

Drive technology for robotics & industrial automation.  
High torque. High dynamics.



# maxon EC-i program



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



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



Shaft with no groove guarantees torsional stability and smooth running.



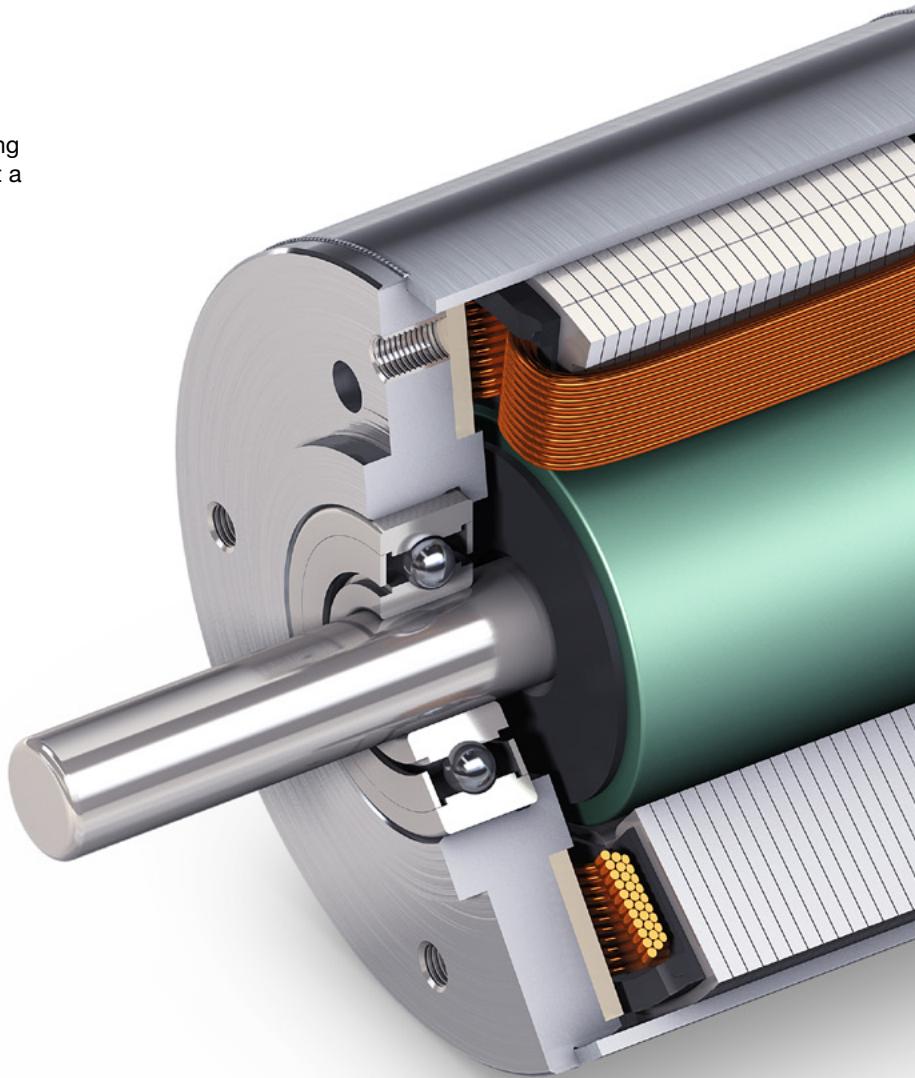
The modular rotor delivers good dynamics and large torques.



"assembled in Korea": High quality due to process-monitored manufacturing on state-of-the-art assembly lines.



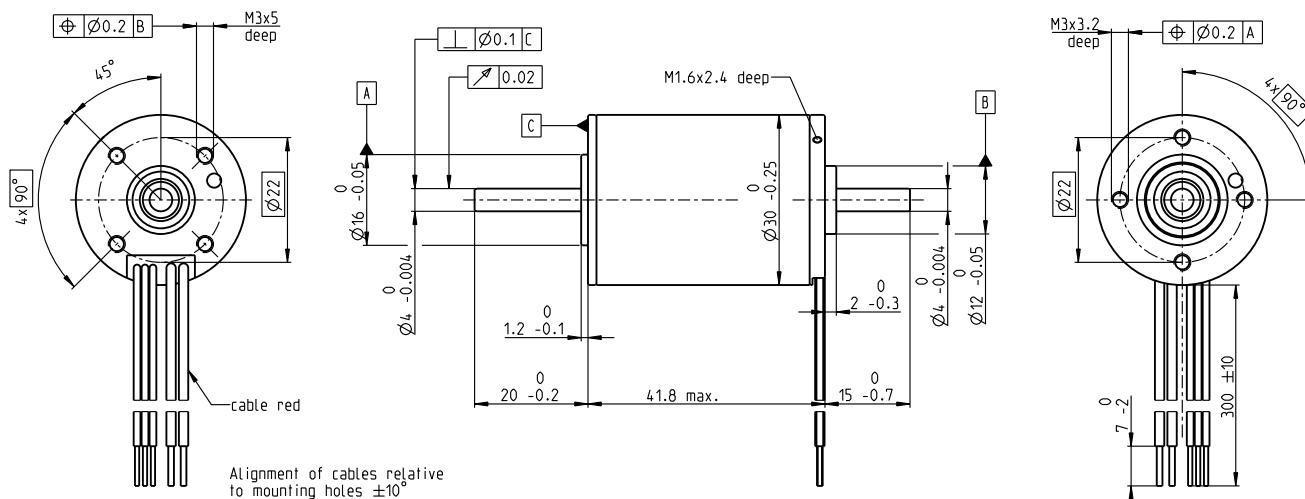
Modular construction with gears, sensors and brakes.



**Dynamic, high torque,  
and unbeatable value.**

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

## 4-Q-Speed Controller



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 <sub>CC</sub>	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 <sup>2</sup>		
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) (static, shaft supported)		48.8 N	
28 Max. radial load, 10 mm from flange		2510 N	
		30 N	

### Other specifications

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

Values listed in the table are nominal.

### Protective functions

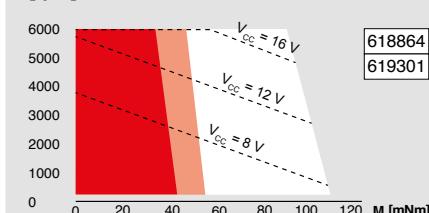
Overload protection, blockage protection, inverse-polarity protection, thermal overload protection, low/high voltage cut-off

### Connection 5 wire version (Cable AWG 20/24)

red	+V <sub>CC</sub> 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)

## Operating Range

### n [rpm]



## Comments

- Continuous operation
- Continuous operation with reduced thermal resistance R<sub>th2</sub> 50%
- Intermittent operation

## maxon Modular System

### Planetary Gearhead

Ø32 mm  
1.0 - 6.0 Nm

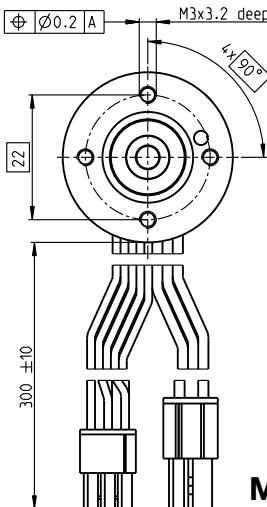
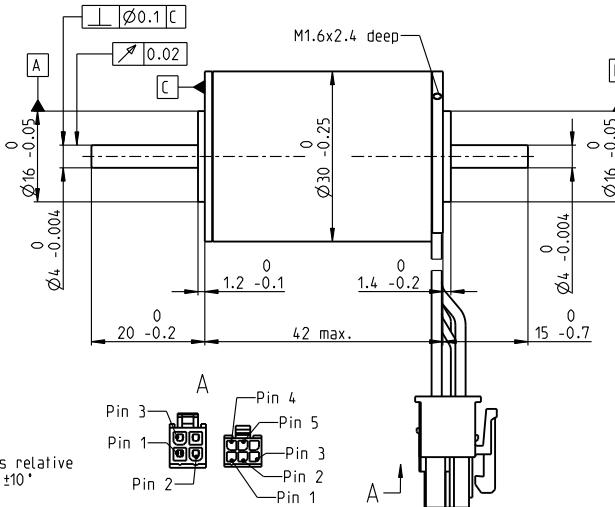
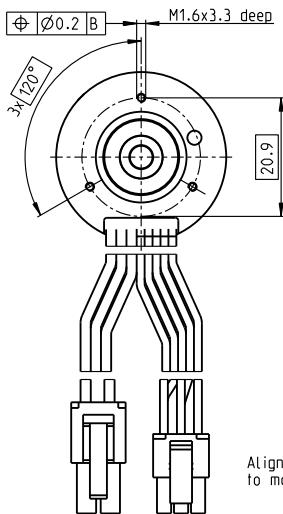
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# EC-i 30 Ø30 mm, brushless, 30 Watt

maxon EC-i



Stock program  
Standard program  
Special program (on request)

## Part Numbers

	with Hall sensors	539472	539473	539474	539475
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### Motor Data (provisional)

#### Values at nominal voltage

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 <sup>1</sup>	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
<b>Characteristics</b>					
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	gcm²	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
25 Radial play	0.14 mm
26 Max. axial load (dynamic)	preloaded
27 Max. force for press fits (static)	5 N
(static, shaft supported)	98 N
28 Max. radial load, 5 mm from flange	2000 N
	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 <sub>Hall</sub> 4.5...24 VDC	Pin 5
	N.C.	Pin 6

#### Connector Article number

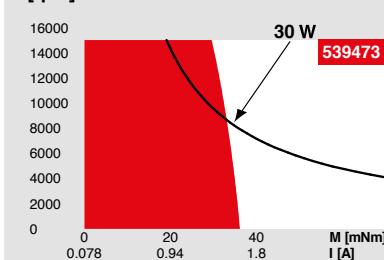
Molex 430-25-0600

Wiring diagram for Hall sensors see p. 47

<sup>1</sup>Calculation does not include saturation effect (p. 57/162)

### Operating Range

#### n [rpm]



### 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

#### Planetary Gearhead

Ø32 mm

1.0 - 6.0 Nm

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#### Screw Drive

Ø32 mm

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128 - 1024 CPT, 3 channels

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#### Encoder 16 EASY Absolute

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#### Encoder 16 RIO

1024 - 32 768 CPT, 3 channels

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#### Encoder HEDL 5540

500 CPT, 3 channels

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#### Encoder AEDL 5810

1024 - 5000 CPT, 3 channels

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#### Recommended Electronics:

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ESCON Module 24/2

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ESCON 36/3 EC

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ESCON Mod. 50/4 EC-S

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ESCON Mod. 50/5

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ESCON 50/5

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DEC Module 24/2

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DEC Module 50/5

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EPOS4 50/5

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EPOS4 Mod./Comp. 50/5

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EPOS2 P 24/5

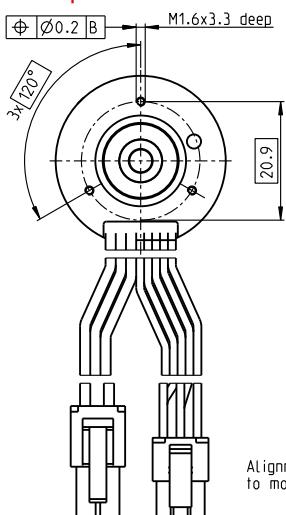
470

MAXPOS 50/5

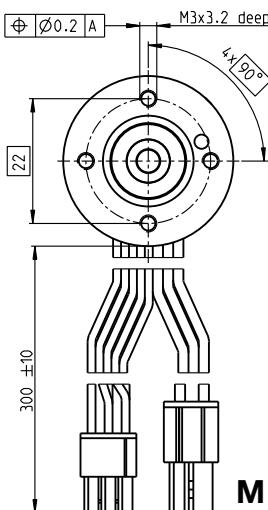
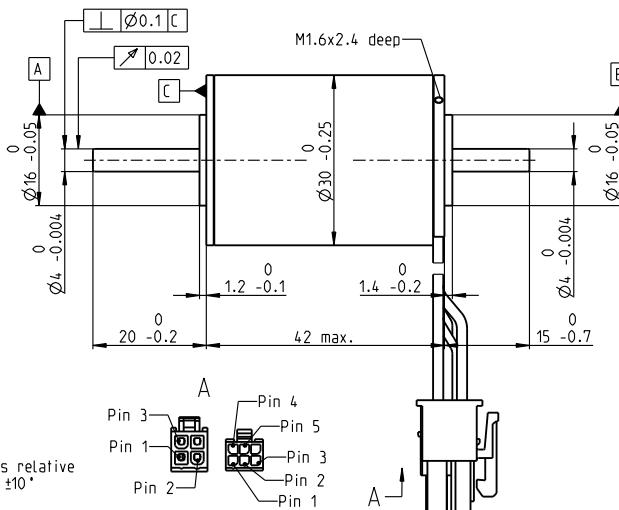
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# EC-i 30 Ø30 mm, brushless, 45 Watt

High Torque



Alignment of cables relative to mounting holes ±10°



M 3:4

Stock program  
Standard program  
Special program (on request)

## Part Numbers

	539480	539481	<b>539482</b>	539483	539484
<b>Motor Data (provisional)</b>					

### Values at nominal voltage

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 <sup>1</sup>	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 <sup>2</sup>	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
25 Radial play	0.14 mm 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	2000 N
	25 N

#### 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
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#### 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 <sub>Hall</sub> 4.5...24 VDC	Pin 5
	N.C.	Pin 6

#### Connector Article number

Molex	430-25-0600
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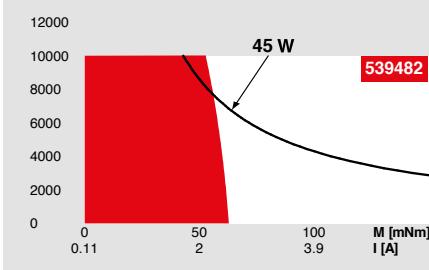
Wiring diagram for Hall sensors see p. 47

<sup>1</sup>Calculation does not include saturation effect (p. 57/162)

### Operating Range

### Comments

#### n [rpm]



#### Continuous operation

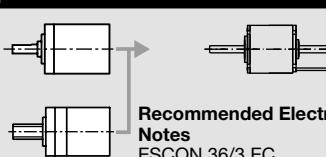
In observation of above listed thermal resistance (lines 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at 25°C ambient.  
= Thermal limit.

#### Short term operation

The motor may be briefly overloaded (recurring).

#### Assigned power rating

### maxon Modular System



### Details on catalog page 34

#### Encoder 16 EASY

128 - 1024 CPT, 3 channels

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#### Encoder 16 EASY Absolute

4096 steps

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#### Encoder 16 RIO

1024 - 32 768 CPT, 3 channels

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#### Encoder HEDL 5540

500 CPT, 3 channels

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#### Encoder AEDL 5810

1024 - 5000 CPT, 3 channels

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#### Recommended Electronics:

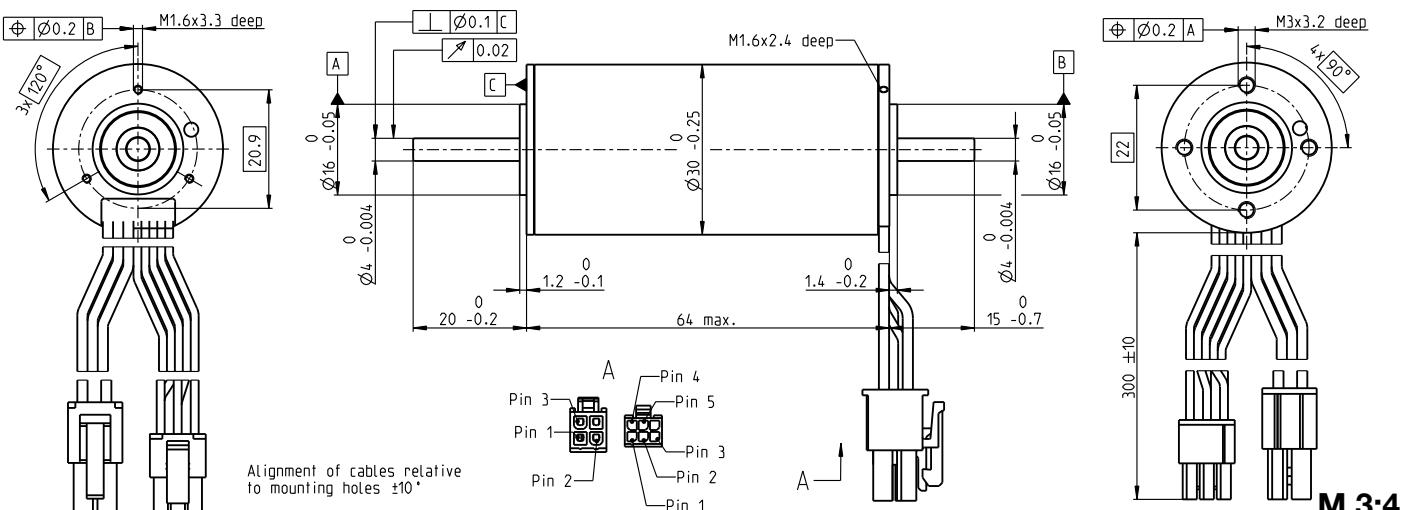
##### Notes

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ESCON Mod. 50/4 EC-S	455
ESCON Mod. 50/5	455
ESCON 50/5	457
DEC Module 50/5	459
EPOS2 P 24/5	470
EPOS4 50/5	463
EPOS4 Mod./Comp. 50/5	463
MAXPOS 50/5	473

# EC-i 30 Ø30 mm, brushless, 50 Watt

maxon EC-i



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

## Part Numbers

	with Hall sensors	539476	539477	539478	539479
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### 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 <sup>1</sup>	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 <sup>2</sup>	13.8	13.8	13.8	13.8

### Specifications

	Operating Range	Comments
n [rpm]	<p>50 W 539477</p>	<p><b>Continuous operation</b> 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.</p>
		<p><b>Short term operation</b> The motor may be briefly overloaded (recurring).</p>
		<p><b>Assigned power rating</b></p>

### Other specifications

29 Number of pole pairs	2	maxon Modular System	Details on catalog page 34
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

### 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 <sub>Hall</sub> 4.5...24 VDC	Pin 5
	N.C.	Pin 6

### Connector Article number

Molex 430-25-0600

Wiring diagram for Hall sensors see p. 47

<sup>1</sup>Calculation does not include saturation effect (p. 57/162)

### maxon Modular System

#### Planetary Gearhead

Ø32 mm

1.0 - 6.0 Nm

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#### Screw Drive

Ø32 mm

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#### Recommended Electronics:

##### Notes

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Encoder 16 EASY

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

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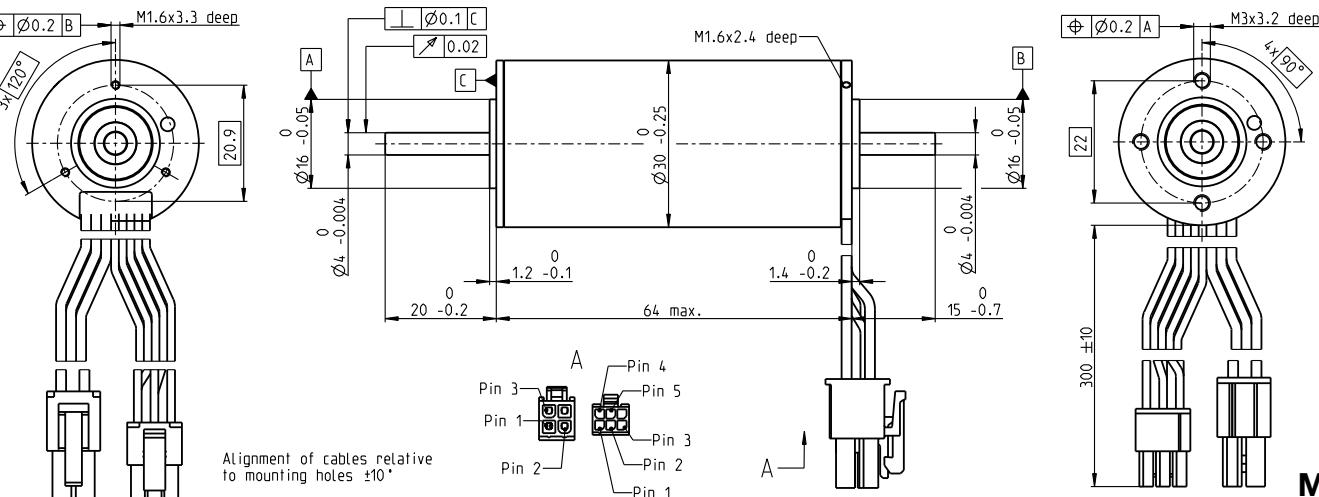
Encoder AEDL 5810

1024 - 5000 CPT, 3 channels

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# EC-i 30 Ø30 mm, brushless, 75 Watt

High Torque



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

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 <sup>1</sup>	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

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 <sup>2</sup>	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)	98 N
(static, shaft supported)	1300 N
28 Max. radial load, 5 mm from flange	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
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#### 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 <sub>Hall</sub> 4.5...24 VDC	Pin 5
	N.C.	Pin 6

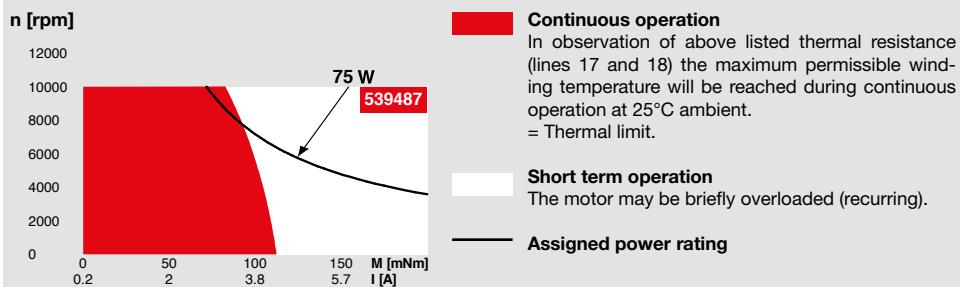
#### Connector Article number

Molex	430-25-0600
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Wiring diagram for Hall sensors see p. 47

<sup>1</sup>Calculation does not include saturation effect (p. 57/162)

### 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

#### Planetary Gearhead

Ø32 mm

1.0 - 6.0 Nm

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#### Screw Drive

Ø32 mm

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### Details on catalog page 34

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128 - 1024 CPT, 3 channels

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#### Encoder 16 EASY Absolute

4096 steps

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#### Encoder 16 RIO

1024 - 32 768 CPT, 3 channels

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#### Encoder HEDL 5540

500 CPT, 3 channels

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#### Encoder AEDL 5810

1024 - 5000 CPT, 3 channels

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### Recommended Electronics:

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ESCON 36/3 EC

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ESCON Mod. 50/4 EC-S

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ESCON Mod. 50/5

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ESCON Mod. 50/8 (HE)

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ESCON 50/5

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DEC Module 50/5

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EPOS4 50/5

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EPOS4 Mod./Comp. 50/5

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EPOS4 Mod./Comp. 50/8

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EPOS4 70/15

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EPOS2 P 24/5

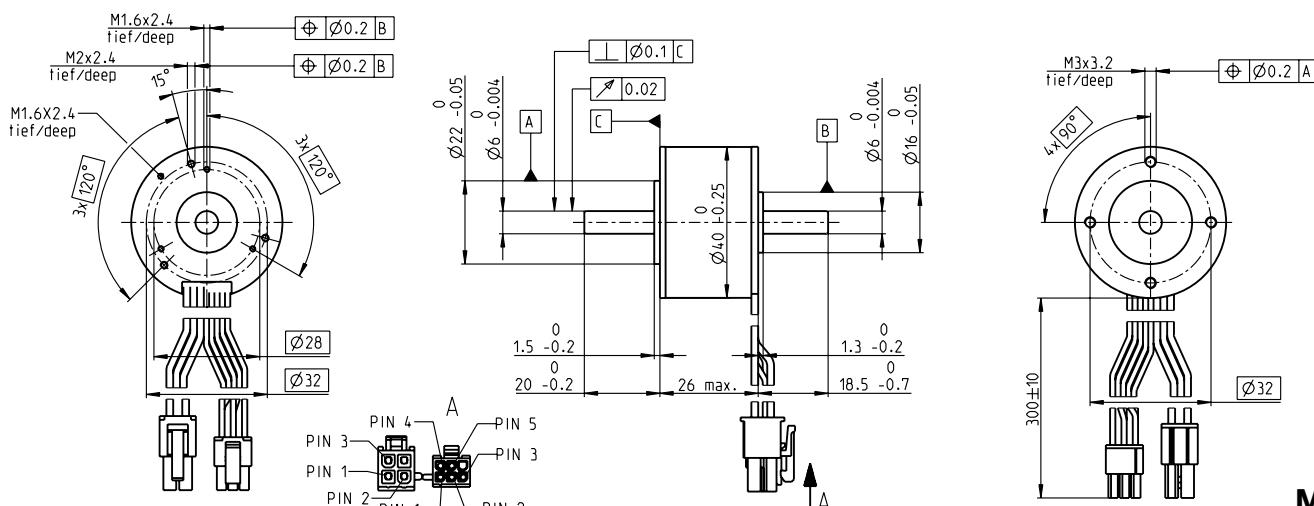
470

MAXPOS 50/5

473

# EC-i 40 Ø40 mm, brushless, 50 Watt

maxon EC-i



M 1:2

## Part Numbers

with Hall sensors	449463	449464
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## Motor Data

### Values at nominal voltage

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 <sup>1</sup>	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	27.1	16.7
15 Mechanical time constant	ms	2.98	1.84
16 Rotor inertia	gcm <sup>2</sup>	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)	87 N
(static, shaft supported)	6500 N
28 Max. radial load, 5 mm from flange	15 N

### 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 <sub>Hall</sub> 4.5...24 VDC	Pin 5
	N.C.	Pin 6

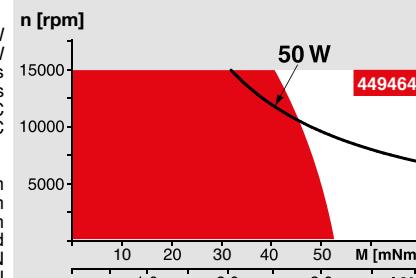
### Connector Article number

Molex 430-25-0600

Wiring diagram for Hall sensors see p. 47

<sup>1</sup>Calculation does not include saturation effect (p. 57/162)

## Operating Range



## Comments

### Continuous operation

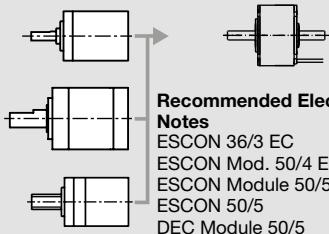
In observation of above listed thermal resistance (lines 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at 25°C ambient.  
= Thermal limit.

### Short term operation

The motor may be briefly overloaded (recurring).

### Assigned power rating

## maxon Modular System



## Details on catalog page 34

### Encoder 16 EASY

128 - 1024 CPT, 3 channels

Page 418

### Encoder 16 EASY Absolute

4096 steps

Page 422

### Encoder 16 RIO

1024 - 32 768 CPT, 3 channels

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### Encoder AEDL 5810

1024 - 5000 CPT, 3 channels

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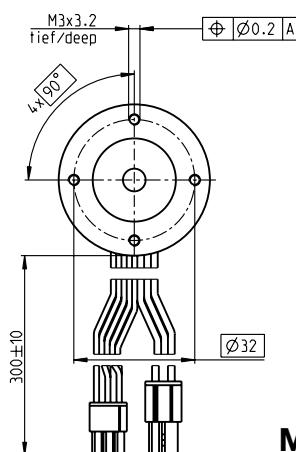
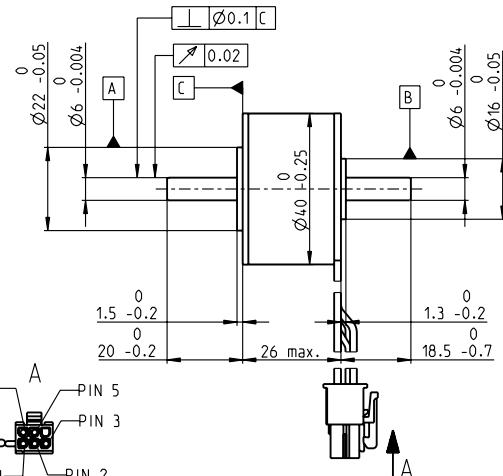
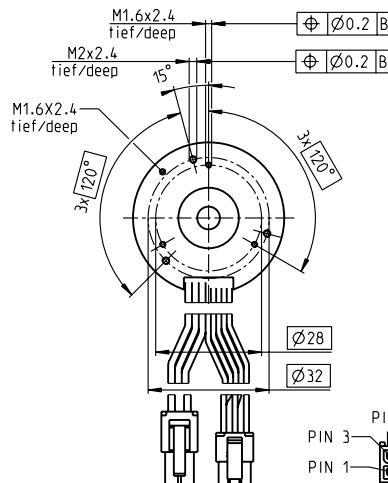
### Encoder HEDL 5540

500 CPT, 3 channels

Page 446

# EC-i 40 Ø40 mm, brushless, 50 Watt

High Torque



M 1:2

Stock program  
Standard program  
Special program (on request)

## Part Numbers

	496650	496651	496652	496653
with Hall sensors				

## Motor Data

### Values at nominal voltage

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 <sup>1</sup>	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 <sup>2</sup>	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)	87 N
(static, shaft supported)	6500 N
28 Max. radial load, 5 mm from flange	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 <sub>Hall</sub> 4.5...24 VDC	Pin 5
	N.C.	Pin 6

### Connector Article number

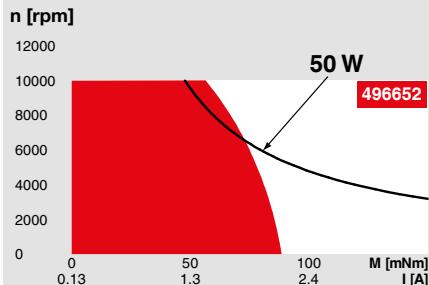
Molex 430-25-0600

Wiring diagram for Hall sensors see p. 47

<sup>1</sup>Calculation does not include saturation effect (p. 57/162)

## 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

### Planetary Gearhead

Ø42 mm  
3 - 15 Nm  
Page 362



## Details on catalog page 34

### Encoder 16 EASY

128 - 1024 CPT, 3 channels

Page 418

### Encoder 16 EASY Absolute

4096 steps

Page 422

### Encoder 16 RIO

1024 - 32 768 CPT, 3 channels

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### Encoder AEDL 5810

1024 - 5000 CPT, 3 channels

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### Encoder HEDL 5540

500 CPT, 3 channels

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### Recommended Electronics:

#### Notes

#### Page 34

ESCON 36/3 EC

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ESCON Mod. 50/4 EC-S

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ESCON Module 50/5

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ESCON Mod. 50/8 (HE)

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ESCON 50/5

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ESCON 70/10

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DEC Module 50/5

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EPOS4 50/5

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EPOS4 Mod./Comp. 50/5

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EPOS4 Mod./Comp. 50/8

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EPOS4 70/15

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EPOS2 P 24/5

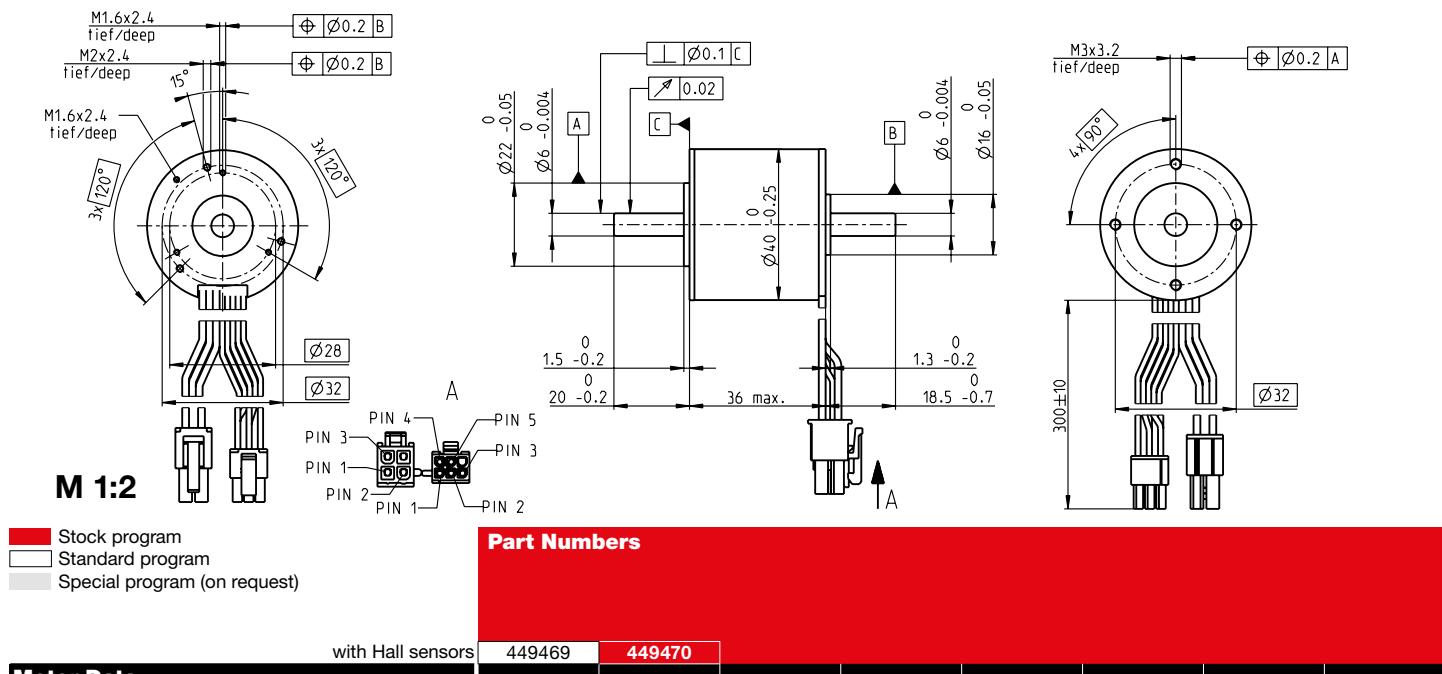
470

MAXPOS 50/5

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# EC-i 40 Ø40 mm, brushless, 70 Watt

maxon EC-i



	with Hall sensors	449469	449470
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## 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 <sup>1</sup>	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 <sup>2</sup>	24.2	24.2

## Specifications

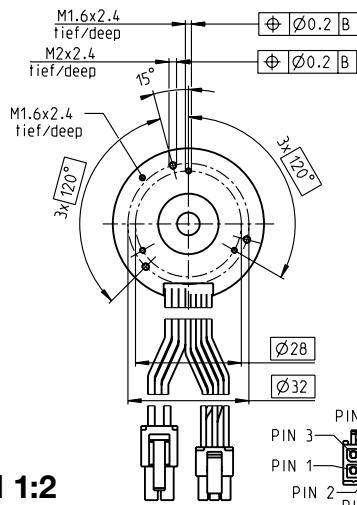
Thermal data		Operating Range		Comments
17 Thermal resistance housing-ambient	7.8 K/W	n [rpm]		<b>Continuous operation</b>
18 Thermal resistance winding-housing	2.6 K/W	15000	70W	In observation of above listed thermal resistance (lines 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at 25°C ambient.
19 Thermal time constant winding	28.1 s	10000	449470	= Thermal limit.
20 Thermal time constant motor	936 s	5000		
21 Ambient temperature	-40...+100°C	20		
22 Max. winding temperature	+155°C	40		
Mechanical data (preloaded ball bearings)		60		
23 Max. speed	15000 rpm	80		<b>Short term operation</b>
24 Axial play at axial load < 9.0 N	0 mm	100		The motor may be briefly overloaded (recurring).
> 9.0 N	0.15 mm	120		
25 Radial play	preloaded	140		
26 Max. axial load (dynamic)	5 N	160		
27 Max. force for press fits (static)	87 N	180		
(static, shaft supported)	5000 N	200		
28 Max. radial load, 5 mm from flange	15 N	220		

Other specifications		maxon Modular System		Details on catalog page 34
29 Number of pole pairs	7	Planetary Gearhead	Encoder 16 EASY	
30 Number of phases	3	Ø32 mm	128 - 1024 CPT, 3 channels	
31 Weight of motor	240 g	1.0 - 6.0 Nm	Page 418	

Values listed in the table are nominal.	Planetary Gearhead	Encoder 16 EASY
Connection motor (Cable AWG 20)	Ø32 mm	128 - 1024 CPT, 3 channels
red Motor winding 1 Pin 1	1.0 - 6.0 Nm	Page 418
black Motor winding 2 Pin 2	Page 353	
white Motor winding 3 Pin 3	Planetary Gearhead	Encoder 16 EASY Absolute
N.C. Pin 4	Ø42 mm	4096 steps
Connector Article number	3 - 15 Nm	Page 422
Molex 39-01-2040	Page 362	Encoder 16 RIO
Connection sensor (Cable AWG 26)	Screw Drive	1024 - 32 768 CPT, 3 channels
yellow Hall sensor 1 Pin 1	Ø32 mm	Page 436
brown Hall sensor 2 Pin 2	Page 382-387	Encoder AEDL 5810
grey Hall sensor 3 Pin 3	ESCON 36/3 EC	1024 - 5000 CPT, 3 channels
blue GND Pin 4	ESCON Mod. 50/4 EC-S	Page 438
green V <sub>Hall</sub> 4.5...24 VDC Pin 5	ESCON Module 50/5	Encoder HEDL 5540
N.C. Pin 6	ESCON 50/5	500 CPT, 3 channels
Connector Article number	DEC Module 50/5	Page 446
Molex 430-25-0600	EPOS4 50/5	
Wiring diagram for Hall sensors see p. 47	EPOS4 Mod./Comp. 50/5	
<sup>1</sup> Calculation does not include saturation effect (p. 57/162)	EPOS2 P 24/5	
	MAXPOS 50/5	

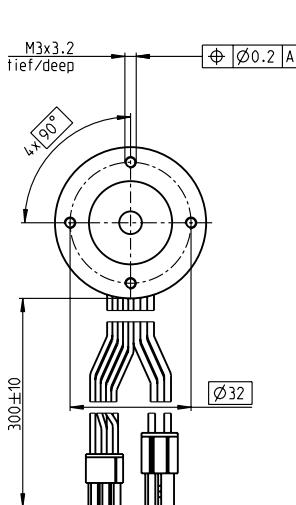
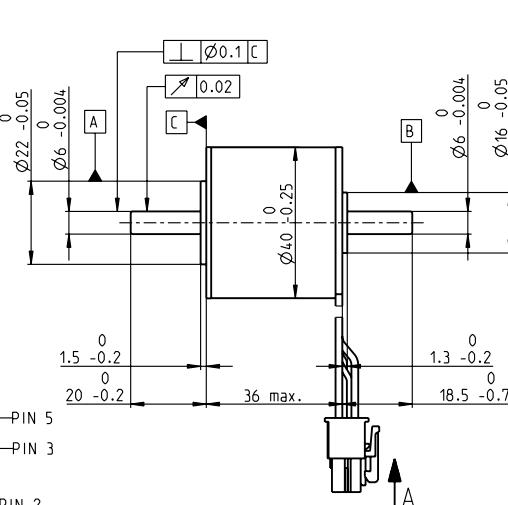
# EC-i 40 Ø40 mm, brushless, 70 Watt

High Torque



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

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 <sup>1</sup>	mNm	1960	2800	1940
8 Stall current	A	90.4	60.9	21.1
9 Max. efficiency	%	86	89	87

#### Characteristics

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 <sup>2</sup>	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
	> 9.0 N
25 Radial play	0 mm
26 Max. axial load (dynamic)	0.15 mm preloaded
27 Max. force for press fits (static)	7 N
(static, shaft supported)	87 N
28 Max. radial load, 5 mm from flange	5000 N
	26 N

#### 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
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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 <sub>Hall</sub> 4.5...24 VDC	Pin 5
	N.C.	Pin 6

#### Connector Article number

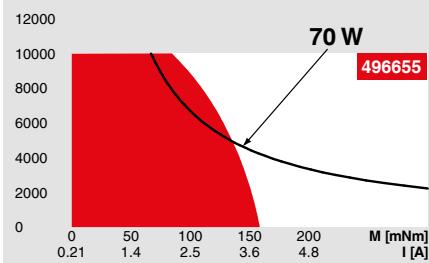
Molex	430-25-0600
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Wiring diagram for Hall sensors see p. 47

<sup>1</sup>Calculation does not include saturation effect (p. 57/162)

### Operating Range

#### n [rpm]



### 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

#### Planetary Gearhead

Ø42 mm  
3 - 15 Nm

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### Details on catalog page 34

#### Encoder 16 EASY

128 - 1024 CPT, 3 channels

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#### Encoder 16 EASY Absolute

4096 steps

Page 422

#### Encoder 16 RIO

1024 - 32 768 CPT, 3 channels

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#### Encoder AEDL 5810

1024 - 5000 CPT, 3 channels

Page 438

#### Encoder HEDL 5540

500 CPT, 3 channels

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#### Recommended Electronics:

##### Notes

ESCON 36/3 EC

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ESCON Mod. 50/4 EC-S

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ESCON Module 50/5

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ESCON 50/5

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DEC Module 50/5

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EPOS4 50/5

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EPOS4 Mod./Comp. 50/5

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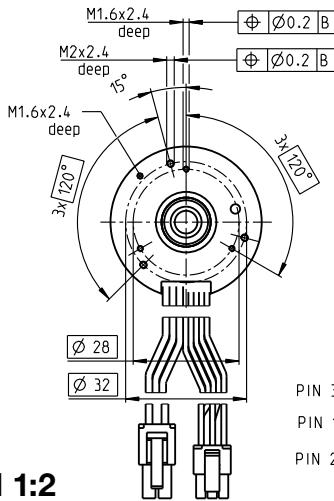
EPOS2 P 24/5

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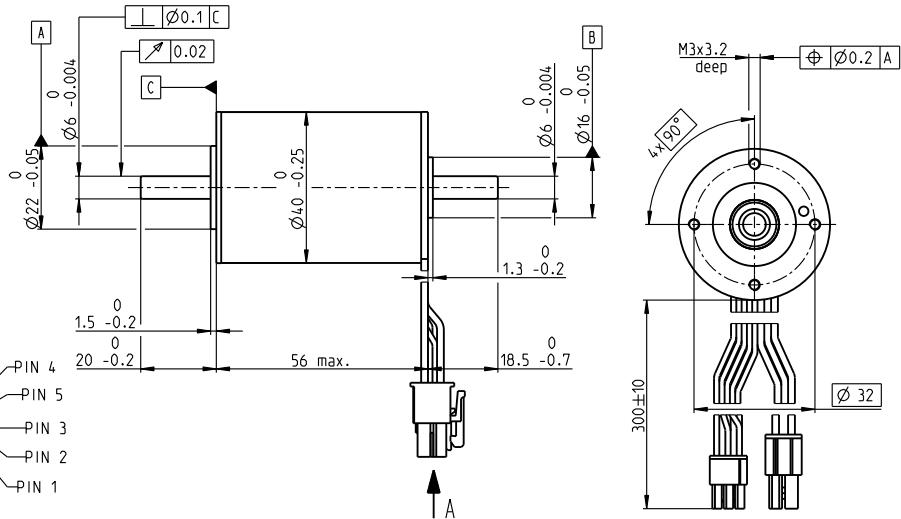
MAXPOS 50/5

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**EC-i 40 Ø40 mm, brushless, 100 Watt****High Torque****M 1:2**

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

**Part Numbers**

	with Hall sensors	496660	496661	488607
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**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 <sup>1</sup>	mNm	2860	3160	4330
8 Stall current	A	76.3	42.2	47.5
9 Max. efficiency	%	87	87	89
<b>Characteristics</b>				
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 <sup>2</sup>	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
25 Radial play	preloaded
26 Max. axial load (dynamic)	7 N
27 Max. force for press fits (static)	87 N
(static, shaft supported)	3000 N
28 Max. radial load, 5 mm from flange	29.9 N

**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 <sub>Hall</sub> 4.5...24 VDC	Pin 5
	N.C.	Pin 6

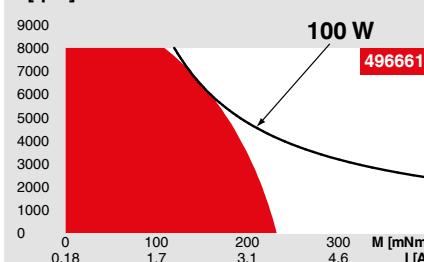
**Connector Article number**

Molex 430-25-0600

Wiring diagram for Hall sensors see p. 47

<sup>1</sup>Calculation does not include saturation effect (p. 57/162)**Operating Range**

n [rpm]

**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****Planetary Gearhead**

Ø42 mm  
3 - 15 Nm  
Page 362

**Details on catalog page 34****Encoder 16 EASY**

128 - 1024 CPT, 3 channels

Page 418

**Encoder 16 EASY Absolute**

4096 steps

Page 422

**Encoder 16 RIO**

1024 - 32 768 CPT, 3 channels

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**Encoder AEDL 5810**

1024 - 5000 CPT, 3 channels

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**Encoder HEDL 5540**

500 CPT, 3 channels

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**Recommended Electronics:****Notes**

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ESCON 36/3 EC

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ESCON Mod. 50/4 EC-S

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ESCON Module 50/5

455

ESCON Mod. 50/8 (HE)

456

ESCON 50/5

457

ESCON 70/10

457

DEC Module 50/5

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EPOS4 50/5

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EPOS4 Mod./Comp. 50/5

463

EPOS4 Mod./Comp. 50/8

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EPOS4 70/15

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EPOS2 P 24/5

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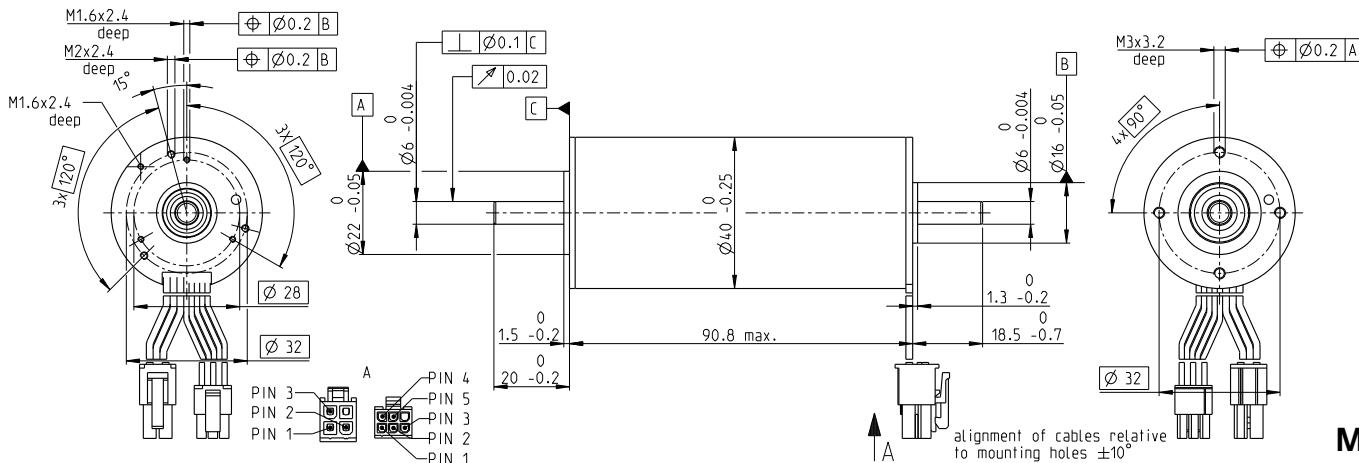
MAXPOS 50/5

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## **EC-i 40 Ø40 mm, brushless, 130 Watt**

NEW

## High Torque



M 1:2

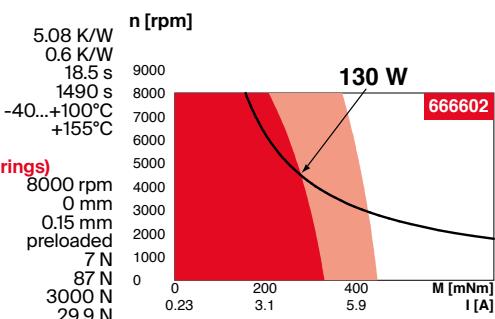
ECL

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

## Part Numbers

with Hall sensors		666601	676600	666602	666603			
<b>Motor Data</b>								
<b>Values at nominal voltage</b>								
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 <sup>1</sup>	mNm	3320	4090	4950	5360			
8 Stall current	A	91	85	68	55			
9 Max. efficiency	%	85.9	87.2	88.4	88.8			
<b>Characteristics</b>								
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 <sup>2</sup>	78	78	78	78			

Specifications		Operating Range		Comments	
<b>Thermal data</b>				<b>Continuous operation</b>	
17 Thermal resistance housing-ambient	5.08 K/W			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.	
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				
<b>Mechanical data (preloaded ball bearings)</b>				<b>Short term operation</b>	
23 Max. speed	8000 rpm			The motor may be briefly overloaded (recurring).	
24 Axial play at axial load	< 9.0 N				
	> 9.0 N				
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	3000 N				
	29.9 N				



Other specifications	
29	Number of pole pairs
30	Number of phases
31	Weight of motor

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 system (Cable AWG 26)**

Connection sensor (Cable AWG 26)		
Connector	Article number	
yellow	Hall sensor 1	Pin 1
brown	Hall sensor 2	Pin 2
grey	Hall sensor 3	Pin 3
blue	GND	Pin 4
green	V <sub>Hall</sub> 4.5...24 VDC N.C.	Pin 5

Wiring diagram for Hall sensors see p. 4

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

(p. 61/168)

**maven Modular System**

**maxon Modular System**



Details on catalog page 36

Details on catalog page 36

128 - 1024 CPI, 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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Page 467  
**Encoder AEDL 5810**  
1024 - 5000 CPT, 3 channels  
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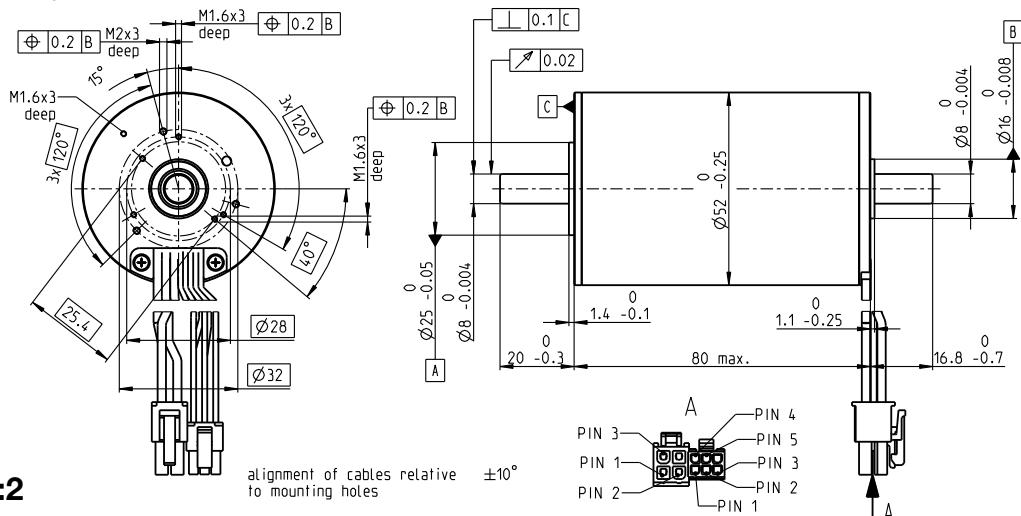
**Encoder HEDL 5540**  
500 CPT, 3 channels  
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#### **Recommended Electronics:**

<b>Notes</b>	<b>Page</b>
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EPOS4 Mod./Comp. 50/8	49
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# EC-i 52 Ø52 mm, brushless, 180 Watt

High Torque



M 1:2

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

## Part Numbers

	with Hall sensors	574740	574741	579164	579165	
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### Motor Data (provisional)

Values at nominal voltage		V	18	24	36	48	
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 <sup>1</sup>	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 <sup>2</sup>	170	170	170	170		

### Specifications

Thermal data	
17 Thermal resistance housing-ambient	4.32 K/W
18 Thermal resistance winding-housing	0.63 K/W
19 Thermal time constant winding	10.2 s
20 Thermal time constant motor	1780 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 < 15 N	0 mm
	> 15 N
25 Radial play	0.14 mm
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
	110 N

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 <sub>Hall</sub> 4.5...24 VDC Pin 5
	N.C. Pin 6

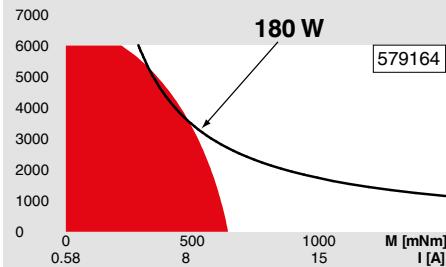
Connector	Article number
Molex	430-25-0600

Wiring diagram for Hall sensors see p. 47

<sup>1</sup>Calculation does not include saturation effect  
(p. 57/162)

## Operating Range

### n [rpm]



## 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

### Planetary Gearhead

Ø52 mm  
4 - 30 Nm  
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## Details on catalog page 34

### Encoder 16 EASY

128 - 1024 CPT, 3 channels

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### Encoder 16 EASY XT

3 channels

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### Encoder 16 EASY Absolute

4096 steps

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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 AEDL 5810

1024 - 5000 CPT, 3 channels

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### Encoder HEDL 5540

500 CPT, 3 channels

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## Recommended Electronics:

### Notes

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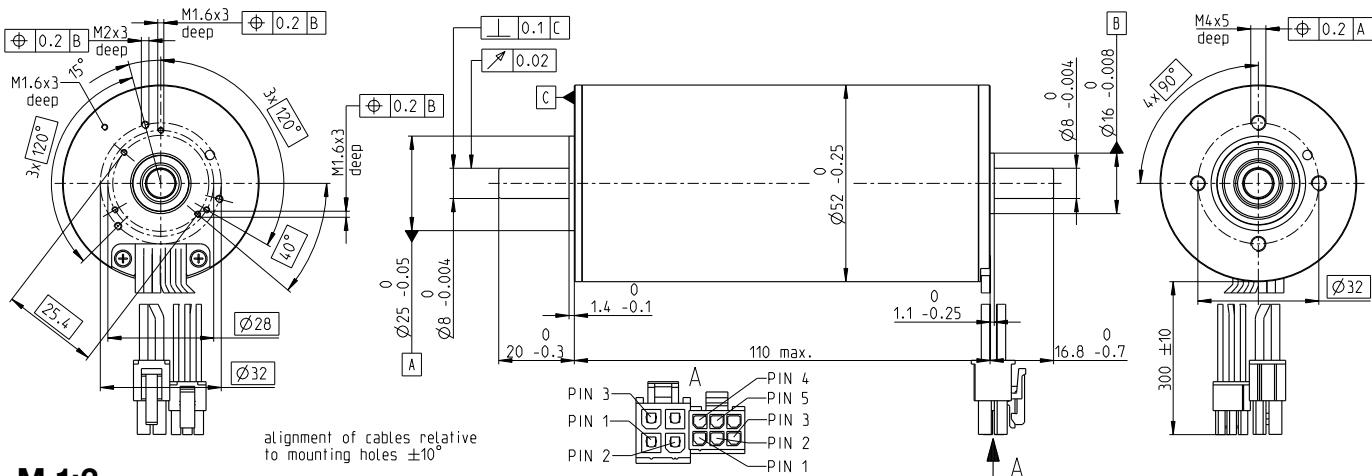
MAXPOS 50/5 473

# EC-i 52 Ø52 mm, brushless, 200 Watt

NEW

High Torque

maxon EC-i



M 1:2

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

## Part Numbers

with Hall sensors    606793    596099    634043

### Motor Data (provisional)

#### Values at nominal voltage

1 Nominal voltage	V	24	36	48
2 No load speed	rpm	3340	3660	3970
3 No load current	mA	657	499	419
4 Nominal speed	rpm	2970	3300	3610
5 Nominal torque (max. continuous torque)	mNm	640	649	622
6 Nominal current (max. continuous current)	A	9.36	6.93	5.44
7 Stall torque <sup>1</sup>	mNm	13800	18800	22900
8 Starting current	A	202	202	200
9 Max. efficiency	%	89	90.4	91.1

#### Characteristics

10 Terminal resistance phase to phase	T	0.119	0.178	0.24
11 Terminal inductance phase to phase	mH	0.149	0.28	0.424
12 Torque constant	mNm/A	68	93.1	115
13 Speed constant	rpm/V	140	103	83.3
14 Speed/torque gradient	rpm/mNm	0.245	0.196	0.174
15 Mechanical time constant	ms	0.677	0.543	0.482
16 Rotor inertia	gcm <sup>2</sup>	264	264	264

### Specifications

#### Thermal data

17 Thermal resistance housing-ambient	4.02 K/W
18 Thermal resistance winding-housing	0.53 K/W
19 Thermal time constant winding	12.8 s
20 Thermal time constant motor	2310 s
21 Ambient temperature	-40...+100°C
22 Max. winding temperature	+155°C

#### Mechanical data (preloaded ball bearings)

23 Max. permissible speed	5000 rpm
24 Axial play at axial load < 15 N	0 mm
	> 15 N
25 Radial play	0.14 mm
26 Max. axial load (dynamic)	preloaded
27 Max. force for press fits (static)	12 N
(static, shaft supported)	150N
28 Max. radial load, 5 mm from flange	6000 N
	110 N

#### Other specifications

29 Number of pole pairs	8
30 Number of phases	3
31 Weight of motor	1150 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

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 <sub>Hall</sub> 4.5...24 VDC	Pin 5

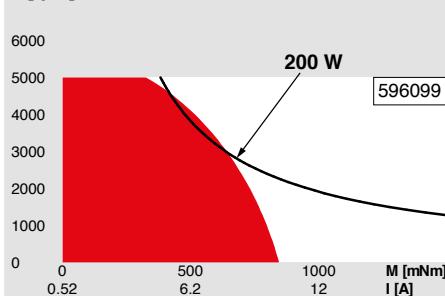
Connector	Article number
Molex	430-25-0600

Wiring diagram for Hall sensors see p. 47

<sup>1</sup>Calculation does not include saturation effect  
(p. 57/162)

### Operating Range

#### n [rpm]



### 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

#### Planetary Gearhead

Ø52 mm  
4 - 30 Nm

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Details on catalog page 34

#### Encoder 16 EASY

128 - 1024 CPT, 3 channels

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#### Encoder 16 EASY XT

3 channels

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#### Encoder 16 EASY Absolute

4096 steps

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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 AEDL 5810

1024 - 5000 CPT, 3 channels

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#### Encoder HEDL 5540

500 CPT, 3 channels

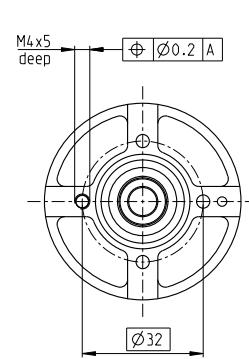
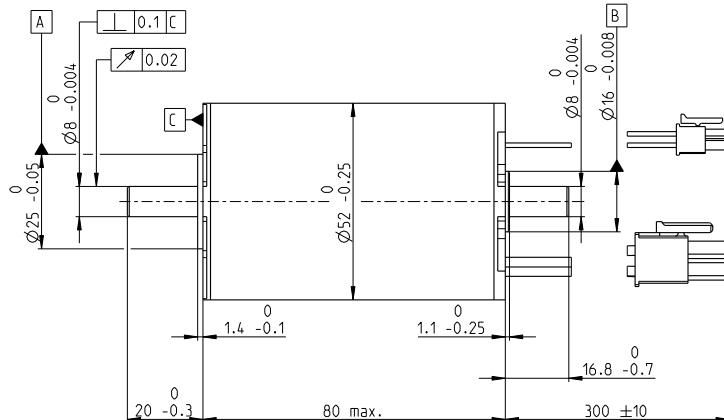
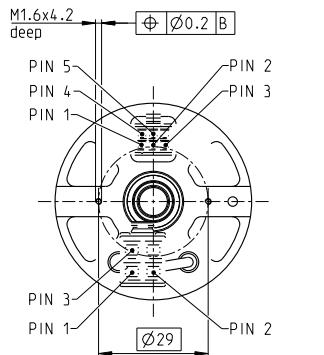
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# EC-i 52 Ø52 mm, brushless, 420 Watt

**NEW**

Ventilated

EC-i



M 1:2

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

## Part Numbers

with Hall sensors	667064	667065	667066	633919
<b>Motor Data</b>				

### 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 <sup>1</sup>	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 <sup>2</sup>	170	170	170	170

### Specifications

#### 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
	0.14 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	12 N
27 Max. force for press fits (static)	150 N
(static, shaft supported)	6000 N
28 Max. radial load, 5 mm from flange	110 N

#### 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.

#### 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)

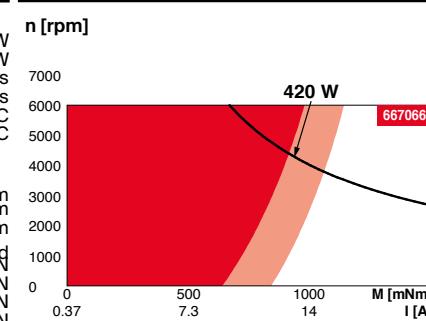
yellow	Hall sensor 1	Pin 1
brown	Hall sensor 2	Pin 2
grey	Hall sensor 3	Pin 3
blue	GND	Pin 4
green	V <sub>Hall</sub> 4.5...24 VDC	Pin 5
	N.C.	Pin 6

#### Connector Article number

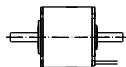
Molex 430-25-0600

Wiring diagram for Hall sensors see p. 49

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



Details on catalog page 36



#### Encoder 16 EASY

128 - 1024 CPT, 3 channels

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#### Encoder 16 EASY XT

128 - 1024 CPT, 3 channels

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#### Encoder 16 EASY Absolute

4096 steps

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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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#### Recommended Electronics:

##### Notes

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EPOS4 Mod./Comp. 50/15 497

EPOS4 70/15 501

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