

maxon EC-max

Standard Specification No. 101	68
Explanation	168
ECX SPEED Program	171-208
ECX SQUARE Program	211
ECX TORQUE Program	215-217
IDX Program	221-222
EC Program	225-232
EC-max Program	235-243
EC-4pole Program	247-253
EC-i Program	257-271
EC flat Program	275-302
EC frameless Program	305-310

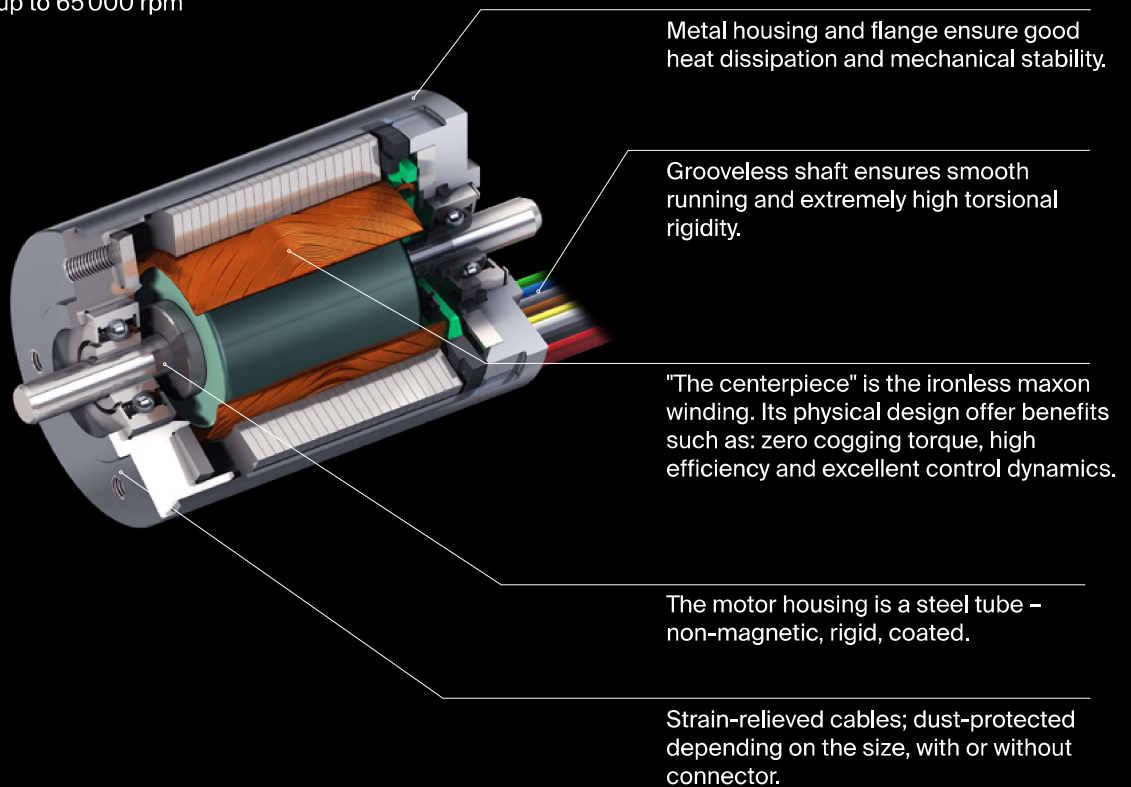


maxon EC-max

The electrically commutated maxon EC motors are longer-lasting than their counterparts in the DC range. The long life span offered by the brushless design can be exploited particularly well using preloaded ball bearings. The EC motors have excellent torque characteristics, high power, and a wide speed range. The outstanding controllability of the motors enables high-precision positioning tasks.

Key data

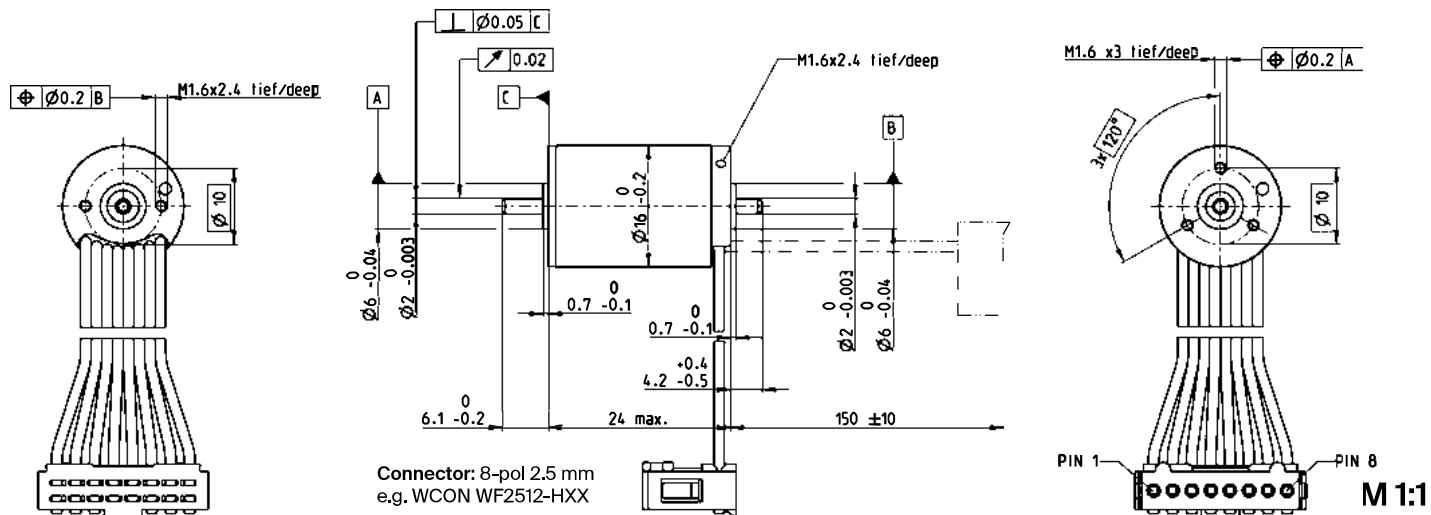
Motor \varnothing	10 ... 60 mm
Motor length	26 ... 180 mm
Power	0.5 ... 400 W
Nominal torque	up to 800 mNm
Max. permissible speed	up to 65 000 rpm



- Designed for long uptime
- Performance optimized at high speeds of up to 65 000 rpm
- Robust design
- From diameter 45 mm with dust and splash protection

EC-max 16 Ø16 mm, brushless, 5 Watt

EC-max



Connector: 8-pol 2.5 mm
e.g. WCON WF2512-HXX

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

Part Numbers

283825	283826	283827	283828
--------	--------	--------	--------

Motor Data

Values at nominal voltage		4.5	6	9	12
1 Nominal voltage	V	4.5	6	9	12
2 No load speed	rpm	12800	13500	12600	13500
3 No load current	mA	148	120	72.4	60.2
4 Nominal speed	rpm	5170	5690	4920	5840
5 Nominal torque (max. continuous torque)	mNm	3.33	3.2	3.29	3.23
6 Nominal current (max. continuous current)	A	1.18	0.903	0.574	0.456
7 Stall torque	mNm	5.82	5.79	5.64	5.95
8 Stall current	A	1.89	1.49	0.901	0.762
9 Max. efficiency	%	53	53	53	53
Characteristics					
10 Terminal resistance phase to phase	Ω	2.38	4.04	9.99	15.7
11 Terminal inductance phase to phase	mH	0.0396	0.0634	0.163	0.254
12 Torque constant	mNm/A	3.08	3.9	6.26	7.8
13 Speed constant	rpm/V	3100	2450	1530	1220
14 Speed/torque gradient	rpm/mNm	2390	2540	2440	2470
15 Mechanical time constant	ms	10.7	11.4	10.9	11.1
16 Rotor inertia	gcm ²	0.428	0.428	0.428	0.428

Specifications

- Thermal data**
- 17 Thermal resistance housing-ambient 23.5 K/W
 - 18 Thermal resistance winding-housing 2.57 K/W
 - 19 Thermal time constant winding 0.943 s
 - 20 Thermal time constant motor 390 s
 - 21 Ambient temperature -40...+100°C
 - 22 Max. winding temperature +155°C

- Mechanical data (preloaded ball bearings)**
- 23 Max. speed 20 000 rpm
 - 24 Axial play at axial load < 1.5 N 0 mm
 - > 1.5 N 0.14 mm
 - 25 Radial play preloaded
 - 26 Max. axial load (dynamic) 1 N
 - 27 Max. force for press fits (static) 18 N
 - (static, shaft supported) 600 N
 - 28 Max. radial load, 5 mm from flange 6 N

Other specifications

- 29 Number of pole pairs 3
- 30 Number of phases 3
- 31 Weight of motor 36 g

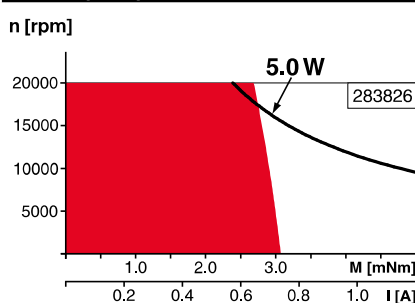
Values listed in the table are nominal.

Connection (Cable AWG 24)

brown	Motor winding 1	Pin 1
red	Motor winding 2	Pin 2
orange	Motor winding 3	Pin 3
yellow	V _{Hall} 3...24 VDC	Pin 4
green	GND	Pin 5
blue	Hall sensor 1	Pin 6
violet	Hall sensor 2	Pin 7
grey	Hall sensor 3	Pin 8

Wiring diagram for Hall sensors see p. 47

Operating Range

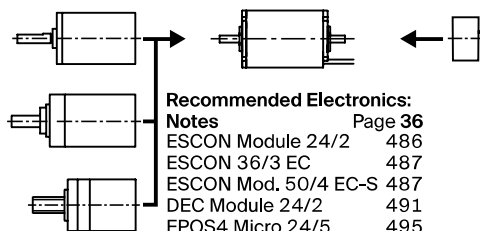


Comments

- 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

- 1 **Planetary Gearhead**
Ø16 mm
0.1 - 0.3 Nm
Page 369
- 3 **Planetary Gearhead**
Ø16 mm
0.2 - 0.6 Nm
Page 370
- 36 g **Screw Drive**
Ø16 mm
Page 411-413



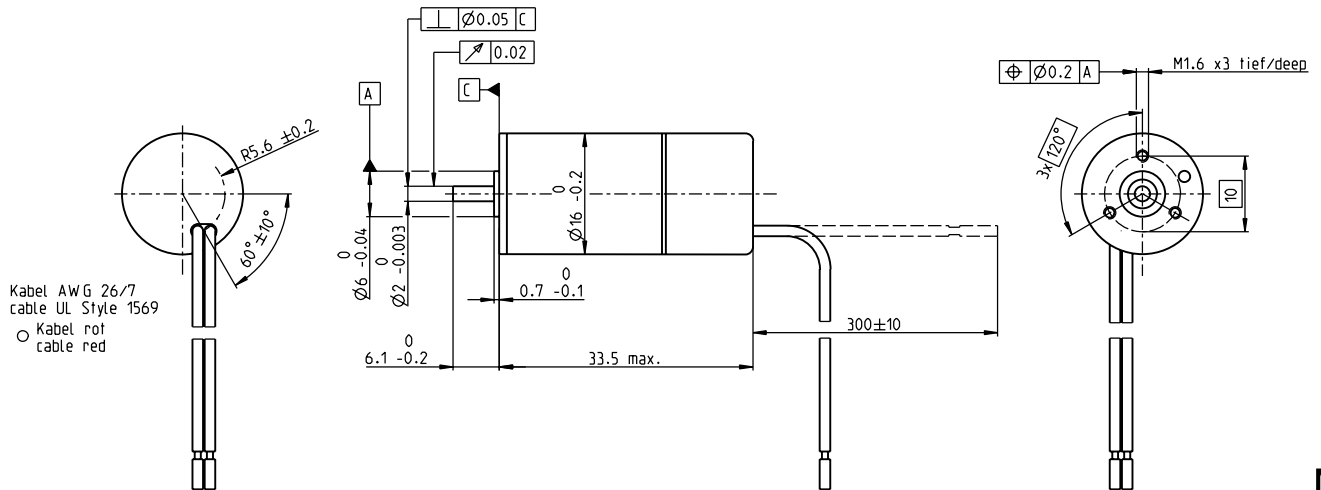
Details on catalog page 36

Encoder MR
128/256/512 CPT,
2/3 channels
Page 462

- Recommended Electronics:**
- | | |
|-------------------------|---------|
| Notes | Page 36 |
| ESCON Module 24/2 | 486 |
| ESCON 36/3 EC | 487 |
| ESCON Mod. 50/4 EC-S | 487 |
| DEC Module 24/2 | 491 |
| EPOS4 Micro 24/5 | 495 |
| EPOS4 Mod./Comp. 24/1.5 | 496 |
| EPOS4 Comp. 24/5 3-axes | 497 |

EC-max 16 2-wire Ø16 mm, brushless, 5 Watt

EC-max



M 1:1

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

Part Numbers

320816	320817	320818	320819
--------	--------	--------	--------

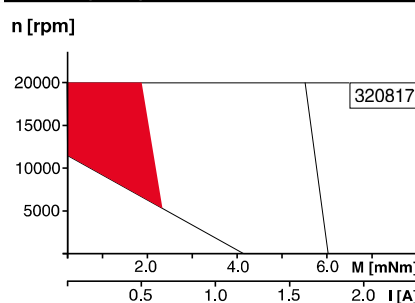
Motor Data

Values at nominal voltage		5	6	9	12
1 Nominal voltage	V	5	6	9	12
2 No load speed	rpm	14200	13400	12600	13800
3 No load current	mA	189	149	97.4	72.7
4 Nominal speed	rpm	8280	7510	6970	8080
5 Nominal torque (max. continuous torque)	mNm	2.19	2.19	2.28	2.26
6 Nominal current (max. continuous current)	A	0.903	0.714	0.465	0.37
7 Stall torque	mNm	4.6	5.25	5.39	5.76
8 Stall current	A	1.7	1.44	0.929	0.801
9 Max. efficiency	%	47.3	46.4	46.2	49
Characteristics					
35 Type of control		controlled	controlled	controlled	controlled
36 Supply voltage +V _{CC}	V	5...15	5...15	5...15	5...15
12 Torque constant	mNm/A	3.06	3.87	6.21	7.73
13 Speed constant	rpm/V	3130	2470	1540	1230
14 Speed/torque gradient	rpm/mNm	2440	2580	2480	2510
15 Mechanical time constant	ms	10.9	11.6	11.1	11.3
16 Rotor inertia	gcm ²	0.428	0.428	0.428	0.428
39 Speed range	rpm	14200-20000	11300-20000	6720-20000	5360-17400

Specifications

Thermal data	
17 Thermal resistance housing-ambient	23.5 K/W
18 Thermal resistance winding-housing	2.57 K/W
19 Thermal time constant winding	0.943 s
20 Thermal time constant motor	390 s
21 Ambient temperature	-40...+85°C
22 Max. temperature of electronics (max. loading capacity of the motor is defined by the electronics)	+100°C
Mechanical data (preloaded ball bearings)	
23 Max. speed	20000 rpm
24 Axial play at axial load < 1.5 N	0 mm
> 1.5 N	0.14 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	1 N
27 Max. force for press fits (static)	18 N
28 Max. radial load, 5 mm from flange	6 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

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

Values listed in the table are nominal.

Connection (Cable AWG 26/7 UL Style 1569)

red	+V _{CC}
black	GND

Protective functions

Inverse-polarity protection up to max.	18 VDC
Blockage protection at speed	< 76 rpm
Temperature monitoring	> 104°C
Current limitation	1.6 A ± 15%
Low voltage monitoring	< 4 VDC

⚠ **Attention:** Operating voltage V_{CC} > 18 VDC will destroy the electronics

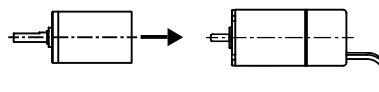
Option: Direction of rotation counter-clockwise (CCW)

maxon Modular System

Details on catalog page 36

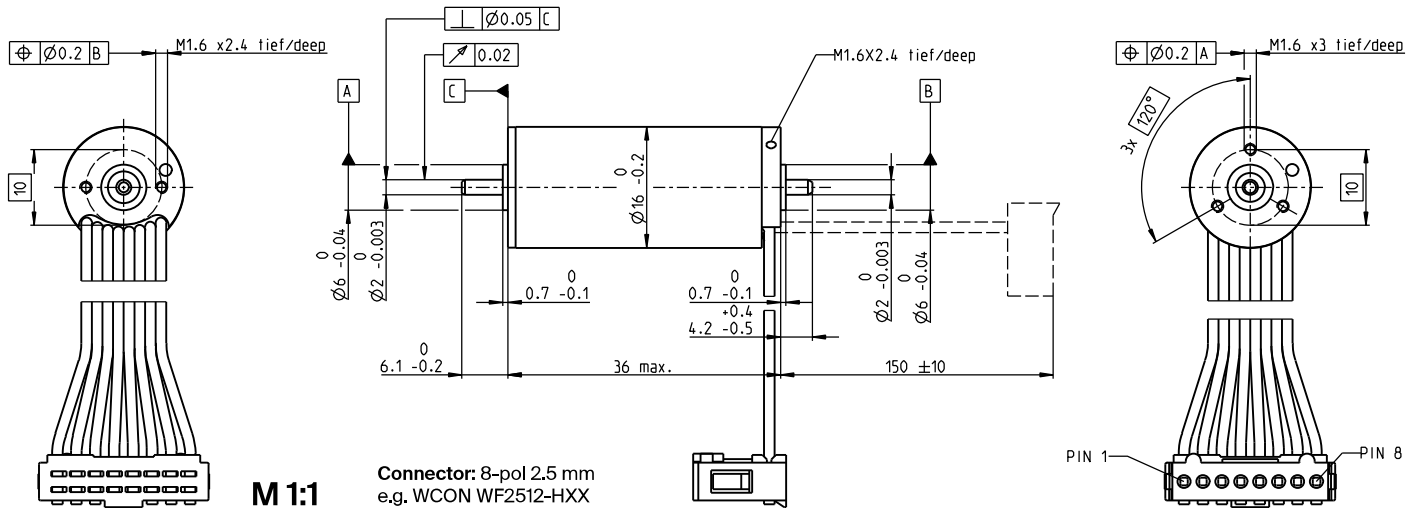
Planetary Gearhead

Ø16 mm
0.1 - 0.3 Nm
Page 369



EC-max 16 Ø16 mm, brushless, 8 Watt

EC-max



M 1:1

Connector: 8-pol 2.5 mm
e.g. WCON WF2512-HXX

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

Part Numbers					

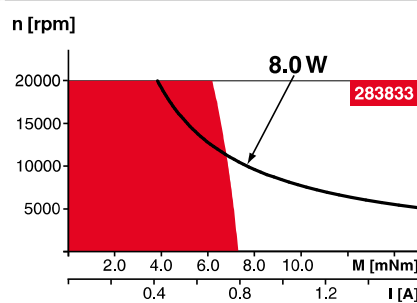
Motor Data

Values at nominal voltage					
1 Nominal voltage	V	6	9	12	18
2 No load speed	rpm	12000	11900	11900	11900
3 No load current	mA	130	85.1	64.2	42.6
4 Nominal speed	rpm	7120	7090	7300	7170
5 Nominal torque (max. continuous torque)	mNm	7.66	7.8	8.02	7.87
6 Nominal current (max. continuous current)	A	1.76	1.17	0.909	0.593
7 Stall torque	mNm	19.2	19.8	21.1	20.3
8 Stall current	A	4.17	2.82	2.27	1.45
9 Max. efficiency	%	69	69	70	70
Characteristics					
10 Terminal resistance phase to phase	Ω	1.44	3.19	5.3	12.4
11 Terminal inductance phase to phase	mH	0.034	0.079	0.14	0.317
12 Torque constant	mNm/A	4.61	7.02	9.32	14
13 Speed constant	rpm/V	2070	1360	1020	681
14 Speed/torque gradient	rpm/mNm	646	619	582	602
15 Mechanical time constant	ms	5.75	5.51	5.18	5.36
16 Rotor inertia	gcm ²	0.85	0.85	0.85	0.85

Specifications

- Thermal data**
- 17 Thermal resistance housing-ambient 17.7 K/W
 - 18 Thermal resistance winding-housing 1.41 K/W
 - 19 Thermal time constant winding 0.9 s
 - 20 Thermal time constant motor 427 s
 - 21 Ambient temperature -40...+100°C
 - 22 Max. winding temperature +155°C
- Mechanical data (preloaded ball bearings)**
- 23 Max. speed 20 000 rpm
 - 24 Axial play at axial load < 1.5 N 0 mm
 - > 1.5 N 0.14 mm
 - 25 Radial play preloaded
 - 26 Max. axial load (dynamic) 1 N
 - 27 Max. force for press fits (static) 18 N
 - (static, shaft supported) 400 N
 - 28 Max. radial load, 5 mm from flange 6 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

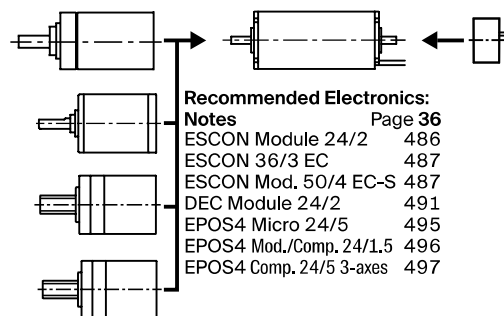
- 29 Number of pole pairs 3
- 30 Number of phases 3
- 31 Weight of motor 52 g

Values listed in the table are nominal.

- Connection (Cable AWG 24)**
- | | | |
|--------|------------------------------|-------|
| brown | Motor winding 1 | Pin 1 |
| red | Motor winding 2 | Pin 2 |
| orange | Motor winding 3 | Pin 3 |
| yellow | V _{Hall} 3...24 VDC | Pin 4 |
| green | GND | Pin 5 |
| blue | Hall sensor 1 | Pin 6 |
| violet | Hall sensor 2 | Pin 7 |
| grey | Hall sensor 3 | Pin 8 |
- Wiring diagram for Hall sensors see p. 47

maxon Modular System

- 1 **Planetary Gearhead**
Ø16 mm
0.2 - 0.6 Nm
Page 370
- 3 **Planetary Gearhead**
Ø22 mm
0.5 - 2.0 Nm
Page 377
- 52 g **Screw Drive**
Ø16 mm
Page 411-413
- Screw Drive**
Ø22 mm
Page 414/415



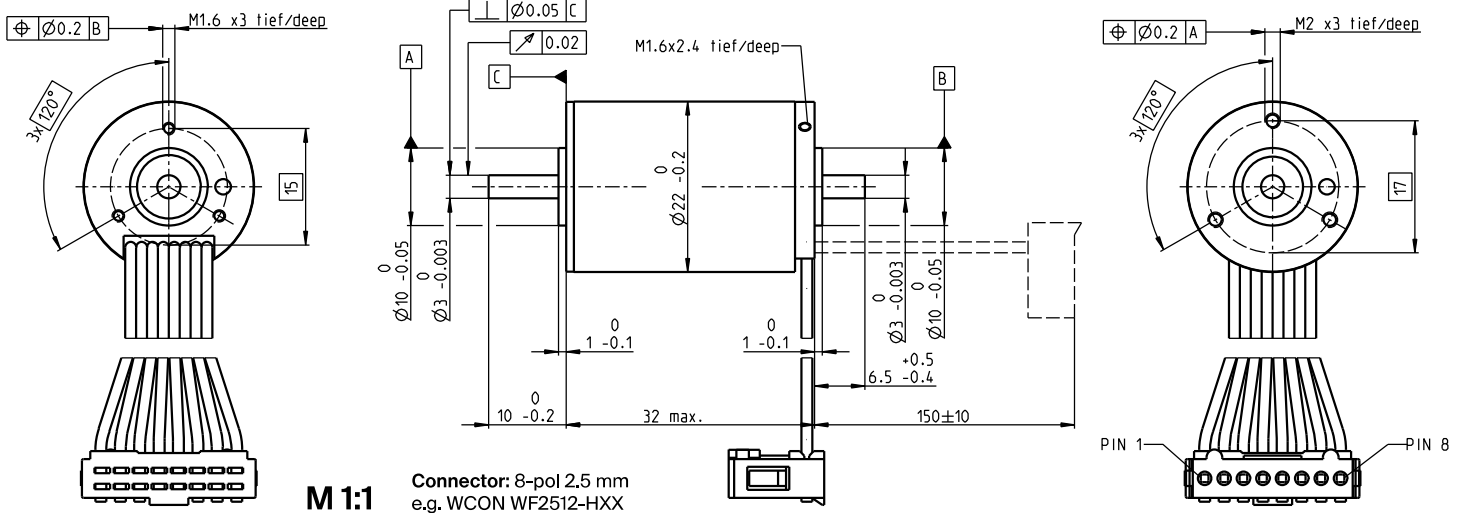
Details on catalog page 36

Encoder MR
128/256/512 CPT,
2/3 channels
Page 462

- Recommended Electronics:**
- | | |
|-------------------------|---------|
| Notes | Page 36 |
| ESCON Module 24/2 | 486 |
| ESCON 36/3 EC | 487 |
| ESCON Mod. 50/4 EC-S | 487 |
| DEC Module 24/2 | 491 |
| EPOS4 Micro 24/5 | 495 |
| EPOS4 Mod./Comp. 24/1.5 | 496 |
| EPOS4 Comp. 24/5 3-axes | 497 |

EC-max 22 Ø22 mm, brushless, 12 Watt

EC-max



M 1:1

Connector: 8-pol 2.5 mm
e.g. WCON WF2512-HXX

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

Part Numbers

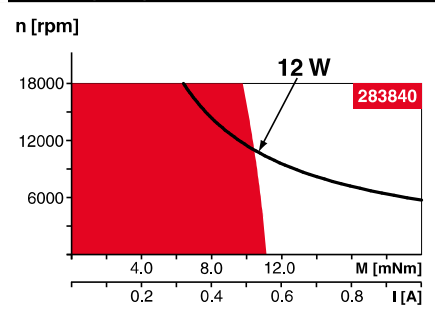
283837	283838	283839	283840	283841	

Motor Data							
Values at nominal voltage							
1	Nominal voltage	V	6	12	18	24	36
2	No load speed	rpm	11900	12100	12100	12100	12100
3	No load current	mA	301	155	103	773	51.6
4	Nominal speed	rpm	7920	8040	8250	8250	8210
5	Nominal torque (max. continuous torque)	mNm	11	10.2	10.9	10.8	10.6
6	Nominal current (max. continuous current)	A	2.61	1.25	0.88	0.657	0.432
7	Stall torque	mNm	33.9	31.3	35.4	35.1	34.1
8	Stall current	A	7.36	3.47	2.6	1.94	1.25
9	Max. efficiency	%	65	63	65	65	65
Characteristics							
10	Terminal resistance phase to phase	Ω	0.816	3.46	6.93	12.4	28.7
11	Terminal inductance phase to phase	mH	0.0315	0.121	0.275	0.488	1.09
12	Torque constant	mNm/A	4.61	9.02	13.6	18.1	27.2
13	Speed constant	rpm/V	2070	1060	701	526	352
14	Speed/torque gradient	rpm/mNm	366	406	356	360	372
15	Mechanical time constant	ms	8.63	9.56	8.39	8.47	8.75
16	Rotor inertia	gcm ²	2.25	2.25	2.25	2.25	2.25

Specifications	Operating Range	Comments
----------------	-----------------	----------

- Thermal data**
- 17 Thermal resistance housing-ambient 13.5 K/W
 - 18 Thermal resistance winding-housing 1.72 K/W
 - 19 Thermal time constant winding 1.85 s
 - 20 Thermal time constant motor 567 s
 - 21 Ambient temperature -40...+100°C
 - 22 Max. winding temperature +155°C

- Mechanical data (preloaded ball bearings)**
- 23 Max. speed 18000 rpm
 - 24 Axial play at axial load < 4 N 0 mm
 - > 4 N 0.14 mm
 - 25 Radial play preloaded
 - 26 Max. axial load (dynamic) 3.5 N
 - 27 Max. force for press fits (static) 53 N
 - (static, shaft supported) 1400 N
 - 28 Max. radial load, 5 mm from flange 16 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

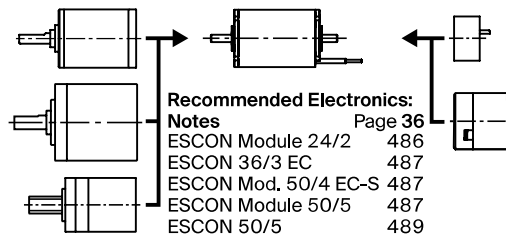
- Other specifications**
- 29 Number of pole pairs 3
 - 30 Number of phases 3
 - 31 Weight of motor 83 g

Values listed in the table are nominal.

- Connection (Cable AWG 24)**
- | | | |
|--------|------------------------------|-------|
| brown | Motor winding 1 | Pin 1 |
| red | Motor winding 2 | Pin 2 |
| orange | Motor winding 3 | Pin 3 |
| yellow | V _{hall} 3...24 VDC | Pin 4 |
| green | GND | Pin 5 |
| blue | Hall sensor 1 | Pin 6 |
| violet | Hall sensor 2 | Pin 7 |
| grey | Hall sensor 3 | Pin 8 |
- Wiring diagram for Hall sensors see p. 47

maxon Modular System	Details on catalog page 36
----------------------	----------------------------

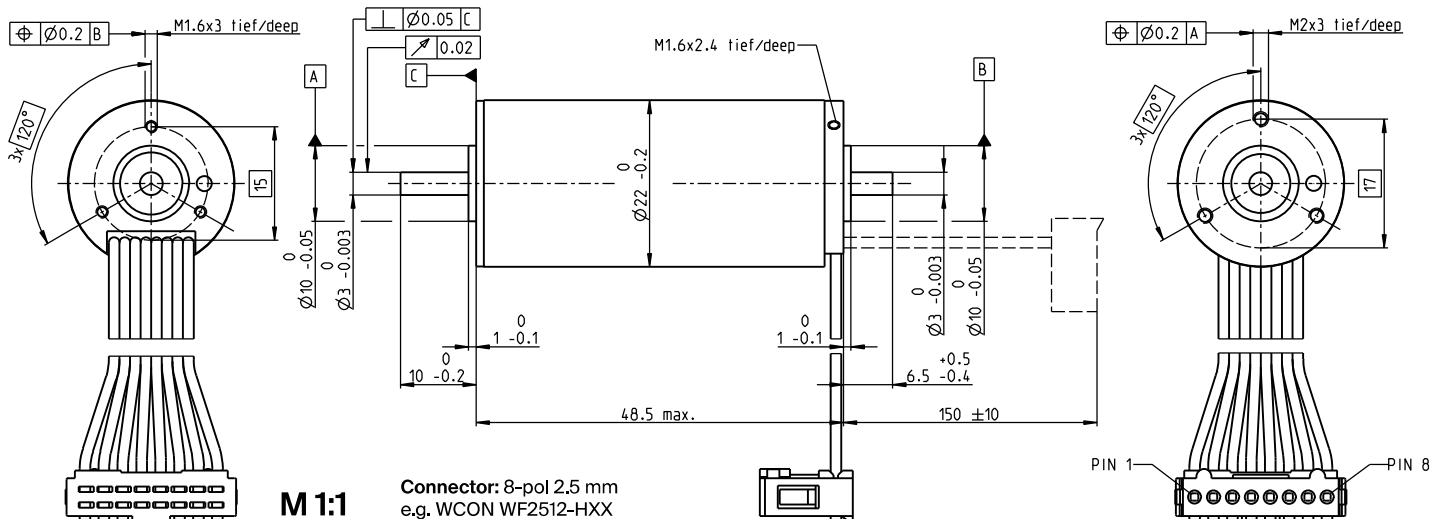
- 1 **Planetary Gearhead**
Ø22 mm
0.5 - 3.4 Nm
Page 377/378
- 3 **Koaxdrive**
Ø32 mm
1.0 - 4.5 Nm
Page 394
- 83 g **Screw Drive**
Ø22 mm
Page 414/415



- Recommended Electronics:**
- Notes** Page 36
- ESCON Module 24/2 486
 - ESCON 36/3 EC 487
 - ESCON Mod. 50/4 EC-S 487
 - ESCON Module 50/5 487
 - ESCON 50/5 489
 - DEC Module 24/2 491
 - DEC Module 50/5 491
 - EPOS4 Micro 24/5 495
 - EPOS4 Mod./Comp. 24/1.5 496
 - EPOS4 Mod./Comp. 50/5 496
 - EPOS4 Comp. 24/5 3-axes 497
 - EPOS4 50/5 501
 - FPOS2 P 24/5 504

- Encoder MR**
128/256/512 CPT,
2/3 channels
Page 462
- Brake AB 20**
24 VDC
0.1 Nm
Page 516

EC-max 22 Ø22 mm, brushless, 25 Watt



EC-max

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

Part Numbers

283856	283857	283858	283859	283860
--------	--------	--------	--------	--------

Motor Data

Values at nominal voltage		12	18	24	36	48
1 Nominal voltage	V	12	18	24	36	48
2 No load speed	rpm	12400	12900	12900	12200	12900
3 No load current	mA	226	161	121	73.5	60.4
4 Nominal speed	rpm	9800	10300	10400	9630	10500
5 Nominal torque (max. continuous torque)	mNm	23	21.8	22.7	22.5	23.2
6 Nominal current (max. continuous current)	A	2.71	1.8	1.4	0.872	0.716
7 Stall torque	mNm	114	112	121	111	127
8 Stall current	A	12.6	8.55	6.97	4	3.66
9 Max. efficiency	%	76	75	76	75	77
Characteristics						
10 Terminal resistance phase to phase	Ω	0.955	2.1	3.44	9.01	13.1
11 Terminal inductance phase to phase	mH	0.05	0.103	0.182	0.462	0.729
12 Torque constant	mNm/A	9.1	13	17.4	27.7	34.8
13 Speed constant	rpm/V	1050	732	549	345	274
14 Speed/torque gradient	rpm/mNm	110	118	109	112	103
15 Mechanical time constant	ms	5.14	5.5	5.06	5.23	4.82
16 Rotor inertia	gcm ²	4.45	4.45	4.45	4.45	4.45

Specifications

Thermal data	
17 Thermal resistance housing-ambient	10.2 K/W
18 Thermal resistance winding-housing	1.02 K/W
19 Thermal time constant winding	1.99 s
20 Thermal time constant motor	628 s
21 Ambient temperature	-40...+100°C
22 Max. winding temperature	+155°C

Mechanical data (preloaded ball bearings)	
23 Max. speed	18 000 rpm
24 Axial play at axial load < 4 N	0 mm
> 4 N	0.14 mm
25 Radial play	preloaded
26 Max. axial load (dynamic)	3.5 N
27 Max. force for press fits (static)	60 N
(static, shaft supported)	1000 N
28 Max. radial load, 5 mm from flange	16 N

Other specifications

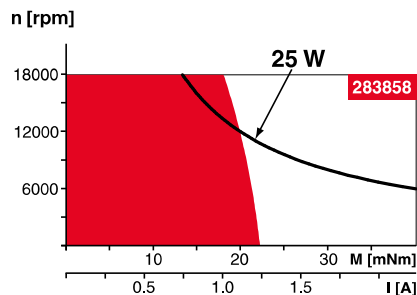
- 29 Number of pole pairs
- 30 Number of phases
- 31 Weight of motor

Values listed in the table are nominal.

Connection (Cable AWG 24)		
brown	Motor winding 1	Pin 1
red	Motor winding 2	Pin 2
orange	Motor winding 3	Pin 3
yellow	V _{Hall} 3...24 VDC	Pin 4
green	GND	Pin 5
blue	Hall sensor 1	Pin 6
violet	Hall sensor 2	Pin 7
grey	Hall sensor 3	Pin 8

Wiring diagram for Hall sensors see p. 47

Operating Range



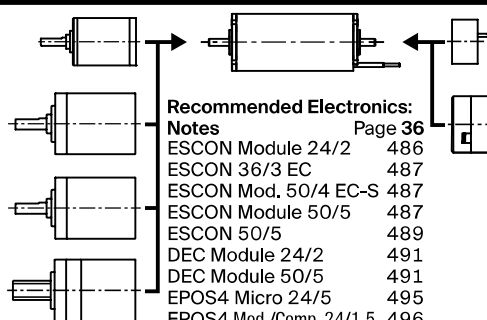
Comments

- 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

- 1 **Planetary Gearhead**
Ø22 mm
0.5 - 3.4 Nm
Page 375/378
- 3 **Planetary Gearhead**
Ø32 mm
1.0 - 6.0 Nm
Page 388
- 110 g **Koaxdrive**
Ø32 mm
1.0 - 4.5 Nm
Page 394
- Screw Drive**
Ø32 mm
Page 416-421



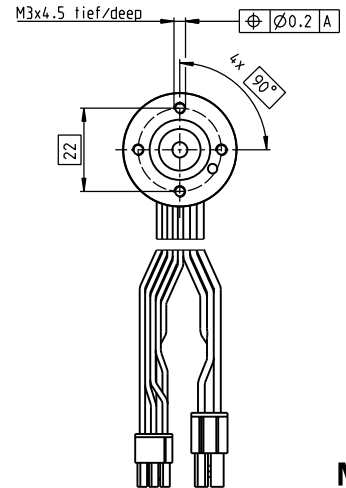
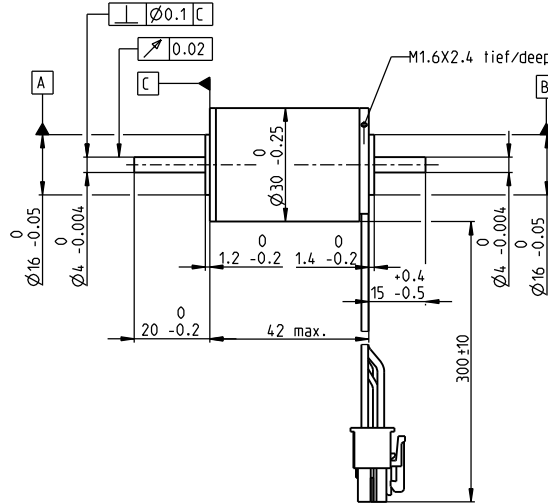
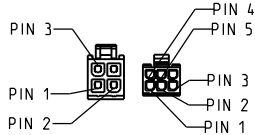
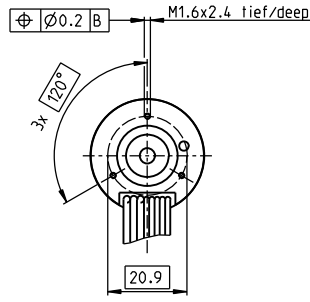
Recommended Electronics:

Notes	Page 36
ESCON Module 24/2	486
ESCON 36/3 EC	487
ESCON Mod./Comp. 50/4 EC-S	487
ESCON Module 50/5	487
ESCON 50/5	489
DEC Module 24/2	491
DEC Module 50/5	491
EPOS4 Micro 24/5	495
EPOS4 Mod./Comp. 24/1.5	496
EPOS4 Mod./Comp. 50/5	496
EPOS4 Comp. 24/5 3-axes	497
EPOS4 50/5	501
EPOS2 P 24/5	504

- Encoder MR**
128/256/512 CPT,
2/3 channels
Page 462
- Brake AB 20**
24 VDC
0.1 Nm
Page 516

EC-max 30 $\varnothing 30$ mm, brushless, 40 Watt

EC-max



M 1:2

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

Part Numbers

272766	272768	272769	272770
--------	--------	--------	--------

Motor Data

Values at nominal voltage		12	24	36	48
1 Nominal voltage	V	12	24	36	48
2 No load speed	rpm	8680	9250	9150	9250
3 No load current	mA	223	123	80.5	61.4
4 Nominal speed	rpm	6630	7220	7090	7210
5 Nominal torque (max. continuous torque)	mNm	34.9	33.8	33.3	33.4
6 Nominal current (max. continuous current)	A	2.88	1.49	0.97	0.738
7 Stall torque	mNm	153	160	154	157
8 Stall current	A	11.8	6.57	4.18	3.24
9 Max. efficiency	%	75	75	75	75
Characteristics					
10 Terminal resistance phase to phase	Ω	1.01	3.65	8.61	14.8
11 Terminal inductance phase to phase	mH	0.088	0.31	0.713	1.24
12 Torque constant	mNm/A	12.9	24.3	36.8	48.6
13 Speed constant	rpm/V	738	393	259	197
14 Speed/torque gradient	rpm/mNm	57.8	59.1	60.6	59.9
15 Mechanical time constant	ms	6.66	6.81	6.98	6.9
16 Rotor inertia	gcm ²	11	11	11	11

Specifications

Thermal data	
17 Thermal resistance housing-ambient	8.6 K/W
18 Thermal resistance winding-housing	1 K/W
19 Thermal time constant winding	3.25 s
20 Thermal time constant motor	777 s
21 Ambient temperature	-40...+100°C
22 Max. winding temperature	+155°C

Mechanical data (preloaded ball bearings)	
23 Max. speed	15 000 rpm
24 Axial play at axial load < 6.0 N	0 mm
24 Axial play at axial load > 6.0 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
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
- 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 Part number

Molex 39-01-2040

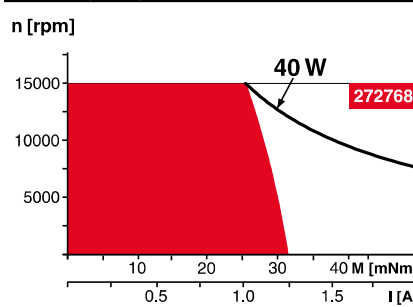
Connection sensors (Cable AWG 26)

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} 3...24 VDC	Pin 5
	N.C.	Pin 6

Connector Part number

Molex 430-25-0600

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

- 1 **Planetary Gearhead**
- 3 $\varnothing 32$ mm
- 195 g 1.0 - 8.0 Nm

Koaxdrive

$\varnothing 32$ mm

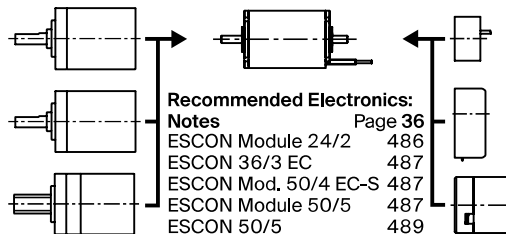
1.0 - 4.5 Nm

Page 394

Screw Drive

$\varnothing 32$ 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 Module 50/5 487

ESCON 50/5 489

DEC Module 24/2 491

DEC Module 50/5 491

EPOS4 Micro 24/5 495

EPOS4 Mod./Comp. 50/5 496

EPOS4 Mod./Comp. 24/1.5 496

EPOS4 Comp. 24/5 3-axes 497

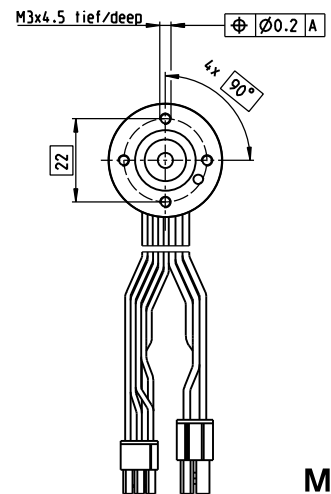
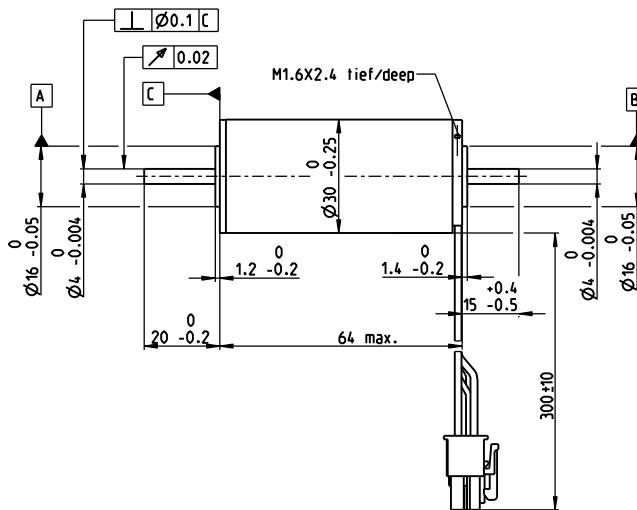
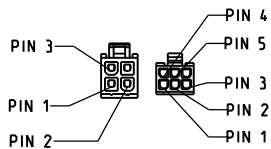
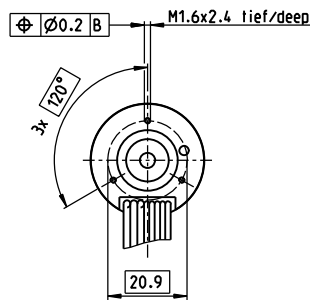
EPOS4 50/5 501

FPOS2 P 24/5 504

Details on catalog page 36

- Encoder MR**
500/1000 CPT,
3 channels
Page 463
- Encoder HEDL 5540**
500 CPT,
24 VDC
3 channels
Page 475
- Brake AB 20**
24 VDC
0.1 Nm
Page 516

EC-max 30 \varnothing 30 mm, brushless, 60 Watt



M 1:2

EC-max

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

Part Numbers

272762	272763	272764	272765
--------	--------	--------	--------

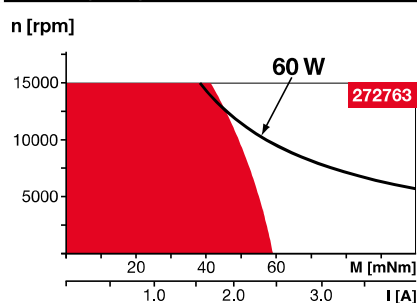
Motor Data

Values at nominal voltage		12	24	36	48
1 Nominal voltage	V	12	24	36	48
2 No load speed	rpm	7980	9340	9490	9350
3 No load current	mA	302	191	130	95.4
4 Nominal speed	rpm	6590	8040	8270	8130
5 Nominal torque (max. continuous torque)	mNm	63.6	60.7	63.7	64.1
6 Nominal current (max. continuous current)	A	4.72	2.66	1.88	1.4
7 Stall torque	mNm	381	458	522	519
8 Stall current	A	26.8	18.8	14.5	10.7
9 Max. efficiency	%	80	81	82	82
Characteristics					
10 Terminal resistance phase to phase	Ω	0.447	1.27	2.48	4.49
11 Terminal inductance phase to phase	mH	0.049	0.143	0.312	0.573
12 Torque constant	mNm/A	14.2	24.3	35.9	48.6
13 Speed constant	rpm/V	672	393	266	197
14 Speed/torque gradient	rpm/mNm	21.2	20.6	18.4	18.2
15 Mechanical time constant	ms	4.86	4.73	4.21	4.17
16 Rotor inertia	gcm ²	21.9	21.9	21.9	21.9

Specifications

- Thermal data**
- 17 Thermal resistance housing-ambient: 7.4 K/W
 - 18 Thermal resistance winding-housing: 0.5 K/W
 - 19 Thermal time constant winding: 2.76 s
 - 20 Thermal time constant motor: 1000 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 < 6.0 N: 0 mm
 - > 6.0 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

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: 1
- 30 Number of phases: 3
- 31 Weight of motor: 305 g

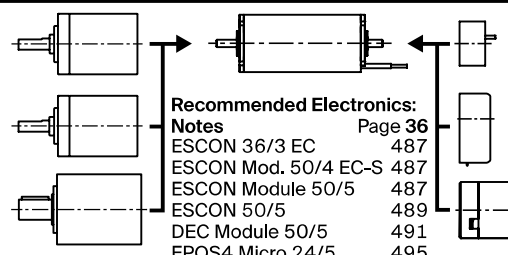
Values listed in the table are nominal.

- 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 Part 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} 3...24 VDC Pin 5
 - N.C. Pin 6
- Connector Part number**
- Molex 430-25-0600

maxon Modular System

Details on catalog page 36

- Planetary Gearhead**
 \varnothing 32 mm
1.0 - 8.0 Nm
Page 388/391
- Koaxdrive**
 \varnothing 32 mm
1.0 - 4.5 Nm
Page 394
- Planetary Gearhead**
 \varnothing 42 mm
3 - 15 Nm
Page 397

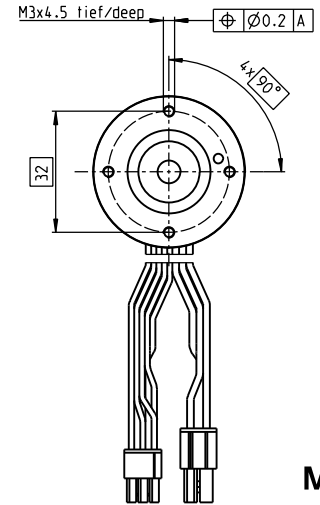
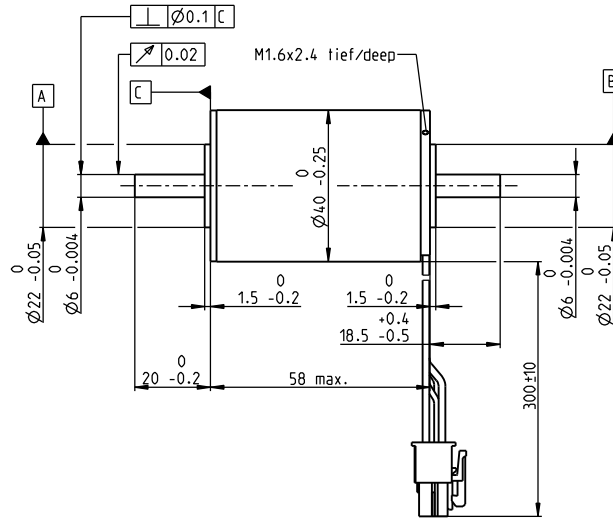
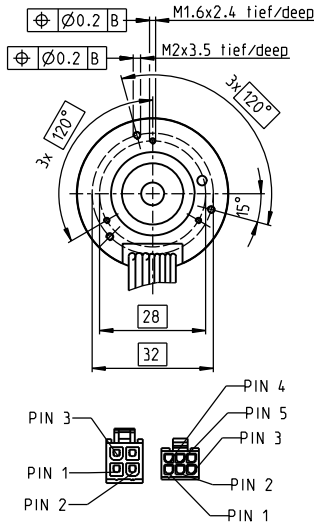


- Recommended Electronics:**
- ESCON 36/3 EC Page 36
 - ESCON Mod. 50/4 EC-S 487
 - ESCON Module 50/5 487
 - ESCON 50/5 489
 - DEC Module 50/5 491
 - EPOS4 Micro 24/5 495
 - EPOS4 Mod./Comp. 50/5 496
 - EPOS4 Comp. 24/5 3-axes 497
 - EPOS4 50/5 501
 - EPOS2 P 24/5 504

- Encoder MR**
500/1000 CPT,
3 channels
Page 463
- Encoder HEDL 5540**
500 CPT,
3 channels
Page 475
- Brake AB 20**
24 VDC
0.1 Nm
Page 516

EC-max 40 \varnothing 40 mm, brushless, 70 Watt

EC-max



M 1:2

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

Part Numbers

283866	283867	283868	283869
--------	--------	--------	--------

Motor Data

Values at nominal voltage		12	24	36	48	
1	Nominal voltage	V	12	24	36	48
2	No load speed	rpm	8030	8040	8470	9030
3	No load current	mA	584	292	209	173
4	Nominal speed	rpm	6410	6520	7030	7610
5	Nominal torque (max. continuous torque)	mNm	89,7	89,6	95	94,2
6	Nominal current (max. continuous current)	A	6,88	3,44	2,55	2,02
7	Stall torque	mNm	466	497	595	636
8	Stall current	A	33,3	17,8	14,9	12,7
9	Max. efficiency	%	76	77	78	79
Characteristics						
10	Terminal resistance phase to phase	Ω	0,36	1,35	2,42	3,78
11	Terminal inductance phase to phase	mH	0,0464	0,186	0,379	0,592
12	Torque constant	mNm/A	14	28	40	50
13	Speed constant	rpm/V	682	341	239	191
14	Speed/torque gradient	rpm/mNm	17,6	16,5	14,4	14,4
15	Mechanical time constant	ms	9,41	8,82	7,74	7,73
16	Rotor inertia	gcm ²	51,2	51,2	51,2	51,2

Specifications

Thermal data		
17	Thermal resistance housing-ambient	4,63 K/W
18	Thermal resistance winding-housing	0,542 K/W
19	Thermal time constant winding	3,78 s
20	Thermal time constant motor	1060 s
21	Ambient temperature	-40...+100°C
22	Max. winding temperature	+155°C

Mechanical data (preloaded ball bearings)		
23	Max. speed	12000 rpm
24	Axial play at axial load < 10 N	0 mm
	> 10 N	0,14 mm
25	Radial play	preloaded
26	Max. axial load (dynamic)	8 N
27	Max. force for press fits (static) (static, shaft supported)	211 N
		5000 N
28	Max. radial load, 5 mm from flange	80 N

Other specifications

- 29 Number of pole pairs
- 30 Number of phases
- 31 Weight of motor

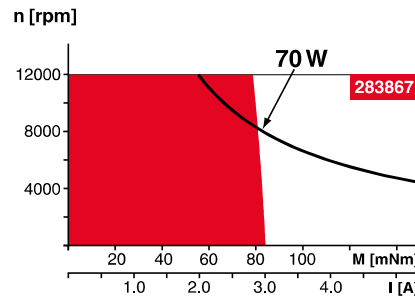
Values listed in the table are nominal.

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 Part 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} 3...24 VDC	Pin 5
	N.C.	Pin 6

Connector Part number	
Molex	430-25-0600

Operating Range

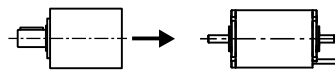


Comments

- 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

- 1 **Planetary Gearhead**
- 3 \varnothing 42 mm
- 3 - 15 Nm
- 460 g
- Page 397



Recommended Electronics:

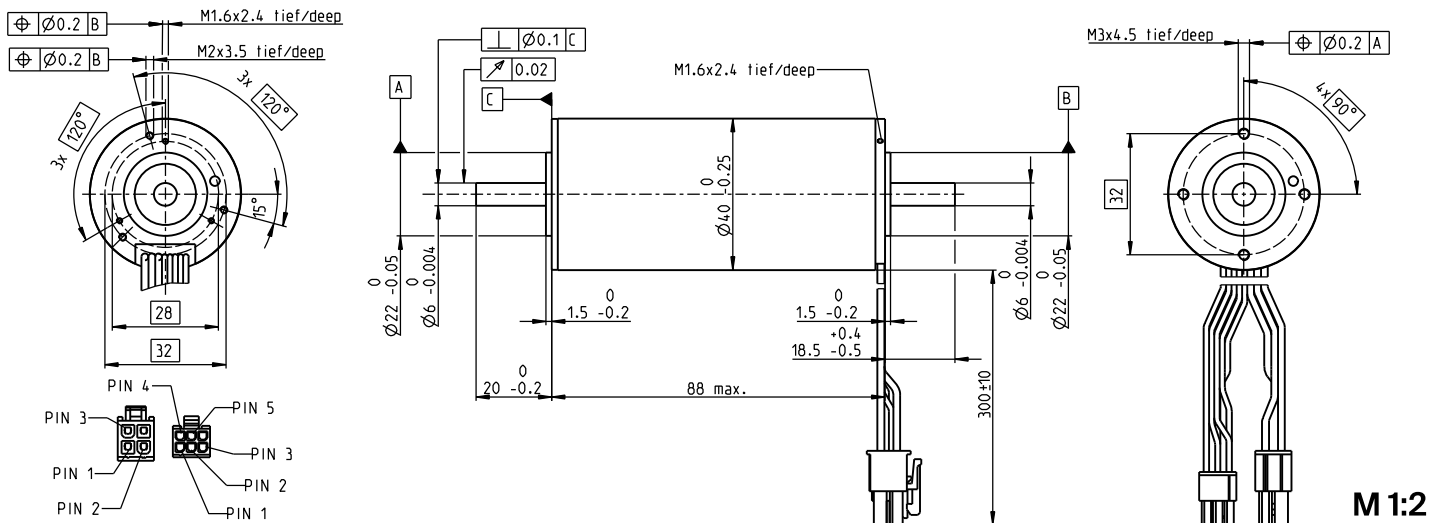
Notes	Page 36
ESCON 36/3 EC	487
ESCON Module 50/5	487
ESCON Mod. 50/4 EC-S	487
ESCON Mod. 50/8 (HE)	488
ESCON 50/5	489
ESCON 70/10	489
DEC Module 50/5	491
EPOS4 Micro 24/5	495
EPOS4 Mod./Comp. 50/5	496
EPOS4 Comp. 24/5 3-axes	497
EPOS4 Mod./Comp. 50/8	497
EPOS4 50/5	501
FPOS4 70/15	501

Details on catalog page 36

- Encoder MR**
256 - 1024 CPT,
3 channels
Page 464
- Encoder HEDL 5540**
500 CPT,
3 channels
Page 475
- Brake AB 28**
24 VDC
0,4 Nm
Page 518

EC-max 40 Ø40 mm, brushless, 120 Watt

EC-max



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

Part Numbers					
283870	283871	283872	283873		

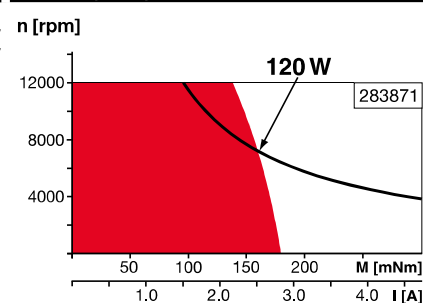
Motor Data

Values at nominal voltage					
1 Nominal voltage	V	48	48	48	48
2 No load speed	rpm	10100	7240	4720	3610
3 No load current	mA	310	188	104	72.8
4 Nominal speed	rpm	9250	6280	3770	2670
5 Nominal torque (max. continuous torque)	mNm	170	185	203	211
6 Nominal current (max. continuous current)	A	4.06	3.1	2.19	1.74
7 Stall torque	mNm	2090	1490	1050	838
8 Stall current	A	46.7	23.7	10.9	6.68
9 Max. efficiency	%	85	83	82	80
Characteristics					
10 Terminal resistance phase to phase	Ω	1.03	2.02	4.4	7.19
11 Terminal inductance phase to phase	mH	0.204	0.4	0.937	1.6
12 Torque constant	mNm/A	44.8	62.8	96.1	126
13 Speed constant	rpm/V	213	152	99.4	76.1
14 Speed/torque gradient	rpm/mNm	4.89	4.9	4.55	4.35
15 Mechanical time constant	ms	5.17	5.19	4.81	4.61
16 Rotor inertia	gcm ²	101	101	101	101

Specifications

- Thermal data**
- 17 Thermal resistance housing-ambient: 3.45 K/W
 - 18 Thermal resistance winding-housing: 0.29 K/W
 - 19 Thermal time constant winding: 3.96 s
 - 20 Thermal time constant motor: 1240 s
 - 21 Ambient temperature: -40...+100°C
 - 22 Max. winding temperature: +155°C
- Mechanical data (preloaded ball bearings)**
- 23 Max. speed: 12000 rpm
 - 24 Axial play at axial load < 10 N: 0 mm
 - > 10 N: 0.14 mm
 - 25 Radial play preloaded: 8 N
 - 26 Max. axial load (dynamic): 211 N
 - 27 Max. force for press fits (static) (static, shaft supported): 4000 N
 - 28 Max. radial load, 5 mm from flange: 80 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: 3
- 30 Number of phases: 3
- 31 Weight of motor: 720 g

Values listed in the table are nominal.

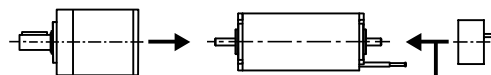
- Connection motor** (Cable AWG 20)
- red Motor winding 1 Pin 1
 - black Motor winding 2 Pin 2
 - white Motor winding 3 Pin 3
 - N.C. N.C. Pin 4

- Connector Part 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} 3...24 VDC Pin 5
 - N.C. N.C. Pin 6

- Connector Part number**
- Molex 430-25-0600

maxon Modular System

- 1 **Planetary Gearhead**
- 3 Ø52 mm
- 4-30 Nm
- 720 g
- Page 402



Recommended Electronics:

- Notes Page 36**
- ESCON Module 50/5 487
 - ESCON Mod. 50/4 EC-S 487
 - ESCON 50/5 489
 - ESCON 70/10 489
 - DEC Module 50/5 491
 - EPOS4 Mod./Comp. 50/5 496
 - EPOS4 Module 50/8 497
 - EPOS4 Comp. 50/8 CAN 499
 - EPOS4 50/5 501
 - EPOS2 P 24/5 504

Details on catalog page 36

- Encoder MR**
- 256 - 1024 CPT,
- 3 channels
- Page 464
- Encoder HEDL 5540**
- 500 CPT,
- 3 channels
- Page 475
- Brake AB 28**
- 24 VDC
- 0.4 Nm
- Page 518