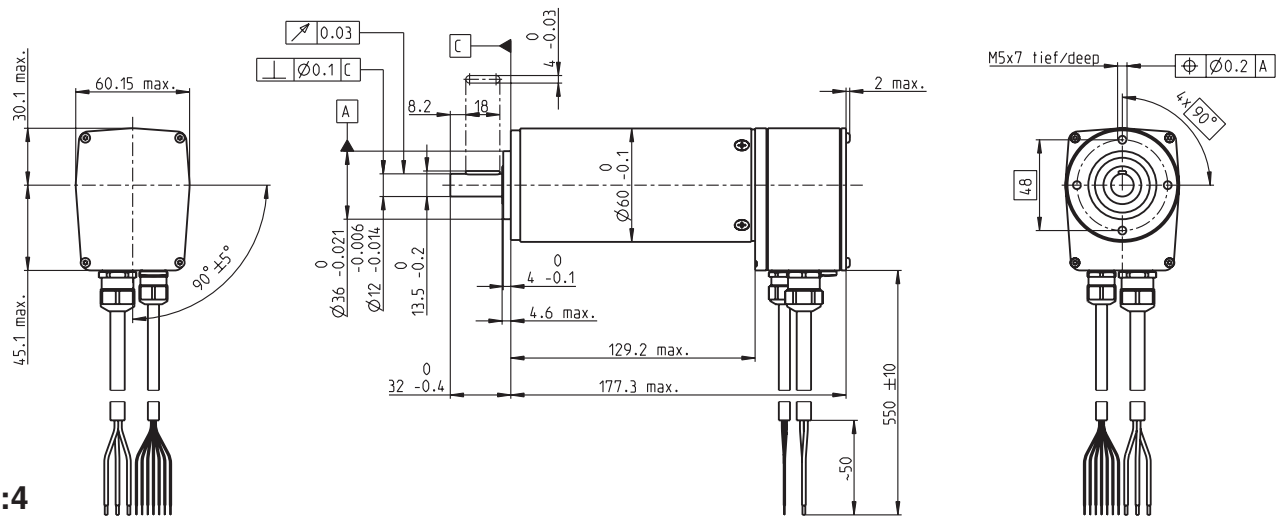
# EC 60 ∅60 mm, brushless, 400 Watt, CE approved






M 1:4

Stock program
Standard program
Special program (on request)

**Order Number**

| | 167132 | 167131 |
|---|---|---|
| **Motor Data** | | |
| **Values at nominal voltage** | | |
| 1 Nominal voltage V | 48.0 | 48.0 |
| 2 No load speed rpm | 5370 | 3100 |
| 3 No load current mA | 733 | 304 |
| 4 Nominal speed rpm | 4960 | 2680 |
| 5 Nominal torque (max. continuous torque) mNm | 747 | 830 |
| 6 Nominal current (max. continuous current) A | 9.38 | 5.85 |
| 7 Stall torque mNm | 11800 | 6820 |
| 8 Starting current A | 139 | 46.4 |
| 9 Max. efficiency % | 86 | 85 |
| **Characteristics** | | |
| 10 Terminal resistance phase to phase Ω | 0.345 | 1.03 |
| 11 Terminal inductance phase to phase mH | 0.273 | 0.82 |
| 12 Torque constant mNm / A | 84.9 | 147 |
| 13 Speed constant rpm / V | 113 | 65.0 |
| 14 Speed / torque gradient rpm / mNm | 0.457 | 0.457 |
| 15 Mechanical time constant ms | 3.98 | 3.98 |
| 16 Rotor inertia gcm² | 831 | 831 |

## Specifications

**Thermal data**

| | | |
|---|---|---|
| 17 | Thermal resistance housing-ambient | 1.3 K / W |
| 18 | Thermal resistance winding-housing | 0.5 K / W |
| 19 | Thermal time constant winding | 33.7 s |
| 20 | Thermal time constant motor | 1200 s |
| 21 | Ambient temperature | -20 ... +100°C |
| 22 | Max. permissible winding temperature | +125°C |

**Mechanical data (preloaded ball bearings)**

| | | | |
|---|---|---|---|
| 23 | Max. permissible speed | | 7000 rpm |
| 24 | Axial play at axial load | < 30 N | 0 mm |
| | | > 30 N | max. 0.14 mm |
| 25 | Radial play | | preloaded |
| 26 | Max. axial load (dynamic) | | 26 N |
| 27 | Max. force for press fits (static) | | 392 N |
| | (static, shaft supported) | | 8000 N |
| 28 | Max. radial loading, 5 mm from flange | | 240 N |

**Other specifications**

| | | |
|---|---|---|
| 29 | Number of pole pairs | 1 |
| 30 | Number of phases | 3 |
| 31 | Weight of motor | 2450 g |
| | Protection to | IP54 |

Values listed in the table are nominal.

**Connection Motor** (Cable AWG 16)

| | |
|---|---|
| Cable 1 | Motor winding 1 |
| Cable 2 | Motor winding 2 |
| Cable 3 | Motor winding 3 |

**Connection sensors** (Cable AWG 24)[1)]

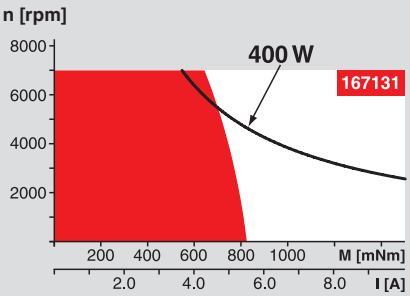
| | |
|---|---|
| white | Hall sensor 3 |
| brown | Hall sensor 2 |
| green | Hall sensor 1 |
| yellow | GND |
| grey | $V_{Hall}$ 4.5 ... 24 VDC |
| blue | Temperature sensor (PTC) |
| pink | Temperature sensor (PTC) |

1) Not lead through in combination with resolver.

Temperature monitoring
PTC resistance Micropille 110°C,
R 25°C < 0.5 kΩ, R 105°C = 1.2 ... 1.5 kΩ,
R 115°C = 7 ... 13 kΩ, R 120°C = 18 ... 35 kΩ

Wiring diagram for Hall sensors see p. 27

## Operating Range




Comments

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

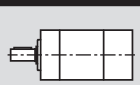
**Short term operation**
The motor may be briefly overloaded (recurring).

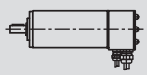
**Assigned power rating**

## maxon Modular System

Overview on page 16 - 21

**Planetary Gearhead**
∅81 mm
20 - 120 Nm
Page 244





**Encoder HEDL 9140**
500 Imp.,
3 channels
Page 271

**Resolver Res**
∅26 mm
10 V
Page 277

**Brake AB 41**
24 VDC
2.0 Nm
Page 320

**Recommended Electronics:**

| | |
|---|---|
| DECS 50/5 | Page 289 |
| DEC 50/5 | 291 |
| DEC Module 50/5 | 291 |
| DEC 70/10 | 297 |
| DES 50/5 | 298 |
| DES 70/10 | 298 |
| EPOS2 70/10 | 305 |
| **Notes** | 20 |