

Heavy Duty Drive Solution.

EC motor Ø22 mm, brushless, 80 / 240 Watt.



Key Features

- Withstands extreme temperatures (-55...200°C)
- Withstands high shock loads and vibrations
- High reliability, even in harsh environments

The motor is designed to withstand harsh environments, such as extreme temperatures, high shock loads and vibrations, as well as high ambient pressure or vacuum. Even submerged operation is possible.

Impeccable operation has been demonstrated in an extended ambient temperature range of -55°C up to 200°C – all internal components are designed to withstand temperatures of at least 240°C.

External shock loads and vibrations can be absorbed over the entire temperature range without damaging the motor.

The motor is available both with and without Hall sensors. Hall sensors come, similar to an encoder, as a package added to the back of the motor (see drawing).

EC 22 Ø22 mm, brushless, 240 Watt

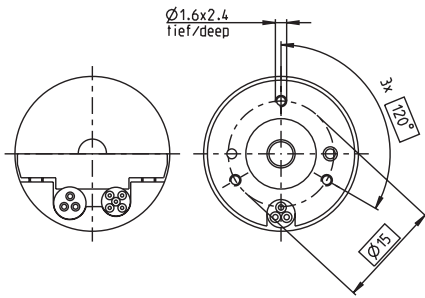
Heavy Duty – for applications in oil

NEW

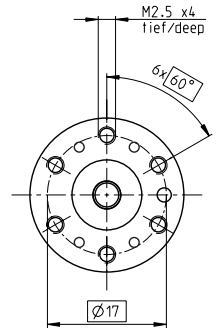
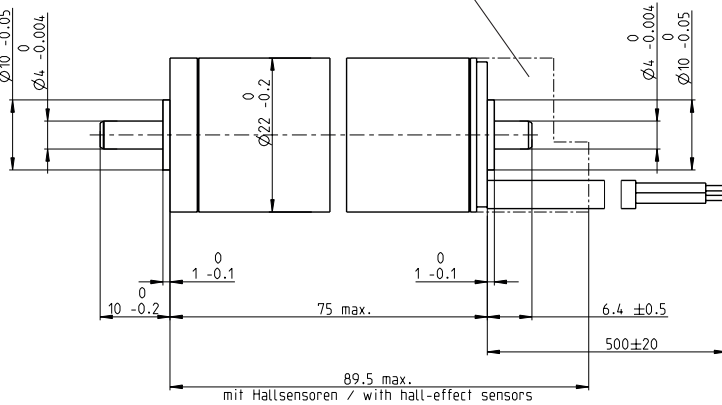
A with hall sensors

B sensorless

A with hall sensors



Lage des Kabelabgangs zum Befestigungsbohrbild ±10°
Alignment of cables relative to mounting holes ±10°



M 1:1

- Stock program
- Standard program
- Special program (on request)

Order Number

A with Hall Sensors
B sensorless

398663
398662

Motor Data (provisional)

Values at nominal voltage and ambient temperature °C	25	100	150	200
1 Nominal voltage	V	48	48	48
2 No load speed	rpm	12900	13500	13900
3 No load current	mA	384	140	144
4 Nominal speed ¹⁾	rpm	8560	8640	9240
5 Nominal torque (max. continuous torque) ¹⁾	mNm	149	120	92.9
6 Nominal current (max. continuous current)	A	4.53	3.64	2.9
7 Stall torque	mNm	460	346	295
8 Starting current	A	13.4	10.3	8.98
9 Max. efficiency	%	71	71	70
Characteristics				
10 Terminal resistance phase to phase	Ω	3.59	4.64	5.35
11 Terminal inductance phase to phase	mH	0.357	0.357	0.357
12 Torque constant	mNm/A	34.4	33.5	32.9
13 Speed constant	rpm/V	278	285	290
14 Speed / torque gradient	rpm/mNm	29	39.5	47.2
15 Mechanical time constant	ms	2.31	2.31	2.31
16 Rotor inertia	gcm ²	7.63	7.63	7.63

¹⁾ Values in thermal steady state.

Specifications

Thermal data	
17 Thermal resistance housing-ambient	0.79 K/W
18 Thermal resistance winding-housing	0.75 K/W
19 Thermal time constant winding	4.8 s
20 Thermal time constant motor	40 s
21 Ambient temperature	-55 ... +200 °C
22 Max. permissible winding temperature	+240 °C
Mechanical data (preloaded ball bearings)	
23 Max. permissible speed	20000 rpm
24 Axial play at axial load < 5 N	0 mm
> 5 N	max. 0.14 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	4 N
27 Max. force for press fits (static) (static, shaft supported)	60 N
28 Max. radial loading, 5 mm from flange	250 N
	16 N

Other specifications

29 Number of pole pairs	1
30 Number of phases	3
31 Weight of motor (sensorless)	230 g

Connection A, motor Cable PTFE blue (AWG 19)

red	Motor winding 1
black	Motor winding 2
white	Motor winding 3

Connection A, sensors Cable PTFE green (AWG 24)

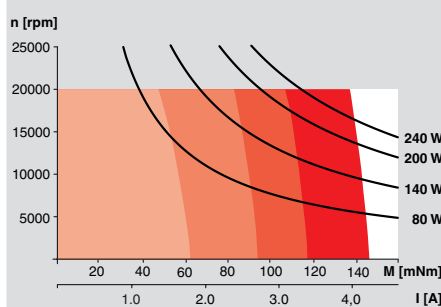
green	VHall 4.5...24 V
blue	GND
red	Hall sensor 1
black	Hall sensor 2
white	Hall sensor 3

Connection B, motor Cable PTFE blue (AWG 19)

red	Motor winding 1
black	Motor winding 2
white	Motor winding 3

Reference Medium used: Shell Tellus Oil T15

Operating Range



Comments

Continuous operation

Using the listed thermal resistance (line 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at the corresponding ambient temperature. = Thermal limit.

Short term operation

The motor may be briefly overloaded (recurring).

Assigned power rating

Application

General

- extreme temperature applications
- shock-loaded and vibration applications (according to MIL-STD810F/Jan2000 Fig. 514.5C-10)
- submerged oil operation under high pressure

Oil & Gas Industry

- oil, gas and geothermal wells

maxon Modular System

EC 22 Ø22 mm, brushless, 80 Watt

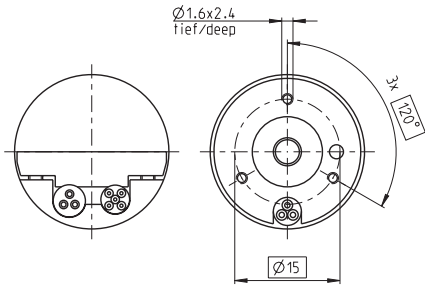
Heavy Duty – for applications in air

NEW

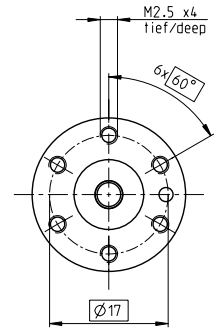
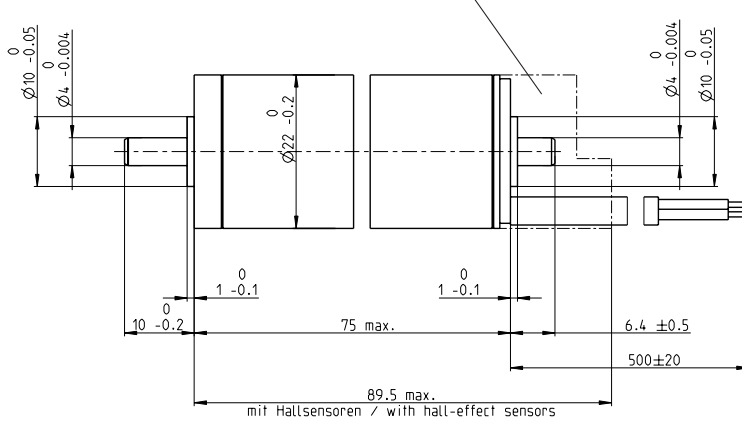
A with hall sensors

B sensorless

A with Hall sensors



Lage des Kabelabgangs zum Befestigungsbohrbild ±10°
Alignment of cables relative to mounting holes ±10°



M 1:1

- Stock program
- Standard program
- Special program (on request)

Order Number

A with Hall sensors
B sensorless

378170
376435

Motor Data (provisional)

Values at nominal voltage and ambient temperature °C	25	100	150	200	
1 Nominal voltage	V	48	48	48	48
2 No load speed	rpm	13300	13600	13900	14100
3 No load current	mA	56.7	47.2	48.6	49.9
4 Nominal speed ¹⁾	rpm	11600	11700	12300	13200
5 Nominal torque (max. continuous torque) ¹⁾	mNm	56.8	41.1	31.7	15
6 Nominal current (max. continuous current)	A	1.69	1.33	1.01	0.514
7 Stall torque	mNm	460	350	297	259
8 Starting current	A	13.4	10.4	9.05	8.02
9 Max. efficiency	%	88	87	86	85
Characteristics					
10 Terminal resistance phase to phase	Ω	3.59	4.64	5.35	6.05
11 Terminal inductance phase to phase	mH	0.357	0.357	0.357	0.357
12 Torque constant	mNm/A	34.4	33.5	32.9	32.3
13 Speed constant	rpm/V	278	285	290	296
14 Speed / torque gradient	rpm/mNm	29	39	47	55
15 Mechanical time constant	ms	2.31	3.15	3.77	4.42
16 Rotor inertia	gcm ²	7.63	7.63	7.63	7.63

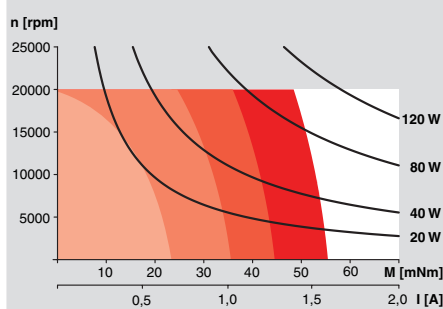
¹⁾ Values in thermal steady state.

Specifications

Thermal data	
17 Thermal resistance housing-ambient	10 K/W
18 Thermal resistance winding-housing	0.48 K/W
19 Thermal time constant winding	3.0 s
20 Thermal time constant motor	507 s
21 Ambient temperature	-55 ... +200 °C
22 Max. permissible winding temperature	+240 °C
Mechanical data (preloaded ball bearings)	
23 Max. permissible speed	20000 rpm
24 Axial play at axial load < 5 N	0 mm
> 5 N	max. 0.14 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	4 N
27 Max. force for press fits (static)	60 N
(static, shaft supported)	250 N
28 Max. radial loading, 5 mm from flange	16 N
Other specifications	
29 Number of pole pairs	1
30 Number of phases	3
31 Weight of motor (sensorless)	230 g

Connection A , motor Cable PTFE blue (AWG 19)	
red	Motor winding 1
black	Motor winding 2
white	Motor winding 3
Connection A, sensors Cable PTFE green (AWG 24)	
green	VHall 4.5...24 V
blue	GND
red	Hall sensor 1
black	Hall sensor 2
white	Hall sensor 3
Connection B, motor Cable PTFE blue (AWG 19)	
red	Motor winding 1
black	Motor winding 2
white	Motor winding 3

Operating Range



Comments

- Continuous operation**
Using the listed thermal resistance (line 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at the corresponding ambient temperature. = Thermal limit.
- Short term operation**
The motor may be briefly overloaded (recurring).
- Assigned power rating**

Application

- General**
 - extreme temperature applications
 - shock-loaded and vibration applications (according to MIL-STD810F/Jan2000 Fig. 514.5C-10)
 - ultra-high vacuum applications (low outgassing, can be baked out at 240°C)

- Aerospace**
 - gas turbine starter/generators for aircraft engines
 - regulation of combustion engines

- Oil & Gas Industry**
 - oil, gas and geothermal wells

- Robotics**
 - robotic exploration vehicles

- Industry**
 - pumps and valves for liquid metal cooling systems/turbine fuel and steam control
 - valve adjustment for gas and steam power plants

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