Precision Drive Systems

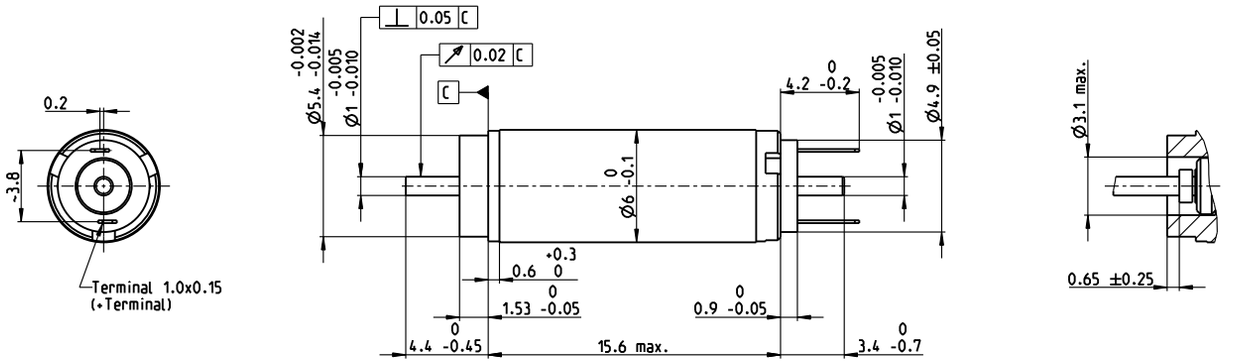
maxon

Product Range 2020/21

DCX 6 M Precious Metal Brushes
DC motor ∅6 mm

Key Data: 0.3/0.56 W, 0.3 mNm, 17300 rpm

DCX



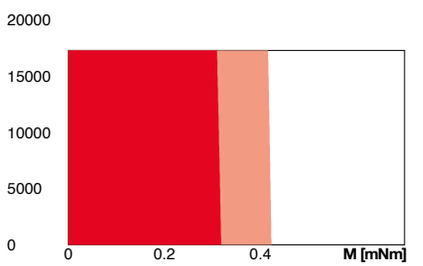
M 5:2

	Motor Data					
1_	Nominal voltage	V	1.5	3	4.5	6
2_	No load speed	rpm	17300	17500	17400	17400
3_	No load current	mA	34.1	17.1	11.4	8.54
4_	Nominal speed	rpm	4950	5940	5730	5690
5_	Nominal torque (max. continuous torque)	mNm	0.309	0.332	0.326	0.325
6_	Nominal current (max. continuous current)	A	0.425	0.228	0.149	0.111
7_	Stall torque	mNm	0.453	0.524	0.507	0.503
8_	Stall current	A	0.581	0.336	0.217	0.161
9_	Max. efficiency	%	58	61	60	60
10_	Terminal resistance	Ω	2.58	9.0	20.8	37.2
11_	Terminal inductance	mH	0.008	0.0316	0.0711	0.126
12_	Torque constant	mNm/A	0.779	1.560	2.34	3.12
13_	Speed constant	rpm/V	12300	6130	4090	3060
14_	Speed/torque gradient	rpm/mNm	40600	35100	36300	36600
15_	Mechanical time constant	ms	7.06	6.74	6.81	6.81
16_	Rotor inertia	gcm²	0.017	0.0183	0.0179	0.018

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	105
18_	Thermal resistance winding-housing	K/W	20
19_	Thermal time constant winding	s	1.71
20_	Thermal time constant motor	s	79
21_	Ambient temperature ball bearings	°C	-30...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	17300
24_	Axial play	mm	0...0.1
	Preload	N	0.5
25_	Radial play	mm	0.012
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	8.8
	(static, shaft supported)	N	100
28_	Max. radial load [mm from flange]	N	0.6 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	17300
24_	Axial play	mm	0.02...0.1
	Preload	N	0
25_	Radial play	mm	0.012
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	10
	(static, shaft supported)	N	100
28_	Max. radial load [mm from flange]	N	0.4 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		5
31_	Weight of motor	g	2.4
32_	Typical noise level	dBA	–

Operating Range

n [rpm] Winding 4.5 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
321_GPX 6 A	1–5	429_ENX 6 MAG	486_ESCON Module 24/2 486_ESCON 36/2 DC 498_EPOS4 Mod./Comp. 24/1.5

Configuration

Bearing: Sleeve bearings/ball bearings preloaded
Commutation: Precious metal brushes
Flange front/back: Standard flange
Shaft front/back: Length
Electric connection: Terminals or cables (encoder always with Flex)

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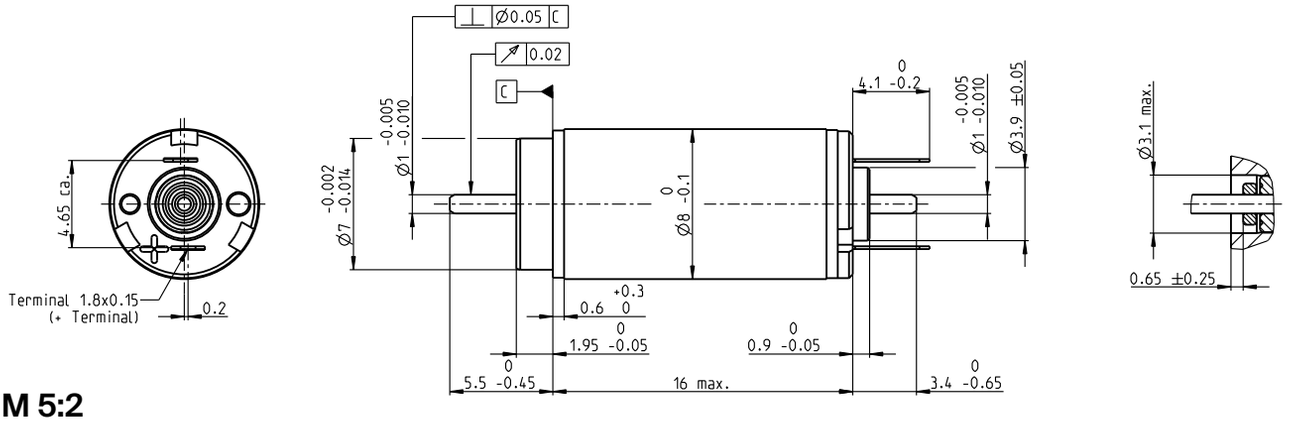
DCX 8 M Precious Metal Brushes
DC motor ∅8 mm

Key Data: 0.5/1.0 W, 0.65 mNm, 17300 rpm

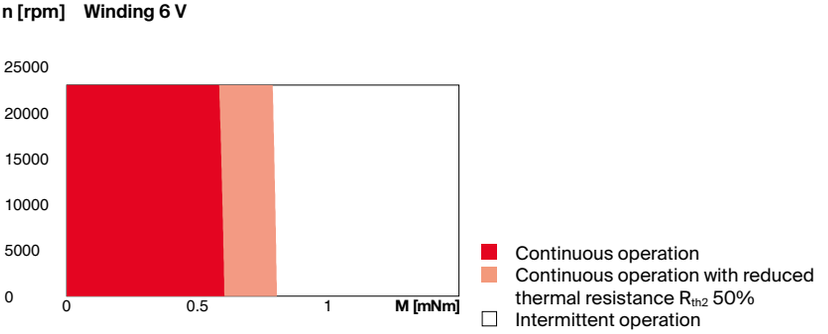


M 5:2

	Motor Data							
1_	Nominal voltage	V	2.4	4.2	6	7.2	9	12
2_	No load speed	rpm	11500	11700	11000	11900	11900	12900
3_	No load current	mA	11.9	6.93	4.51	4.12	3.3	2.74
4_	Nominal speed	rpm	4780	4950	4190	4820	5190	5800
5_	Nominal torque (max. continuous torque)	mNm	0.653	0.649	0.641	0.62	0.652	0.614
6_	Nominal current (max. continuous current)	A	0.345	0.199	0.13	0.113	0.0949	0.0728
7_	Stall torque	mNm	1.13	1.14	1.05	1.06	1.17	1.13
8_	Stall current	A	0.581	0.34	0.207	0.187	0.166	0.13
9_	Max. efficiency	%	74	74	73	73	74	74
10_	Terminal resistance	Ω	4.13	12	29	38.5	54.3	92.2
11_	Terminal inductance	mH	0.014	0.0411	0.0941	0.117	0.183	0.276
12_	Torque constant	mNm/A	1.95	3.360	5.08	5.67	7.07	8.71
13_	Speed constant	rpm/V	4900	2850	1880	1680	1350	1100
14_	Speed/torque gradient	rpm/mNm	10400	10500	10700	11400	10400	11600
15_	Mechanical time constant	ms	4.17	4.15	4.18	4.24	4.15	4.28
16_	Rotor inertia	gcm²	0.038	0.0379	0.0372	0.035	0.038	0.035

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	101
18_	Thermal resistance winding-housing	K/W	16.9
19_	Thermal time constant winding	s	2.31
20_	Thermal time constant motor	s	162
21_	Ambient temperature ball bearings	°C	-30...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	17300
24_	Axial play	mm	0...0.1
	Preload	N	0.5
25_	Radial play	mm	0.012
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	8.8
	(static, shaft supported)	N	100
28_	Max. radial load [mm from flange]	N	0.6 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	17300
24_	Axial play	mm	0.02...0.1
	Preload	N	0
25_	Radial play	mm	0.012
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	10
	(static, shaft supported)	N	100
28_	Max. radial load [mm from flange]	N	0.4 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		5
31_	Weight of motor	g	4.4
32_	Typical noise level	dBA	–

Operating Range



maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
322_GPX 8 A	1–5	430_ENX 8 MAG	486_ESCON Module 24/2 486_ESCON 36/2 DC 498_EPOS4 Mod./Comp. 24/1.5

Configuration

Bearing: Sleeve bearings/ball bearings preloaded
Commutation: Precious metal brushes with or without CLL
Flange front/back: Standard flange
Shaft front/back: Length
Electric connection: Terminals or cables (encoder always with Flex)

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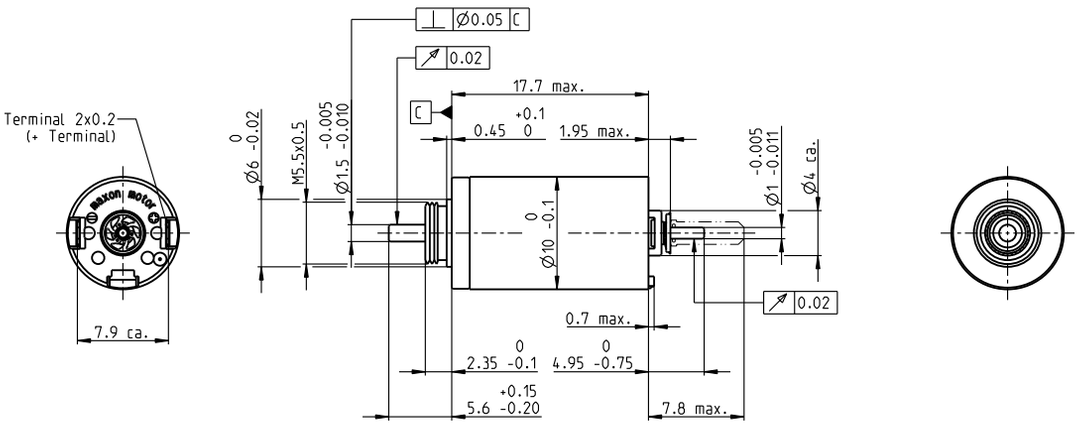
DCX 10 S Precious Metal Brushes
DC motor ∅10 mm

Key Data: 1/1.4 W, 0.9 mNm, 14300 rpm

DCX



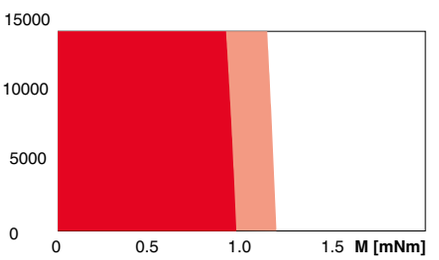
M 3:2

	Motor Data							
1_	Nominal voltage	V	1.5	3	4.5	6	9	12
2_	No load speed	rpm	12600	13000	12600	11400	12600	12500
3_	No load current	mA	84.1	43.8	28	18.2	14	10.5
4_	Nominal speed	rpm	4530	4690	4270	3310	3930	3890
5_	Nominal torque (max. continuous torque)	mNm	0.918	0.948	0.944	0.993	0.909	0.905
6_	Nominal current (max. continuous current)	A	0.924	0.49	0.316	0.223	0.152	0.114
7_	Stall torque	mNm	1.49	1.54	1.48	1.46	1.38	1.37
8_	Stall current	A	1.39	0.742	0.463	0.307	0.215	0.16
9_	Max. efficiency	%	58	58	58	58	56	56
10_	Terminal resistance	Ω	1.08	4.04	9.72	19.5	41.8	74.9
11_	Terminal inductance	mH	0.014	0.051	0.122	0.268	0.488	0.868
12_	Torque constant	mNm/A	1.07	2.07	3.2	4.74	6.4	8.53
13_	Speed constant	rpm/V	8950	4600	2980	2010	1490	1120
14_	Speed/torque gradient	rpm/mNm	9030	8970	9060	8290	9750	9830
15_	Mechanical time constant	ms	7.24	7.19	7.21	7.03	7.27	7.26
16_	Rotor inertia	gcm²	0.077	0.077	0.076	0.081	0.071	0.071

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	37.6
18_	Thermal resistance winding-housing	K/W	22.0
19_	Thermal time constant winding	s	4.69
20_	Thermal time constant motor	s	156
21_	Ambient temperature ball bearings	°C	-40...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	14300
24_	Axial play	mm	0...0.1
	Preload	N	0.5
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.5
27_	Max. force for press fits (static)	N	8.8
	(static, shaft supported)	N	120
28_	Max. radial load [mm from flange]	N	1.5 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	14300
24_	Axial play	mm	0...0.15
	Preload	N	0
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	30
	(static, shaft supported)	N	120
28_	Max. radial load [mm from flange]	N	0.8 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		7
31_	Weight of motor	g	6.3
32_	Typical noise level	dBA	35

Operating Range

n [rpm] Winding 4.5 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
323_GPX 10 A	1–5	433_ENX 10 EASY	486_ESCON Module 24/2
		433_ENX 10 QUAD	486_ESCON 36/2 DC
		434_ENX 10 EASY XT	498_EPOS4 Mod./Comp. 24/1.5

Configuration

Bearing: Sleeve bearings/ball bearings preloaded
Commutation: Precious metal brushes with or without CLL
Flange front/back: Standard flange/Flange with thread holes/no flange
Shaft front/back: Length
Electric connection: Terminals or cable/cable length/connector type

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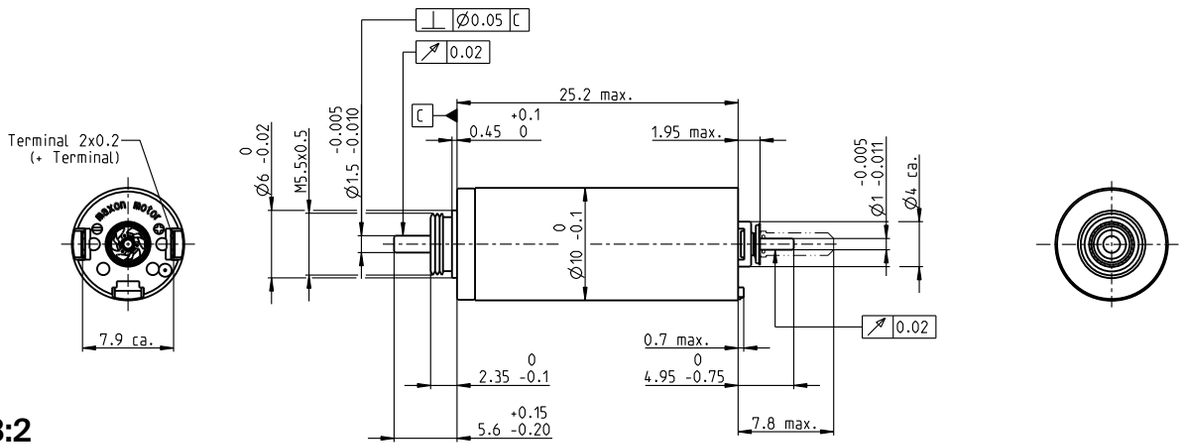
DCX 10 L Precious Metal Brushes
DC motor ∅10 mm

DCX

Key Data: 1.5/3 W, 2.2 mNm, 14 300 rpm



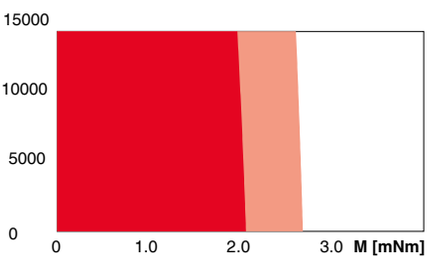
M 3:2

	Motor Data							
1_	Nominal voltage	V	1.5	3	4.5	6	9	12
2_	No load speed	rpm	11600	12200	12000	12200	12000	11300
3_	No load current	mA	72.1	38.7	25.2	19.3	12.6	8.71
4_	Nominal speed	rpm	9230	6930	7110	6640	6780	5980
5_	Nominal torque (max. continuous torque)	mNm	1.04	2.05	2.2	1.94	2.06	2.03
6_	Nominal current (max. continuous current)	A	0.924	0.922	0.648	0.436	0.304	0.211
7_	Stall torque	mNm	5.13	4.81	5.45	4.32	4.8	4.36
8_	Stall current	A	4.23	2.09	1.55	0.937	0.682	0.439
9_	Max. efficiency	%	75	75	77	74	75	74
10_	Terminal resistance	Ω	0.355	1.44	2.9	6.4	13.2	27.3
11_	Terminal inductance	mH	0.005	0.020	0.045	0.078	0.181	0.362
12_	Torque constant	mNm/A	1.21	2.31	3.52	4.61	7.04	10.0
13_	Speed constant	rpm/V	7870	4140	2710	2070	1360	960
14_	Speed/torque gradient	rpm/mNm	2300	2590	2240	2880	2550	2640
15_	Mechanical time constant	ms	3.68	3.57	3.54	3.58	3.56	3.59
16_	Rotor inertia	gcm²	0.153	0.132	0.151	0.119	0.134	0.130

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	36.5
18_	Thermal resistance winding-housing	K/W	10.6
19_	Thermal time constant winding	s	3.94
20_	Thermal time constant motor	s	151
21_	Ambient temperature ball bearings	°C	-40...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	14 300
24_	Axial play	mm	0...0.1
	Preload	N	0.5
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.5
27_	Max. force for press fits (static)	N	8.8
	(static, shaft supported)	N	120
28_	Max. radial load [mm from flange]	N	1.5 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	14 300
24_	Axial play	mm	0...0.15
	Preload	N	0
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	30
	(static, shaft supported)	N	120
28_	Max. radial load [mm from flange]	N	0.8 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		7
31_	Weight of motor	g	11
32_	Typical noise level	dBA	37

Operating Range

n [rpm] Winding 4.5 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
323_GPX 10 A	1–5	433_ENX 10 EASY	486_ESCON Module 24/2
		433_ENX 10 QUAD	486_ESCON 36/2 DC
		434_ENX 10 EASY XT	498_EPOS4 Mod./Comp. 24/1.5

Configuration

Bearing: Sleeve bearings/ball bearings preloaded
Commutation: Precious metal brushes with or without CLL
Flange front/back: Standard flange/Flange with thread holes/no flange
Shaft front/back: Length
Electric connection: Terminals or cable/cable length/connector type

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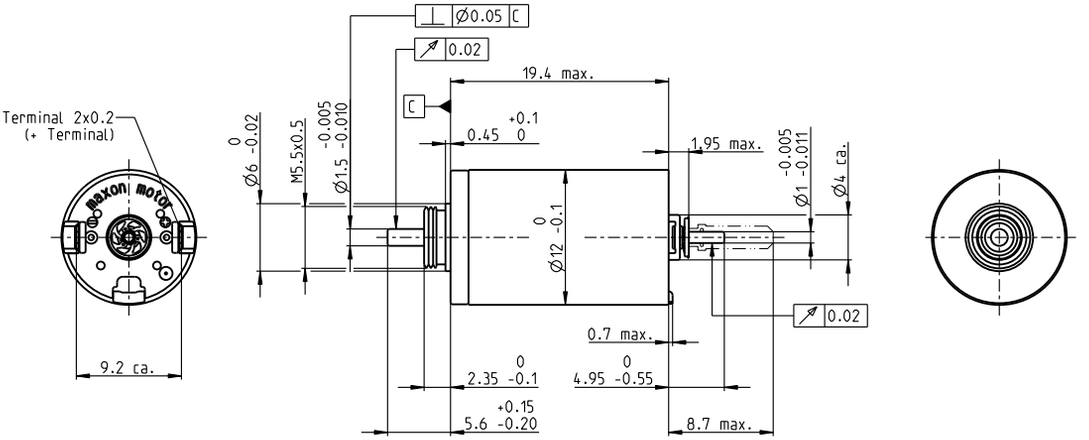
DCX 12 S Precious Metal Brushes
DC motor ∅12 mm

Key Data: 1.6/2 W, 2.0 mNm, 13 000 rpm



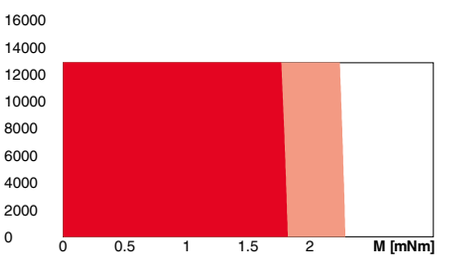
M 3:2

	Motor Data						
1_	Nominal voltage	V	3	4.5	6	9	12
2_	No load speed	rpm	9090	9000	9100	9010	9020
3_	No load current	mA	31.8	20.9	15.9	10.5	7.88
4_	Nominal speed	rpm	3760	3620	3870	3700	3620
5_	Nominal torque (max. continuous torque)	mNm	1.92	1.9	1.95	1.92	1.88
6_	Nominal current (max. continuous current)	A	0.655	0.427	0.332	0.216	0.159
7_	Stall torque	mNm	3.35	3.25	3.46	3.33	3.21
8_	Stall current	A	1.09	0.701	0.566	0.36	0.261
9_	Max. efficiency	%	69	69	70	69	69
10_	Terminal resistance	Ω	2.74	6.42	10.6	25	46
11_	Terminal inductance	mH	0.0724	0.166	0.29	0.664	1.17
12_	Torque constant	mNm/A	3.06	4.63	6.12	9.26	12.3
13_	Speed constant	rpm/V	3120	2060	1560	1030	775
14_	Speed/torque gradient	rpm/mNm	2800	2860	2700	2780	2890
15_	Mechanical time constant	ms	8.37	8.32	8.31	8.33	8.33
16_	Rotor inertia	gcm²	0.286	0.278	0.293	0.286	0.275

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	35
18_	Thermal resistance winding-housing	K/W	14.4
19_	Thermal time constant winding	s	7.18
20_	Thermal time constant motor	s	146
21_	Ambient temperature ball bearings	°C	-40...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	13 000
24_	Axial play	mm	0...0.1
	Preload	N	0.5
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.5
27_	Max. force for press fits (static)	N	8.8
	(static, shaft supported)	N	120
28_	Max. radial load [mm from flange]	N	1.5 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	13 000
24_	Axial play	mm	0...0.15
	Preload	N	0
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	30
	(static, shaft supported)	N	120
28_	Max. radial load [mm from flange]	N	0.8 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		7
31_	Weight of motor	g	11
32_	Typical noise level	dBA	40

Operating Range

n [rpm] Winding 4.5 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
324_GPX 12 A/C	1–4	433_ENX 10 EASY	486_ESCON Module 24/2
325_GPX 12 LN/LZ	1–4	433_ENX 10 QUAD	486_ESCON 36/2 DC
326_GPX 12 HP	2–4	434_ENX 10 EASY XT	498_EPOS4 Mod./Comp. 24/1.5
328_GPX 14 A/C	3–4		
329_GPX 14 LN/LZ	3–4		
330_GPX 14 HP	4		

Configuration

Bearing: Sleeve bearings/ball bearings preloaded
Commutation: Precious metal brushes with or without CLL
Flange front/back: Standard flange/Flange with thread holes/no flange
Shaft front/back: Length
Electric connection: Terminals or cable/cable length/connector type

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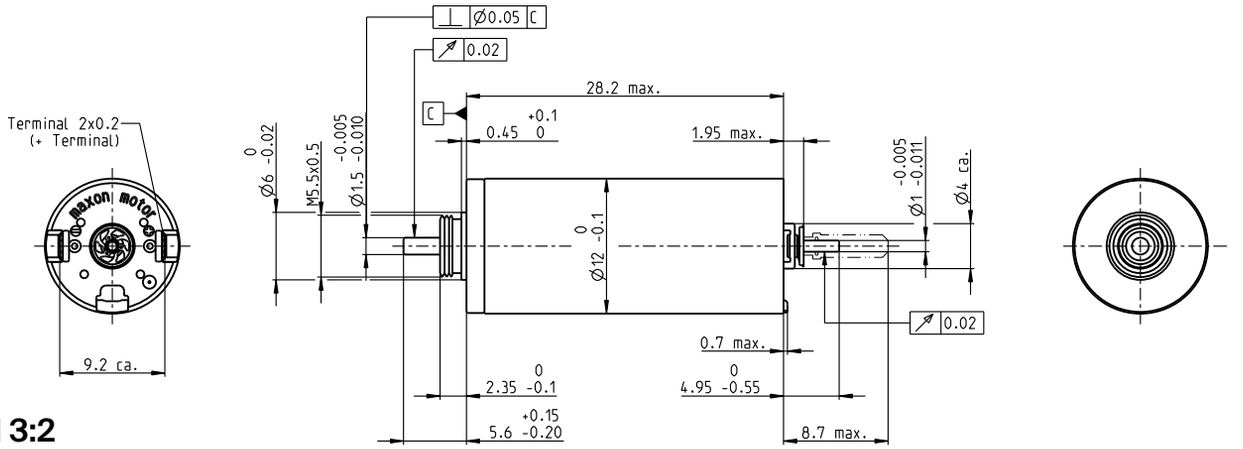
DCX 12 L Precious Metal Brushes
DC motor ∅12 mm

DCX

Key Data: 2.5/4.8 W, 4.2 mNm, 12 000 rpm

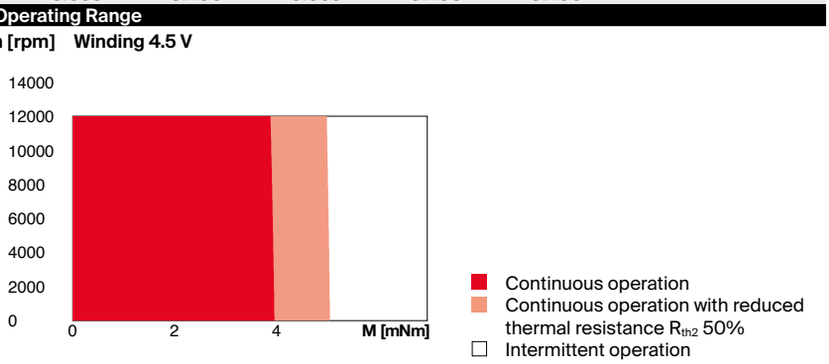


M 3:2

	Motor Data							
1_	Nominal voltage	V	3	4.5	6	9	12	18
2_	No load speed	rpm	8810	8820	8810	8820	8810	8810
3_	No load current	mA	31.3	20.9	15.7	10.4	7.83	5.22
4_	Nominal speed	rpm	6230	5640	5540	5750	5560	5540
5_	Nominal torque (max. continuous torque)	mNm	2.88	4.02	3.88	4.13	3.89	3.87
6_	Nominal current (max. continuous current)	A	0.924	0.851	0.616	0.437	0.309	0.205
7_	Stall torque	mNm	9.9	11.2	10.5	11.9	10.6	10.5
8_	Stall current	A	3.08	2.32	1.63	1.23	0.824	0.543
9_	Max. efficiency	%	81	82	82	83	82	82
10_	Terminal resistance	Ω	0.975	1.94	3.68	7.29	14.6	33.1
11_	Terminal inductance	mH	0.031	0.071	0.125	0.282	0.502	1.13
12_	Torque constant	mNm/A	3.22	4.83	6.44	9.66	12.9	19.3
13_	Speed constant	rpm/V	2970	1980	1480	989	741	494
14_	Speed/torque gradient	rpm/mNm	898	793	846	746	839	848
15_	Mechanical time constant	ms	4.55	4.43	4.4	4.37	4.38	4.39
16_	Rotor inertia	gcm²	0.484	0.533	0.496	0.559	0.498	0.495

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	31
18_	Thermal resistance winding-housing	K/W	10.3
19_	Thermal time constant winding	s	10.1
20_	Thermal time constant motor	s	194
21_	Ambient temperature ball bearings	°C	-40...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	12 000
24_	Axial play	mm	0...0.1
	Preload	N	0.5
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.5
27_	Max. force for press fits (static)	N	8.8
	(static, shaft supported)	N	120
28_	Max. radial load [mm from flange]	N	1.5 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	12 000
24_	Axial play	mm	0...0.15
	Preload	N	0
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	30
	(static, shaft supported)	N	120
28_	Max. radial load [mm from flange]	N	0.8 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		7
31_	Weight of motor	g	16
32_	Typical noise level	dBA	44

Operating Range



maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
324_GPX 12 A/C	1–4	433_ENX 10 EASY	486_ESCON Module 24/2
325_GPX 12 LN/LZ	1–4	433_ENX 10 QUAD	486_ESCON 36/2 DC
326_GPX 12 HP	2–4	434_ENX 10 EASY XT	498_EPOS4 Mod./Comp. 24/1.5
328_GPX 14 A/C	3–4		
329_GPX 14 LN/LZ	3–4		
330_GPX 14 HP	4		

Configuration

Bearing: Sleeve bearings/ball bearings preloaded
Commutation: Precious metal brushes with or without CLL
Flange front/back: Standard flange/Flange with thread holes/no flange
Shaft front/back: Length
Electric connection: Terminals or cable/cable length/connector type

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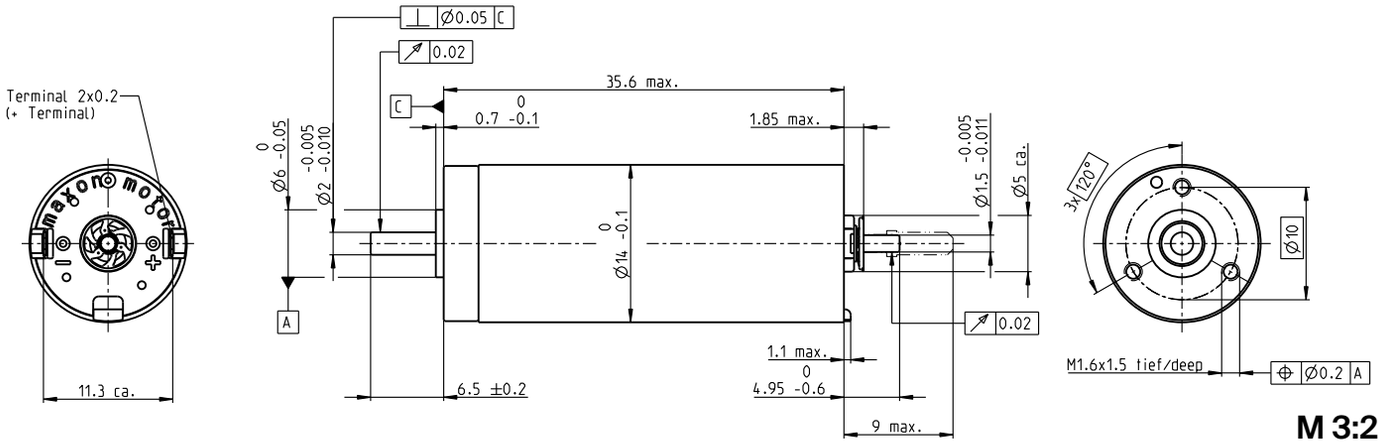
DCX 14 L Precious Metal Brushes
DC motor ∅14 mm

Key Data: 3/5 W, 6.3 mNm, 8680 rpm

DCX



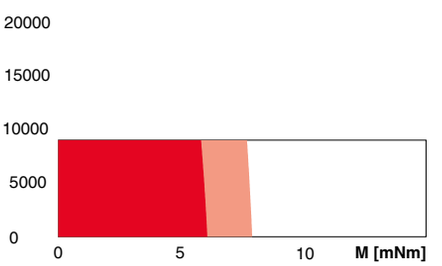
M 3:2

	Motor Data								
1_	Nominal voltage	V	3	4.5	6	9	12	18	24
2_	No load speed	rpm	7720	7740	7740	7740	7740	7730	7740
3_	No load current	mA	73.6	49.1	36.8	24.5	18.4	12.2	9.2
4_	Nominal speed	rpm	5770	5160	5140	5200	5200	5040	5150
5_	Nominal torque (max. continuous torque)	mNm	4.12	6.29	6.23	6.37	6.38	6.01	6.24
6_	Nominal current (max. continuous current)	A	1.2	1.2	0.889	0.605	0.454	0.286	0.223
7_	Stall torque	mNm	16.5	19.1	18.8	19.6	19.7	17.5	18.9
8_	Stall current	A	4.52	3.49	2.57	1.79	1.35	0.799	0.647
9_	Max. efficiency	%	76	77.7	77.6	78	78.1	77	77.7
10_	Terminal resistance	Ω	0.664	1.29	2.33	5.02	8.9	22.5	37.1
11_	Terminal inductance	mH	0.0252	0.0567	0.101	0.227	0.403	0.908	1.61
12_	Torque constant	mNm/A	3.65	5.47	7.3	10.9	14.6	21.9	29.2
13_	Speed constant	rpm/V	2620	1740	1310	872	654	436	327
14_	Speed/torque gradient	rpm/mNm	476	411	418	400	399	449	415
15_	Mechanical time constant	ms	4.14	4.06	4.05	4.04	4.05	4.1	4.09
16_	Rotor inertia	gcm²	0.831	0.942	0.926	0.966	0.97	0.872	0.939

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	22.2
18_	Thermal resistance winding-housing	K/W	8.63
19_	Thermal time constant winding	s	10.3
20_	Thermal time constant motor	s	226
21_	Ambient temperature ball bearings	°C	-40...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	8680
24_	Axial play	mm	0...0.1
	Preload	N	0.8
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.8
27_	Max. force for press fits (static)	N	18
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	10 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	8680
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	60
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	2 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		7
31_	Weight of motor	g	26
32_	Typical noise level	dBA	44

Operating Range

n [rpm] Winding 9 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
328_GPX 14 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
329_GPX 14 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
330_GPX 14 HP	2–3 [4]	434_ENX 10 EASY XT	498_EPOS4 Mod./Comp. 24/1.5
331_GPX 16 A/C	3–4		
332_GPX 16 LN/LZ	3–4		
333_GPX 16 HP	4		

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with CLL/graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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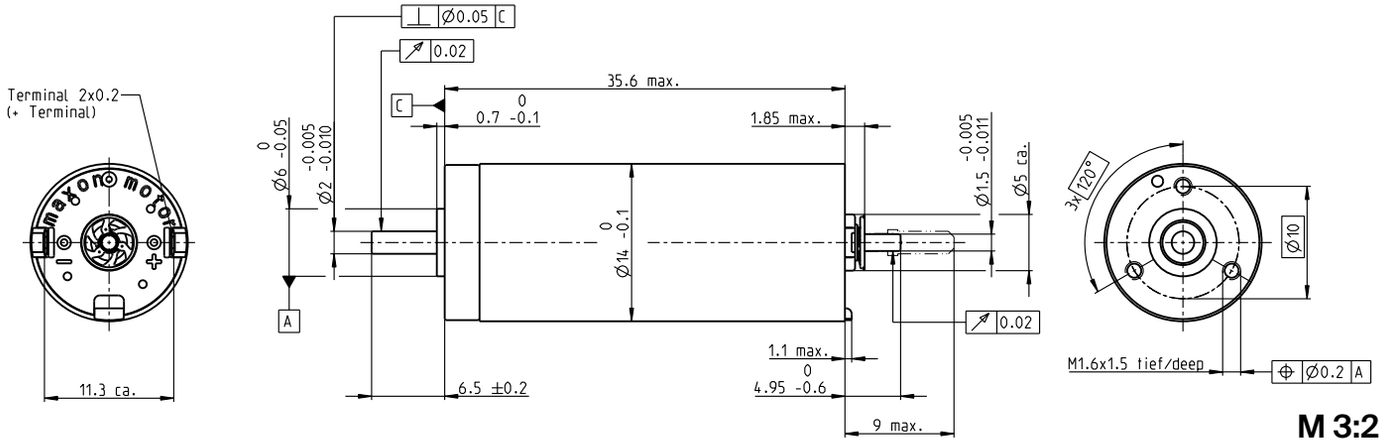
DCX 14 L Graphite Brushes
DC motor ∅14 mm

DCX

Key Data: 6/10 W, 6.9 mNm, 17000 rpm



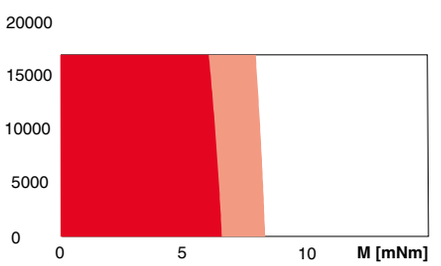
M 3:2

	Motor Data							
1_	Nominal voltage	V	4.5	6	9	12	18	24
2_	No load speed	rpm	11600	10400	11700	10300	11600	10300
3_	No load current	mA	73.9	46.4	37	23.2	18.5	11.6
4_	Nominal speed	rpm	8460	7430	8750	7370	8760	7300
5_	Nominal torque (max. continuous torque)	mNm	6.36	6.96	6.88	6.91	6.94	6.66
6_	Nominal current (max. continuous current)	A	1.81	1.31	0.974	0.651	0.492	0.314
7_	Stall torque	mNm	23.5	24.8	27.8	24.7	28.5	22.9
8_	Stall current	A	6.45	4.53	3.8	2.26	1.95	1.05
9_	Max. efficiency	%	79.5	80.8	81.4	80.1	81.3	80.1
10_	Terminal resistance	Ω	0.698	1.33	2.37	5.31	9.21	22.9
11_	Terminal inductance	mH	0.0252	0.0567	0.101	0.227	0.403	0.908
12_	Torque constant	mNm/A	3.65	5.47	7.3	10.9	14.6	21.9
13_	Speed constant	rpm/V	2620	1740	1310	872	654	436
14_	Speed/torque gradient	rpm/mNm	500	422	424	423	413	456
15_	Mechanical time constant	ms	4.35	4.17	4.11	4.28	4.19	4.17
16_	Rotor inertia	gcm²	0.831	0.942	0.926	0.966	0.97	0.872

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	22.2
18_	Thermal resistance winding-housing	K/W	8.63
19_	Thermal time constant winding	s	10.3
20_	Thermal time constant motor	s	226
21_	Ambient temperature ball bearings	°C	-40...+100
	Ambient temperature sleeve bearings	°C	-30...+100
22_	Max. winding temperature	°C	125
	Mechanical data ball bearings		
23_	Max. speed	rpm	17000
24_	Axial play	mm	0...0.1
	Preload	N	0.8
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.8
27_	Max. force for press fits (static)	N	18
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	10 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	15000
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	60
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	2 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		7
31_	Weight of motor	g	26
32_	Typical noise level	dBA	40

Operating Range

n [rpm] Winding 12 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
328_GPX 14 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
329_GPX 14 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
330_GPX 14 HP	2–3 [4]	434_ENX 10 EASY XT	498_EPOS4 Mod./Comp. 24/1.5
331_GPX 16 A/C	3–4		
332_GPX 16 LN/LZ	3–4		
333_GPX 16 HP	4		

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with CLL/graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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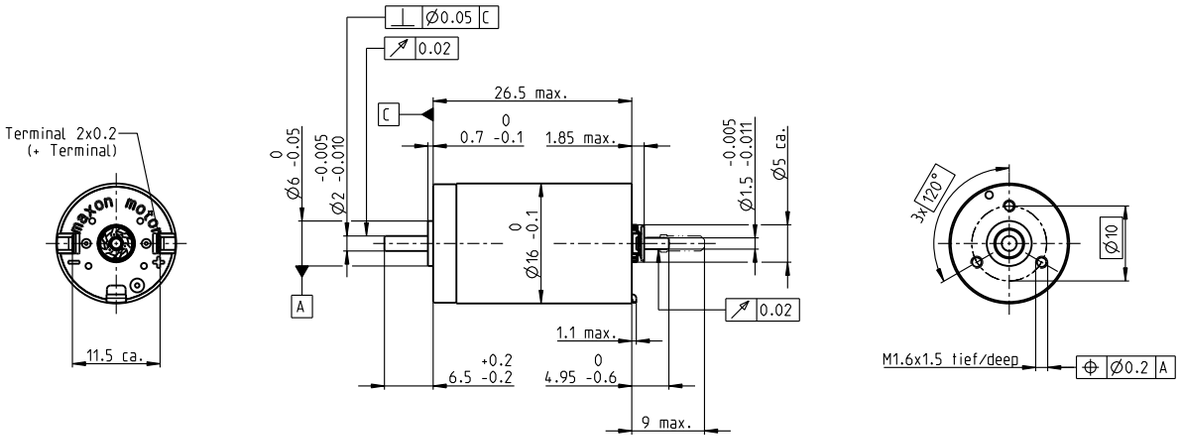
DCX 16 S Precious Metal Brushes
DC motor ∅16 mm

DCX

Key Data: 3/5 W, 5.3 mNm, 8680 rpm



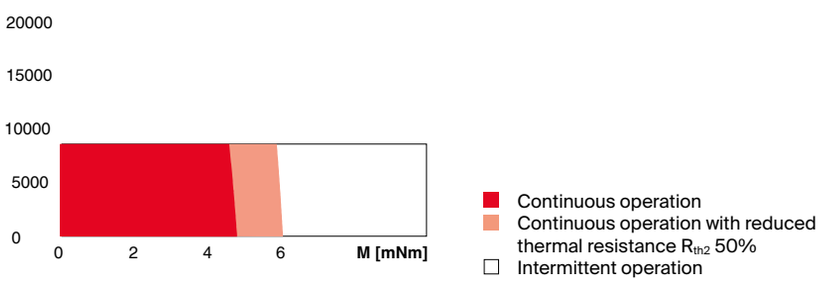
M 1:1

	Motor Data								
1_	Nominal voltage	V	3	4.5	6	9	12	18	24
2_	No load speed	rpm	6320	6320	6610	6320	6260	6340	6250
3_	No load current	mA	44.6	29.7	23.4	14.9	11	7.43	5.51
4_	Nominal speed	rpm	3350	3300	3760	3270	3320	3530	3200
5_	Nominal torque (max. continuous torque)	mNm	5.15	5.05	5.36	5	5.19	5.45	4.99
6_	Nominal current (max. continuous current)	A	1.20	0.784	0.65	0.389	0.299	0.211	0.144
7_	Stall torque	mNm	11.1	10.7	12.6	10.6	11.2	12.5	10.4
8_	Stall current	A	2.49	1.61	1.48	0.791	0.624	0.467	0.289
9_	Max. efficiency	%	75	75	77	75	75	77	74
10_	Terminal resistance	Ω	1.20	2.80	4.06	11.4	19.2	38.6	83.1
11_	Terminal inductance	mH	0.036	0.080	0.131	0.320	0.581	1.28	2.32
12_	Torque constant	mNm/A	4.45	6.67	8.53	13.3	18.0	26.7	36.0
13_	Speed constant	rpm/V	2150	1430	1120	715	531	358	265
14_	Speed/torque gradient	rpm/mNm	580	600	533	610	568	517	613
15_	Mechanical time constant	ms	6.09	6.09	6.05	6.13	6.11	6.08	6.17
16_	Rotor inertia	gcm²	1.00	0.97	1.08	0.959	1.03	1.12	0.960

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	23.5
18_	Thermal resistance winding-housing	K/W	9.9
19_	Thermal time constant winding	s	9.63
20_	Thermal time constant motor	s	227
21_	Ambient temperature ball bearings	°C	-40...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	8680
24_	Axial play	mm	0...0.1
	Preload	N	0.8
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.8
27_	Max. force for press fits (static)	N	18
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	10 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	8680
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	60
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	2 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		7
31_	Weight of motor	g	26
32_	Typical noise level	dBA	40

Operating Range

n [rpm] Winding 12 V



maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
331_GPX 16 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
332_GPX 16 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
333_GPX 16 HP	2–3 [4]	434_ENX 10 EASY XT	496_EPOS4 Mod. 24/1.5
335_GPX 19 A/C	3–4	436_ENX 16 EASY	498_EPOS4 Comp. 24/1.5
336_GPX 19 LN/LZ	3–4	437_ENX 16 EASY XT	501_EPOS4 50/5
337_GPX 19 HP	4	438_ENX 16 EASY Abs.	
		439_ENX 16 EASY Abs. XT	
		443_ENX 16 RIO	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with CLL/graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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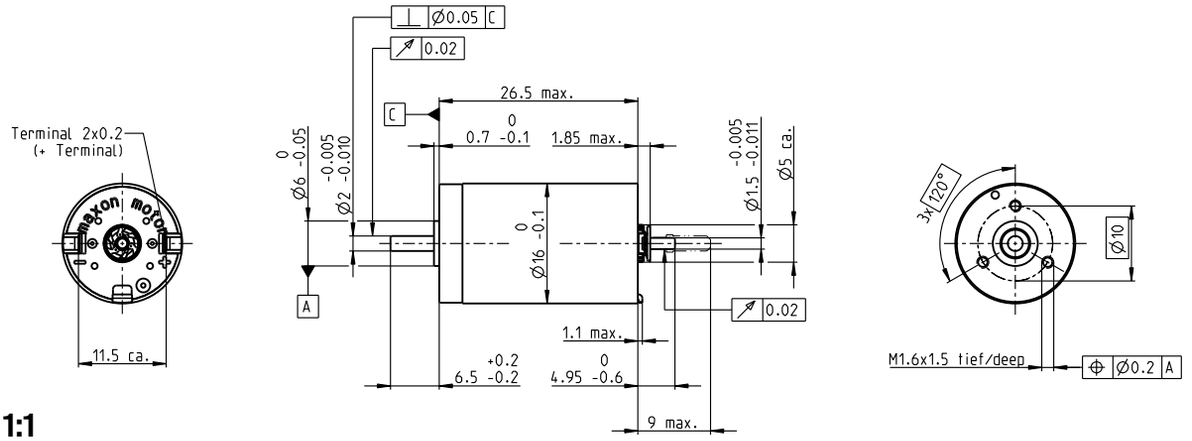
DCX 16 S Graphite Brushes
DC motor ∅16 mm

Key Data: 5/10 W, 5.4 mNm, 17000 rpm



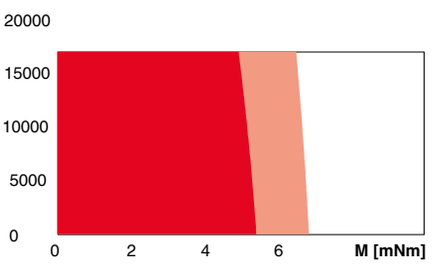
M 1:1

	Motor Data							
1_	Nominal voltage	V	6	9	12	18	24	48
2_	No load speed	rpm	12700	12700	13200	12700	12700	12600
3_	No load current	mA	63.9	42.6	35.4	22.4	16.8	8.28
4_	Nominal speed	rpm	9400	9400	9850	9260	9430	9250
5_	Nominal torque (max. continuous torque)	mNm	5.45	5.4	5.36	5.21	5.43	5.32
6_	Nominal current (max. continuous current)	A	1.28	0.847	0.662	0.411	0.321	0.156
7_	Stall torque	mNm	21.3	21	22.6	20.1	21.7	20.6
8_	Stall current	A	4.79	3.15	2.65	1.51	1.22	0.572
9_	Max. efficiency	%	78	78	76	76	78	77
10_	Terminal resistance	Ω	1.25	2.85	4.53	12	19.7	83.9
11_	Terminal inductance	mH	0.036	0.080	0.131	0.320	0.569	2.32
12_	Torque constant	mNm/A	4.45	6.67	8.53	13.3	17.8	36.0
13_	Speed constant	rpm/V	2150	1430	1120	715	536	265
14_	Speed/torque gradient	rpm/mNm	605	612	594	641	592	620
15_	Mechanical time constant	ms	6.35	6.21	6.74	6.43	6.32	6.23
16_	Rotor inertia	gcm²	1.00	0.970	1.08	0.959	1.02	0.960

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	23.5
18_	Thermal resistance winding-housing	K/W	9.9
19_	Thermal time constant winding	s	9.63
20_	Thermal time constant motor	s	227
21_	Ambient temperature ball bearings	°C	-40...+100
	Ambient temperature sleeve bearings	°C	-30...+100
22_	Max. winding temperature	°C	125
	Mechanical data ball bearings		
23_	Max. speed	rpm	17000
24_	Axial play	mm	0...0.1
	Preload	N	0.8
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.8
27_	Max. force for press fits (static)	N	18
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	10 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	17000
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	60
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	2 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		7
31_	Weight of motor	g	26
32_	Typical noise level	dBA	38

Operating Range

n [rpm] Winding 12 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
331_GPX 16 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
332_GPX 16 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
333_GPX 16 HP	2–3 [4]	434_ENX 10 EASY XT	487_ESCON Module 50/5
335_GPX 19 A/C	3–4	436_ENX 16 EASY	489_ESCON 50/5
336_GPX 19 LN/LZ	3–4	437_ENX 16 EASY XT	496_EPOS4 Mod./Comp. 50/5
337_GPX 19 HP	4	438_ENX 16 EASY Abs.	498_EPOS4 Mod./Comp. 24/1.5
		439_ENX 16 EASY Abs. XT	501_EPOS4 50/5
		443_ENX 16 RIO	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with CLL/graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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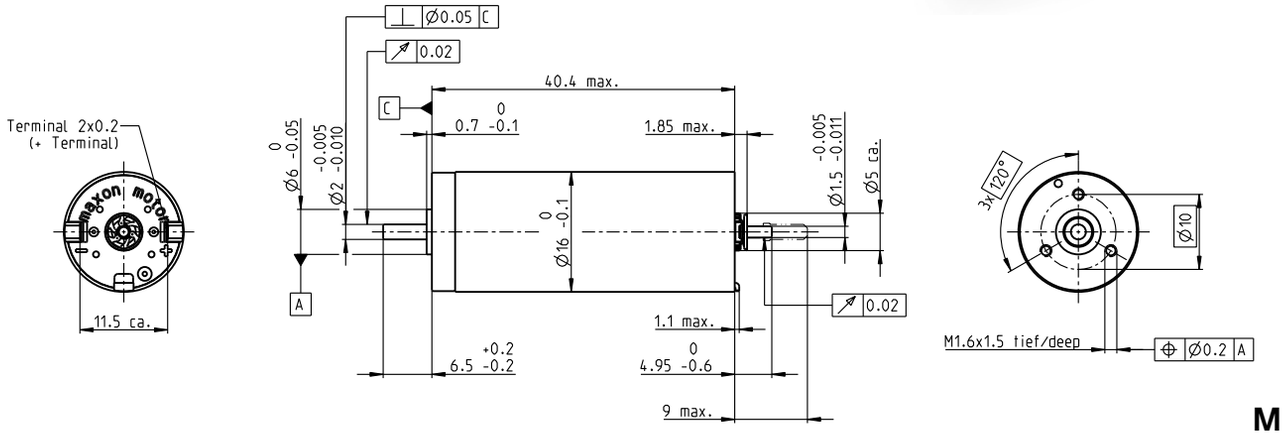
DCX 16 L Precious Metal Brushes
DC motor ∅16 mm

Key Data: 5/10 W, 11.5 mNm, 8680 rpm

DCX

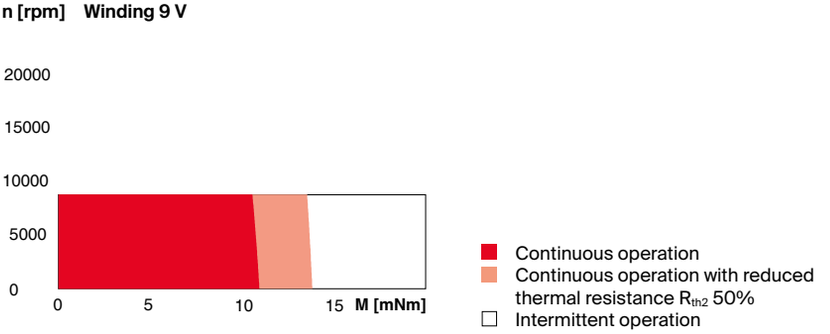


M 1:1

	Motor Data							
1_	Nominal voltage	V	3	6	9	12	18	24
2_	No load speed	rpm	6400	6620	6410	6400	6400	6560
3_	No load current	mA	62.5	32.6	20.8	15.6	10.4	8.05
4_	Nominal speed	rpm	5450	4920	4620	4490	4510	4630
5_	Nominal torque (max. continuous torque)	mNm	5.06	10.0	11.6	10.8	10.9	10.7
6_	Nominal current (max. continuous current)	A	1.20	1.20	0.89	0.625	0.42	0.316
7_	Stall torque	mNm	34.4	39.3	41.8	36.6	37.3	36.6
8_	Stall current	A	7.73	4.57	3.14	2.06	1.40	1.06
9_	Max. efficiency	%	83	84	84	83	84	83
10_	Terminal resistance	Ω	0.388	1.31	2.87	5.82	12.9	22.7
11_	Terminal inductance	mH	0.026	0.096	0.231	0.411	0.925	1.56
12_	Torque constant	mNm/A	4.44	8.59	13.3	17.8	26.7	34.7
13_	Speed constant	rpm/V	2150	1110	716	537	358	276
14_	Speed/torque gradient	rpm/mNm	188	170	154	176	173	181
15_	Mechanical time constant	ms	4.29	4.20	4.18	4.19	4.22	4.23
16_	Rotor inertia	gcm²	2.18	2.36	2.59	2.28	2.33	2.23

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	17.9
18_	Thermal resistance winding-housing	K/W	7.21
19_	Thermal time constant winding	s	21.5
20_	Thermal time constant motor	s	294
21_	Ambient temperature ball bearings	°C	-40...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	8680
24_	Axial play	mm	0...0.1
	Preload	N	0.8
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.8
27_	Max. force for press fits (static)	N	18
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	10 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	8680
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	60
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	2 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		7
31_	Weight of motor	g	42
32_	Typical noise level	dBA	44

Operating Range



maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
331_GPX 16 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
332_GPX 16 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
333_GPX 16 HP	2–3 [4]	434_ENX 10 EASY XT	496_EPOS4 Mod./Comp. 24/1.5
335_GPX 19 A/C	3–4	436_ENX 16 EASY	504_EPOS2 P 24/5
336_GPX 19 LN/LZ	3–4	437_ENX 16 EASY XT	
337_GPX 19 HP	4	438_ENX 16 EASY Abs.	
		439_ENX 16 EASY Abs. XT	
		443_ENX 16 RIO	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with CLL/graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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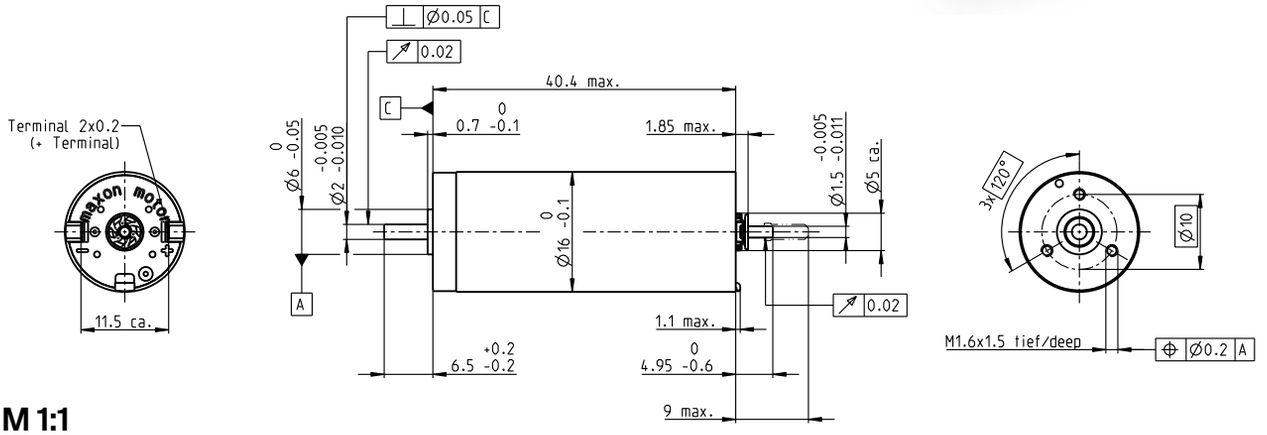
DCX 16 L Graphite Brushes
DC motor ∅16 mm

Key Data: 10/19 W, 11.7 mNm, 17 000 rpm



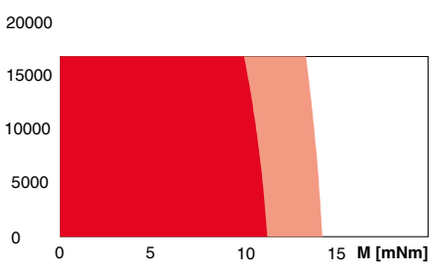
M 1:1

	Motor Data							
1_	Nominal voltage	V	6	9	12	18	24	36
2_	No load speed	rpm	12800	13100	13200	12800	12800	12800
3_	No load current	mA	73.5	50.7	38.6	24.5	18.4	12.3
4_	Nominal speed	rpm	11000	11000	10700	10600	10600	10700
5_	Nominal torque (max. continuous torque)	mNm	8.58	11.8	10.4	11.6	11.3	11.6
6_	Nominal current (max. continuous current)	A	2.00	1.85	1.24	0.896	0.651	0.447
7_	Stall torque	mNm	61.8	74.2	63.3	74.5	68.5	72
8_	Stall current	A	13.9	11.4	7.37	5.59	3.85	2.70
9_	Max. efficiency	%	85	87	83	86	86	87
10_	Terminal resistance	Ω	0.431	0.791	1.63	3.22	6.23	13.3
11_	Terminal inductance	mH	0.026	0.055	0.096	0.231	0.411	0.925
12_	Torque constant	mNm/A	4.44	6.52	8.59	13.3	17.8	26.7
13_	Speed constant	rpm/V	2150	1470	1110	716	537	358
14_	Speed/torque gradient	rpm/mNm	209	178	211	173	188	179
15_	Mechanical time constant	ms	4.77	4.47	5.21	4.70	4.48	4.37
16_	Rotor inertia	gcm²	2.18	2.40	2.36	2.59	2.28	2.33

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	17.9
18_	Thermal resistance winding-housing	K/W	7.21
19_	Thermal time constant winding	s	21.5
20_	Thermal time constant motor	s	294
21_	Ambient temperature ball bearings	°C	-40...+100
	Ambient temperature sleeve bearings	°C	-30...+100
22_	Max. winding temperature	°C	125
	Mechanical data ball bearings		
23_	Max. speed	rpm	17 000
24_	Axial play	mm	0...0.1
	Preload	N	0.8
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.8
27_	Max. force for press fits (static)	N	18
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	10 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	15 000
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.015
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	60
	(static, shaft supported)	N	300
28_	Max. radial load [mm from flange]	N	2 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		7
31_	Weight of motor	g	42
32_	Typical noise level	dBA	40

Operating Range

n [rpm] Winding 12 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
331_GPX 16 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
332_GPX 16 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
333_GPX 16 HP	2–3 [4]	434_ENX 10 EASY XT	496_EPOS4 Mod./Comp. 24/1.5
335_GPX 19 A/C	3–4	436_ENX 16 EASY	496_EPOS4 Mod./Comp. 50/5
336_GPX 19 LN/LZ	3–4	437_ENX 16 EASY XT	501_EPOS4 50/5
337_GPX 19 HP	4	438_ENX 16 EASY Abs.	504_EPOS2 P 24/5
		439_ENX 16 EASY Abs. XT	
		443_ENX 16 RIO	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with CLL/graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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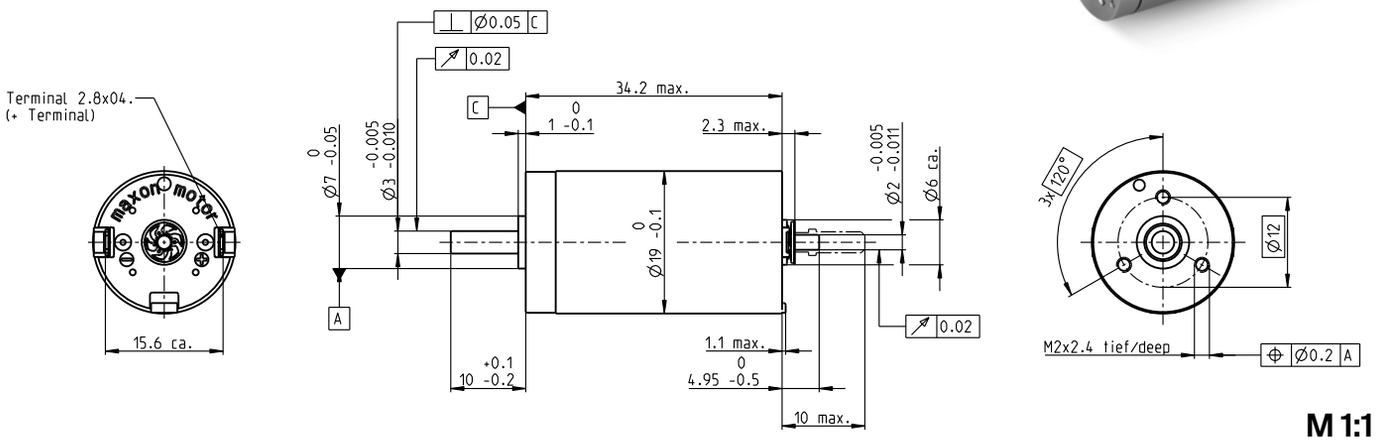
DCX 19 S Precious Metal Brushes
DC motor ∅19 mm

Key Data: 5/8 W, 11.0 mNm, 7500 rpm

DCX



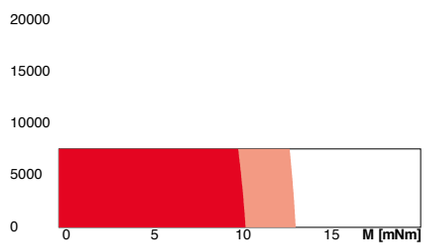
M 1:1

	Motor Data							
1_	Nominal voltage	V	4.5	6	9	12	18	24
2_	No load speed	rpm	6440	6350	6260	6360	6360	6350
3_	No load current	mA	72	53	34.6	26.5	17.7	13.2
4_	Nominal speed	rpm	5080	4540	4350	4490	4490	4480
5_	Nominal torque (max. continuous torque)	mNm	7.46	10.3	10.8	11.0	11.0	10.9
6_	Nominal current (max. continuous current)	A	1.20	1.20	0.829	0.643	0.428	0.319
7_	Stall torque	mNm	35.7	36.3	35.8	38.0	37.8	37.5
8_	Stall current	A	5.42	4.07	2.64	2.13	1.41	1.05
9_	Max. efficiency	%	78	79	79	79	79	79
10_	Terminal resistance	Ω	0.831	1.47	3.40	5.63	12.7	22.8
11_	Terminal inductance	mH	0.045	0.082	0.191	0.329	0.740	1.320
12_	Torque constant	mNm/A	6.58	8.90	13.5	17.8	26.7	35.6
13_	Speed constant	rpm/V	1450	1070	705	536	358	268
14_	Speed/torque gradient	rpm/mNm	183	177	177	170	170	172
15_	Mechanical time constant	ms	5.12	4.99	4.92	4.89	4.89	4.90
16_	Rotor inertia	gcm²	2.67	2.68	2.65	2.75	2.74	2.72

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	17.6
18_	Thermal resistance winding-housing	K/W	6.5
19_	Thermal time constant winding	s	11.6
20_	Thermal time constant motor	s	312
21_	Ambient temperature ball bearings	°C	-40...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	7500
24_	Axial play	mm	0...0.1
	Preload	N	2.5
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	2.5
27_	Max. force for press fits (static)	N	30
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	16 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	7500
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	80
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	3 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		9
31_	Weight of motor	g	50
32_	Typical noise level	dBA	48

Operating Range

n [rpm] Winding 9 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
335_GPX 19 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
336_GPX 19 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
337_GPX 19 HP	2–3 [4]	434_ENX 10 EASY XT	496_EPOS4 Mod./Comp. 24/1.5
339_GPX 22 A/C	3–4	436_ENX 16 EASY	504_EPOS2 P 24/5
340_GPX 22 LN/LZ	3–4	437_ENX 16 EASY XT	
341_GPX 22 HP	4	438_ENX 16 EASY Abs.	
		439_ENX 16 EASY Abs. XT	
		443_ENX 16 RIO	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with CLL/graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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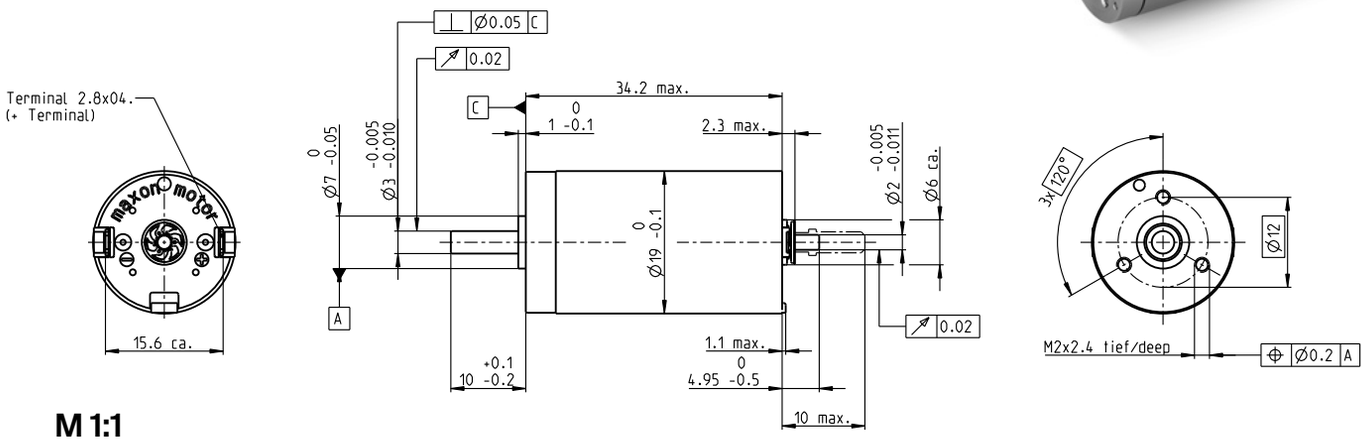
DCX 19 S Graphite Brushes
DC motor ∅19 mm

Key Data: 11/17 W, 11.3 mNm, 16 000 rpm



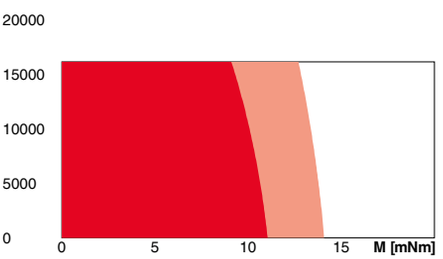
M 1:1

	Motor Data							
1_	Nominal voltage	V	9	12	18	24	36	48
2_	No load speed	rpm	12900	12800	12600	12700	12700	12700
3_	No load current	mA	102	75	48.9	37.4	25	18.7
4_	Nominal speed	rpm	10900	10800	10600	10600	10700	10700
5_	Nominal torque (max. continuous torque)	mNm	11.3	11.4	11.4	11.1	11.3	11.3
6_	Nominal current (max. continuous current)	A	1.81	1.35	0.884	0.657	0.445	0.335
7_	Stall torque	mNm	73.8	73.9	72.2	73.2	73.9	73.8
8_	Stall current	A	11.2	8.30	5.33	4.11	2.77	2.07
9_	Max. efficiency	%	82	82	82	81	82	82
10_	Terminal resistance	Ω	0.802	1.45	3.38	5.84	13.0	23.2
11_	Terminal inductance	mH	0.045	0.082	0.191	0.329	0.740	1.320
12_	Torque constant	mNm/A	6.58	8.90	13.5	17.8	26.7	35.6
13_	Speed constant	rpm/V	1450	1070	705	536	358	268
14_	Speed/torque gradient	rpm/mNm	177	174	176	176	174	174
15_	Mechanical time constant	ms	4.94	4.90	4.88	5.07	5.00	4.97
16_	Rotor inertia	gcm²	2.67	2.68	2.65	2.75	2.74	2.72

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	17.6
18_	Thermal resistance winding-housing	K/W	6.5
19_	Thermal time constant winding	s	11.6
20_	Thermal time constant motor	s	312
21_	Ambient temperature ball bearings	°C	-40...+100
	Ambient temperature sleeve bearings	°C	-30...+100
22_	Max. winding temperature	°C	125
	Mechanical data ball bearings		
23_	Max. speed	rpm	16 000
24_	Axial play	mm	0...0.1
	Preload	N	2.5
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	2.5
27_	Max. force for press fits (static)	N	30
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	16 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	13 500
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	80
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	3 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		9
31_	Weight of motor	g	50
32_	Typical noise level	dBA	40

Operating Range

n [rpm] Winding 18 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
335_GPX 19 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
336_GPX 19 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
337_GPX 19 HP	2–3 [4]	434_ENX 10 EASY XT	487_ESCON Module 50/5
339_GPX 22 A/C	3–4	436_ENX 16 EASY	489_ESCON 50/5
340_GPX 22 LN/LZ	3–4	437_ENX 16 EASY XT	496_EPOS4 Mod./Comp. 24/1.5
341_GPX 22 HP	4	438_ENX 16 EASY Abs.	496_EPOS4 Mod./Comp. 50/5
		439_ENX 16 EASY Abs. XT	501_EPOS4 50/5
		443_ENX 16 RIO	504_EPOS2 P 24/5

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with CLL/graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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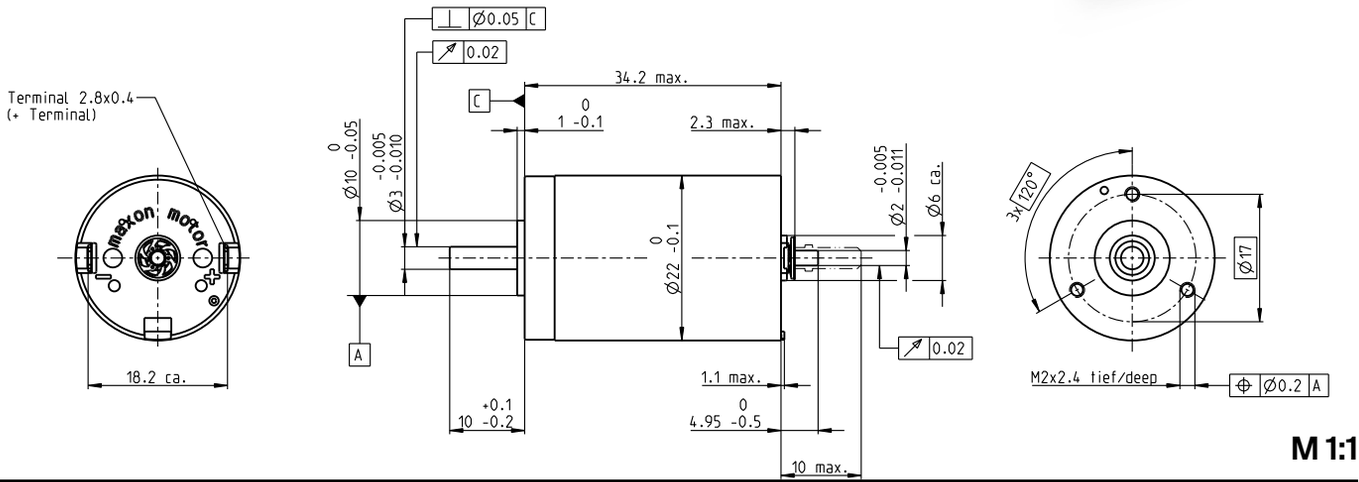
DCX 22 S Precious Metal Brushes
DC motor ∅22 mm

DCX

Key Data: 6/10 W, 14.5 mNm, 7160 rpm



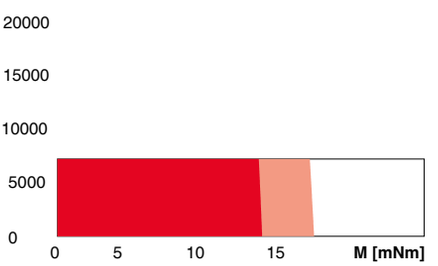
M 1:1

	Motor Data							
1_	Nominal voltage	V	6	12	18	24	36	48
2_	No load speed	rpm	6200	6200	6110	6340	6550	5890
3_	No load current	mA	39.2	19.6	12.8	10.1	7.09	4.55
4_	Nominal speed	rpm	4960	4670	4560	4700	4940	4240
5_	Nominal torque (max. continuous torque)	mNm	10.7	14.7	14.5	13.6	13.8	13.6
6_	Nominal current (max. continuous current)	A	1.20	0.817	0.531	0.388	0.272	0.180
7_	Stall torque	mNm	53.7	59.7	57.5	52.7	56.5	48.6
8_	Stall current	A	5.85	3.25	2.06	1.47	1.08	0.63
9_	Max. efficiency	%	84	85	85	84	85	84
10_	Terminal resistance	Ω	1.02	3.69	8.75	16.3	33.3	76.2
11_	Terminal inductance	mH	0.058	0.231	0.535	0.881	1.86	4.08
12_	Torque constant	mNm/A	9.18	18.4	28.0	35.9	52.2	77.2
13_	Speed constant	rpm/V	1040	520	342	266	183	124
14_	Speed/torque gradient	rpm/mNm	116	104	107	121	117	122
15_	Mechanical time constant	ms	6.14	6.07	6.09	5.93	6.15	6.19
16_	Rotor inertia	gcm²	5.05	5.55	5.44	4.67	5.03	4.84

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	16
18_	Thermal resistance winding-housing	K/W	7
19_	Thermal time constant winding	s	20
20_	Thermal time constant motor	s	528
21_	Ambient temperature ball bearings	°C	-40...85
	Ambient temperature sleeve bearings	°C	-30...85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	7160
24_	Axial play	mm	0...0.1
	Preload	N	2.5
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	2.5
27_	Max. force for press fits (static)	N	30
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	16 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	7160
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	80
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	3 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		9
31_	Weight of motor	g	66
32_	Typical noise level	dBA	48

Operating Range

n [rpm] Winding 18 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
339_GPX 22 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
340_GPX 22 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
341_GPX 22 HP	2–3 [4]	434_ENX 10 EASY XT	487_ESCON Module 50/5
342_GPX 22 UP	1–4	436_ENX 16 EASY	489_ESCON 50/5
344_GPX 26 A/C	3	437_ENX 16 EASY XT	496_EPOS4 Mod./Comp. 24/1.5
345_GPX 26 LN/LZ	3	438_ENX 16 EASY Abs.	496_EPOS4 Mod./Comp. 50/5
346_GPX 26 HP	4	439_ENX 16 EASY Abs. XT	501_EPOS4 50/5
		443_ENX 16 RIO	504_EPOS2 P 24/5
		470_ENC AEDL 5810	
		471_ENC 30 HEDS 5540	
		477_ENC 30 HEDL 5540	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with or without CLL/graphite brushes/EMI filter
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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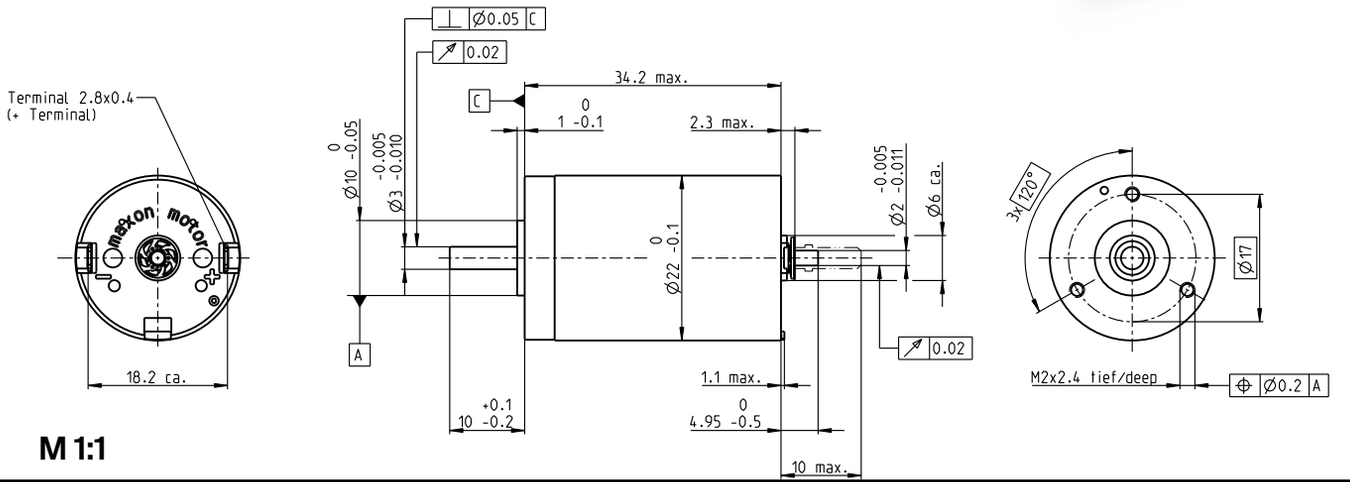
DCX 22 S Graphite Brushes
DC motor ∅22 mm

DCX

Key Data: 14/24 W, 15.3 mNm, 18 000 rpm



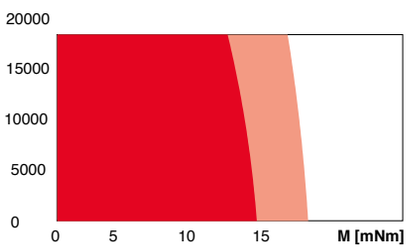
M 1:1

	Motor Data							
1_	Nominal voltage	V	6	12	18	24	36	48
2_	No load speed	rpm	11400	12400	12400	12400	12200	12700
3_	No load current	mA	126	71.7	47.8	35.9	23.4	18.5
4_	Nominal speed	rpm	9700	10700	10800	10800	10500	10900
5_	Nominal torque (max. continuous torque)	mNm	14.4	14.6	14.9	15.3	14.8	14.0
6_	Nominal current (max. continuous current)	A	3.00	1.65	1.12	0.869	0.552	0.406
7_	Stall torque	mNm	101	108	112	120	113	104
8_	Stall current	A	20.2	11.8	8.15	6.51	4.03	2.90
9_	Max. efficiency	%	85	85	85	86	85	84
10_	Terminal resistance	Ω	0.297	1.02	2.21	3.69	8.94	16.6
11_	Terminal inductance	mH	0.017	0.058	0.130	0.231	0.535	0.881
12_	Torque constant	mNm/A	5.01	9.18	13.8	18.4	28.0	35.9
13_	Speed constant	rpm/V	1910	1040	693	520	342	266
14_	Speed/torque gradient	rpm/mNm	113	116	111	104	109	123
15_	Mechanical time constant	ms	6.23	6.12	6.08	6.07	6.22	6.01
16_	Rotor inertia	gcm²	5.27	5.05	5.22	5.55	5.44	4.67

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	16
18_	Thermal resistance winding-housing	K/W	7
19_	Thermal time constant winding	s	20
20_	Thermal time constant motor	s	528
21_	Ambient temperature ball bearings	°C	-40...+100
	Ambient temperature sleeve bearings	°C	-30...+100
22_	Max. winding temperature	°C	125
	Mechanical data ball bearings		
23_	Max. speed	rpm	18 000
24_	Axial play	mm	0...0.1
	Preload	N	2.5
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	2.5
27_	Max. force for press fits (static)	N	30
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	16 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	18 000
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	80
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	3 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		9
31_	Weight of motor	g	66
32_	Typical noise level	dBA	41

Operating Range

n [rpm] Winding 18 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
339_GPX 22 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
340_GPX 22 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
341_GPX 22 HP	2–3 [4]	434_ENX 10 EASY XT	487_ESCON Module 50/5
342_GPX 22 UP	1–4	436_ENX 16 EASY	489_ESCON 50/5
344_GPX 26 A/C	3	437_ENX 16 EASY XT	496_EPOS4 Mod./Comp. 24/1.5
345_GPX 26 LN/LZ	3	438_ENX 16 EASY Abs.	496_EPOS4 Mod./Comp. 50/5
346_GPX 26 HP	4	439_ENX 16 EASY Abs. XT	501_EPOS4 50/5
		443_ENX 16 RIO	504_EPOS2 P 24/5
		470_ENC AEDL 5810	
		471_ENC 30 HEDS 5540	
		477_ENC 30 HEDL 5540	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with or without CLL/graphite brushes/EMI filter
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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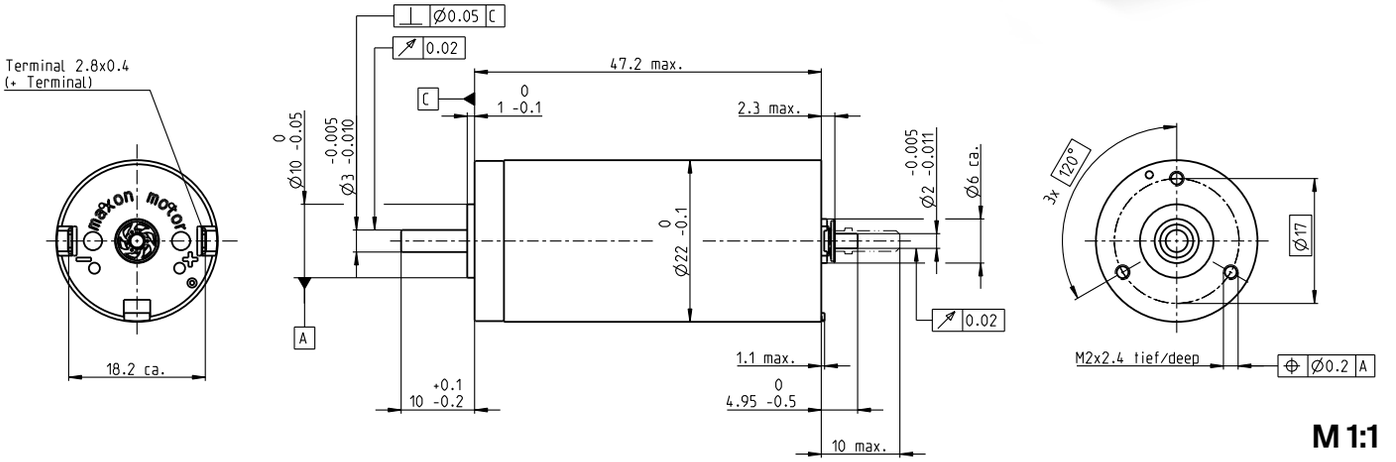
DCX 22 L Precious Metal Brushes
DC motor ∅22 mm

DCX

Key Data: 11/20 W, 29.8 mNm, 7160 rpm

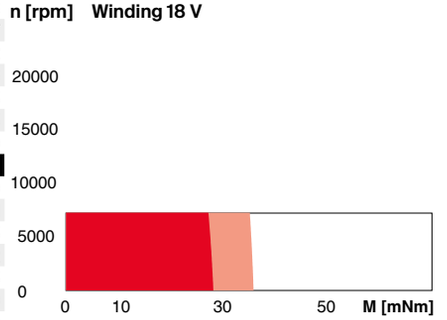


M 1:1

	Motor Data								
1_	Nominal voltage	V	6	9	12	18	24	36	48
2_	No load speed	rpm	5870	5870	4980	5740	5060	6020	5220
3_	No load current	mA	51.0	34	20.0	16.4	10.2	8.82	5.36
4_	Nominal speed	rpm	5380	5210	4000	4780	4070	5040	4180
5_	Nominal torque (max. continuous torque)	mNm	14.1	21.4	29.5	29.8	29.2	29.2	27.8
6_	Nominal current (max. continuous current)	A	1.50	1.50	1.30	1.01	0.655	0.520	0.322
7_	Stall torque	mNm	170	191	150	178	150	180	140
8_	Stall current	A	17.5	13.1	6.54	5.97	3.31	3.16	1.60
9_	Max. efficiency	%	89	90	89	90	89	90	89
10_	Terminal resistance	Ω	0.343	0.687	1.84	3.01	7.25	11.4	29.9
11_	Terminal inductance	mH	0.035	0.078	0.192	0.326	0.746	1.19	2.80
12_	Torque constant	mNm/A	9.73	14.6	22.9	29.9	45.2	57.0	87.6
13_	Speed constant	rpm/V	981	654	416	320	211	168	109
14_	Speed/torque gradient	rpm/mNm	34.6	30.8	33.3	32.2	33.9	33.5	37.3
15_	Mechanical time constant	ms	3.28	3.17	3.14	3.13	3.14	3.14	3.17
16_	Rotor inertia	gcm²	9.06	9.82	9.00	9.26	8.85	8.94	8.12

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	13.6
18_	Thermal resistance winding-housing	K/W	4.57
19_	Thermal time constant winding	s	22
20_	Thermal time constant motor	s	646
21_	Ambient temperature ball bearings	°C	-40...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	7160
24_	Axial play	mm	0...0.1
	Preload	N	2.5
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	2.5
27_	Max. force for press fits (static)	N	30
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	16 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	7160
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	80
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	3 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		9
31_	Weight of motor	g	95
32_	Typical noise level	dBA	52

Operating Range



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
339_GPX 22 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
340_GPX 22 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
341_GPX 22 HP	2–3 [4]	434_ENX 10 EASY XT	487_ESCON Module 50/5
342_GPX 22 UP	1–4	436_ENX 16 EASY	489_ESCON 50/5
344_GPX 26 A/C	3	437_ENX 16 EASY XT	496_EPOS4 Mod./Comp. 24/1.5
345_GPX 26 LN/LZ	3	438_ENX 16 EASY Abs.	496_EPOS4 Mod./Comp. 50/5
346_GPX 26 HP	4	439_ENX 16 EASY Abs. XT	501_EPOS4 50/5
		443_ENX 16 RIO	504_EPOS2 P 24/5
		470_ENC AEDL 5810	
		471_ENC 30 HEDS 5540	
		477_ENC 30 HEDL 5540	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with or without CLL/graphite brushes/EMI filter
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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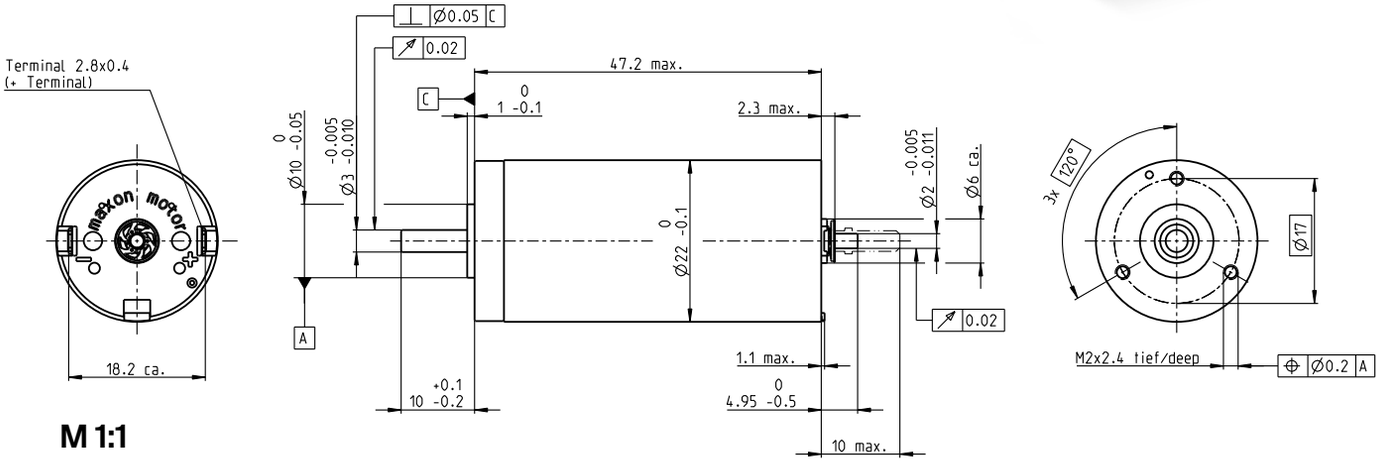
DCX 22 L Graphite Brushes
DC motor ∅22 mm

DCX

Key Data: 20/49 W, 32.2 mNm, 18 000 rpm



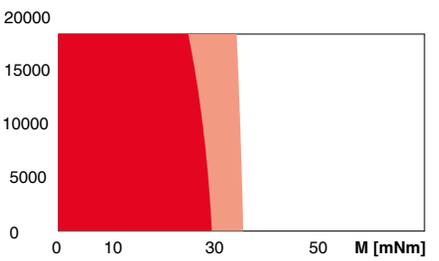
M 1:1

	Motor Data						
1_	Nominal voltage	V	9	12	18	36	48
2_	No load speed	rpm	12300	11700	11800	11400	10100
3_	No load current	mA	118	81.8	54.6	26.3	16.2
4_	Nominal speed	rpm	11400	10700	10800	10400	9020
5_	Nominal torque (max. continuous torque)	mNm	27.0	30.5	32.2	30.0	30.3
6_	Nominal current (max. continuous current)	A	4.00	3.21	2.26	1.03	0.687
7_	Stall torque	mNm	371	348	386	346	294
8_	Stall current	A	53.4	35.8	26.5	11.6	6.50
9_	Max. efficiency	%	90	91	91	90	90
10_	Terminal resistance	Ω	0.168	0.335	0.680	3.11	7.39
11_	Terminal inductance	mH	0.018	0.035	0.078	0.326	0.746
12_	Torque constant	mNm/A	6.95	9.73	14.6	29.9	45.2
13_	Speed constant	rpm/V	1370	981	654	320	211
14_	Speed/torque gradient	rpm/mNm	33.3	33.8	30.5	33.3	34.6
15_	Mechanical time constant	ms	3.27	3.21	3.13	3.23	3.20
16_	Rotor inertia	gcm²	9.37	9.06	9.82	9.26	8.85

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	13.6
18_	Thermal resistance winding-housing	K/W	4.57
19_	Thermal time constant winding	s	22
20_	Thermal time constant motor	s	646
21_	Ambient temperature ball bearings	°C	-40...+100
	Ambient temperature sleeve bearings	°C	-30...+100
22_	Max. winding temperature	°C	125
	Mechanical data ball bearings		
23_	Max. speed	rpm	18 000
24_	Axial play	mm	0...0.1
	Preload	N	2.5
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	2.5
27_	Max. force for press fits (static)	N	30
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	16 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	18 000
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	80
	(static, shaft supported)	N	440
28_	Max. radial load [mm from flange]	N	3 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		9
31_	Weight of motor	g	95
32_	Typical noise level	dBA	44

Operating Range

n [rpm] Winding 18 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
339_GPX 22 A/C	1–2 [3–4]	433_ENX 10 EASY	486_ESCON Module 24/2
340_GPX 22 LN/LZ	1–2 [3–4]	433_ENX 10 QUAD	486_ESCON 36/2 DC
341_GPX 22 HP	2–3 [4]	434_ENX 10 EASY XT	487_ESCON Module 50/5
342_GPX 22 UP	1–4	436_ENX 16 EASY	489_ESCON 50/5
344_GPX 26 A/C	3	437_ENX 16 EASY XT	496_EPOS4 Mod./Comp. 24/1.5
345_GPX 26 LN/LZ	3	438_ENX 16 EASY Abs.	496_EPOS4 Mod./Comp. 50/5
346_GPX 26 HP	4	439_ENX 16 EASY Abs. XT	501_EPOS4 50/5
		443_ENX 16 RIO	504_EPOS2 P 24/5
		470_ENC AEDL 5810	
		471_ENC 30 HEDS 5540	
		477_ENC 30 HEDL 5540	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with or without CLL/graphite brushes/EMI filter
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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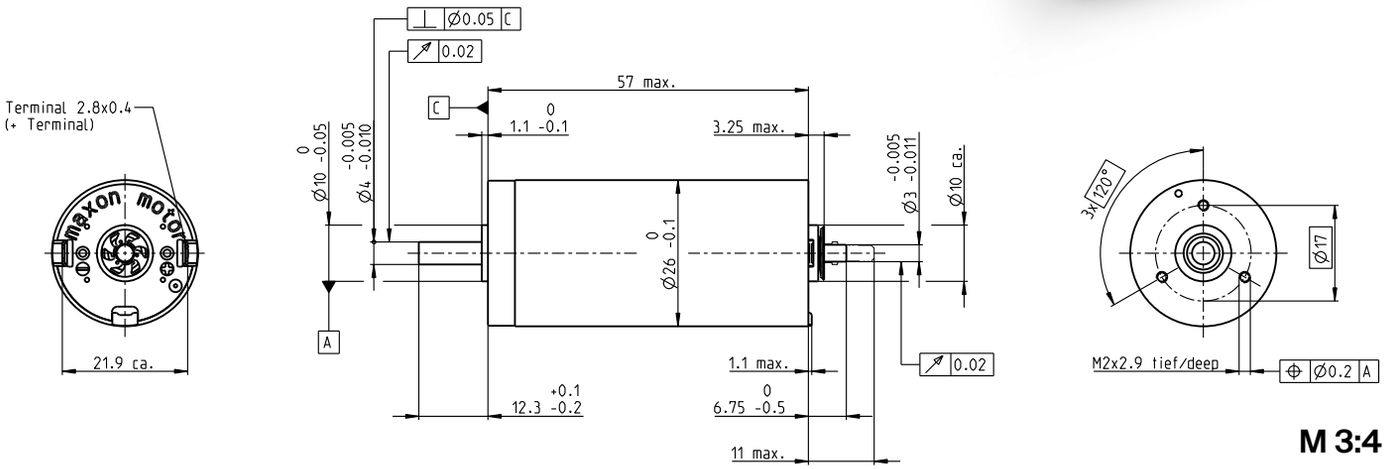
DCX 26 L Precious Metal Brushes
DC motor ∅26 mm

DCX

Key Data: 18/29 W, 52.3 mNm, 5900 rpm



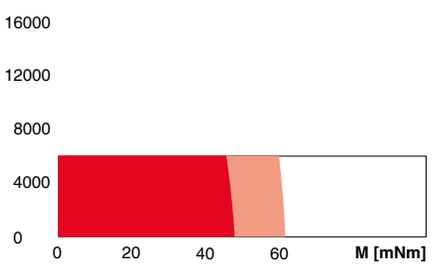
M 3:4

	Motor Data							
1_	Nominal voltage	V	9	12	18	24	36	48
2_	No load speed	rpm	5530	5330	5530	5330	5430	5320
3_	No load current	mA	80.5	56.8	40.2	28.4	19.5	14.2
4_	Nominal speed	rpm	5060	4690	4770	4600	4680	4570
5_	Nominal torque (max. continuous torque)	mNm	32.9	46.1	49.8	52.3	50.8	50.3
6_	Nominal current (max. continuous current)	A	2.2	2.2	1.64	1.25	0.822	0.599
7_	Stall torque	mNm	384	384	362	384	370	355
8_	Stall current	A	24.8	17.9	11.7	8.95	5.86	4.14
9_	Max. efficiency	%	89	89	89	89	89	89
10_	Terminal resistance	Ω	0.363	0.671	1.54	2.68	6.15	11.6
11_	Terminal inductance	mH	0.067	0.129	0.268	0.514	1.11	2.06
12_	Torque constant	mNm/A	15.5	21.4	31	42.9	63.2	85.8
13_	Speed constant	rpm/V	616	445	308	223	151	111
14_	Speed/torque gradient	rpm/mNm	14.4	13.9	15.3	13.9	14.7	15
15_	Mechanical time constant	ms	3.23	3.13	3.11	3.09	3.1	3.11
16_	Rotor inertia	gcm²	21.3	21.4	19.4	21.2	20.1	19.7

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	10.2
18_	Thermal resistance winding-housing	K/W	3.01
19_	Thermal time constant winding	s	24
20_	Thermal time constant motor	s	620
21_	Ambient temperature ball bearings	°C	-40...+85
	Ambient temperature sleeve bearings	°C	-30...+85
22_	Max. winding temperature	°C	100
	Mechanical data ball bearings		
23_	Max. speed	rpm	5900
24_	Axial play	mm	0...0.1
	Preload	N	5.5
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	5.5
27_	Max. force for press fits (static)	N	40
	(static, shaft supported)	N	500
28_	Max. radial load [mm from flange]	N	20.5 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	5900
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	80
	(static, shaft supported)	N	500
28_	Max. radial load [mm from flange]	N	5.5 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		11
31_	Weight of motor	g	170
32_	Typical noise level	dBA	48

Operating Range

n [rpm] Winding 18 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
344_GPX 26 A/C	1–2 [3]	433_ENX 10 EASY	486_ESCON 36/2 DC
345_GPX 26 LN/LZ	1–2 [3]	433_ENX 10 QUAD	487_ESCON Module 50/5
346_GPX 26 HP	2–3 [4]	434_ENX 10 EASY XT	489_ESCON 50/5
347_GPX 32 A/C	3	436_ENX 16 EASY	496_EPOS4 Mod./Comp. 24/1.5
348_GPX 32 LN/LZ	3	437_ENX 16 EASY XT	496_EPOS4 Mod./Comp. 50/5
349_GPX 32 HP	4	438_ENX 16 EASY Abs.	501_EPOS4 50/5
		439_ENX 16 EASY Abs. XT	504_EPOS2 P 24/5
		443_ENX 16 RIO	
		470_ENC AEDL 5810	
		471_ENC 30 HEDS 5540	
		477_ENC 30 HEDL 5540	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with CLL/graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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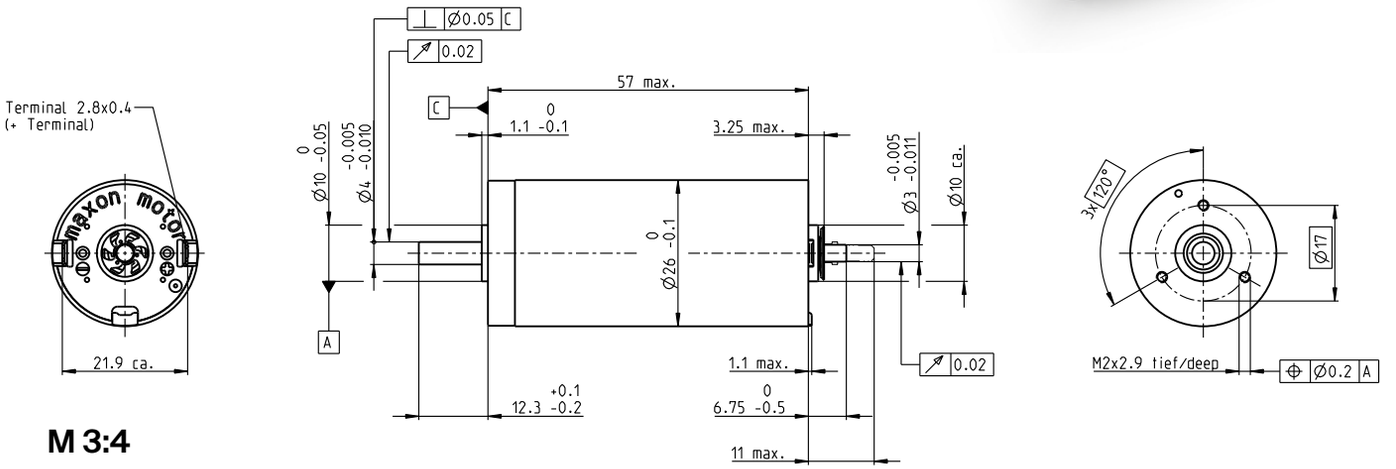
DCX 26 L Graphite Brushes
DC motor ∅26 mm

DCX

Key Data: 40/74 W, 59.8 mNm, 14400 rpm



M 3:4

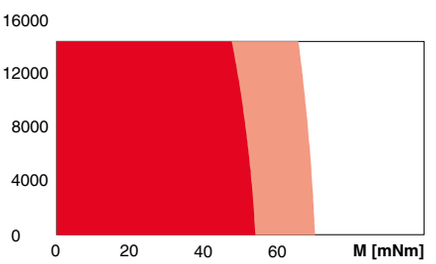
	Motor Data							
1_	Nominal voltage	V	12	18	24	36	48	60
2_	No load speed	rpm	10600	11100	10700	11100	10700	10900
3_	No load current	mA	131	93	65.7	46.5	32.9	27.3
4_	Nominal speed	rpm	9460	10000	9690	10000	9730	10000
5_	Nominal torque (max. continuous torque)	mNm	46.9	54.3	57.8	54	59.1	59.8
6_	Nominal current (max. continuous current)	A	4.5	3.59	2.76	1.79	1.41	1.17
7_	Stall torque	mNm	532	653	695	639	697	750
8_	Stall current	A	49.7	42.2	32.4	20.6	16.2	14.3
9_	Max. efficiency	%	88	90	91	90	91	91
10_	Terminal resistance	Ω	0.242	0.427	0.74	1.75	2.95	4.19
11_	Terminal inductance	mH	0.032	0.067	0.129	0.268	0.514	0.768
12_	Torque constant	mNm/A	10.7	15.5	21.4	31	42.9	52.4
13_	Speed constant	rpm/V	890	616	445	308	223	182
14_	Speed/torque gradient	rpm/mNm	20.1	17	15.4	17.4	15.3	14.6
15_	Mechanical time constant	ms	4.5	3.79	3.45	3.53	3.4	3.16
16_	Rotor inertia	gcm²	21.4	21.3	21.4	19.4	21.2	20.7

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	10.2
18_	Thermal resistance winding-housing	K/W	3.01
19_	Thermal time constant winding	s	24
20_	Thermal time constant motor	s	620
21_	Ambient temperature ball bearings	°C	-40...+100
	Ambient temperature sleeve bearings	°C	-30...+100
22_	Max. winding temperature	°C	155
	Mechanical data ball bearings		
23_	Max. speed	rpm	14400
24_	Axial play	mm	0...0.1
	Preload	N	5.5
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	5.5
27_	Max. force for press fits (static)	N	40
	(static, shaft supported)	N	500
28_	Max. radial load [mm from flange]	N	20.5 [5]
	Mechanical data sleeve bearings		
23_	Max. speed	rpm	8600
24_	Axial play	mm	0...0.2
	Preload	N	0
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	80
	(static, shaft supported)	N	500
28_	Max. radial load [mm from flange]	N	5.5 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		11
31_	Weight of motor	g	170
32_	Typical noise level	dBA	44

Motor specifications may vary for version with sintered bearing (max. winding temperature 125°C).

Operating Range

n [rpm] Winding 18 V



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

maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
344_GPX 26 A/C	1–2 [3]	433_ENX 10 EASY	486_ESCON 36/2 DC
345_GPX 26 LN/LZ	1–2 [3]	433_ENX 10 QUAD	487_ESCON Module 50/5
346_GPX 26 HP	2–3 [4]	434_ENX 10 EASY XT	489_ESCON 50/5
347_GPX 32 A/C	3	436_ENX 16 EASY	496_EPOS4 Mod./Comp. 50/5
348_GPX 32 LN/LZ	3	437_ENX 16 EASY XT	501_EPOS4 50/5
349_GPX 32 HP	4	438_ENX 16 EASY Abs.	504_EPOS2 P 24/5
		439_ENX 16 EASY Abs. XT	
		443_ENX 16 RIO	
		470_ENC AEDL 5810	
		471_ENC 30 HEDS 5540	
		477_ENC 30 HEDL 5540	

Configuration

Bearing: Ball bearings preloaded/sleeve bearings
Commutation: Precious metal brushes with CLL/graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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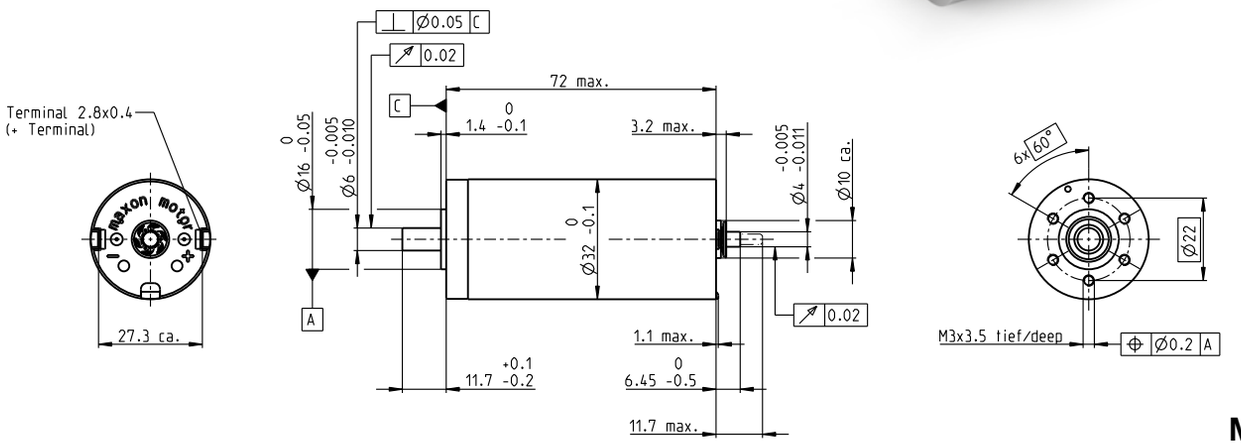
DCX 32 L Graphite Brushes
DC motor ∅32 mm

Key Data: 70/110 W, 128 mNm, 11300 rpm

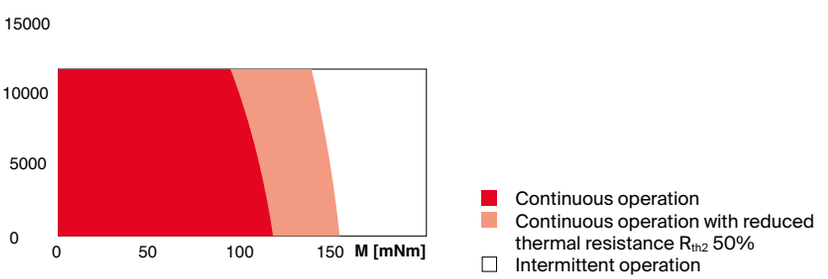


M 1:2

	Motor Data							
1_	Nominal voltage	V	12	18	24	36	48	60
2_	No load speed	rpm	7120	8630	8270	7940	7780	5840
3_	No load current	mA	274	234	164	103	75.2	41.6
4_	Nominal speed	rpm	6560	8070	7710	7410	7260	5290
5_	Nominal torque (max. continuous torque)	mNm	89.4	101	108	119	123	128
6_	Nominal current (max. continuous current)	A	6.00	5.42	4.12	2.87	2.17	1.35
7_	Stall torque	mNm	1730	2120	1980	2020	2000	1420
8_	Stall current	A	111	109	72.5	47.1	34.2	14.5
9_	Max. efficiency	%	85	88	88	90	90	89
10_	Terminal resistance	Ω	0.108	0.165	0.331	0.764	1.40	4.12
11_	Terminal inductance	mH	0.034	0.053	0.103	0.254	0.473	1.31
12_	Torque constant	mNm/A	15.6	19.5	27.3	42.9	58.5	97.5
13_	Speed constant	rpm/V	612	490	350	223	163	97.9
14_	Speed/torque gradient	rpm/mNm	4.24	4.15	4.24	3.96	3.92	4.14
15_	Mechanical time constant	ms	3.44	3.30	3.24	3.19	3.11	3.11
16_	Rotor inertia	gcm²	77.6	75.9	72.8	76.8	75.9	71.7

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	7.28
18_	Thermal resistance winding-housing	K/W	2.3
19_	Thermal time constant winding	s	42.2
20_	Thermal time constant motor	s	837
21_	Ambient temperature	°C	-40...+100
22_	Max. winding temperature	°C	155
	Mechanical data ball bearings		
23_	Max. speed	rpm	11300
24_	Axial play	mm	0...0.1
	Preload	N	7
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	7
27_	Max. force for press fits (static)	N	22.6
	(static, shaft supported)	N	2510
28_	Max. radial load [mm from flange]	N	65.3 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		11
31_	Weight of motor	g	325
32_	Typical noise level	dBA	47

Operating Range



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maxon gear	Stages [opt.]	maxon sensor	maxon motor control
347_GPX 32 A/C	1–2 [3]	433_ENX 10 EASY	487_ESCON Module 50/5
348_GPX 32 LN/LZ	1–2 [3]	433_ENX 10 QUAD	488_ESCON Module 50/8 HE
349_GPX 32 HP	2–3 [4]	434_ENX 10 EASY XT	489_ESCON 50/5
350_GPX 32 UP	1–4	436_ENX 16 EASY	489_ESCON 70/10
351_GPX 37 A	3	437_ENX 16 EASY XT	496_EPOS4 Mod./Comp. 50/5
352_GPX 37 LN/LZ	3	438_ENX 16 EASY Abs.	497_EPOS4 Mod./Comp. 50/8
		439_ENX 16 EASY Abs. XT	501_EPOS4 50/5
		443_ENX 16 RIO	501_EPOS4 70/15
		470_ENC AEDL 5810	504_EPOS2 P 24/5
		471_ENC 30 HEDS 5540	
		477_ENC 30 HEDL 5540	

Configuration

Bearing: Ball bearings preloaded
Commutation: Graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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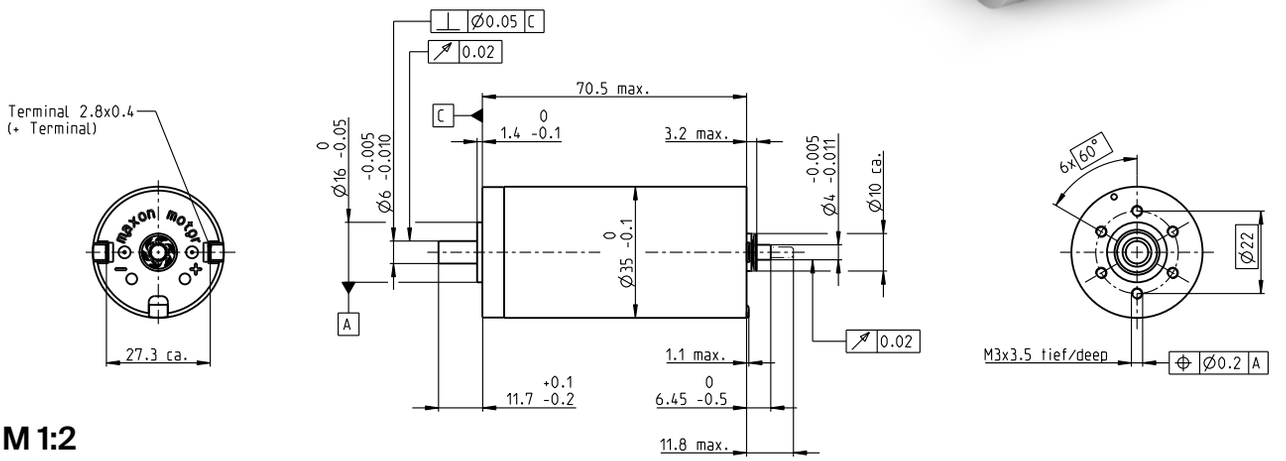
DCX 35 L Graphite Brushes
DC motor ∅35 mm

DCX

Key Data: 80/120 W, 138 mNm, 12300 rpm

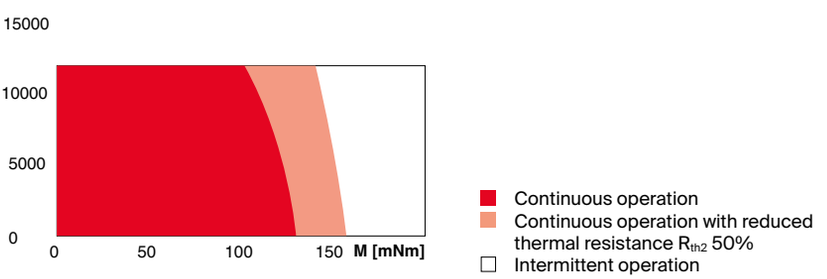


M 1:2

	Motor Data							
1_	Nominal voltage	V	12	18	24	36	48	60
2_	No load speed	rpm	8130	7200	7720	7940	6670	7690
3_	No load current	mA	320	177	146	101	58.6	57.5
4_	Nominal speed	rpm	7610	6640	7160	7410	6140	7160
5_	Nominal torque (max. continuous torque)	mNm	77.7	120	121	128	138	132
6_	Nominal current (max. continuous current)	A	6.00	5.32	4.26	3.07	2.08	1.84
7_	Stall torque	mNm	2080	1980	2030	2160	1860	2050
8_	Stall current	A	152	84.8	69.3	50.3	27.3	27.7
9_	Max. efficiency	%	85	88	89	90	90	90
10_	Terminal resistance	Ω	0.079	0.212	0.346	0.716	1.76	2.16
11_	Terminal inductance	mH	0.026	0.077	0.121	0.260	0.658	0.776
12_	Torque constant	mNm/A	13.7	23.4	29.3	42.9	68.3	74.1
13_	Speed constant	rpm/V	699	408	326	223	140	129
14_	Speed/torque gradient	rpm/mNm	4.04	3.70	3.86	3.72	3.61	3.76
15_	Mechanical time constant	ms	4.21	3.97	3.91	3.84	3.76	3.75
16_	Rotor inertia	gcm²	99.5	102	96.6	98.7	99.5	95.2

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	6.98
18_	Thermal resistance winding-housing	K/W	2.1
19_	Thermal time constant winding	s	43.9
20_	Thermal time constant motor	s	1030
21_	Ambient temperature	°C	-40...+100
22_	Max. winding temperature	°C	155
	Mechanical data ball bearings		
23_	Max. speed	rpm	12300
24_	Axial play	mm	0...0.1
	Preload	N	7
25_	Radial play	mm	0.02
26_	Max. axial load (dynamic)	N	7
27_	Max. force for press fits (static)	N	22.6
	(static, shaft supported)	N	2510
28_	Max. radial load [mm from flange]	N	65.3 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of commutator segments		11
31_	Weight of motor	g	385
32_	Typical noise level	dBA	48

Operating Range



maxon Modular System Details on catalog page 32

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
351_GPX 37 A	1–2	433_ENX 10 EASY	487_ESCON Module 50/5
352_GPX 37 LN/LZ	1–2	433_ENX 10QUAD	488_ESCON Module 50/8 HE
353_GPX 42 C	1–4	434_ENX 10 EASY XT	489_ESCON 50/5
353_GPX 42 UP	1–4	436_ENX 16 EASY	489_ESCON 70/10
		437_ENX 16 EASY XT	496_EPOS4 Mod./Comp. 50/5
		438_ENX 16 EASY Abs.	497_EPOS4 Mod./Comp. 50/8
		439_ENX 16 EASY Abs. XT	501_EPOS4 50/5
		443_ENX 16 RIO	501_EPOS4 70/15
		470_ENC AEDL 5810	504_EPOS2 P 24/5
		471_ENC 30 HEDS 5540	
		477_ENC 30 HEDL 5540	

Configuration

Bearing: Ball bearings preloaded
Commutation: Graphite brushes
Flange front/back: Standard flange/configurable flange/no flange
Shaft front/back: Length/diameter/flat face
Electric connection: Terminals or cable/alignment of connection/cable length/connector type

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