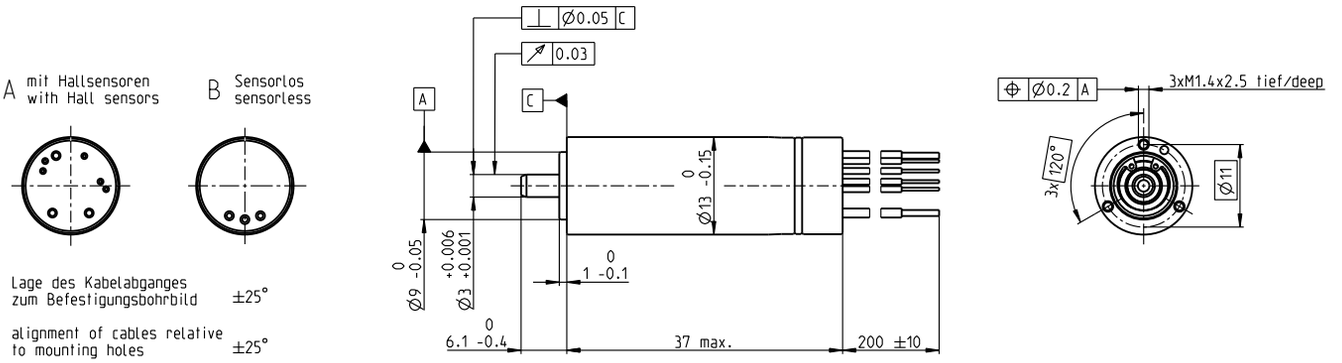
ECX SPEED 13 M ∅13 mm, brushless, BLDC motor

Sterilizable

Key Data: 25/25 W, 3.3 mNm, 90 000 rpm



M 1:1

	Motor Data					
1_	Nominal voltage	V	18	24	36	48
2_	No load speed	rpm	77600	77600	77600	74500
3_	No load current	mA	208	156	104	72.9
4_	Nominal speed	rpm	74300	74500	74500	71300
5_	Nominal torque (max. continuous torque)	mNm	2.67	2.64	2.48	2.73
6_	Nominal current (max. continuous current)	A	1.41	1.05	0.663	0.517
7_	Stall torque	mNm	68.8	72.3	68.1	69.2
8_	Stall current	A	31.3	24.7	15.5	11.3
9_	Max. efficiency	%	85	85	85	85
10_	Terminal resistance	Ω	0.576	0.973	2.33	4.24
11_	Terminal inductance	mH	0.0135	0.024	0.054	0.104
12_	Torque constant	mNm/A	2.2	2.93	4.4	6.11
13_	Speed constant	rpm/V	4340	3260	2170	1560
14_	Speed/torque gradient	rpm/mNm	1140	1080	1150	1080
15_	Mechanical time constant	ms	1.55	1.47	1.56	1.48
16_	Rotor inertia	gcm²	0.13	0.13	0.13	0.13

	Thermal data		
17_	Thermal resistance housing-ambient	K/W	29.5
18_	Thermal resistance winding-housing	K/W	2.5
19_	Thermal time constant winding	s	1.69
20_	Thermal time constant motor	s	475
21_	Ambient temperature	°C	-40...+135
22_	Max. winding temperature	°C	155
	Mechanical data ball bearings		
23_	Max. speed	rpm	90 000
24_	Axial play	mm	0...0.28
	Preload	N	1.5
	Direction of force		pull
25_	Radial play		preloaded
26_	Max. axial load (dynamic)	N	1.5
27_	Max. force for press fits (static)	N	50
	(static, shaft supported)	N	1500
28_	Max. radial load [mm from flange]	N	6 [5]
	Other specifications		
29_	Number of pole pairs		1
30_	Number of phases		3
31_	Weight of motor	g	32
32_	Typical noise level [rpm]	dBA	46 [50 000]

Connection A and B, motor (Cable AWG A: 26, B: 22)

red	Motor winding 1
black	Motor winding 2
white	Motor winding 3

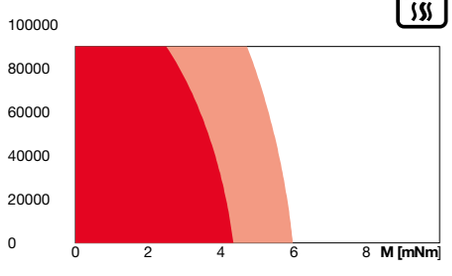
Connection A, sensors (Cable AWG 28)

orange	V_{CC} 5 ±0.5 V
blue	GND
yellow	Hall sensor 1
brown	Hall sensor 2
grey	Hall sensor 3

Output signals: CMOS compatible push-pull stage. No pull-up resistor required. Hall signals are generated by an EASY INT sensor. In combination with the ENX EASY INT, the orange (V_{CC}) and blue (GND) connections are not used.

Operating Range

n [rpm] winding 36 V



Sterilization information

Sterilization cycles
Sensorless: typical 2000
Hall sensors: typical 1000

Sterilization with steam

Temperature	+134°C ±4°C
Compression pressure up to	2.3 bar
Rel. humidity	100%
Cycle length	18 min.

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

maxon Modular System Details on catalog page 34

maxon gear	Stages [opt.]	maxon sensor	maxon motor control
337_GPX 13 SPEED	1–3	for motor type A: 449_ENX 13 EASY INT for motor type B: 449_ENX 13 EASY INT Abs.	500_ESCON Module 24/2 501_ESCON 36/3 EC 501_ESCON Module 50/4 EC-S 501_ESCON Module 50/5 503_ESCON 50/5 505_DEC Module 24/2 505_DEC Module 50/5 509_EPOS4 Micro 24/5 510_EPOS4 Mod./Comp. 24/1.5 510_EPOS4 Mod./Comp. 50/5 511_EPOS4 Comp. 24/5 3-axes 515_EPOS4 50/5 516_EPOS4 Disk 60/8 520_EPOS2 P 24/5

Configuration

Flange front: thread holes/center thread
Flange back: metal ring/external thread
Shaft front: length/diameter
Electric connection: cable length/pin connection
Appropriate connectors and connecting cables are available for the configuration of the pin connection together with the external thread: see catalog, Accessories section.

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