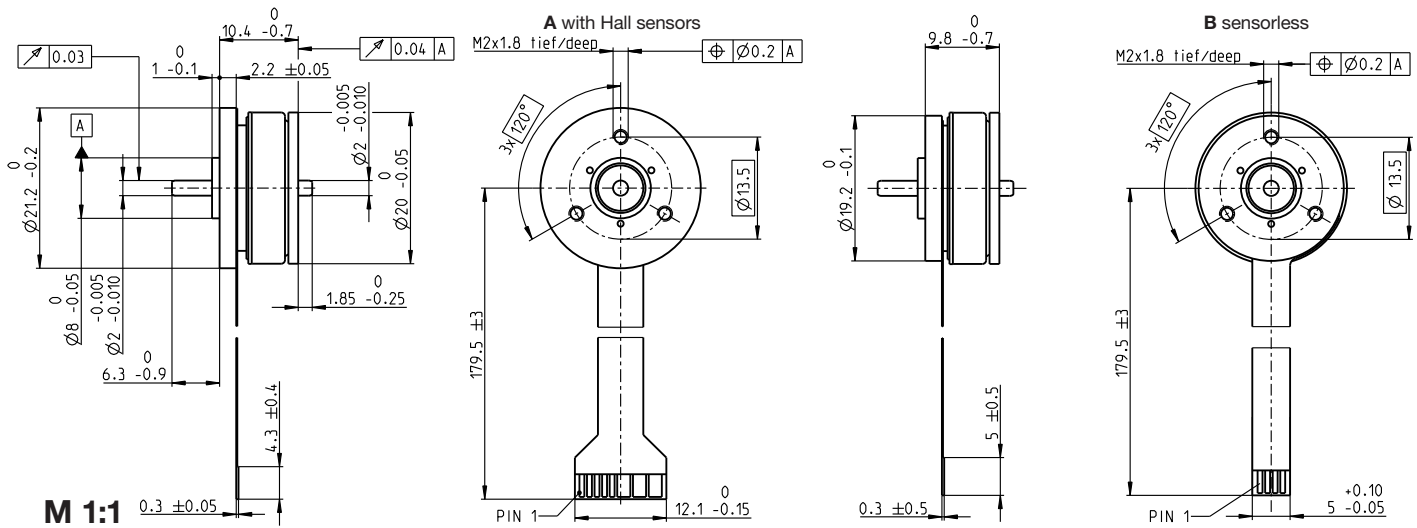


# EC 20 flat Ø20 mm, brushless, 3 Watt



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

## Part Numbers

	351098	351099	351100	351101
A with Hall sensors	351098	351099	351100	351101
B sensorless	339255	241916	339257	339258

## Motor Data

Values at nominal voltage		6	9	12	24
1 Nominal voltage	V	6	9	12	24
2 No load speed	rpm	9070	9760	9540	9450
3 No load current	mA	53.6	35.1	25.8	12.6
4 Nominal speed	rpm	3030	4140	3490	3830
5 Nominal torque (max. continuous torque)	mNm	3.22	4.08	3.28	3.78
6 Nominal current (max. continuous current)	A	0.56	0.478	0.294	0.163
7 Stall torque	mNm	5.29	8.04	5.67	7.12
8 Stall current	A	0.9	0.957	0.503	0.309
9 Max. efficiency	%	59	66	61	65
Characteristics		6.67	9.4	23.9	77.7
10 Terminal resistance phase to phase	Ω	6.67	9.4	23.9	77.7
11 Terminal inductance phase to phase	mH	0.639	1.3	2.35	9.8
12 Torque constant	mNm/A	5.88	8.4	11.3	23
13 Speed constant	rpm/V	1620	1140	847	414
14 Speed/torque gradient	rpm/mNm	1840	1270	1790	1400
15 Mechanical time constant	ms	74.1	51.2	72.1	56.2
16 Rotor inertia	gcm <sup>2</sup>	3.84	3.84	3.84	3.84

## Specifications

<b>Thermal data</b>	
17 Thermal resistance housing-ambient	19.2 K/W
18 Thermal resistance winding-housing	8.41 K/W
19 Thermal time constant winding	3.69 s
20 Thermal time constant motor	31.8 s
21 Ambient temperature	-40...+100°C
22 Max. winding temperature	+125°C
<b>Mechanical data (preloaded ball bearings)</b>	
23 Max. speed	15000 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	1.9 N

## Other specifications

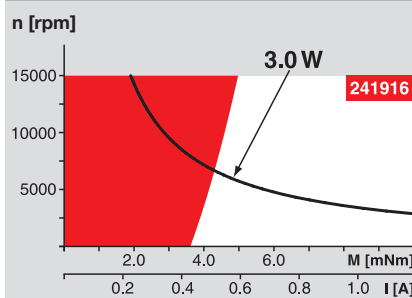
29 Number of pole pairs	4
30 Number of phases	3
31 Weight of motor	15 g

Values listed in the table are nominal.

Connection	with Hall sensors	sensorless	Part number
Pin 1	V <sub>Hall</sub> 4.5...24 VDC	Motor winding 1	220300
Pin 2	Hall sensor 3	Motor winding 2	220310
Pin 3	Hall sensor 1	Motor winding 3	1-84953-1
Pin 4	Hall sensor 2	↘ neutral point	84953-4
Pin 5	GND		52207-1133
Pin 6	Motor winding 3		52207-0433
Pin 7	Motor winding 2		52089-1119
Pin 8	Motor winding 1		52089-0419
<b>Adapter</b>	<b>Part number</b>	<b>Part number</b>	
see p. 438	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. 37

## Operating Range



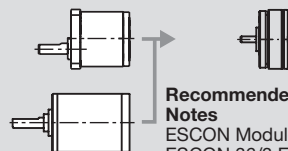
## Comments

- 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 20–27

- Spur Gearhead**  
Ø20.3 mm  
0.06 - 0.25 Nm  
Page 326
- Planetary Gearhead**  
Ø22 mm  
0.5 - 2.0 Nm  
Page 329/332



- Recommended Electronics:**
- | Notes                | Page 26 |
|----------------------|---------|
| ESCON Module 24/2    | 416     |
| ESCON 36/3 EC        | 417     |
| ESCON Mod. 50/4 EC-S | 417     |
| DEC Module 24/2      | 420     |
| EPOS2 24/2           | 424     |
| EPOS2 Module 36/2    | 424     |
| MAXPOS 50/5          | 435     |