PRODUCT INFORMATION

flexLock

RFID-MONITORED SAFETY LOCKING DEVICE WITH 180° ACTUATION RADIUS

Safety locking devices

SICK
Sensor Intelligence.

For flexible use

With an actuation radius of 180° and a flexible actuator entry point, you can use the flexLock safety locking device in a wide variety of door guarding applications. Even with small door radii.

For a clean solution

The clean design with rounded corners and flat surfaces saves you time and money on cleaning. This makes the flexLock particularly well-suited for use in challenging environments.

YOUR FLEXIBLE SOLUTION FOR GUARD LOCKING

You have high demands on safety locking devices?
They need to be rugged, easy to clean and, above all, flexible in use?
Then the flexLock is perfect for you. Thanks to the infinitely variable actuation radius of 180° and the open locking head, flexLock keeps doors and flaps of all types safely closed. The high offset tolerance ensures quick mounting and reliable functions, even with door sagging. For reliable personal protection and seamless processes.

More information
→ www.sick.com/flexLock

For constant availability

Thanks to clearly visible diagnostic LEDs, you can see the device status at a glance. This makes it possible to reduce downtime. Even if doors sink slightly over time, the flexLock enables permanently high machine availability.

For high safety

Thanks to its high locking force and performance level up to PL e, the flexLock ensures optimum safety when locking doors and flaps. The RFID monitoring with high coding level offers reliable protection against manipulation.

THE CLEAN SOLUTION FOR COUNTLESS APPLICATIONS

Developed for the everyday challenges of industry, the flexLock safety locking device with IP69K is particularly resistant to dust and water. In areas with strict hygienic requirements, the open locking head and the rounded housing make cleaning easy. It is also tolerant to sources of interference such as misalignments due to door sagging or inaccurate mounting. The flexLock thus ensures smooth, productive and safe operation.

One flexLock – many variants.

The flexLock is coded either universally or uniquely to suit applications without any incentive for manipulation or to specifically prevent manipulation.

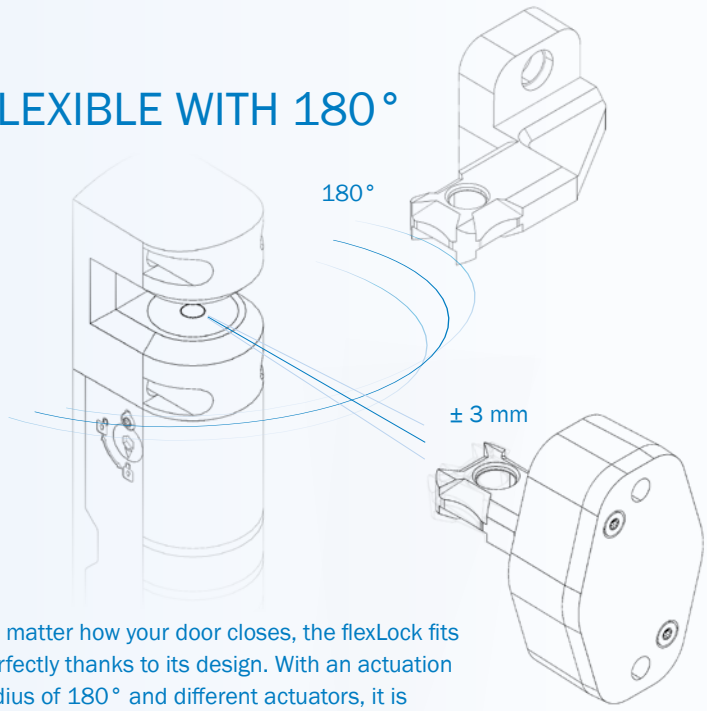
Two principles of operation enable different scenarios. With a bistable solenoid, the flexLock remains closed even in the event of a power failure and is therefore ideally suited for personal protection. The variant with the power to lock principle is suitable for machines without run-down times in which production processes have to be protected against interruptions.

For applications in which people can be locked in unintentionally, the flexLock is also available in a variant with escape release.

Learn more
➜ www.sick.com/flexLock

8026423/2022-08-03
Subject to change without notice

FLEXIBLE WITH 180°



No matter how your door closes, the flexLock fits perfectly thanks to its design. With an actuation radius of 180° and different actuators, it is the most effective choice when you can have no restrictions in terms of flexibility.

Safe control solutions

The Flexi Loop safe series connection reduces wiring work and the required inputs in the controller. This saves installation costs and enables ideal control and monitoring with the space-saving and user-friendly Flexi Compact safety controller.

→ www.sick.com/Flexi_Loop
→ www.sick.com/Flexi_Compact

SICK is there for you

In addition to products and systems, SICK also offers a complete portfolio of useful services from risk assessment through to verification and validation. Specialists in safety applications will support you as you implement each step on the path to safe processes.

CREATING
SAFE
PRODUCTIVITY

RFID-MONITORED SAFETY LOCKING DEVICE WITH 180° ACTUATION RADIUS

Product description

The flexLock safety locking device with RFID monitoring is characterized by an infinitely variable actuation radius of 180°. It thus offers a high level of flexibility for the safety locking function of doors and flaps – even with small door radii. The clearly visible LEDs show the device status continuously at all viewing angles. The open locking head and the rounded housing of the flexLock allow for easy cleaning. In addition, the high offset tolerance ensures easy mounting and high system availability, even when the door is lowered. Variants for personal or process protection are well suited for use in a wide range of applications up to PL e. The optional escape release allows the locking device to be unlocked from the hazardous area.

At a glance

- Innovative design: Open locking head with 180° actuation radius, rounded housing, bright LEDs (visible from three sides)
- PL e for door and locking monitoring with low or high coding
- IP67 and IP69K enclosure rating
- High locking force: Up to 3150 N
- Flexible actuator for high offset tolerance

Your benefits

- Makes machine integration easier thanks to the flexible entry point of the actuator into the locking head – even for applications with small door radii
- Provides high manipulation protection at a high coding level
- Saves you time and money when cleaning the housing, making it particularly well-suited for use in dirty environments
- Ensures a high level of safety thanks to PL e and high locking force
- Makes mounting easy and offers you a high machine availability thanks to offset tolerance
- Able to be used in hazardous areas that are not fully visible thanks to escape release

Additional information

→ www.sick.com/flexLock

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.

8026423/2022-08-03
Subject to change without notice

Detailed technical data

More detailed data can be found in the operating instructions. Download ➜ www.sick.com/flexLock

Features

	FXL1-SPBxxxxx	FXL1-SPExxxxx	FXL1-SPLxxxxx
Sensor principle	RFID		
Locking principle	Power to release		Power to lock
Coding	Universally coded / uniquely coded (depending on type)		
Locking force F_{max}			
Flexible actuator	4,100 N (EN ISO 14119)		
Rigid actuator (frontal)	3,630 N (EN ISO 14119)		
Rigid actuator (lateral)	3,510 N (EN ISO 14119)		
Locking force F_{Zh}			
Flexible actuator	3,150 N (EN ISO 14119)		
Rigid actuator (frontal)	2,790 N (EN ISO 14119)		
Rigid actuator (lateral)	2,700 N (EN ISO 14119)		
Actuation force	20 N		
Retaining force	30 N		
Force against which unlocking is possible	≤ 25 N		
Actuation frequency	≤ 1 Hz		
Approach speed	≤ 20 m/min		

Safety-related parameters

Safety integrity level	SIL3 (IEC 61508)
Category	Category 4 (EN ISO 13849) [1]
Performance level	PL e (EN ISO 13849) [1]
PFH_D (mean probability of a dangerous failure per hour)	6.79×10^{-9} (EN ISO 13849) [2]
T_M (mission time)	20 years (EN ISO 13849)
Type	Type 4 (EN ISO 14119)
Actuator coding level	
Model universally coded	Low coding level (EN ISO 14119)
Model uniquely coded	High 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] Applies for monitoring of the door position (interlocking monitoring) and locking monitoring.

[2] At 40 °C and 0 m above sea level.

Functions

	FXL1-SPBxxxxx	FXL1-SPExxxxx	FXL1-SPLxxxxx
Auxiliary release	✔		–
Escape release	–	✔	–
Switching behavior of the OSSDs	Locking monitoring		Locking monitoring / actuator monitoring (depending on type)
Safe series connection	In control cabinet (with diagnostics) With Flexi Loop (with diagnostics) With T-connector (without diagnostics)		

Interfaces

Connection type	Plug connector, M12, 8-pin
Diagnostics indicator	✔
Status display	✔

Electrical data

	FXL1-SPBxxxxx	FXL1-SPExxxxx	FXL1-SPLxxxxx
Protection class	III (IEC 61140)		
Contamination rating	3 (IEC 60947-1)		
Classification according to cULus	Class 2		
Usage category	DC-13 (IEC 60947-5-3)		
Rated insulation voltage U_i	32 V		
Rated impulse withstand voltage U_{imp}	1,500 V		
Supply voltage V_S	24 V DC (19.2 V DC ... 28.8 V DC)		
Power consumption			
Locking device unlocked	65 mA		
Locking device locked	65 mA		125 mA
Peak current	800 mA, 200 ms		
Type of output	Self-monitoring semiconductor outputs (OSSDs)		
Safety outputs	2 PNP semiconductors, short-circuit protected, cross-circuit monitored		
Output current			
Safety outputs	≤ 100 mA		
Application diagnostic outputs	≤ 50 mA		
Output voltage	U_V - 2 V DC ... U_V		
Response time	≤ 150 ms [1]		
Release time	≤ 350 ms [1]		
Risk time	150 ms [1]		
Switch-on time	3 s		
Locking principle	Power to release		Power to lock

[1] In safe series connection: The value increases by 70 ms with each additional switch.

Mechanical data

	FXL1-SPBxxxxx	FXL1-SPExxxxx	FXL1-SPLxxxxx
Weight	480 g		535 g
Material			
Housing	VISTAL®		
Ball bracket	Stainless steel		
Latch plate of the actuator	Stainless steel		
Plug connectors	Stainless steel		
Escape release	–	Aluminum	–
Mechanical life	1 x 10^6 switching cycles		

Ambient data

Enclosure rating	IP65 (IEC 60529) IP67 (IEC 60529) IP69K (IEC 20653)
Ambient operating temperature	–20 °C ... +55 °C
Storage temperature	–25 °C ... +70 °C
Relative humidity	10 % ... 95 %, at 40 °C (IEC 60068)
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, EN 300330

Ordering information

Items supplied flexLock:

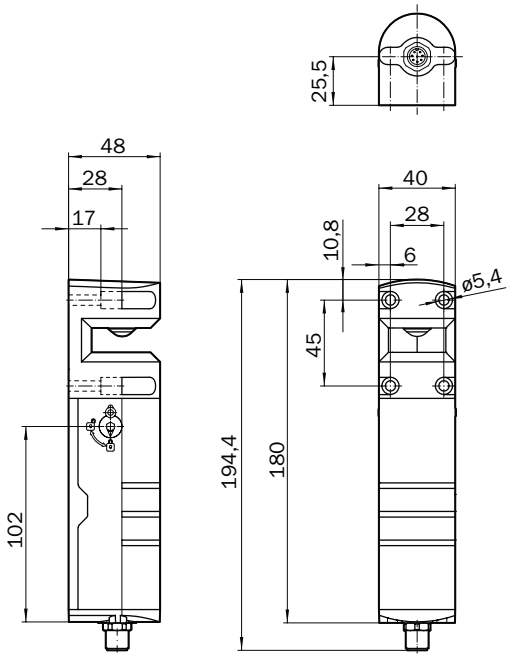
- Safety switch
- Protective caps for secure mounting
- Mounting instructions
- Safety instruction
- Operating instructions for download ➜ **www.sick.com/flexLock**

Locking principle	Switching behavior of the OSSDs	Coding	Auxiliary release	Escape release	Type	Part no.
Power to release	Locking monitoring	Universally coded	✔	–	FXL1-SPBMSA00	1101321
				✔	FXL1-SPEMSA00	1120828
		Uniquely coded	✔	–	FXL1-SPBUSA00	1101320
				✔	FXL1-SPEUSA00	1120827
Power to lock	Locking monitoring	Universally coded	–	–	FXL1-SPLMSA00	1101323
		Uniquely coded	–	–	FXL1-SPLUSA00	1101322
	Actuator monitoring	Universally coded	–	–	FXL1-SPLMAA00	1101325
		Uniquely coded	–	–	FXL1-SPLUAA00	1101324

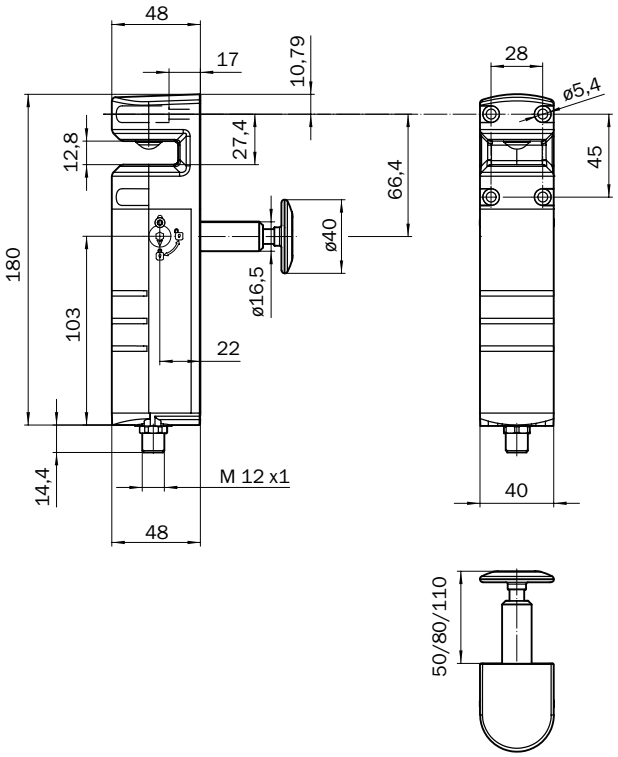
8026423/2022-08-03
Subject to change without notice

Dimensional drawings (Dimensions in mm)

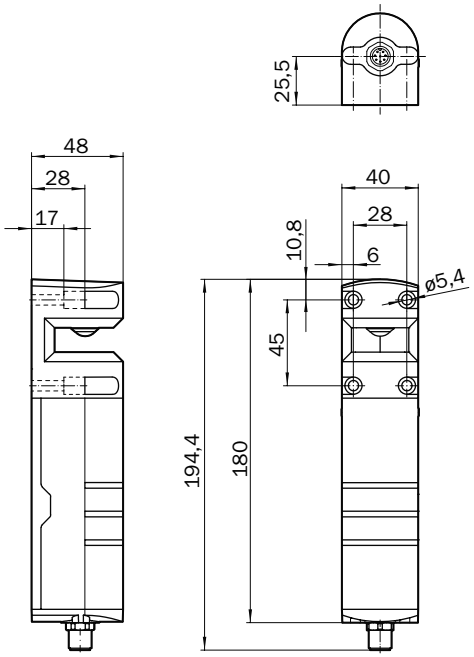
FXL1-SPBxxxxx



FXL1-SPExxxxx

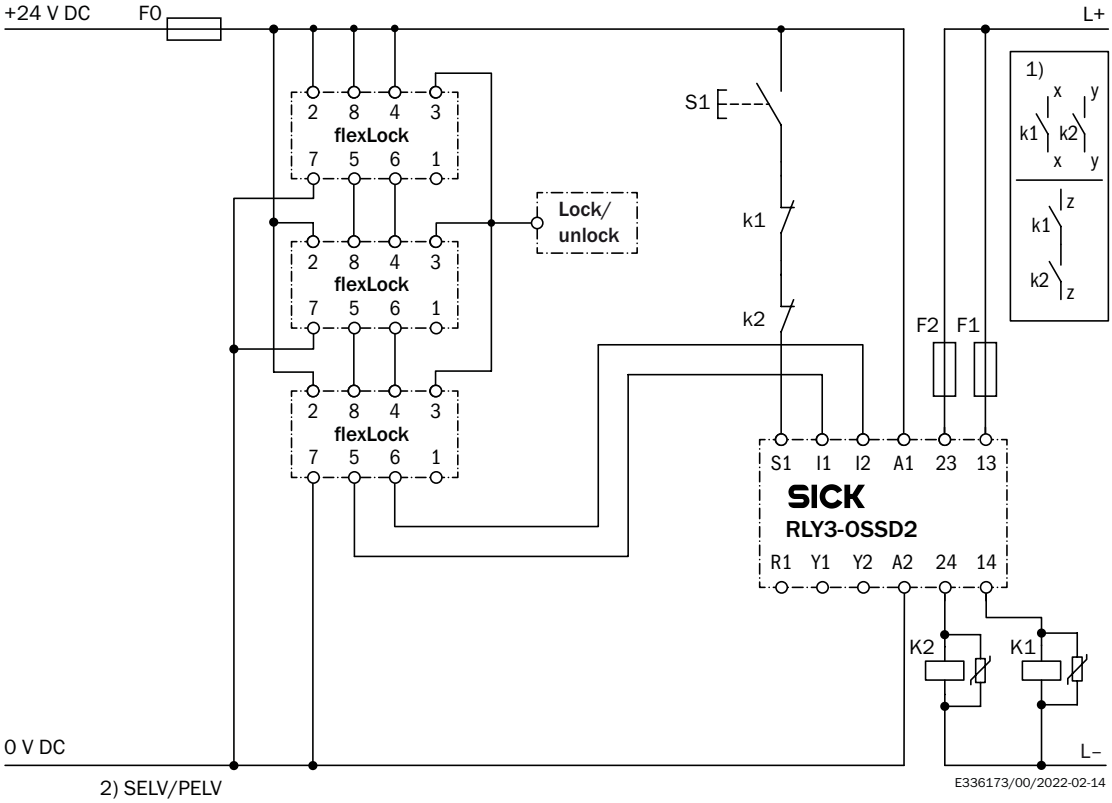


FXL1-SPLxxxxx

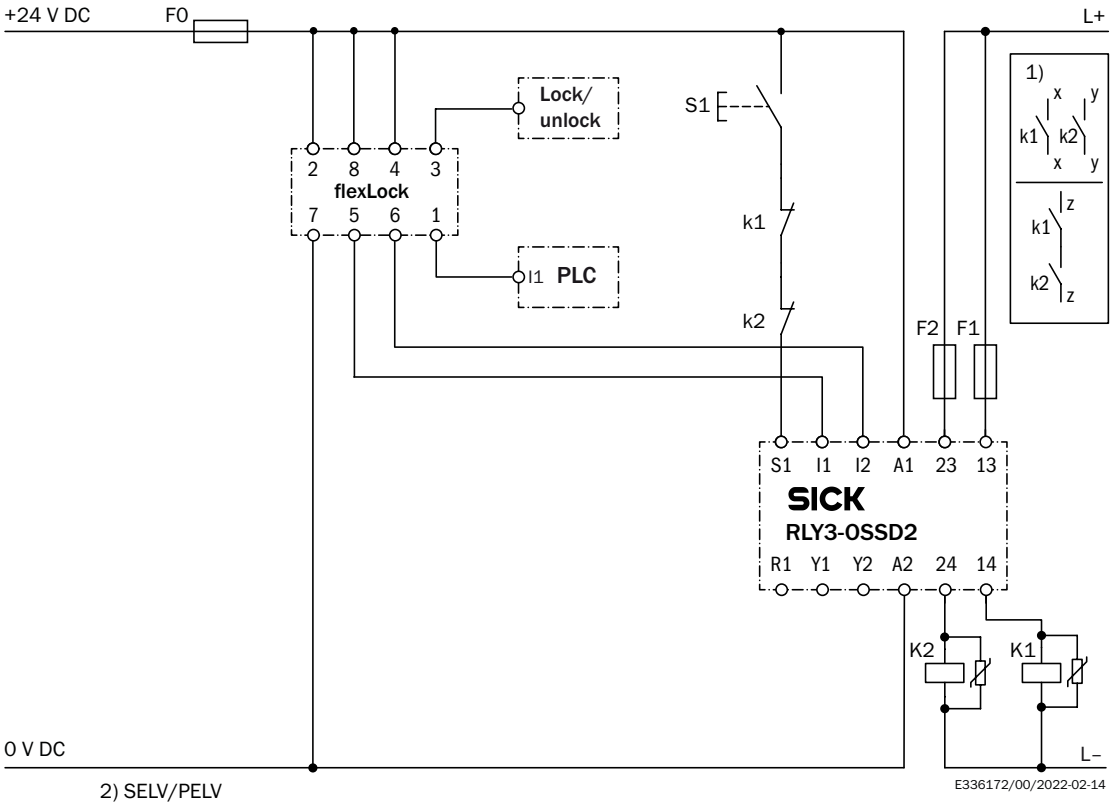


Connection diagrams

Series connection of three flexLock safety locking devices to RLY3-OSSD2 safety relay

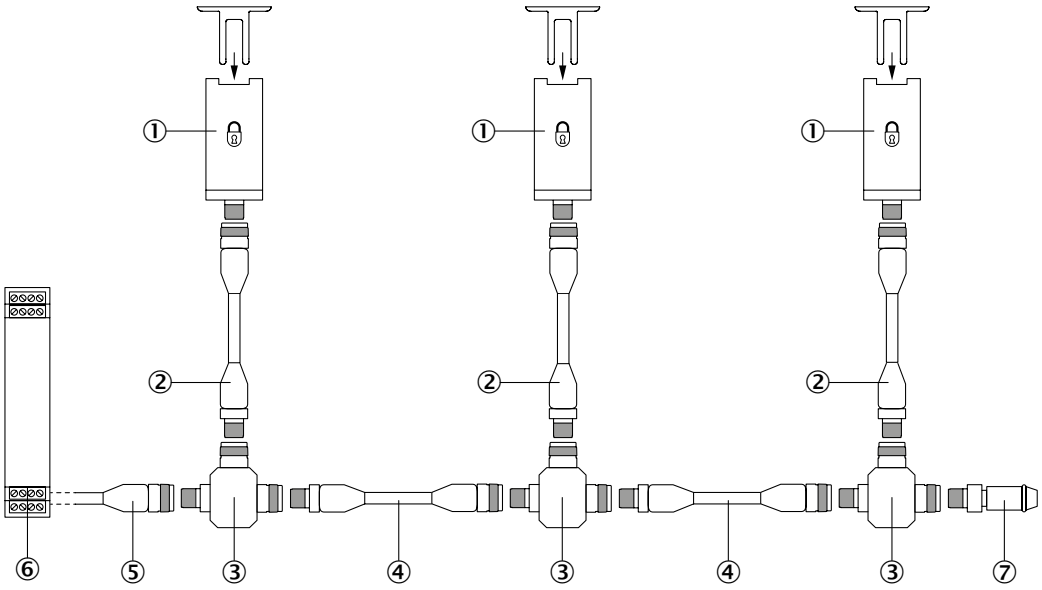


flexLock safety locking device to RLY3-OSSD2 safety relay



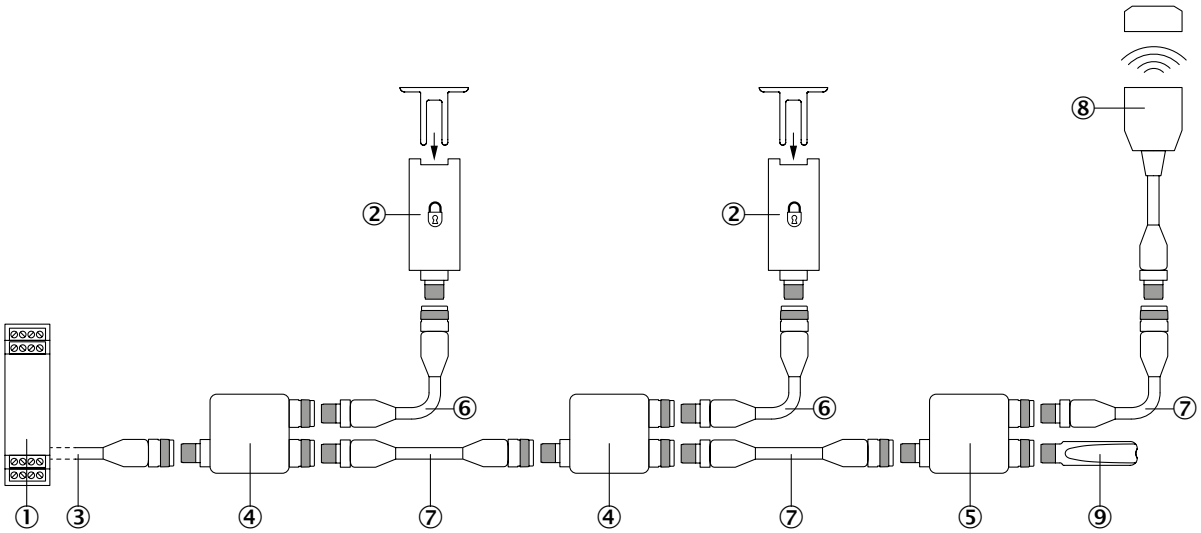
Series connection

Series connection with T-piece (without diagnostics)



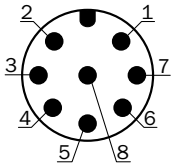
① flexLock safety locking device
② Connection cable with 8-pin, M12 male connector and 8-pin, M12 female connector (e.g., YF2A18-xxxUA5M2A18)
③ T-junctions
④ Connection cable with 5-pin, M12 male connector and 5-pin, M12 female connector (e.g., YF2A15-xxxUB5M2A15)
⑤ Connecting cable with M12 female connector, 5-pin and flying leads (e.g., YF2A15-xxxVB5XLEAX)
⑥ Safe evaluation unit
⑦ End plug

Series connection with Flexi Loop (with diagnostics)



① Flexi Compact safety controller
② flexLock safety locking device
③ Connecting cable with M12 female connector, 5-pin and flying leads (e.g., YF2A15-xxxVB5XLEAX)
④ FLN-OSSD1100108 Flexi Loop node
⑤ FLN-OSSD1000105 Flexi Loop node
⑥ Connection cable with 8-pin, M12 male connector and 8-pin, M12 female connector (e.g., YF2A18-xxxUA5M2A18)
⑦ Connection cable with 5-pin, M12 male connector and 5-pin, M12 female connector (e.g., YF2A15-xxxUB5M2A15)
⑧ STR1 RFID safety switch (e.g., STR1-SAxx0AC5)
⑨ FLT-TERM00001 Flexi Loop terminating element

Pin assignment



Pin	Designation	Description
1	Out AUX	Application diagnostic output (not safe)
2	+24 V DC	24 V DC voltage supply
3	LOCK	Locking device input
4	In 2	Enable input for OSSD 2*
5	OSSD 1	OSSD 1 output
6	OSSD 2	OSSD 2 output
7	0 V	0 V DC voltage supply
8	In 1	Enable input for OSSD 1*

* When used as an individual safety locking device or as the first safety locking device in a safe series connection, apply 24 V DC.

Accessories required for commissioning

Description	Number	Items supplied	Further information
Connecting cable	1	–	→ Plug connectors and cables
Actuators	1	–	→ Further accessories
Operating instructions	1	✔	→ www.sick.com/flexLock

Accessories

Mounting systems

Mounting brackets

	Description	Packing unit	Type	Part no.
	Angled mounting plate, for sensor, Aluminum	1 piece	FXL1-XMS1	1122229

Device protection (mechanical)

Protective caps

	Description	Packing unit	Type	Part no.
	Protective cap for sensor mounting holes	20 pieces	Protective cap	2128062
	Protective cap for actuator mounting holes	20 pieces	Protective cap	2128063

Further accessories

Actuators

	Description	Type	Part no.
	Flexible actuator, can be inserted into the locking device from the front	FXL1-AF1	1101326
	Rigid actuator, can be inserted into the locking device from the front or side	FXL1-AR1	1101327

Plug connectors and cables

Connecting cables

- **Model:** PUR, halogen-free, unshielded

	Connection type		Conductor cross-section	Length of cable	Type	Part no.
	Female connector, M12, 8-pin, straight	Flying leads	0.25 mm²	2 m	YF2A18-020UA5XLEAX	2095652
				2.5 m	YF2A18-025UA5XLEAX	2099229
				5 m	YF2A18-050UA5XLEAX	2095653
				7.5 m	YF2A18-075UA5XLEAX	2099230
				10 m	YF2A18-100UA5XLEAX	2095654
				15 m	YF2A18-150UA5XLEAX	2095679
				20 m	YF2A18-200UA5XLEAX	2095680
				30 m	YF2A18-300UA5XLEAX	2095681
	Female connector, M12, 8-pin, angled	Flying leads	0.25 mm²	2 m	YG2A18-020UA5XLEAX	2095779
				5 m	YG2A18-050UA5XLEAX	2095780
				10 m	YG2A18-100UA5XLEAX	2095781

Connection cables

- **Model:** PUR, halogen-free, unshielded

	Connection type		Conductor cross-section	Length of cable	Type	Part no.
	Female connector, M12, 5-pin, straight	Male connector, M12, 5-pin, straight	0.34 mm²	1 m	YF2A15-010UB5M2A15	2096007
				2 m	YF2A15-020UB5M2A15	2096009
				5 m	YF2A15-050UB5M2A15	2096010
				10 m	YF2A15-100UB5M2A15	2096011
				15 m	YF2A15-150UB5M2A15	2096171
				0.6 m	YF2A15-C60UB5M2A15	2096006
	Female connector, M12, 8-pin, straight	Male connector, M12, 8-pin, straight	0.25 mm²	1 m	YF2A18-010UA5M2A18	2096032
				2 m	YF2A18-020UA5M2A18	2096033
				5 m	YF2A18-050UA5M2A18	2096034
				10 m	YF2A18-100UA5M2A18	2096035
				15 m	YF2A18-150UA5M2A18	2104374
				0.6 m	YF2A18-C60UA5M2A18	2096031

Distributors

T-junctions

	Brief description	Type	Part no.
	Head A: male connector, M12, 5-pin, A-coded Head B: female connector, M12, 5-pin, A-coded M12 male connector, 5-pin, A-coded, on 1 x M12 female connector, 5-pin, A-coded, on 1 x M12 female connector, 8-pin, A-coded	STR1-XXA	5339609

Adaptor

Other adapters

	Description	Type	Part no.
	Node for voltage supply	MLP1-XXN	1078202
	End connector for serial connection in combination with STR1-XXA	MLP1-XXT	1078201

8026423/2022-08-03
Subject to change without notice

Mechanical bolts for safety switches MB1

MB1

	Brief description	Type	Part no.
	• **Catch release button/ANSI-compliant locking mechanism:** yes • **Escape release:** no • **Frame plate with latching function:** no • **Suitable for:** flexLock safety locking device (with actuator FXL-AR1) • **Items supplied:** Bolt unit, frame plate flexLock, adapter for actuator mounting (MB1-BRFL), safety screws for installing provided adapters, Mounting instructions	MB1-BF10	1111207
	• **Catch release button/ANSI-compliant locking mechanism:** yes • **Escape release:** yes • **Frame plate with latching function:** no • **Suitable for:** flexLock safety locking device (with actuator FXL-AR1) • **Items supplied:** Bolt unit, frame plate flexLock, adapter for actuator mounting (MB1-BRFL), safety screws for installing provided adapters, Mounting instructions, escape release	MB1-BF11	1111206

Safe series connection Flexi Loop

Flexi Loop

	Brief description	Type	Part no.
	• **Flexi Loop component:** Node for safety sensors (OSSD) • **Use of Flexi Loop node:** For safety sensor with dual-channel OSSD outputs, With standard input, with standard output • **Connection type safety device:** Female connector M12, 8-pin	FLN-OSSD1100108	1061710
	• **Flexi Loop component:** Module to terminate series connection • **Description:** The terminator is used to terminate the safe series connection at the last Flexi Loop node.	FLT-TERM00001	1061716

8026423/2022-08-03

WORKING WITH SICK IN A DIGITAL WORLD

Making your digital business environment comfortable

Find a suitable solution in next to no time

- Online product catalog
- Application Solver
- Online configurators and selectors

My SICK is your personal self-service portal

- Open around the clock
- Clear product information
- Company-specific price conditions
- Convenience during the ordering process
- Document overview
- Availability and delivery times

Register now:
➜ www.sick.com/myBenefits

Even more value

- Digital Customer Trainings ➜ www.sick.com/c/g300887
- Digital Service Catalog ➜ cloud.sick.com
- SICK AppPool ➜ apppool.cloud.sick.com

SERVICES FOR MACHINES AND PLANTS: SICK LifeTime Services

Our comprehensive and versatile LifeTime Services are the perfect addition to the comprehensive range of products from SICK. The services range from product-independent consulting to traditional product services.

Consulting and design
Safe and professional

Product and system support
Reliable, fast, and on-site

Verification and optimization
Safe and regularly inspected

Upgrade and retrofits
Easy, safe, and economical

Training and education
Practical, focused, and professional

8026423/2022-08-03 · BEM · Pre USmod en51

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 10,400 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. 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.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the 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 SICK a reliable supplier and development partner.

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

That is "Sensor Intelligence."

Worldwide presence:

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations ➜ www.sick.com

SICK
Sensor Intelligence.