

maxon EC-i

Standard Specification No.101	68
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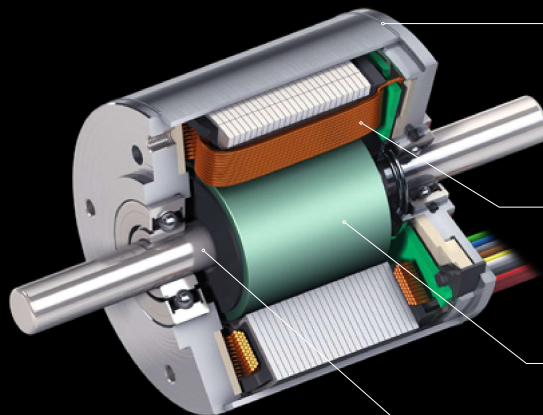


maxon EC-i

Powerhouses for extremely small spaces. With their optimized magnetic circuit, these brushless EC-i motors with iron windings offer a very high torque density and very low cogging torque. The multipole internal rotor has excellent dynamics. The robust design with a steel flange and housing makes this unit suitable for a wide variety of applications.

Key data

Motor \varnothing	30 ... 52 mm
Motor length	26 ... 110 mm
Power	20 ... 200 W
Nominal torque	up to 649 mNm
Max. permissible speed	up to 15 000 rpm



The steel housing and flange ensure good heat dissipation and mechanical stability.

The stator with an iron winding is designed for high power at a low cogging torque.

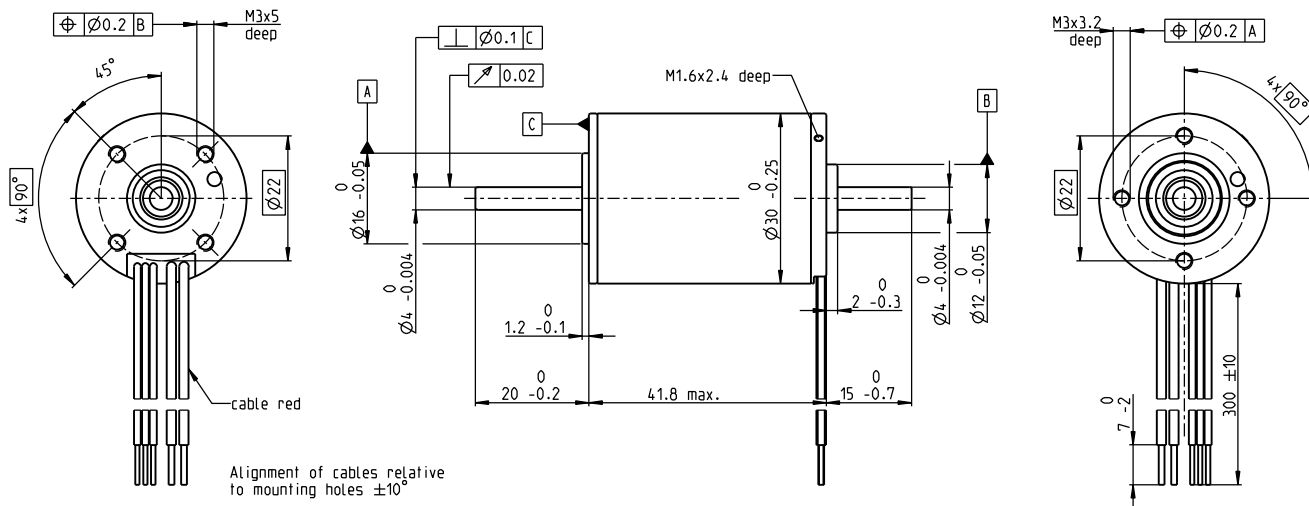
The modular rotor delivers good dynamics and large torques.

Grooveless shaft ensures smooth running and extremely high torsional rigidity.

- Highly dynamic due to internal, multi-pole rotor
- Mechanical time constants of less than 3 milliseconds
- High torque density
- Speeds up to 15 000 rpm

EC-i 30 Ø30 mm brushless, 20 Watt, with integrated electronics

4-Q-Speed Controller



EC-i

M 3:4

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

Part Numbers

5 wire version	
Enable	Direction
618864	619301

Motor Data (provisional)

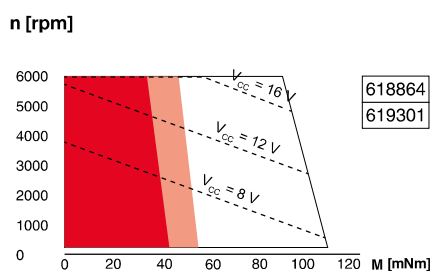
Values at nominal voltage			
1 Nominal voltage	V	24	24
2 No load speed	rpm	6000	6000
3 No load current	mA	107	107
4 Nominal speed	rpm	6000	6000
5 Nominal torque (max. continuous torque)	mNm	32.6	32.6
6 Nominal current (max. continuous current)	A	1.19	1.19
33 Max. torque	mNm	105	105
34 Max. current	A	6.5	6.5
9 Max. efficiency	%	75.4	75.4
Characteristics			
35 Type of control			
36 Supply voltage +V _{CC}	V	8...28	8...28
37 Speed set value input	V	0.42...10.1	0.42...10.1
38 Scale speed set value input	rpm/V	600	600
39 Speed range	rpm	250...6060	250...6060
40 Max. acceleration	rpm/s	6000	6000

Specifications

Thermal data	
17 Thermal resistance housing-ambient	13.0 K/W
18 Thermal resistance winding-housing	5.9 K/W
19 Thermal time constant winding	34.1 s
20 Thermal time constant motor	1030 s
21 Ambient temperature	-40...+85°C
22 Max. winding temperature	+155°C
41 Max. temperature of electronics	100°C

Mechanical data (preloaded ball bearings)	
16 Rotor inertia	6.69 gcm ²
24 Axial play at axial load < 9.0 N	0 mm
> 9.0 N	0.14 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	9 N
27 Max. force for press fits (static)	48.8 N
(static, shaft supported)	2510 N
28 Max. radial load, 10 mm from flange	30 N

Operating Range



- Continuous operation
- Continuous operation with reduced thermal resistance R_{th2} 50%
- Intermittent operation

Other specifications

31 Weight of motor	160 g
32 Direction of rotation	Clockwise (CW)

Values listed in the table are nominal.

Protective functions

Overload protection, blockage protection, inverse-polarity protection, thermal overload protection, low/high voltage cut-off

Connection 5 wire version (Cable AWG 20/24)

red	+V _{CC} 8...28 VDC
black	GND
white	Speed set value input
green	Monitor n (6 pulses per revolution)
grey	Disable (Type Enable) or sense of direction (Type Direction)

maxon Modular System

Details on catalog page 36

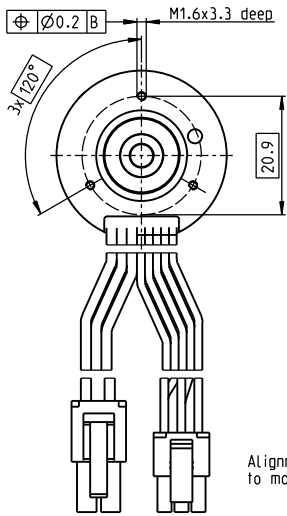
Planetary Gearhead

Ø32 mm
1.0 - 6.0 Nm
Page 389

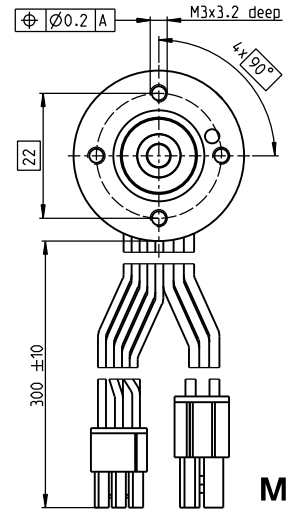
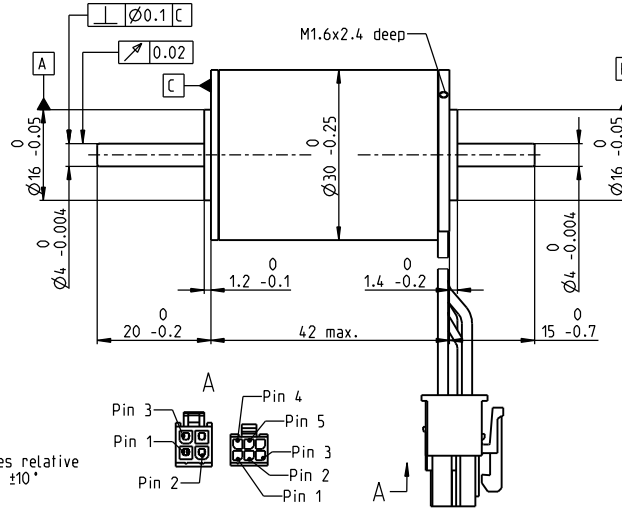


EC-i 30 Ø30 mm, brushless, 30 Watt

EC-i



Alignment of cables relative to mounting holes $\pm 10^\circ$



M 3:4

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

Part Numbers

with Hall sensors

539472 **539473** 539474 539475

Motor Data (provisional)

Values at nominal voltage		12	24	36	48
1 Nominal voltage	V	12	24	36	48
2 No load speed	rpm	9190	9190	9190	9010
3 No load current	mA	206	103	68.6	50.1
4 Nominal speed	rpm	7710	7770	7760	7600
5 Nominal torque (max. continuous torque)	mNm	37.3	37.3	35.9	37.4
6 Nominal current (max. continuous current)	A	3.05	1.52	0.982	0.748
7 Stall torque ¹	mNm	341	360	338	358
8 Stall current	A	27.7	14.6	9.15	7.11
9 Max. efficiency	%	83.7	84.1	83.6	84.1
Characteristics		0.434	1.64	3.93	6.76
10 Terminal resistance phase to phase	Ω	0.434	1.64	3.93	6.76
11 Terminal inductance phase to phase	mH	0.279	1.12	2.51	4.66
12 Torque constant	mNm/A	12.3	24.6	37	50.3
13 Speed constant	rpm/V	775	387	258	190
14 Speed/torque gradient	rpm/mNm	27.3	25.8	27.5	25.5
15 Mechanical time constant	ms	2.08	1.98	2.1	1.95
16 Rotor inertia	gcm ²	7.3	7.3	7.3	7.3

Specifications

- Thermal data**
- 17 Thermal resistance housing-ambient 11.1 K/W
 - 18 Thermal resistance winding-housing 3.75 K/W
 - 19 Thermal time constant winding 29.1 s
 - 20 Thermal time constant motor 849 s
 - 21 Ambient temperature -40...+100°C
 - 22 Max. winding temperature +125°C

- Mechanical data (preloaded ball bearings)**
- 23 Max. speed 15000 rpm
 - 24 Axial play at axial load < 9.0 N 0 mm
 - > 9.0 N 0,14 mm
 - 25 Radial play preloaded 5 N
 - 26 Max. axial load (dynamic) 98 N
 - 27 Max. force for press fits (static) (static, shaft supported) 2000 N
 - 28 Max. radial load, 5 mm from flange 25 N

Other specifications

- 29 Number of pole pairs 2
- 30 Number of phases 3
- 31 Weight of motor 153 g

Values listed in the table are nominal.

Connection motor (Cable AWG 20)

- red Motor winding 1 Pin 1
- black Motor winding 2 Pin 2
- white Motor winding 3 Pin 3
- N.C. Pin 4

Connector Article number

Molex 39-01-2040

Connection sensors (Cable AWG 26)

- yellow Hall sensor 1 Pin 1
- brown Hall sensor 2 Pin 2
- grey Hall sensor 3 Pin 3
- blue GND Pin 4
- green V_{Hall} 4.5...24 VDC Pin 5
- N.C. Pin 6

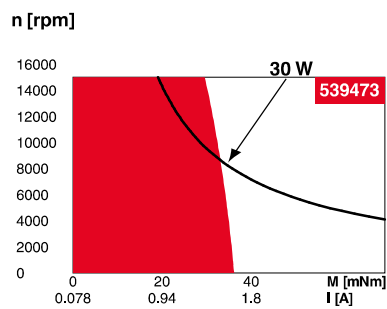
Connector Article number

Molex 430-25-0600

Wiring diagram for Hall sensors see p. 49

¹Calculation does not include saturation effect

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**

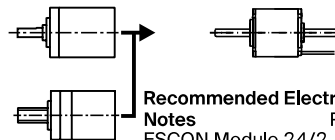
maxon Modular System

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Planetary Gearhead

Ø32 mm
1.0 - 6.0 Nm
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Screw Drive
Ø32 mm
Page 416-421



Recommended Electronics:

Notes Page 36

- ESCON Module 24/2 486
- ESCON 36/3 EC 487
- ESCON Mod. 50/4 EC-S 487
- ESCON Mod. 50/5 487
- ESCON 50/5 489
- DEC Module 24/2 491
- DEC Module 50/5 491
- EPOS4 Mod./Comp. 50/5 496
- EPOS4 50/5 501
- EPOS2 P 24/5 504

Encoder 16 EASY/XT

128 - 1024 CPT, 3 channels
Page 449/451

Encoder 16 EASY Absolute/XT

4096 steps
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Encoder 16 RIO

1024 - 32768 CPT, 3 channels
Page 466

Encoder HEDL 5540

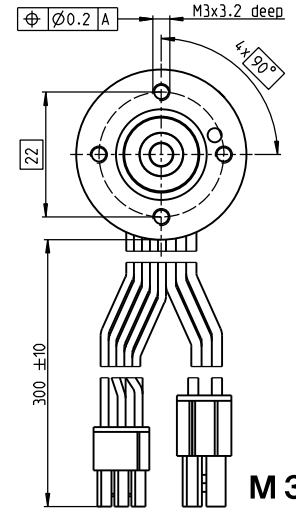
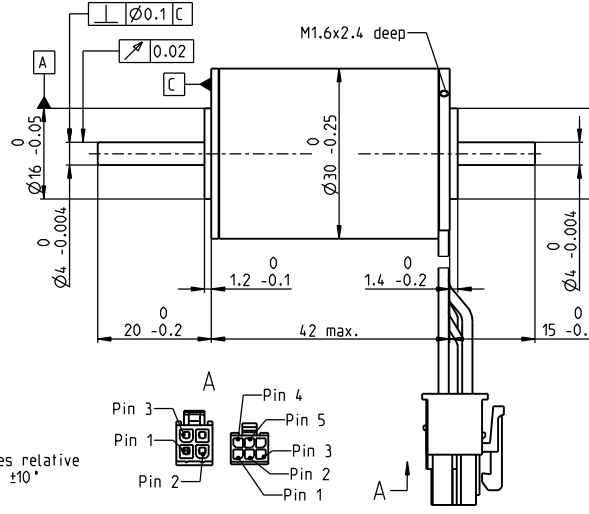
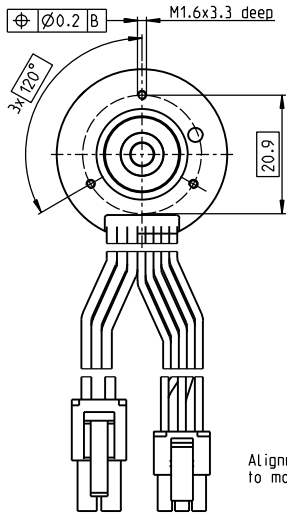
500 CPT, 3 channels
Page 469

Encoder AEDL 5810

1024 - 5000 CPT, 3 channels
Page 476

EC-i 30 Ø30 mm, brushless, 45 Watt

High Torque



EC-i

M 3:4

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

Part Numbers					
with Hall sensors	539480	539481	539482	539483	539484

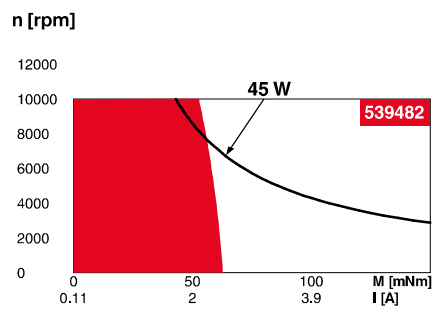
Motor Data (provisional)

Values at nominal voltage		12	18	24	36	48
1 Nominal voltage	V	12	18	24	36	48
2 No load speed	rpm	8250	8250	8520	8250	8520
3 No load current	mA	273	182	143	91.1	71.5
4 Nominal speed	rpm	6710	6760	7030	6790	7050
5 Nominal torque (max. continuous torque)	mNm	65.4	67.7	63.8	67.6	63.8
6 Nominal current (max. continuous current)	A	4.51	3.09	2.28	1.54	1.14
7 Stall torque ¹	mNm	731	840	811	885	835
8 Stall current	A	53.2	40.8	30.5	21.5	15.7
9 Max. efficiency	%	86.3	87.2	86.9	87.5	87.1
Characteristics						
10 Terminal resistance phase to phase	Ω	0.225	0.441	0.787	1.68	3.06
11 Terminal inductance phase to phase	mH	0.199	0.449	0.749	1.8	3
12 Torque constant	mNm/A	13.7	20.6	26.6	41.2	53.2
13 Speed constant	rpm/V	696	464	359	232	180
14 Speed/torque gradient	rpm/mNm	11.4	9.94	10.6	9.43	10.3
15 Mechanical time constant	ms	0.969	0.843	0.902	0.8	0.876
16 Rotor inertia	gcm ²	8.1	8.1	8.1	8.1	8.1

Specifications

- Thermal data**
- 17 Thermal resistance housing-ambient 11.1 K/W
 - 18 Thermal resistance winding-housing 3.75 K/W
 - 19 Thermal time constant winding 27.8 s
 - 20 Thermal time constant motor 866 s
 - 21 Ambient temperature -40...+100°C
 - 22 Max. winding temperature +155°C
- Mechanical data (preloaded ball bearings)**
- 23 Max. speed 10000 rpm
 - 24 Axial play at axial load < 9.0 N 0 mm
 - > 9.0 N 0.14 mm
 - 25 Radial play preloaded 5 N
 - 26 Max. axial load (dynamic) 5 N
 - 27 Max. force for press fits (static) 98 N
 - (static, shaft supported) 2000 N
 - 28 Max. radial load, 5 mm from flange 25 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 156 g

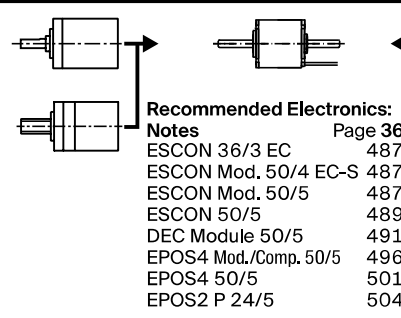
Values listed in the table are nominal.

- Connection motor (Cable AWG 20)**
- red Motor winding 1 Pin 1
 - black Motor winding 2 Pin 2
 - white Motor winding 3 Pin 3
 - N.C. Pin 4
- Connector Article number**
- Molex 39-01-2040
- Connection sensors (Cable AWG 26)**
- yellow Hall sensor 1 Pin 1
 - brown Hall sensor 2 Pin 2
 - grey Hall sensor 3 Pin 3
 - blue GND Pin 4
 - green V_{Hall} 4.5...24 VDC Pin 5
 - N.C. Pin 6
- Connector Article number**
- Molex 430-25-0600

maxon Modular System

Details on catalog page 36

- Planetary Gearhead**
Ø32 mm
1.0 – 6.0 Nm
Page 389
- Screw Drive**
Ø32 mm
Page 416–421

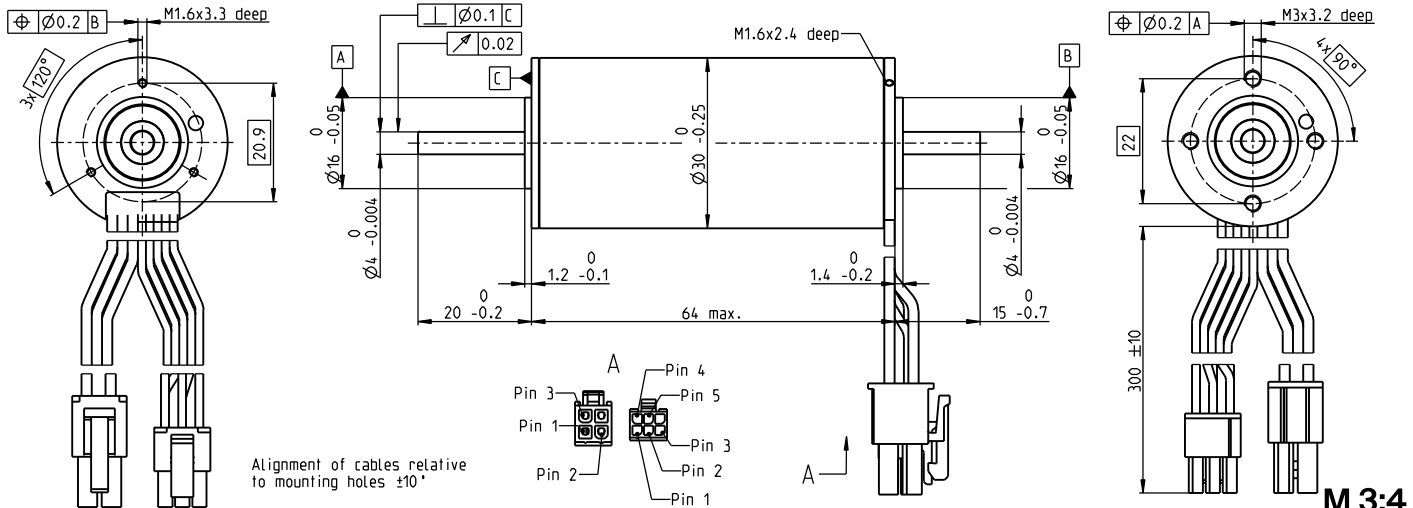


- Encoder 16 EASY/XT**
128 – 1024 CPT, 3 channels
Page 449/451
- Encoder 16 EASY Absolute/XT**
4096 steps
Page 453/455
- Encoder 16 RIO**
1024 – 32768 CPT, 3 channels
Page 466
- Encoder HEDL 5540**
500 CPT, 3 channels
Page 469
- Encoder AEDL 5810**
1024 – 5000 CPT, 3 channels
Page 476

¹Calculation does not include saturation effect

EC-i 30 Ø30 mm, brushless, 50 Watt

EC-i



Alignment of cables relative to mounting holes $\pm 10^\circ$

M 3:4

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

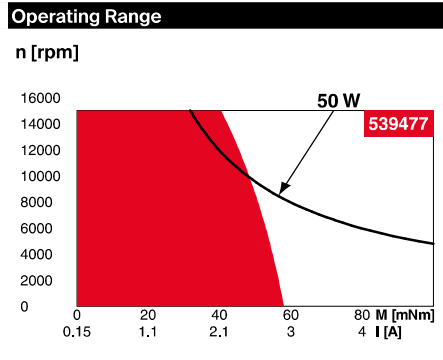
Part Numbers				
with Hall sensors	539476	539477	539478	539479

Motor Data (provisional)

Values at nominal voltage					
1 Nominal voltage	V	12	24	36	48
2 No load speed	rpm	9950	9960	10300	10200
3 No load current	mA	337	169	117	86.8
4 Nominal speed	rpm	8750	8840	9160	9110
5 Nominal torque (max. continuous torque)	mNm	55.6	55.5	53.1	58.4
6 Nominal current (max. continuous current)	A	4.98	2.48	1.64	1.33
7 Stall torque ¹	mNm	682	768	762	909
8 Stall current	A	59.8	33.7	23	20.4
9 Max. efficiency	%	85.7	86.5	86.3	87.5
Characteristics					
10 Terminal resistance phase to phase	Ω	0.201	0.713	1.57	2.35
11 Terminal inductance phase to phase	mH	0.119	0.475	1.01	1.82
12 Torque constant	mNm/A	11.4	22.8	33.2	44.6
13 Speed constant	rpm/V	837	418	288	214
14 Speed/torque gradient	rpm/mNm	14.7	13.1	13.6	11.3
15 Mechanical time constant	ms	2.13	1.89	1.96	1.63
16 Rotor inertia	gcm ²	13.8	13.8	13.8	13.8

Specifications

- Thermal data**
- 17 Thermal resistance housing-ambient 9,01 K/W
 - 18 Thermal resistance winding-housing 2,46 K/W
 - 19 Thermal time constant winding 31,2 s
 - 20 Thermal time constant motor 1080 s
 - 21 Ambient temperature -40...+100°C
 - 22 Max. winding temperature +125°C
- Mechanical data (preloaded ball bearings)**
- 23 Max. speed 15000 rpm
 - 24 Axial play at axial load < 9,0 N 0 mm
 - > 9,0 N 0,14 mm
 - 25 Radial play preloaded 5 N
 - 26 Max. axial load (dynamic) 5 N
 - 27 Max. force for press fits (static) 98 N
 - (static, shaft supported) 1300 N
 - 28 Max. radial load, 5 mm from flange 25 N



- Operating Range**
- 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 2
 - 30 Number of phases 3
 - 31 Weight of motor 240 g

maxon Modular System

Details on catalog page 36

- Values listed in the table are nominal.
- Connection motor** (Cable AWG 20)
- red Motor winding 1 Pin 1
 - black Motor winding 2 Pin 2
 - white Motor winding 3 Pin 3
 - N.C. Pin 4
- Connector Article number**
- Molex 39-01-2040
- Connection sensors** (Cable AWG 26)
- yellow Hall sensor 1 Pin 1
 - brown Hall sensor 2 Pin 2
 - grey Hall sensor 3 Pin 3
 - blue GND Pin 4
 - green V_{Hall} 4.5...24 VDC Pin 5
 - N.C. Pin 6
- Connector Article number**
- Molex 430-25-0600
- Wiring diagram for Hall sensors see p. 49
- ¹Calculation does not include saturation effect

Planetary Gearhead

- Ø32 mm
- 1,0 - 6,0 Nm
- Page 389

Screw Drive

- Ø32 mm
- Page 416-421

Recommended Electronics:

- Notes Page 36
- ESCON 36/3 EC 487
- ESCON Mod. 50/4 EC-S 487
- ESCON Mod. 50/5 487
- ESCON 50/5 489
- DEC Module 50/5 491
- EPOS4 Mod./Comp. 50/5 496
- EPOS4 50/5 501
- EPOS2 P 24/5 504

Encoder 16 EASY/XT

- 128 - 1024 CPT, 3 channels
- Page 450/452

Encoder 16 EASY Absolute/XT

- 4096 steps
- Page 454/456

Encoder 16 RIO

- 1024 - 32768 CPT, 3 channels
- Page 467

Encoder HEDL 5540

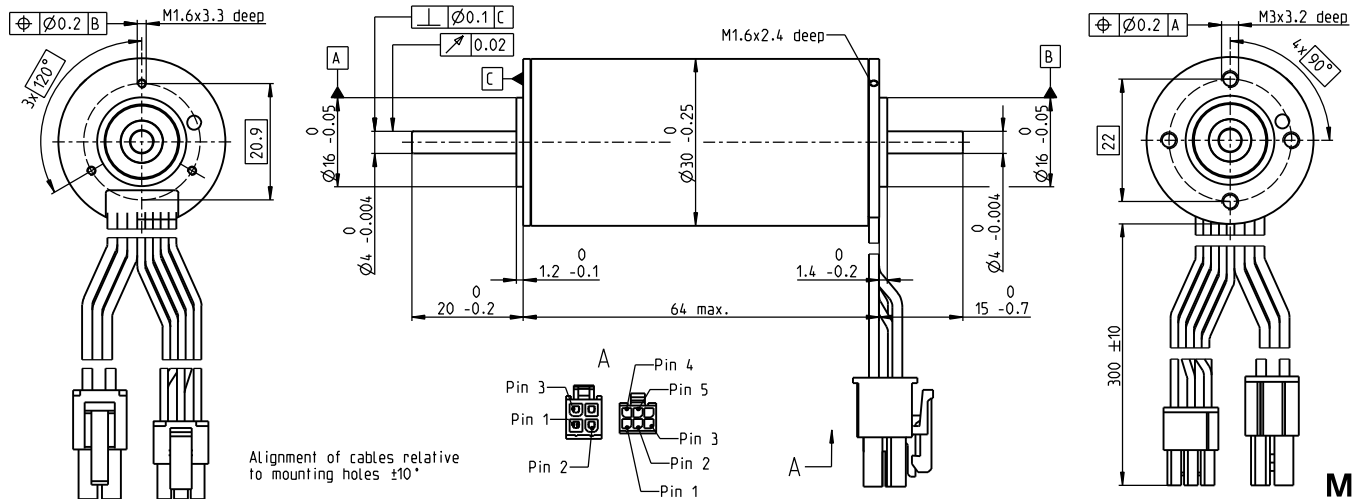
- 500 CPT, 3 channels
- Page 469

Encoder AEDL 5810

- 1024 - 5000 CPT, 3 channels
- Page 476

EC-i 30 Ø30 mm, brushless, 75 Watt

High Torque



EC-i

M 3:4

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

Part Numbers

with Hall sensors

539485	539486	539487	539488	539489
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Motor Data (provisional)

Values at nominal voltage

	V	12	18	24	36	48
1 Nominal voltage	V	12	18	24	36	48
2 No load speed	rpm	7940	7950	7950	7950	8210
3 No load current	mA	447	298	223	149	117
4 Nominal speed	rpm	6760	6840	6870	6890	7150
5 Nominal torque (max. continuous torque)	mNm	108	110	107	110	104
6 Nominal current (max. continuous current)	A	7.32	4.97	3.64	2.48	1.83
7 Stall torque ¹	mNm	1460	1770	1800	1970	1910
8 Stall current	A	102	82.5	63.1	46	34.6
9 Max. efficiency	%	87.3	88.5	88.6	89	88.8

Characteristics

	Ω	0.118	0.218	0.38	0.782	1.39
10 Terminal resistance phase to phase	Ω	0.118	0.218	0.38	0.782	1.39
11 Terminal inductance phase to phase	mH	0.0975	0.219	0.39	0.877	1.46
12 Torque constant	mNm/A	14.3	21.4	28.6	42.9	55.4
13 Speed constant	rpm/V	668	446	334	223	173
14 Speed/torque gradient	rpm/mNm	5.5	4.54	4.45	4.07	4.33
15 Mechanical time constant	ms	0.893	0.736	0.722	0.66	0.702
16 Rotor inertia	gcm ²	15.5	15.5	15.5	15.5	15.5

Specifications

Thermal data

17 Thermal resistance housing-ambient	9.01 K/W
18 Thermal resistance winding-housing	2.46 K/W
19 Thermal time constant winding	32.7 s
20 Thermal time constant motor	1090 s
21 Ambient temperature	-40...+100°C
22 Max. winding temperature	+155°C

Mechanical data (preloaded ball bearings)

23 Max. speed	10000 rpm
24 Axial play at axial load < 9.0 N	0 mm
> 9.0 N	0.14 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	5 N
27 Max. force for press fits (static) (static, shaft supported)	98 N
28 Max. radial load, 5 mm from flange	1300 N
	25 N

Other specifications

29 Number of pole pairs	4
30 Number of phases	3
31 Weight of motor	242 g

Values listed in the table are nominal.

Connection motor (Cable AWG 20)

red	Motor winding 1	Pin 1
black	Motor winding 2	Pin 2
white	Motor winding 3	Pin 3
	N.C.	Pin 4

Connector Article number

Molex 39-01-2040

Connection sensors (Cable AWG 26)

yellow	Hall sensor 1	Pin 1
brown	Hall sensor 2	Pin 2
grey	Hall sensor 3	Pin 3
blue	GND	Pin 4
green	V _{Hall} 4.5...24 VDC	Pin 5
	N.C.	Pin 6

Connector Article number

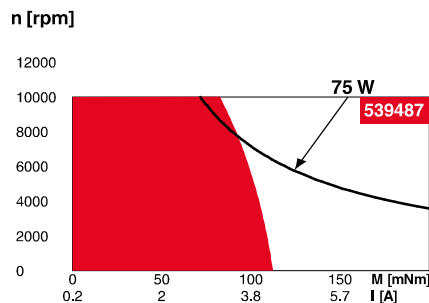
Molex 430-25-0600

Wiring diagram for Hall sensors see p. 49

¹Calculation does not include saturation effect

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

Details on catalog page 36

Planetary Gearhead

Ø32 mm

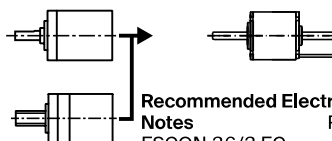
1.0 - 6.0 Nm

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Screw Drive

Ø32 mm

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Recommended Electronics:

Notes Page 36

ESCON 36/3 EC 487

ESCON Mod. 50/4 EC-S 487

ESCON Mod. 50/5 487

ESCON Mod. 50/8 (HE) 488

ESCON 50/5 489

DEC Module 50/5 491

EPOS4 Mod./Comp. 50/5 496

EPOS4 Mod./Comp. 50/8 497

EPOS4 50/5 501

EPOS4 70/15 501

EPOS2 P 24/5 504

Encoder 16 EASY/XT

128 - 1024 CPT, 3 channels

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Encoder 16 EASY Absolute/XT

4096 steps

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Encoder 16 RIO

1024 - 32768 CPT, 3 channels

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Encoder HEDL 5540

500 CPT, 3 channels

Page 469

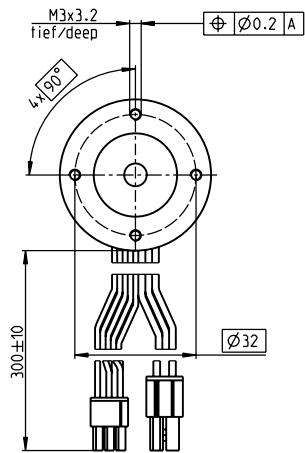
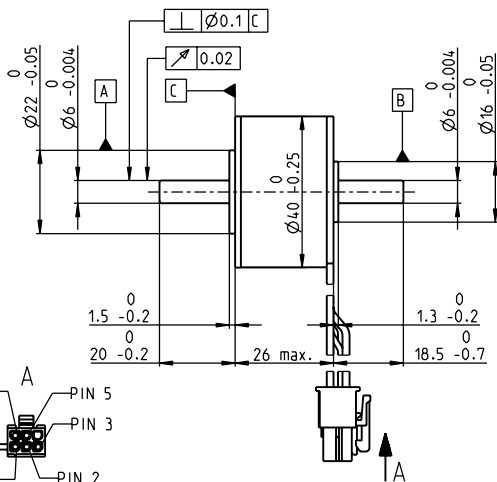
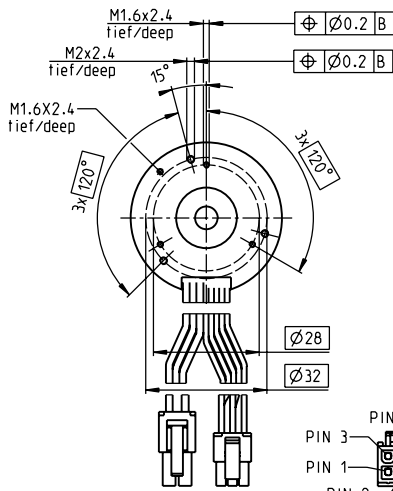
Encoder AEDL 5810

1024 - 5000 CPT, 3 channels

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EC-i 40 Ø40 mm, brushless, 50 Watt

EC-i



M 1:2

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

Part Numbers	
with Hall sensors	449463 449464

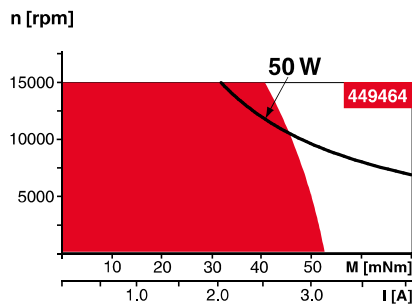
Motor Data

Values at nominal voltage		12	24
1 Nominal voltage	V	12	24
2 No load speed	rpm	12400	13200
3 No load current	mA	522	285
4 Nominal speed	rpm	9660	10300
5 Nominal torque (max. continuous torque)	mNm	43.3	52.8
6 Nominal current (max. continuous current)	A	4.53	2.8
7 Stall torque ¹	mNm	473	810
8 Stall current	A	52.9	47.9
9 Max. efficiency	%	81	85
Characteristics			
10 Terminal resistance phase to phase	Ω	0,227	0,501
11 Terminal inductance phase to phase	mH	0,109	0,39
12 Torque constant	mNm/A	8.95	16.9
13 Speed constant	rpm/V	1070	565
14 Speed/torque gradient	rpm/mNm	271	16.7
15 Mechanical time constant	ms	2.98	1.84
16 Rotor inertia	gcm ²	10,5	10,5

Specifications

Thermal data	
17 Thermal resistance housing-ambient	9.66 K/W
18 Thermal resistance winding-housing	2.57 K/W
19 Thermal time constant winding	17,5 s
20 Thermal time constant motor	821 s
21 Ambient temperature	-40...+100°C
22 Max. winding temperature	+155°C
Mechanical data (preloaded ball bearings)	
23 Max. speed	15000 rpm
24 Axial play at axial load < 9,0 N	0 mm
> 9,0 N	0,15 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	5 N
27 Max. force for press fits (static) (static, shaft supported)	87 N
28 Max. radial load, 5 mm from flange	6500 N
	15 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	7
30 Number of phases	3
31 Weight of motor	170 g

Values listed in the table are nominal.

Connection motor (Cable AWG 20)

red	Motor winding 1	Pin 1
black	Motor winding 2	Pin 2
white	Motor winding 3	Pin 3
	N.C.	Pin 4

Connector Article number

Molex	39-01-2040	
Connection sensor (Cable AWG 26)		
yellow	Hall sensor 1	Pin 1
brown	Hall sensor 2	Pin 2
grey	Hall sensor 3	Pin 3
blue	GND	Pin 4
green	V _{Hall} 4.5...24 VDC	Pin 5
	N.C.	Pin 6

Connector Article number

Molex 430-25-0600

Wiring diagram for Hall sensors see p. 49

¹Calculation does not include saturation effect

maxon Modular System

Details on catalog page 36

Planetary Gearhead

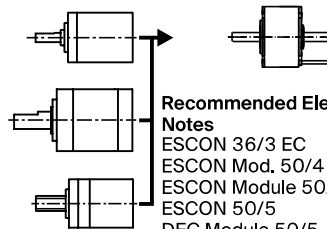
Ø32 mm
1.0 - 6.0 Nm
Page 389

Planetary Gearhead

Ø42 mm
3 - 15 Nm
Page 398

Screw Drive

Ø32 mm
Page 416-421



Recommended Electronics:

Notes	
ESCON 36/3 EC	487
ESCON Mod. 50/4 EC-S	487
ESCON Module 50/5	487
ESCON 50/5	489
DEC Module 50/5	491
EPOS4 Mod./Comp. 50/5	496
EPOS4 50/5	501
EPOS2 P 24/5	504

Encoder 16 EASY/XT

128 - 1024 CPT, 3 channels
Page 450/452

Encoder 16 EASY Absolute/XT

4096 steps
Page 454/456

Encoder 16 RIO

1024 - 32768 CPT, 3 channels
Page 467

Encoder AEDL 5810

1024 - 5000 CPT, 3 channels
Page 470

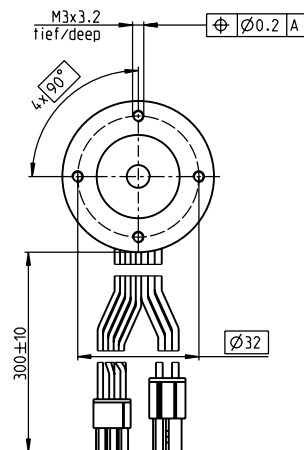
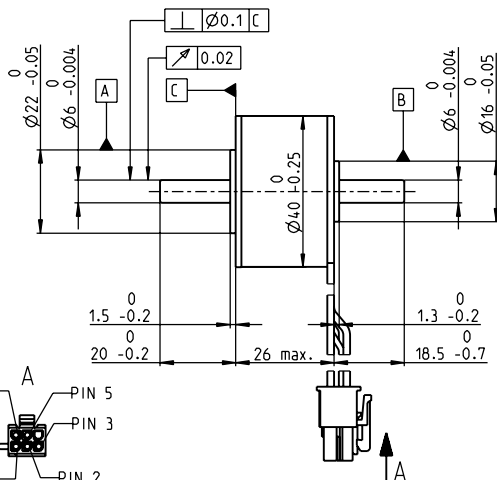
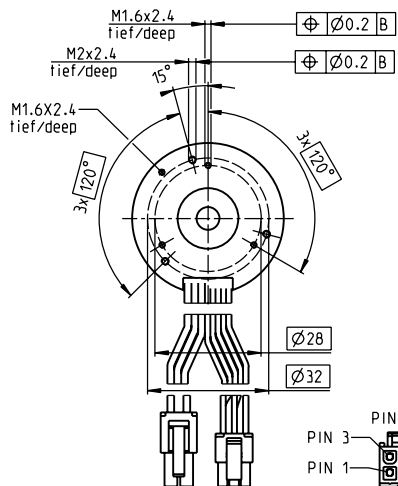
Encoder HEDL 5540

500 CPT, 3 channels
Page 477

EC-i 40 Ø40 mm, brushless, 50 Watt

High Torque

EC-i



M 1:2

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

Part Numbers

with Hall sensors	496650	496651	496652	496653
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Motor Data

Values at nominal voltage		9	18	36	48
1 Nominal voltage	V	9	18	36	48
2 No load speed	rpm	7770	7790	7350	7560
3 No load current	mA	577	289	131	103
4 Nominal speed	rpm	6390	6520	6080	6310
5 Nominal torque (max. continuous torque)	mNm	65.2	64.6	78.2	73.3
6 Nominal current (max. continuous current)	A	5.91	2.93	1.61	1.18
7 Stall torque ¹	mNm	716	858	1150	1090
8 Stall current	A	66	39.5	25	18.2
9 Max. efficiency	%	82	84	86	85
Characteristics					
10 Terminal resistance phase to phase	Ω	0.136	0.455	1.44	2.63
11 Terminal inductance phase to phase	mH	0.064	0.255	1.15	1.93
12 Torque constant	mNm/A	10.8	21.7	46.1	59.6
13 Speed constant	rpm/V	881	440	207	160
14 Speed/torque gradient	rpm/mNm	11.1	9.24	6.48	7.07
15 Mechanical time constant	ms	1.48	1.24	0.869	0.948
16 Rotor inertia	gcm ²	12.8	12.8	12.8	12.8

Specifications

Thermal data	
17 Thermal resistance housing-ambient	9.91 K/W
18 Thermal resistance winding-housing	3.77 K/W
19 Thermal time constant winding	25.6 s
20 Thermal time constant motor	892 s
21 Ambient temperature	-40...+100°C
22 Max. winding temperature	+155°C

Mechanical data (preloaded ball bearings)	
23 Max. speed	10000 rpm
24 Axial play at axial load < 9.0 N	0 mm
> 9.0 N	0.15 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	7 N
27 Max. force for press fits (static) (static, shaft supported)	87 N
28 Max. radial load, 5 mm from flange	6500 N
	21 N

Other specifications

- 29 Number of pole pairs: 7
- 30 Number of phases: 3
- 31 Weight of motor: 180 g

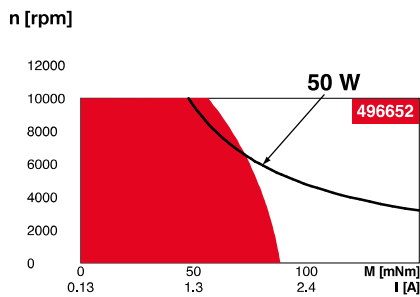
Values listed in the table are nominal.

Connection motor (Cable AWG 20)		
red	Motor winding 1	Pin 1
black	Motor winding 2	Pin 2
white	Motor winding 3	Pin 3
	N.C.	Pin 4

Connector Article number		
Molex	39-01-2040	
Connection sensor (Cable AWG 26)		
yellow	Hall sensor 1	Pin 1
brown	Hall sensor 2	Pin 2
grey	Hall sensor 3	Pin 3
blue	GND	Pin 4
green	V _{Hall} 4.5...24 VDC	Pin 5
	N.C.	Pin 6
Connector Article number		
Molex	430-25-0600	

¹Calculation does not include saturation effect

Operating Range



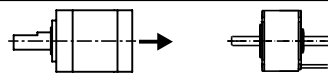
Comments

- 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

Details on catalog page 36

Planetary Gearhead
Ø42 mm
3 - 15 Nm
Page 398



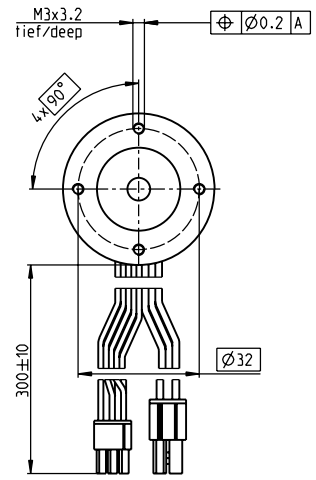
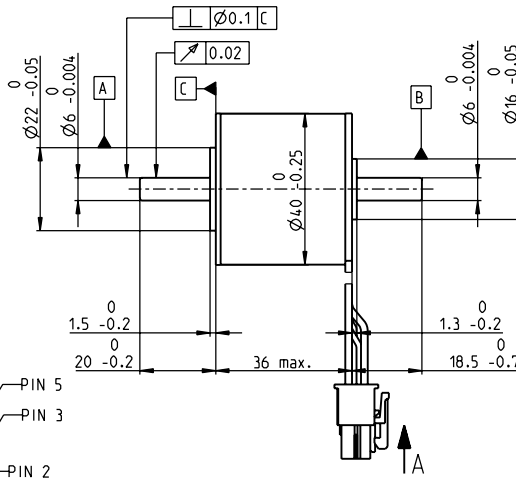
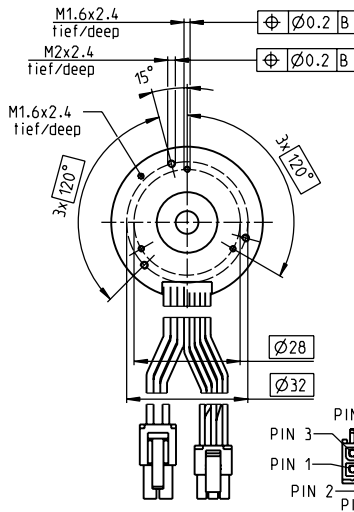
Recommended Electronics:

Notes	Page 36
ESCON 36/3 EC	487
ESCON Mod. 50/4 EC-S	487
ESCON Module 50/5	487
ESCON Mod. 50/8 (HE)	488
ESCON 50/5	489
ESCON 70/10	489
DEC Module 50/5	491
EPOS4 Mod./Comp. 50/5	496
EPOS4 Mod./Comp. 50/8	499
EPOS4 50/5	501
EPOS4 70/15	501
EPOS2 P 24/5	504

Encoder 16 EASY/XT	128 - 1024 CPT, 3 channels	Page 450/452
Encoder 16 EASY Absolute/XT	4096 steps	Page 454/456
Encoder 16 RIO	1024 - 32768 CPT, 3 channels	Page 467
Encoder AEDL 5810	1024 - 5000 CPT, 3 channels	Page 470
Encoder HEDL 5540	500 CPT, 3 channels	Page 477

EC-i 40 Ø40 mm, brushless, 70 Watt

EC-i



M 1:2

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

Part Numbers	
with Hall sensors	449469 449470

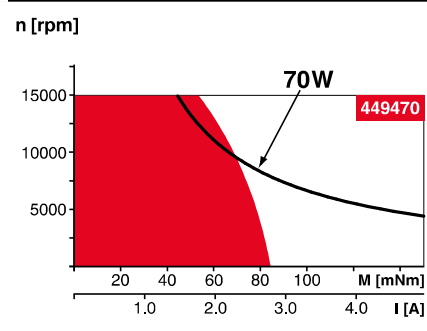
Motor Data

Values at nominal voltage			
1 Nominal voltage	V	18	36
2 No load speed	rpm	10100	10700
3 No load current	mA	354	192
4 Nominal speed	rpm	8230	8740
5 Nominal torque (max. continuous torque)	mNm	68,7	83,4
6 Nominal current (max. continuous current)	A	3,93	2,43
7 Stall torque ¹	mNm	876	1460
8 Stall current	A	52,5	46,3
9 Max. efficiency	%	84	87
Characteristics			
10 Terminal resistance phase to phase	Ω	0,343	0,778
11 Terminal inductance phase to phase	mH	0,18	0,644
12 Torque constant	mNm/A	16,7	31,5
13 Speed constant	rpm/V	572	303
14 Speed/torque gradient	rpm/mNm	11,7	7,47
15 Mechanical time constant	ms	2,98	1,89
16 Rotor inertia	gcm ²	24,2	24,2

Specifications

Thermal data	
17 Thermal resistance housing-ambient	7,8 K/W
18 Thermal resistance winding-housing	2,6 K/W
19 Thermal time constant winding	28,1 s
20 Thermal time constant motor	936 s
21 Ambient temperature	-40...+100°C
22 Max. winding temperature	+155°C
Mechanical data (preloaded ball bearings)	
23 Max. speed	15000 rpm
24 Axial play at axial load < 9,0 N	0 mm
> 9,0 N	0,15 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	5 N
27 Max. force for press fits (static) (static, shaft supported)	87 N
28 Max. radial load, 5 mm from flange	5000 N
	15 N

Operating Range



- 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	7
30 Number of phases	3
31 Weight of motor	240 g

Values listed in the table are nominal.

Connection motor (Cable AWG 20)

red	Motor winding 1	Pin 1
black	Motor winding 2	Pin 2
white	Motor winding 3	Pin 3
	N.C.	Pin 4

Connector Article number

Molex	39-01-2040
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Connection sensor (Cable AWG 26)

yellow	Hall sensor 1	Pin 1
brown	Hall sensor 2	Pin 2
grey	Hall sensor 3	Pin 3
blue	GND	Pin 4
green	V _{Hall} 4.5...24 VDC	Pin 5
	N.C.	Pin 6

Connector Article number

Molex	430-25-0600
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Wiring diagram for Hall sensors see p. 49

¹Calculation does not include saturation effect

maxon Modular System

Details on catalog page 36

Planetary Gearhead

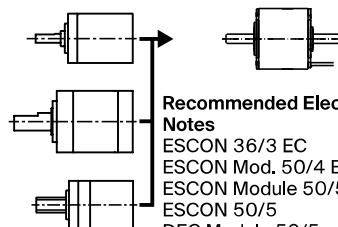
Ø32 mm
1,0 - 6,0 Nm
Page 389

Planetary Gearhead

Ø42 mm
3 - 15 Nm
Page 398

Screw Drive

Ø32 mm
Page 416-421



Recommended Electronics:

Notes Page 36

ESCON 36/3 EC	487
ESCON Mod. 50/4 EC-S	487
ESCON Module 50/5	487
ESCON 50/5	489
DEC Module 50/5	491
EPOS4 Mod./Comp. 50/5	496
EPOS4 50/5	501
EPOS2 P 24/5	504

Encoder 16 EASY/XT

128 - 1024 CPT, 3 channels
Page 450/452

Encoder 16 EASY Absolute/XT

4096 steps
Page 454/456

Encoder 16 RIO

1024 - 32768 CPT, 3 channels
Page 467

Encoder AEDL 5810

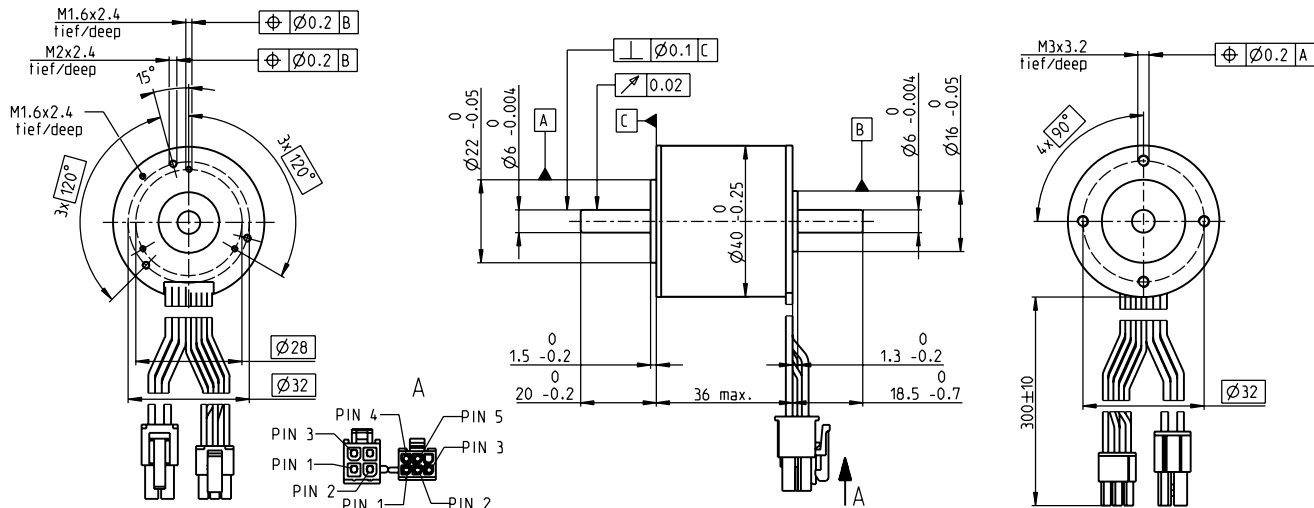
1024 - 5000 CPT, 3 channels
Page 470

Encoder HEDL 5540

500 CPT, 3 channels
Page 477

EC-i 40 Ø40 mm, brushless, 70 Watt

High Torque



EC-i

M 1:2

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

Part Numbers

with Hall sensors **496654** **496655** **496656**

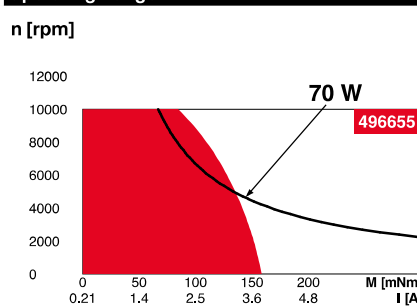
Motor Data

Values at nominal voltage		18	36	48
1 Nominal voltage	V	18	36	48
2 No load speed	rpm	7840	7390	4930
3 No load current	mA	448	205	86.4
4 Nominal speed	rpm	6890	6450	4100
5 Nominal torque (max. continuous torque)	mNm	105	129	151
6 Nominal current (max. continuous current)	A	4.87	2.73	1.55
7 Stall torque ¹	mNm	1960	2800	1940
8 Stall current	A	90.4	60.9	21.1
9 Max. efficiency	%	86	89	87
Characteristics		0.199	0.591	2.28
10 Terminal resistance phase to phase	Ω	0.199	0.591	2.28
11 Terminal inductance phase to phase	mH	0.113	0.512	2.05
12 Torque constant	mNm/A	21.7	46.1	92.1
13 Speed constant	rpm/V	441	207	104
14 Speed/torque gradient	rpm/mNm	4.05	2.66	2.56
15 Mechanical time constant	ms	0.975	0.641	0.617
16 Rotor inertia	gcm ²	23	23	23

Specifications

- Thermal data**
- 17 Thermal resistance housing-ambient 8,17 K/W
 - 18 Thermal resistance winding-housing 2,27 K/W
 - 19 Thermal time constant winding 24,5 s
 - 20 Thermal time constant motor 1020 s
 - 21 Ambient temperature -40...+100°C
 - 22 Max. winding temperature +155°C
- Mechanical data (preloaded ball bearings)**
- 23 Max. speed 10000 rpm
 - 24 Axial play at axial load < 9,0 N 0 mm
 - > 9,0 N 0,15 mm
 - 25 Radial play preloaded 7 N
 - 26 Max. axial load (dynamic) 7 N
 - 27 Max. force for press fits (static) (static, shaft supported) 87 N
 - 5000 N
 - 28 Max. radial load, 5 mm from flange 26 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 7
- 30 Number of phases 3
- 31 Weight of motor 250 g

Values listed in the table are nominal.

Connection motor (Cable AWG 20)

- red Motor winding 1 Pin 1
- black Motor winding 2 Pin 2
- white Motor winding 3 Pin 3
- N.C. Pin 4

Connector Article number

Molex 39-01-2040

Connection sensor (Cable AWG 26)

- yellow Hall sensor 1 Pin 1
- brown Hall sensor 2 Pin 2
- grey Hall sensor 3 Pin 3
- blue GND Pin 4
- green V_{Hall} 4.5...24 VDC Pin 5
- N.C. Pin 6

Connector Article number

Molex 430-25-0600

Wiring diagram for Hall sensors see p. 49

¹Calculation does not include saturation effect

maxon Modular System

Details on catalog page 36

Planetary Gearhead

- Ø42 mm
- 3 - 15 Nm
- Page 398



Recommended Electronics:

Notes Page 36

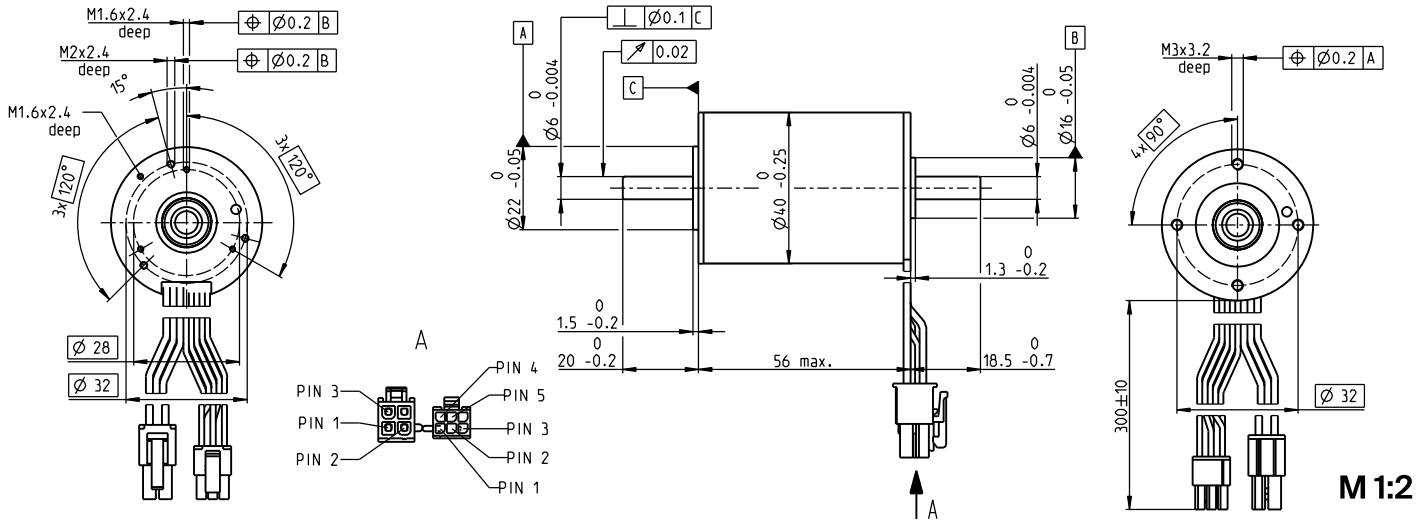
- ESCON 36/3 EC 487
- ESCON Mod. 50/4 EC-S 487
- ESCON Module 50/5 487
- ESCON 50/5 489
- DEC Module 50/5 491
- EPOS4 Mod./Comp. 50/5 496
- EPOS4 50/5 501
- EPOS2 P 24/5 504

- Encoder 16 EASY/XT**
128 - 1024 CPT, 3 channels
Page 450/452
- Encoder 16 EASY Absolute/XT**
4096 steps
Page 454/456
- Encoder 16 RIO**
1024 - 32768 CPT, 3 channels
Page 467
- Encoder AEDL 5810**
1024 - 5000 CPT, 3 channels
Page 470
- Encoder HEDL 5540**
500 CPT, 3 channels
Page 477

EC-i 40 Ø40 mm, brushless, 100 Watt

High Torque

EC-i



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

Part Numbers

with Hall sensors **496660** **496661** **488607**

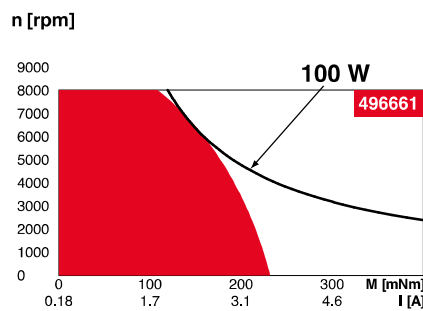
Motor Data

Values at nominal voltage					
1	Nominal voltage	V	18	36	48
2	No load speed	rpm	4540	4550	5000
3	No load current	mA	352	176	150
4	Nominal speed	rpm	3920	3950	4390
5	Nominal torque (max. continuous torque)	mNm	207	207	222
6	Nominal current (max. continuous current)	A	5.46	2.72	2.39
7	Stall torque ¹	mNm	2860	3160	4330
8	Stall current	A	76.3	42.2	47.5
9	Max. efficiency	%	87	87	89
Characteristics					
10	Terminal resistance phase to phase	Ω	0.236	0.853	1.01
11	Terminal inductance phase to phase	mH	0.169	0.675	0.995
12	Torque constant	mNm/A	37.5	74.9	91
13	Speed constant	rpm/V	255	127	105
14	Speed/torque gradient	rpm/mNm	1.6	1.45	1.16
15	Mechanical time constant	ms	0.739	0.669	0.537
16	Rotor inertia	gcm ²	44	44	44

Specifications

- Thermal data**
- 17 Thermal resistance housing-ambient 7,17 K/W
 - 18 Thermal resistance winding-housing 1,35 K/W
 - 19 Thermal time constant winding 20,7 s
 - 20 Thermal time constant motor 1400 s
 - 21 Ambient temperature -40...+100°C
 - 22 Max. winding temperature +155°C
- Mechanical data (preloaded ball bearings)**
- 23 Max. speed 8000 rpm
 - 24 Axial play at axial load < 9,0 N 0 mm
 - > 9,0 N 0,15 mm preloaded
 - 25 Radial play 7 N
 - 26 Max. axial load (dynamic) 7 N
 - 27 Max. force for press fits (static) (static, shaft supported) 87 N
 - 28 Max. radial load, 5 mm from flange 3000 N
 - 29,9 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 7
- 30 Number of phases 3
- 31 Weight of motor 390 g

Values listed in the table are nominal.

Connection motor (Cable AWG 20)

- red Motor winding 1 Pin 1
- black Motor winding 2 Pin 2
- white Motor winding 3 Pin 3
- N.C. Pin 4

Connector Article number

Molex 39-01-2040

Connection sensor (Cable AWG 26)

- yellow Hall sensor 1 Pin 1
- brown Hall sensor 2 Pin 2
- grey Hall sensor 3 Pin 3
- blue GND Pin 4
- green V_{Hall} 4.5...24 VDC Pin 5
- N.C. Pin 6

Connector Article number

Molex 430-25-0600

Wiring diagram for Hall sensors see p. 49

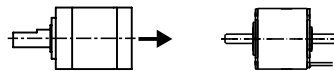
¹Calculation does not include saturation effect

maxon Modular System

Details on catalog page 36

Planetary Gearhead

Ø42 mm
3 - 15 Nm
Page 398



Recommended Electronics:

- Notes Page 36
- ESCON 36/3 EC 487
 - ESCON Mod. 50/4 EC-S 487
 - ESCON Module 50/5 487
 - ESCON Mod. 50/8 (HE) 488
 - ESCON 50/5 489
 - ESCON 70/10 489
 - DEC Module 50/5 491
 - EPOS4 Mod./Comp. 50/5 496
 - EPOS4 Mod./Comp. 50/8 499
 - EPOS4 50/5 501
 - EPOS4 70/15 501
 - EPOS2 P 24/5 504

Encoder 16 EASY/XT

128 - 1024 CPT, 3 channels
Page 450/452

Encoder 16 EASY Absolute/XT

4096 steps
Page 454/456

Encoder 16 RIO

1024 - 32768 CPT, 3 channels
Page 467

Encoder AEDL 5810

1024 - 5000 CPT, 3 channels
Page 470

Encoder HEDL 5540

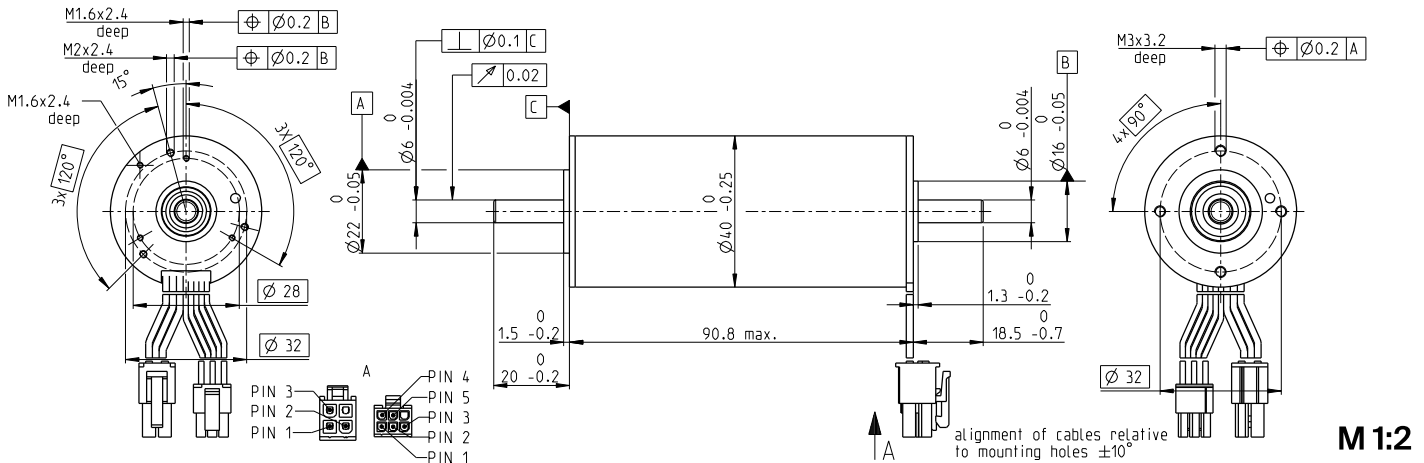
500 CPT, 3 channels
Page 477

EC-i 40 Ø40 mm, brushless, 130 Watt

High Torque

NEW

EC-i



M 1:2

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

Part Numbers

with Hall sensors

666601 676600 666602 666603

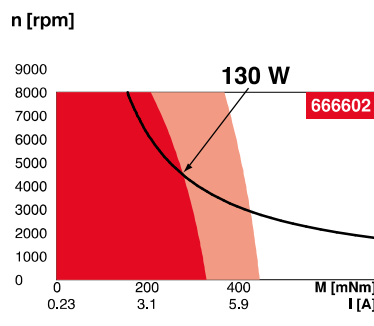
Motor Data

Values at nominal voltage		18	24	36	48
1 Nominal voltage	V	18	24	36	48
2 No load speed	rpm	4670	4730	4670	4640
3 No load current	mA	496	379	248	185
4 Nominal speed	rpm	3920	3990	3940	3910
5 Nominal torque (max. continuous torque)	mNm	276	299	327	340
6 Nominal current (max. continuous current)	A	7,38	6,01	4,27	3,29
7 Stall torque ¹	mNm	3320	4090	4950	5360
8 Stall current	A	91	85	68	55
9 Max. efficiency	%	85,9	87,2	88,4	88,8
Characteristics					
10 Terminal resistance phase to phase	Ω	0,198	0,281	0,529	0,876
11 Terminal inductance phase to phase	mH	0,128	0,222	0,512	0,922
12 Torque constant	mNm/A	36,4	47,9	72,8	97,8
13 Speed constant	rpm/V	262	199	131	97,7
14 Speed/torque gradient	rpm/mNm	1,420	1,170	0,953	0,875
15 Mechanical time constant	ms	1,16	0,956	0,778	0,715
16 Rotor inertia	gcm ²	78	78	78	78

Specifications

- Thermal data**
- 17 Thermal resistance housing-ambient 5,08 K/W
 - 18 Thermal resistance winding-housing 0,6 K/W
 - 19 Thermal time constant winding 18,5 s
 - 20 Thermal time constant motor 1490 s
 - 21 Ambient temperature -40...+100°C
 - 22 Max. winding temperature +155°C
- Mechanical data (preloaded ball bearings)**
- 23 Max. speed 8000 rpm
 - 24 Axial play at axial load < 9,0 N 0 mm
 - > 9,0 N 0,15 mm
 - 25 Radial play preloaded 7 N
 - 26 Max. axial load (dynamic) 87 N
 - 27 Max. force for press fits (static) (static, shaft supported) 3000 N
 - 28 Max. radial load, 5 mm from flange 29,9 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 8
- 30 Number of phases 3
- 31 Weight of motor 587 g

Values listed in the table are nominal.

Connection motor (Cable AWG 20)

- red Motor winding 1 Pin 1
- black Motor winding 2 Pin 2
- white Motor winding 3 Pin 3
- N.C. Pin 4

Connector Article number

Molex 39-01-2040

Connection sensor (Cable AWG 26)

- yellow Hall sensor 1 Pin 1
- brown Hall sensor 2 Pin 2
- grey Hall sensor 3 Pin 3
- blue GND Pin 4
- green V_{Hall} 4.5...24 VDC Pin 5
- N.C. Pin 6

Connector Article number

Molex 430-25-0600

Wiring diagram for Hall sensors see p. 49

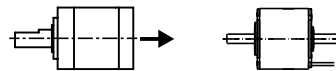
¹Calculation does not include saturation effect

maxon Modular System

Details on catalog page 36

Planetary Gearhead

Ø42 mm
3 - 15 Nm
Page 398



Recommended Electronics:

- Notes Page 36
- ESCON Mod. 50/4 EC-S 487
 - ESCON Module 50/5 487
 - ESCON Mod. 50/8 (HE) 488
 - ESCON 50/5 489
 - ESCON 70/10 489
 - DEC Module 50/5 491
 - EPOS4 Mod./Comp. 50/5 499
 - EPOS4 Mod./Comp. 50/8 499
 - EPOS4 50/5 501
 - EPOS4 70/15 501
 - EPOS2 P 24/5 504

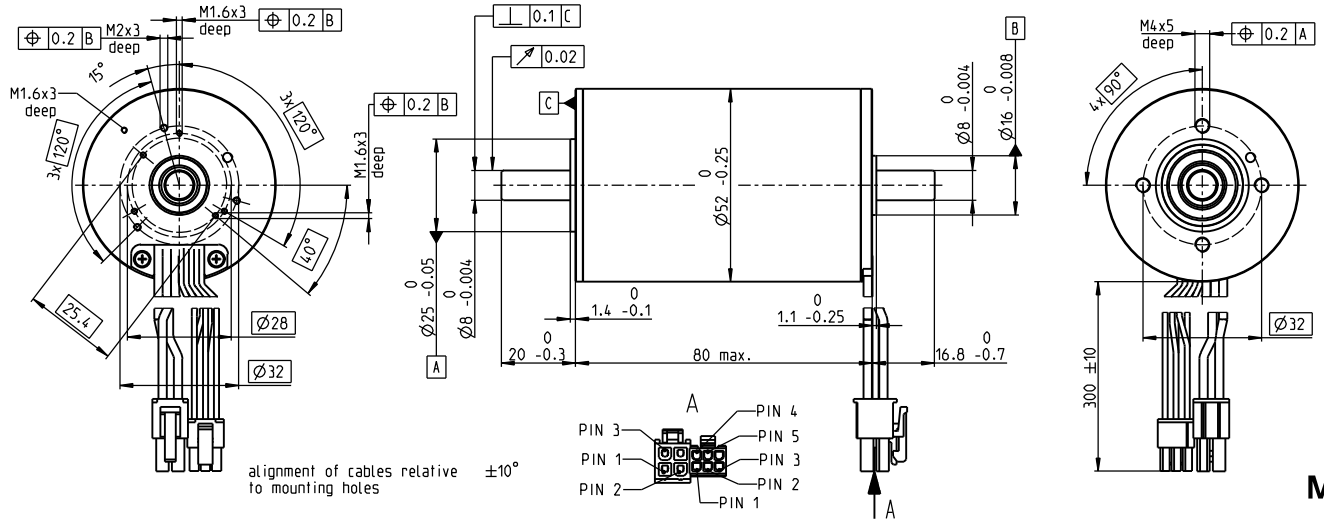
Encoder 16 EASY/XT

- 128 - 1024 CPT, 3 channels
Page 450/452
- Encoder 16 EASY Absolute/XT
4096 steps
Page 454/456
- Encoder 16 RIO
1024 - 32768 CPT, 3 channels
Page 467
- Encoder AEDL 5810
1024 - 5000 CPT, 3 channels
Page 470
- Encoder HEDL 5540
500 CPT, 3 channels
Page 477

EC-i 52 Ø52 mm, brushless, 180 Watt

High Torque

EC-i

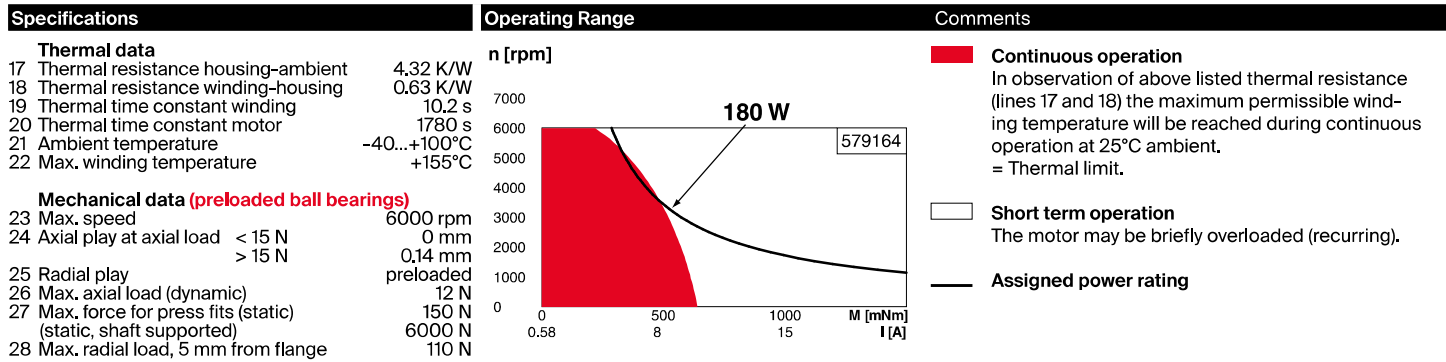


M 1:2

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

		Part Numbers			
with Hall sensors		574740	574741	579164	579165

Motor Data (provisional)					
Values at nominal voltage					
1 Nominal voltage	V	18	24	36	48
2 No load speed	rpm	4820	4680	4820	4900
3 No load current	mA	1010	726	507	390
4 Nominal speed	rpm	4360	4200	4360	4450
5 Nominal torque (max. continuous torque)	mNm	388	428	438	412
6 Nominal current (max. continuous current)	A	11,1	8,81	6,18	4,47
7 Stall torque ¹	mNm	11500	13000	15900	15700
8 Stall current	A	325	268	225	169
9 Max. efficiency	%	89,3	90	90,8	90,7
Characteristics					
10 Terminal resistance phase to phase	Ω	0,0555	0,0894	0,16	0,284
11 Terminal inductance phase to phase	mH	0,0643	0,122	0,257	0,443
12 Torque constant	mNm/A	35,3	48,6	70,6	92,7
13 Speed constant	rpm/V	270	197	135	103
14 Speed/torque gradient	rpm/mNm	0,425	0,362	0,306	0,316
15 Mechanical time constant	ms	0,756	0,645	0,544	0,562
16 Rotor inertia	gcm ²	170	170	170	170



Other specifications

29 Number of pole pairs: 8

30 Number of phases: 3

31 Weight of motor: 823 g

Values listed in the table are nominal.

- Connection motor** (Cable AWG 16)
- red Motor winding 1 Pin 1
 - black Motor winding 2 Pin 2
 - white Motor winding 3 Pin 3
 - N.C. Pin 4
- Connector Article number**
- Molex 39-01-2040
- Connection sensor** (Cable AWG 26)
- yellow Hall sensor 1 Pin 1
 - brown Hall sensor 2 Pin 2
 - grey Hall sensor 3 Pin 3
 - blue GND Pin 4
 - green V_{Hall} 4.5...24 VDC Pin 5
 - N.C. Pin 6
- Connector Article number**
- Molex 430-25-0600

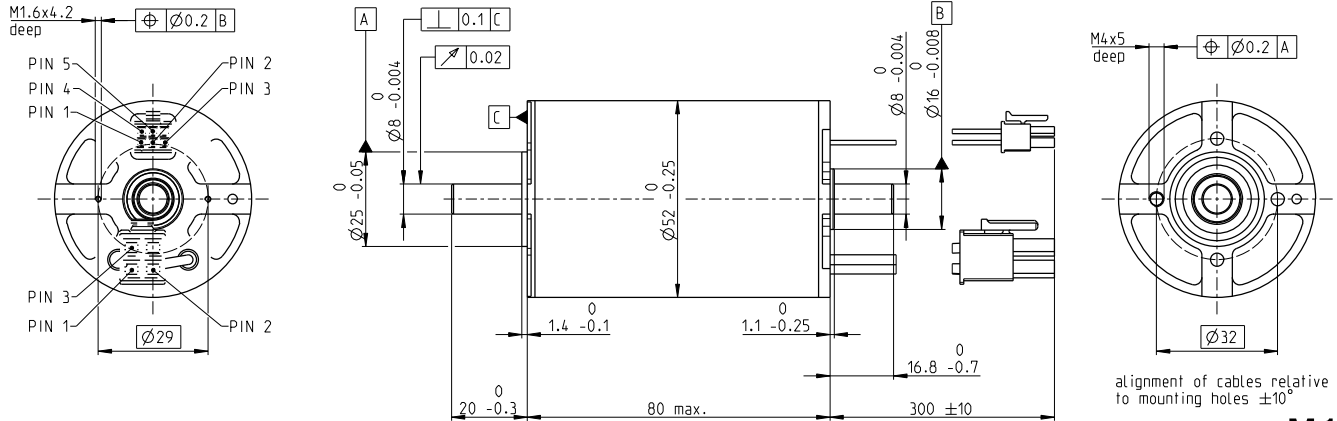
¹Calculation does not include saturation effect

EC-i 52 Ø52 mm, brushless, 250 Watt

Open Motor

NEW

EC-i



M 1:2

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

Part Numbers

with Hall sensors

667060	667061	667062	667063
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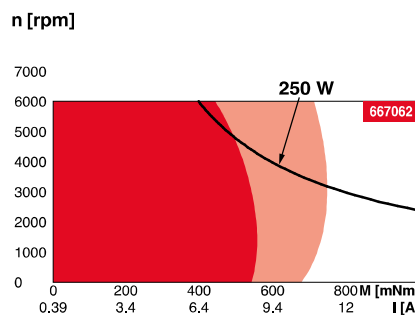
Motor Data

Values at nominal voltage		18	24	36	48
1 Nominal voltage	V	18	24	36	48
2 No load speed	rpm	4450	4860	5010	5090
3 No load current	mA	829	707	493	379
4 Nominal speed	rpm	3840	4220	4360	4440
5 Nominal torque (max. continuous torque)	mNm	520	534	564	544
6 Nominal current (max. continuous current)	A	13.1	10.9	7.89	5.83
7 Stall torque ¹	mNm	10300	12800	15600	15300
8 Stall current	A	269	274	229	171
9 Max. efficiency	%	89.3	90.2	91	90.9
Characteristics					
10 Terminal resistance phase to phase	Ω	0.0668	0.0876	0.157	0.281
11 Terminal inductance phase to phase	mH	0.0826	0.123	0.261	0.45
12 Torque constant	mNm/A	38.2	46.7	68	89.2
13 Speed constant	rpm/V	250	204	140	107
14 Speed/torque gradient	rpm/mNm	0.436	0.383	0.325	0.337
15 Mechanical time constant	ms	0.776	0.681	0.578	0.599
16 Rotor inertia	gcm ²	170	170	170	170

Specifications

Thermal data		
17 Thermal resistance housing-ambient	4.09 K/W	
18 Thermal resistance winding-housing	0.641 K/W	
19 Thermal time constant winding	23.1 s	
20 Thermal time constant motor	1530 s	
21 Ambient temperature	-40...+100°C	
22 Max. winding temperature	+155°C	
Mechanical data (preloaded ball bearings)		
23 Max. speed	6000 rpm	
24 Axial play at axial load < 9.0 N	0 mm	
	> 9.0 N	0.14 mm
25 Radial play	preloaded	12 N
26 Max. axial load (dynamic)	150 N	
27 Max. force for press fits (static) (static, shaft supported)	6000 N	
28 Max. radial load, 5 mm from flange	110 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	8
30 Number of phases	3
31 Weight of motor	750 g

Values listed in the table are nominal.

Connection motor (Cable AWG 16)

red	Motor winding 1	Pin 1
black	Motor winding 2	Pin 2
white	Motor winding 3	Pin 3
	N.C.	Pin 4

Connector Article number

Molex	171692-0104
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Connection sensor (Cable AWG 26)

yellow	Hall sensor 1	Pin 1
brown	Hall sensor 2	Pin 2
grey	Hall sensor 3	Pin 3
blue	GND	Pin 4
green	V _{Hall} 4.5...24 VDC	Pin 5
	N.C.	Pin 6

Connector Article number

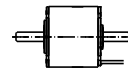
Molex	430-25-0600
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Wiring diagram for Hall sensors see p. 49

¹Calculation does not include saturation effect (p. 61/168)

maxon Modular System

Details on catalog page 36



Recommended Electronics:

Notes Page 36

ESCON Mod. 50/8 (HE) 488

ESCON 70/10 489

EPOS4 Mod./Comp. 50/8 497

EPOS4 Mod./Comp. 50/15 497

EPOS4 70/15 501

Encoder 16 EASY

128 - 1024 CPT, 3 channels

Page 450

Encoder 16 EASY XT

128 - 1024 CPT, 3 channels

Page 452

Encoder 16 EASY Absolute

4096 steps

Page 454

Encoder 16 EASY Absolute XT

4096 steps

Page 456

Encoder 16 RIO

1024 - 32768 CPT, 3 channels

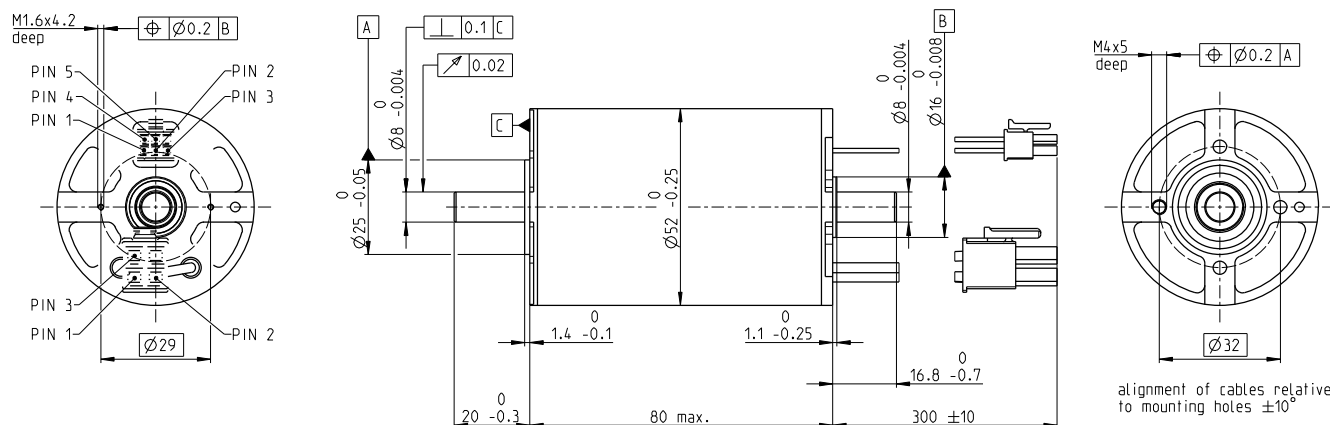
Page 467

EC-i 52 Ø52 mm, brushless, 420 Watt

Ventilated

NEW

EC-i



M 1:2

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

Part Numbers				

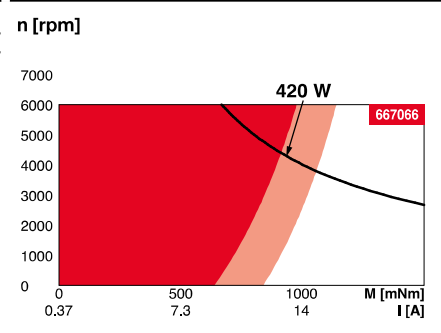
with Hall sensors

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Motor Data	667064	667065	667066	633919	
Values at nominal voltage					
1 Nominal voltage	V	18	24	36	48
2 No load speed	rpm	4450	4860	5010	5090
3 No load current	mA	829	707	493	379
4 Nominal speed	rpm	3470	3800	3920	3990
5 Nominal torque (max. continuous torque)	mNm	896	964	1040	1010
6 Nominal current (max. continuous current)	A	20.8	18.1	13.2	9.87
7 Stall torque ¹	mNm	10300	12800	15600	15300
8 Stall current	A	269	274	229	171
9 Max. efficiency	%	89.3	90.2	91	90.9
Characteristics					
10 Terminal resistance phase to phase	Ω	0.0668	0.0876	0.157	0.281
11 Terminal inductance phase to phase	mH	0.0826	0.123	0.261	0.45
12 Torque constant	mNm/A	38.2	46.7	68	89.2
13 Speed constant	rpm/V	250	204	140	107
14 Speed/torque gradient	rpm/mNm	0.436	0.383	0.325	0.337
15 Mechanical time constant	ms	0.776	0.681	0.578	0.599
16 Rotor inertia	gcm ²	170	170	170	170

Specifications **Operating Range** **Comments**

- Thermal data**
- 17 Thermal resistance housing-ambient: 1.77 K/W
 - 18 Thermal resistance winding-housing: 0.34 K/W
 - 19 Thermal time constant winding: 12.2 s
 - 20 Thermal time constant motor: 667 s
 - 21 Ambient temperature: -40...+100°C
 - 22 Max. winding temperature: +155°C
- Mechanical data (preloaded ball bearings)**
- 23 Max. speed: 6000 rpm
 - 24 Axial play at axial load < 9.0 N: 0 mm
 - > 9.0 N: 0.14 mm
 - 25 Radial play: preloaded
 - 26 Max. axial load (dynamic): 12 N
 - 27 Max. force for press fits (static) (static, shaft supported): 150 N
 - 28 Max. radial load, 5 mm from flange: 6000 N

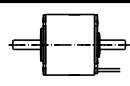


- Continuous operation**
In observation of above listed thermal resistance (lines 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at 25°C ambient. = Thermal limit.
- Short term operation**
The motor may be briefly overloaded (recurring).
- Assigned power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

- Other specifications**
- 29 Number of pole pairs: 8
 - 30 Number of phases: 3
 - 31 Weight of motor: 752 g
- Values listed in the table are nominal.

maxon Modular System Details on catalog page 36

- Connection motor (Cable AWG 16)**
- | | | |
|-------|-----------------|-------|
| red | Motor winding 1 | Pin 1 |
| black | Motor winding 2 | Pin 2 |
| white | Motor winding 3 | Pin 3 |
| | N.C. | Pin 4 |
- Connector Article number**
- Molex 171692-0104
- Connection sensor (Cable AWG 26)**
- | | | |
|--------|--------------------------------|-------|
| yellow | Hall sensor 1 | Pin 1 |
| brown | Hall sensor 2 | Pin 2 |
| grey | Hall sensor 3 | Pin 3 |
| blue | GND | Pin 4 |
| green | V _{Hall} 4.5...24 VDC | Pin 5 |
| | N.C. | Pin 6 |
- Connector Article number**
- Molex 430-25-0600
- Wiring diagram for Hall sensors see p. 49
- ¹Calculation does not include saturation effect (p. 61/168)



- Recommended Electronics:**
- | | |
|------------------------|---------|
| Notes | Page 36 |
| ESCON 70/10 | 489 |
| EPOS4 Mod./Comp. 50/15 | 497 |
| EPOS4 70/15 | 501 |

- Encoder 16 EASY**
128 - 1024 CPT, 3 channels
Page 450
- Encoder 16 EASY XT**
128 - 1024 CPT, 3 channels
Page 452
- Encoder 16 EASY Absolute**
4096 steps
Page 454
- Encoder 16 EASY Absolute XT**
4096 steps
Page 456
- Encoder 16 RIO**
1024 - 32768 CPT, 3 channels
Page 467