SICK.COM

DATA SHEET

MLP1-SMMA0AC

MLP1
Safety locking devices

SICK Sensor Intelligence

SAFETY LOCKING DEVICES

MLP1-SMMA0AC

ORDERING INFORMATION

Type	part no.
MLP1-SMMA0AC	1077943

Further device versions and accessories at 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)

[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.

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 mm²
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]
Switch-on time	2.5 s

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

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°

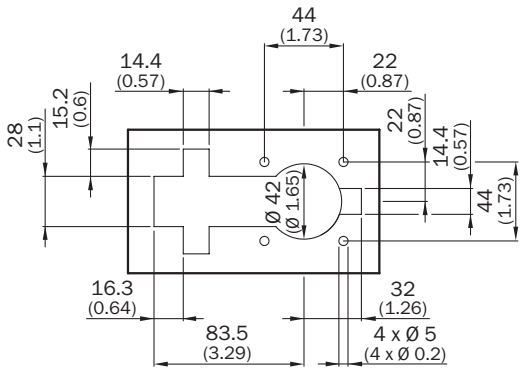
AMBIENT DATA

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

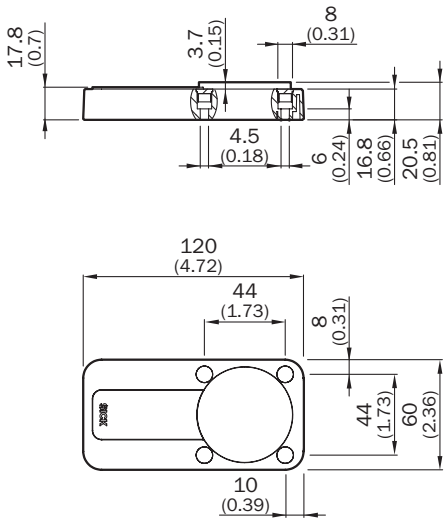
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China RoHS	✓
UK-Type-Examination approval	✓
cULus certificate	✓
FCC certificate	✓
TÜV approval	✓
TÜV approval annex	✓
EC-Type-Examination approval	✓

DIMENSIONAL DRAWING RECESS FOR FLUSH MOUNTING



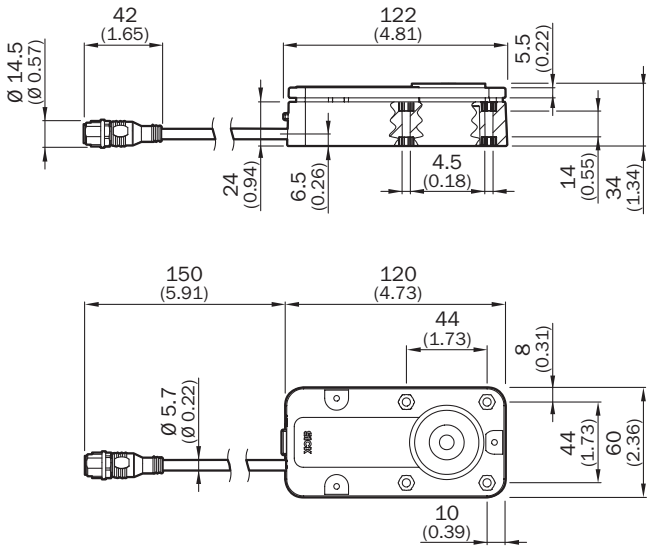
Dimensions in mm (inch)

DIMENSIONAL DRAWING ACTUATOR



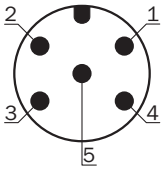
Dimensions in mm (inch)

DIMENSIONAL DRAWING SENSOR WITH M12 MALE CONNECTOR



Dimensions in mm (inch)

PINOUTS



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

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at www.sick.com/1077943

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SICK AT A GLANCE

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SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

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