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TECHNOLOGY GROUP

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Find the *Maxon Motors 26* at our website: ***Click HERE***



maxon A-max

maxon A-max

– Good price/performance ratio
– Equipped with AlNiCo magnets
– High and consistent quality thanks to mastery and monitoring of the processes
– Same part platform – compatible with the RE-max
– Automated manufacturing process
– Open for customer-oriented modifications

Summary	118
DC motor 12–32 mm in diameter	119–144

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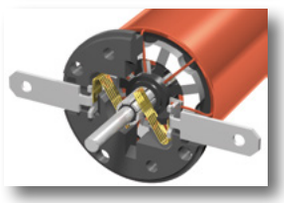
maxon A-max program

The economically priced DC motor program that gives you top performance and convincing quality.





Motor housing, precision-made from rolled steel, delivers high strength yet minimizes waste material to reduce costs.



Power leads or AMP-compatible terminals. Save strain relieve on power leads.



Elimination of a C-Clip groove results in higher torsional stability and greater cross-sectional strength.



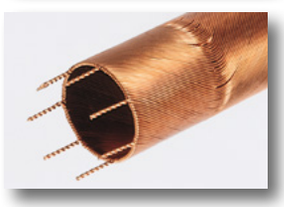
Reduced-diameter commutator, employing more segments, provides longer life.



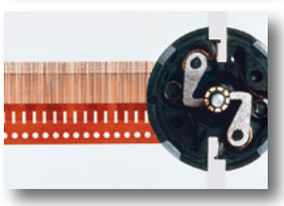
Hybrid process forms the stator by assembling motor housing, magnet and end cap in one step using injection molding of PPA plastic. Customers can select either sleeve or ball bearings.



Glass-fibre reinforced polyphtalamide plastic (PPA), impact-resistant, heat-resistant up to 125°C and noise absorbing.

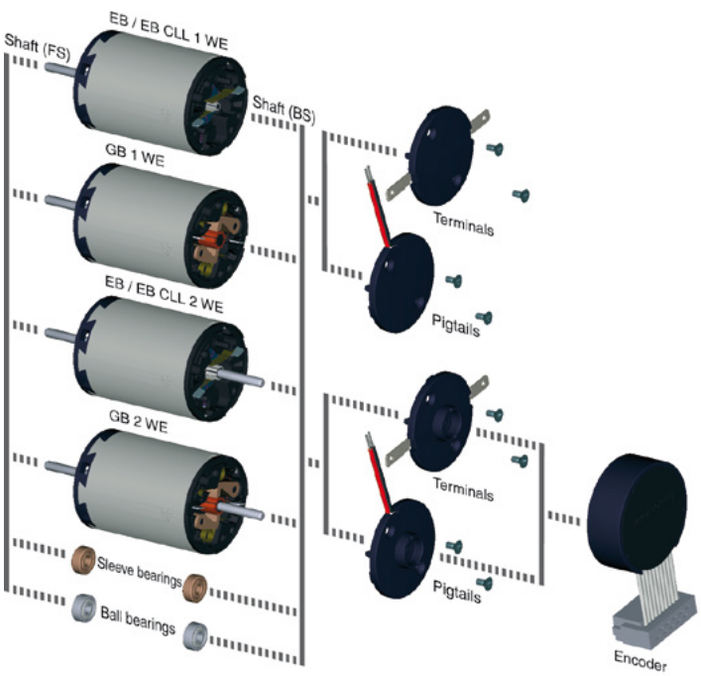


Proven winding technology provides a high-performance relationship between the coil and magnet system.



Graphite brushes for the most demanding tasks. 4-, 5- or 7-fingered precious metal brushes for fine rotary motions.

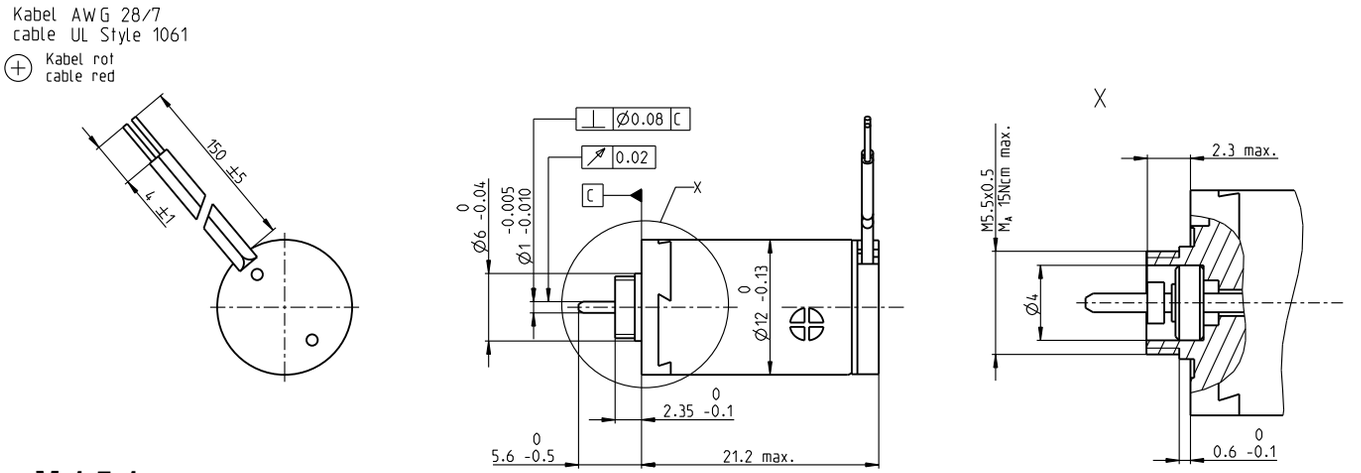
Modular construction of the A-max series



X = Standard X = Option	WE = Shaft end	A-max 12 1 WE	A-max 12 2 WE	A-max 16 1 WE	A-max 16 2 WE	A-max 19 1 WE	A-max 19 2 WE	A-max 22 1 WE	A-max 22 2 WE	A-max 26 1 WE	A-max 26 2 WE	A-max 32 1 WE	A-max 32 2 WE
Precious Metal Brushes (EB)				x	x	x	x	x	x	x	x		
Precious Metal Brushes (EB) and CLL		x	x	x	x	x	x	x	x	x	x		
Graphite Brushes (GB)				x	x	x	x	x	x	x	x	x	x
Sleeve Bearings		x	x	x	x	x	x	x	x	x	x	x	x
Ball Bearings		x	x	x	x	x	x	x	x	x	x	x	x
Terminals				x	x	x	x	x	x	x	x	x	x
Pigtails		x	x	x	x	x	x	x	x	x	x	x	x
Shaft flange side (FS)	min.	4.5	4.5	4.5	4.5	5.0	5.0	5.0	6.0	6.0	6.0	6.0	
	max.	10.0	10.0	15.0	15.0	27.4	27.4	25.0	25.0	27.0	27.0	27.0	27.0
Shaft brush side (BS)	min.		2.6		2.6		2.6		2.6		2.6		3.0
	max.		9.4		10.0		16.6		16.0		16.0		19.3

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A-max 12 ∅12 mm, Precious Metal Brushes CLL, 0.75 Watt



M 1.5:1

Stock program
Standard program
Special program (on request)

Part Numbers

200937	265374	265375	265376	265377	265378

Motor Data

	Values at nominal voltage							
1	Nominal voltage	V	3	4.5	6	9	12	15
2	No load speed	rpm	13900	11900	12800	12100	12300	13800
3	No load current	mA	21.1	11.5	9.47	5.87	4.5	4.2
4	Nominal speed	rpm	5980	4380	5260	4470	4610	5030
5	Nominal torque (max. continuous torque)	mNm	0.897	0.961	0.948	0.941	0.931	0.804
6	Nominal current (max. continuous current)	A	0.465	0.282	0.225	0.141	0.107	0.0836
7	Stall torque	mNm	1.58	1.55	1.63	1.52	1.52	1.29
8	Stall current	A	0.789	0.438	0.374	0.22	0.168	0.129
9	Max. efficiency	%	70	71	71	70	70	68
	Characteristics							
10	Terminal resistance	Ω	3.8	10.3	16	40.9	71.6	116
11	Terminal inductance	mH	0.0851	0.263	0.402	1.01	1.74	2.13
12	Torque constant	mNm/A	2.01	3.53	4.36	6.92	9.06	10
13	Speed constant	rpm/V	4760	2710	2190	1380	1050	952
14	Speed / torque gradient	rpm/mNm	9030	7880	8060	8170	8330	11000
15	Mechanical time constant	ms	20.6	20.3	20.4	20.4	20.5	21.1
16	Rotor inertia	gcm²	0.218	0.246	0.241	0.238	0.235	0.183

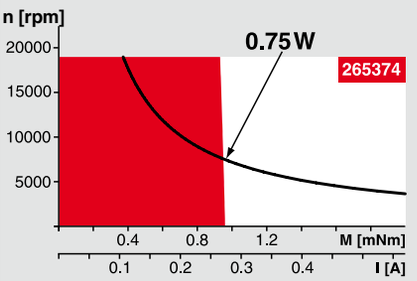
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	44.5 K/W
18	Thermal resistance winding-housing	15 K/W
19	Thermal time constant winding	5.03 s
20	Thermal time constant motor	245 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C
	Mechanical data (sleeve bearings)	
23	Max. speed	19000 rpm
24	Axial play	0.05 - 0.15 mm mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	0.15 N
27	Max. force for press fits (static)	15 N
28	Max. radial load, 4 mm from flange	0.4 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	7
31	Weight of motor	11 g

CLL = Capacitor Long Life
Alignment of the electronic connections not specified.

Values listed in the table are nominal.
Explanation of the figures on page 79.

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

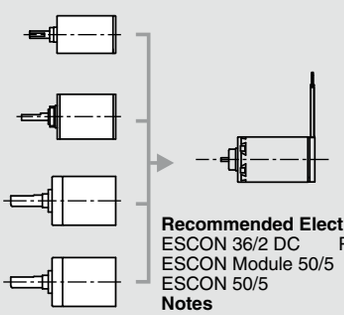
Overview on page 20–25

Planetary Gearhead
∅10 mm
0.005 - 0.15 Nm
Page 245

Spur Gearhead
∅12 mm
0.008 - 0.025 Nm
Page 246

Planetary Gearhead
∅13 mm
0.05 - 0.15 Nm
Page 247

Planetary Gearhead
∅13 mm
0.2 - 0.35 Nm
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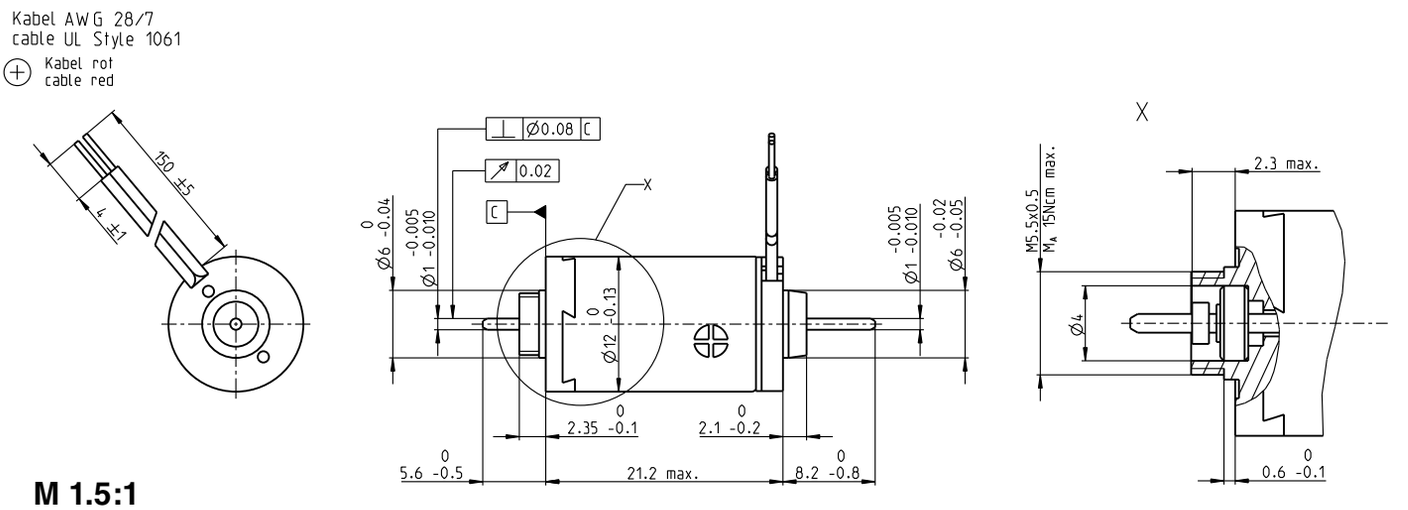


Recommended Electronics:

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A-max 12 ∅12 mm, Precious Metal Brushes CLL, 0.5 Watt



M 1.5:1

Stock program
Standard program
Special program (on request)

Part Numbers

200938 **265389** 265390 265391 265392 265393

Motor Data

			200938	265389	265390	265391	265392	265393
	Values at nominal voltage							
1	Nominal voltage	V	3	4.5	6	9	12	15
2	No load speed	rpm	13700	11700	12600	11900	12100	13500
3	No load current	mA	34.5	18.8	15.5	9.63	7.38	6.88
4	Nominal speed	rpm	6000	4390	5280	4480	4620	5050
5	Nominal torque (max. continuous torque)	mNm	0.872	0.937	0.923	0.918	0.908	0.78
6	Nominal current (max. continuous current)	A	0.464	0.282	0.225	0.141	0.106	0.0835
7	Stall torque	mNm	1.58	1.55	1.63	1.52	1.52	1.29
8	Stall current	A	0.789	0.438	0.374	0.22	0.168	0.129
9	Max. efficiency	%	63	63	64	63	63	60
	Characteristics							
10	Terminal resistance	Ω	3.8	10.3	16	40.9	71.6	116
11	Terminal inductance	mH	0.0851	0.263	0.402	1.01	1.74	2.13
12	Torque constant	mNm/A	2.01	3.53	4.36	6.92	9.06	10
13	Speed constant	rpm/V	4760	2710	2190	1380	1050	952
14	Speed / torque gradient	rpm/mNm	9030	7880	8060	8170	8330	11000
15	Mechanical time constant	ms	20.6	20.3	20.4	20.4	20.5	21.1
16	Rotor inertia	gcm²	0.218	0.246	0.241	0.238	0.235	0.183

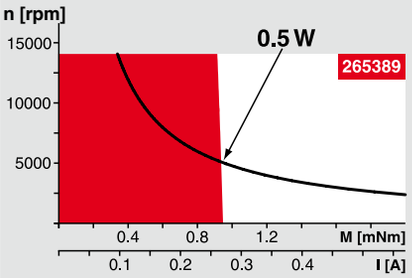
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	44.5 K/W
18	Thermal resistance winding-housing	15 K/W
19	Thermal time constant winding	5.03 s
20	Thermal time constant motor	267 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C
	Mechanical data (sleeve bearings)	
23	Max. speed	14000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	0.15 N
27	Max. force for press fits (static)	15 N
	(static, shaft supported)	70 N
28	Max. radial load, 4 mm from flange	0.4 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	7
31	Weight of motor	12 g

CLL = Capacitor Long Life
Alignment of the electronic connections not specified.

Values listed in the table are nominal.
Explanation of the figures on page 79.

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

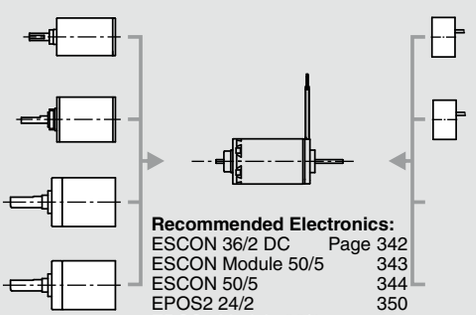
Overview on page 20–25

Planetary Gearhead
∅10 mm
0.01 - 0.15 Nm
Page 245

Spur Gearhead
∅12 mm
0.008 - 0.025 Nm
Page 246

Planetary Gearhead
∅13 mm
0.05 - 0.15 Nm
Page 247

Planetary Gearhead
∅13 mm
0.2 - 0.35 Nm
Page 248



Encoder MR
16 CPT,
2 channels
Page 312

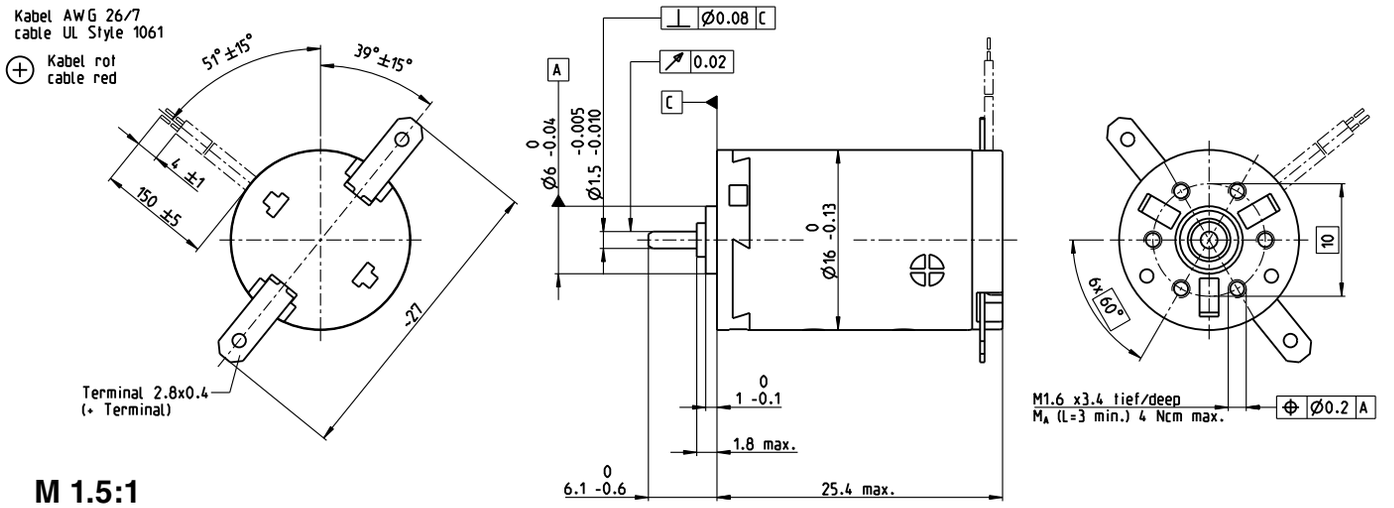
Encoder MR
64 - 256 CPT,
2 channels
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A-max 16 ∅16 mm, Precious Metal Brushes CLL, 2 Watt



M 1.5:1

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110041	**110042**	110043	110044	**110045**	110046	110047	110048	110049	110050
with cables	139820	352815	134844	231379	220514	304672	352823	352816	260678	352817

Motor Data

	Values at nominal voltage										
1	Nominal voltage	V	1.5	3	6	9	12	15	18	21	24	30
2	No load speed	rpm	10800	12300	10100	12300	12300	13200	14100	13700	13800	11400
3	No load current	mA	61.4	38.1	13.9	12.7	9.54	8.57	7.99	6.53	5.83	3.37
4	Nominal speed	rpm	9360	8810	4530	6700	6660	7590	8480	8040	8120	5480
5	Nominal torque (max. continuous torque)	mNm	0.712	1.3	2.22	2.19	2.17	2.17	2.15	2.14	2.11	2.08
6	Nominal current (max. continuous current)	A	0.6	0.6	0.408	0.327	0.243	0.209	0.185	0.153	0.134	0.0864
7	Stall torque	mNm	4.79	4.51	4.03	4.82	4.77	5.16	5.44	5.22	5.12	4.04
8	Stall current	A	3.66	1.97	0.723	0.702	0.52	0.482	0.453	0.362	0.315	0.164
9	Max. efficiency	%	77	75	75	76	76	76	76	76	76	74
	Characteristics											
10	Terminal resistance	Ω	0.41	1.52	8.3	12.8	23.1	31.1	39.7	57.9	76.2	183
11	Terminal inductance	mH	0.017	0.0519	0.306	0.467	0.831	1.13	1.42	2.05	2.61	6.01
12	Torque constant	mNm/A	1.31	2.29	5.57	6.88	9.17	10.7	12	14.4	16.3	24.7
13	Speed constant	rpm/V	7290	4170	1720	1390	1040	893	795	663	587	387
14	Speed / torque gradient	rpm/mNm	2280	2770	2560	2590	2620	2600	2630	2670	2750	2880
15	Mechanical time constant	ms	25.3	23.8	23.3	23.3	23.3	23.4	23.5	23.4	23.5	23.9
16	Rotor inertia	gcm²	1.06	0.82	0.868	0.859	0.849	0.859	0.852	0.838	0.816	0.793

Specifications

Thermal data

17	Thermal resistance housing-ambient	29.8 K/W
18	Thermal resistance winding-housing	5.5 K/W
19	Thermal time constant winding	3.55 s
20	Thermal time constant motor	165 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C

Mechanical data (sleeve bearings)

23	Max. speed	19000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	0.8 N
27	Max. force for press fits (static)	35 N
28	Max. radial load, 5 mm from flange	1.4 N

Mechanical data (ball bearings)

23	Max. speed	19000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	2.2 N
27	Max. force for press fits (static)	30 N
28	Max. radial load, 5 mm from flange	7.8 N

Other specifications

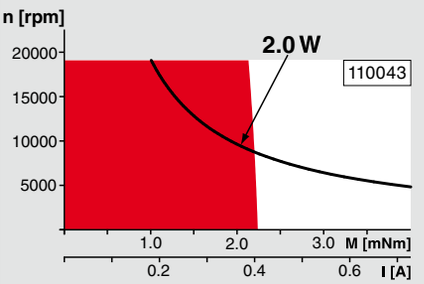
29	Number of pole pairs	1
30	Number of commutator segments	7
31	Weight of motor	21 g

CLL = Capacitor Long Life

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings
Without CLL

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

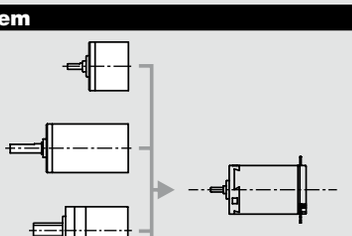
maxon Modular System

Overview on page 20–25

Spur Gearhead
∅16 mm
0.01 - 0.1 Nm
Page 250–253

Planetary Gearhead
∅16 mm
0.1 - 0.6 Nm
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Spindle Drive
∅16 mm
Page 296–298

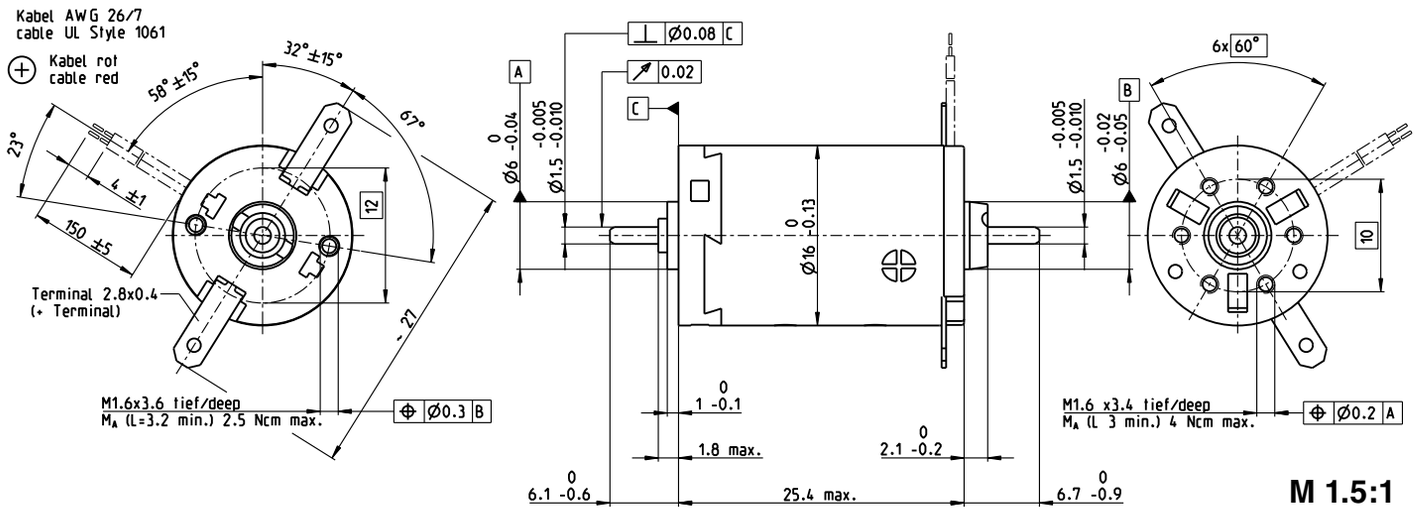


Recommended Electronics:

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ESCON 50/5	344
Notes	**22**

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A-max 16 ∅16 mm, Precious Metal Brushes CLL, 1.2 Watt



Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110051	110052	**110053**	110054	**110055**	110056	110057	110058	110059	110060
with cables	139823	352825	352826	352827	352828	352829	352830	352831	352832	352833

Motor Data

	Values at nominal voltage										
1	Nominal voltage	V	1.2	2.4	6	7.2	9	12	15	18	18	30
2	No load speed	rpm	8560	9730	10000	9740	9120	10400	11600	11600	10300	11300
3	No load current	mA	73.9	44.1	18.3	14.7	10.8	9.69	8.99	7.49	6.34	4.33
4	Nominal speed	rpm	7170	6310	4540	4200	3530	4900	6090	6050	4580	5500
5	Nominal torque (max. continuous torque)	mNm	0.694	1.29	2.18	2.17	2.16	2.16	2.13	2.12	2.09	2.04
6	Nominal current (max. continuous current)	A	0.6	0.6	0.407	0.327	0.244	0.21	0.185	0.153	0.134	0.0862
7	Stall torque	mNm	3.83	3.61	4.03	3.86	3.57	4.13	4.54	4.48	3.84	4.04
8	Stall current	A	2.93	1.58	0.723	0.561	0.39	0.386	0.378	0.311	0.236	0.164
9	Max. efficiency	%	71	70	71	71	70	71	72	72	71	71
	Characteristics										
10	Terminal resistance	Ω	0.41	1.52	8.3	12.8	23.1	31.1	39.7	57.9	76.2	183
11	Terminal inductance	mH	0.017	0.0519	0.306	0.467	0.831	1.13	1.42	2.05	2.61	6.01
12	Torque constant	mNm/A	1.31	2.29	5.57	6.88	9.17	10.7	12	14.4	16.3	24.7
13	Speed constant	rpm/V	7290	4170	1720	1390	1040	893	795	663	587	387
14	Speed / torque gradient	rpm/mNm	2280	2770	2560	2590	2620	2600	2630	2670	2750	2880
15	Mechanical time constant	ms	25.3	23.7	23.2	23.3	23.3	23.3	23.4	23.3	23.4	23.8
16	Rotor inertia	gcm²	1.06	0.818	0.866	0.857	0.847	0.857	0.85	0.836	0.814	0.791

Specifications

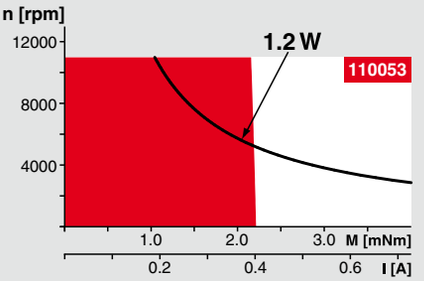
	Thermal data	
17	Thermal resistance housing-ambient	29.8 K/W
18	Thermal resistance winding-housing	5.5 K/W
19	Thermal time constant winding	3.55 s
20	Thermal time constant motor	165 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C
	Mechanical data (sleeve bearings)	
23	Max. speed	11000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	0.8 N
27	Max. force for press fits (static)	35 N
	(static, shaft supported)	280 N
28	Max. radial load, 5 mm from flange	1.4 N
	Mechanical data (ball bearings)	
23	Max. speed	11000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	2.2 N
27	Max. force for press fits (static)	30 N
	(static, shaft supported)	280 N
28	Max. radial load, 5 mm from flange	**7.8 N**
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	7
31	Weight of motor	22 g

CLL = Capacitor Long Life

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings
Without CLL

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

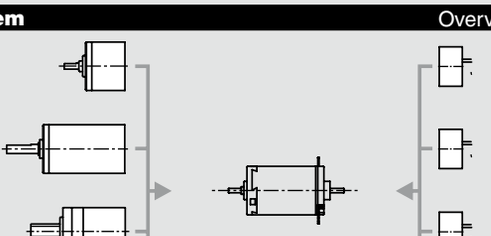
maxon Modular System

Overview on page 20–25

Spur Gearhead
∅16 mm
0.01 - 0.1 Nm
Page 250–253

Planetary Gearhead
∅16 mm
0.1 - 0.6 Nm
Page 254/255

Spindle Drive
∅16 mm
Page 296–298



Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

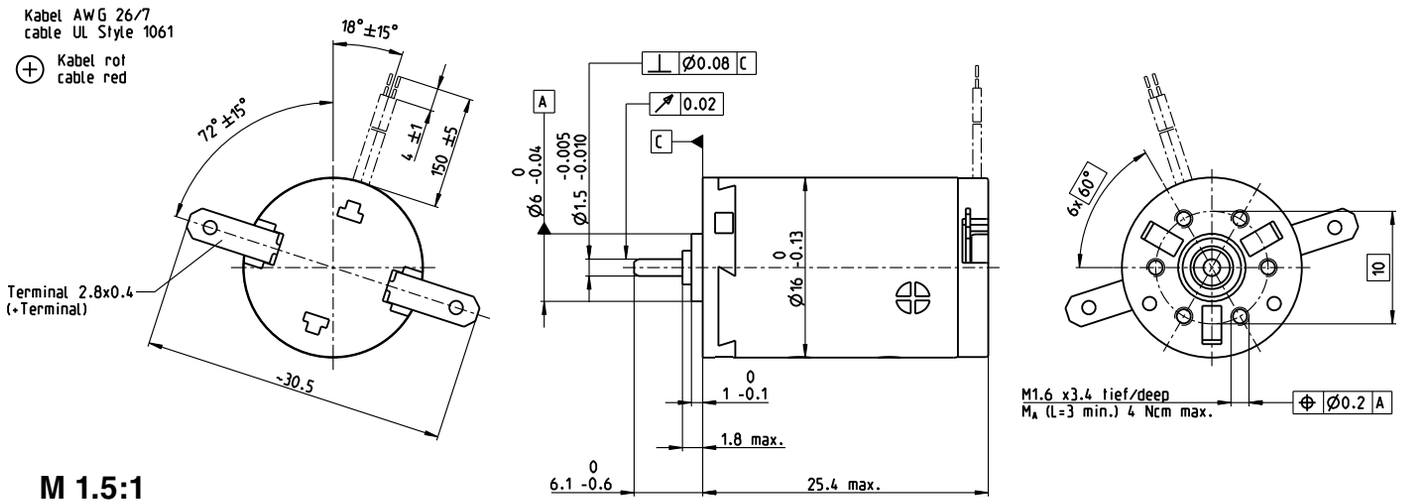
Encoder MR
32 CPT,
2 / 3 channels
Page 315

Encoder MR
128 / 256 / 512 CPT,
2 / 3 channels
Page 317

Encoder MEnc
∅13 mm
16 CPT, 2 channels
Page 334

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A-max 16 ∅16 mm, Graphite Brushes, 2 Watt



M 1.5:1

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110061	110062	110063	**110064**	110065	110066	110067	110068	**110069**	110070
with cables	139821	352853	352854	352855	325083	352856	205903	352857	266076	352858

Motor Data

	Values at nominal voltage										
1	Nominal voltage	V	1.5	3	6	9	12	14	15	18	21	30
2	No load speed	rpm	10200	11500	9360	11500	11500	11500	11000	10900	11300	10500
3	No load current	mA	282	164	65.6	54.6	41	35.1	31.1	25.9	23	15
4	Nominal speed	rpm	9010	8060	3280	5510	5460	5500	4860	4810	5100	4180
5	Nominal torque (max. continuous torque)	mNm	0.579	1.29	2.42	2.36	2.34	2.35	2.35	2.33	2.28	2.24
6	Nominal current (max. continuous current)	A	0.72	0.72	0.495	0.394	0.293	0.253	0.224	0.186	0.162	0.105
7	Stall torque	mNm	5.36	4.65	4.05	4.84	4.78	4.82	4.54	4.48	4.49	4.04
8	Stall current	A	4.1	2.03	0.727	0.704	0.521	0.451	0.378	0.311	0.276	0.164
9	Max. efficiency	%	54	51	49	52	52	52	51	51	51	48
	Characteristics											
10	Terminal resistance	Ω	0.366	1.48	8.25	12.8	23	31.1	39.7	57.9	76.1	183
11	Terminal inductance	mH	0.0169	0.0519	0.306	0.467	0.83	1.13	1.42	2.05	2.61	6.01
12	Torque constant	mNm/A	1.31	2.29	5.57	6.88	9.17	10.7	12	14.4	16.3	24.7
13	Speed constant	rpm/V	7290	4170	1720	1390	1040	893	795	663	587	387
14	Speed / torque gradient	rpm/mNm	2040	2690	2540	2580	2620	2590	2630	2660	2750	2880
15	Mechanical time constant	ms	22.6	23.1	23.1	23.2	23.3	23.3	23.5	23.4	23.5	23.9
16	Rotor inertia	gcm²	1.06	0.82	0.868	0.859	0.849	0.859	0.852	0.838	0.816	0.793

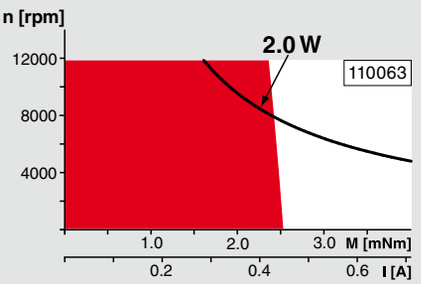
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	29.8 K/W
18	Thermal resistance winding-housing	5.5 K/W
19	Thermal time constant winding	4.42 s
20	Thermal time constant motor	165 s
21	Ambient temperature	-30…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (sleeve bearings)	
23	Max. speed	11900 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	0.8 N
27	Max. force for press fits (static)	35 N
28	Max. radial load, 5 mm from flange	1.4 N
	Mechanical data (ball bearings)	
23	Max. speed	11900 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	2.2 N
27	Max. force for press fits (static)	30 N
28	Max. radial load, 5 mm from flange	7.8 N
	Other specifications	1
29	Number of pole pairs	7
30	Number of commutator segments	21 g
31	Weight of motor	

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

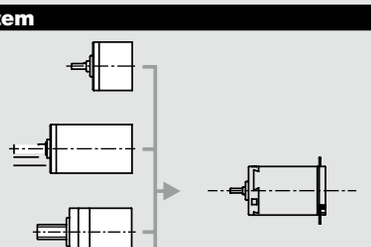
maxon Modular System

Overview on page 20–25

Spur Gearhead
∅16 mm
0.01 - 0.1 Nm
Page 250–253

Planetary Gearhead
∅16 mm
0.1 - 0.6 Nm
Page 254/255

Spindle Drive
∅16 mm
Page 296–298

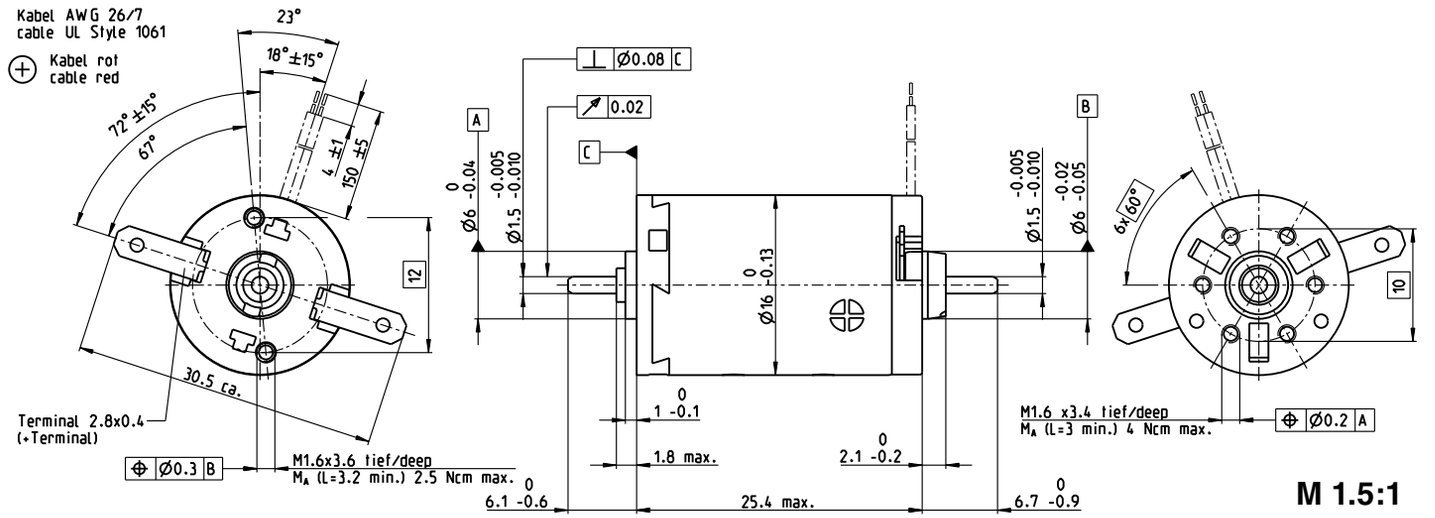


Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
Notes	**22**

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A-max 16 ∅16 mm, Graphite Brushes, 2 Watt



Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110071	110072	**110073**	110074	**110075**	110076	110077	110078	110079	110080
with cables	139825	352870	352871	352872	352873	352874	352875	352876	352877	352878

Motor Data

	Values at nominal voltage										
1	Nominal voltage	V	1.5	3	6	9	12	14	15	18	21	30
2	No load speed	rpm	10200	11500	9360	11500	11500	11500	11000	10900	11300	10500
3	No load current	mA	282	164	65.6	54.6	41	35.1	31.1	25.9	23	15
4	Nominal speed	rpm	9010	8060	3280	5510	5460	5500	4860	4810	5100	4180
5	Nominal torque (max. continuous torque)	mNm	0.579	1.29	2.42	2.36	2.34	2.35	2.35	2.33	2.28	2.24
6	Nominal current (max. continuous current)	A	0.72	0.72	0.495	0.394	0.293	0.253	0.224	0.186	0.162	0.105
7	Stall torque	mNm	5.36	4.65	4.05	4.84	4.78	4.82	4.54	4.48	4.49	4.04
8	Stall current	A	4.1	2.03	0.727	0.704	0.521	0.451	0.378	0.311	0.276	0.164
9	Max. efficiency	%	54	51	49	52	52	52	51	51	51	48
	Characteristics										
10	Terminal resistance	Ω	0.366	1.48	8.25	12.8	23	31.1	39.7	57.9	76.1	183
11	Terminal inductance	mH	0.0169	0.0519	0.306	0.467	0.83	1.13	1.42	2.05	2.61	6.01
12	Torque constant	mNm/A	1.31	2.29	5.57	6.88	9.17	10.7	12	14.4	16.3	24.7
13	Speed constant	rpm/V	7290	4170	1720	1390	1040	893	795	663	587	387
14	Speed / torque gradient	rpm/mNm	2040	2690	2540	2580	2620	2590	2630	2660	2750	2880
15	Mechanical time constant	ms	22.6	23.1	23.1	23.2	23.3	23.3	23.5	23.4	23.5	23.9
16	Rotor inertia	gcm²	1.06	0.82	0.868	0.859	0.849	0.859	0.852	0.838	0.816	0.793

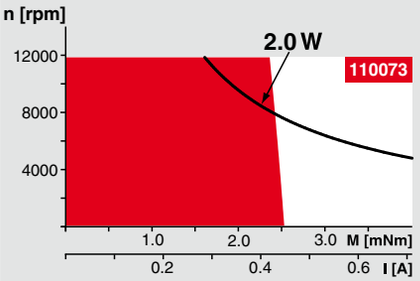
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	29.8 K/W
18	Thermal resistance winding-housing	5.5 K/W
19	Thermal time constant winding	4.42 s
20	Thermal time constant motor	165 s
21	Ambient temperature	-30…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (sleeve bearings)	
23	Max. speed	11900 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	0.8 N
27	Max. force for press fits (static)	35 N
	(static, shaft supported)	280 N
28	Max. radial load, 5 mm from flange	1.4 N
	Mechanical data (ball bearings)	
23	Max. speed	11900 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	2.2 N
27	Max. force for press fits (static)	30 N
	(static, shaft supported)	280 N
28	Max. radial load, 5 mm from flange	7.8 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	7
31	Weight of motor	22 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

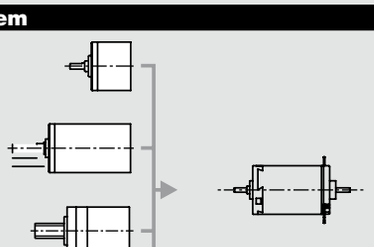
maxon Modular System

Overview on page 20–25

Spur Gearhead
∅16 mm
0.01 - 0.1 Nm
Page 250–253

Planetary Gearhead
∅16 mm
0.1 - 0.6 Nm
Page 254/255

Spindle Drive
∅16 mm
Page 296–298



Recommended Electronics:

ESCON 36/2 DC	Page 342
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ESCON 50/5	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

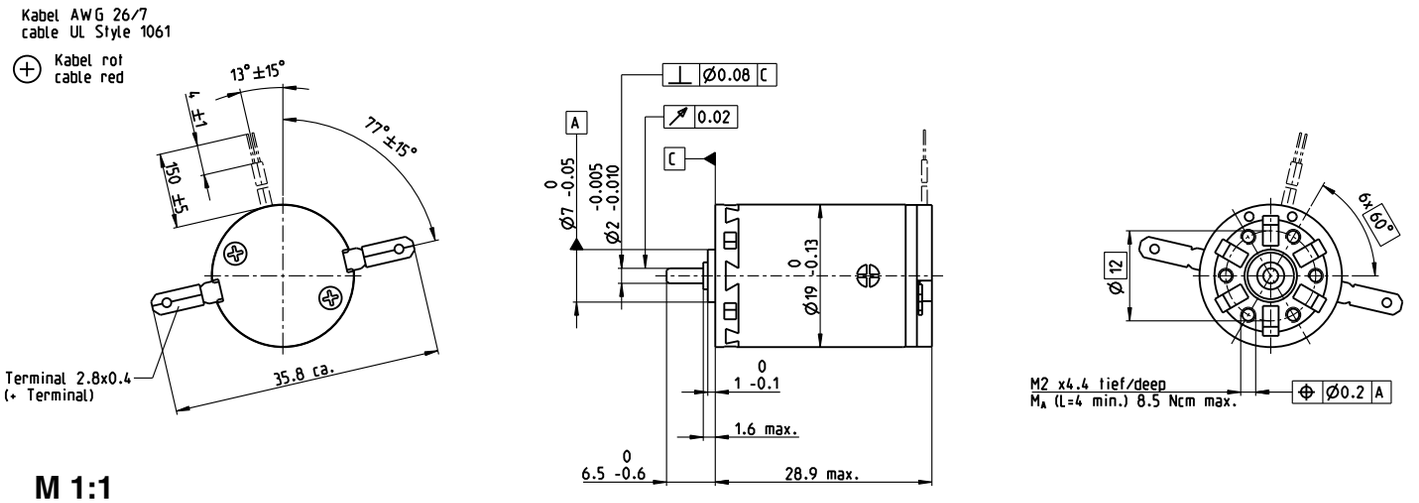
Encoder MR
32 CPT,
2 / 3 channels
Page 315

Encoder MR
128 / 256 / 512 CPT,
2 / 3 channels
Page 317

Encoder MEnc
∅13 mm
16 CPT, 2 channels
Page 334

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A-max 19 ∅19 mm, Precious Metal Brushes CLL, 2.5 Watt



M 1:1

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110081	110082	110083	**110084**	110085	110086	**110087**	110088	110089
with cables	139828	202411	352922	202412	352923	233453	238388	267427	235373

Motor Data

	Values at nominal voltage									
1	Nominal voltage	V	1.5	3.6	4.5	6	9	12	15	18	24
2	No load speed	rpm	8040	10800	9420	7790	9220	10300	10300	9300	8870
3	No load current	mA	78	52.9	33.6	18.6	16.2	14.6	11.7	8.25	5.73
4	Nominal speed	rpm	6840	8080	5710	4000	5470	6510	6500	5380	4900
5	Nominal torque (max. continuous torque)	mNm	1.35	2.48	3.61	3.59	3.59	3.49	3.48	3.42	3.39
6	Nominal current (max. continuous current)	A	0.84	0.84	0.83	0.51	0.403	0.33	0.264	0.195	0.138
7	Stall torque	mNm	7.79	9.43	9	7.36	8.83	9.47	9.45	8.16	7.63
8	Stall current	A	4.44	3.02	2.01	1.02	0.963	0.867	0.692	0.45	0.301
9	Max. efficiency	%	76	76	77	76	76	76	76	76	75
	Characteristics									
10	Terminal resistance	Ω	0.338	1.19	2.24	5.88	9.34	13.8	21.7	40	79.7
11	Terminal inductance	mH	0.0186	0.0587	0.121	0.314	0.506	0.719	1.12	1.98	3.87
12	Torque constant	mNm/A	1.76	3.12	4.49	7.22	9.17	10.9	13.7	18.1	25.4
13	Speed constant	rpm/V	5440	3060	2130	1320	1040	874	699	526	377
14	Speed / torque gradient	rpm/mNm	1050	1170	1060	1080	1060	1110	1110	1160	1180
15	Mechanical time constant	ms	27.9	25.4	24.3	24.2	24.1	24.2	24.3	25	24.6
16	Rotor inertia	gcm²	2.54	2.07	2.18	2.14	2.16	2.09	2.09	2.06	1.99

Specifications

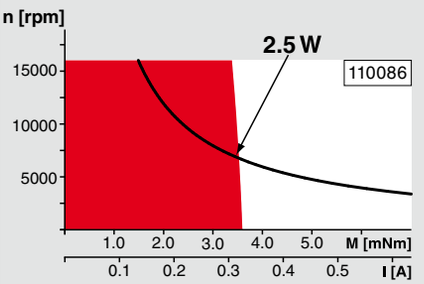
	Thermal data	
17	Thermal resistance housing-ambient	21.3 K/W
18	Thermal resistance winding-housing	10.5 K/W
19	Thermal time constant winding	11 s
20	Thermal time constant motor	201 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C
	Mechanical data (sleeve bearings)	
23	Max. speed	16000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1 N
27	Max. force for press fits (static)	80 N
28	Max. radial load, 5 mm from flange	2.7 N
	Mechanical data (ball bearings)	
23	Max. speed	16000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	3.3 N
27	Max. force for press fits (static)	45 N
28	Max. radial load, 5 mm from flange	11.9 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	9
31	Weight of motor	33 g

CLL = Capacitor Long Life

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings
Without CLL

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

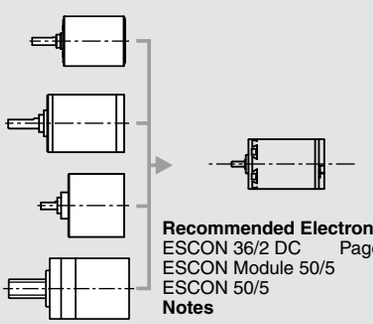
Overview on page 20–25

Planetary Gearhead
∅19 mm
0.1 - 0.3 Nm
Page 257

Planetary Gearhead
∅22 mm
0.1 - 2.0 Nm
Page 262/264

Spur Gearhead
∅24 mm
0.1 Nm
Page 269

Spindle Drive
∅22 mm
Page 299/300

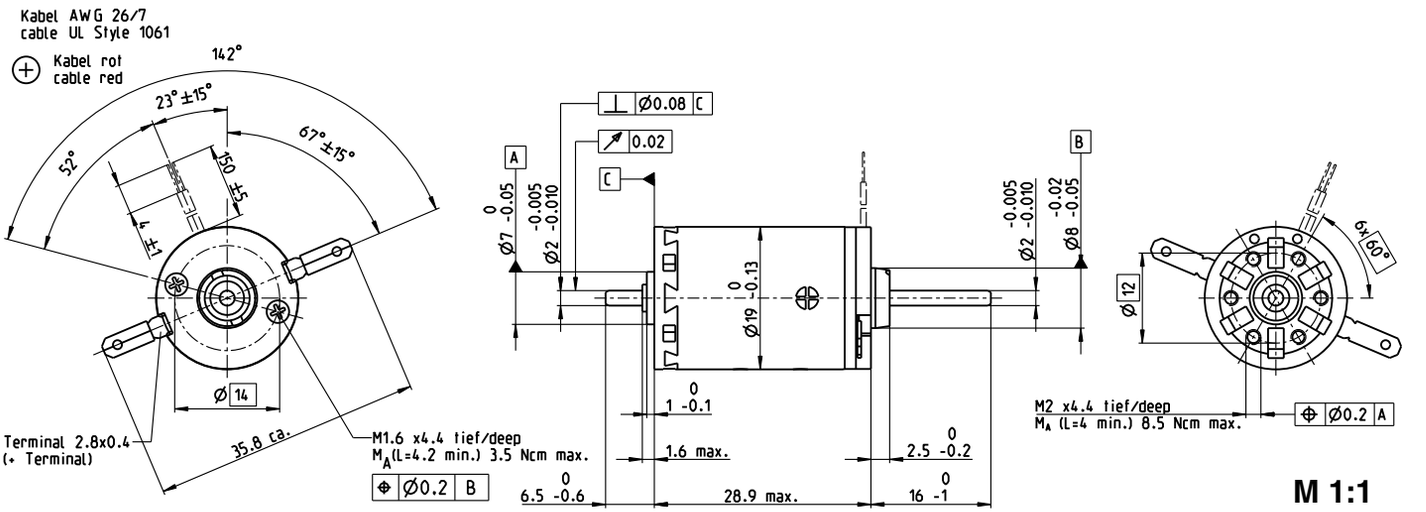


Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
Notes	**22**

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A-max 19 ∅19 mm, Precious Metal Brushes CLL, 1.5 Watt



Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110090	110091	110092	110093	110094	**110095**	110096	110097	110098
with cables	139832	352925	352926	352927	352928	352929	352930	315468	352931

Motor Data

	Values at nominal voltage									
1	Nominal voltage	V	1.2	2.4	3	4.8	6	7.2	9	12	18
2	No load speed	rpm	6390	7160	6230	6190	6090	6130	6130	6140	6590
3	No load current	mA	88.3	52	34.2	21.2	16.6	14	11.2	8.41	6.19
4	Nominal speed	rpm	5210	4410	2500	2410	2330	2290	2280	2210	2630
5	Nominal torque (max. continuous torque)	mNm	1.33	2.49	3.62	3.57	3.59	3.51	3.51	3.43	3.38
6	Nominal current (max. continuous current)	A	0.84	0.84	0.833	0.511	0.405	0.332	0.265	0.195	0.138
7	Stall torque	mNm	6.23	6.28	6	5.89	5.89	5.68	5.67	5.44	5.73
8	Stall current	A	3.55	2.01	1.34	0.816	0.642	0.52	0.415	0.3	0.226
9	Max. efficiency	%	72	71	71	71	71	71	71	70	70
	Characteristics									
10	Terminal resistance	Ω	0.338	1.19	2.24	5.88	9.34	13.8	21.7	40	79.7
11	Terminal inductance	mH	0.0186	0.0587	0.121	0.314	0.506	0.719	1.12	1.98	3.87
12	Torque constant	mNm/A	1.76	3.12	4.49	7.22	9.17	10.9	13.7	18.1	25.4
13	Speed constant	rpm/V	5440	3060	2130	1320	1040	874	699	526	377
14	Speed / torque gradient	rpm/mNm	1050	1170	1060	1080	1060	1110	1110	1160	1180
15	Mechanical time constant	ms	27.9	25.4	24.3	24.2	24.1	24.3	24.3	25	24.7
16	Rotor inertia	gcm²	2.54	2.08	2.18	2.15	2.17	2.09	2.09	2.06	1.99

Specifications

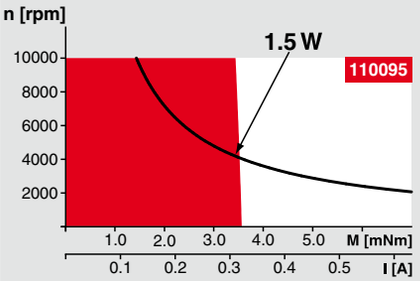
	Thermal data	
17	Thermal resistance housing-ambient	21.3 K/W
18	Thermal resistance winding-housing	10.5 K/W
19	Thermal time constant winding	11 s
20	Thermal time constant motor	201 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C
	Mechanical data (sleeve bearings)	
23	Max. speed	10000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1 N
27	Max. force for press fits (static)	80 N
	(static, shaft supported)	440 N
28	Max. radial load, 5 mm from flange	2.7 N
	Mechanical data (ball bearings)	
23	Max. speed	10000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	3.3 N
27	Max. force for press fits (static)	45 N
	(static, shaft supported)	440 N
28	Max. radial load, 5 mm from flange	11.9 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	9
31	Weight of motor g	34 g

CLL = Capacitor Long Life

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings
Without CLL

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

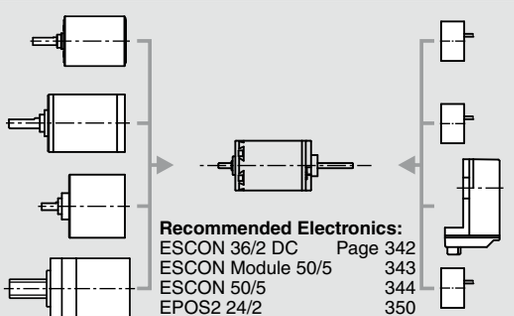
Overview on page 20–25

Planetary Gearhead
∅19 mm
0.1 - 0.3 Nm
Page 257

Planetary Gearhead
∅22 mm
0.1 - 2.0 Nm
Page 262/264

Spur Gearhead
∅24 mm
0.1 Nm
Page 269

Spindle Drive
∅22 mm
Page 299/300



Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

Encoder MR
32 CPT,
2 / 3 channels
Page 315

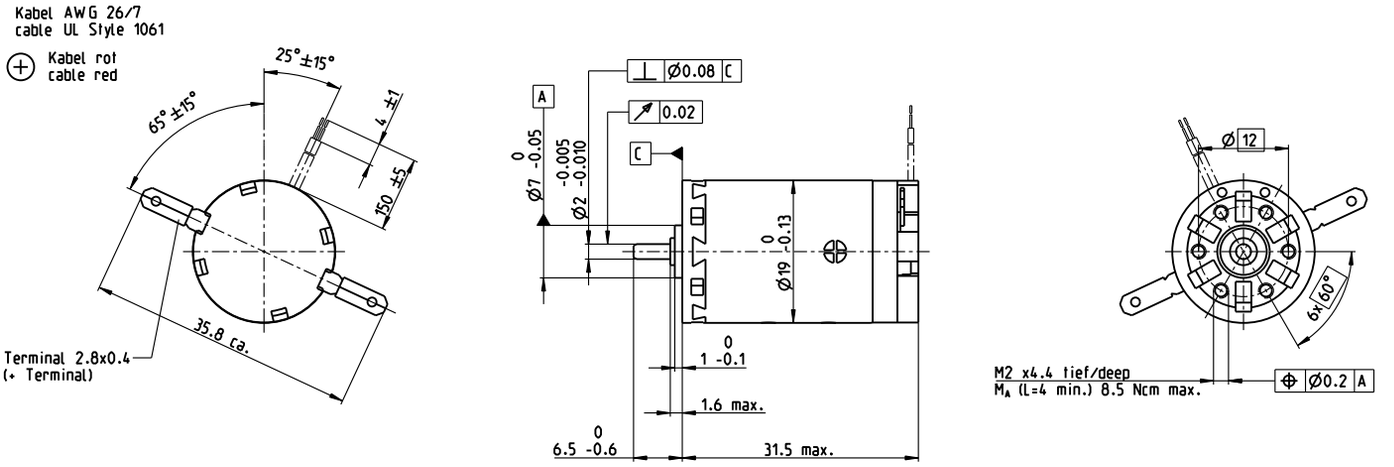
Encoder MR
128 / 256 / 512 CPT,
2 / 3 channels
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Encoder Enc
22 mm
100 CPT, 2 channels
Page 324

Encoder MEnc
∅13 mm
16 CPT, 2 channels
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A-max 19 ∅19 mm, Graphite Brushes, 2.5 Watt



M 1:1

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	249982	249983	249984	249985	249986	**249987**	249988	249989	**249990**
with cables	240133	352942	310977	352943	352944	352945	352946	352947	310980

Motor Data

	Values at nominal voltage									
1	Nominal voltage	V	2.4	3.6	6	7.2	9	12	15	18	24
2	No load speed	rpm	12400	10400	12200	8980	8850	9930	9930	8910	8470
3	No load current	mA	292	158	114	66.1	51.9	44.6	35.7	26.3	18.6
4	Nominal speed	rpm	11700	8350	9310	4750	4630	5670	5670	4520	4020
5	Nominal torque (max. continuous torque)	mNm	0.759	1.78	2.75	3.98	4.02	3.89	3.89	3.83	3.8
6	Nominal current (max. continuous current)	A	0.72	0.72	0.72	0.612	0.485	0.397	0.317	0.235	0.167
7	Stall torque	mNm	14.1	9.66	12.1	8.84	8.83	9.47	9.44	8.16	7.63
8	Stall current	A	8.04	3.09	2.71	1.23	0.963	0.867	0.691	0.45	0.301
9	Max. efficiency	%	64	59	63	59	59	60	60	58	57
	Characteristics									
10	Terminal resistance	Ω	0.299	1.16	2.22	5.88	9.35	13.8	21.7	40	79.8
11	Terminal inductance	mH	0.0186	0.0587	0.121	0.314	0.506	0.719	1.12	1.98	3.87
12	Torque constant	mNm/A	1.76	3.12	4.49	7.22	9.17	10.9	13.7	18.1	25.4
13	Speed constant	rpm/V	5440	3060	2130	1320	1040	874	699	526	377
14	Speed / torque gradient	rpm/mNm	925	1140	1050	1080	1060	1110	1110	1160	1180
15	Mechanical time constant	ms	24.9	25.1	24.4	24.5	24.4	24.6	24.7	25.4	25
16	Rotor inertia	gcm²	2.57	2.1	2.21	2.17	2.2	2.12	2.12	2.09	2.02

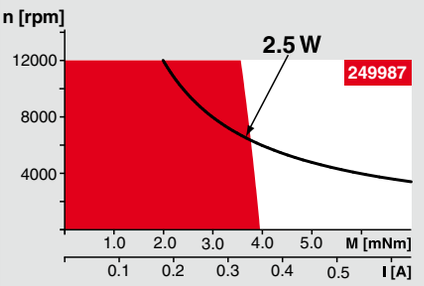
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	21.3 K/W
18	Thermal resistance winding-housing	10.5 K/W
19	Thermal time constant winding	13.7 s
20	Thermal time constant motor	201 s
21	Ambient temperature	-30…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (sleeve bearings)	
23	Max. speed	12000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1 N
27	Max. force for press fits (static)	80 N
28	Max. radial load, 5 mm from flange	2.7 N
	Mechanical data (ball bearings)	
23	Max. speed	12000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	3.3 N
27	Max. force for press fits (static)	45 N
28	Max. radial load, 5 mm from flange	11.9 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	9
31	Weight of motor	33 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

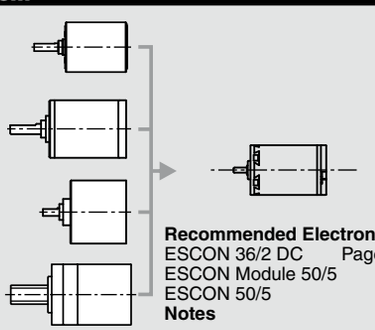
Overview on page 20–25

Planetary Gearhead
∅19 mm
0.1 - 0.3 Nm
Page 257

Planetary Gearhead
∅22 mm
0.1 - 2.0 Nm
Page 262/264

Spur Gearhead
∅24 mm
0.1 Nm
Page 269

Spindle Drive
∅22 mm
Page 299/300

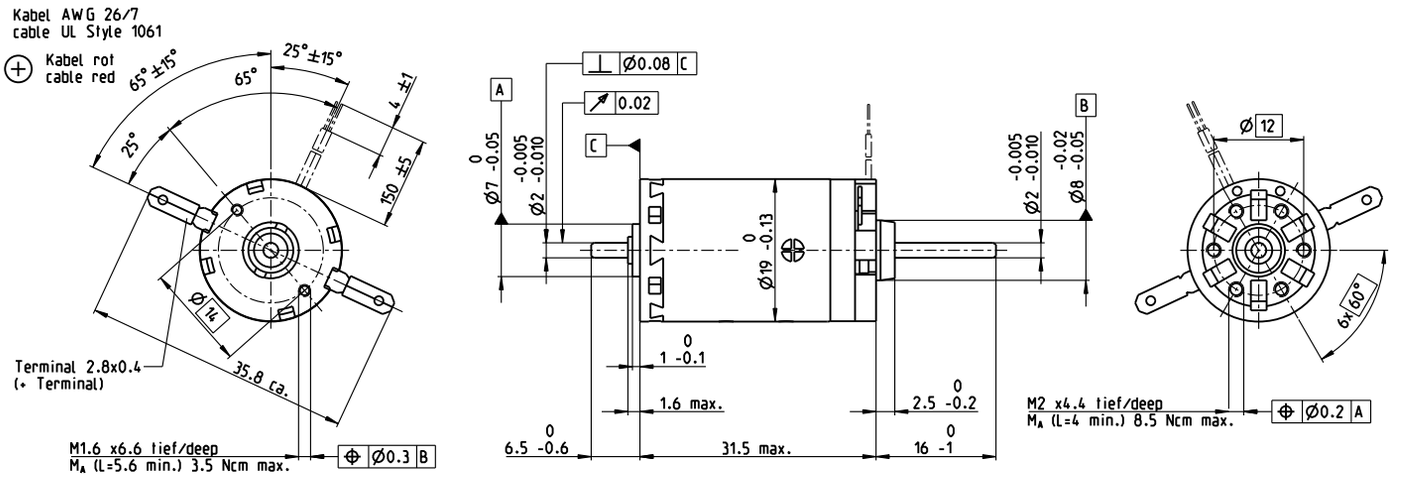


Recommended Electronics:

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ESCON Module 50/5	343
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Notes	**22**

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A-max 19 ∅19 mm, Graphite Brushes, 2.5 Watt



M 1:1

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	249991	249992	249993	249994	249995	**249996**	249997	249998	249999
with cables	240035	352971	353590	352972	352973	344596	352974	352975	352976

Motor Data

	Values at nominal voltage									
1	Nominal voltage	V	2.4	3.6	6	7.2	9	12	15	18	24
2	No load speed	rpm	12400	10400	12200	8980	8850	9930	9930	8910	8470
3	No load current	mA	292	158	114	66.1	51.9	44.6	35.7	26.3	18.6
4	Nominal speed	rpm	11700	8350	9310	4750	4630	5670	5670	4520	4020
5	Nominal torque (max. continuous torque)	mNm	0.759	1.78	2.75	3.98	4.02	3.89	3.89	3.83	3.8
6	Nominal current (max. continuous current)	A	0.72	0.72	0.72	0.612	0.485	0.397	0.317	0.235	0.167
7	Stall torque	mNm	14.1	9.66	12.1	8.84	8.83	9.47	9.44	8.16	7.63
8	Stall current	A	8.04	3.09	2.71	1.23	0.963	0.867	0.691	0.45	0.301
9	Max. efficiency	%	64	59	63	59	59	60	60	58	57
	Characteristics									
10	Terminal resistance	Ω	0.299	1.16	2.22	5.88	9.35	13.8	21.7	40	79.8
11	Terminal inductance	mH	0.0186	0.0587	0.121	0.314	0.506	0.719	1.12	1.98	3.87
12	Torque constant	mNm/A	1.76	3.12	4.49	7.22	9.17	10.9	13.7	18.1	25.4
13	Speed constant	rpm/V	5440	3060	2130	1320	1040	874	699	526	377
14	Speed / torque gradient	rpm/mNm	925	1140	1050	1080	1060	1110	1110	1160	1180
15	Mechanical time constant	ms	24.6	24.8	24	24.2	24.1	24.2	24.3	25	24.6
16	Rotor inertia	gcm²	2.54	2.07	2.18	2.14	2.16	2.09	2.09	2.06	1.99

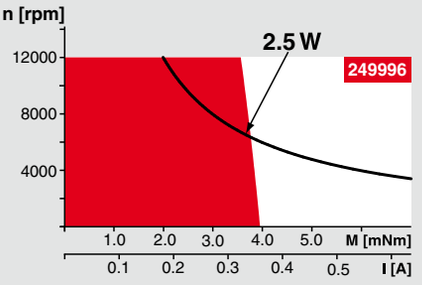
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	21.3 K/W
18	Thermal resistance winding-housing	10.5 K/W
19	Thermal time constant winding	13.7 s
20	Thermal time constant motor	201 s
21	Ambient temperature	-30…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (sleeve bearings)	
23	Max. speed	12000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1 N
27	Max. force for press fits (static)	80 N
	(static, shaft supported)	240 N
28	Max. radial load, 5 mm from flange	2.7 N
	Mechanical data (ball bearings)	
23	Max. speed	12000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	3.3 N
27	Max. force for press fits (static)	45 N
	(static, shaft supported)	240 N
28	Max. radial load, 5 mm from flange	11.9 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	9
31	Weight of motor	34 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

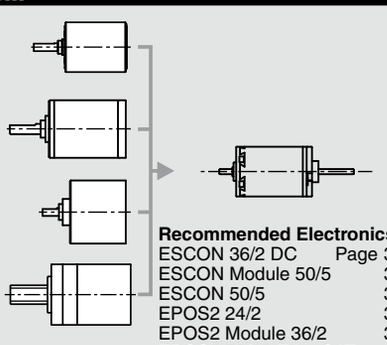
Overview on page 20–25

Planetary Gearhead
∅19 mm
0.1 - 0.3 Nm
Page 257

Planetary Gearhead
∅22 mm
0.1 - 2.0 Nm
Page 262/264

Spur Gearhead
∅24 mm
0.1 Nm
Page 269

Spindle Drive
∅22 mm
Page 299/300



Recommended Electronics:

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ESCON Module 50/5	343
ESCON 50/5	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

Encoder MR
32 CPT,
2 / 3 channels
Page 315

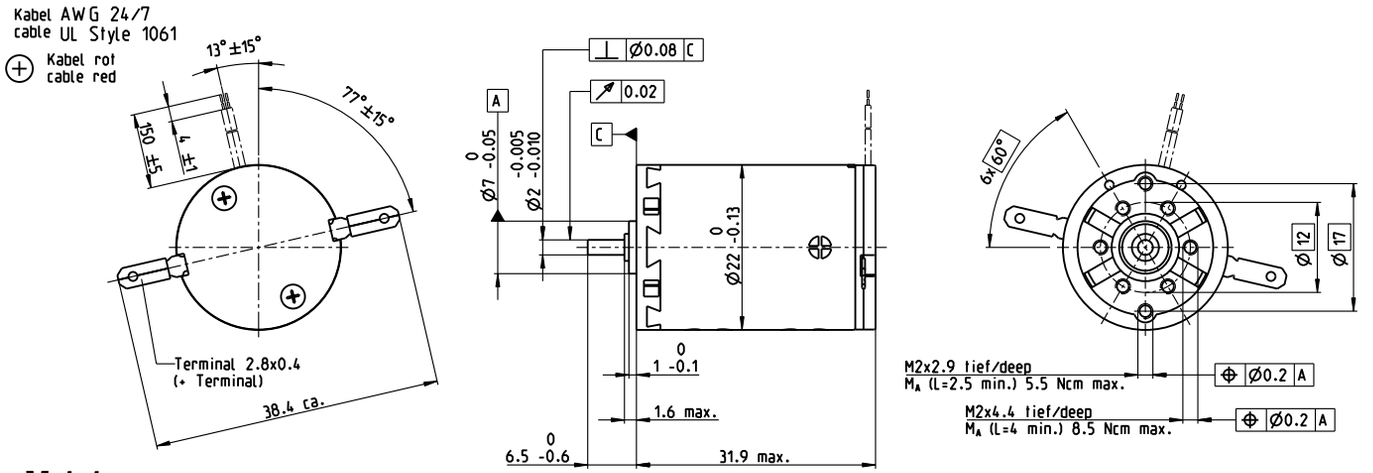
Encoder MR
128 / 256 / 512 CPT,
2 / 3 channels
Page 317

Encoder Enc
22 mm
100 CPT, 2 channels
Page 324

Encoder MEnc
∅13 mm
16 CPT, 2 channels
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A-max 22 ∅22 mm, Precious Metal Brushes CLL, 5 Watt



M 1:1

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110117	110119	110120	**110121**	110122	110123	110124	**110125**	110126	110127	**110128**	110129
with cables	139838	218799	238798	202413	258367	137255	134267	134666	267423	137476	310003	342390

Motor Data

	Values at nominal voltage												
1	Nominal voltage	V	6	9	9	12	12	15	18	24	30	36	48	48
2	No load speed	rpm	9630	9970	8760	10400	9400	10300	9970	10700	10800	9800	9280	8370
3	No load current	mA	29.5	20.8	16.8	16.8	14.2	13.1	10.4	8.81	7.18	5.06	3.47	2.93
4	Nominal speed	rpm	7390	7300	6100	7770	6700	7530	7220	7970	8070	7000	6420	5520
5	Nominal torque (max. continuous torque)	mNm	4.81	6.22	6.3	6.24	6.18	6.1	6.05	6.02	5.98	5.94	5.83	5.9
6	Nominal current (max. continuous current)	A	0.84	0.745	0.661	0.586	0.523	0.451	0.362	0.291	0.234	0.175	0.122	0.111
7	Stall torque	mNm	20.1	22.9	20.5	24.3	21.4	22.9	22	23.5	23.5	20.8	19	17.4
8	Stall current	A	3.42	2.68	2.11	2.23	1.77	1.65	1.28	1.11	0.894	0.599	0.387	0.32
9	Max. efficiency	%	83	84	83	84	83	83	83	83	83	83	82	82
	Characteristics													
10	Terminal resistance	Ω	1.76	3.36	4.27	5.39	6.78	9.07	14	21.6	33.5	60.1	124	150
11	Terminal inductance	mH	0.106	0.222	0.288	0.362	0.445	0.584	0.89	1.37	2.1	3.68	7.29	8.95
12	Torque constant	mNm/A	5.9	8.55	9.73	10.9	12.1	13.9	17.1	21.2	26.2	34.8	48.9	54.3
13	Speed constant	rpm/V	1620	1120	981	875	790	689	558	450	364	274	195	176
14	Speed / torque gradient	rpm/mNm	482	438	430	432	443	451	458	459	465	474	494	486
15	Mechanical time constant	ms	20.5	19.8	19.7	19.7	19.8	20.2	20.1	20.2	20.3	20.3	20.5	20.4
16	Rotor inertia	gcm²	4.07	4.32	4.37	4.36	4.26	4.27	4.2	4.2	4.16	4.09	3.97	4.01

Specifications

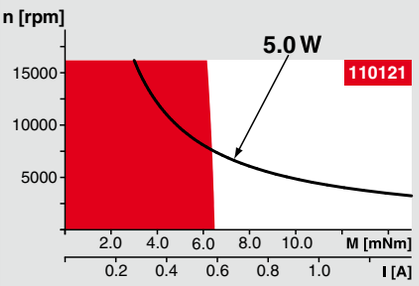
	Thermal data	
17	Thermal resistance housing-ambient	20 K/W
18	Thermal resistance winding-housing	6.0 K/W
19	Thermal time constant winding	10.2 s
20	Thermal time constant motor	313 s
21	Ambient temperatureC	-30…+65°C
22	Max. winding temperature	+85°C
	Mechanical data (sleeve bearings)	
23	Max. speed	16000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1 N
27	Max. force for press fits (static)	80 N
28	Max. radial load, 5 mm from flange	2.8 N
	Mechanical data (ball bearings)	
23	Max. speed	16000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	3.3 N
27	Max. force for press fits (static)	45 N
28	Max. radial load, 5 mm from flange	12.3 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	9
31	Weight of motor	54 g

CLL = Capacitor Long Life

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings
Without CLL

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

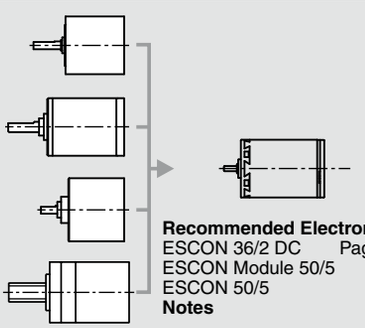
Overview on page 20–25

Planetary Gearhead
∅22 mm
0.1 - 0.6 Nm
Page 260/261

Planetary Gearhead
∅22 mm
0.5 - 2.0 Nm
Page 262/264

Spur Gearhead
∅24 mm
0.1 Nm
Page 269

Spindle Drive
∅22 mm
Page 299/300

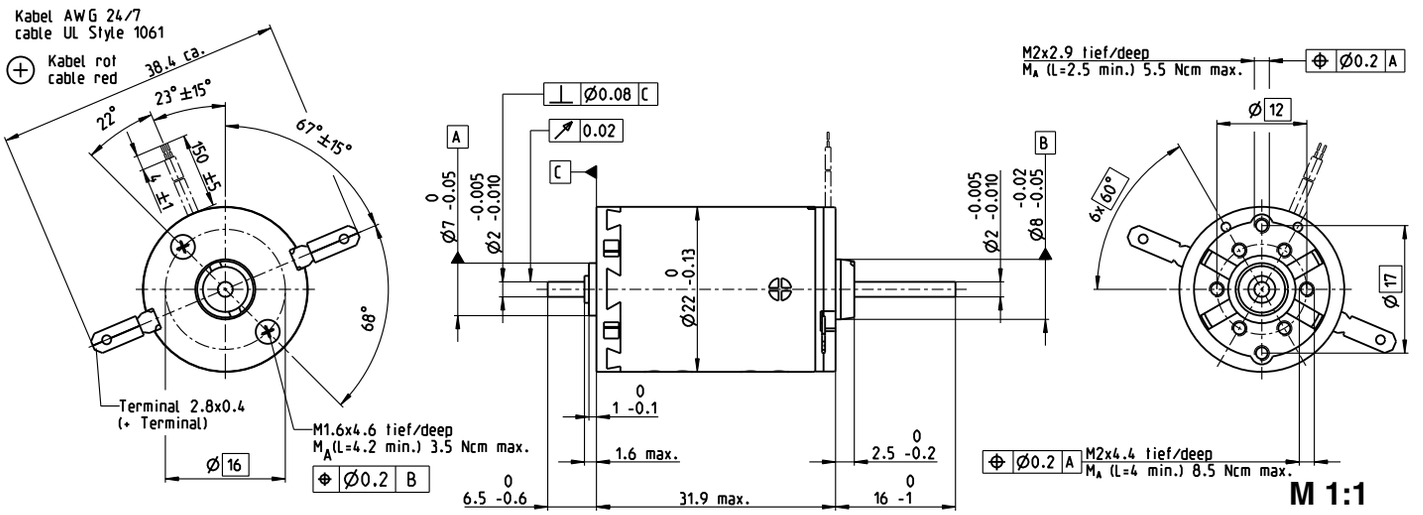


Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
Notes	**22**

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A-max 22 ∅22 mm, Precious Metal Brushes CLL, 3.5 Watt



Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110130	110132	110133	110134	110135	110136	110137	**110138**	110139	**110140**	110141	110142	
with cables	139846	352986	352987	352988	352989	352990	352991	352992	352993	352994	352995	352996	

Motor Data

	Values at nominal voltage													
1	Nominal voltage	V	4.5	6	7.2	7.2	7.2	9	12	15	18	24	36	42
2	No load speed	rpm	7210	6630	7000	6240	5620	6140	6630	6680	6480	6520	6950	7320
3	No load current	mA	26.7	17.8	16	13.6	11.8	10.6	8.88	7.17	5.73	4.33	3.16	2.92
4	Nominal speed	rpm	4970	4380	4770	3990	3340	3830	4320	4360	4140	4160	4540	4940
5	Nominal torque (max. continuous torque)	mNm	4.82	5.24	5.27	5.27	5.22	5.15	5.1	5.09	5.05	5	4.89	4.92
6	Nominal current (max. continuous current)	A	0.84	0.628	0.555	0.495	0.442	0.381	0.306	0.246	0.197	0.147	0.103	0.0932
7	Stall torque	mNm	15.1	15.3	16.4	14.6	12.8	13.7	14.6	14.7	14.1	13.9	14.2	15.2
8	Stall current	A	2.56	1.79	1.69	1.34	1.06	0.992	0.856	0.693	0.537	0.399	0.29	0.28
9	Max. efficiency	%	81	81	82	81	80	81	81	81	81	81	81	81
	Characteristics													
10	Terminal resistance	Ω	1.76	3.36	4.27	5.39	6.78	9.07	14	21.6	33.5	60.1	124	150
11	Terminal inductance	mH	0.106	0.222	0.288	0.362	0.445	0.584	0.89	1.37	2.1	3.68	7.29	8.95
12	Torque constant	mNm/A	5.9	8.55	9.73	10.9	12.1	13.9	17.1	21.2	26.2	34.8	48.9	54.3
13	Speed constant	rpm/V	1620	1120	981	875	790	689	558	450	364	274	195	176
14	Speed / torque gradient	rpm/mNm	482	438	430	432	443	451	458	459	465	474	494	486
15	Mechanical time constant	ms	20.6	19.8	19.7	19.7	19.8	20.2	20.1	20.2	20.3	20.3	20.6	20.4
16	Rotor inertia	gcm²	4.07	4.32	4.38	4.36	4.26	4.27	4.2	4.21	4.16	4.1	3.97	4.01

Specifications

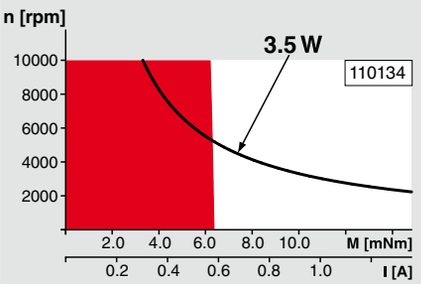
	Thermal data	
17	Thermal resistance housing-ambient	20 K/W
18	Thermal resistance winding-housing	6.0 K/W
19	Thermal time constant winding	10.2 s
20	Thermal time constant motor	313 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C
	Mechanical data (sleeve bearings)	
23	Max. speed	10000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1 N
27	Max. force for press fits (static)	80 N
	(static, shaft supported)	440 N
28	Max. radial load, 5 mm from flange	2.8 N
	Mechanical data (ball bearings)	
23	Max. speed	10000 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	3.3 N
27	Max. force for press fits (static)	45 N
	(static, shaft supported)	440 N
28	Max. radial load, 5 mm from flange	12.3 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	9
31	Weight of motor	54 g

CLL = Capacitor Long Life

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings
Without CLL

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

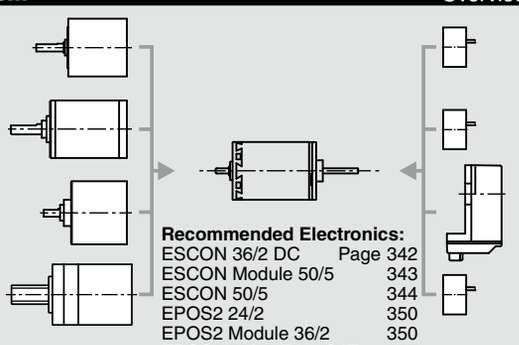
Overview on page 20–25

Planetary Gearhead
∅22 mm
0.1 - 0.6 Nm
Page 260/261

Planetary Gearhead
∅22 mm
0.5 - 2.0 Nm
Page 262/264

Spur Gearhead
∅24 mm
0.1 Nm
Page 269

Spindle Drive
∅22 mm
Page 299/300



Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

Encoder MR
32 CPT,
2 / 3 channels
Page 315

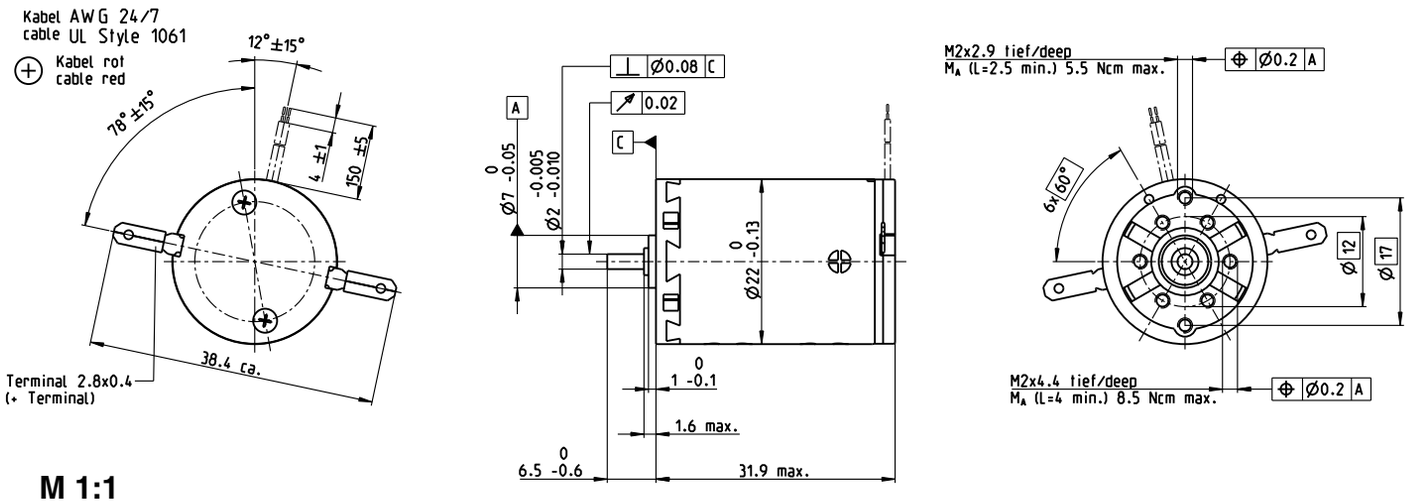
Encoder MR
128 / 256 / 512 CPT,
2 / 3 channels
Page 317

Encoder Enc
22 mm
100 CPT, 2 channels
Page 324

Encoder MEnc
∅13 mm
16 CPT, 2 channels
Page 335

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A-max 22 ∅22 mm, Graphite Brushes, 6 Watt



M 1:1

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110143	110145	110146	**110147**	110148	110149	110150	**110151**	110152	110153	110154	110155
with cables	139840	353017	199807	320206	323856	108828	199424	202921	267433	325492	313302	353019

Motor Data

	Values at nominal voltage												
1	Nominal voltage	V	6	9	9	12	12	15	18	24	24	36	48	48
2	No load speed	rpm	9240	9690	8500	10200	9170	10000	9770	10500	8480	9630	9110	8210
3	No load current	mA	83.1	57.9	49.6	45.8	40.5	36	29	23.7	18.4	14.2	9.99	8.84
4	Nominal speed	rpm	6240	6530	5350	7060	6000	6890	6600	7380	5270	6420	5840	4940
5	Nominal torque (max. continuous torque)	mNm	5.91	6.88	7.04	6.96	6.95	6.93	6.92	6.9	6.97	6.86	6.75	6.86
6	Nominal current (max. continuous current)	A	1.08	0.859	0.77	0.681	0.613	0.534	0.432	0.347	0.283	0.21	0.147	0.135
7	Stall torque	mNm	19.4	22.1	19.8	23.7	20.9	22.9	22	23.7	18.9	21.1	19.2	17.6
8	Stall current	A	3.29	2.59	2.04	2.17	1.72	1.65	1.29	1.12	0.721	0.606	0.393	0.325
9	Max. efficiency	%	67	70	69	72	70	72	72	73	70	72	71	70
	Characteristics													
10	Terminal resistance	Ω	1.82	3.48	4.42	5.53	6.96	9.09	14	21.5	33.3	59.4	122	148
11	Terminal inductance	mH	0.106	0.223	0.288	0.363	0.445	0.585	0.891	1.37	2.1	3.69	7.3	8.97
12	Torque constant	mNm/A	5.9	8.55	9.73	10.9	12.1	13.9	17.1	21.2	26.2	34.8	48.9	54.3
13	Speed constant	rpm/V	1620	1120	981	875	790	689	558	450	364	274	195	176
14	Speed / torque gradient	rpm/mNm	500	454	446	444	455	452	457	456	461	468	487	479
15	Mechanical time constant	ms	20.9	20.2	20.1	19.9	19.9	19.9	19.7	19.7	19.8	19.7	19.9	19.8
16	Rotor inertia	gcm²	4	4.25	4.3	4.29	4.19	4.2	4.13	4.13	4.09	4.02	3.9	3.94

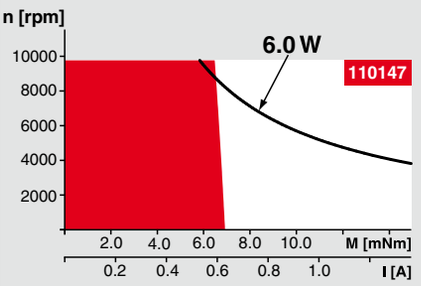
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	20 K/W
18	Thermal resistance winding-housing	6.0 K/W
19	Thermal time constant winding	9.43 s
20	Thermal time constant motor	314 s
21	Ambient temperature	-30…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (sleeve bearings)	
23	Max. speed	9800 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1 N
27	Max. force for press fits (static)	80 N
28	Max. radial load, 5 mm from flange	2.8 N
	Mechanical data (ball bearings)	
23	Max. speed	9800 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	3.3 N
27	Max. force for press fits (static)	45 N
28	Max. radial load, 5 mm from flange	12.3 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	9
31	Weight of motor	54 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

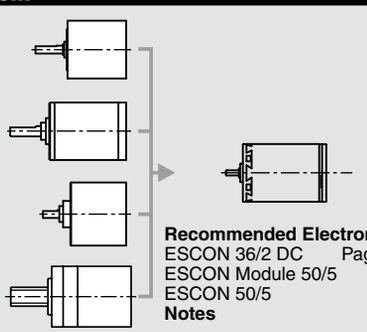
Overview on page 20–25

Planetary Gearhead
∅22 mm
0.1 - 0.6 Nm
Page 260/261

Planetary Gearhead
∅22 mm
0.5 - 2.0 Nm
Page 262/264

Spur Gearhead
∅24 mm
0.1 Nm
Page 269

Spindle Drive
∅22 mm
Page 299/300

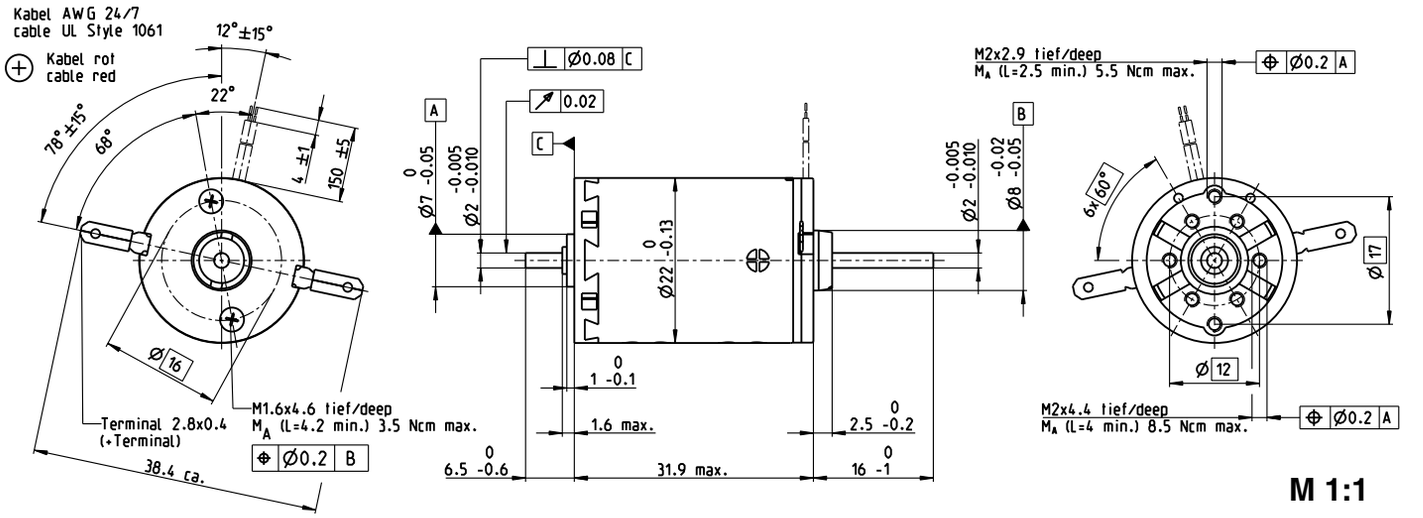


Recommended Electronics:

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Notes	**22**

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A-max 22 ∅22 mm, Graphite Brushes, 6 Watt



M 1:1

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110156	110158	110159	**110160**	110161	110162	110163	**110164**	110165	110166	110167	110168
with cables	139848	353023	353024	231171	353025	353026	231174	353027	353028	353029	316659	353603

Motor Data

	Values at nominal voltage												
1	Nominal voltage	V	6	9	9	12	12	15	18	24	24	36	48	48
2	No load speed	rpm	9240	9690	8500	10200	9170	10000	9770	10500	8480	9630	9110	8210
3	No load current	mA	83.1	57.9	49.6	45.8	40.5	36	29	23.7	18.4	14.2	9.99	8.84
4	Nominal speed	rpm	6240	6530	5350	7060	6000	6890	6600	7380	5270	6420	5840	4940
5	Nominal torque (max. continuous torque)	mNm	5.91	6.88	7.04	6.96	6.95	6.93	6.92	6.9	6.97	6.86	6.75	6.86
6	Nominal current (max. continuous current)	A	1.08	0.859	0.77	0.681	0.613	0.534	0.432	0.347	0.283	0.21	0.147	0.135
7	Stall torque	mNm	19.4	22.1	19.8	23.7	20.9	22.9	22	23.7	18.9	21.1	19.2	17.6
8	Stall current	A	3.29	2.59	2.04	2.17	1.72	1.65	1.29	1.12	0.721	0.606	0.393	0.325
9	Max. efficiency	%	67	70	69	72	70	72	72	73	70	72	71	70
	Characteristics													
10	Terminal resistance	Ω	1.82	3.48	4.42	5.53	6.96	9.09	14	21.5	33.3	59.4	122	148
11	Terminal inductance	mH	0.106	0.223	0.288	0.363	0.445	0.585	0.891	1.37	2.1	3.69	7.3	8.97
12	Torque constant	mNm/A	5.9	8.55	9.73	10.9	12.1	13.9	17.1	21.2	26.2	34.8	48.9	54.3
13	Speed constant	rpm/V	1620	1120	981	875	790	689	558	450	364	274	195	176
14	Speed / torque gradient	rpm/mNm	500	454	446	444	455	452	457	456	461	468	487	479
15	Mechanical time constant	ms	21.3	20.5	20.4	20.2	20.3	20.2	20.1	20.1	20.1	20.1	20.2	20.1
16	Rotor inertia	gcm²	4.07	4.32	4.37	4.36	4.26	4.27	4.2	4.2	4.16	4.09	3.97	4.01

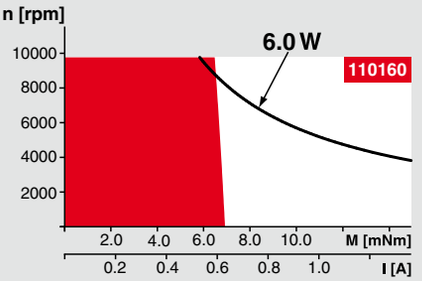
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	20 K/W
18	Thermal resistance winding-housing	6.0 K/W
19	Thermal time constant winding	9.43 s
20	Thermal time constant motor	313 s
21	Ambient temperature	-30…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (sleeve bearings)	
23	Max. speed	9800 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1 N
27	Max. force for press fits (static)	80 N
	(static, shaft supported)	240 N
28	Max. radial load, 5 mm from flange	2.8 N
	Mechanical data (ball bearings)	
23	Max. speed	9800 rpm
24	Axial play	0.05 - 0.15 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	3.3 N
27	Max. force for press fits (static)	45 N
	(static, shaft supported)	240 N
28	Max. radial load, 5 mm from flange	12.3 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	9
31	Weight of motor	54 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

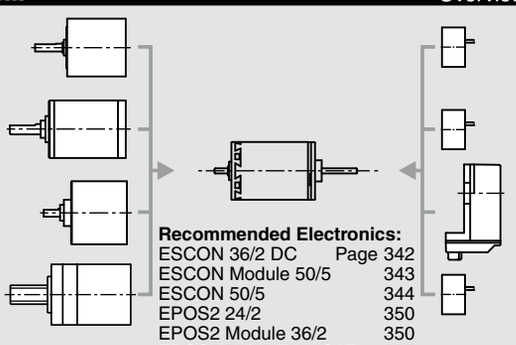
Overview on page 20–25

Planetary Gearhead
∅22 mm
0.1 - 0.6 Nm
Page 260/261

Planetary Gearhead
∅22 mm
0.5 - 2.0 Nm
Page 262/264

Spur Gearhead
∅24 mm
0.1 Nm
Page 269

Spindle Drive
∅22 mm
Page 299/300



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ESCON 50/5	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

Encoder MR
32 CPT,
2 / 3 channels
Page 315

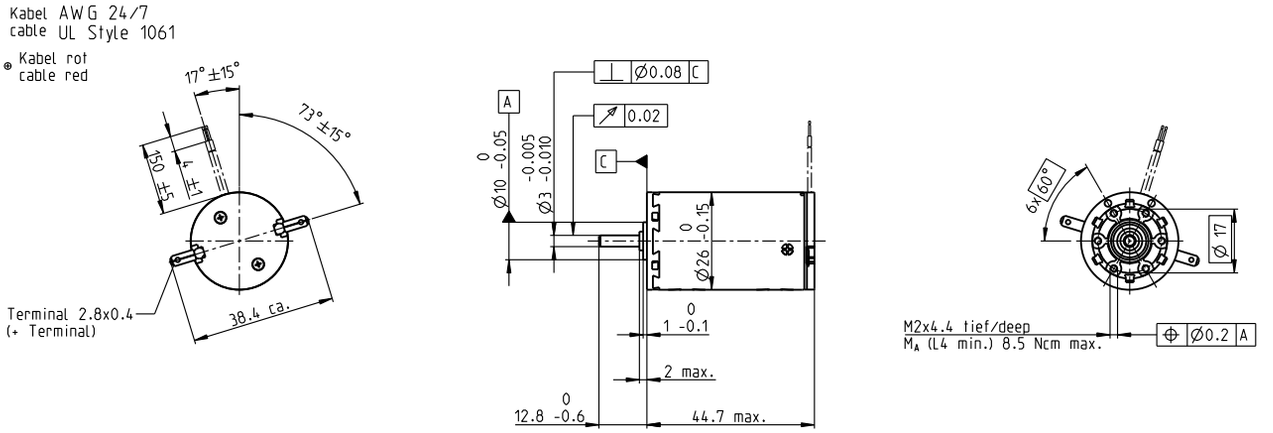
Encoder MR
128 / 256 / 512 CPT,
2 / 3 channels
Page 317

Encoder Enc
22 mm
100 CPT, 2 channels
Page 324

Encoder MEnc
∅13 mm
16 CPT, 2 channels
Page 335

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A-max 26 ∅26 mm, Precious Metal Brushes CLL, 4 Watt



M 1:2

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110169	110170	110171	110172	**110173**	110174	110175	110176	110177	**110178**	110179	110180
with cables	353039	353040	353041	353042	220031	353043	353044	353045	353046	353047	353048	353049

Motor Data

	Values at nominal voltage												
1	Nominal voltage	V	4.5	4.5	4.5	7.2	12	12	15	18	18	24	30	42
2	No load speed	rpm	6120	5230	3860	5110	5590	5020	5430	5980	5340	5670	5890	5520
3	No load current	mA	60	47.4	30.4	28.5	19.6	16.7	15	14.5	12.2	10	8.5	5.51
4	Nominal speed	rpm	5140	3910	2400	3290	3470	2880	3190	3690	3160	3500	3680	3270
5	Nominal torque (max. continuous torque)	mNm	5.45	6.46	8.95	10.9	12.4	12.4	11.8	11.4	12.1	12.1	11.9	11.7
6	Nominal current (max. continuous current)	A	0.84	0.84	0.84	0.84	0.631	0.565	0.464	0.414	0.392	0.312	0.255	0.168
7	Stall torque	mNm	32.6	24.9	23.3	30.2	32.8	29.3	28.6	29.9	29.9	31.8	31.9	28.9
8	Stall current	A	4.7	3.08	2.12	2.27	1.62	1.3	1.1	1.05	0.94	0.797	0.665	0.403
9	Max. efficiency	%	79	77	78	79	80	79	78	78	79	79	79	79
	Characteristics													
10	Terminal resistance	Ω	0.958	1.46	2.12	3.17	7.41	9.24	13.7	17.1	19.2	30.1	45.1	104
11	Terminal inductance	mH	0.101	0.138	0.254	0.372	0.862	1.07	1.42	1.69	2.13	3.35	4.85	10.8
12	Torque constant	mNm/A	6.94	8.09	11	13.3	20.2	22.5	26	28.3	31.8	39.9	48	71.6
13	Speed constant	rpm/V	1380	1180	869	718	472	423	367	337	300	239	199	133
14	Speed / torque gradient	rpm/mNm	190	213	168	171	173	173	193	203	181	181	187	194
15	Mechanical time constant	ms	24.6	24.4	23.8	23.7	23.6	23.6	23.8	23.9	23.7	23.7	23.8	24
16	Rotor inertia	gcm²	12.3	10.9	13.6	13.2	13.1	13	11.8	11.2	12.5	12.5	12.2	11.8

Specifications

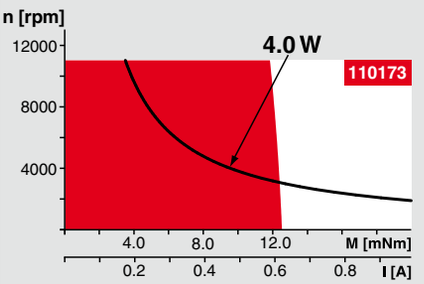
	Thermal data	
17	Thermal resistance housing-ambient	13.2 K/W
18	Thermal resistance winding-housing	3.2 K/W
19	Thermal time constant winding	12.5 s
20	Thermal time constant motor	423 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C
	Mechanical data (sleeve bearings)	
23	Max. speed	11 000 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1.7 N
27	Max. force for press fits (static)	80 N
28	Max. radial load, 5 mm from flange	5.5 N
	Mechanical data (ball bearings)	
23	Max. speed	11 000 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	5 N
27	Max. force for press fits (static)	75 N
28	Max. radial load, 5 mm from flange	20.5 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	100 g

CLL = Capacitor Long Life

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings
Without CLL

Operating Range



Comments

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

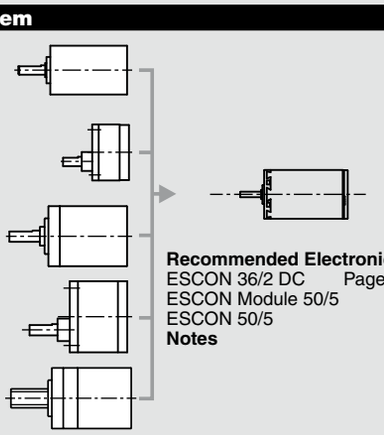
Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

Overview on page 20–25

Planetary Gearhead
∅26 mm
0.75 - 4.5 Nm
Page 270
Spur Gearhead
∅30 mm
0.07 - 0.2 Nm
Page 271
Planetary Gearhead
∅32 mm
0.75 - 6.0 Nm
Page 272/273/276
Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282
Spindle Drive
∅32 mm
Page 301–303

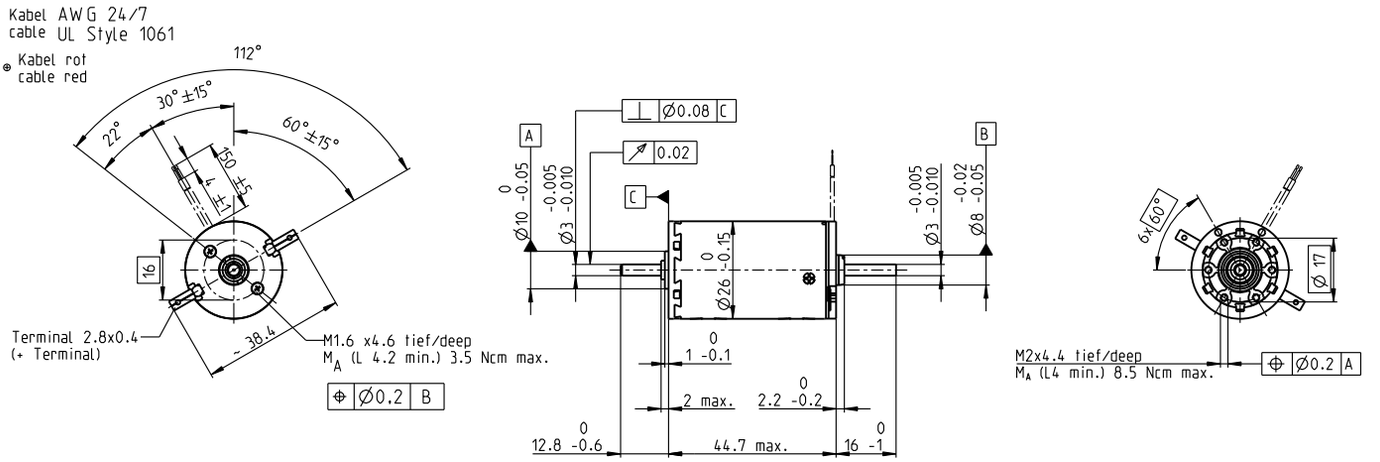


Recommended Electronics:

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ESCON 50/5	344
Notes	**22**

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A-max 26 ∅26 mm, Precious Metal Brushes CLL, 4 Watt



M 1:2

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110192	110193	110194	110195	**110196**	110197	110198	110199	110200	**110201**	110202	110203	
with cables	353064	353065	353066	353067	205635	353068	353069	353070	353071	353072	353073	353074	
Motor Data													
Values at nominal voltage													
1 Nominal voltage	V	3.6	4.5	6	7.2	9	9	12	15	18	21	24	30
2 No load speed	rpm	4870	5210	5140	5090	4180	3740	4320	4970	5320	4950	4690	3920
3 No load current	mA	63.9	56.8	41.5	34.1	20.2	17.2	16	15.8	14.6	11.2	9.04	5.54
4 Nominal speed	rpm	3910	3910	3700	3350	2400	1960	2450	3060	3530	3140	2850	2040
5 Nominal torque (max. continuous torque)	mNm	5.43	6.4	8.84	10.4	10.4	10.4	9.83	9.5	10	10.1	9.94	9.82
6 Nominal current (max. continuous current)	A	0.84	0.84	0.84	0.811	0.531	0.476	0.39	0.348	0.328	0.262	0.214	0.141
7 Stall torque	mNm	26.1	24.9	31.1	30.2	24.6	22	22.8	24.9	29.9	27.8	25.5	20.6
8 Stall current	A	3.76	3.08	2.83	2.27	1.22	0.974	0.878	0.879	0.94	0.697	0.532	0.288
9 Max. efficiency	%	76	75	78	78	76	76	75	76	77	77	76	75
Characteristics													
10 Terminal resistance	Ω	0.958	1.46	2.12	3.17	7.41	9.24	13.7	17.1	19.2	30.1	45.1	104
11 Terminal inductance	mH	0.101	0.138	0.254	0.372	0.862	1.07	1.42	1.69	2.13	3.35	4.85	10.8
12 Torque constant	mNm/A	6.94	8.09	11	13.3	20.2	22.5	26	28.3	31.8	39.9	48	71.6
13 Speed constant	rpm/V	1380	1180	869	718	472	423	367	337	300	239	199	133
14 Speed / torque gradient	rpm/mNm	190	213	168	171	173	173	193	203	181	181	187	194
15 Mechanical time constant	ms	24.6	24.4	23.8	23.7	23.6	23.6	23.8	24	23.8	23.7	23.9	24
16 Rotor inertia	gcm²	12.4	11	13.6	13.2	13.1	13	11.8	11.3	12.6	12.5	12.2	11.8

Specifications

Thermal data

17	Thermal resistance housing-ambient	13.2 K/W
18	Thermal resistance winding-housing	3.2 K/W
19	Thermal time constant winding	12.5 s
20	Thermal time constant motor	660 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C

Mechanical data (sleeve bearings)

23	Max. speed	6700 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1.7 N
27	Max. force for press fits (static)	80 N
	(static, shaft supported)	1200 N
28	Max. radial load, 5 mm from flange	5.5 N

Mechanical data (ball bearings)

23	Max. speed	6700 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	5.0 N
27	Max. force for press fits (static)	75 N
	(static, shaft supported)	1200 N
28	Max. radial load, 5 mm from flange	20.5 N

Other specifications

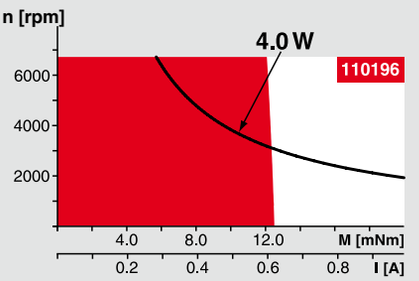
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	100 g

CLL = Capacitor Long Life

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings
Without CLL

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

Overview on page 20–25

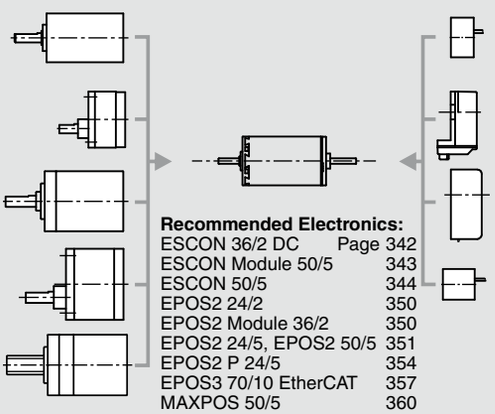
Planetary Gearhead
∅26 mm
0.75 - 4.5 Nm
Page 270

Spur Gearhead
∅30 mm
0.07 - 0.2 Nm
Page 271

Planetary Gearhead
∅32 mm
0.75 - 6.0 Nm
Page 272/273/276

Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282

Spindle Drive
∅32 mm
Page 301–303



Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS2 24/5, EPOS2 50/5	351
EPOS2 P 24/5	354
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

Encoder MR
128 - 1000 CPT,
3 channels
Page 319

Encoder Enc
22 mm
100 CPT, 2 channels
Page 324

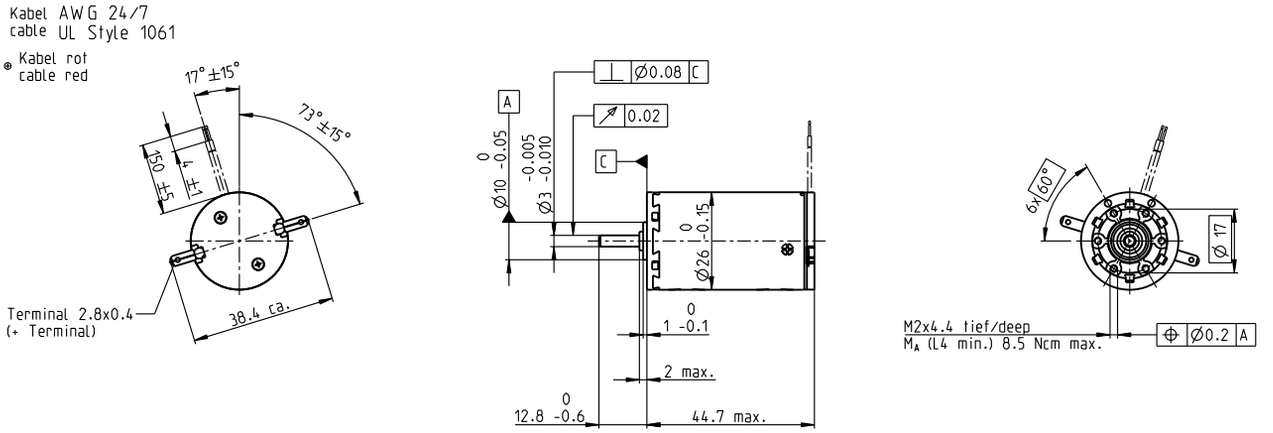
Encoder HED_ 5540
500 CPT,
3 channels
Page 326/327

Encoder MEnc
∅13 mm
16 CPT, 2 channels
Page 335

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A-max 26 ∅26 mm, Precious Metal Brushes CLL, 7 Watt

High Power



M 1:2

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110181	110182	110183	**110184**	110185	110186	**110187**	110188	110189	110190	110191	
with cables	353078	353079	353080	353081	329757	353082	332818	353083	353084	353085	353086	
Motor Data												
Values at nominal voltage												
1 Nominal voltage	V	4.5	6	9	12	15	18	24	30	36	42	48
2 No load speed	rpm	7320	8670	6160	6780	6720	6690	5670	6090	6780	6570	6050
3 No load current	mA	78.9	77.7	30.2	26.3	20.7	17.1	9.97	8.9	8.76	7.15	5.5
4 Nominal speed	rpm	6900	8130	5000	5340	5060	5010	3940	4370	5060	4820	4280
5 Nominal torque (max. continuous torque)	mNm	4.46	5.02	11.3	13.7	15.8	15.6	15.3	15.3	15.2	15	15
6 Nominal current (max. continuous current)	A	0.84	0.84	0.84	0.84	0.766	0.627	0.391	0.336	0.31	0.254	0.204
7 Stall torque	mNm	67.3	73.5	58.8	63.5	63.6	62.1	50.3	54.2	60.2	56.4	51.4
8 Stall current	A	11.5	11.2	4.25	3.78	3.01	2.43	1.25	1.16	1.2	0.93	0.683
9 Max. efficiency	%	84	84	84	84	84	84	83	84	84	84	83
Characteristics												
10 Terminal resistance	Ω	0.39	0.536	2.12	3.17	4.99	7.41	19.2	25.8	30.1	45.1	70.2
11 Terminal inductance	mH	0.0402	0.0509	0.227	0.333	0.529	0.77	1.9	2.58	2.99	4.34	6.68
12 Torque constant	mNm/A	5.84	6.57	13.9	16.8	21.2	25.5	40.1	46.7	50.3	60.6	75.2
13 Speed constant	rpm/V	1640	1450	689	569	451	374	238	205	190	158	127
14 Speed / torque gradient	rpm/mNm	109	119	105	108	106	108	114	113	114	117	119
15 Mechanical time constant	ms	16.5	16	15	14.9	14.8	14.8	14.9	14.9	14.9	15	15
16 Rotor inertia	gcm²	14.4	12.9	13.6	13.2	13.3	13.1	12.5	12.6	12.5	12.2	12.1

Specifications

Thermal data

17	Thermal resistance housing-ambient	13.2 K/W
18	Thermal resistance winding-housing	3.2 K/W
19	Thermal time constant winding	13.8 s
20	Thermal time constant motor	473 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C

Mechanical data (sleeve bearings)

23	Max. speed	11000 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1.7 N
27	Max. force for press fits (static)	80 N
28	Max. radial load, 5 mm from flange	5.5 N

Mechanical data (ball bearings)

23	Max. speed	11000 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	5 N
27	Max. force for press fits (static)	75 N
28	Max. radial load, 5 mm from flange	20.5 N

Other specifications

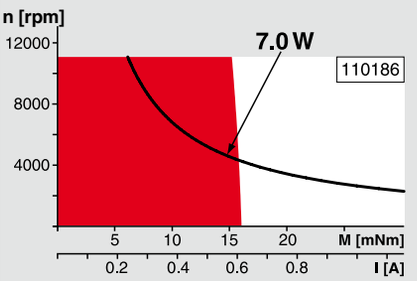
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	117 g

CLL = Capacitor Long Life

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings
Without CLL

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

Overview on page 20–25

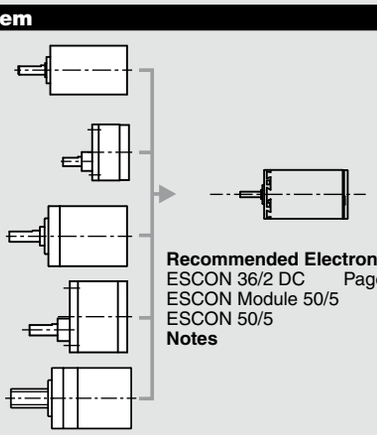
Planetary Gearhead
∅26 mm
0.75 - 4.5 Nm
Page 270

Spur Gearhead
∅30 mm
0.07 - 0.2 Nm
Page 271

Planetary Gearhead
∅32 mm
0.75 - 6.0 Nm
Page 272/273/276

Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282

Spindle Drive
∅32 mm
Page 301–303



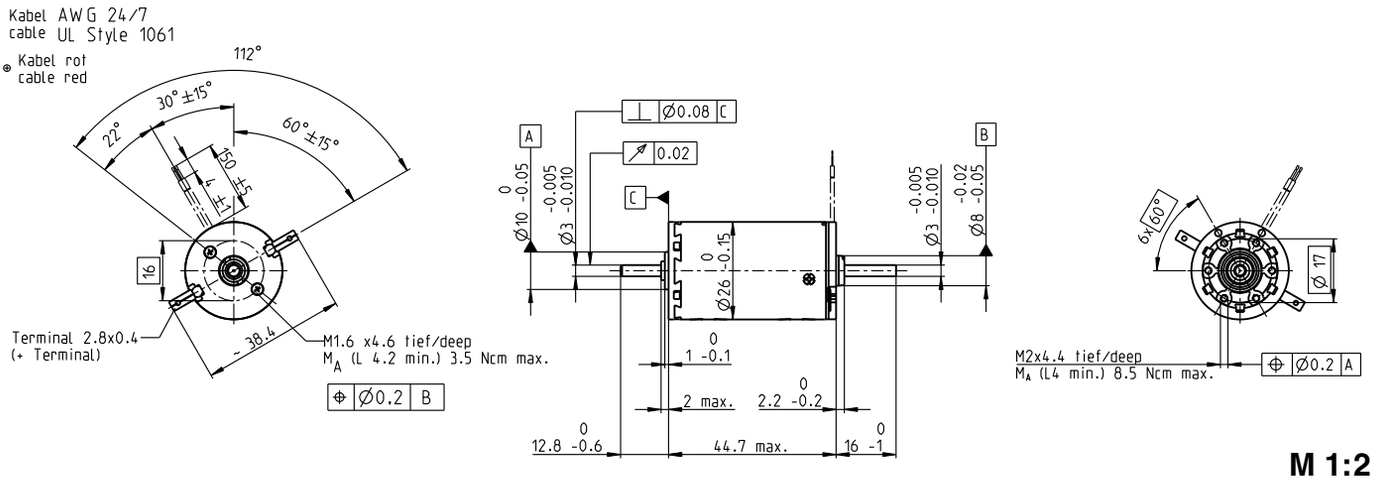
Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
Notes	**22**

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A-max 26 ∅26 mm, Precious Metal Brushes CLL, 4.5 Watt

High Power



M 1:2

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110204	110205	110206	110207	110208	**110209**	110210	110211	**110212**	110213	110214
with cables	353109	353110	353111	353112	353113	353114	353115	353116	353117	353118	353119

Motor Data

	Values at nominal voltage											
1	Nominal voltage	V	2.4	3.6	6	7.2	9	12	15	18	24	30	36
2	No load speed	rpm	3890	5190	4090	4060	4020	4440	3530	3640	4510	4680	4520
3	No load current	mA	67.7	69.9	29.2	24	19	16.5	9.41	8.2	8.45	7.16	5.67
4	Nominal speed	rpm	3460	4640	2940	2650	2620	3030	2070	2180	3060	3210	3050
5	Nominal torque (max. continuous torque)	mNm	4.53	5.08	11.3	13.3	13.4	13.2	12.9	12.9	12.8	12.6	12.5
6	Nominal current (max. continuous current)	A	0.84	0.84	0.84	0.814	0.647	0.529	0.33	0.284	0.262	0.214	0.171
7	Stall torque	mNm	35.9	44.1	39.2	38.1	38.2	41.4	31.4	32.5	40.1	40.3	38.5
8	Stall current	A	6.15	6.71	2.83	2.27	1.8	1.62	0.783	0.697	0.797	0.665	0.513
9	Max. efficiency	%	81	81	81	81	81	81	80	80	81	81	81
	Characteristics											
10	Terminal resistance	Ω	0.39	0.536	2.12	3.17	4.99	7.41	19.2	25.8	30.1	45.1	70.2
11	Terminal inductance	mH	0.0402	0.0509	0.227	0.332	0.528	0.77	1.9	2.57	2.99	4.34	6.68
12	Torque constant	mNm/A	5.84	6.57	13.9	16.8	21.2	25.5	40.1	46.7	50.3	60.6	75.2
13	Speed constant	rpm/V	1640	1450	689	569	451	374	238	205	190	158	127
14	Speed / torque gradient	rpm/mNm	109	119	105	108	106	108	114	113	114	117	119
15	Mechanical time constant	ms	16.6	16.1	15	14.9	14.9	14.9	14.9	14.9	14.9	15	15
16	Rotor inertia	gcm²	14.4	12.9	13.6	13.2	13.3	13.1	12.6	12.6	12.5	12.2	12.1

Specifications

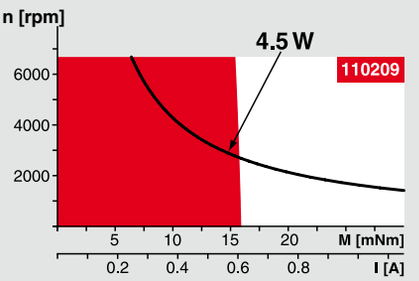
	Thermal data	
17	Thermal resistance housing-ambient	13.2 K/W
18	Thermal resistance winding-housing	3.2 K/W
19	Thermal time constant winding	12.5 s
20	Thermal time constant motor	473 s
21	Ambient temperature	-30…+65°C
22	Max. winding temperature	+85°C
	Mechanical data (sleeve bearings)	
23	Max. speed	6700 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1.7 N
27	Max. force for press fits (static)	80 N
	(static, shaft supported)	1200 N
28	Max. radial load, 5 mm from flange	5.5 N
	Mechanical data (ball bearings)	
23	Max. speed	6700 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	5.0 N
27	Max. force for press fits (static)	75 N
	(static, shaft supported)	1200 N
28	Max. radial load, 5 mm from flange	20.5 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	119 g

CLL = Capacitor Long Life

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Ball bearings in place of sleeve bearings
Without CLL

Operating Range



Comments

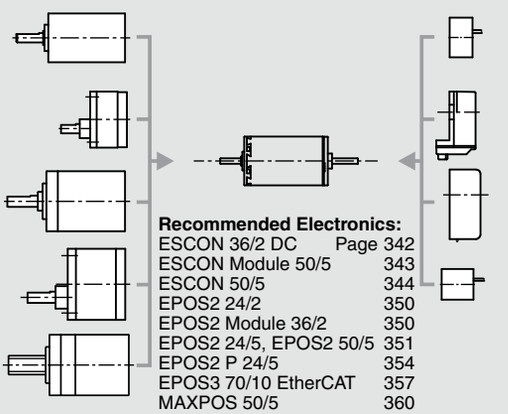
Continuous operation
In observation of above listed thermal resistance (lines 17 and 18) the maximum permissible winding temperature will be reached during continuous operation at 25°C ambient.
= Thermal limit.

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

Overview on page 20–25



Planetary Gearhead
∅26 mm
0.75 - 4.5 Nm
Page 270

Spur Gearhead
∅30 mm
0.07 - 0.2 Nm
Page 271

Planetary Gearhead
∅32 mm
0.4 - 6.0 Nm
Page 272/273/276

Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282

Spindle Drive
∅32 mm
Page 301–303

Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS2 24/5, EPOS2 50/5	351
EPOS2 P 24/5	354
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

Encoder MR
128 - 1000 CPT,
3 channels
Page 319

Encoder Enc
22 mm
100 CPT, 2 channels
Page 324

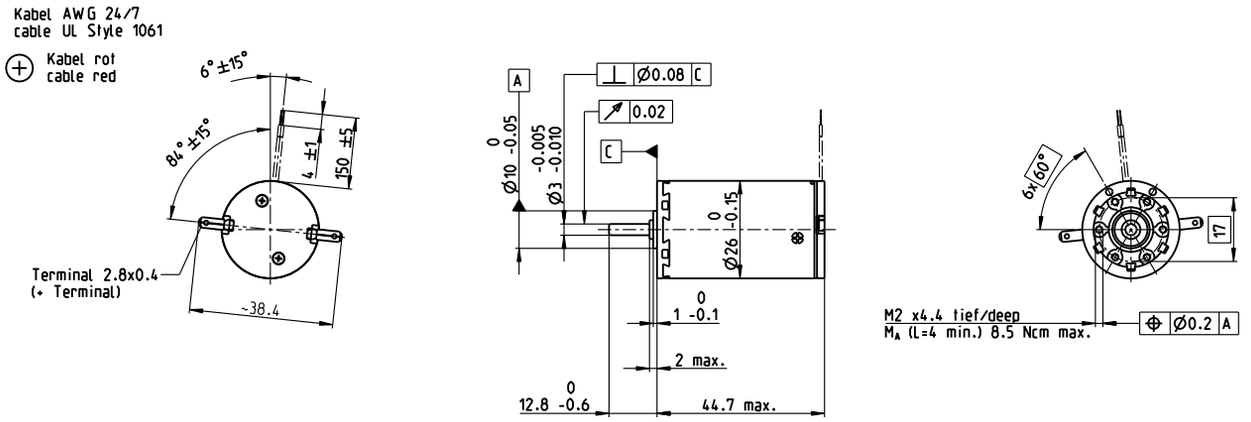
Encoder HED_ 5540
500 CPT,
3 channels
Page 326/327

Encoder MEnc
∅13 mm
16 CPT, 2 channels
Page 335

May 2014 edition / subject to change

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A-max 26 ∅26 mm, Graphite Brushes, 6 Watt



M 1:2

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110923	110924	110925	**110926**	110927	110928	110929	**110930**	110931	110932	110933	110934
with cables	353132	353133	353134	353135	340503	353136	353137	353138	353139	353140	353141	353605

Motor Data														
	Values at nominal voltage													
1	Nominal voltage	V	7.2	9	12	12	18	18	24	24	30	36	42	48
2	No load speed	rpm	9790	10500	10300	8510	8380	7510	8680	7950	8890	8500	8230	6280
3	No load current	mA	121	106	77.7	60.2	39.4	34.2	31	27.7	25.5	20.1	16.5	10.3
4	Nominal speed	rpm	8580	8840	8510	6210	5890	5000	6050	5250	6350	5950	5630	3590
5	Nominal torque (max. continuous torque)	mNm	6.67	7.91	11	13.6	14.5	14.6	13.7	13.4	14.1	14.1	13.9	13.8
6	Nominal current (max. continuous current)	A	1.08	1.08	1.08	1.08	0.755	0.679	0.554	0.498	0.467	0.373	0.305	0.203
7	Stall torque	mNm	54.6	51.4	63.4	50.9	49.4	44	45.7	39.8	49.8	47.6	44.6	32.9
8	Stall current	A	7.89	6.36	5.79	3.84	2.45	1.96	1.76	1.41	1.57	1.2	0.931	0.461
9	Max. efficiency	%	77	76	79	77	77	76	76	74	76	76	76	73
	Characteristics													
10	Terminal resistance	Ω	0.912	1.41	2.07	3.13	7.36	9.19	13.6	17	19.1	30.1	45.1	104
11	Terminal inductance	mH	0.101	0.138	0.254	0.372	0.861	1.07	1.42	1.69	2.13	3.35	4.85	10.8
12	Torque constant	mNm/A	6.92	8.07	11	13.3	20.2	22.5	25.9	28.3	31.7	39.8	47.9	71.4
13	Speed constant	rpm/V	1380	1180	872	720	473	425	368	338	301	240	199	134
14	Speed / torque gradient	rpm/mNm	182	207	165	170	173	174	193	204	181	181	188	195
15	Mechanical time constant	ms	23.5	23.7	23.4	23.5	23.6	23.6	23.8	24	23.8	23.8	23.9	24.1
16	Rotor inertia	gcm²	12.3	10.9	13.6	13.2	13.1	13	11.8	11.2	12.5	12.5	12.2	11.8

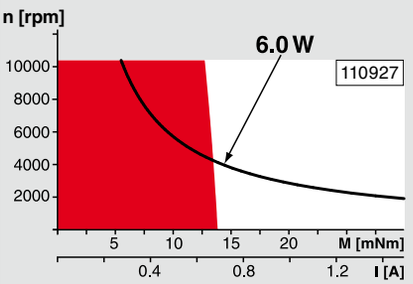
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	13.2 K/W
18	Thermal resistance winding-housing	3.2 K/W
19	Thermal time constant winding	11.7 s
20	Thermal time constant motor	423 s
21	Ambient temperature	-30…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (ball bearings)	
23	Max. speed	10400 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	5 N
27	Max. force for press fits (static)	75 N
28	Max. radial load, 5 mm from flange	20.5 N
	Mechanical data (sleeve bearings)	
23	Max. speed	10400 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1.7 N
27	Max. force for press fits (static)	80 N
28	Max. radial load, 5 mm from flange	5.5 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	98 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Sleeve bearings in place of ball bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

Overview on page 20–25

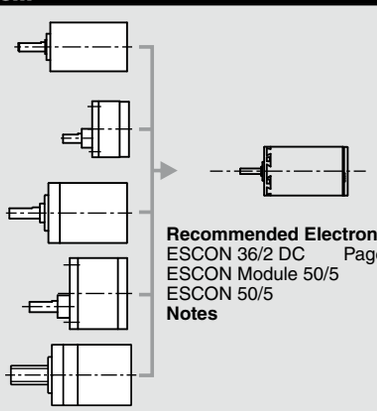
Planetary Gearhead
∅26 mm
0.75 - 4.5 Nm
Page 270

Spur Gearhead
∅30 mm
0.07 - 0.2 Nm
Page 271

Planetary Gearhead
∅32 mm
0.4 - 6.0 Nm
Page 272/273/276

Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282

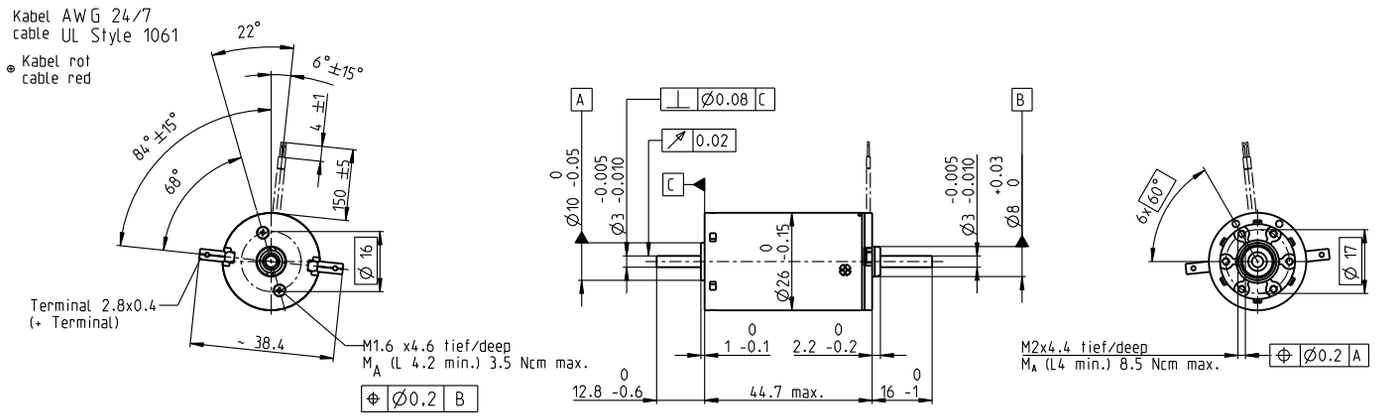
Spindle Drive
∅32 mm
Page 301–303



Recommended Electronics:
ESCON 36/2 DC Page 342
ESCON Module 50/5 343
ESCON 50/5 344
Notes **22**

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A-max 26 ∅26 mm, Graphite Brushes, 6 Watt



M 1:2

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110946	110947	110948	110949	**110950**	110951	110952	**110953**	110954	110955	110956	110957
with cables	353143	353144	353145	353146	353147	353148	353149	353150	353151	353152	353153	353154

Motor Data

	Values at nominal voltage												
1	Nominal voltage	V	7.2	9	12	12	18	18	24	24	30	36	42	48
2	No load speed	rpm	9790	10500	10300	8510	8380	7510	8680	7950	8890	8500	8230	6280
3	No load current	mA	121	106	77.7	60.2	39.4	34.2	31	27.7	25.5	20.1	16.5	10.3
4	Nominal speed	rpm	8580	8840	8510	6210	5890	5000	6050	5250	6350	5950	5630	3590
5	Nominal torque (max. continuous torque)	mNm	6.67	7.91	11	13.6	14.5	14.6	13.7	13.4	14.1	14.1	13.9	13.8
6	Nominal current (max. continuous current)	A	1.08	1.08	1.08	1.08	0.755	0.679	0.554	0.498	0.467	0.373	0.305	0.203
7	Stall torque	mNm	54.6	51.4	63.4	50.9	49.4	44	45.7	39.8	49.8	47.6	44.6	32.9
8	Stall current	A	7.89	6.36	5.79	3.84	2.45	1.96	1.76	1.41	1.57	1.2	0.931	0.461
9	Max. efficiency	%	77.1	76.2	78.5	76.8	76.5	75.6	75.6	74.3	76.4	76.1	75.5	72.7
	Characteristics													
10	Terminal resistance	Ω	0.912	1.41	2.07	3.13	7.36	9.19	13.6	17	19.1	30.1	45.1	104
11	Terminal inductance	mH	0.101	0.138	0.254	0.372	0.861	1.07	1.42	1.69	2.13	3.35	4.85	10.8
12	Torque constant	mNm/A	6.92	8.07	11	13.3	20.2	22.5	25.9	28.3	31.7	39.8	47.9	71.4
13	Speed constant	rpm/V	1380	1180	872	720	473	425	368	338	301	240	199	134
14	Speed / torque gradient	rpm/mNm	182	207	165	170	173	174	193	204	181	181	188	195
15	Mechanical time constant	ms	23.5	23.7	23.4	23.5	23.6	23.6	23.8	24	23.8	23.8	23.9	24.1
16	Rotor inertia	gcm²	12.3	10.9	13.6	13.2	13.1	13	11.8	11.2	12.5	12.5	12.2	11.8

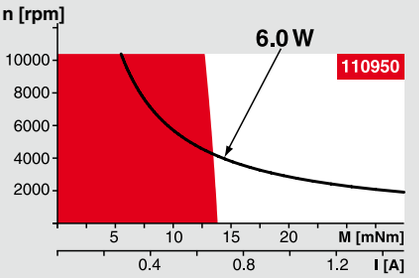
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	13.2 K/W
18	Thermal resistance winding-housing	3.2 K/W
19	Thermal time constant winding	11.7 s
20	Thermal time constant motor	660 s
21	Ambient temperature	-30…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (ball bearings)	
23	Max. speed	10400 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	5 N
27	Max. force for press fits (static)	75 N
	(static, shaft supported)	1200 N
28	Max. radial load, 5 mm from flange	20.5 N
	Mechanical data (sleeve bearings)	
23	Max. speed	10400 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1.7 N
27	Max. force for press fits (static)	80 N
	(static, shaft supported)	1200 N
28	Max. radial load, 5 mm from flange	5.5 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	100 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Sleeve bearings in place of ball bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

Overview on page 20–25

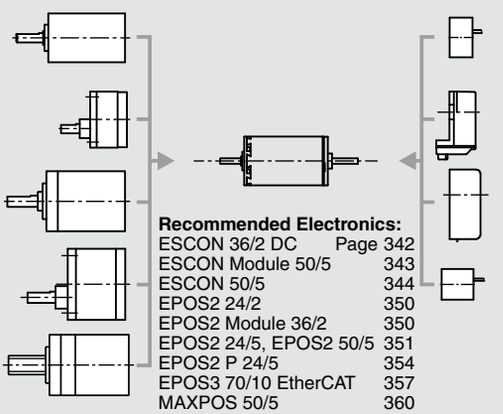
Planetary Gearhead
∅26 mm
0.75 - 4.5 Nm
Page 270

Spur Gearhead
∅30 mm
0.07 - 0.2 Nm
Page 271

Planetary Gearhead
∅32 mm
0.4 - 6.0 Nm
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Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282

Spindle Drive
∅32 mm
Page 301–303



Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS2 24/5, EPOS2 50/5	351
EPOS2 P 24/5	354
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

Encoder MR
128 - 1000 CPT,
3 channels
Page 319

Encoder Enc
22 mm
100 CPT, 2 channels
Page 324

Encoder HED_ 5540
500 CPT,
3 channels
Page 326/327

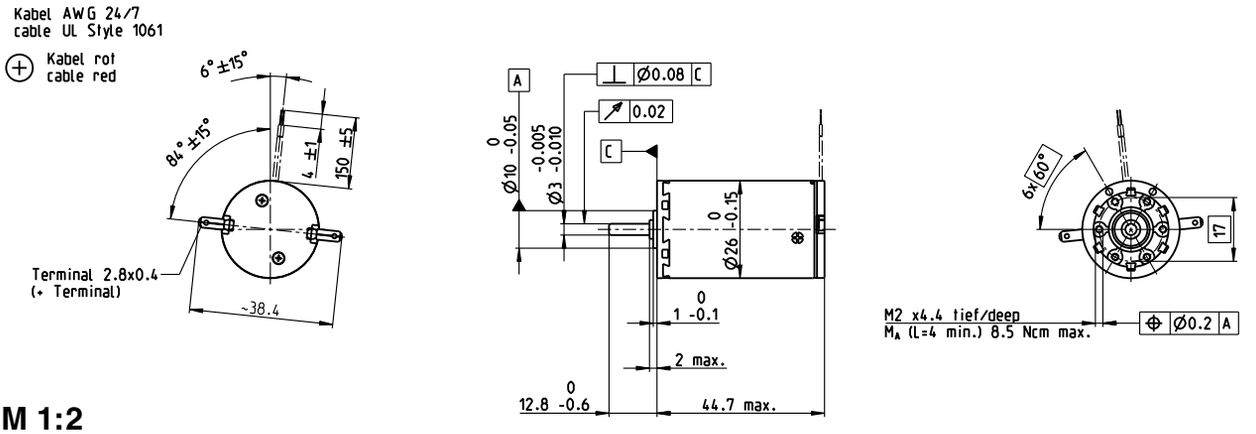
Encoder MEnc
∅13 mm
16 CPT, 2 channels
Page 335

May 2014 edition / subject to change

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A-max 26 ∅26 mm, Graphite Brushes, 11 Watt

High Power



M 1:2

maxon A-max

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110935	110936	**110937**	110938	110939	**110940**	110941	110942	110943	110944	110945
with cables	139852	353166	353167	353168	353169	206344	353171	314214	202893	353174	353175

Motor Data

	Values at nominal voltage											
1	Nominal voltage	V	6	7.2	12	15	18	24	30	36	42	48	48
2	No load speed	rpm	9740	10400	8190	8450	8040	8890	7050	7280	7880	7470	6010
3	No load current	mA	143	130	57	47.5	37.1	31.7	18.9	16.4	15.5	12.7	9.66
4	Nominal speed	rpm	9210	9700	6720	6620	6080	6910	5000	5230	5840	5390	3900
5	Nominal torque (max. continuous torque)	mNm	5.48	6.26	14.2	17.4	18.7	18.4	18.2	18.2	18.1	17.8	17.9
6	Nominal current (max. continuous current)	A	1.08	1.08	1.08	1.08	0.919	0.749	0.47	0.404	0.373	0.305	0.247
7	Stall torque	mNm	102	96.4	80.2	80.5	77.1	83.3	63	65.2	70.3	64.5	51.4
8	Stall current	A	17.4	14.7	5.79	4.8	3.64	3.26	1.57	1.4	1.4	1.06	0.684
9	Max. efficiency	%	83	82	81	81	81	82	80	80	80	80	78
	Characteristics												
10	Terminal resistance	Ω	0.345	0.49	2.07	3.13	4.94	7.36	19.1	25.8	30.1	45.1	70.2
11	Terminal inductance	mH	0.0402	0.0509	0.227	0.333	0.529	0.77	1.9	2.58	2.99	4.34	6.68
12	Torque constant	mNm/A	5.84	6.57	13.9	16.8	21.2	25.5	40.1	46.7	50.3	60.6	75.2
13	Speed constant	rpm/V	1640	1450	689	569	451	374	238	205	190	158	127
14	Speed / torque gradient	rpm/mNm	96.6	109	103	106	105	108	113	113	113	117	119
15	Mechanical time constant	ms	14.6	14.7	14.6	14.7	14.7	14.7	14.9	14.9	14.9	15	15
16	Rotor inertia	gcm²	14.4	12.9	13.6	13.2	13.3	13.1	12.5	12.6	12.5	12.2	12.1

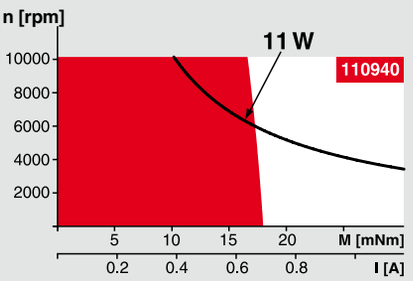
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	13.2 K/W
18	Thermal resistance winding-housing	3.2 K/W
19	Thermal time constant winding	13.8 s
20	Thermal time constant motor	473 s
21	Ambient temperature	-30…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (ball bearings)	
23	Max. speed	10400 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	5 N
27	Max. force for press fits (static)	75 N
28	Max. radial load, 5 mm from flange	20.5 N
	Mechanical data (sleeve bearings)	
23	Max. speed	10400 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1.7 N
27	Max. force for press fits (static)	80 N
28	Max. radial load, 5 mm from flange	5.5 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	117 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Sleeve bearings in place of ball bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

Overview on page 20–25

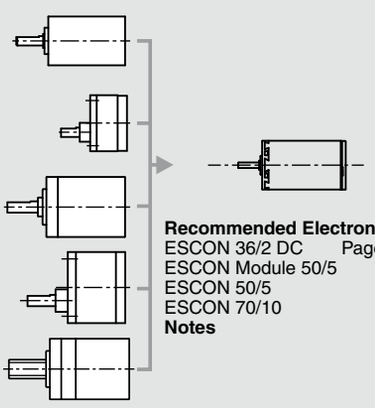
Planetary Gearhead
∅26 mm
0.75 - 4.5 Nm
Page 270

Spur Gearhead
∅30 mm
0.07 - 0.2 Nm
Page 271

Planetary Gearhead
∅32 mm
0.4 - 6.0 Nm
Page 272/273/276

Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282

Spindle Drive
∅32 mm
Page 301–303



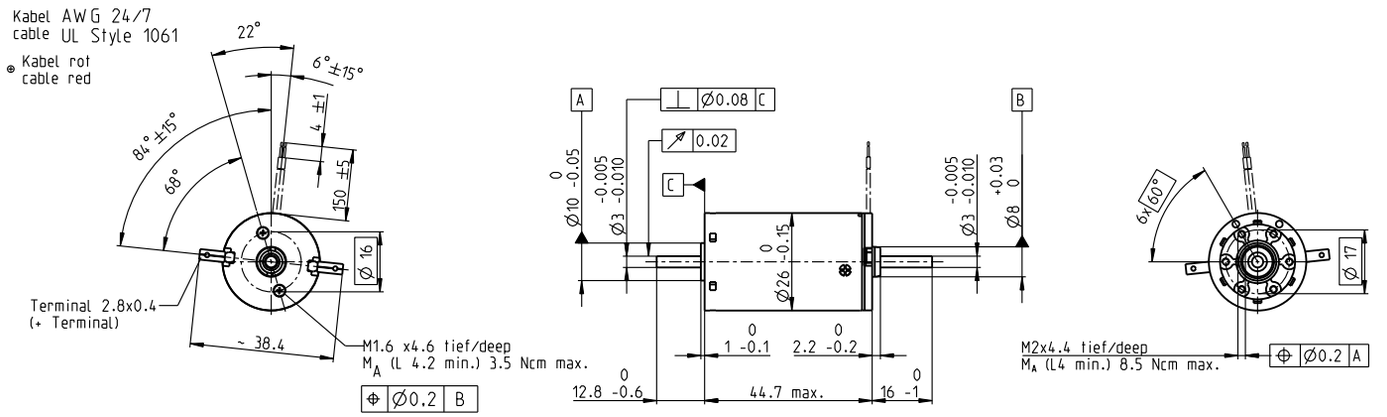
Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
ESCON 70/10	344
Notes	**22**

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A-max 26 ∅26 mm, Graphite Brushes, 11 Watt

High Power



M 1:2

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	110958	110959	**110960**	110961	110962	**110963**	110964	110965	110966	110967	110968	
with cables	353606	353607	353608	353609	353610	353611	353612	353613	353614	353615	353616	
Motor Data												
Values at nominal voltage												
1 Nominal voltage	V	6	7.2	12	15	18	24	30	36	42	48	48
2 No load speed	rpm	9740	10400	8190	8450	8040	8890	7050	7280	7880	7470	6010
3 No load current	mA	143	130	57	47.5	37.1	31.7	18.9	16.4	15.5	12.7	9.66
4 Nominal speed	rpm	9210	9700	6720	6620	6080	6910	5000	5230	5840	5390	3900
5 Nominal torque (max. continuous torque)	mNm	5.48	6.26	14.2	17.4	18.7	18.4	18.2	18.2	18.1	17.8	17.9
6 Nominal current (max. continuous current)	A	1.08	1.08	1.08	1.08	0.919	0.749	0.47	0.404	0.373	0.305	0.247
7 Stall torque	mNm	102	96.4	80.2	80.5	77.1	83.3	63	65.2	70.3	64.5	51.4
8 Stall current	A	17.4	14.7	5.79	4.8	3.64	3.26	1.57	1.4	1.4	1.06	0.684
9 Max. efficiency	%	83	82	81	81	81	82	80	80	80	80	78
Characteristics												
10 Terminal resistance	Ω	0.345	0.49	2.07	3.13	4.94	7.36	19.1	25.8	30.1	45.1	70.2
11 Terminal inductance	mH	0.0402	0.0509	0.227	0.333	0.529	0.77	1.9	2.58	2.99	4.34	6.68
12 Torque constant	mNm/A	5.84	6.57	13.9	16.8	21.2	25.5	40.1	46.7	50.3	60.6	75.2
13 Speed constant	rpm/V	1640	1450	689	569	451	374	238	205	190	158	127
14 Speed / torque gradient	rpm/mNm	96.6	109	103	106	105	108	113	113	113	117	119
15 Mechanical time constant	ms	14.6	14.7	14.6	14.7	14.7	14.7	14.9	14.9	14.9	15	15
16 Rotor inertia	gcm²	14.4	12.9	13.6	13.2	13.3	13.1	12.5	12.6	12.5	12.2	12.1

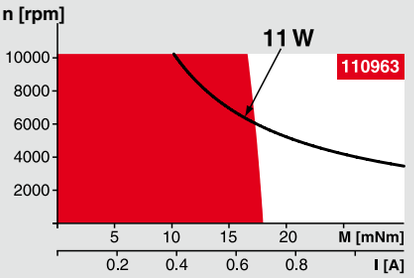
Specifications

Thermal data		
17	Thermal resistance housing-ambient	13.2 K/W
18	Thermal resistance winding-housing	3.2 K/W
19	Thermal time constant winding	13.8 s
20	Thermal time constant motor	473 s
21	Ambient temperature	-30…+85°C
22	Max. winding temperature	+125°C
Mechanical data (ball bearings)		
23	Max. speed	10400 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	5 N
27	Max. force for press fits (static)	75 N
	(static, shaft supported)	1200 N
28	Max. radial load, 5 mm from flange	20.5 N
Mechanical data (sleeve bearings)		
23	Max. speed	10400 rpm
24	Axial play	0.1 - 0.2 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	1.7 N
27	Max. force for press fits (static)	80 N
	(static, shaft supported)	1200 N
28	Max. radial load, 5 mm from flange	5.5 N
Other specifications		
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	119 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Sleeve bearings in place of ball bearings

Operating Range



Comments

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

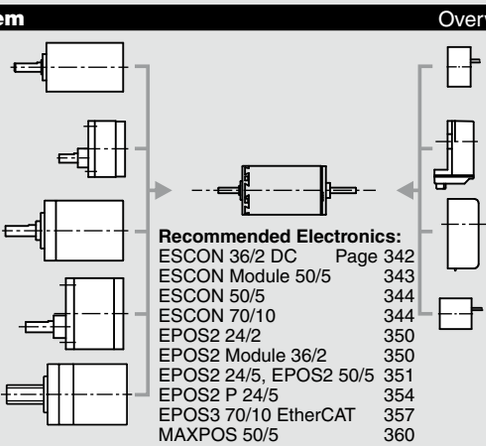
Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

maxon Modular System

Overview on page 20–25

Planetary Gearhead
∅26 mm
0.75 - 4.5 Nm
Page 270
Spur Gearhead
∅30 mm
0.07 - 0.2 Nm
Page 271
Planetary Gearhead
∅32 mm
0.4 - 6.0 Nm
Page 272/273/276
Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282
Spindle Drive
∅32 mm
Page 301–303



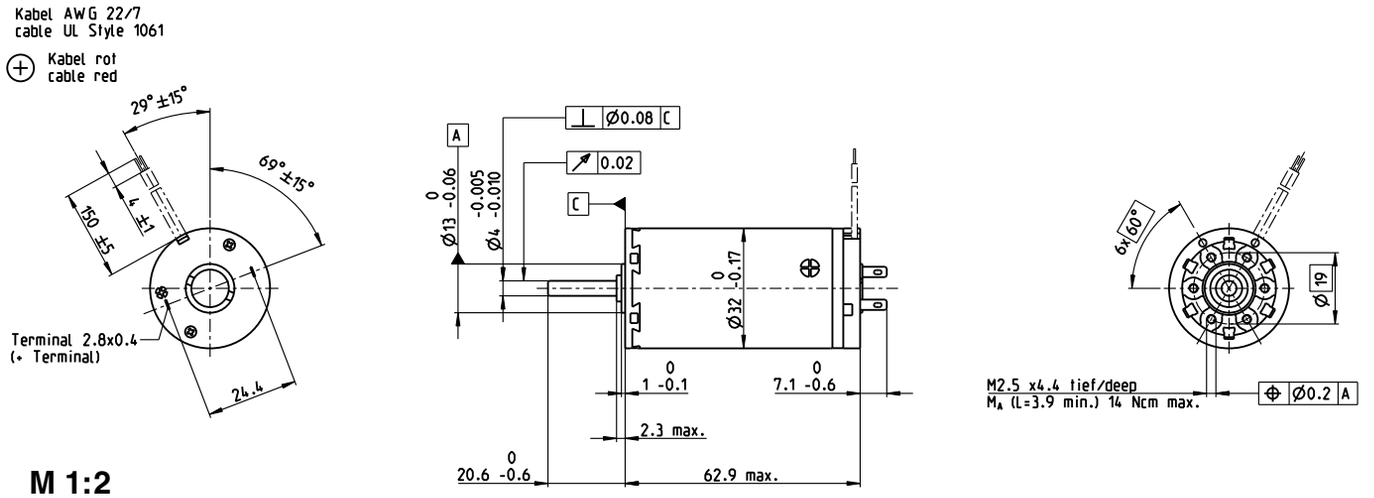
Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
ESCON 70/10	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS2 24/5, EPOS2 50/5	351
EPOS2 P 24/5	354
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

Encoder MR
128 - 1000 CPT,
3 channels
Page 319
Encoder Enc
22 mm
100 CPT, 2 channels
Page 324
Encoder HED_ 5540
500 CPT,
3 channels
Page 326/327
Encoder MEnc
∅13 mm
16 CPT, 2 channels
Page 335

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A-max 32 ∅32 mm, Graphite Brushes, 15 Watt



Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	236643	236644	**236645**	236646	**236647**	236648	236649	236650
with cables	353184	353185	353186	353187	353188	353189	353190	353191

Motor Data

	Values at nominal voltage								
1	Nominal voltage	V	6	9	12	18	24	30	36	48
2	No load speed	rpm	5870	4940	4680	5280	5930	5870	5830	3870
3	No load current	mA	154	83.5	58.6	44.9	38.7	30.6	25.3	11.8
4	Nominal speed	rpm	4110	3090	2920	3590	4210	4160	4100	2090
5	Nominal torque (max. continuous torque)	mNm	36.5	35	37.2	38.3	37.3	37.5	37.1	37
6	Nominal current (max. continuous current)	A	3.95	2.13	1.6	1.23	1.01	0.806	0.661	0.328
7	Stall torque	mNm	127	95.3	101	122	130	130	127	81.6
8	Stall current	A	13.2	5.58	4.19	3.78	3.42	2.7	2.17	0.7
9	Max. efficiency	%	78	77	77	79	80	80	80	76
	Characteristics								
10	Terminal resistance	Ω	0.454	1.61	2.86	4.76	7.03	11.1	16.6	68.6
11	Terminal inductance	mH	0.0657	0.209	0.416	0.739	1.04	1.66	2.43	9.71
12	Torque constant	mNm/A	9.58	17.1	24.1	32.2	38.2	48.2	58.3	117
13	Speed constant	rpm/V	996	559	396	297	250	198	164	81.9
14	Speed / torque gradient	rpm/mNm	47.2	52.8	47	44	46	45.6	46.6	48.2
15	Mechanical time constant	ms	21.9	21.7	21.4	21.3	21.3	21.3	21.4	21.5
16	Rotor inertia	gcm²	44.2	39.2	43.5	46.2	44.2	44.6	43.8	42.6

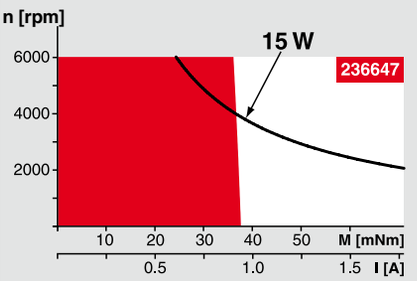
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	7.5 K/W
18	Thermal resistance winding-housing	2.1 K/W
19	Thermal time constant winding	17.8 s
20	Thermal time constant motor	791 s
21	Ambient temperature	-20…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (ball bearings)	
23	Max. speed	6000 rpm
24	Axial play	0.12 - 0.22 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	7.6 N
27	Max. force for press fits (static)	110 N
28	Max. radial load, 5 mm from flange	32 N
	Mechanical data (sleeve bearings)	
23	Max. speed	6000 rpm
24	Axial play	0.12 - 0.22 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	5.0 N
27	Max. force for press fits (static)	110 N
28	Max. radial load, 5 mm from flange	10.5 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	211 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Sleeve bearings in place of ball bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

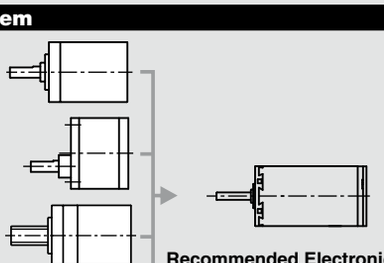
maxon Modular System

Overview on page 20–25

Planetary Gearhead
∅32 mm
0.75 - 6.0 Nm
Page 272–278

Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282

Spindle Drive
∅32 mm
Page 301–303

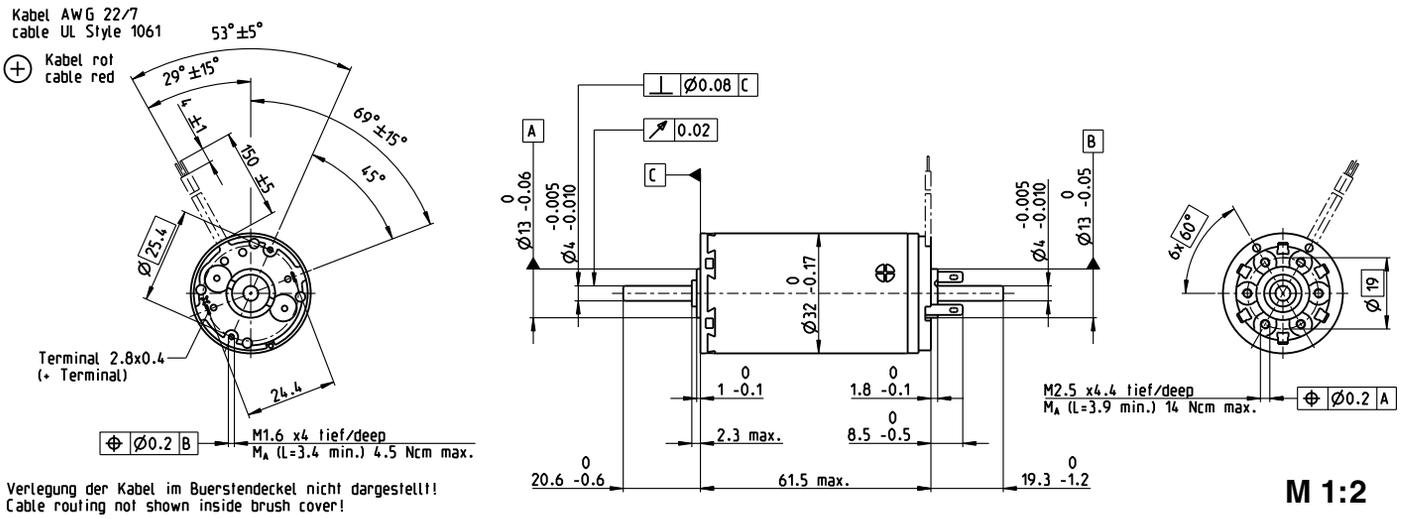


Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
ESCON 70/10	344
Notes	**22**

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A-max 32 ∅32 mm, Graphite Brushes, 15 Watt



Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	236651	236652	**236653**	236654	**236655**	236656	236657	236658
with cables	353220	353221	353222	353223	353224	353225	353226	353227

Motor Data

	Values at nominal voltage								
1	Nominal voltage	V	6	9	12	18	24	30	36	48
2	No load speed	rpm	5870	4940	4680	5280	5930	5870	5830	3870
3	No load current	mA	154	83.5	58.6	44.9	38.7	30.6	25.3	11.8
4	Nominal speed	rpm	4110	3090	2920	3590	4210	4160	4100	2090
5	Nominal torque (max. continuous torque)	mNm	36.5	35	37.2	38.3	37.3	37.5	37.1	37
6	Nominal current (max. continuous current)	A	3.95	2.13	1.6	1.23	1.01	0.806	0.661	0.328
7	Stall torque	mNm	127	95.3	101	122	130	130	127	81.6
8	Stall current	A	13.2	5.58	4.19	3.78	3.42	2.7	2.17	0.7
9	Max. efficiency	%	78	77	77	79	80	80	80	76
	Characteristics								
10	Terminal resistance	Ω	0.454	1.61	2.86	4.76	7.03	11.1	16.6	68.6
11	Terminal inductance	mH	0.0657	0.209	0.416	0.739	1.04	1.66	2.43	9.71
12	Torque constant	mNm/A	9.58	17.1	24.1	32.2	38.2	48.2	58.3	117
13	Speed constant	rpm/V	996	559	396	297	250	198	164	81.9
14	Speed / torque gradient	rpm/mNm	47.2	52.8	47	44	46	45.6	46.6	48.2
15	Mechanical time constant	ms	21.9	21.7	21.4	21.3	21.3	21.3	21.4	21.5
16	Rotor inertia	gcm²	44.2	39.2	43.5	46.2	44.2	44.6	43.8	42.6

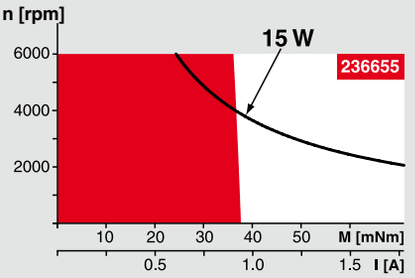
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	7.5 K/W
18	Thermal resistance winding-housing	2.1 K/W
19	Thermal time constant winding	17.8 s
20	Thermal time constant motor	791 s
21	Ambient temperature	-20…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (ball bearings)	
23	Max. speed	6000 rpm
24	Axial play	0.12 - 0.22 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	7.6 N
27	Max. force for press fits (static)	110 N
	(static, shaft supported)	2000 N
28	Max. radial load, 5 mm from flange	32 N
	Mechanical data (sleeve bearings)	
23	Max. speed	6000 rpm
24	Axial play	0.12 - 0.22 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	5.0 N
27	Max. force for press fits (static)	110 N
	(static, shaft supported)	2000 N
28	Max. radial load, 5 mm from flange	10.5 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	211 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Sleeve bearings in place of ball bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

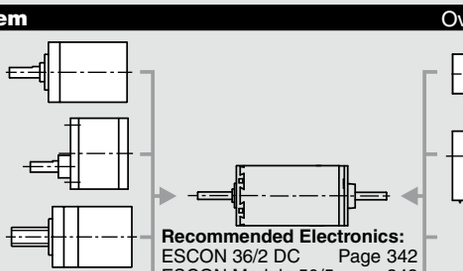
maxon Modular System

Overview on page 20–25

Planetary Gearhead
∅32 mm
0.75 - 6.0 Nm
Page 272–277

Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282

Spindle Drive
∅32 mm
Page 301–303



Encoder MR
256 - 1024 CPT,
3 channels
Page 320

Encoder HED_ 5540
500 CPT,
3 channels
Page 326/327

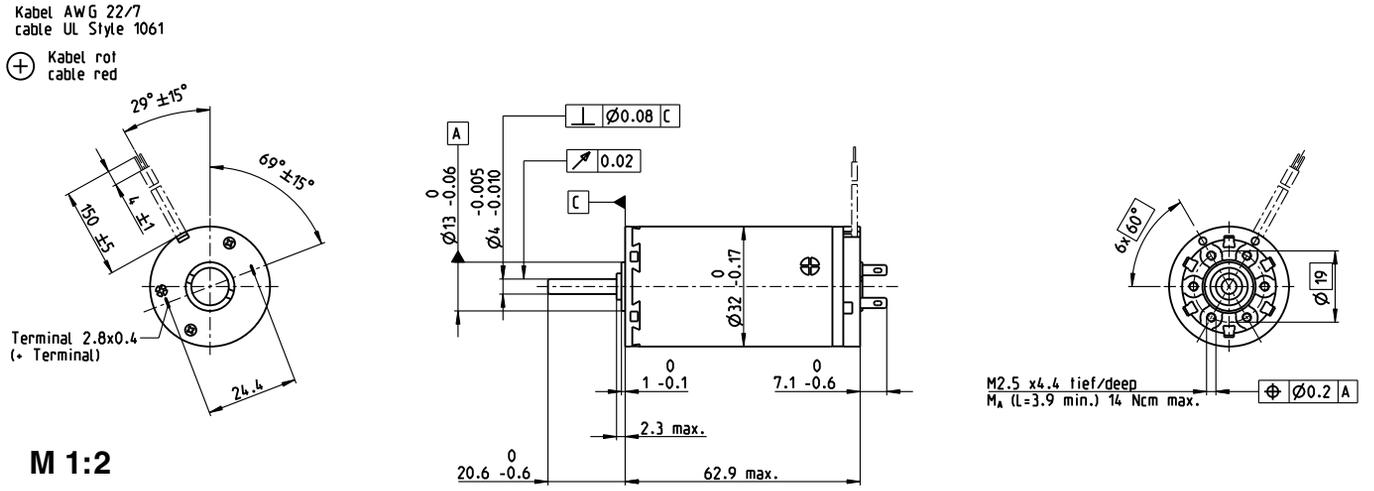
Recommended Electronics:

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Notes	**22**

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A-max 32 ∅32 mm, Graphite Brushes, 20 Watt

High Power



Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	236659	236660	**236661**	**236662**	236663	236664	236665
with cables	353230	353231	353232	262500	341970	353233	353234

Motor Data								
	Values at nominal voltage							
1	Nominal voltage	V	6	9	12	24	30	36	42
2	No load speed	rpm	4880	5000	4670	6460	6160	5860	5650
3	No load current	mA	123	84.2	58.2	42.8	32.3	25.3	20.8
4	Nominal speed	rpm	3400	3480	3170	5060	4740	4430	4210
5	Nominal torque (max. continuous torque)	mNm	44.5	43.1	44	45.5	45.1	45.4	45
6	Nominal current (max. continuous current)	A	3.96	2.62	1.87	1.33	1.01	0.804	0.659
7	Stall torque	mNm	153	146	140	212	197	189	178
8	Stall current	A	13.2	8.57	5.77	6.02	4.27	3.24	2.54
9	Max. efficiency	%	80	81	81	84	83	83	83
	Characteristics							
10	Terminal resistance	Ω	0.454	1.05	2.08	3.99	7.02	11.1	16.6
11	Terminal inductance	mH	0.0601	0.13	0.264	0.556	0.954	1.52	2.22
12	Torque constant	mNm/A	11.6	17	24.3	35.2	46.1	58.2	70.4
13	Speed constant	rpm/V	825	562	394	271	207	164	136
14	Speed / torque gradient	rpm/mNm	32.4	34.8	33.8	30.8	31.6	31.3	31.9
15	Mechanical time constant	ms	15	14.9	14.7	14.6	14.6	14.6	14.7
16	Rotor inertia	gcm²	44.2	40.8	41.7	45.3	44.2	44.6	43.8

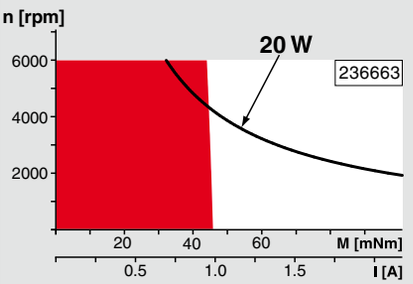
Specifications

	Thermal data	
17	Thermal resistance housing-ambient	7.5 K/W
18	Thermal resistance winding-housing	2.1 K/W
19	Thermal time constant winding	17.8 s
20	Thermal time constant motor	521 s
21	Ambient temperature	-20…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (ball bearings)	
23	Max. speed	6000 rpm
24	Axial play	0.12 - 0.22 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	7.6 N
27	Max. force for press fits (static)	110 N
28	Max. radial load, 5 mm from flange	32 N
	Mechanical data (sleeve bearings)	
23	Max. speed	6000 rpm
24	Axial play	0.12 - 0.22 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	5 N
27	Max. force for press fits (static)	110 N
28	Max. radial load, 5 mm from flange	10.5 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	240 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Sleeve bearings in place of ball bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

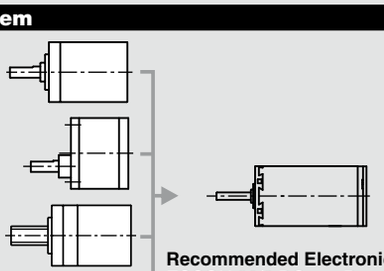
maxon Modular System

Overview on page 20–25

Planetary Gearhead
∅32 mm
0.75 - 6.0 Nm
Page 272–277

Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282

Spindle Drive
∅32 mm
Page 301–303



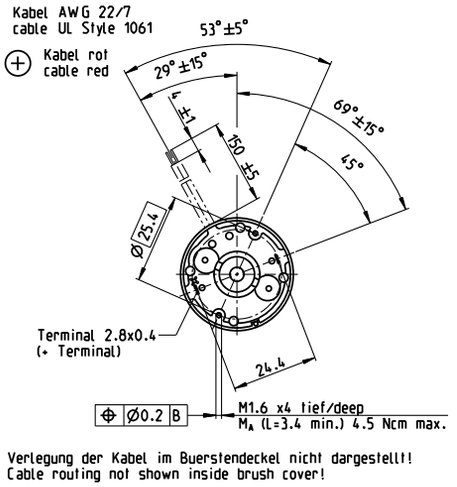
Recommended Electronics:

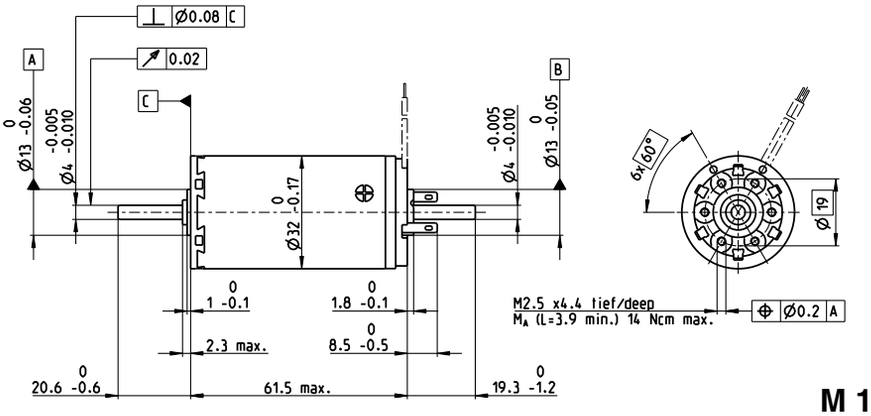
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ESCON Module 50/5	343
ESCON 50/5	344
ESCON 70/10	344
Notes	**22**

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A-max 32 ∅32 mm, Graphite Brushes, 20 Watt

High Power





M 1:2

Stock program
Standard program
Special program (on request)

Part Numbers

with terminals	236666	236667	**236668**	**236669**	236670	236671	236672
with cables	353236	353237	301030	353239	353240	353241	353242

Motor Data

	Values at nominal voltage							
1	Nominal voltage	V	6	9	12	24	30	36	42
2	No load speed	rpm	4880	5000	4670	6460	6160	5860	5650
3	No load current	mA	123	84.2	58.2	42.8	32.3	25.3	20.8
4	Nominal speed	rpm	3400	3480	3170	5060	4740	4430	4210
5	Nominal torque (max. continuous torque)	mNm	44.5	43.1	44	45.5	45.1	45.4	45
6	Nominal current (max. continuous current)	A	3.96	2.62	1.87	1.33	1.01	0.804	0.659
7	Stall torque	mNm	153	146	140	212	197	189	178
8	Stall current	A	13.2	8.57	5.77	6.02	4.27	3.24	2.54
9	Max. efficiency	%	80	81	81	84	83	83	83
	Characteristics							
10	Terminal resistance	Ω	0.454	1.05	2.08	3.99	7.02	11.1	16.6
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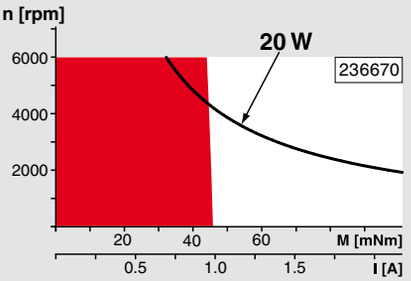
Specifications

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19	Thermal time constant winding	17.8 s
20	Thermal time constant motor	521 s
21	Ambient temperature	-20…+85°C
22	Max. winding temperature	+125°C
	Mechanical data (ball bearings)	
23	Max. speed	6000 rpm
24	Axial play	0.12 - 0.22 mm
25	Radial play	0.025 mm
26	Max. axial load (dynamic)	7.6 N
27	Max. force for press fits (static)	110 N
	(static, shaft supported)	2000 N
28	Max. radial load, 5 mm from flange	32 N
	Mechanical data (sleeve bearings)	
23	Max. speed	6000 rpm
24	Axial play	0.12 - 0.22 mm
25	Radial play	0.012 mm
26	Max. axial load (dynamic)	5.0 N
27	Max. force for press fits (static)	110 N
	(static, shaft supported)	2000 N
28	Max. radial load, 5 mm from flange	10.5 N
	Other specifications	
29	Number of pole pairs	1
30	Number of commutator segments	13
31	Weight of motor	240 g

Values listed in the table are nominal.
Explanation of the figures on page 79.

Option
Sleeve bearings in place of ball bearings

Operating Range



Comments

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

Short term operation
The motor may be briefly overloaded (recurring).

Assigned power rating

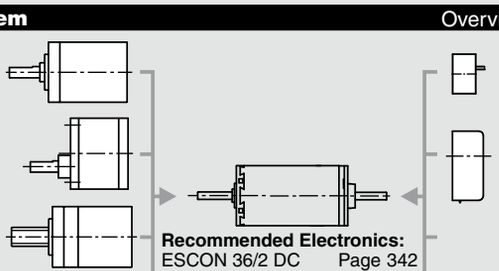
maxon Modular System

Overview on page 20–25

Planetary Gearhead
∅32 mm
0.75 - 6.0 Nm
Page 272–277

Spur Gearhead
∅38 mm
0.1 - 0.6 Nm
Page 282

Spindle Drive
∅32 mm
Page 301–303



Encoder MR
256 - 1024 CPT,
3 channels
Page 320

Encoder HED_ 5540
500 CPT,
3 channels
Page 326/327

Recommended Electronics:

ESCON 36/2 DC	Page 342
ESCON Module 50/5	343
ESCON 50/5	344
ESCON 70/10	344
EPOS2 24/2	350
EPOS2 Module 36/2	350
EPOS2 24/5, EPOS2 50/5	351
EPOS2 P 24/5	354
EPOS3 70/10 EtherCAT	357
MAXPOS 50/5	360
Notes	**22**

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