Data sheet

# MAXFMC-33PBD301870

MAX

MAGNETOSTRICTIVE LINEAR ENCODERS

SICK
Sensor Intelligence.

Illustration may differ

## Ordering information

| Type | part no. |
|---|---|
| MAXFMC-33PBD301870 | 1107761 |

Other models and accessories ➜ www.sick.com/MAX

## Detailed technical data

### Features

| | |
|---|---|
| **Additional information** | CAT® Part no.: 589-8349 |

### Performance

| | |
|---|---|
| **Pressure pipe/End cap** | 10 mm |
| **Connection type** | Male connector, M12, 4-pin |
| **Direction of connection** | Axial |
| **Measuring range** | |
| Measured values | Positioning |
| Position (F.S.) | 0 mm ... 1,870 mm [1] |
| Null zone | 30 mm |
| Damping zone | 63.5 mm |
| **Operating conditions** | |
| Air humidity | 90 % (Condensation not permitted) |
| Operating pressure $P_N$ | 35 MPa |
| Supply voltage | 9 V DC (7 ... 11 V DC) |
| Switch-on time | < 150 ms |
| Switch-on current | Typ. ≤ 140 mA |
| Measuring frequency (internal) | 2 ms |
| Transmission rate (cycle time) | Type-dependent, according to PWM frequency |
| **Accuracy** | |
| Setpoint tolerance | Typ. ± 0.5 mm |
| Hysteresis | ± 0,1 mm |
| Repeatability | Typ. ± 0.2 mm |
| Linearity | ≤ ± 0.04% F.S. (min. ≤ ± 0.25 mm) |
| **Temperature drift** | |
| In the operational status | ≤ ± 0.04% F.S. (min. ≤ ± 0.25 mm) |

[1] F.S. = Full Scale (Measuring range).

### Interfaces

| | |
|---|---|
| **Communication interface** | PWM |
| **Puls width** | 10% ... 90% |
| **Frequency** | 250 Hz |

## Electronics

| | |
|---|---|
| **Connection type** | Male connector, M12, 4-pin |
| **PIN assignment** | 1=n.c.; 2=V DC; 3=GND; 4=SIG |
| **Electrical operation** | |
| Supply voltage | 9 V DC (7 ... 11 V DC) |
| Residual ripple | ≤ ± 5 % S-S |
| Current consumption | ≤ 50 mA |
| **Overvoltage protection during power-up (60 s)** | ≤ 36 V at all poles during power-up (60 s) |
| **Reverse polarity protection** | ≤ 16 (V DC - GND) |
| **Insulation resistance** | 24 V DC (housing) Riso ≥ 10 MΩ, 60 s |
| **Dielectric strength** | 0 V DC (60 s) to housing ($R_{ISO}$ ≥ 1 MΩ) |
| **Short-circuit protection** | $V_S$ – GND on housing |

## Mechanics

| | |
|---|---|
| **Dimensions** | |
| Housing | FM, SAE flange caterpillar |
| Ø pressure pipe | 10 mm |
| **Material** | |
| Housing | Stainless steel 1.4305 (AISI 303) |
| Pressure pipe | Stainless steel 1.4306, AISI 304L |
| M12 male connector | Glass fiber reinforced polyamide, nickel-/gold-plated brass contacts |
| M12 flange | Nickel-plated brass with O-ring (NBR) [1] |

[1] Acc. to CAT® part number 435-3388 .

## Ambient data

| | |
|---|---|
| **EMC** | |
| Agricultural and forestry machinery | EN ISO 14982 |
| Transient pulses | ISO 7637-1/ISO 7637-2 |
| ESD (air and contact discharge) | ISO 61000-4-2 / ISO 10605 |
| **Vibration** | |
| Broadband noise (resonance peaks removed) | 20.4 g (r.m.s.), 6 h / spatial axis, 20 ... 2,000 Hz (acc. to CAT® EC1 V9.0 Profile 10) |
| **Pressure load** | |
| Operating pressure $P_N$ | 35 MPa |
| Overload pressure $P_{max} = P_N \times 1.2$ | 42 MPa |
| Test pressure $P_{stat} = P_N \times 1.5$ | 53 MPa |
| **Temperature and air humidity** | |
| Storage | –20 °C ... +65 °C [1] |
| Operation (electronics) | –40 °C ... +120 °C |
| Maximum air humidity | 90 % (Condensation not permitted) |
| **Enclosure rating** | |

[1] R. H. 55%.
[2] With suitable coupling (sealing through O-ring in M12 coupling nut).

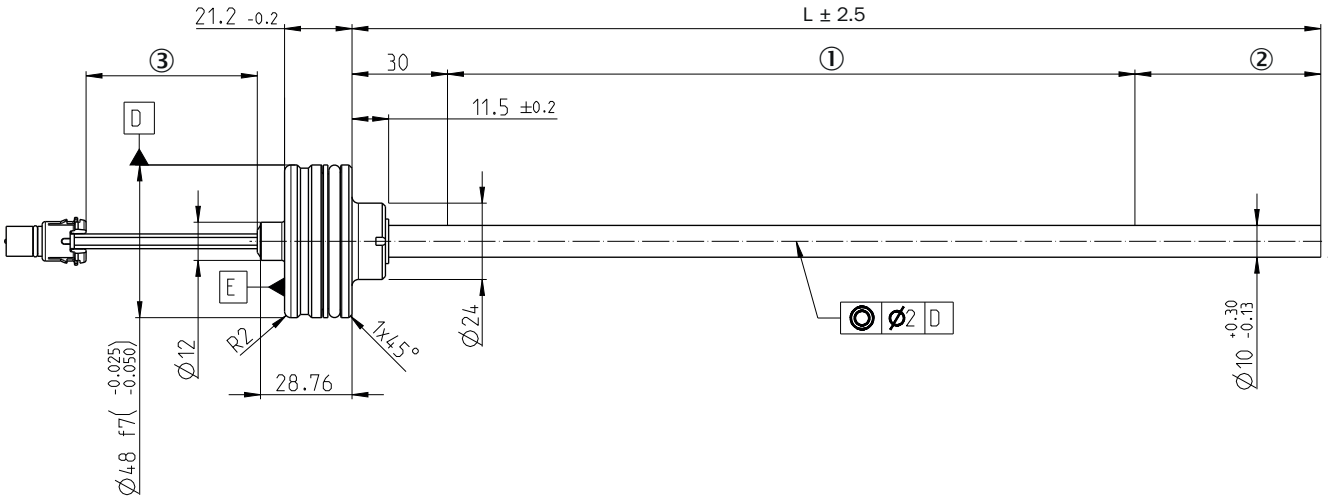
| | |
|---|---|
| Housing | According to CAT® "HOT DUNK TEST" |
| M12 male connector | IP69K (ISO 20653) [2] |

[1] R. H. 55%.
[2] With suitable coupling (sealing through O-ring in M12 coupling nut).

## Classifications

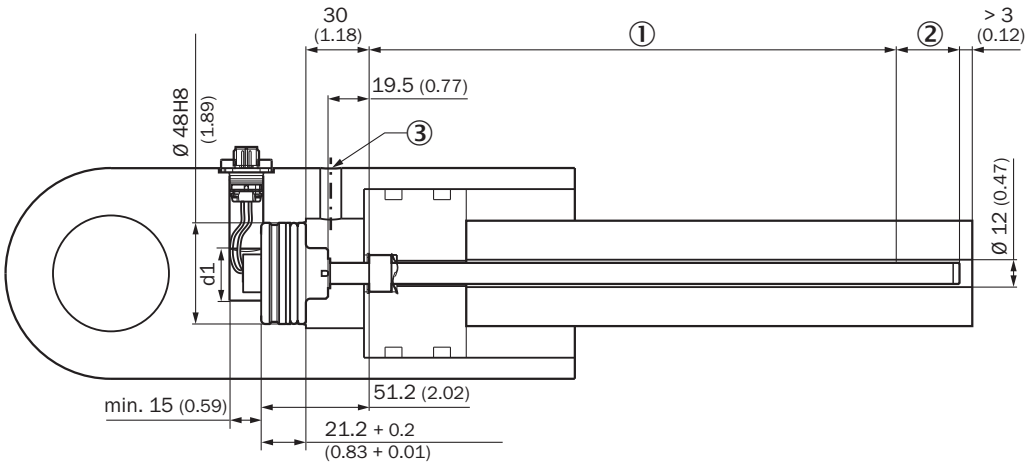
| | |
|---|---|
| **ECLASS 5.0** | 27270705 |
| **ECLASS 5.1.4** | 27270705 |
| **ECLASS 6.0** | 27270705 |
| **ECLASS 6.2** | 27270705 |
| **ECLASS 7.0** | 27270705 |
| **ECLASS 8.0** | 27270705 |
| **ECLASS 8.1** | 27270705 |
| **ECLASS 9.0** | 27270705 |
| **ECLASS 10.0** | 27270705 |
| **ECLASS 11.0** | 27270705 |
| **ECLASS 12.0** | 27274304 |
| **ETIM 5.0** | EC002544 |
| **ETIM 6.0** | EC002544 |
| **ETIM 7.0** | EC002544 |
| **ETIM 8.0** | EC002544 |
| **UNSPSC 16.0901** | 41111613 |

## Dimensional drawing MAX48C



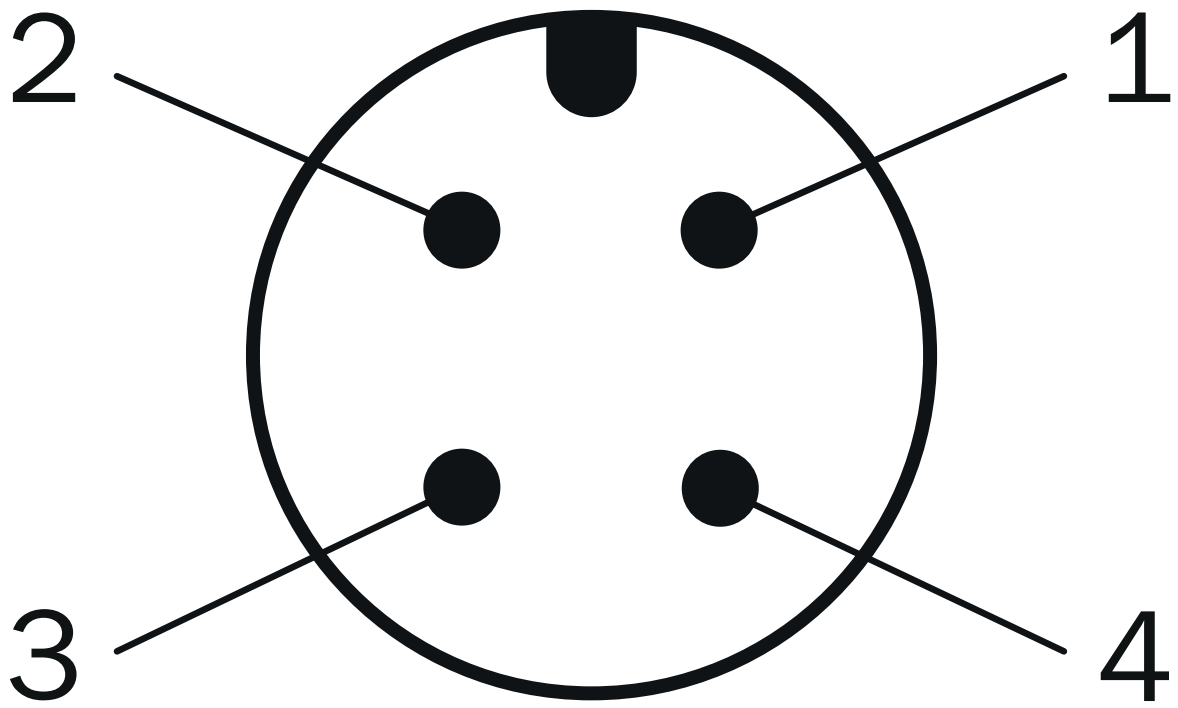

Dimensions in mm (inch)
① Measuring range
② damping zone
③ wire length

## Attachment specifications Installation space for cylinders




Please note the information in the operating instructions (d: 32 ≤ d1 ≤ 40).
① Measuring range
② damping zone
③ Hydraulic port

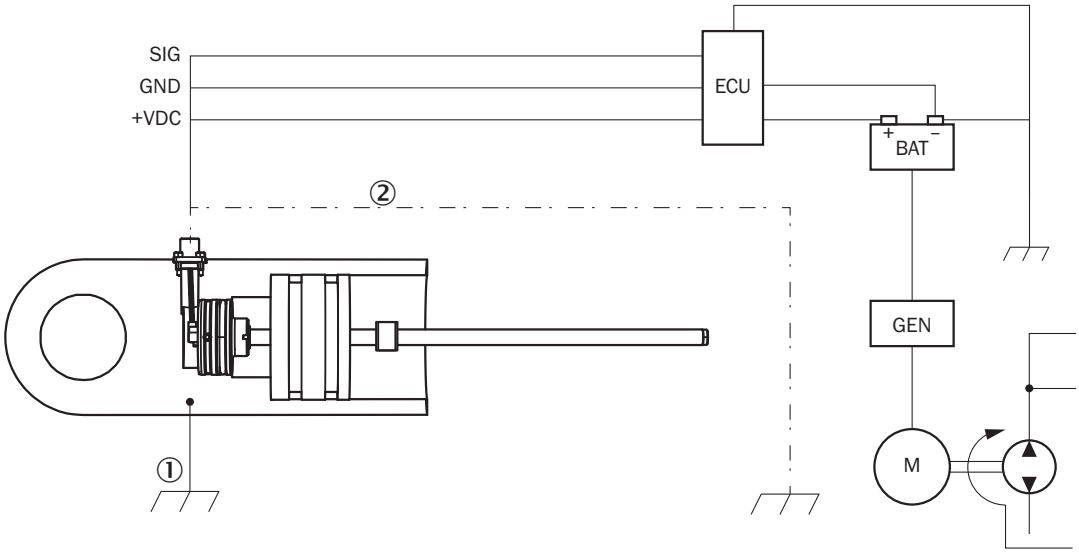
## PIN assignment Pin assignment P




① N.C.
② V DC
③ GND

④ Signal

## Connection diagram




connection diagram
① Chassis GND
② Cable shielding (optional)

## Recommended accessories

Other models and accessories ➜ www.sick.com/MAX

| | Brief description | Type | part no. |
|---|---|---|---|
| magnets | | | |
| | • **Product segment:** Magnets<br>• **Product:** Position magnets<br>• **Description:** Position magnet for magnetostrictive linear encoder ring magnet, overmolded, dimensions: 17.5 x 28.6 x 11.4 mm | MAG-O-C286-144 | 2124327 |
| | • **Product segment:** Magnets<br>• **Product:** Position magnets<br>• **Description:** Position magnet for magnetostrictive linear encoder ring magnet, dimensions: 13.5 x 17.4 x 5.84 mm | MAG-O-C174-144 | 2124326 |
| | • **Product segment:** Magnets<br>• **Product:** Position magnets<br>• **Description:** Position magnet for magnetostrictive linear encoder ring magnet, overmolded, dimensions: 13.5 x 20.6 x 14.3 mm | MAG-O-C206-120 | 2124328 |
| Mounting systems | | | |
| | • **Description:** Flange for M12 male connector, type C 3-hole square flange (24 mm x 24 mm) with axial seal, 250 pieces<br>• **Material:** Brass<br>• **Details:** Nickel-plated brass<br>• **Packing unit:** 250 pieces | BEF-FA-M12C-250 | 2124448 |

# SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

**For us, that is “Sensor Intelligence.”**

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