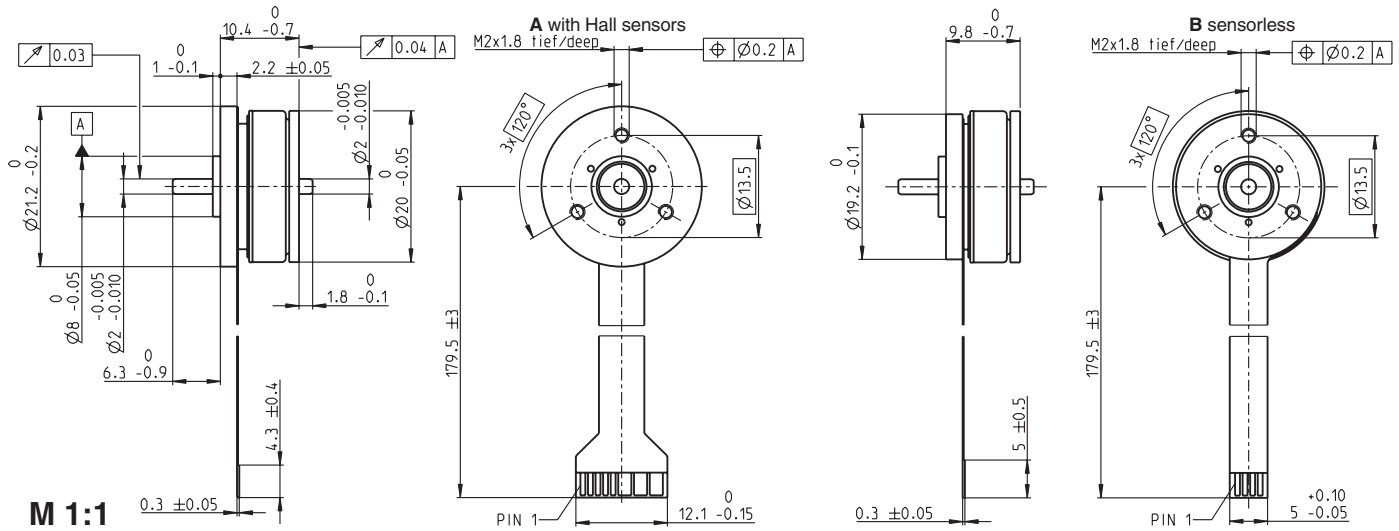


# EC 20 flat Ø20 mm, brushless, 3 Watt



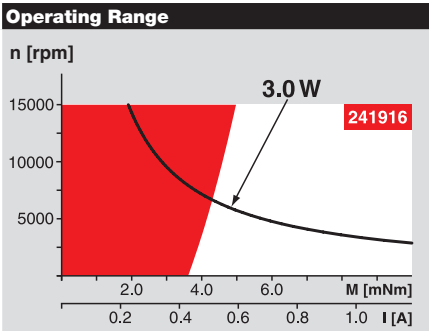
maxon flat motor

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

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

Motor Data					
Values at nominal voltage					
1 Nominal voltage	V	6.0	9.0	12.0	24.0
2 No load speed	rpm	8960	9630	9370	9310
3 No load current	mA	62.5	44.9	33.1	16.2
4 Nominal speed	rpm	3160	4230	3530	3840
5 Nominal torque (max. continuous torque)	mNm	3.07	3.91	3.16	3.67
6 Nominal current (max. continuous current)	A	0.548	0.470	0.292	0.163
7 Stall torque	mNm	5.29	8.04	5.67	7.12
8 Starting current	A	0.900	0.957	0.503	0.309
9 Max. efficiency	%	55	62	56	60
Characteristics					
10 Terminal resistance phase to phase	Ω	6.67	9.40	23.9	77.7
11 Terminal inductance phase to phase	mH	0.639	1.30	2.35	9.80
12 Torque constant	mNm / A	5.88	8.40	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**
- Thermal data**
- 17 Thermal resistance housing-ambient: 15.3 K / W
  - 18 Thermal resistance winding-housing: 7.5 K / W
  - 19 Thermal time constant winding: 3.28 s
  - 20 Thermal time constant motor: 25.4 s
  - 21 Ambient temperature: -40 ... +100°C
  - 22 Max. permissible winding temperature: +125°C
- Mechanical data (preloaded ball bearings)**
- 23 Max. permissible 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): 10 N
  - 28 Max. radial loading, 5 mm from flange: 1.8 N



**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**

- 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.
- |                                     |                   |  |
|-------------------------------------|-------------------|--|
| <b>Connection with Hall sensors</b> | <b>sensorless</b> |  |
| Pin 1: 4.5 ... 24 VDC               | Motor winding 1   |  |
| 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>Order number</b>   | <b>Order number</b>   |
| see p. 310       | 220300                | 220310                |
| <b>Connector</b> | <b>Article number</b> | <b>Article number</b> |
| TYCO             | 1-84953-1             | 84953-4               |
| MOLEX            | 52207-1185            | 52207-0485            |
| 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. 29

**maxon Modular System**      Overview on page 16 - 21

**Spur Gearhead**  
Ø20.3 mm  
0.06 - 0.25 Nm  
Page 219

**Planetary Gearhead**  
Ø22 mm  
0.5 - 2.0 Nm  
Page 222 / 224

**Recommended Electronics:**

DECS 50/5	Page 289
DEC 24/1	289
DEC Module 24/2	290
<b>Notes</b>	<b>20</b>