

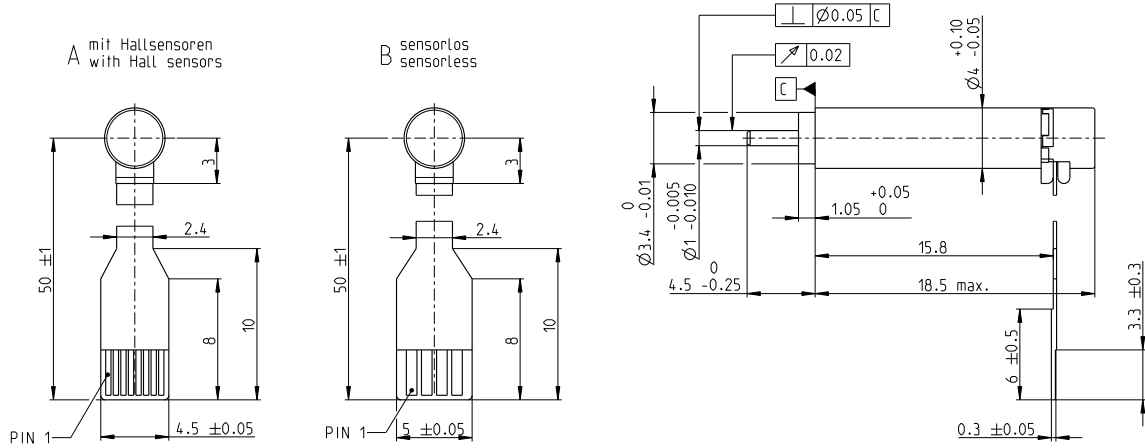
ECX SPEED 4 M brushless BLDC motor \varnothing 4 mm

NEW



ECX SPEED

Key Data: 1.5/1.0 W, 0.23 mNm, 50 000 rpm



M 2:1

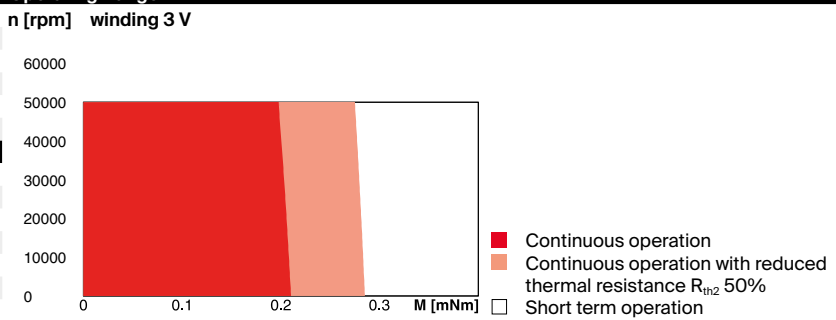
Motor Data

1_	Nominal voltage	V	3	6
2_	No load speed	rpm	35200	35400
3_	No load current	mA	28.8	14.4
4_	Nominal speed	rpm	11700	13400
5_	Nominal torque (max. continuous torque)	mNm	0.225	0.239
6_	Nominal current (max. continuous current)	A	0.317	0.167
7_	Stall torque	mNm	0.355	0.403
8_	Stall current	A	0.465	0.264
9_	Max. efficiency	%	57	59.3
10_	Terminal resistance	Ω	6.45	22.8
11_	Terminal inductance	mH	0.0749	0.285
12_	Torque constant	mNm/A	0.763	1.53
13_	Speed constant	rpm/V	12500	6240
14_	Speed/torque gradient	rpm/mNm	106000	92900
15_	Mechanical time constant	ms	1.23	1.08
16_	Rotor inertia	gcm ²	0.00111	0.00111

Thermal data

17_	Thermal resistance housing-ambient	K/W	96.7
18_	Thermal resistance winding-housing	K/W	15.2
19_	Thermal time constant winding	s	0.738
20_	Thermal time constant motor	s	58.5
21_	Ambient temperature	°C	-20 ... +80
22_	Max. winding temperature	°C	125

Operating Range



Mechanical data

23_	Max. speed	rpm	50 000
24_	Max. Axial play	mm	0.06
	Preload	N	-
	Direction of force		-
25_	Radial play		0.012
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static)	N	10
	(static, shaft supported)	N	10
28_	Max. radial load [mm from flange]	N	0.2 [2]

Other specifications

29_	Number of pole pairs		1
30_	Number of phases		3
31_	Weight of motor	g	1.2
32_	Typical noise level [rpm]	dBA	46 [50 000]

maxon Modular System

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
320_GPX 4 C	2-4	for motor type A: 428_ENX 4 MAG	486_ESCON Module 24/2 487_ESCON 36/3 EC 487_ESCON Module 50/4 EC-S 491_DEC Module 24/2 498_EPOS4 Mod./Comp. 24/1.5

Connection motor with hall sensor (A)

FPC Flexprint 8-pole, pitch 0.5 mm
 Pin 1 Motor winding 1
 Pin 2 Motor winding 2
 Pin 3 Motor winding 3
 Pin 4 V_{Hall} 2.5...5.5 VDC
 Pin 5 GND
 Pin 6 hall sensor 1
 Pin 7 hall sensor 2
 Pin 8 hall sensor 3
 Output signals: CMOS compatible push-pull stage
 Output current per channel: max. 0.5 mA

Connection motor sensorless (B)

FPC flexprint 4-pole, pitch 1.0 mm:
 Pin 1 Motor winding 1
 Pin 2 Motor winding 2
 Pin 3 Motor winding 3
 Pin 4 N.C.

Configuration

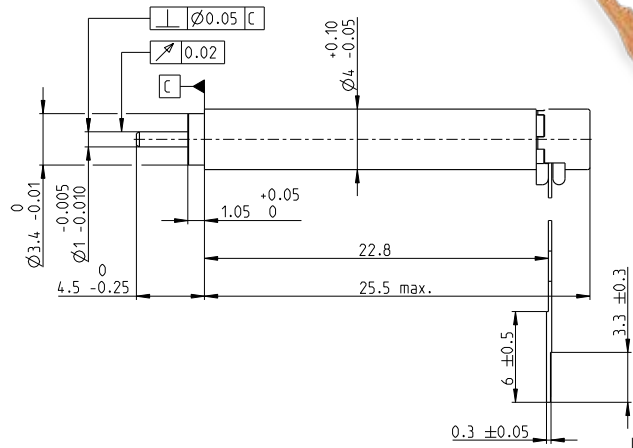
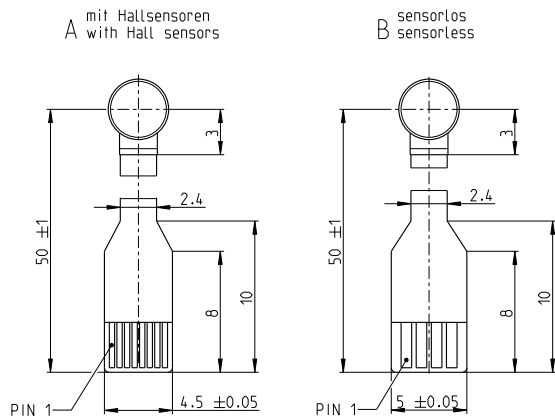
Shaft front: length/diameter
 Electrical connection: Flex cable/round cable

ECX SPEED 4 L brushless BLDC motor $\varnothing 4$ mm

NEW

ECX SPEED

Key Data: 1.0/1.6 W, 0.34 mNm, 50 000 rpm



M 2:1

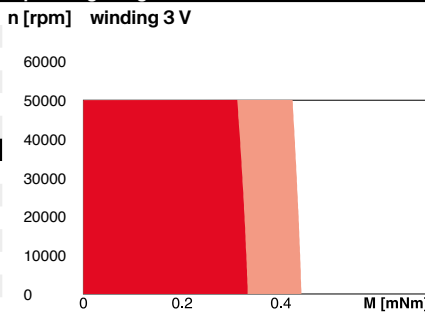
Motor Data

1_	Nominal voltage	V	3	6
2_	No load speed	rpm	40700	30500
3_	No load current	mA	55.6	18.9
4_	Nominal speed	rpm	23000	13400
5_	Nominal torque (max. continuous torque)	mNm	0.338	0.341
6_	Nominal current (max. continuous current)	A	0.545	0.206
7_	Stall torque	mNm	0.817	0.641
8_	Stall current	A	1.22	0.36
9_	Max. efficiency	%	62.6	60
10_	Terminal resistance	Ω	2.46	16.7
11_	Terminal inductance	mH	0.0458	0.323
12_	Torque constant	mNm/A	0.67	1.78
13_	Speed constant	rpm/V	14300	5360
14_	Speed/torque gradient	rpm/mNm	52300	50200
15_	Mechanical time constant	ms	0.903	0.867
16_	Rotor inertia	gcm ²	0.00165	0.00165

Thermal data

17_	Thermal resistance housing-ambient	K/W	84
18_	Thermal resistance winding-housing	K/W	16.7
19_	Thermal time constant winding	s	1.31
20_	Thermal time constant motor	s	76.4
21_	Ambient temperature	°C	-20 ... +80
22_	Max. winding temperature	°C	125

Operating Range



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

Mechanical data

23_	Max. speed	rpm	50 000
24_	Max. Axial play	mm	0.06
	Preload	N	-
	Direction of force		-
25_	Radial play		0.012
26_	Max. axial load (dynamic)	N	0.1
27_	Max. force for press fits (static) (static, shaft supported)	N	10
28_	Max. radial load [mm from flange]	N	0.2 [2]

Other specifications

29_	Number of pole pairs		1
30_	Number of phases		3
31_	Weight of motor	g	1.8
32_	Typical noise level [rpm]	dBA	47 [50 000]

maxon Modular System

maxon gear	Stages [opt.]	maxon sensor
320_GPX 4 C	2-4	for motor type A: 428_ENX 4 MAG

Details on catalog page 32

maxon motor control
486_ESCON Module 24/2
487_ESCON 36/3 EC
487_ESCON Module 50/4 EC-S
491_DEC Module 24/2
498_EPOS4 Mod./Comp. 24/1.5

Connection motor with hall sensor (A)

FPC Flexprint 8-pole, pitch 0.5 mm
 Pin 1 Motor winding 1
 Pin 2 Motor winding 2
 Pin 3 Motor winding 3
 Pin 4 V_{Hall} 2.5...5.5 VDC
 Pin 5 GND
 Pin 6 hall sensor 1
 Pin 7 hall sensor 2
 Pin 8 hall sensor 3
 Output signals: CMOS compatible push-pull stage
 Output current per channel: max. 0.5 mA

Connection motor sensorless (B)

FPC flexprint 4-pole, pitch 1.0 mm:
 Pin 1 Motor winding 1
 Pin 2 Motor winding 2
 Pin 3 Motor winding 3
 Pin 4 N.C.

Configuration

Shaft front: length/diameter
 Electrical connection: Flex cable/round cable

GPX 4

Planetary Gearhead $\varnothing 4$ mm

NEW

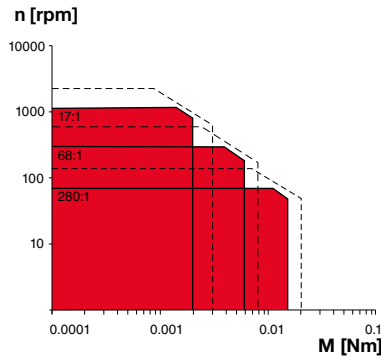
GPX



Key Data		C Ceramic Version	
Max. transmittable power	W	0.17	
Max. continuous torque	Nm	0.015	
Max. continuous input speed	rpm	20 000	
Ambient temperature	°C	-15 ... +80	
Bearing at output		Sleeve bearing	

Operating Range (output shaft)	C Ceramic Version
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■ Continuous operation
 - - - - Intermittent operation



Specifications		C Ceramic Version		
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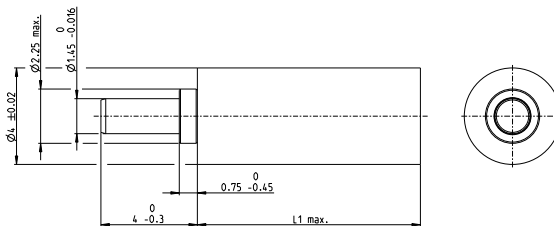
		2	3	4
Number of stages		2	3	4
Max. transmittable power (continuous)	W	0.17	0.12	0.08
Max. transmittable power (intermittent)	W	0.21	0.15	0.10
Max. continuous torque	Nm	0.002	0.006	0.015
Max. intermittent torque	Nm	0.003	0.008	0.020
Max. continuous input speed	rpm	20 000	20 000	20 000
Max. intermittent input speed	rpm	40 000	40 000	40 000
Max. efficiency	%	76	70	65
Average backlash no load	°	5	5	5
Max. axial load (dynamic)	N	5	5	5
Max. radial load, 4 mm from flange	N	3	4	4
Gearhead length L ¹	mm	9.3	11.0	12.7
Weight	g	0.4	0.5	0.6

Configuration		C Ceramic Version		
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		2	3	4
Number of stages		2	3	4
Reduction	X:1	17	68	280
Absolute reduction: (see online)				
Version		Ceramic Version		
Flange		Standard flange		
Shaft		with/without flat face		

maxon Modular System		Page	Dimensions	M 3:1
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maxon EC motor	Nº of stages [opt.]		
ECX SPEED 4 M	2-4	171	
ECX SPEED 4 L	2-4	172	



¹This length may vary depending on the configuration and choice of motor. The effective length is calculated at the end of the configuration process.

gpx.maxongroup.com

ENX 4 MAG

Encoder \varnothing 4 mm, 1...256 CPT

NEW

ENX



Key Data		ENX 4 MAG Incremental, Commutation Signal
Number of channels		3
Max. counts per turn		256
Additional length at motor	mm	2.7
Ambient temperature	°C	-40.. 100
Weight	g	1

Selection criteria		ENX 4 MAG Incremental, Commutation Signal
Speed and rotation direction detection		■
Speed and position control		■
Compact and robust design		■
High resolution		▲
Cost effective		■

■ suitable ▲ suitable to a limited extent ● not suitable

Specifications		ENX 4 MAG Incremental, Commutation Signal
Supply voltage Vcc	V	3.0.. 3.6
Typical current draw	mA	13
Max. operating frequency	kHz	500
Max. Speed	min ⁻¹	100 000
Connection		FPC, 12 pole, pitch 0.5 mm
		Pin 1 W1
		Pin 2 W2
		Pin 3 W3
		Pin 4 GND
		Pin 5 V _{CC}
		Pin 6 Channel A
		Pin 7 Channel B
		Pin 8 Channel I
		Pin 9 H1
		Pin 10 H2
		Pin 11 H3
		Pin 12 Not connect ¹
		Output signal: CMOS compatible
		Output current per channel: ±4 mA

Configuration		ENX 4 MAG Incremental, Commutation Signal
Counts per turn ²		1...256

maxon Modular System	Page	Dimensions Standard Version	Notes
maxon EC motor			
ECX SPEED 4 M	171		¹ Applying voltage to these pins may destroy the encoder. ² maxon controllers require a resolution of at least 16 pulses. Compatible connector: Molex 52745-1297, TE 1-1734839-2 Adapter 498157 required for all maxon controllers Please note: max. continuous current 0.5 A
ECX SPEED 4 L	172		

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