



MLP1-SMMA0AC

MLP1

SAFETY LOCKING DEVICES

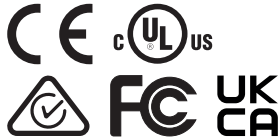
SICK
Sensor Intelligence.



Ordering information

| Type | part no. |
|--------------|----------|
| MLP1-SMMA0AC | 1077943 |

Other models and accessories → www.sick.com/MLP1



Detailed technical data

Features

| | |
|--|-------------------|
| Sensor principle | RFID |
| Locking principle | Power to lock |
| Coding | Universally coded |
| Locking force F_{max} | 550 N (GS-ET-19) |
| Locking force F_{Zh} | 500 N (GS-ET-19) |
| Retaining force | 25 N |
| Offset tolerance | ≤ 5 mm |
| Assured switch off distance S_{ar} | 45 mm |
| For process protection only | ✓ |

Safety-related parameters

| | |
|---|--|
| Safety integrity level | SIL 3 (IEC 61508) |
| Category | Category 4 (EN ISO 13849) |
| Performance level | PL e (EN ISO 13849) ¹⁾ |
| PFH_D (mean probability of a dangerous failure per hour) | $15 * 10^{-9}$ ²⁾ |
| T_M (mission time) | 20 years (EN ISO 13849) |
| Type | Type 4 (EN ISO 14119) |
| Actuator coding level | Low coding level (EN ISO 14119) |
| Safe state in the event of a fault | At least one safety-related semiconductor output (OSSD) is in the OFF state. |

¹⁾ In a safe series connection, the performance level for the safe series connection as a whole depends on the number and type of devices in the safe series connection. PL e is only possible in safe series connections with a maximum of 6 devices.

²⁾ At 40 °C and 1000 m above sea level.

Functions

| | |
|--|---------------------|
| Switching behavior of the OSSDs | Actuator monitoring |
|--|---------------------|

| | |
|-------------------------------|---|
| Safe series connection | None, only individual wiring (with diagnostics) |
|-------------------------------|---|

Interfaces

| | |
|---------------------------------------|------------------------------|
| Connection type | Cable with plug M12, 5-pin |
| Length of cable | 150 mm |
| Long connecting cable | ≤ 140 m |
| Cable diameter | 5.5 mm |
| Conductor cross section | 0.12 mm ² |
| Bend radius (with fixed installation) | > 8 x cable diameter |
| Bend radius (with moving cable) | > 12 x cable diameter |
| Cable material | PVC |
| Conductor material | Copper |
| Coupling nut material | Zinc die-cast, nickel-plated |
| Display elements | LEDs |
| Status display | ✓ |

Electronics

| | |
|---|---|
| Protection class | III (IEC 61140) |
| Contamination rating | 3 (EN 60947-1) |
| Classification according to cULus | Class 2 |
| Usage category | DC-13 (IEC 60947-5-1) |
| Rated insulation voltage U_i | 32 V |
| Rated impulse withstand voltage U_{imp} | 1,500 V |
| Supply voltage U_v when an individual safety switch is connected | |
| Sensor | 24 V DC (19.2 V DC ... 28.8 V DC) |
| Magnet | 24 V DC (19.2 V DC ... 28.8 V DC) |
| Supply voltage U_v when a cascade is connected | |
| Sensor | 24 V DC (22.8 V DC ... 28.8 V DC) |
| Magnet | 24 V DC (21.6 V DC ... 28.8 V DC) |
| Power consumption | |
| Locking active | 350 mA |
| Locking deactivated | 50 mA |
| Switching frequency | ≤ 0.5 Hz |
| Type of output | Self-monitoring semiconductor outputs (OSSDs) |
| Output current (OSSDs) | ≤ 100 mA |
| Diagnostic output | ≤ 25 mA, short-circuit protected |
| Cable capacitance | 400 nF (for OUT A and OUT B) |
| Response time | 50 ms ¹⁾ |
| Release time | 100 ms ¹⁾ |
| Risk time | 100 ms ¹⁾ |

¹⁾ In a cascade, the value is multiplied by the number of safety switches in the cascade.

| | |
|--------------------------|---------------|
| Switch-on time | 2.5 s |
| Locking principle | Power to lock |

¹⁾ In a cascade, the value is multiplied by the number of safety switches in the cascade.

Mechanics

| | | |
|-------------------------------|------------------------|----------------------------|
| Weight | Switches (spare parts) | 510 g |
| | Actuator | 210 g |
| Material | Sensor housing | Anodized aluminum |
| | Actuator housing | Fiber-glass-reinforced PVC |
| | Anchor plate | Nickel-plated steel |
| Dimensions (W x H x D) | Switches (spare parts) | 120 mm x 60 mm x 38.5 mm |
| | Actuator | 120 mm x 60 mm x 20.5 mm |
| Offset tolerance | Vertical | ≤ 5 mm |
| | Horizontal | ≤ 5 mm |
| | Aperture angle | ≤ 3° |

Ambient data

| | |
|--------------------------------------|--|
| Enclosure rating | IP67 (EN 60529) |
| Ambient operating temperature | -20 °C ... +55 °C |
| Storage temperature | -25 °C ... +70 °C |
| Relative humidity | 50 %, at 70 °C (IEC 60947-5-2) |
| Vibration resistance | 10 Hz ... 55 Hz, 1 mm (IEC 60068-2-6) |
| Shock resistance | 30 g, 11 ms (EN 60068-2-27) |
| EMC | EN IEC 61326-3-1 EN IEC 60947-5-2 EN IEC 60947-5-3 |

Certificates

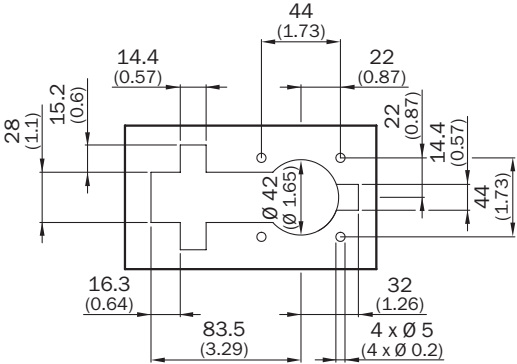
| | |
|---------------------------------------|---|
| EU declaration of conformity | ✓ |
| UK declaration of conformity | ✓ |
| ACMA declaration of conformity | ✓ |
| China-RoHS | ✓ |
| UK-Type-Examination approval | ✓ |
| cULus certificate | ✓ |
| FCC certificate | ✓ |
| TÜV approval | ✓ |
| TÜV approval annex | ✓ |
| EC-Type-Examination approval | ✓ |

Classifications

| | |
|-------------------|----------|
| ECLASS 5.0 | 27272603 |
|-------------------|----------|

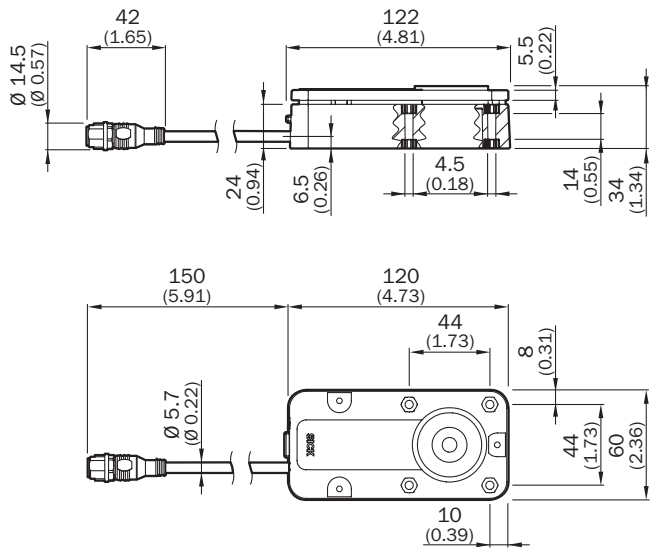
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|-----------------------|----------|
| ECLASS 5.1.4 | 27272603 |
| ECLASS 6.0 | 27272603 |
| ECLASS 6.2 | 27272603 |
| ECLASS 7.0 | 27272603 |
| ECLASS 8.0 | 27272603 |
| ECLASS 8.1 | 27272603 |
| ECLASS 9.0 | 27272603 |
| ECLASS 10.0 | 27272603 |
| ECLASS 11.0 | 27272603 |
| ECLASS 12.0 | 27272603 |
| ETIM 5.0 | EC002593 |
| ETIM 6.0 | EC002593 |
| ETIM 7.0 | EC002593 |
| ETIM 8.0 | EC002593 |
| UNSPSC 16.0901 | 39122205 |

Dimensional drawing Recess for flush mounting



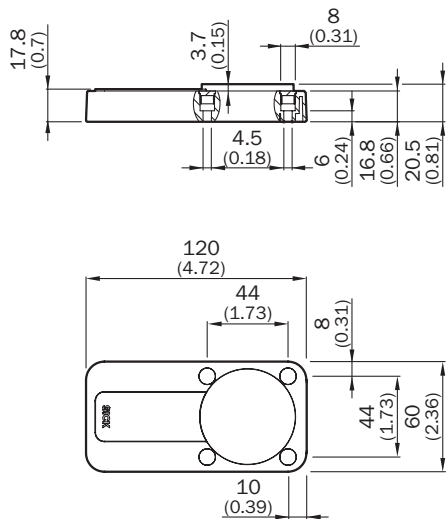
Dimensions in mm (inch)

Dimensional drawing Sensor with M12 male connector



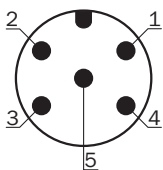
Dimensions in mm (inch)

Dimensional drawing Actuator



Dimensions in mm (inch)

Pinouts



| Pin | Designation | Description |
|-----|-------------|------------------------------|
| 1 | +24 V DC | Safety switch voltage supply |

| Pin | Designation | Description |
|------------|--------------------|------------------------|
| 2 | OSSD 1 | OSSD 1 output |
| 3 | 0 V | 0 V DC voltage supply |
| 4 | OSSD 2 | OSSD 2 output |
| 5 | Magnet | Magnet control 24 V DC |

For details see operating instructions

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