To complement the extensive range of mechanical safety switches offered by BERNSTEIN, a new series of contactless safety switches is now available. These safety sensors ensure that safety doors and protective guards remain closed when danger is present.

The contactless safety technology offers the following advantages:

- Wear-free actuating
- Very easy to clean
- No actuator, therefore:
  - No mechanical damage possible
  - No hazards or restrictions caused by protruding actuator
- Switching function not affected by contaminants

BERNSTEIN offers two different technologies in the field of contactless safety technology:

- Safety sensors on magnetic basis, MAK series
- Safety sensors on RFID basis, CSMS series

Safety sensors CSMS

The CSMS can directly be connected to contactors or to an evaluation unit (dependent on the respective model). The RRS version integrates an evaluation of a return circuit and start button with direct connection to contactors. With the CSMS, PL e and SIL 3 is achieved.
This is the case with only one CSMS and also with series circuits with up to 32 sensors the case.

Product features

- Performance Level e
- Up to 32 series circuits without leaving the PL e
- Power supply 24 V DC
- High coding level corresponding to the draft DIN EN ISO 14119
- No need of any additional external monitoring (dep. on the type)
- Connection of return circuit and start button possible (dep. on the type)
- Output current up to 250 mA per safety output
- Large diagnostic possibility
- 3 LEDs for status information of the CSMS
- Switching distance: 13 mm
- Dimensions: 110 mm x 30 mm x 15 mm
- IP 67

Safety sensors MAK

To achieve a PL or SIL value with the MAK safety sensors, it is necessary to connect them to a safety evaluation unit. The magnetic safety sensors are dual channel versions. The evaluation unit (BERNSTEIN designation: MÜZ) monitors the correct switching of the two MAK channels and a defined time window in which the two channels must switch.

With the combination of MAK and MÜZ, a PL D and a SIL 3 can be reached. Besides the 3 different types of magnetic safety switches, BERNSTEIN also offers two different evaluation units.

Product features

- Performance Level d
- Redundancy with NO and NC contacts
- Switching distance: 6 mm
- IP 67

Comparison CSMS – MAK

Product characteristics	CSMS	MAK
Operating principle	elektro-magnetic, RFID	magnetic, Reed
Safety parameters	PL e, SIL3	PL d, SIL 3
Safety outputs	electrical outputs	mechanical contacts
Can be switched in series	yes, when a constant safety level is guaranteed	yes, with falling safety level
Evaluation unit required	no	yes
Actuator coding	high	low
Diagnostic interface	via LED and electronically	no
Mechanical sensitivity	low	very high
Approach possibility of the actuator	4	1
Safety outputs	2	1
Return circuit evaluation	yes	partially (depending on the evaluation unit)
Start button monitoring	yes	partially (depending on the evaluation unit)

CSMS Contactless **S**afety **M**onitoring **S**ensor

The **CSMS** is a future-proofed safety product. The CSMS is a contactless safety sensor that uses RFID technology. It can be used as a single device as well as being connected in series up to PL e and SIL 3. BERNSTEIN offers two general product versions.

- CSMS-…-RRS… ❶

With this product version, safety sensors can be connected to contactors without using an evaluation device. The product has an integrated evaluation of the return circuit and allows connection of a start button.

- CSMS-…-R… ❷

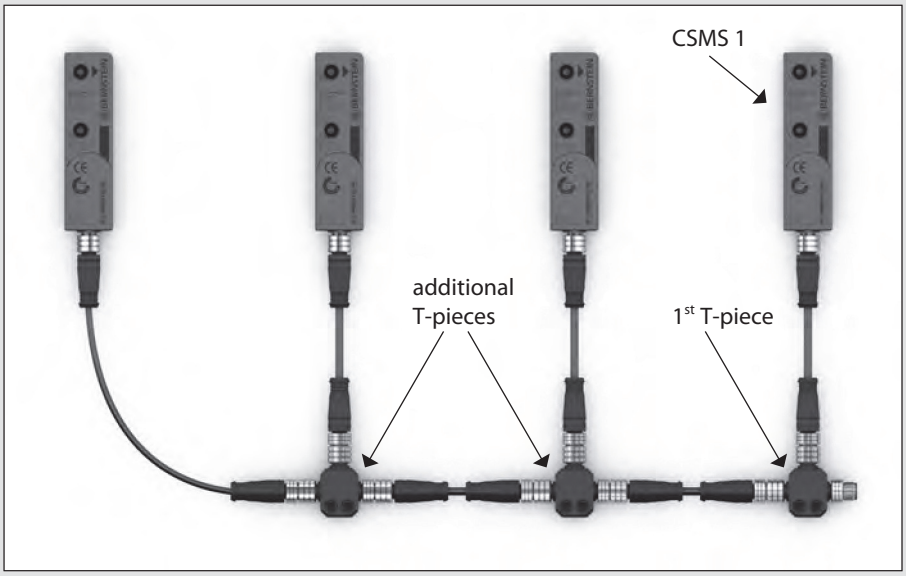
This product version can be connected to a safety evaluation unit. Optionally, another safety sensor can be connected to the first CSMS with OSSD output (e.g. light curtains).

Both versions have extensive diagnostic capabilities. This is transmitted over a communication channel to a diagnostic device. This is displayed via PNP outputs if the CSMS is opened or closed. Moreover, it is possible to obtain information about the system and the sensor via integrated LEDs.

In order to ensure a particularly high manipulation protection (according to draft DIN EN ISO 14119), each sensor is assigned to one actuator. Thus, it is ensured that the CSMS cannot be "tricked" with different actuators.

The fast and accurate connection of the CSMS is realised by M12 connector cables and T-pieces.

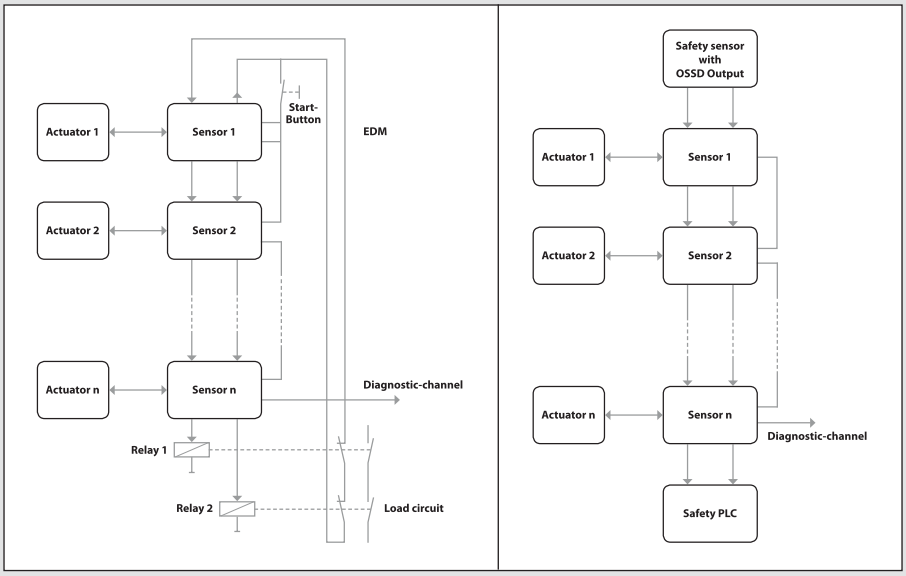
Connection example



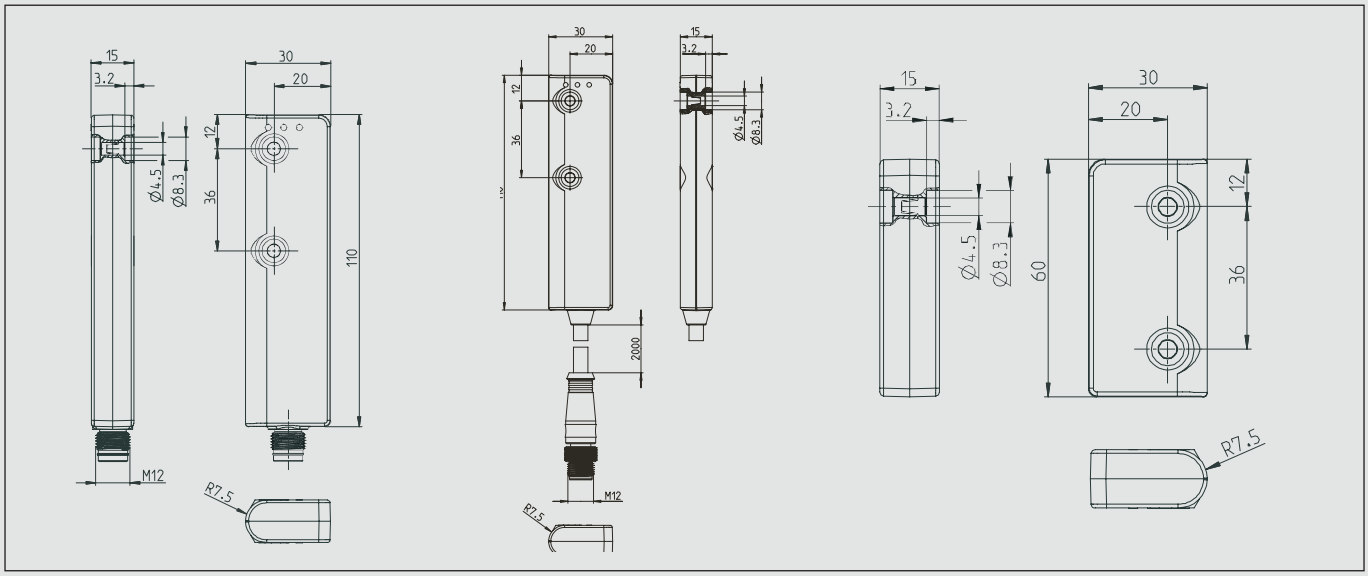
CSMS type	Start function	1. T-piece	Following T-pieces
CSMS…RRS…	manual start automatic start	Grey Black	Black Black
CSMS…R…		Grey	Black
Grey	T-adapter MS	6075989037	
Black	T-adapter AS	6075989036	

❶ CSMS
Series circuits without additional evaluation

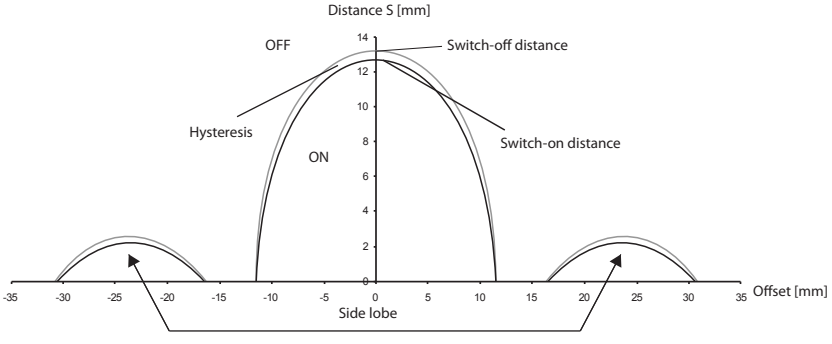
❷ CSMS
Series circuits with evaluation device



Application examples



Sensing distance (only works with actuator 6075980023 (CSMS-S))				
		min.	typ.	max.
Rated sensing distance	S_n		13 mm	
Assured sensing distance – On	S_{ao}	10 mm		
Hysteresis	H		0,5 mm	
Assured sensing distance – Off	S_{ar}			19 mm



Metal can influence the sensing distance.

To achieve the stated sensing distances on metal substrates, CSMS spacers must be used.

Product selection

Article number	Designation	Description
6075988029	CSMS-SET-RRS-U-KA	can be switched in series, with EDM and start button monitoring, cable version
6075988027	CSMS-SET-RRS-U-ST	can be switched in series, with EDM and start button monitoring, M12 connector
6075988030	CSMS-SET-R-U-KA	can be switched in series, be connected to a monitoring device, cable version
6075988028	CSMS-SET-R-U-ST	can be switched in series, be connected to a monitoring device, M12 connector
6075985025	CSMS-M-RRS-U-KA	can be switched in series, with EDM and start button monitoring, integrated 2 m connect. cable with M12 connect.
6075986022	CSMS-M-RRS-U-ST	can be switched in series, with EDM and start button monitoring, M12 connector
6075985026	CSMS-M-R-U-KA	can be switched in series, be connected to a monitoring device, integrated 2 m connect. cable with M12 connect.
6075986024	CSMS-M-R-U-ST	can be switched in series, with EDM and start button monitoring, M12 connector
6075980023	CSMS-S	CSMS Slave
6075989036	T-PIECE AS	T-Adapter for series circuits (black)
6075989037	T-PIECE MS	T-Adapter for series circuits (grey)
6075989047	CSMS SLAVE TEACHADAPTER	Tool for teaching in a replacement actuator
6075989035	CSMS BASIS CONNECT. DEVICE	Connection device for easy and fast installation of the CSMS system
6073900070	CSMS SPACER 8MM	Insertion spacer for actuator
6075989044	CSMS SPACER 8MM	Insertion spacer for sensor
6075989038	CON-CAB. CSMS 0,5M G/G	Connection cable, 0,5 meter, connector, straight on both ends
6075989039	CON-CAB. CSMS 1M G/G	Connection cable, 1 meter, connector, straight on both ends
6075989040	CON-CAB. CSMS 2M G/G	Connection cable, 2 meter, connector, straight on both ends
6075989041	CON-CAB. CSMS 5M G/G	Connection cable, 5 meter, connector, straight on both ends
6075989042	CON-CAB. CSMS 10M G/G	Connection cable, 10 meter, connector, straight on both ends
6075989043	CON-CAB. CSMS 20M G/G	Connection cable, 20 meter, connector, straight on both ends

The set includes a sensor and actuator, in this case the actuator is assigned to the sensor. If the products are delivered separately, a “teaching tool“ will be required to assign the actuator to the sensor.