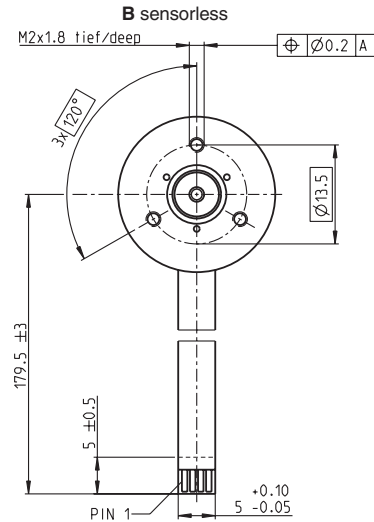
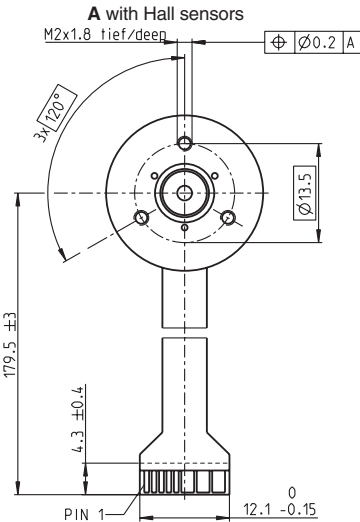
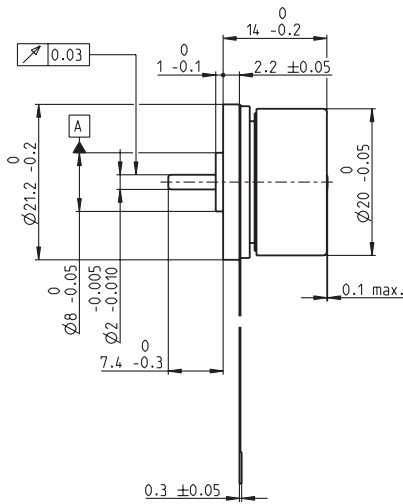


# EC 20 flat Ø20 mm, brushless, 5 Watt



M 1:1

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

		Part Numbers			
	A with Hall sensors	351005	351006	351007	351008
	B sensorless	351054	351055	351056	351057

### Motor Data (provisional)

Values at nominal voltage		6	9	12	24	
1	Nominal voltage	V	6	9	12	24
2	No load speed	rpm	9350	9430	9380	9300
3	No load current	mA	102	68.3	51.1	25.1
4	Nominal speed	rpm	4780	5310	5170	5220
5	Nominal torque (max. continuous torque)	mNm	7.59	8.58	7.59	7.74
6	Nominal current (max. continuous current)	A	1.31	0.974	0.655	0.329
7	Stall torque	mNm	17.2	22.4	18.9	19.9
8	Starting current	A	2.93	2.54	1.61	0.838
9	Max. efficiency	%	67	71	68	69
<b>Characteristics</b>						
10	Terminal resistance phase to phase	Ω	2.05	3.54	7.45	28.6
11	Terminal inductance phase to phase	mH	0.189	0.424	0.754	3.09
12	Torque constant	mNm/A	5.88	8.82	11.8	23.8
13	Speed constant	rpm/V	1620	1080	812	402
14	Speed/torque gradient	rpm/mNm	567	435	515	484
15	Mechanical time constant	ms	30.3	23.2	27.5	25.8
16	Rotor inertia	gcm <sup>2</sup>	5.1	5.1	5.1	5.1

### Specifications

<b>Thermal data</b>		
17	Thermal resistance housing-ambient	16.5 K/W
18	Thermal resistance winding-housing	2.66 K/W
19	Thermal time constant winding	1.77 s
20	Thermal time constant motor	27.5 s
21	Ambient temperature	-40...+100°
22	Max. permissible winding temperature	+125°C
<b>Mechanical data (preloaded ball bearings)</b>		
23	Max. permissible speed	15 000 rpm
24	Axial play at axial load < 2.0 N	0 mm
	> 2.0 N	0.14 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	1.8 N
27	Max. force for press fits (static) (static, shaft supported)	200 N
28	Max. radial load, 5 mm from flange	10 N

### Other specifications

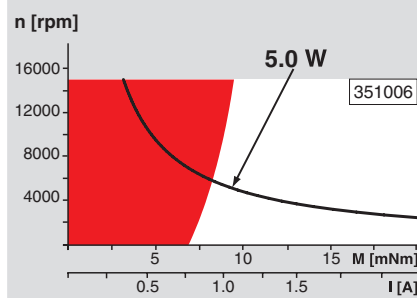
29	Number of pole pairs	4
30	Number of phases	3
31	Weight of motor	22 g

Values listed in the table are nominal.

Connection	with Hall sensors	sensorless	Part number	Part number
Pin 1	V <sub>Hall</sub> 4.5...24 VDC	Motor winding 1	220300	220310
Pin 2	Hall sensor 3	Motor winding 2		
Pin 3	Hall sensor 1	Motor winding 3		
Pin 4	Hall sensor 2	neutral point		
Pin 5	GND			
Pin 6	Motor winding 3			
Pin 7	Motor winding 2			
Pin 8	Motor winding 1			
<b>Adapter</b>	<b>Part number</b>	<b>Part number</b>		
see p. 362	220300	220310		
<b>Connector</b>	<b>Part number</b>	<b>Part number</b>		
Tyco	1-84953-1	84953-4		
Molex	52207-1133	52207-0433		
Molex	52089-1119	52089-0419		

Pin for design with Hall sensors:  
FPC, 11-pol, Pitch 1.0 mm, top contact style  
Wiring diagram for Hall sensors see p. 35

### Operating Range



### Comments

- Continuous operation**  
In observation of above listed thermal resistance (lines 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at 25°C ambient.  
= Thermal limit.
- Short term operation**  
The motor may be briefly overloaded (recurring).
- Assigned power rating**

### maxon Modular System

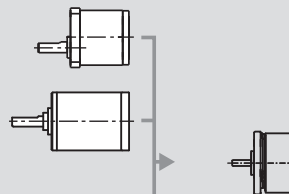
Overview on page 20–25

#### Spur Gearhead

Ø20.3 mm  
0.06 - 0.25 Nm  
Page 259

#### Planetary Gearhead

Ø22 mm  
0.5 - 2.0 Nm  
Page 262/265



#### Recommended Electronics:

ESCON 36/3 EC	Page 342
ESCON Mod. 50/4 EC-S	343
ESCON Module 50/5	343
ESCON 50/5	344
DEC Module 24/2	346
EPOS2 24/2	350
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
<b>Notes</b>	<b>24</b>