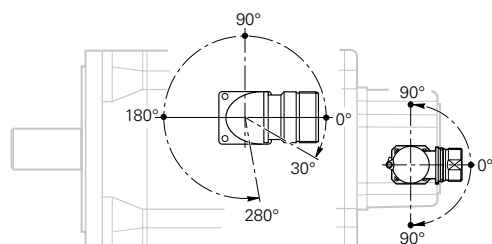


Motor	QSY 260B EcoDyn		QSY 260C EcoDyn	
Rated voltage U_N	352 V/350 V		376 V/373 V	
Rated power output P_N	12.0 kW/10.8 kW		16.0 kW/14.4 kW	
Rated shaft speed n_N	2 000 rpm (in EcoDyn mode)			
Rated torque $M_N^{1)}$	57.3 Nm/51.6 Nm		76.4 Nm/68.8 Nm	
Rated current $I_N^{1)}$	21.5 A/19.4 A		28 A/25.2 A	
Stall torque $M_0^{1)}$	85.0 Nm		120.0 Nm	
Stall current $I_0^{1)}$	31.0 A		43.5 A	
Max. speed n_{max}	3 000 rpm (in EcoDyn mode)			
Max. torque $M_{max}^{2)}$	250 Nm		360 Nm	
Max. current $I_{max}^{2)}$	130.0 A		173.0 A	
Mass m	62.0 kg	75.0 kg	74.0 kg	87.0 kg
Rotor inertia J	357.0 kgcm ²	368.0 kgcm ²	538.0 kgcm ²	557.0 kgcm ²
Brake Rated voltage U_{Br} Rated current I_{Br} Holding torque M_{Br}	Without — — —	With 24 V DC 2.05 A 110 Nm	Without — — —	With 24 V DC 2.05 A 125 Nm
ID For motor with ERN 1387 For motor with EQN 1325	1110623-13 1110623-63	1110623-14 1110623-64	1100242-13 1100242-63	1100242-14 1100242-64

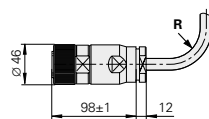
¹⁾ At 100 K ²⁾ Max. 200 ms

In italics: Data for motors with EQN 1325 (rated torque reduced by 10 %)

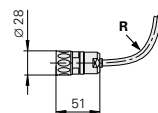
Rotatable connections



Power connector

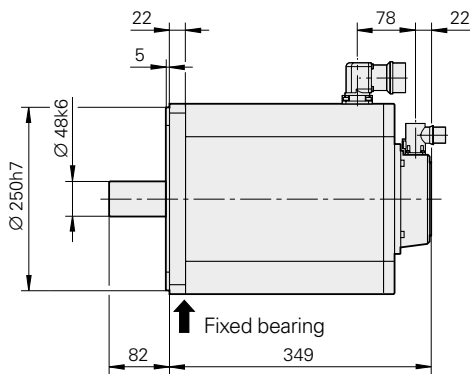


Encoder connector

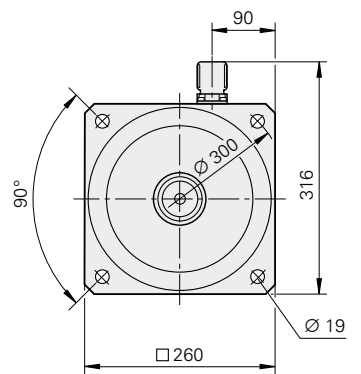
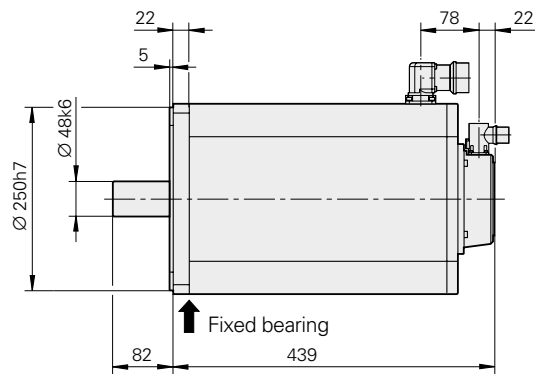


For R, see page 26

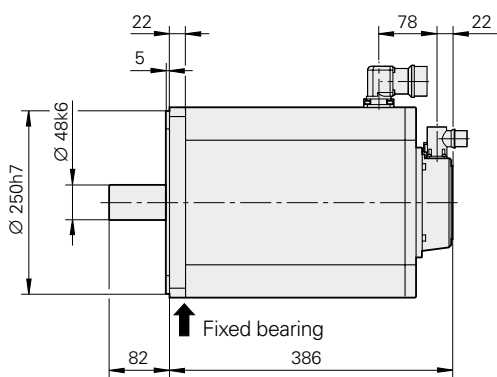
QSY 260B Without brake



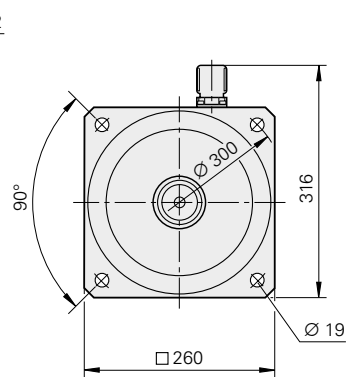
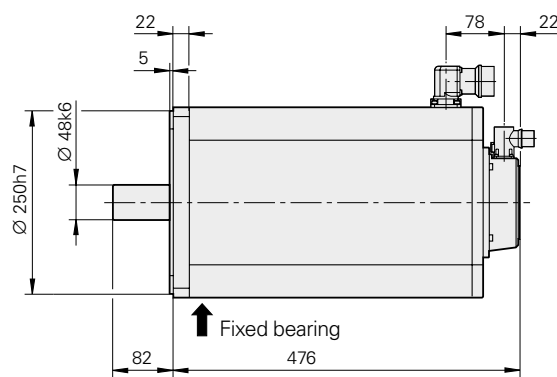
With brake



QSY 260C Without brake



With brake



mm

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

Synchronous motors

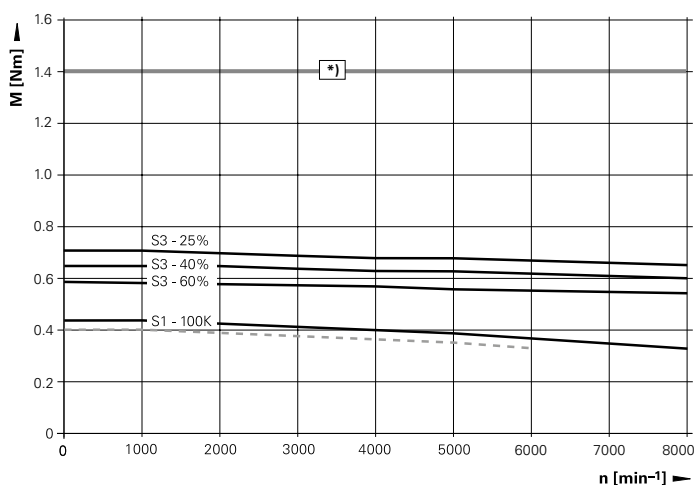
Torque characteristics

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

*) Characteristic curve at maximum motor current
 **) Characteristic curve when using compact inverters

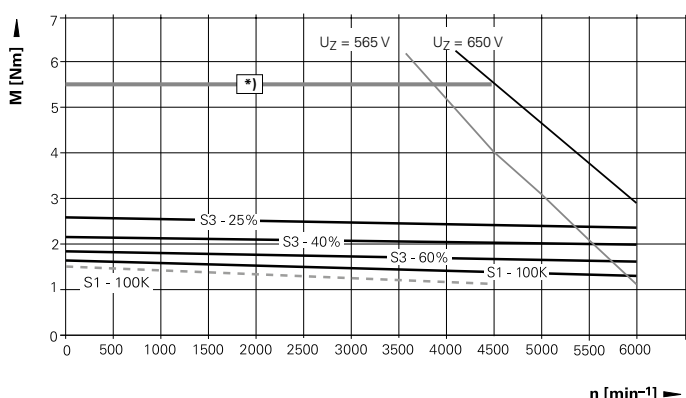
QSY 55C

*) $M_{\max} = 1.4 \text{ Nm}$ at $I_{\max} = 6.15 \text{ A}_{\text{eff}}$



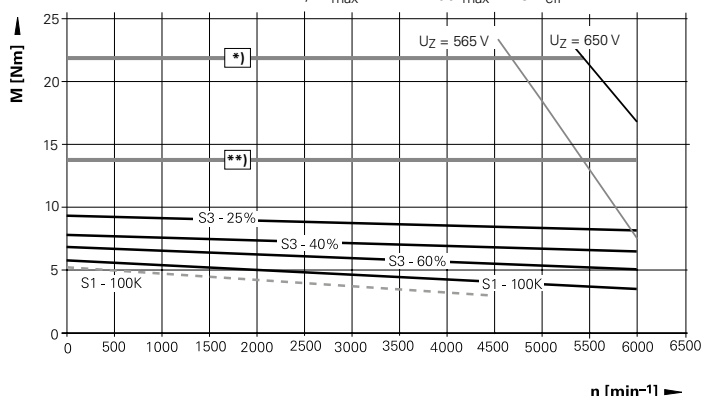
QSY 96A

*) $M_{\max} = 5.5 \text{ Nm}$ at $I_{\max} = 6.3 \text{ A}_{\text{eff}}$



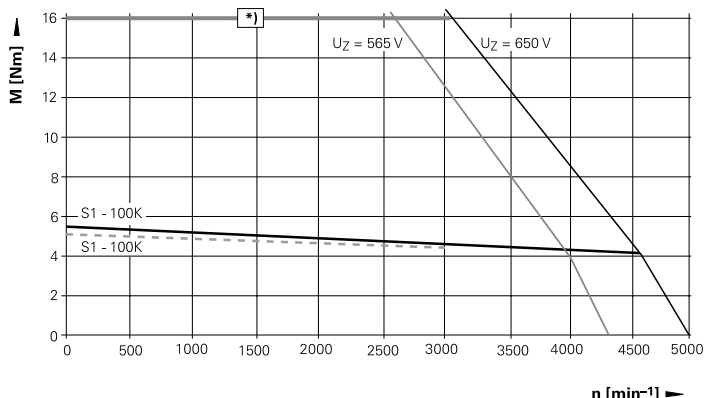
QSY 96G

*) $M_{\max} = 22 \text{ Nm}$ at $I_{\max} = 25.4 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 14 \text{ Nm}$ at $I_{\max} = 15 \text{ A}_{\text{eff}}$



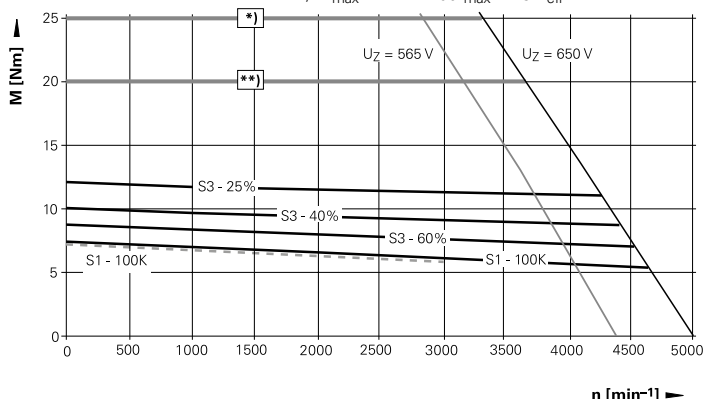
QSY 116C

*) $M_{\max} = 16 \text{ Nm}$ at $I_{\max} = 12.7 \text{ A}_{\text{eff}}$



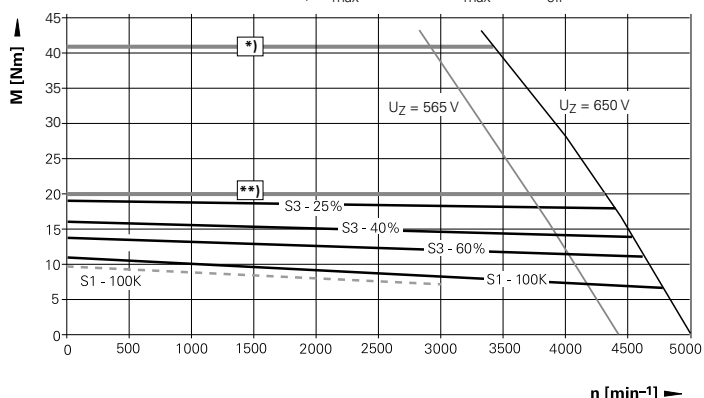
QSY 116E

*) $M_{\max} = 25 \text{ Nm}$ at $I_{\max} = 19 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 21 \text{ Nm}$ at $I_{\max} = 15 \text{ A}_{\text{eff}}$



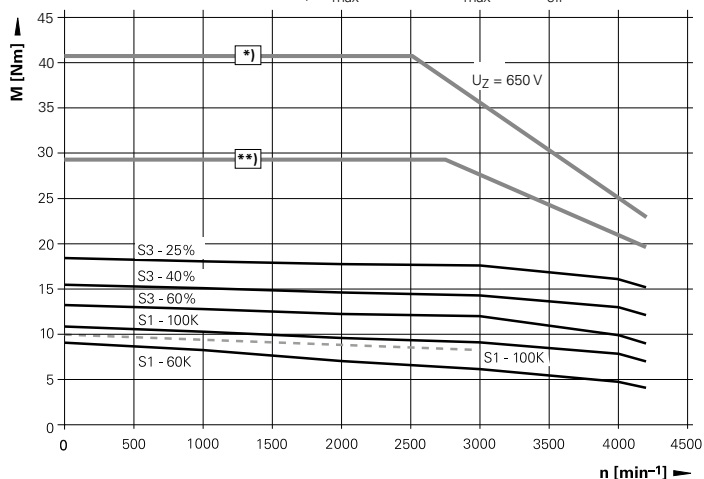
QSY 116J

*) $M_{\max} = 41 \text{ Nm}$ at $I_{\max} = 32.6 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 21 \text{ Nm}$ at $I_{\max} = 15 \text{ A}_{\text{eff}}$



QSY 116J EcoDyn

*) $M_{\max} = 41 \text{ Nm}$ at $I_{\max} = 23 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 29 \text{ Nm}$ at $I_{\max} = 15 \text{ A}_{\text{eff}}$

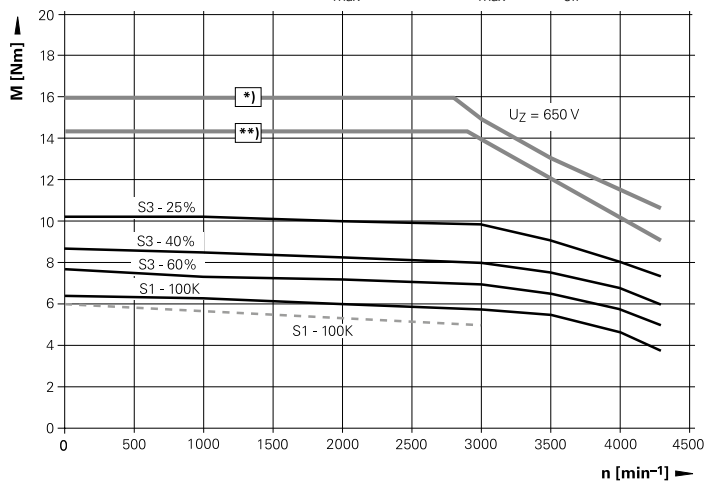


Notes

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

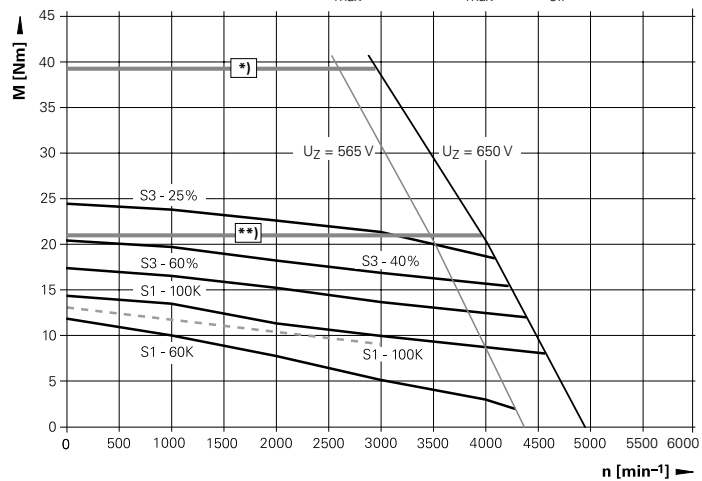
QSY 130C EcoDyn

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



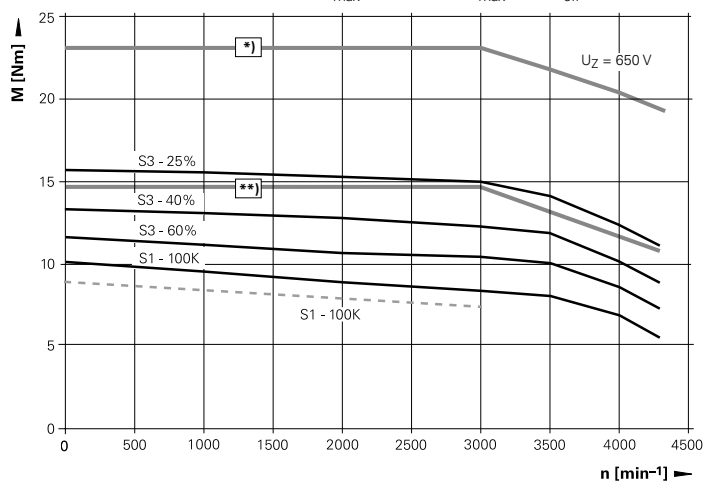
QSY 155B

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



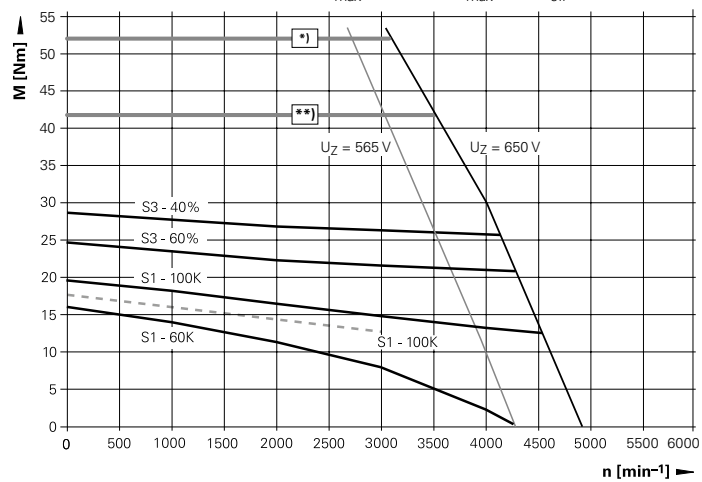
QSY 130E EcoDyn

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



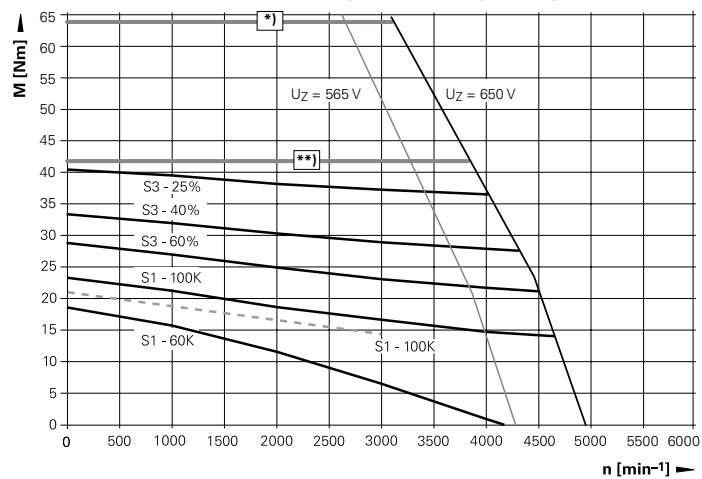
QSY 155C

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



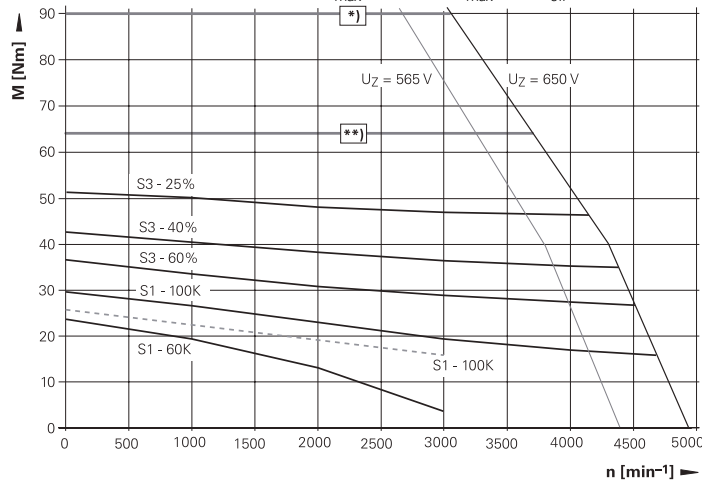
QSY 155D

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

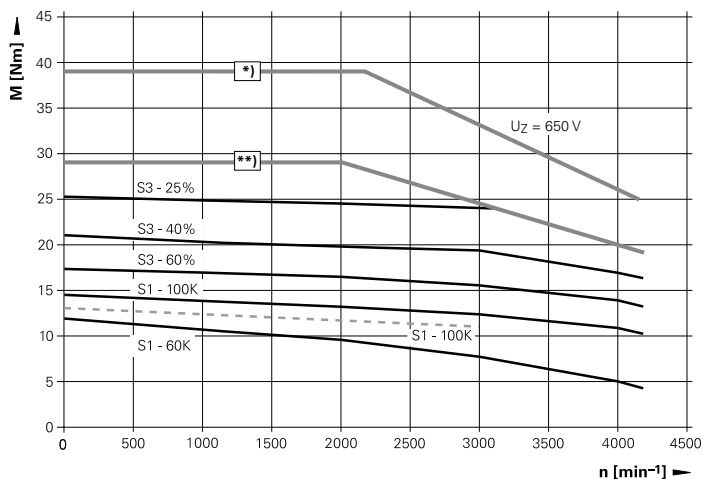


QSY 155F

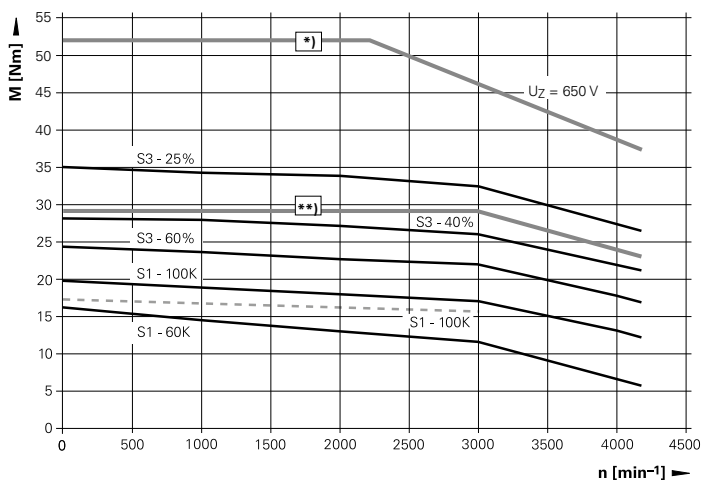
*) $M_{\max} = 90 \text{ Nm}$ at $I_{\max} = 68.6 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 64 \text{ Nm}$ at $I_{\max} = 46 \text{ A}_{\text{eff}}$



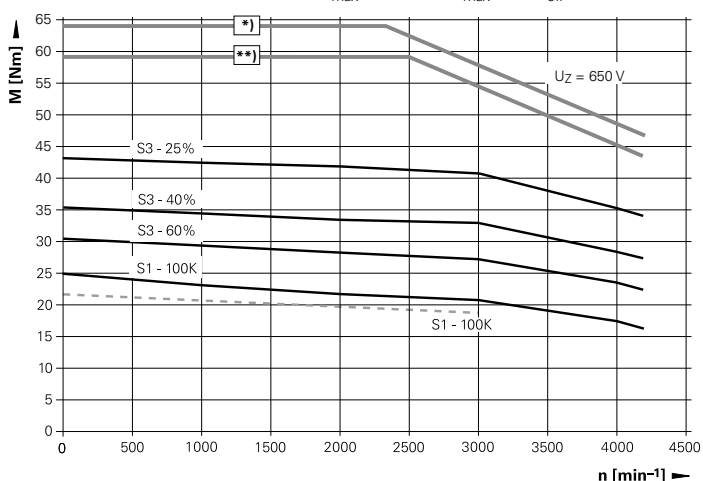
*) $M_{\max} = 39 \text{ Nm}$ at $I_{\max} = 21.2 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 29 \text{ Nm}$ at $I_{\max} = 15 \text{ A}_{\text{eff}}$



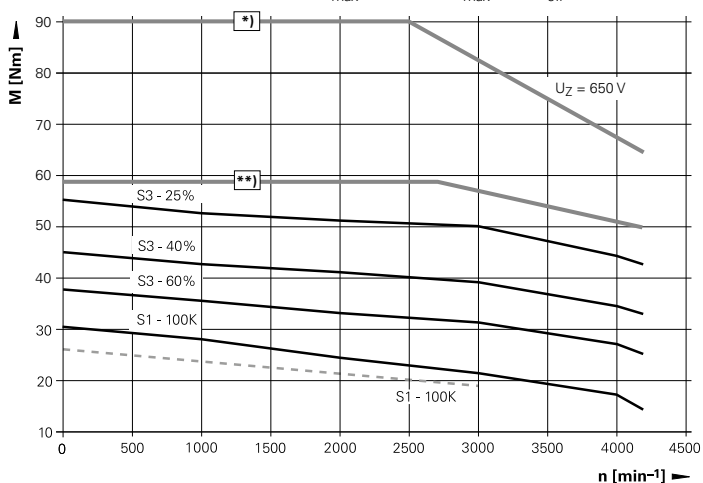
*) $M_{\max} = 52 \text{ Nm}$ at $I_{\max} = 27.6 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 29 \text{ Nm}$ at $I_{\max} = 15 \text{ A}_{\text{eff}}$



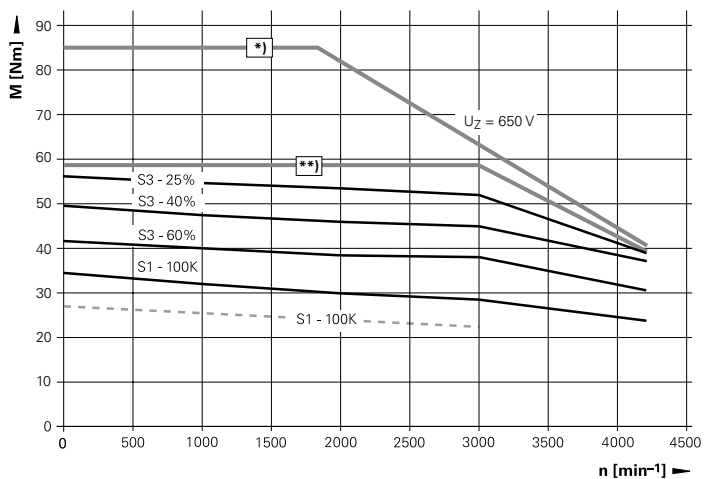
*) $M_{\max} = 64 \text{ Nm}$ at $I_{\max} = 35 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 59 \text{ Nm}$ at $I_{\max} = 30 \text{ A}_{\text{eff}}$



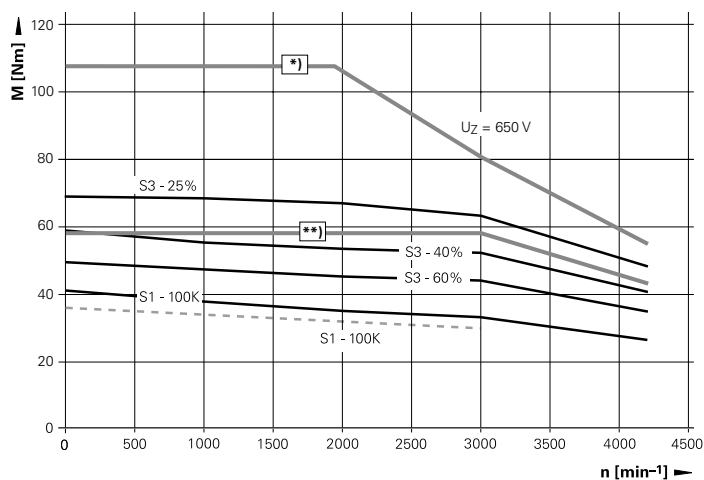
*) $M_{\max} = 90 \text{ Nm}$ at $I_{\max} = 49.5 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 59 \text{ Nm}$ at $I_{\max} = 30 \text{ A}_{\text{eff}}$



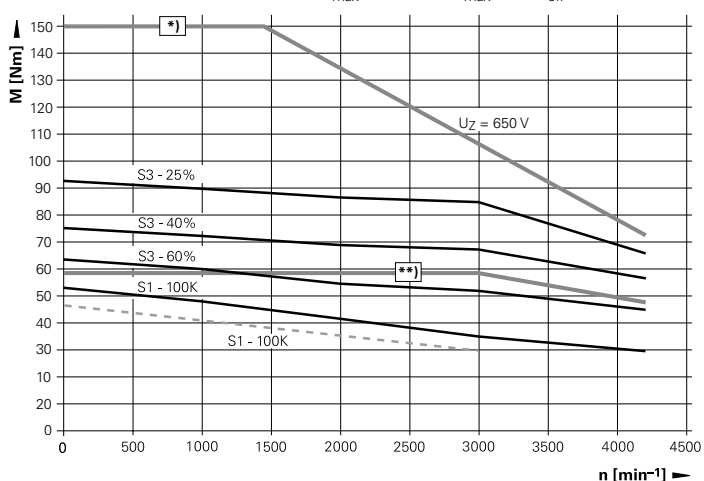
*) $M_{\max} = 85 \text{ Nm}$ at $I_{\max} = 50.2 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 59 \text{ Nm}$ at $I_{\max} = 30 \text{ A}_{\text{eff}}$



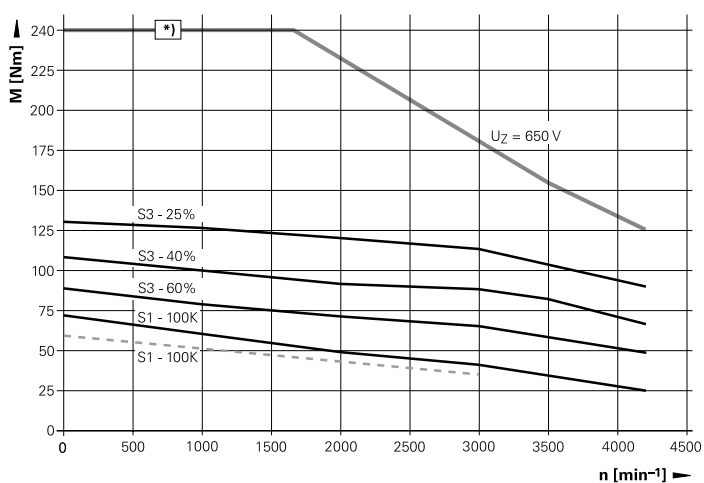
*) $M_{\max} = 107 \text{ Nm}$ at $I_{\max} = 62.9 \text{ A}_{\text{eff}}$
 **) $M_{\max} = 59 \text{ Nm}$ at $I_{\max} = 30 \text{ A}_{\text{eff}}$



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

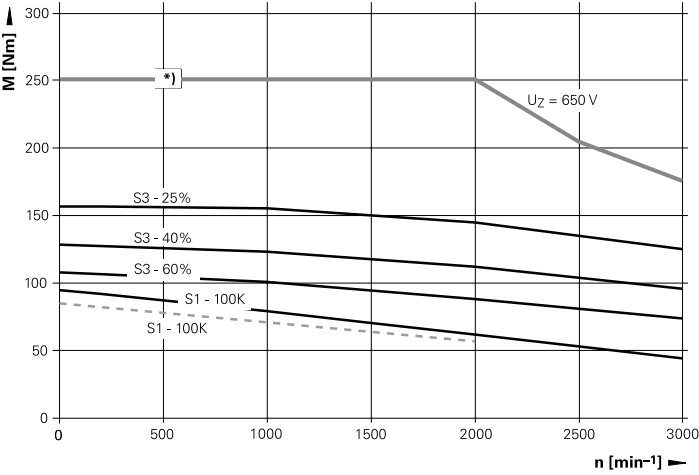


*) $M_{\max} = 240 \text{ Nm}$ at $I_{\max} = 134.3 \text{ A}_{\text{eff}}$



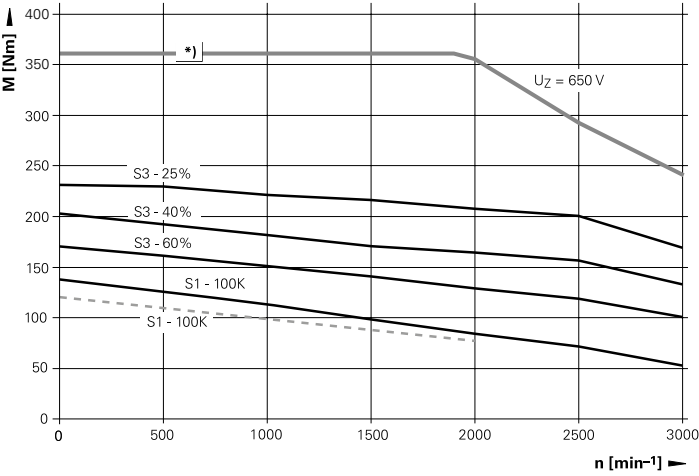
QSY 260B EcoDyn

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



QSY 260C EcoDyn

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



Synchronous motors

Cables and connectors

Power cables

Current load at ambient temperature up to 40 °C

	Cable w/ one connector ¹⁾ ID	Connector ID	Cable only ID	Bend radius R for frequent flexing	Cable type	Diameter
Current load up to 13.8 A						
QSY 55 QSY 96 QSY 116 QSY 130 QSY 155 B EcoDyn QSY 155 C EcoDyn QSY 155 D EcoDyn	352960-xx	325165-02	348948-01	≥ 65 mm	PUR [4 x 1.5 mm ² + (2 x 1.0 mm ²)]	12.5 mm
QSY 155 B QSY 155 C QSY 155 F EcoDyn	352962-xx	333090-02				
Current load up to 26.0 A						
QSY 155 D QSY 155 F QSY 190 C EcoDyn QSY 190 D EcoDyn QSY 190 F EcoDyn	352963-xx	333090-02	348948-03	≥ 75 mm	PUR [4 x 4 mm ² + (2 x 1.0 mm ²)]	14.8 mm
Current load up to 32.8 A						
QSY 190 K EcoDyn QSY 260 B EcoDyn	393570-xx	333090-03	348948-04	≥ 85 mm	PUR [4 x 6 mm ² + (2 x 1.0 mm ²)]	16.4 mm
Current load up to 45.8 A						
QSY 260 C EcoDyn	1119325-xx	333090-03	348948-05	≥ 105 mm	PUR [4 x 10 mm ² + (2 x 1.0 mm ²)]	20.8 mm

¹⁾ Toroidal cores need to be used in motor lines with lengths greater than 15 m (see page 47).

Encoder cables

	Cable length	Cable complete with connectors ID	Line drop compensator ID	Extension cable ID	Bend radius R for frequent flexing
QSY with ECN 1313 or EQN 1325	< 15 m	336376-xx	–	340302-xx (as required)	≥ 100 mm
	> 15 m	336376-xx	370224-01	340302-xx	
QSY synchronous motor with ERN 1185 or ERN 1387	< 30 m	289440-xx	–	336847-xx (as required)	≥ 100 mm
	> 30 m	289440-xx	370226-01	336847-xx	

Asynchronous motors

QAN overview

General technical information

Speed measurement

An integrated rotary encoder from HEIDENHAIN measures the shaft speed.

- ERN 1381 with 1024 lines for motors with stub shaft
- ERM 280 with 600 lines for motors with hollow shaft.

Specifications

The specifications and the characteristic curves apply to motors mounted without thermal insulation. The temperature may differ from the maximum permissible ambient temperature of 40 °C by a maximum of 105 K. If the motor is mounted so that it is thermally insulated, it is necessary to reduce the motor torque in order to avoid thermal overloading of the motor.

Shaft bearing

HEIDENHAIN asynchronous motors are equipped with maintenance-free bearings. The shaft bearing on **motors with stub shaft** is optionally available as either standard bearing or as spindle bearing. The version with spindle bearing can withstand greater radial forces and allows higher spindle speeds.

Motors with spindle bearing have a slightly larger overall length.

The **hollow-shaft motors** always have spindle bearings.

Mechanical life

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

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 for QAN motors.

Shaft end

QAN asynchronous motors from HEIDENHAIN have a cylindrical shaft end as per DIN 748-1. The stub-shaft motors have a centering hole as per DIN 332-DR.

The QAN asynchronous motors with stub shaft are optionally available with plain shaft or with shaft with keyway:

- **Plain shaft end:** This shaft without keyway is the standard shaft for all asynchronous motors with spindle bearing.
- **Shaft end with keyway:** Asynchronous motors with keyway are **flush feather-key balanced**. The feather key as per DIN 6885-1 is included with the motors:
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 shaft with keyway is the standard shaft for all asynchronous motors with standard bearing:

Please note:

The asynchronous motors with keyway were supplied with **full-key balancing until mid-2014**. The current motors are **flush feather-key balanced**. They are unambiguously identified by their ID number that always ends with xxxxxx-xH (e.g. 374328-0H).

Precision balancing

QAN asynchronous motors from HEIDENHAIN can be balanced at any time.

Hollow-shaft motors

The QAN 200 UH and QAN 260 xH motors with hollow shaft are suited for direct mounting to mechanical spindles. The hollow shaft permits you to convey coolant to tools with inner cooling.

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

Mechanical data

Design IM B35 (mounting via flange/base) according to EN 60 034-7

Mounting of the motor

The following screws are recommended for securing the motor:

<i>Fastening:</i>	<i>Flange</i>	<i>Base</i>
QAN 200	M12	M10
QAN 260	M16	M10
QAN 320	M16	M12

Flange: Dimensions as per DIN 42 948 and IEC 72

Protection as per EN 60529

Motor: IP 54

Shaft end: IP 43

Vibration severity

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

Thermal specifications

Separate cooling via integrated fan
Temperature monitoring with KTY 84-130 thermistor in the stator winding
Thermal class F

Asynchronous motors with stub shaft	Rated power output	Rated speed	Max. speed		Rated torque	Rated current	Recommended inverters ³⁾			Page
			Standard bearing	Spindle bearing			1-axis module	2-axis module	Compact inverter	
QAN 200M	5.5 kW	1 500 rpm	9000 rpm	12000 rpm	35.0 Nm	18.0 A	UM 112 D	UM 122 D	Spindle output	30
QAN 200L	7.5 kW	1 500 rpm	9000 rpm	12000 rpm	47.8 Nm	20.1 A	UM 112 D	UM 122 D	Spindle output	
QAN 200U	10.0 kW	1 500 rpm	9000 rpm	12000 rpm	63.7 Nm	25.0 A	UM 112 D	UM 122 D	Spindle output ¹⁾	
QAN 260M	15.0 kW	1 500 rpm	8000 rpm	10000 rpm	95.5 Nm	35.0 A	UM 113 D	–	Spindle output ²⁾	32
QAN 260L	20.0 kW	1 500 rpm	8000 rpm	10000 rpm	127.3 Nm	46.0 A	UM 113 D	–	–	
QAN 260U	24.0 kW	1 500 rpm	8000 rpm	10000 rpm	152.8 Nm	58.0 A	UM 114 D	–	–	
QAN 260W	12.0 kW	750 rpm	8000 rpm	10000 rpm	152.8 Nm	29.0 A	UM 112 D	–	Spindle output ²⁾	
QAN 320M	32.0 kW	1 500 rpm	8000 rpm	10000 rpm	203.7 Nm	77.5 A	UM 114 D	–	–	34
QAN 320L	40.0 kW	1 500 rpm	8000 rpm	10000 rpm	254.6 Nm	99.0 A	UM 115 D	–	–	
QAN 320W	18.0 kW	750 rpm	8000 rpm	10000 rpm	229.2 Nm	43.0 A	UM 114 D	–	–	

Asynchronous motors with hollow shaft	Rated power output	Rated speed	Max. speed		Rated torque	Rated current	Recommended inverters ³⁾			Page
			Standard bearing	Spindle bearing			1-axis module	2-axis module	Compact inverters	
QAN 200UH	10.0 kW	1 500 rpm	–	12000 rpm 15000 rpm	63.7 Nm	25.0 A	UM 112 D	UM 122 D	Spindle output ¹⁾	36
QAN 260MH	15.0 kW	1 500 rpm	–	12000 rpm	96.0 Nm	35.0 A	UM 113 D	–	Spindle output ²⁾	38
QAN 260LH	20.0 kW	1 500 rpm	–	12000 rpm	128.0 Nm	46.0 A	UM 113 D	–	–	
QAN 260UH	22.0 kW	1 500 rpm	–	10000 rpm 12000 rpm	140.0 Nm	54.0 A	UM 113D ¹⁾ UM 114 D	–	–	

¹⁾ Only UE 24xB, UR 24x

²⁾ Only UR 24x

³⁾ 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 stub shaft

QAN 200 series

Spindle motors with 2 pole pairs
Rated power output 5.5 kW to 10 kW
Choice of standard or spindle bearing

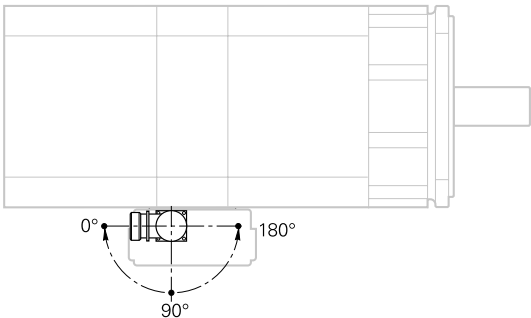


Motor	QAN 200M		QAN 200L		QAN 200U	
Rated voltage U _N	250 V		305 V		330 V	
Rated power output P _N	5.5 kW		7.5 kW		10.0 kW	
Rated shaft speed n _N	1 500 rpm					
Rated torque M _N (105 K)	35.0 Nm		47.8 Nm		63.7 Nm	
Rated current I _N (105 K)	18.0 A		20.1 A		25.0 A	
Efficiency	0.85					
Max. speed n _{max} ¹⁾ Standard bearing Spindle bearing	9 000 rpm 12 000 rpm		9 000 rpm 12 000 rpm			
Max. current I _{max}	33 A		36 A		44 A	
Mass m	51 kg		68 kg		83 kg	
Rotor inertia J	245 kgcm ²		353 kgcm ²		405 kgcm ²	
Protection	IP 54					
Fan Rated voltage U _L Rated current I _L Frequency f _L	400 V 3 AC 0.2 A 50 Hz/60 Hz					
ID Motor with standard bearing Motor with spindle bearing	Plain shaft 374328-03 374328-13	With keyway 374328-0H 374328-1H	Plain shaft 374329-03 374329-13	With keyway 374329-0H 374329-1H	Plain shaft 374330-03 374330-13	With keyway 374330-0H 374330-1H

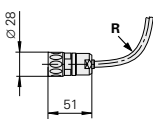
¹⁾ The max. speed depends on the motor's application conditions, such as the shaft load
(see the *Inverter Systems and Motors* Technical Manual).

Bold: Standard version

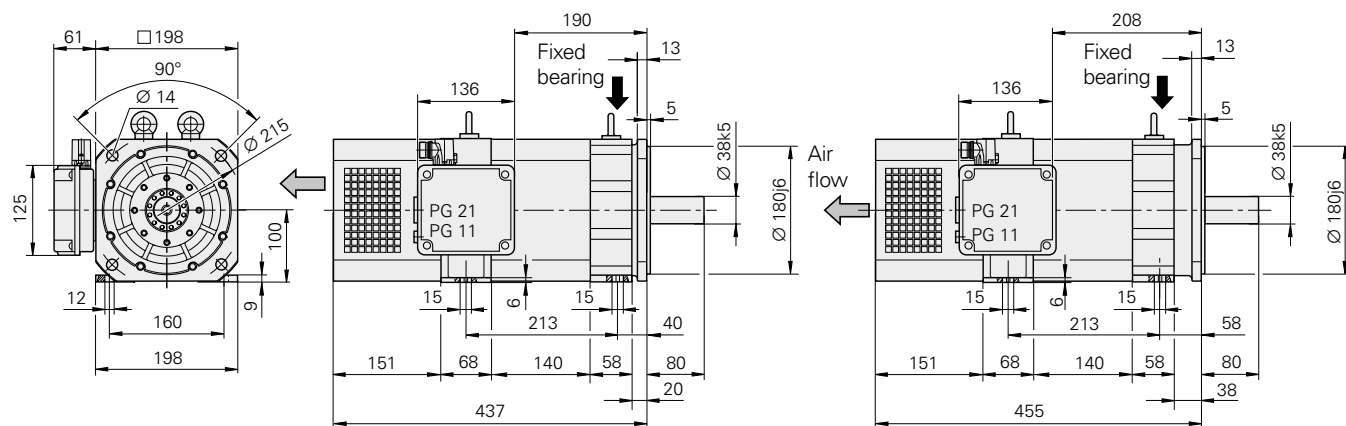
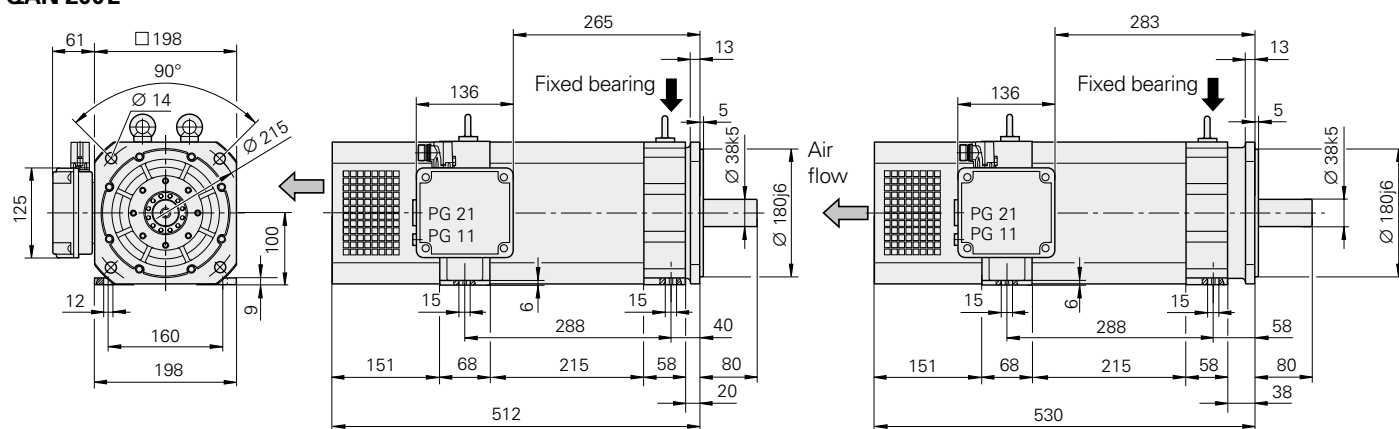
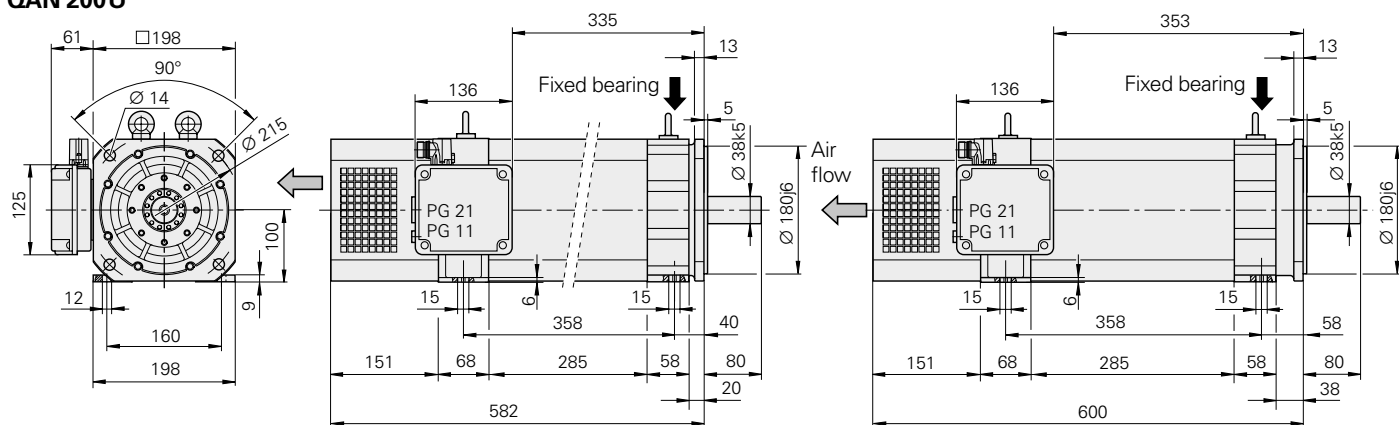
Rotatable connections



Encoder connector



For R, see page 46

QAN 200M**With standard bearing****With spindle bearing****QAN 200L****QAN 200U**

mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ±0.2 mm

Asynchronous motors with stub shaft

QAN 260 series

Spindle motors with 2 pole pairs
Rated power output 12 kW to 24 kW
Choice of standard or spindle bearing



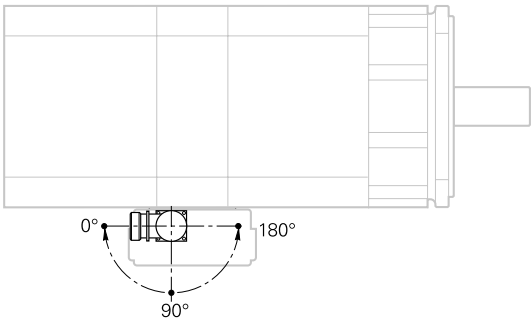
Motor	QAN 260M		QAN 260L		QAN 260U		QAN 260W	
Rated voltage U _N	348 V		331 V		318 V		335 V	
Rated power output P _N	15 kW		20 kW		24 kW		12 kW	
Rated shaft speed n _N	1500 rpm						750 rpm	
Rated torque M _N (105 K)	96.0 Nm		128.0 Nm		153.0 Nm		153.0 Nm	
Rated current I _N (105 K)	35.0 A		46.0 A		58.0 A		29.0 A	
Efficiency	0.85							
Max. speed n _{max} ¹⁾ Standard bearing Spindle bearing*	8000 rpm 10000 rpm or 12000 rpm				8000 rpm 10000 rpm			
Max. current I _{max}	70 A		96 A		116 A		62 A	
Mass m	112 kg		135 kg		158 kg		158 kg	
Rotor inertia J	700 kgcm ²		920 kgcm ²		1100 kgcm ²		1100 kgcm ²	
Protection	IP 54							
Fan Rated voltage U _L Rated current I _L Frequency f _L	400 V 3 AC 0.19 A 50 Hz/60 Hz							
ID	Stub shaft	With keyway	Stub shaft	With keyway	Stub shaft	With keyway	Stub shaft	With keyway
Motor with standard bearing	510019-63	510019-4H	510020-43	510020-4H	510021-43	510021-4H	510022-43	510022-4H
Motor with spindle bearing	510019-53	510019-5H	510020-53	510020-5H	510021-53	510021-5H	510022-53	510022-5H
10000 rpm	510019-73	—	510020-73	—	—	—	—	—
12000 rpm								

¹⁾ The max. speed depends on the motor's application conditions, such as the shaft load (see the *Inverter Systems and Motors* Technical Manual).

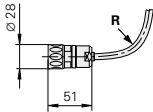
* Please select when ordering

Bold: Standard version

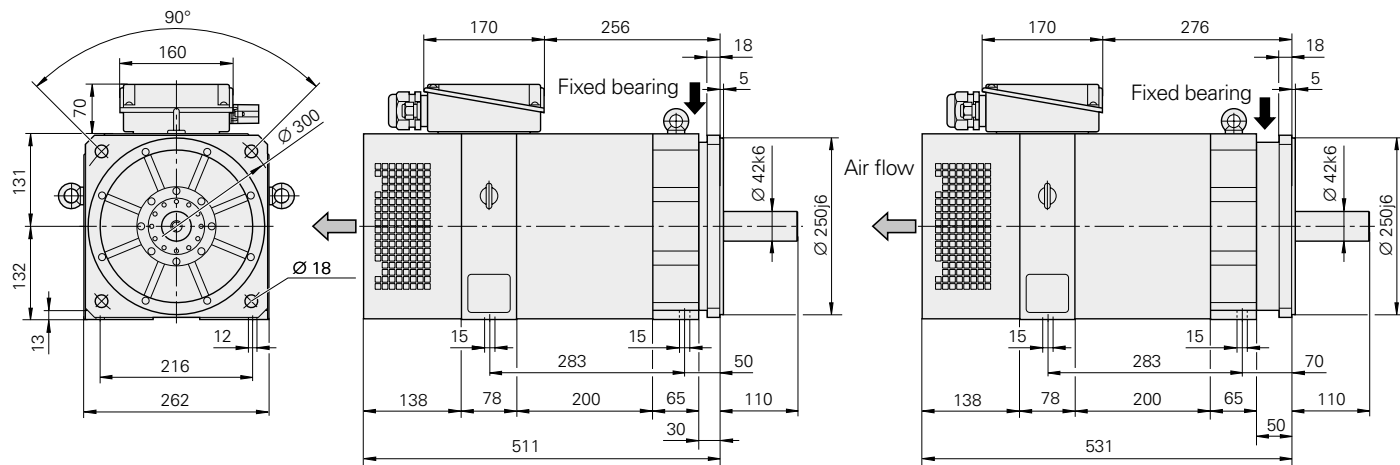
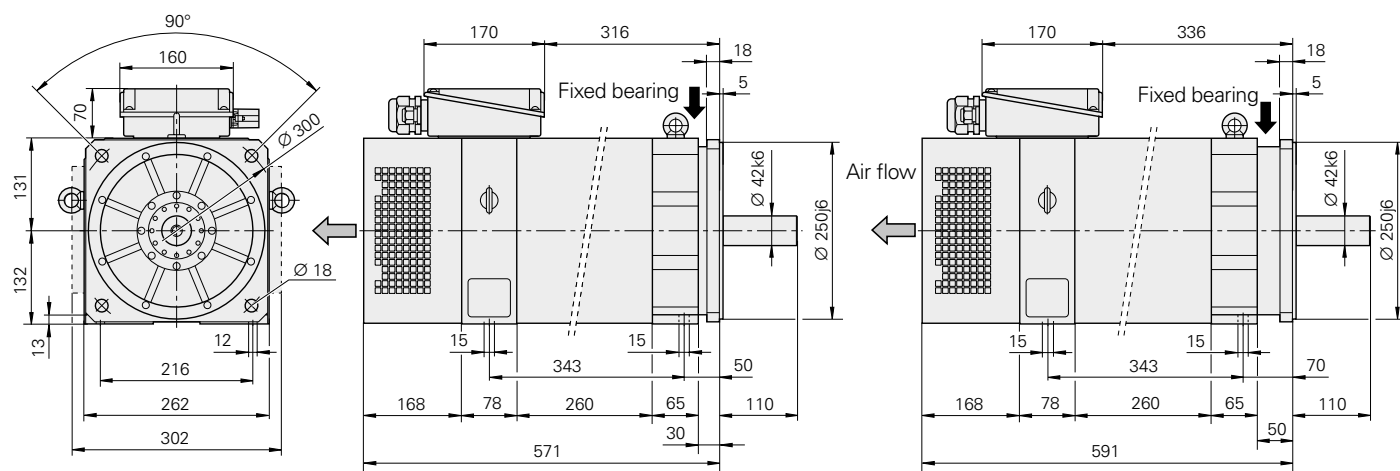
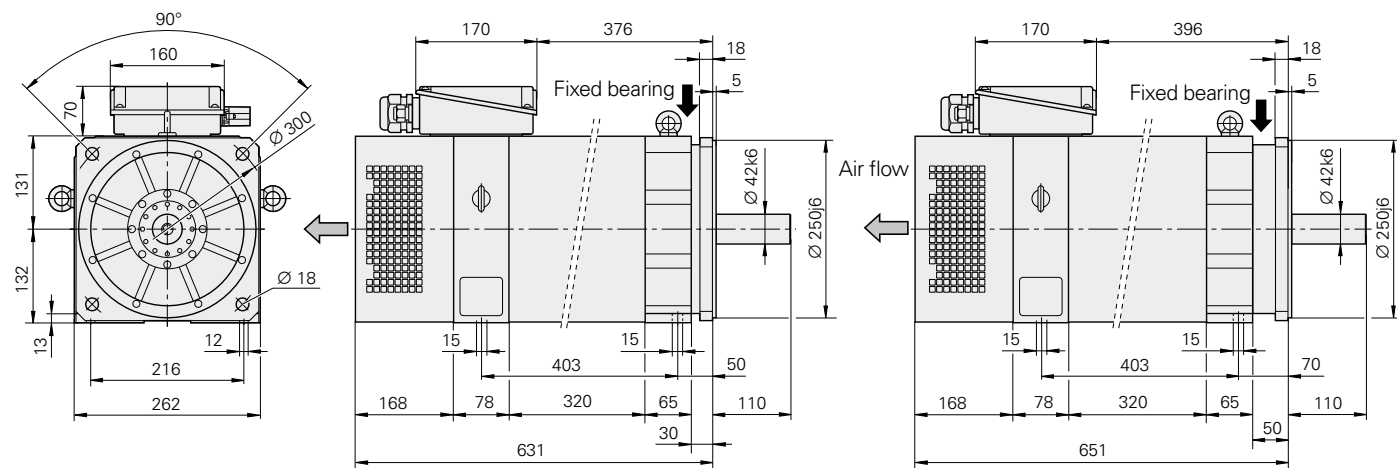
Rotatable connections



Encoder connector



For R, see page 46

QAN 260M**With standard bearing****With spindle bearing****QAN 260L****QAN 260U
QAN 260W**

mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ±0.2 mm

Asynchronous motors with stub shaft

QAN 320 series

Spindle motors with 2 pole pairs
Rated power output 18 kW to 40 kW

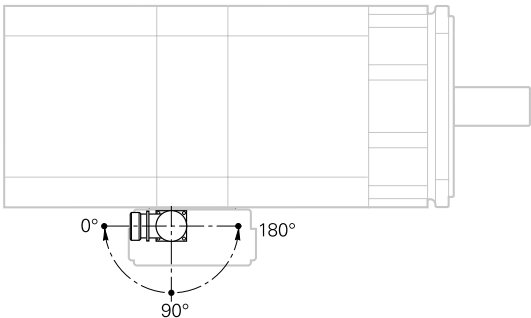


Motor	QAN 320M		QAN 320W		QAN 320L	
Rated voltage U _N	317 V		320 V		315 V	
Rated power output P _N	32 kW		18 kW		40 kW	
Rated shaft speed n _N	1 500 rpm		750 rpm		1 500 rpm	
Rated torque M _N (105 K)	203.7 Nm		229.2 Nm		254.6 Nm	
Rated current I _N (105 K)	77.5 A		43.0 A		99.0 A	
Efficiency	0.85				0.91	
Max. speed n _{max} ¹⁾ Standard bearing Spindle bearing	8 000 rpm 10 000 rpm					
Max. current I _{max}	155 A		86 A		186 A	
Mass m	240 kg				280 kg	
Rotor inertia J	1 870 kgcm ²				2 300 kgcm ²	
Fan Rated voltage U _L Rated current I _L Frequency f _L	400 V 3 AC 0.6 A 50 Hz/60 Hz					
ID Motor with standard bearing Motor with spindle bearing	Plain shaft 513302-03 513302-13	With keyway 513302-0H 513302-1H	Plain shaft 517952-03 517952-13	With keyway 517952-0H 517952-1H	Plain shaft 577484-03 577484-13	With keyway 577484-0H 577484-1H

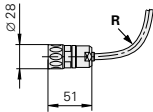
¹⁾ The max. speed depends on the motor's application conditions, such as the shaft load (see the *Inverter Systems and Motors* Technical Manual).

Bold: Standard version

Rotatable connections

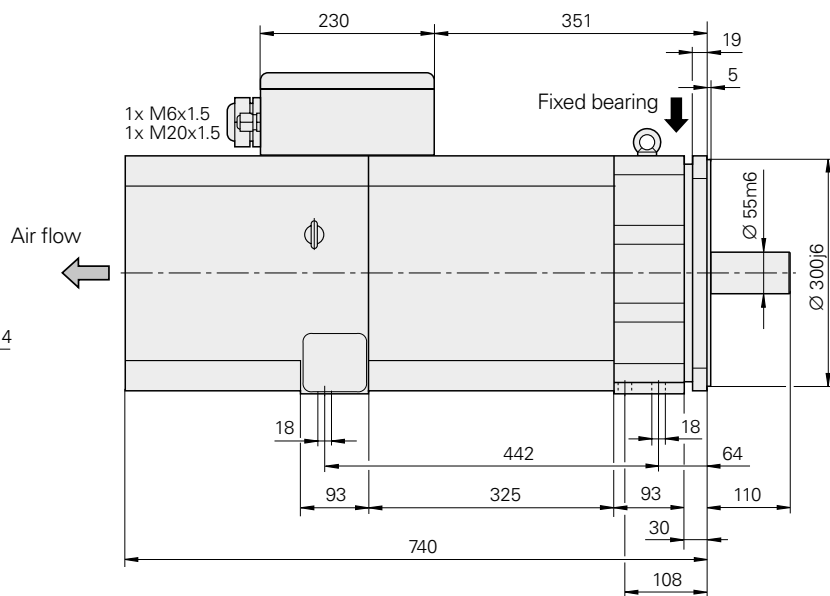
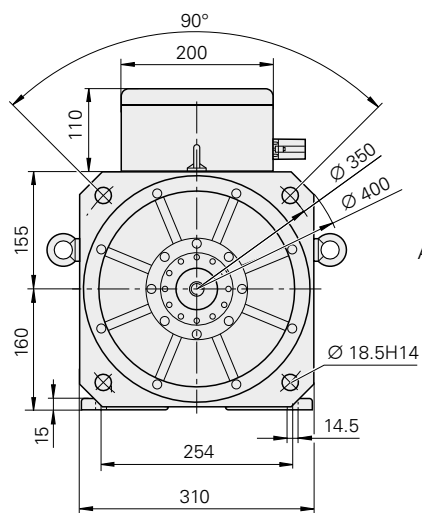


Encoder connector

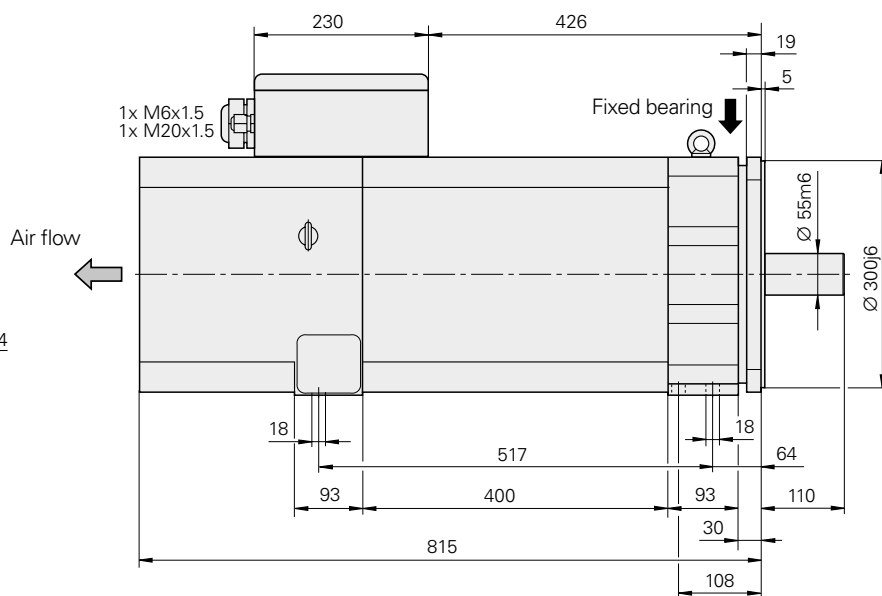
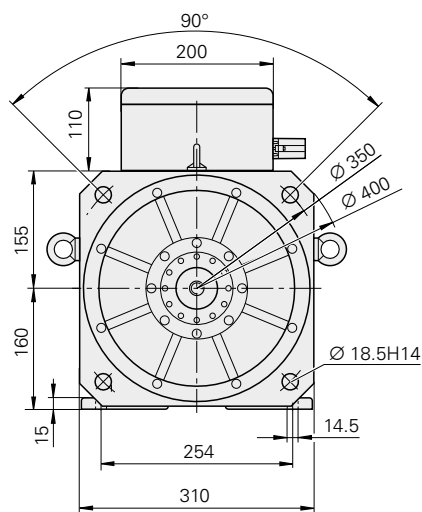


For R, see page 46

QAN 320M
QAN 320W



QAN 320L



mm



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

Asynchronous motors with hollow shaft

QAN 200 UH

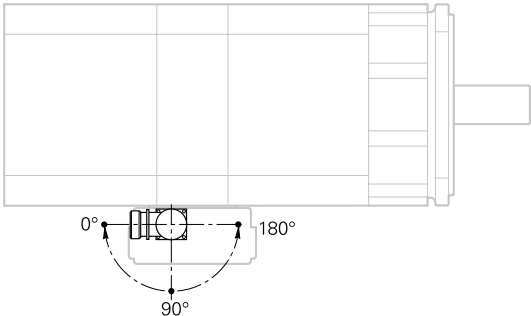
Hollow-shaft spindle motor with 2 pole pairs
 Rated power output to 10 kW
 With spindle bearing



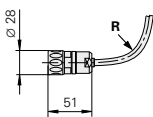
Motor	QAN 200 UH	
Rated voltage U _N	330 V	
Rated power output P _N	10.0 kW	
Rated shaft speed n _N	1 500 rpm	
Rated torque M _N (105 K)	63.7 Nm	
Rated current I _N (105 K)	25.0 A	
Efficiency	0.85	
Max. speed n _{max} ¹⁾ Spindle bearing	12 000 rpm	15 000 rpm
Max. current I _{max}	44 A	
Bore hole in shaft	Ø 9 mm	
Mass m	91 kg	
Rotor inertia J	405 kgcm ²	
Protection	IP 54	
Fan Rated voltage U _L Rated current I _L Frequency f _L	400 V 3 AC 0.2 A 50 Hz/60 Hz	
ID Motor with spindle bearing	536257-18	536257-43

1) The max. speed depends on the motor’s application conditions, such as the shaft load (see the *Inverter Systems and Motors* Technical Manual).

Rotatable connections

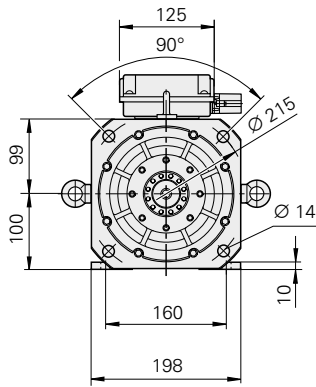


Encoder connector

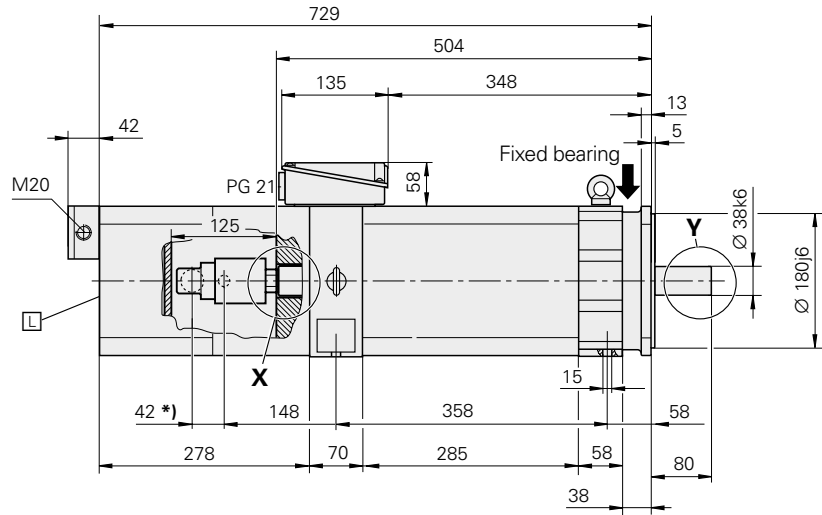


For R, see page 46

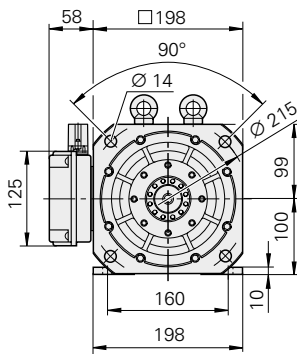
QAN 200UH 12 000 rpm



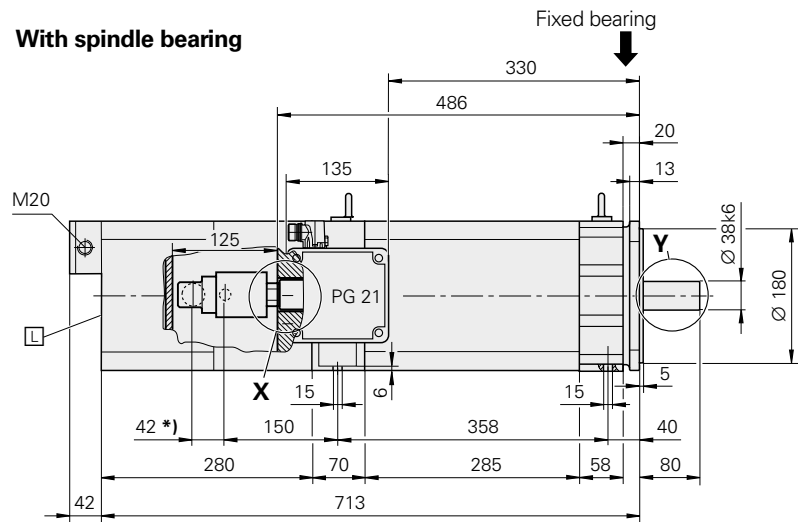
With spindle bearing



QAN 200UH 15 000 rpm

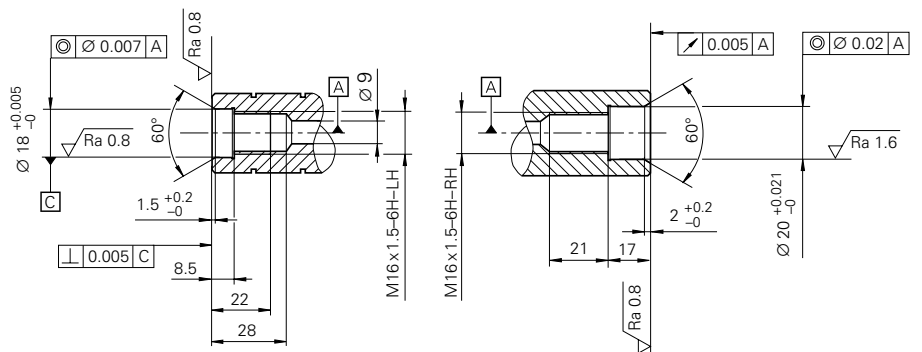


With spindle bearing



X

Y



□ = Air outlet at the rear

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

mm



Tolerancing ISO 8015

ISO 2768 - m H

< 6 mm: ±0.2 mm

Asynchronous motors with hollow shaft

QAN 260xH series

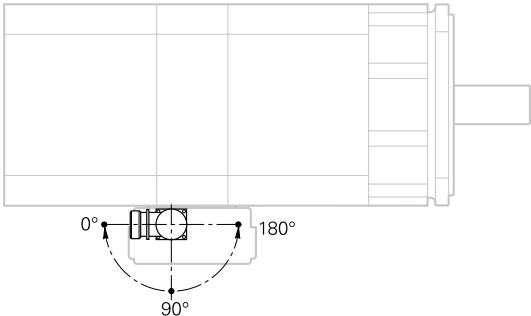
Hollow-shaft spindle motor with 2 pole pairs
 Rated power output 15 kW to 22 kW
 With spindle bearing



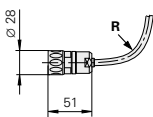
Motor	QAN 260MH	QAN 260LH	QAN 260UH
Rated voltage U _N	348 V	331 V	318 V
Rated power output P _N	15 kW	20 kW	22 kW
Rated shaft speed n _N	1 500 rpm		
Rated torque M _N (105 K)	96.0 Nm	128.0 Nm	140.0 Nm
Rated current I _N (105 K)	35.0 A	46.0 A	54.0 A
Efficiency	0.85		
Max. speed n _{max} ¹⁾ Spindle bearing*	12 000 rpm		10 000 rpm or 12 000 rpm
Max. current I _{max}	70 A	96 A	116 A
Mass m	120 kg	143 kg	158 kg
Rotor inertia J	700 kgcm ²	920 kgcm ²	1 100 kgcm ²
Protection	IP 54		
Fan Rated voltage U _L Rated current I _L Frequency f _L	400 V 3 AC 0.19 A 50 Hz/60 Hz		
ID Motor with spindle bearing 10 000 rpm 12 000 rpm	– 642855-73	– 631449-73	536259-53 536259-73

¹⁾The max. speed depends on the motor's application conditions, such as the shaft load (see the *Inverter Systems and Motors* Technical Manual).
 * Please select when ordering

Rotatable connections

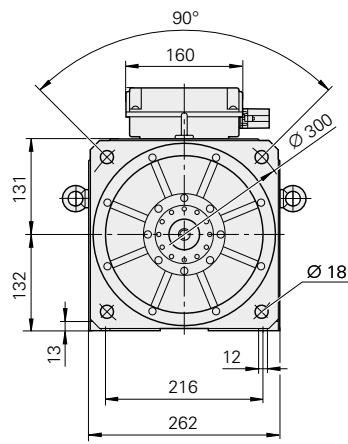


Encoder connector

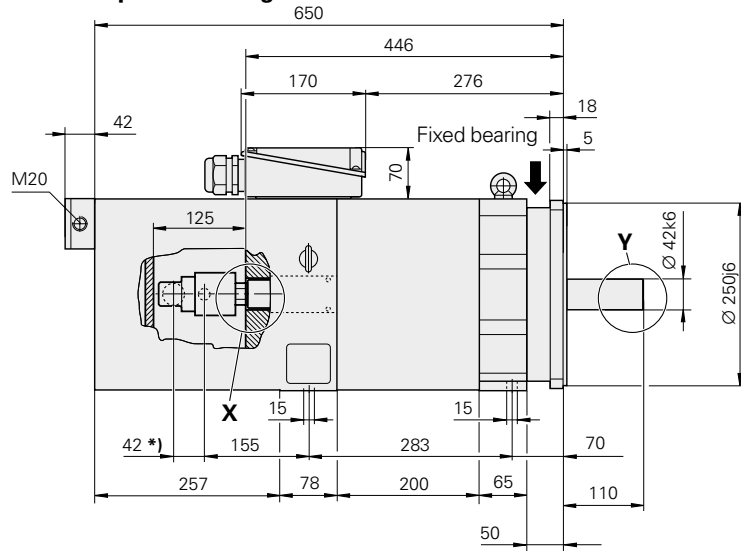


For R, see page 46

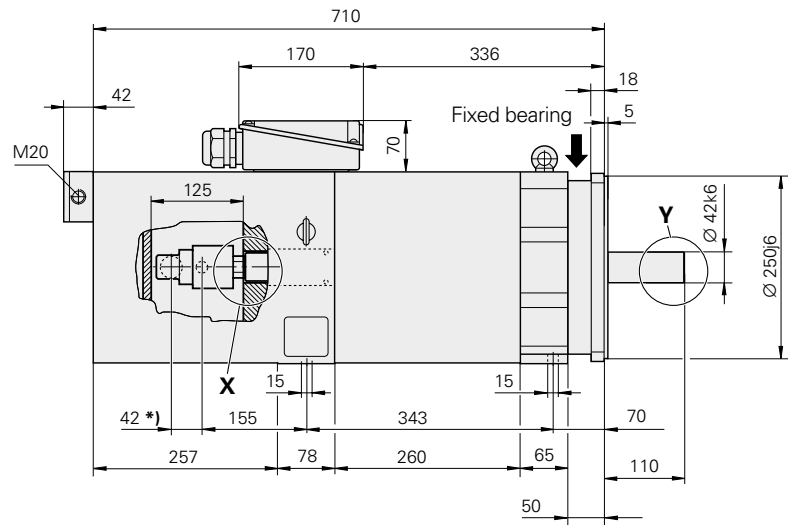
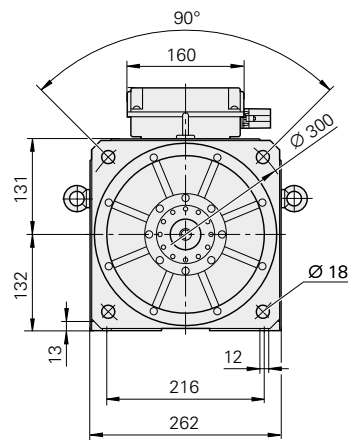
QAN 260MH



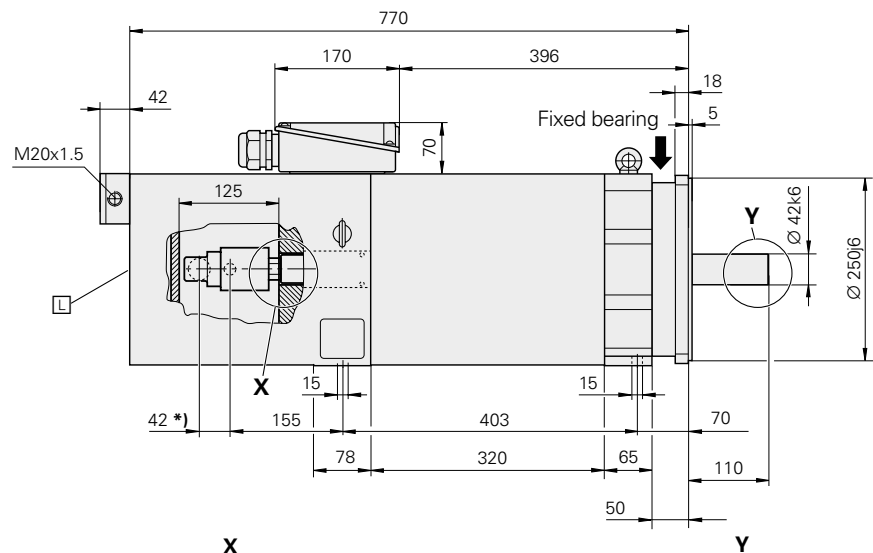
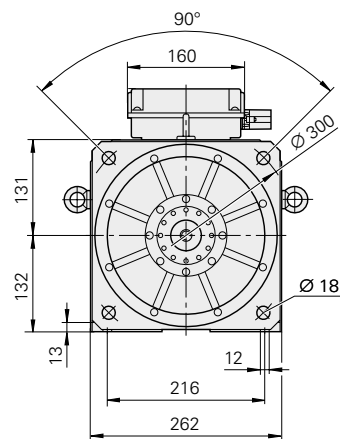
With spindle bearing



QAN 260LH



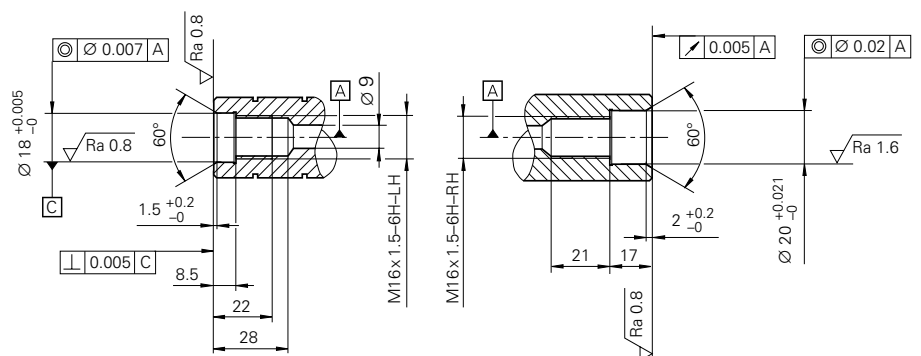
QAN 260UH



□ = Air outlet on both sides

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

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



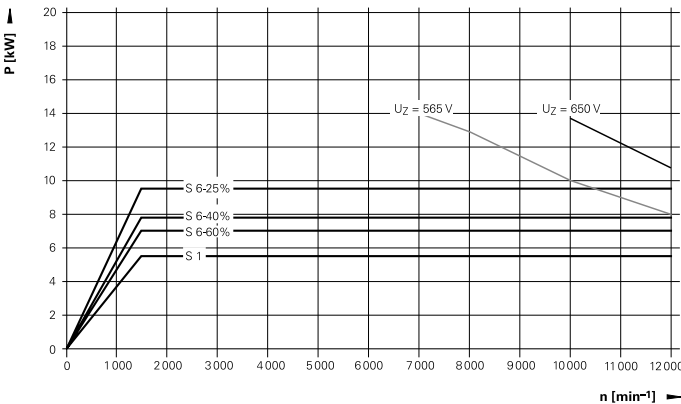
Asynchronous motors

Characteristics of power and torque

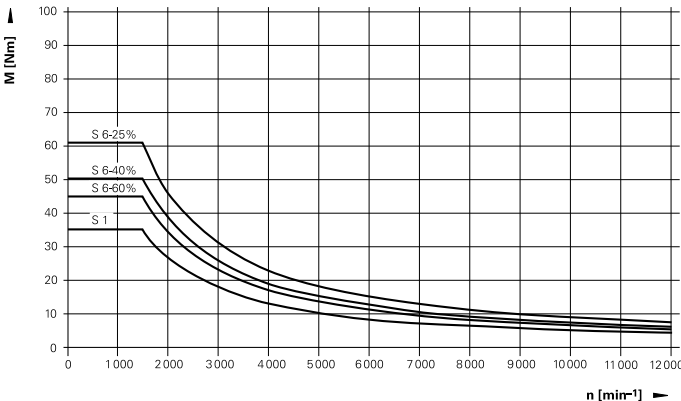
QAN 200M

Mode of operation	Speed n	Power P	Torque M	Current I
S1	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	–
S6-60%	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	–
S6-40%	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	–
S6-25%	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



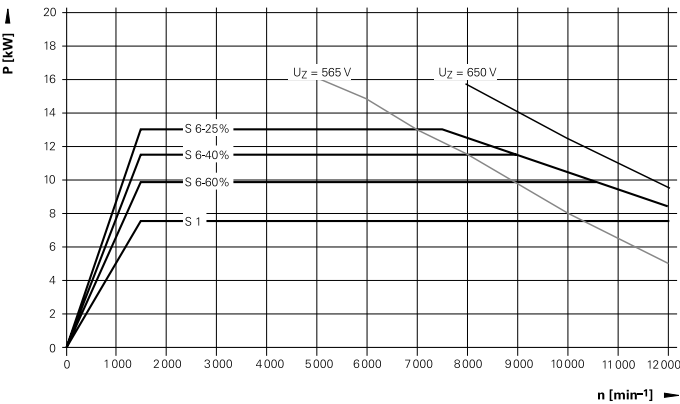
Torque characteristic curve



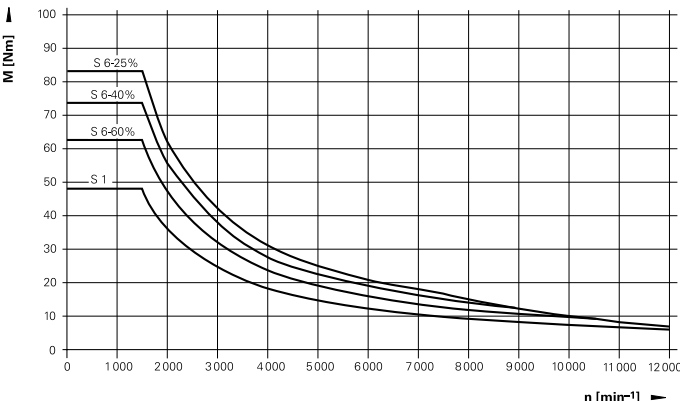
QAN 200L

Mode of operation	Speed n	Power P	Torque M	Current I
S1	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	–
S6-60%	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	–
S6-40%	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	–
S6-25%	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



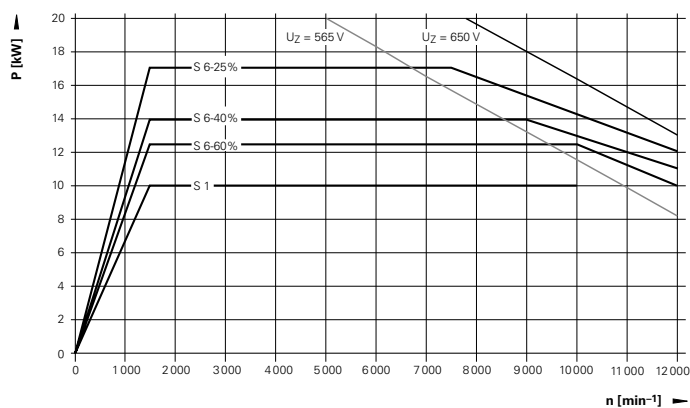
Note

- S6 mode
Cycle duration 10 minutes
In the rest period the motor is idle.

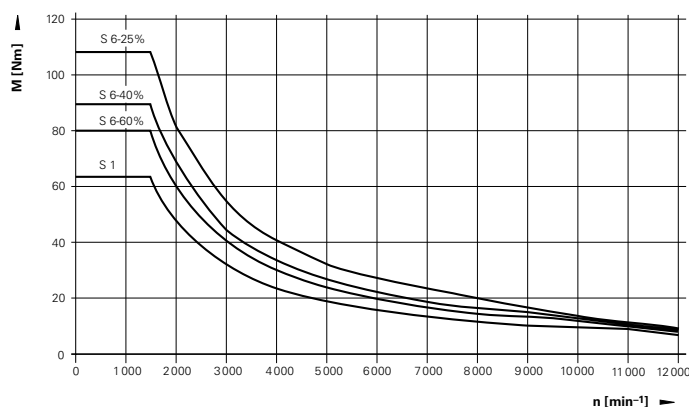
QAN 200U

Mode of operation	Speed n	Power P	Torque M	Current I
S1	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	–
S6-60%	1 500 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	–
S6-40%	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	–
S6-25%	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



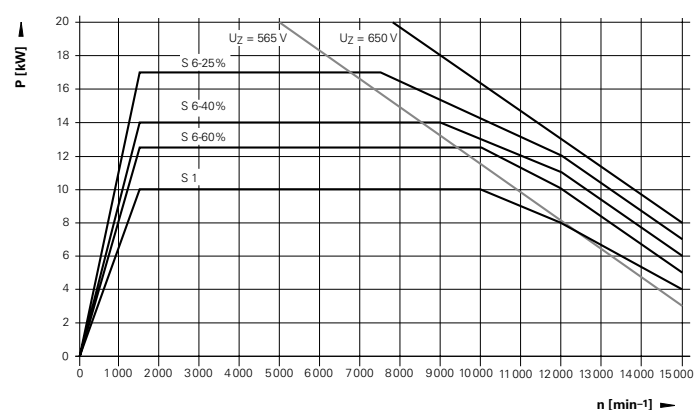
Torque characteristic curve



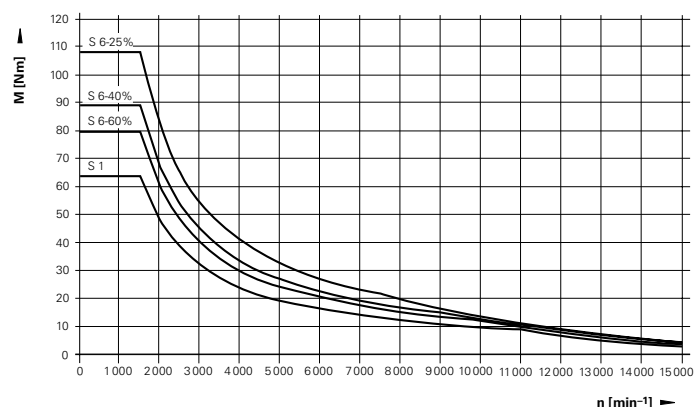
QAN 200UH

Mode of operation	Speed n	Power P	Torque M	Current I
S1	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	–
S6-60%	1 500 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	–
S6-40%	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	–
S6-25%	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



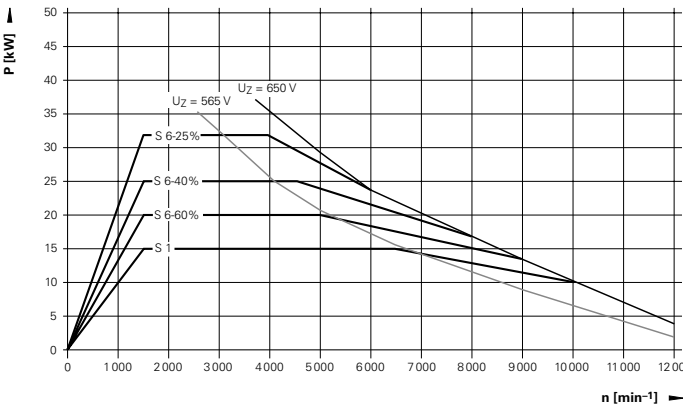
Torque characteristic curve



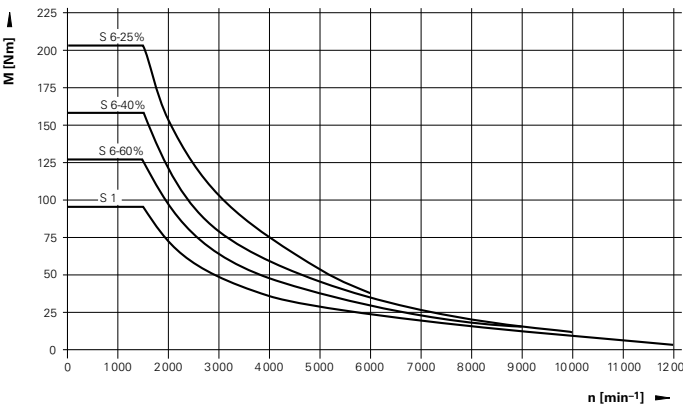
QAN 260M, QAN 260MH

Mode of operation	Speed n	Power P	Torque M	Current I
S1	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	—
S6-60%	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	—
S6-40%	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	—
S6-25%	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



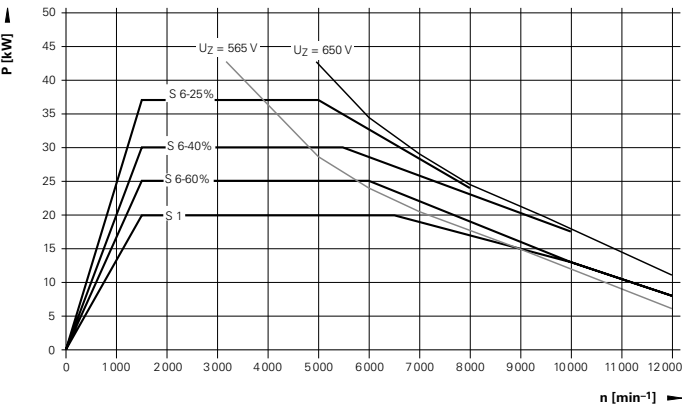
Torque characteristic curve



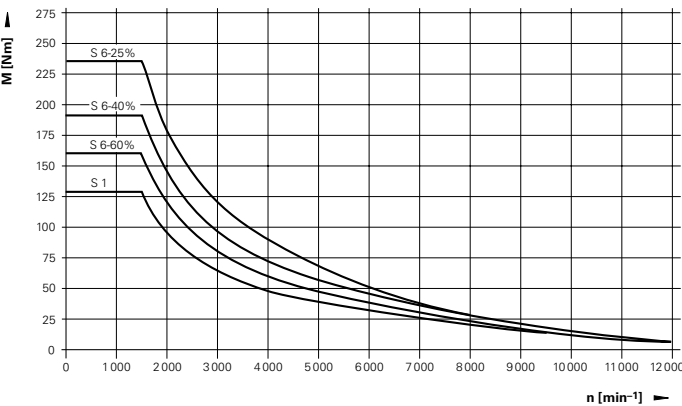
QAN 260L, QAN 260LH

Mode of operation	Speed n	Power P	Torque M	Current I
S1	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	—
S6-60%	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	—
S6-40%	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	—
S6-25%	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



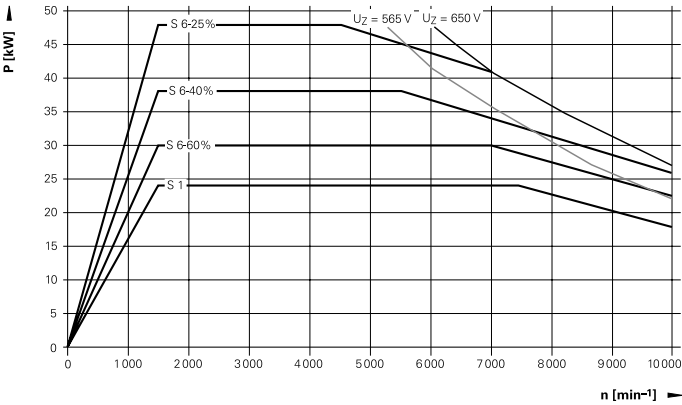
Torque characteristic curve



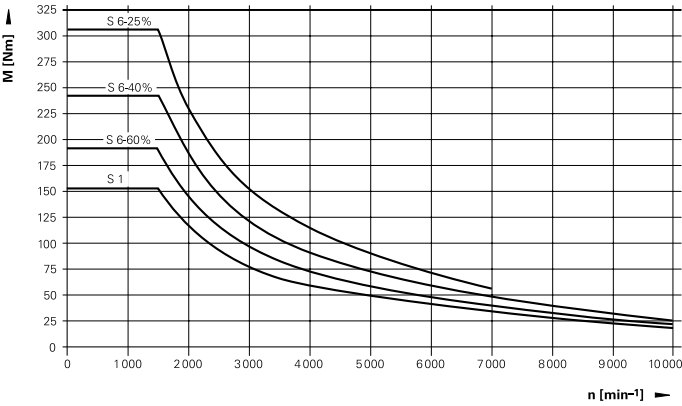
QAN 260 U

Mode of operation	Speed n	Power P	Torque M	Current I
S1	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	–
S6-60%	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	–
S6-40%	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	–
S6-25%	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



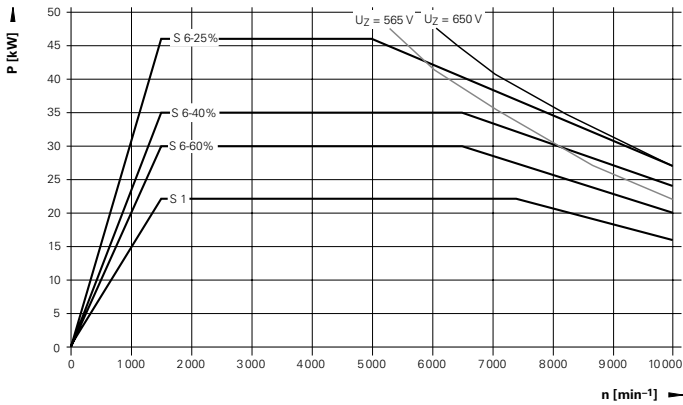
Torque characteristic curve



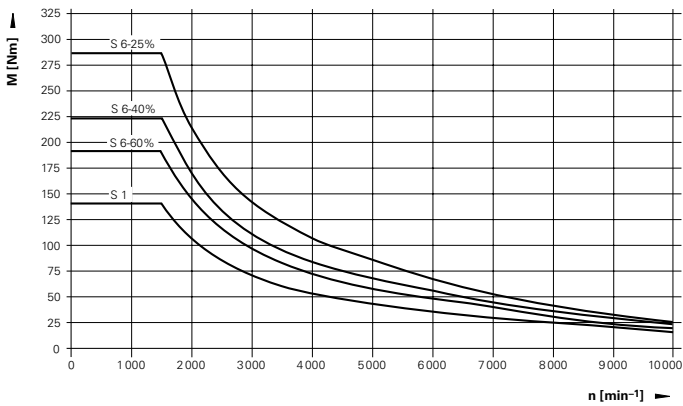
QAN 260 UH

Mode of operation	Speed n	Power P	Torque M	Current I
S1	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	–
S6-60%	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	–
S6-40%	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	–
S6-25%	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



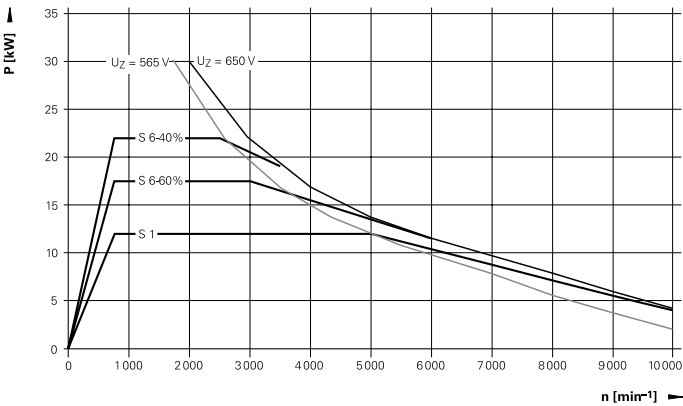
Torque characteristic curve



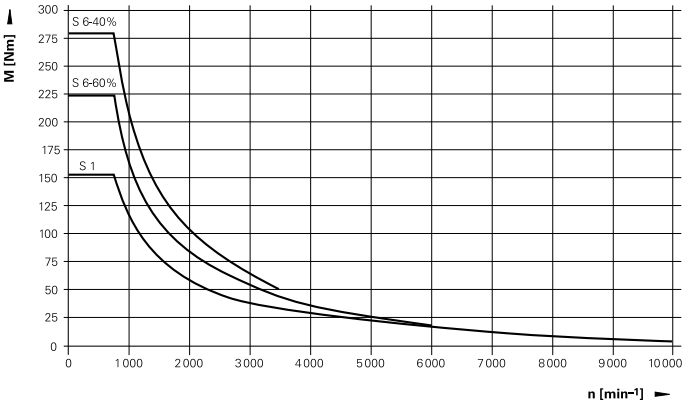
QAN 260W

Mode of operation	Speed n	Power P	Torque M	Current I
S1	750 rpm	12.0 kW	152.8 Nm	29.0 A
	5000 rpm	12.0 kW	22.9 Nm	–
	10000 rpm	4.0 kW	3.8 Nm	–
S6-60%	750 rpm	17.5 kW	222.8 Nm	38.1 A
	3000 rpm	17.5 kW	55.7 Nm	–
	6000 rpm	11.3 kW	18.0 Nm	–
S6-40%	750 rpm	22.0 kW	280.1 Nm	46.4 A
	2500 rpm	22.0 kW	84.0 Nm	–
	3500 rpm	19.0 kW	51.8 Nm	–

Power characteristic curve



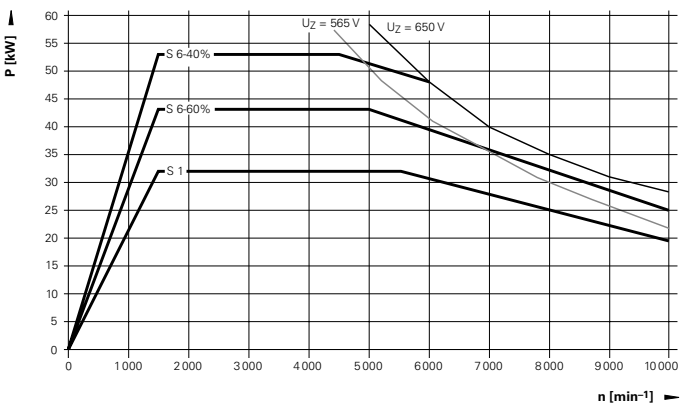
Torque characteristic curve



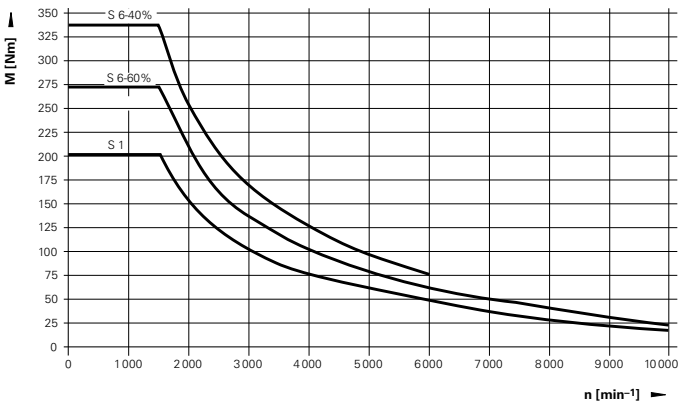
QAN 320M

Mode of operation	Speed n	Power P	Torque M	Current I
S1	1500 rpm	32.0 kW	203.7 Nm	77.5 A
	5500 rpm	32.0 kW	55.0 Nm	–
	10000 rpm	19.5 kW	18.6 Nm	–
S6-60%	1500 rpm	43.0 kW	273.7 Nm	98.0 A
	5500 rpm	43.0 kW	71.5 Nm	–
	10000 rpm	25.0 kW	23.9 Nm	–
S6-40%	1500 rpm	53.0 kW	337.4 Nm	118.0 A
	5500 rpm	53.0 kW	86.2 Nm	–
	6000 rpm	48.0 kW	76.4 Nm	–

Power characteristic curve



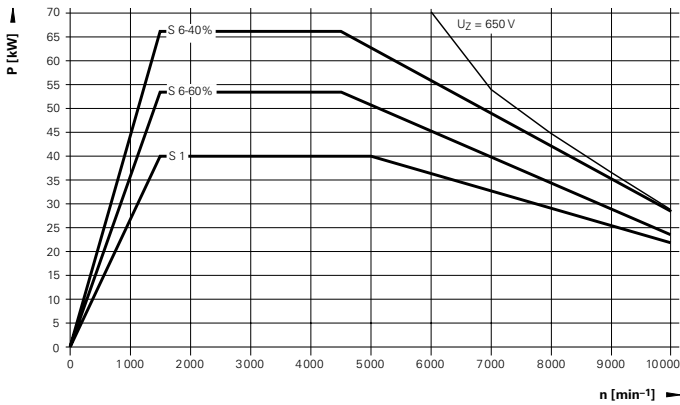
Torque characteristic curve



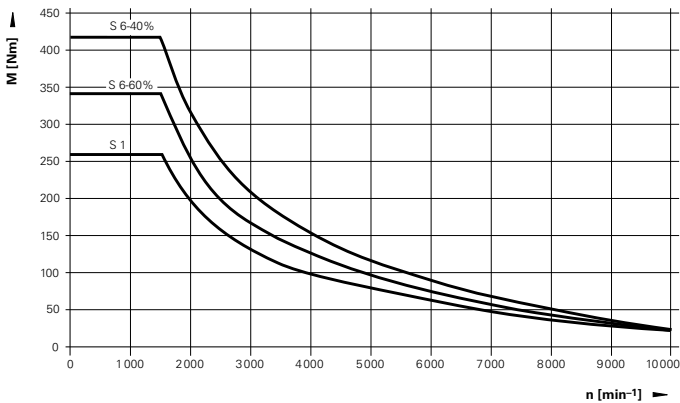
QAN 320L

Mode of operation	Speed n	Power P	Torque M	Current I
S1	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	–
S6-60%	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	–
S6-40%	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



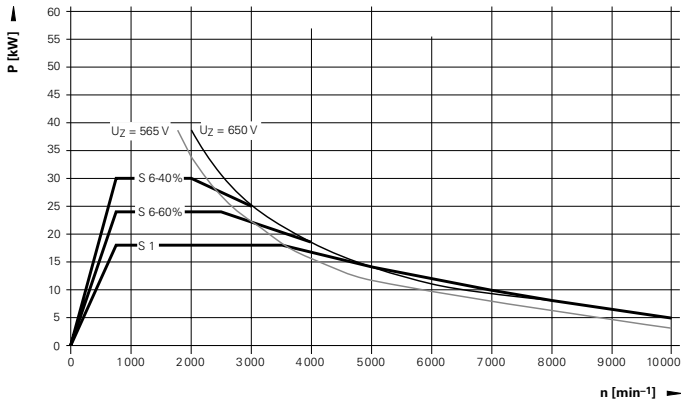
Torque characteristic curve



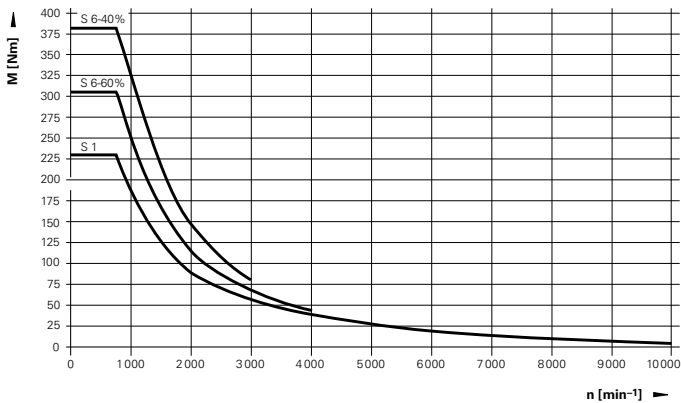
QAN 320W

Mode of operation	Speed n	Power P	Torque M	Current I
S1	750 rpm	18.0 kW	229.2 Nm	43.0 A
	3 500 rpm	18.0 kW	49.1 Nm	–
	10 000 rpm	5.0 kW	4.8 Nm	–
S6-60%	750 rpm	24.0 kW	305.6 Nm	54.0 A
	2 000 rpm	24.0 kW	114.6 Nm	–
	4 000 rpm	18.5 kW	44.2 Nm	–
S6-40%	750 rpm	30.0 kW	382.0 Nm	71.0 A
	2 000 rpm	30.0 kW	143.2 Nm	–
	3 000 rpm	25.0 kW	79.6 Nm	–

Power characteristic curve



Torque characteristic curve



Asynchronous motors

Cables

Power cables

Current load at ambient temperature up to 40 °C

	Cable only ID	Bend radius R for frequent flexing	Cable type	Diameter
Current load up to 26 A (installation type B2)				
QAN 200M QAN 200L QAN 200U QAN 200UH	348949-04	≥ 70 mm	PUR [4 x 4 mm ²]	14.1 mm
Current load up to 32.8 A (installation type B2)				
QAN 260W	348949-05	≥ 75 mm	PUR [4 x 6 mm ²]	15.6 mm
Current load up to 45.2 A (installation type B2)				
QAN 260M QAN 260MH QAN 320W	348949-06		PUR [4 x 10 mm ²]	20.3 mm
Current load up to 59.9 A (installation type B2)				
QAN 260L QAN 260LH QAN 260U QAN 260UH	348949-07	≥ 135 mm	PUR [4 x 16 mm ²]	27.3 mm
Current load up to 93.8 A (installation type B2)				
QAN 320M	348949-09	≥ 175 mm	PUR [4 x 35 mm ²]	35.5 mm
Current load up to 117.5 A (installation types C and E)				
QAN 320L	348949-09	≥ 175 mm	PUR [4 x 35 mm ²]	35.5 mm

Encoder cables

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

Cables for fans

	Cable only ID	Bend radius R for frequent flexing	Cable type	Diameter
All QANs	348949-01	≥ 50 mm	PUR [4 x 0.75 mm ²]	10 mm

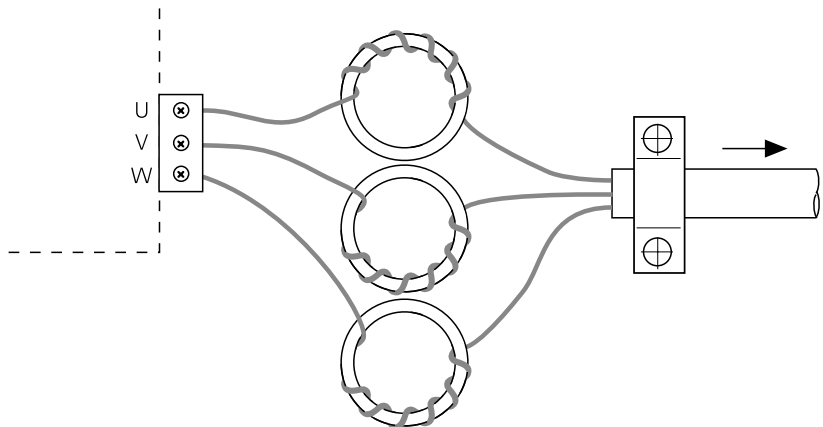
Accessories

Toroidal cores

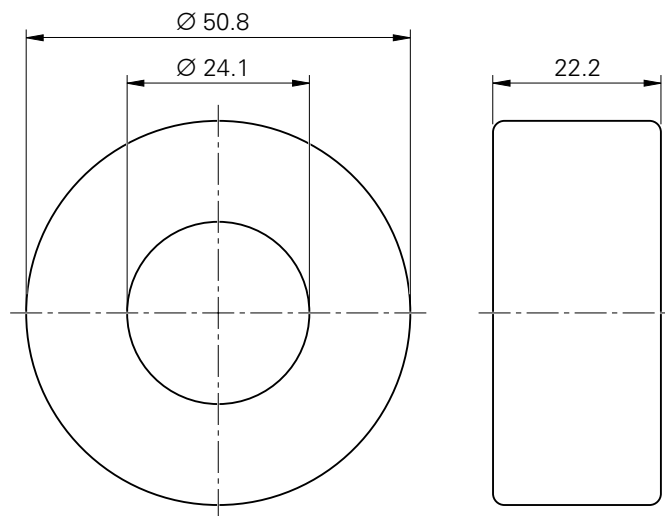
With large line lengths, voltage peaks that may damage the motor can occur. For this reason, toroidal cores need to be used in motor lines with lengths greater than 15 m. One toroidal core is required per phase. The toroidal cores must be located close to the inverter (max. 2 m).

Toroidal core

For motor line > 15 m
ID 827054-01



Dimensions



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

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