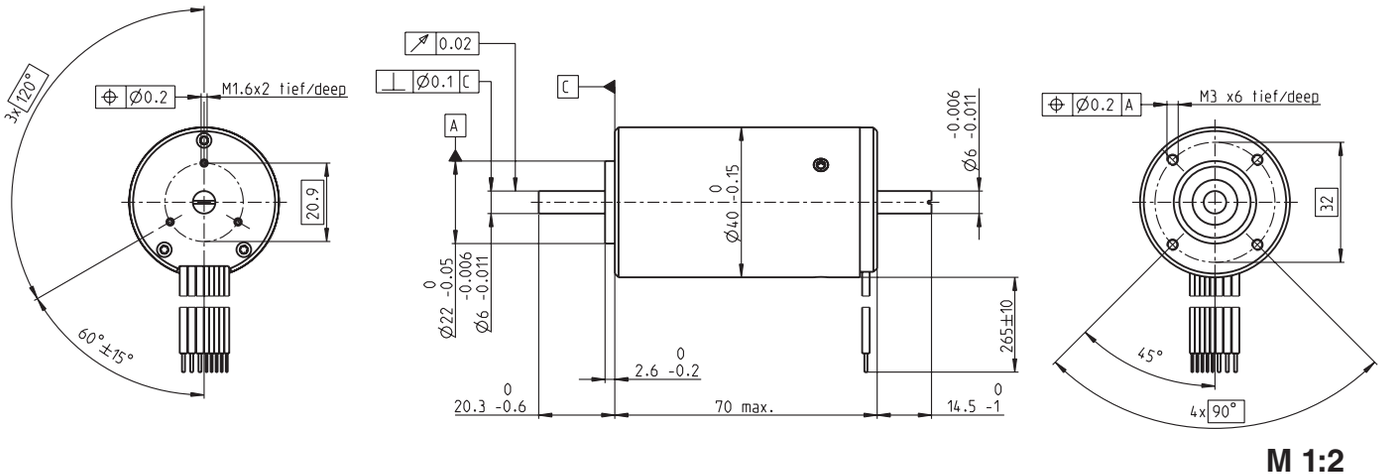
EC 40 ∅40 mm, brushless, 120 Watt

NRND See page 13
Not recommended for New Design

maxon special program



M 1:2

Stock program
Standard program
Special program (on request)

Part Numbers

	167176	167177	118894	118895	167178	167179	118896	118897	167180	118898	167181	167183	118899	118901
Motor Data														
Values at nominal voltage														
1 Nominal voltage V	12	18	21	30	24	36	42	48	48	48	48	48	48	48
2 No load speed rpm	10300	12000	10400	11600	10300	9830	10400	7560	10300	5930	5420	3530	3110	2020
3 No load current mA	886	754	515	426	443	275	258	139	222	97.8	86.2	48.6	41.3	24.4
4 Nominal speed rpm	9050	10900	9240	10500	9160	8710	9290	6450	9190	4830	4290	2400	1990	893
5 Nominal torque (max. continuous torque) mNm	107	113	116	120	120	123	122	127	123	130	126	127	129	129
6 Nominal current (max. continuous current) A	10.4	8.62	6.46	5.24	5.78	3.76	3.40	2.22	2.96	1.77	1.57	1.03	0.920	0.599
7 Stall torque mNm	985	1340	1150	1420	1210	1200	1280	940	1270	743	639	410	370	237
8 Starting current A	89.2	94.4	60.1	57.9	55.0	34.6	33.5	15.7	28.8	9.72	7.65	3.21	2.56	1.07
9 Max. efficiency %	81	83	83	84	83	83	84	82	84	81	80	77	76	72
Characteristics														
10 Terminal resistance phase to phase Ω	0.134	0.191	0.349	0.518	0.436	1.04	1.25	3.07	1.66	4.94	6.28	14.9	18.8	44.8
11 Terminal inductance phase to phase mH	0.0266	0.0439	0.0797	0.132	0.106	0.263	0.319	0.788	0.425	1.28	1.52	3.56	4.57	10.7
12 Torque constant mNm/A	11.0	14.2	19.1	24.6	22.1	34.7	38.2	60.1	44.1	76.4	83.5	128	145	221
13 Speed constant rpm/V	865	673	500	389	433	275	250	159	216	125	114	74.8	66.0	43.2
14 Speed/torque gradient rpm/mNm	10.5	9.05	9.13	8.20	8.55	8.26	8.20	8.12	8.16	8.07	8.59	8.76	8.56	8.75
15 Mechanical time constant ms	9.39	8.06	8.13	7.30	7.61	7.35	7.30	7.22	7.26	7.18	7.64	7.79	7.62	7.78
16 Rotor inertia gcm²	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0

Specifications

Thermal data

17	Thermal resistance housing-ambient	3.2 K/W
18	Thermal resistance winding-housing	1.2 K/W
19	Thermal time constant winding	17.1 s
20	Thermal time constant motor	1050 s
21	Ambient temperature	-20…+100°C
22	Max. permissible winding temperature	+125°C

Mechanical data (preloaded ball bearings)

23	Max. permissible speed	18000 rpm
24	Axial play at axial load < 8 N	0 mm
	> 8 N	max. 0.14 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	7 N
27	Max. force for press fits (static)	133 N
	(static, shaft supported)	5000 N
28	Max. radial loading, 5 mm from flange	70 N

Other specifications

29	Number of pole pairs	1
30	Number of phases	3
31	Weight of motor	390 g

Values listed in the table are nominal.
Explanation of the figures on page 161

Connection motor (Cable AWG 22)

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

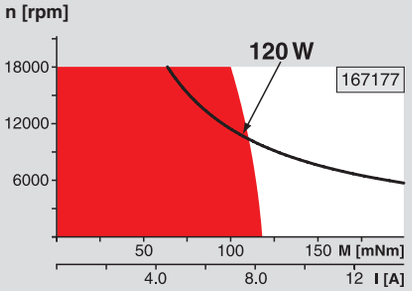
Connection sensors (Cable AWG 26)[1)]

green	VHall 4.5 ... 24 VDC
blue	GND
red/grey	Hall sensor 1
black/grey	Hall sensor 2
white/grey	Hall sensor 3

Wiring diagram for Hall sensors see p. 35

1) Not lead through in combination with resolver.

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).

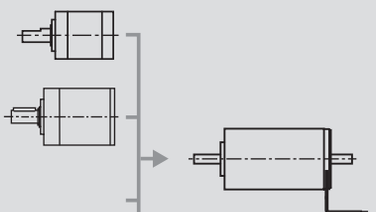
Assigned power rating

maxon Modular System

Overview on page 20 - 25

Planetary Gearhead
∅42 mm
3 - 15 Nm
Page 270

Planetary Gearhead
∅52 mm
4 - 30 Nm
Page 273



Recommended Electronics:

ESCON 50/5	Page 321
DECS 50/5	324
DEC Module 50/5	325
EPOS2 24/5, 50/5, 70/10	331
EPOS2 P 24/5	334
Notes	**24**

Encoder HED_5540
500 CPT,
3 channels
Page 306/308

Resolver Res 26
∅26 mm
10 V
Page 316

Brake AB 28
24 VDC
0.4 Nm
Page 348