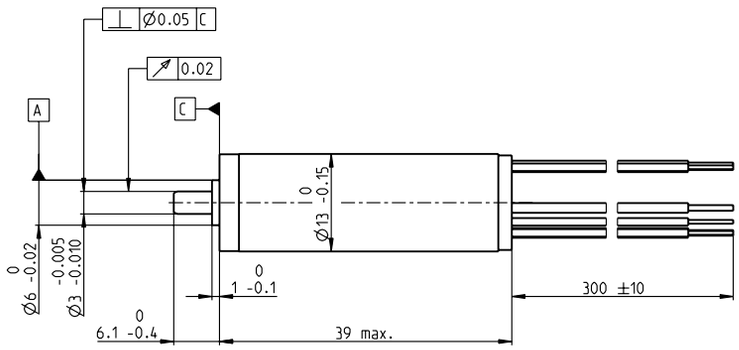
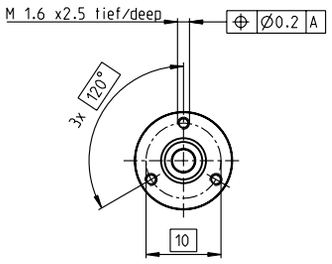
# EC 13 ∅13 mm, brushless, 30 Watt

sterilizable




**M 1:1**

Stock program
Standard program
Special program (on request)

## Part Numbers

| | | | |
|---|---|---|---|
| **A** with Hall sensors | 448825 | 448826 | 448827 |
| **B** sensorless | 448831 | 448832 | 448833 |

## Motor Data (provisional)

| | | | | |
|---|---|---|---|---|
| **Values at nominal voltage** | | | | |
| 1 Nominal voltage | V | 12 | 24 | 48 |
| 2 No load speed | rpm | 65300 | 65400 | 76000 |
| 3 No load current | mA | 171 | 85.6 | 54 |
| 4 Nominal speed | rpm | 59600 | 59900 | 70700 |
| 5 Nominal torque (max. continuous torque) | mNm | 4.63 | 4.63 | 4.12 |
| 6 Nominal current (max. continuous current) | A | 2.79 | 1.39 | 0.731 |
| 7 Stall torque | mNm | 60.1 | 64.3 | 68.1 |
| 8 Stall current | A | 34.5 | 18.4 | 11.4 |
| 9 Max. efficiency | % | 87 | 87 | 87 |
| **Characteristics** | | | | |
| 10 Terminal resistance phase to phase | Ω | 0.348 | 1.3 | 4.22 |
| 11 Terminal inductance phase to phase | mH | 0.018 | 0.072 | 0.213 |
| 12 Torque constant | mNm/A | 1.74 | 3.49 | 5.99 |
| 13 Speed constant | rpm/V | 5480 | 2740 | 1590 |
| 14 Speed/torque gradient | rpm/mNm | 1090 | 1020 | 1120 |
| 15 Mechanical time constant | ms | 1.64 | 1.53 | 1.68 |
| 16 Rotor inertia | $gcm^2$ | 0.143 | 0.143 | 0.143 |

## Specifications

| | | |
|---|---|---|
| **Thermal data** | | |
| 17 Thermal resistance housing-ambient | | 22.5 K/W |
| 18 Thermal resistance winding-housing | | 3.51 K/W |
| 19 Thermal time constant winding | | 2.54 s |
| 20 Thermal time constant motor | | 425 s |
| 21 Ambient temperature | | -40…+135°C |
| 22 Max. winding temperature | | +155°C |
| **Mechanical data (preloaded ball bearings)** | | |
| 23 Max. speed | | 90000 rpm |
| 24 Axial play at axial load | < 7 N | 0 mm |
| | > 7 N | max. 0.85 mm |
| 25 Radial play | | preloaded |
| 26 Max. axial load (dynamic) | | 6 N |
| 27 Max. force for press fits (static) | | 7 N |
| 28 Max. radial load, 5 mm from flange | | 4 N |
| **Other specifications** | | |
| 29 Number of pole pairs | | 1 |
| 30 Number of phases | | 3 |
| 31 Weight of motor | | 37 g |

Alignment of the electronic connections not specified.

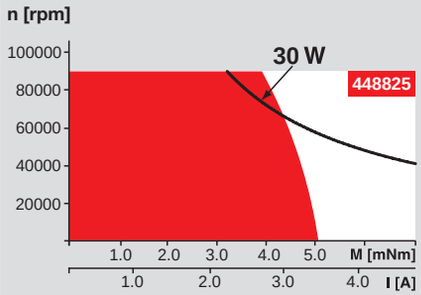
Values listed in the table are nominal.

**Connection A and B, motor** (cable AWG 22)
red — Motor winding 1
black — Motor winding 2
white — Motor winding 3
**Connection A, sensors** (cable AWG 26)
green — $V_{Hall}$ 3.8...24 VDC
blue — GND
red/grey — Hall sensor 1
black/grey — Hall sensor 2
white/grey — Hall sensor 3

**Option:** Inch-version size 5 available as standard version.

Wiring diagram for Hall sensors see page 35

## 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**

## Application

135°C

**Sterilizable Devices**

Saws
Surgical Reamers
Arthroscopic Shavers
Surgical Staplers
Dental Tools

## Sterilization information

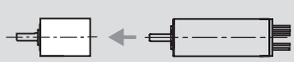
Sensorless: typically 2000 autoclave cycles
Hall sensor: typically 1000 autoclave cycles

| | |
|---|---|
| Sterilization with steam | |
| Temperature | +134°C ± 4°C |
| Compression pressure up to | 2.3 bar |
| Rel. humidity | 100 % |
| Cycle length | 18 minutes |

## maxon modular system

Overview on page 20–27

**Planetary Gearhead**
sterilizable
∅13 mm
0.05 - 0.275 Nm
Page 318



**Recommended Electronics:**

| **Notes** | Page **26** |
|---|---|
| ESCON Module 24/2 | 416 |
| ESCON 36/3 EC | 417 |
| ESCON Mod. 50/4 EC-S | 417 |
| ESCON Module 50/5 | 417 |
| ESCON 50/5 | 418 |
| DEC Module 24/2, 50/5 | 420 |

Choke may be required



April 2016 edition / subject to change