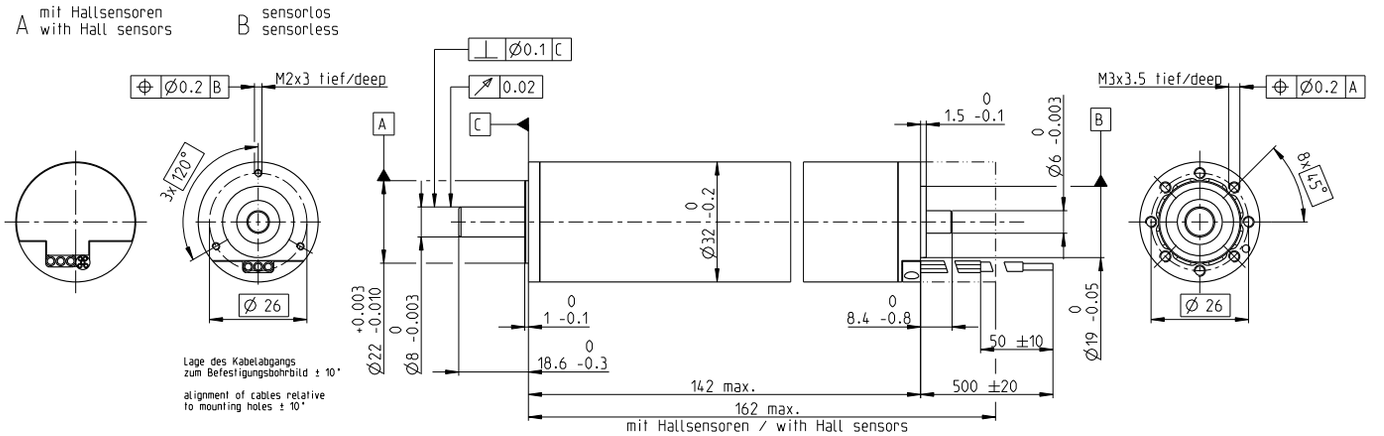
EC-4pole 32 ∅32 mm, brushless, 220 watt

Heavy Duty – for applications in air

EC-4pole



M 1:2

Stock program
Standard program
Special program (on request)

Part numbers	
A with Hall sensors	397798
B sensorless	393879

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	6470	6650	6770	6890	
3 No load current	mA	149	113	109	107	
4 Nominal speed[1]	rpm	5710	5870	6080	6470	
5 Nominal torque[1]	mNm	334	261	196	104	
6 Nominal current (max. continuous current)	A	4.87	3.85	2.98	1.67	
7 Stall torque	mNm	3350	2520	2150	1860	
8 Stall current	A	47.5	36.7	31.9	28.1	
9 Max. efficiency	%	89	89	89	88	
Characteristics						
10 Terminal resistance phase to phase	Ω	1.01	1.31	1.51	1.71	
11 Terminal inductance phase to phase	mH	0.298	0.298	0.298	0.298	
12 Torque constant	mNm/A	70.5	68.7	67.4	66.2	
13 Speed constant	rpm/V	135	139	142	144	
14 Speed / torque gradient	rpm/mNm	1.94	2.65	3.16	3.71	
15 Mechanical time constant	ms	2.6	3.55	4.24	4.98	
16 Rotor inertia	gcm²	128	128	128	128	

[1]Values for operation in thermal equilibrium.

Specifications

Thermal data

17	Thermal resistance housing-ambient	4 K/W
18	Thermal resistance winding-housing	0.53 K/W
19	Thermal time constant winding	18.4 s
20	Thermal time constant motor	1720 s
21	Ambient temperature*	-55...+200°C
22	Max. winding temperature	+240°C

Mechanical data (preloaded ball bearings)

23	Max. speed	12 000 rpm
24	Axial play at axial load < 20 N	0 mm
	> 20 N	0.14 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	16 N
27	Max. force for press fits (static)	80 N
	(static, shaft supported)	3000 N
28	Max. radial load, 5 mm from flange	75 N

Other specifications

29	Number of pole pairs	2
30	Number of phases	3
31	Weight of motor	860 g

Connection A, motor cable PTFE (AWG 14)

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

Connection A, sensors cable PTFE (AWG 24)

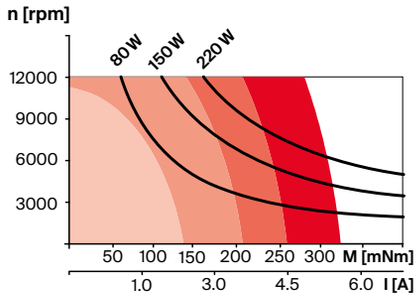
green	V_{Hall} 4.5...24 V
blue	GND
red	Hall sensor 1
black	Hall sensor 2
white	Hall sensor 3

Connection B, motor cable PTFE (AWG 14)

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

Wiring diagram for Hall sensors see p. 67

Operating range



TA = 25°C
TA = 100°C
TA = 150°C
TA = 200°C

Comments

Continuous operation
In observation of above listed thermal resistance (lines 17 and 18) and above listed ambient temperature, the maximum permissible winding temperature will be reached during continuous operation = thermal limit.

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

Application

General
- extreme temperature applications
- vibration tested (according to MIL-STD810F/Jan2000 Fig. 514.5C-10)
- ultra-high vacuum applications (modifications necessary). 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

Notice

This motor contains leaded solder. It therefore does not fulfill the requirements for the permitted maximum concentration of hazardous substances in accordance with the EC directive 2011/65/EC (RoHS) for all applications. The motor may therefore only be used for devices that are not subject to this directive.

*The Hall sensors in this motor are rated for ambient temperatures up to 150°C. The motor with Hall sensors is fully tested at 200°C in the final inspection. Nevertheless, the Hall sensors may temporarily fail below 200°C under certain conditions.