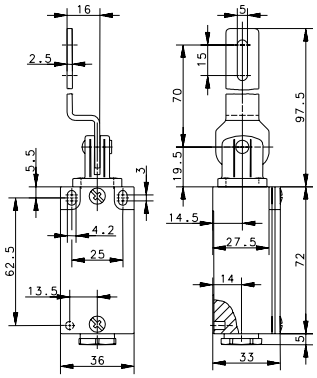
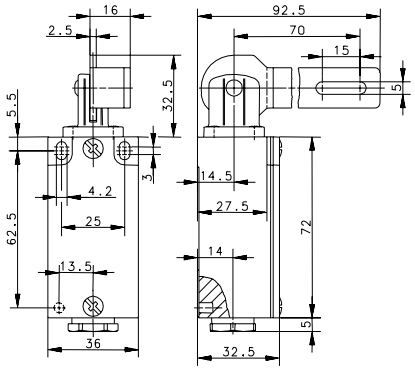
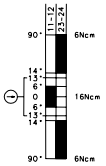
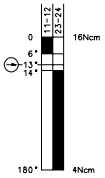
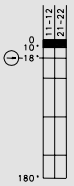
	GC VKS	GC VKW
		
Switching operation	**Slow-action** **Snap-action**	**Slow-action** **Snap-action**
1 NC / 1 NO contact	**6121100622** GC-U1Z VKS 	**6121100623** GC-U1Z VKW 
2 NC contact		**6121800835** GC-A2Z VKW 
2 NO contacts		
1 NC / 1 NO contact Overlapping		
Approvals		
	Replacement actuator: 3912001277	**Replacement actuator: 3912001278**
	Special features / variants (on request)	**Special features / variants** (on request)

Notes

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
Sensing distance	13 mm	3–4 mm
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.

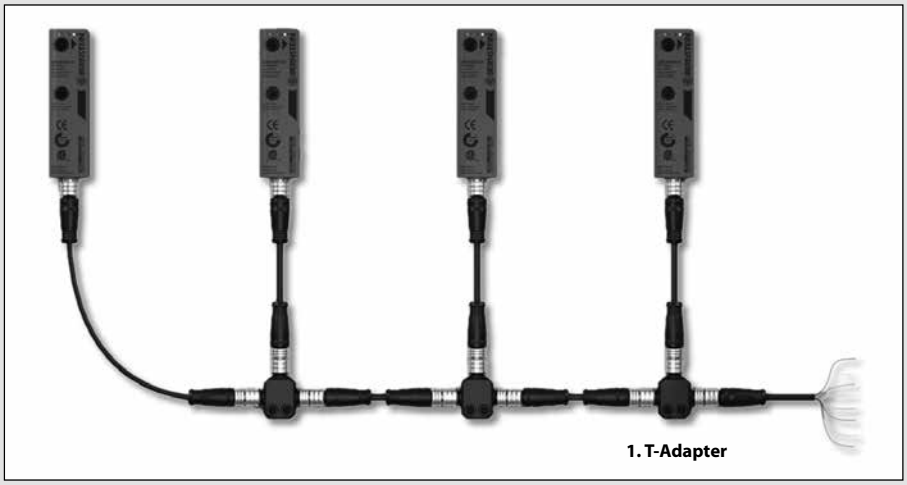
In order to ensure a particularly high manipulation protection (according to draft DIN EN ISO 14119), each sensor is assigned to one actuator. Thus, it is ensured that the CSMS cannot be "tricked" with different actuators.

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

- CSMS-…-A… ❸

This product version allows a direct connection of several safety sensors to the safety controller by parallel wiring.

Connection example

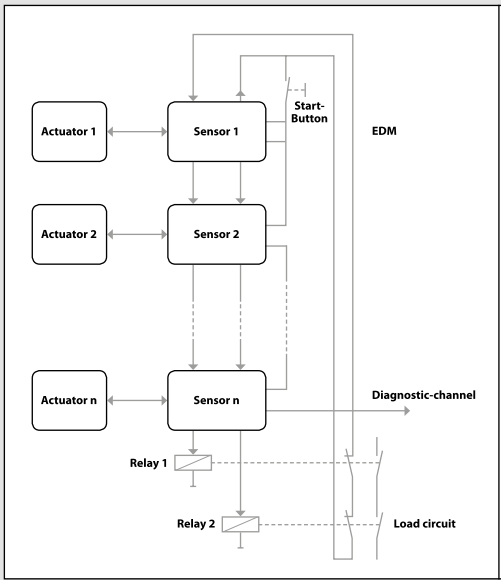


T-Adapters to be used

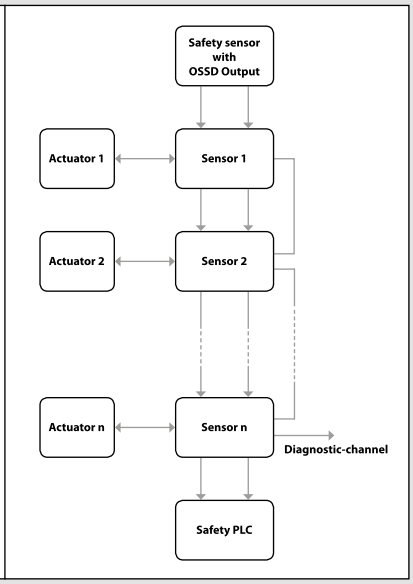
Versions	Start function	1. T-Adapter	Following T-Adapter
Version RRS	Manual start Automatic start	Grey Black	Black Black
Version R		Grey	Black

Application examples

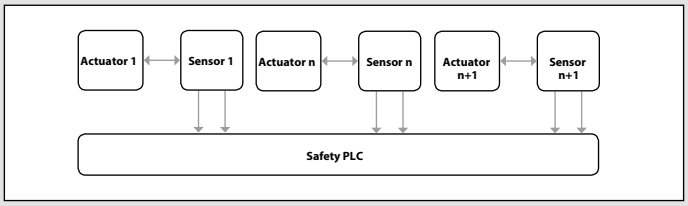
❶ CSMS
Series circuits without additional evaluation

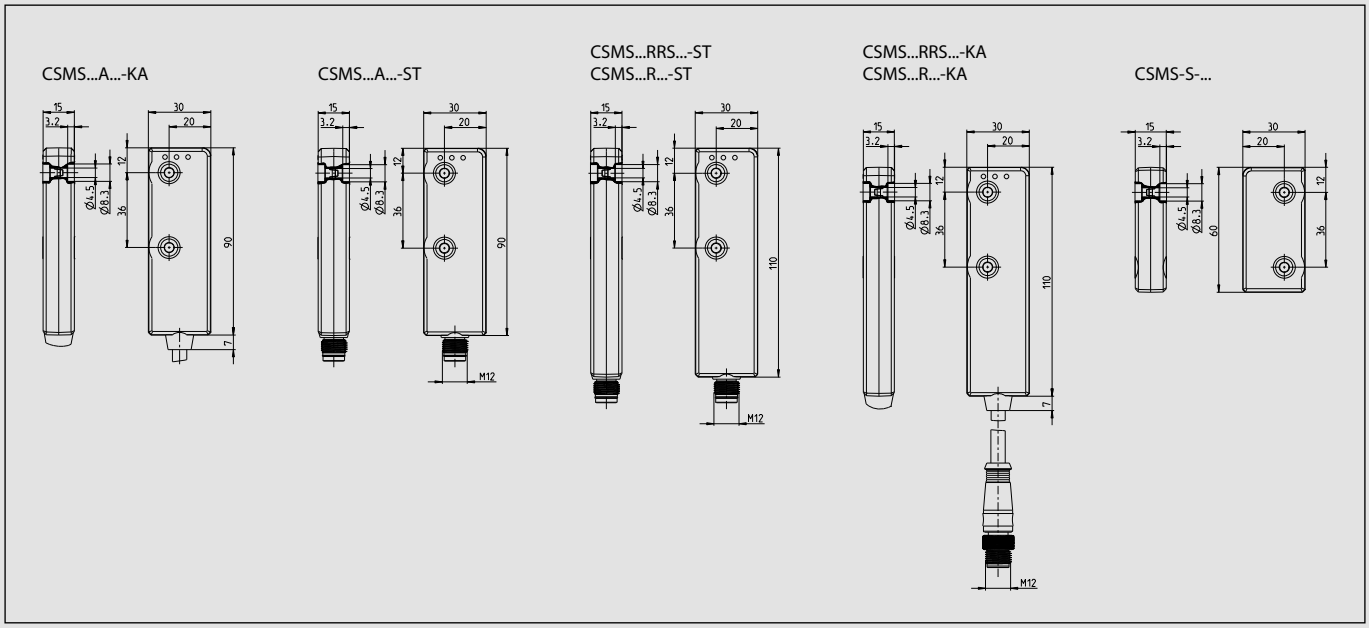


❷ CSMS
Series circuits with evaluation device



❸ CSMS
Parallel connection to a safety controller





According to **ISO 14119,** interlocking devices are mechanical or electrical devices which are designed to prevent the operation of a machine element for as long as the movable safety guard is left open.

The CSMS based on RFID is contactless and fulfils the highest requirement (high-level coding) of protection against manipulation of **ISO 14119.**

The BERNSTEIN CSMS offers both a high-level coding and a low-level coding, in order to provide the optimum protection against manipulation for each application.

The safety-related capacity of the CSMS is demonstrated through full observation of the following standards:

- Requirements for safety-related parts of control systems up to **PL e in accordance with ISO 13849-1**
- Functional safety up to **SIL 3 in accordance with IEC 62061**
- Choice and use of safety-related interlocking devices of **type 4 in accordance with ISO 14119**

unicode/high coding:
Sensor accepts only one actuator
multicode/low coding:
Sensor accepts several actuators

CSMS - SET - RRS - H - ST

ST M12 connector
KA Cable

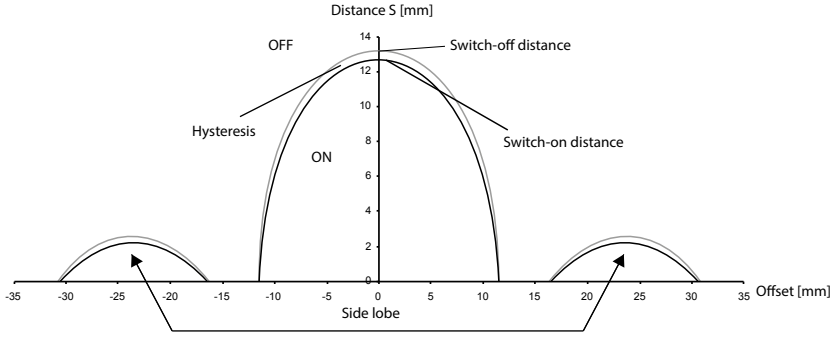
H High-level coding (unicode)
L Low-level coding (multicode)

RRS Serial connection, with evaluation of a return circuit
R Serial connection, without evaluation of a return circuit
A Stand-Alone application, without evaluation of a return circuit

SET Set, comprising the master and slave
M Master
S Slave

CSMS Contactless Safety Monitoring Sensor

Sensing distance		
Rated sensing distance	S_n	13 mm
Assured sensing distance – (On)	S_{ao}	min. 10 mm
Hysteresis	H	0,5 mm
Assured sensing distance – (Off)	S_{ar}	max. 19 mm



Metal can influence the sensing distance.

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

CSMS-RRS
with evaluation of a return circuit

Advantages

- Individual CSMS or safe serial connection with max. 32 CSMS up to **PL e**
- Manual or automatic start
- No external safety evaluation unit required
- Uni- or multi-coding
- Integrated evaluation of a return circuit and start button with direct connection to contactors

Unicode	Multicode	M12 connector	2 m cable + M12 connector	Article number	Designation
x			x	6075988057	CSMS-SET-RRS-H-KA
x		x		6075988058	CSMS-SET-RRS-H-ST
	x	x		6075988066	CSMS-SET-RRS-L-ST
	x		x	6075988068	CSMS-SET-RRS-L-KA
x			x	6075985048	CSMS-M-RRS-H-KA
x		x		6075986050	CSMS-M-RRS-H-ST
	x		x	6075985061	CSMS-M-RRS-L-KA
	x	x		6075986062	CSMS-M-RRS-L-ST
	Replacement actuator Multicode			6075980065	CSMS-S-L
	Replacement actuator Unicode			6075980052	CSMS-S-H*

*Must be taught in with 6075989056 (CSMS SLAVE TEACHADAPTER) for the master.

CSMS-R
for the connection to a safety evaluation unit

Advantages

- Safe serial connection with max. 32 CSMS up to **PL e**
- Connection to an external safety evaluation unit for ex. SCR ON
- Optional: Connection of a safety sensor (for ex. safety light curtain) with OSSD output to the first CSMS
- Uni- or multi-coding

Unicode	Multicode	M12 connector	2 m cable + M12 connector	Article number	Designation
x			x	6075988059	CSMS-SET-R-H-KA
x		x		6075988060	CSMS-SET-R-H-ST
	x	x		6075988067	CSMS-SET-R-L-ST
	x		x	6075988069	CSMS-SET-R-L-KA
x			x	6075985049	CSMS-M-R-H-KA
x		x		6075986051	CSMS-M-R-H-ST
	x		x	6075985063	CSMS-M-R-L-KA
	x	x		6075986064	CSMS-M-R-L-ST
	Replacement actuator Multicode			6075980065	CSMS-S-L
	Replacement actuator Unicode			6075980052	CSMS-S-H*

*Must be taught in with 6075989056 (CSMS SLAVE TEACHADAPTER) for the master.

CSMS-A
for direct connection to a control unit

Advantages

- Up to **PL e / SIL 3**
- Multi-coding
- Compact construction
- Connection to an external safety evaluation unit for ex. SCR ON

Unicode	Multicode	M12 connector	2 m cable	Article number	Designation
	x	x		6075988072	CSMS-SET-A-L-ST
	x		x	6075988073	CSMS-SET-A-L-KA
	x		x	6075985070	CSMS-M-A-L-KA
	x	x		6075986071	CSMS-M-A-L-ST
	Replacement actuator Multicode			6075980065	CSMS-S-L

CSMS diagnosis

The CSMS product family offers one of the largest diagnostic options on the market. Opened protective devices or actuators in the transitional area as well as system failures can be rapidly and precisely identified. Due to the optional diagnostic devices, the status of each CSMS appears in the security chain.

- Status display of each CSMS in the security chain
- Electronical outputs or bus interface

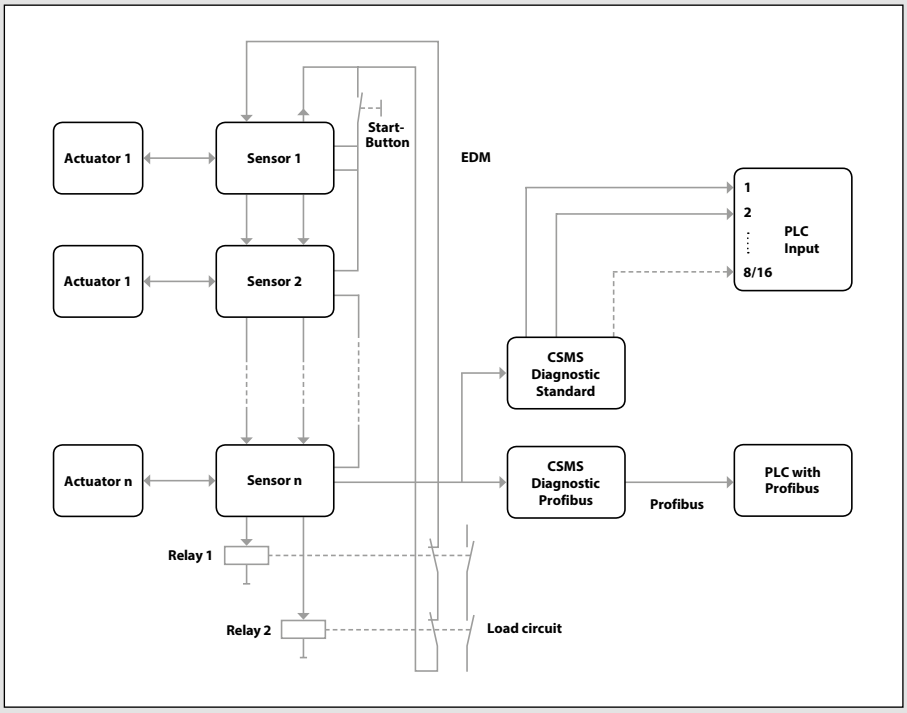
CSMS Standard Diagnosis

The CSMS Standard Diagnosis has 8 or 16 electronic outputs. Each output is assigned to one CSMS. It is possible to switch on the output, even at the maximum operating distance. The output is switched on by dip switches on the diagnostic device.
In maximum system conception, the status of all 32 CSMS can be displayed simply by cascading the diagnostic devices.

CSMS Diagnosis Profibus

The CSMS Diagnosis Profibus with Profibus interface ensures the direct transmission of the diagnostic information from each CSMS to the control unit.
Advantages include considerably reduced wiring expenses, a clearer arrangement and a substantially higher functionality.
As well as protective devices in an open position or in the transitional area, attempts to tamper with the machine and system errors can also be detected.
The machine down time can be reduced to a minimum by the extensive diagnostic options.
Further bus systems on request.

Parallel connection



Article number	Designation	Description
6075989031	CSMS DIAGNOSE STANDARD 8	Diagnosis for 8 CSMS
6075989032	CSMS DIAGNOSE STANDARD 16	Diagnosis for 16 CSMS
6075989033	CSMS DIAGNOSE PROFIBUS	Profibus Gateway

Magnetic controllers for safety functions

BERNSTEIN offers magnetic controllers for safety functions that fulfill performance level d according to EN 13849-1 and SIL 3 according to EN 61508 or rather EN 62061.

A safety system consists of the safety magnetic controllers and a coded transducer unit.

The anti-tamper security of the transducer unit is achieved by variable coding of the actuator magnets and magnetic switches.

Depending on the type of device, one or two coded transducer units (magnetic switch with corresponding magnet) of type:

- MAK-4236
- MAK-5236
- MAK-5336

can be connected to and monitored by the safety magnetic controllers.

The safety magnetic controller processes the NC or NO contact signals coming from the coded magnetic switches.
Thereby, it is possible to detect the opening of the safety guard (door, hatch, protective hood etc.) and to turn off the safety output. Thanks to the redundant evaluation, the magnetic controller is switched to the “safe state” should a fault or manipulation occur, or if the time difference is exceeded between the NC contact signal and the NO contact signal. An LED indicates that the safety magnetic controller is in the “safe state”.

To ensure fault detection of the switch-off device, the MÜZ-102 offers the possibility to connect a return circuit. The system additionally features a NC contact for signalling purposes.

- Redundancy by NO and NC contacts
- Manipulation safety by coding
- Monitoring of the return circuit (depending on device type)

MAK-4236-x with magnet TK-42-CD

MAK-5236-x with magnet TK-52-CD / 2

MAK-5336-x with magnet TK-43-CD

Magnetic controllers for safety functions

TÜV certified

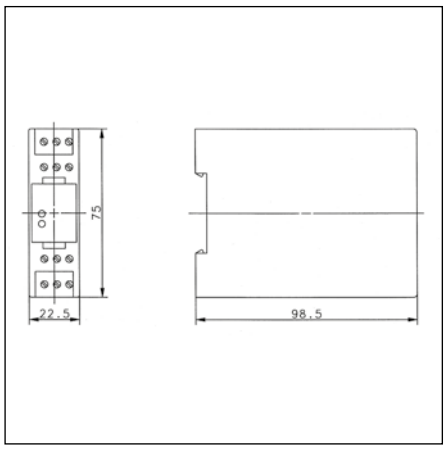
- EN ISO 13849-1 Performance Level d
- EN 61508 and EN 62061 SIL 3
- EN 60947-5-3 Single fault security S

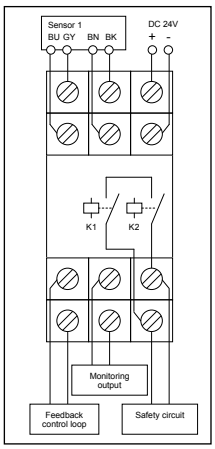
Coded transducer units

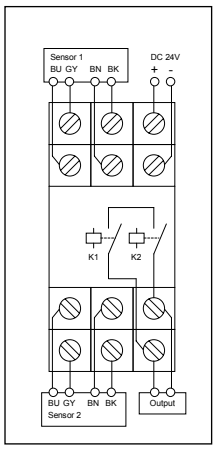
Magnetic switches

Type designation		MÜZ-102/D24-FL-DA	MÜZ-202/D24-FL
Article number		**6392701306**	**6392702307**
Max. number of connectable transducer units		1	2
Safety output, NO contact		●	●
Feedback circuit		●	–
Data output (NC contact)		●	–
Technical data			
Operating voltage		24 V DC	24 V DC
Operating current		60 mA	60 mA
Switching capacity, safety output			
Switching voltage	max	AC 250 V	AC 250 V
Switching current	max	8 A	8 A
Switching power	max	1700 VA	1700 VA
LED: Hazard status/switching status		●/–	●/–
LED: Supply voltage/ON		●	–
Relay: Positive-action/standard		●/–	●/–
Ambient conditions			
Temperature range	min/max	0 °C/+55 °C	0 °C/+55 °C
		32 °F/+131 °F	32 °F/+131 °F
Protection class (to IEC 529, EN 60529)		IP20	IP20
Enclosure material		PC	PC
Mounting system (DIN 50022)		TS 35	TS 35
Type of connection: Terminal block		max. 2.5 mm²	max. 2.5 mm²

Type designation		
Article number		
Cable length		
Type designation		
Article number		
Cable length		
Type designation		
Article number		
Cable length		
Type designation		
Article number		
Cable length		
Ambient conditions		
Temperature range		min/max
Protection class (to IEC 529, EN 60529)		
Enclosure material		
Sensing distance	S on	min
	S on	max
Actuating magnet		
Type designation		
Article number		
Use: safety magnetic controller		
Article number		





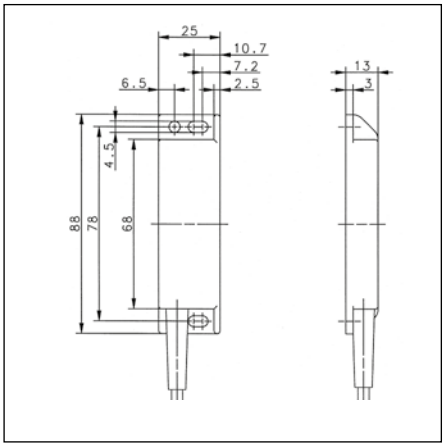


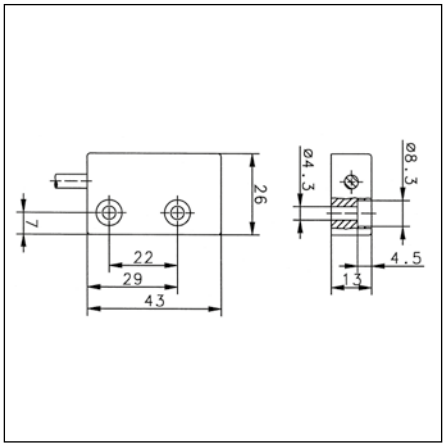
All dimensions in mm

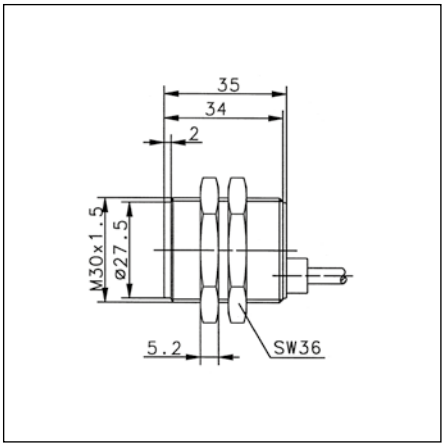
Other types available on request.

MAK-4236-3	MAK-5236-3	MAK-5336-3
6490642315	**6490652316**	**6490653317**
3 m PVC cable	3 m PVC cable	3 m PVC cable
MAK-4236-6	MAK-5236-6	MAK-5336-6
6490642302	**6490652307**	**6490653311**
6 m PVC cable	6 m PVC cable	6 m PVC cable
MAK-4236-9	MAK-5236-9	MAK-5336-9
6490642303	**6490652308**	**6490653312**
9 m PVC cable	9 m PVC cable	9 m PVC cable
MAK-4236-STK	MAK-5236-STK	MAK-5336-STK
6490642305	**6490652309**	**6490653313**
4-pin connector	4-pin connector	4-pin connector

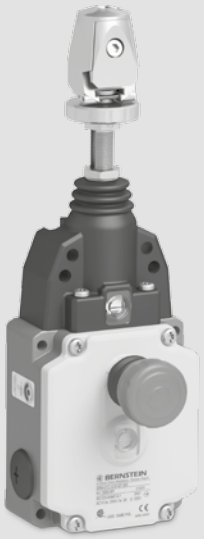
–5 °C/+70 °C	–5 °C/+70 °C	–5 °C/+70 °C
+23 °F/+158 °F	+23 °F/+158 °F	+23 °F/+158 °F
IP67	IP67	IP67
PA 6.6	PBT	PA 6.6
4 mm	3 mm	3 mm
14 mm	14 mm	14 mm
TK-42-CD	TK-52-CD/2	TK-43-CD
6402042310	**6402052311**	**6402043312**
6392701306	**6392701306**	**6392701306**
6392702307	**6392702307**	**6392702307**







SRM, SR



SRM

SR

General information on safety rope pull switches

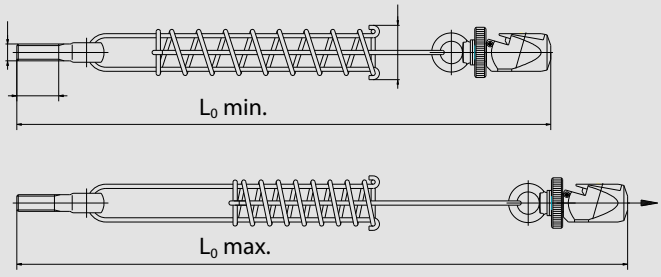
The series SR and SRM safety rope pull switching devices developed and manufactured by BERNSTEIN AG are designed and approved in accordance with the standards IEC 947-5-5, DIN EN 60947-5-5 and ISO 13850, i.e. on actuation or in the event of cable breakage, the emergency stop switching device locks automatically and can only be reset to its initial setting by means of the resetting device on the switch.

In order for the overall system to conform to the standards EN 60947-5-5 and EN 13850 governing the emergency stop function of rope pull switches it is necessary to integrate a spring in the system. The reasoning behind this requirement is that a person who triggers the emergency stop functions does not need to consider the activation direction. With the spring it is possible to pull the cable in the direction of the rope pull switch, thus activating the emergency stop function.

Safety rope pull switches may only be used in control power circuits. Safety rope pull switches are used on accessible sides of conveyor systems or machines. In contrast to Emergency Stop switching devices (e.g. mushroom pushbuttons) installed at intervals, with which the emergency stop signal can only be generated at the device itself, with the safety rope pull switch it is possible to generate the signal at any point in a section. Depending on the type of switching device, a span of up to 75 m can be achieved with a pull cable connected to the pulling element.

The maximum possible span length of a pull cable switch is always dependent on the temperature fluctuations to which the system is exposed. It is possible that the pull cable switch may trip due to the fact that, owing to its temperature coefficient, the length of the steel cable can change in response to changes in temperature. Ultimately, this change in length is dependent on the length of the cable, the difference in the temperature change and the type of springs used in the pull cable switch. Overview 1 shows which cable lengths are possible as a function of change in temperature.

Pull cable counterspring
With overstretch safeguard based on compression spring principle



Application		
Type	SR...100/SR...175/SRM...175	SR...300/SRM...300
Spring Art. No.	**3911042153**	**3911042154**
$L_{0\,min.}$	383	483
$L_{max.}$	487	653

Advantages of SRM / SR safety rope pull switches:

- The SR (plastic enclosure) and SRM (metal enclosure) safety rope pull switches are available with the Quickfix quick-connect system, which renders unnecessary cable eye stiffeners, cable grips and turnbuckles that are otherwise required for mounting the cable. Added to this, the time required to install the cable is drastically reduced. Versions with a conventional eye are, of course, also available.
- All variants of the SRM and especially of the SR are equipped with an integrated emergency stop impact button that can be actuated by pressing in hazardous situations. In the same way as pulling the pull cable, the safety contacts are opened and the switch is locked.
- The type SRM...E-... safety rope pull switches are optionally available with a remote indicator for monitoring the cable tension. This option has an integrated sensor unit that monitors situations in which the cable tension may overshoot or undershoot the permissible value, or triggering of the safety rope pull switch is imminent.

  This electronic output signals in good time that maintenance / adjustment is required otherwise the machine will shut down. This output can also be used for event signalling purposes or optionally available indicator lamps can be connected. This connection configuration conforms to "preventative maintenance" requirements.
- During installation / adjustment of the cable span, the correct tension of the cable can be checked through the integrated inspection window. To ensure optimum cable tension as part of the adjustment procedure, the tips of the indicator arrows should be aligned with the marking.
- A second inspection window integrated in the SRM version makes it possible to check the status of the locking function and of the contacts. Yellow in the inspection window indicates that the safety rope pull switch is locked. Green in the inspection window indicates that the rope pull switch is ready for operation and the cable assembly is monitored.

Overview 1

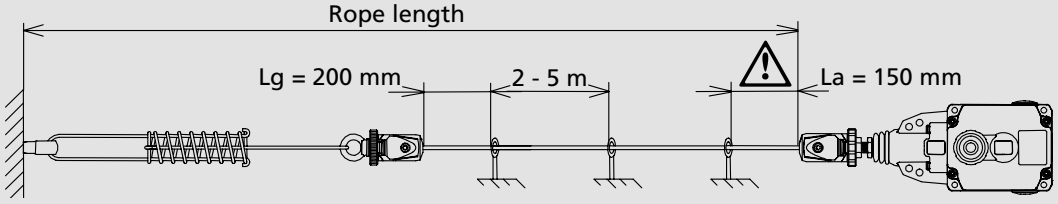
	Span L max. in metres [m]																																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	55	60	65	70	75
Max. temperature variation in Kelvin (K)	+/– 110 K																																						
	+/– 100 K																																						
	+/– 90 K																																						
	+/– 70 K																																						
	+/– 50 K																																						
	+/– 40 K																																						
	+/– 26 K																																						
	+/– 14 K																																						
	+/– 9 K																																						
SR...100	Max. span 25 metres																																						
SR...175/SRM...175	Max. span 37.5 metres																																						
SR...300/SRM...300	Max. span 75 metres																																						

The parameter 100, 175 and 300 in the product designation indicates the force of the springs used in the rope pull switch. It should be noted that a greater actuating force is required for higher spring forces.

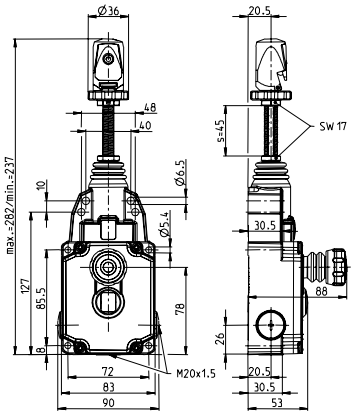
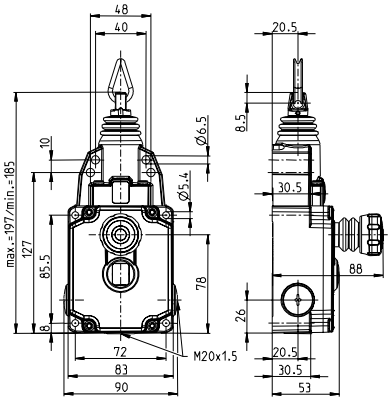
The indications of the temperature ranges refer to a system for emergency stop applications with return spring.

With a system without return spring, emergency stop applications are not permitted.
In this case, the above mentioned Kelvin values have to be halved.

Installation example

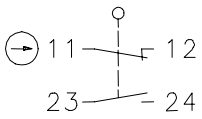
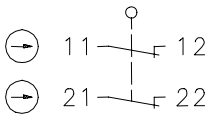


Safety Rope Pull Switches

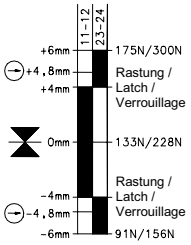
Max. span length	75 metres (Dimensioned drawing 1)		37,5 metres (Dimensioned drawing 2)	
				
	2 Ö/2 S	**3 Ö/1 S**	**2 Ö/2 S**	**3 Ö/1 S**
Quickfix **(Dimensioned drawing 1)**	**6012929087** SRM-U1Z/U1Z-QF-300	**6012999096** SRM-A2Z/U1Z-QF-300	**6012929085** SRM-U1Z/U1Z-QF-175	**6012999094** SRM-A2Z/U1Z-QF-175
Eye **(Dimensioned drawing 2)**	**6012921091** SRM-U1Z/U1Z-LU-300	**6012991100** SRM-A2Z/U1Z-LU-300	**6012921089** SRM-U1Z/U1Z-LU-175	**6012991098** SRM-A2Z/U1Z-LU-175
Quickfix **with remote monitoring** **(Dimensioned drawing 1)**	**6012929088** SRM-U1Z/U1Z-QF-300-E	**6012999097** SRM-A2Z/U1Z-QF-300-E	**6012929086** SRM-U1Z/U1Z-QF-175-E	**6012999095** SRM-A2Z/U1Z-QF-175-E
Eye **with remote monitoring** **(Dimensioned drawing 2)**	**6012921092** SRM-U1Z/U1Z-LU-300-E	**6012991101** SRM-A2Z/U1Z-LU-300-E	**6012921090** SRM-U1Z/U1Z-LU-175-E	**6012991099** SRM-A2Z/U1Z-LU-175-E
Approvals				

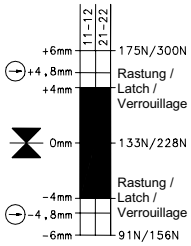
Technical data

Electrical data		
Rated insulation voltage	U_i max.	250 V AC
Rated operating voltage	U_e max.	240 V
Conventional thermal current	I_{the}	10 A
Utilisation category	U_e /I_e	AC-15, U_e /I_e 240 V / 3 A; 120 V/6 A DC-13 U_e /I_e 250 V/0.27 A; 125 V/0.55 A
Short-circuit protection		6 A gL/gG
Protection class		I
Mechanical data		
Enclosure	Aluminium pressure die-casting	
Ambient temperature	–30°C to + 80°C	
Mechanical service life	1 x 10^5	
Switching frequency max.	≤ 20 / min.	
Mounting	4 x M6 or 4 x M5	
B10d	0.2 mill.	
Type of connection	Screw connections	
Conductor cross sections	Single-wire 0.5 – 1.5 mm^2	
Cable entry	3 x M20 x 1.5	
Protection class	IP 67 conforming to IEC/EN 60529	
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1 VDE 0660 T210, DIN EN 60947-5-5, IEC 60947-5-5 ISO 13850		

Contact type	**1 NC / 1 NO (Zb)**	**2 NC (Zb)**
Action contacts	**U1Z**	**A2Z**
Circuit symbol	**Slow-action contacts** 	**Slow-action contacts** 
Switching diagram		

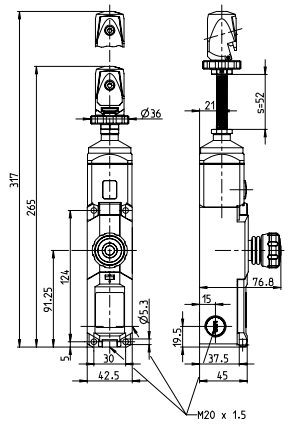
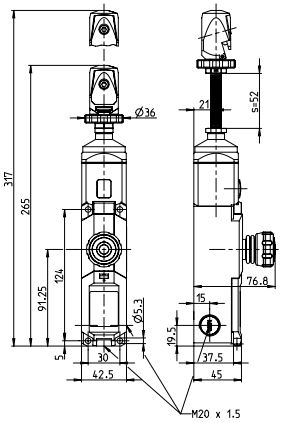
On
OFF





The pulling force data depend on the type of switch used. (SRM...175/SRM...300)
Tolerances: Switching point + / – 0.5 mm, actuating force + / – 15 %

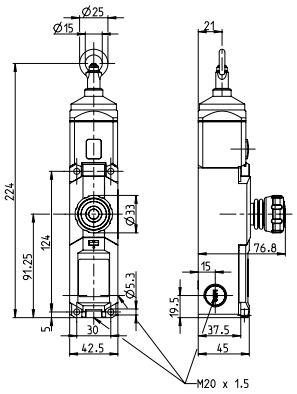
Safety Rope Pull Switches

Max. span length	75 metres (Dimensioned drawing 1)		37.5 metres (Dimensioned drawing 2)	
				
	2 NC / 2 NO	**4 NC**	**2 NC/ 2 NO**	**4 NC**
Quickfix (Dimensioned drawing 1)	**6011629072** SR-U2Z-0-QF-300-L0-0-0	**6011691082** SR-A4Z-0-QF-300-L0-0-0	**6011629071** SR-U2Z-0-QF-175-L0-0-0	**6011691081** SR-A4Z-0-QF-175-L0-0-0
Quickfix N.A. (Dimensioned drawing 2)	**6011629069** SR-U2Z-NA-QF-300-L0-0-0	**6011691079** SR-A4Z-NA-QF-300-L0-0-0	**6011629068** SR-U2Z-NA-QF-175-L0-0-0	**6011691078** SR-A4Z-NA-QF-175-L0-0-0
Eye (Dimensioned drawing 3)	**6011621066** SR-U2Z-0-LU-300-L0-0-0	**6011691076** SR-A4Z-0-LU-300-L0-0-0	**6011621065** SR-U2Z-0-LU-175-L0-0-0	**6011691075** SR-A4Z-0-LU-175-L0-0-0
Approvals				

Technical data

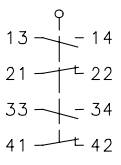
Electrical data		
Rated insulation voltage	U_i max.	250 V AC
Rated operating voltage	U_e max.	240 V
Conventional thermal current	I_{the}	10 A
Utilisation category	U_e /I_e	AC-15, U_e /I_e 240 V / 3 A
Short-circuit protection		6 A gL/gG
Protection class		II, Insulated
Mechanical data		
Enclosure	PA 6 GV (UL94-V0)	
Ambient temperature	–25°C to +70°C	
Mechanical service life	1 x 10^5 switching cycles	
Switching frequency max.	≤ 20 / min.	
Mounting	4 x M5	
B10d	1 x 10^5 million	
Type of connection	Cage clamp terminal	
Conductor cross sections	≤ 1.5 – 2 mm^2	
Cable entry	3 x M20 x 1.5	
Protection class	IP 67 conforming to IEC/EN 60529	
Standards		
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1 VDE 0660 T210, DIN EN 60947-5-5, IEC 60947-5-5 ISO 13850		

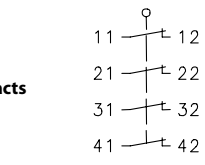
25 metres (Dimensioned drawing 3)



2 NC / 2 NO	4 NC
6011629070 SR-U2Z-0-QF-100-L0-0-0	**6011691080** SR-A4Z-0-QF-100-L0-0-0
6011629067 SR-U2Z-NA-QF-100-L0-0-0	**6011691077** SR-A4Z-NA-QF-100-L0-0-0
6011621064 SR-U2Z-0-LU-100-L0-0-0	**6011691074** SR-A4Z-0-LU-100-L0-0-0

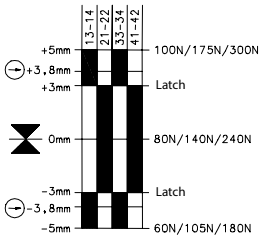
Contact type	2 NC / 2 NO (Zb)	4 NC
Action contacts	**U2Z**	**A4Z**
Circuit symbol	**Slow-action contacts**	**Slow-action contacts**

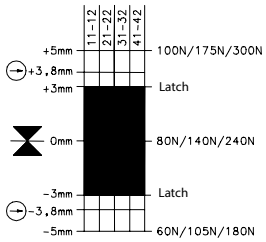




Switching diagram

On
Off



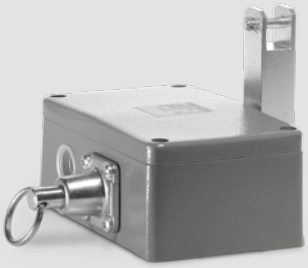


The pulling force data depend on the type of switch used. (SR...100/SR...175/SR...300)
Tolerances: Switching point +/– 0.5 mm, actuating force +/– 15 %

SiRK, Si1, Si2

SiRK

Si2



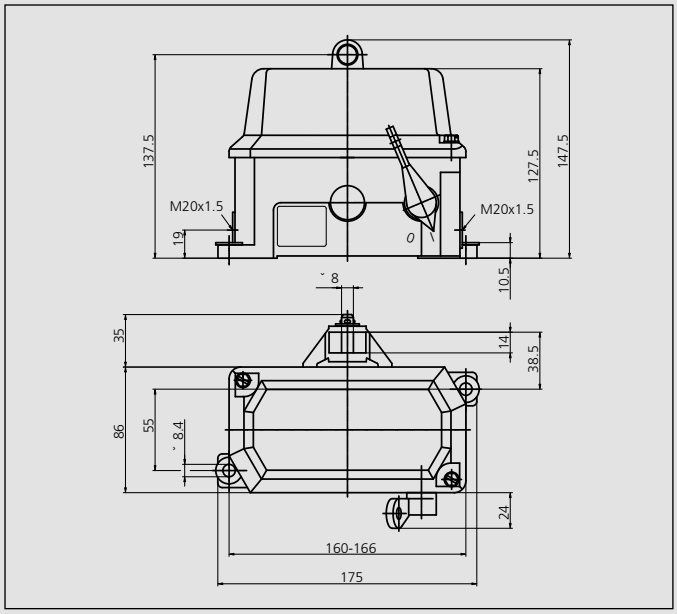
Si1

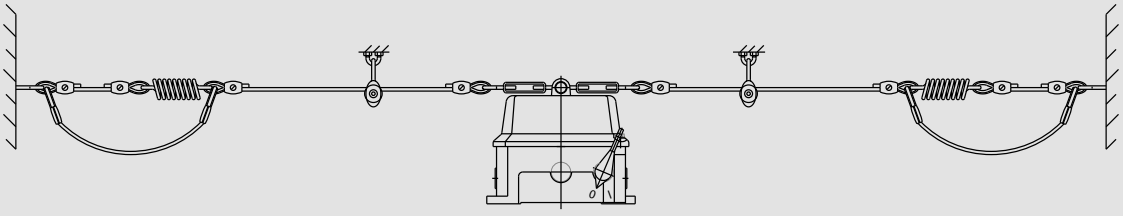
BERNSTEIN double-spanned rope pull switches (SiRK, Si1 and Si2) are also used in emergency stop applications. When the cable is pulled the switching lever is deflected in the corresponding direction and the system shut down.

The switches are available in two metal versions, the Si1 and Si2, as well as an insulation-enclosed version, the SiRK.

These types of rope pull switch are ideally suited for applications with high temperature fluctuations and long cable spans. With their sturdy enclosure, the Si1 and Si2 are the perfect switches for harsh environments.

Two cables spanned in opposite directions are attached to the switching device. The countersprings are secured to the wall at the ends of the cables. Provided the change in temperature is the same at all points along the cable, the springs will effectively compensate for the change in cable length.





Product selection

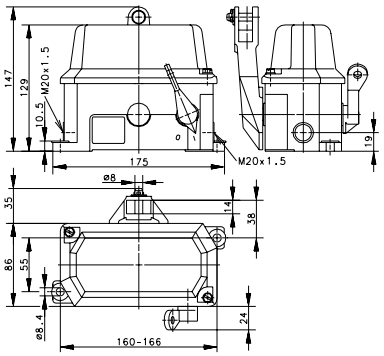
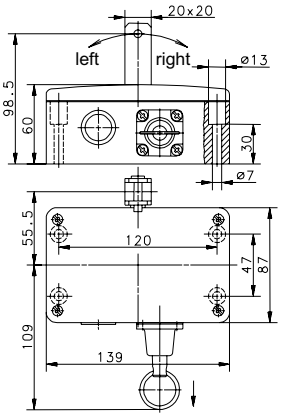
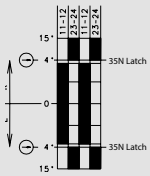
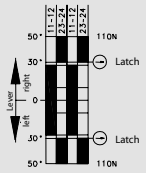
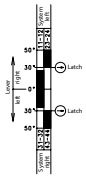
Designation	Article number	Max. span length
SI1-U2Z AK R-RAST	**6014735001**	2 x 50 m
SI1-U1Z/U1Z AK R-RAST	**6014735025**	2 x 50 m
SI2-U2Z AK R-RAST	**6015735002**	2 x 50 m
SIRK-U2Z R	**6015625001**	2 x 75 m

Technical data

		SiRK	Si1	Si2
Electrical data				
Rated insulation voltage	U_i	250 V AC	250 V AC	400 V AC
Rated operating voltage	U_e	240 V	250 V	240 V
Conventional thermal current	I_{the}	10 A	10 A	10 A
Utilisation category		AC 15, A 300 240 V /3 A, 120 V /6 A DC 13, Q300 250 V/0.27 A, 125 V/0.55 A	AC-15, U_e /I_e 240 V / 3 A	AC-15, U_e /I_e 240 V / 3 A
Positive opening action	⊖	as per IEC/EN 60947-5-1, Addendum K	as per IEC/EN 60947-5-1, Addendum K	as per IEC/EN 60947-5-1, Addendum K
Short-circuit protection		Fuse 6 A gL/gG	Fuse 6 A gL/gG	Fuse 10 A gL/gG
Protection class		II, Insulated	I	I
Mechanical data				
Enclosure		ABS	Aluminium sand casting	Cast iron
Cover		ABS	Aluminium sand casting	Cast iron
Actuation		Lever, plastic (glass fibre-reinforced)	Lever (GRP)	Lever (GRP)
Ambient temperature		– 30°C to + 80°C	– 30°C to + 80°C	– 30°C to + 80°C
Contact type		2 NC / 2 NO contact (Zb)	2 NC / 2 NO contact (Zb)	2 NC / 2 NO contact (Zb)
Mechanical service life (up to) ①		1 x 10^5 switching cycles	1 x 10^6 switching cycles	1 x 10^6 switching cycles
Switching frequency max.		Max. 30/min.	≤ 10 / min.	≤ 10 / min.
Mounting		2 x M8	4 x M8	4 x M8
B10d (up to) ①		0,2 mill.	2 mill.	2 mill.
Type of connection		8 Screw connections (M3, 5)	8 Screw connections (M3, 5)	8 Screw connections (M3, 5)
Conductor cross sections		Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2	Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2	Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2
Cable entry		2 x M20 x 1.5	1 x M20 x 1.5	3 x M20 x 1.5
Weight		≈ 0.8 kg	≈ 1.62 kg	≈ 4.21 kg
Installation position		Any	Any	Any
Protection class		IP 65 conforming to EN 60529	IP 65 conforming to EN 60529	IP 65 conforming to EN 60529
Standards				
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1				

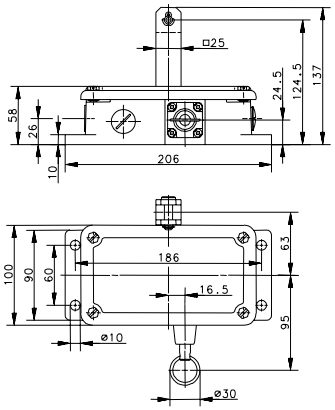
① Depending on switching system. See Table on Pages 70 – 73.

Double-Spanned Rope Pull Switches

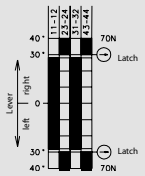
		SIRK	SI1
			
Variant 1	**Article No.** **Designation** Max. span	**6015625001** SIRK-U2Z R 2 x 75 m 	**6014735001** SI1-U2Z AK R-RAST 2 x 50 m 
Variant 2	**Article No.** **Designation** Max. span		**6014735025** SI1-U1Z/U1Z AK R-RAST 2 x 50 m 
Variant 3	**Article No.** **Designation** Max. span		

Technical Data		
Rated insulation voltage U_i max.	250 V AC	250 V AC
Rated operating voltage U_e max	240 V	240 V
Conventional thermal current I_{the}	10 A	10 A
Utilisation category U_e/I_e	AC-15, 240 V/3 A, 120 V/6	AC-15, 240 V/3 A
Approvals		

SI2



6015735002
SI2-U2Z AK R-RAST
2 x 50 m



400 V AC
240 V
10 A
AC-15, 240 V/3 A

With and Without Latching Function


SEK


SEM2


SIEM2


SD


SID


SID


SIN

Because of their specifications governed by corresponding standards (see Cable Safety Pull Switches SRM/SR), these cable pull switches are used exclusively as safety command devices.

These switches are available in metal enclosures as well as in insulation-enclosed versions. They are operated manually by pulling on the attached cable.

Thanks to their pretension, these switches, which feature a switching contact with overlap, execute a switching function when the cable is pulled or in the event of cable breakage.

The field of application for these rope pull switches includes

- Opening and closing of (garage) doors
- Starting machines
- Issuing commands in production processes

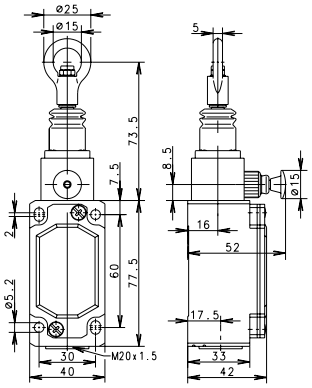
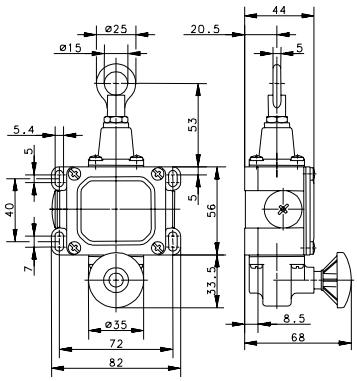
The basic design of the standard rope pull switches is based on that of position switches.

The specified cable length refers to the maximum length at minimum temperature variation. The maximum cable length may decrease under different environmental conditions.

Technical data		SEK	SiEK	SEM2	SiEM2
Electrical data					
Rated insulation voltage	U_i	400 V AC	400 V AC	400 V AC	400 V AC
Rated operating voltage	U_e	240 V	240 V	240 V	240 V
Conventional thermal current	I_{the}	10 A	10 A	10 A	10 A
Utilisation category	U_e / I_e	AC-15, U_e /I_e 240 V / 3 A	AC-15, U_e /I_e 240 V / 3 A	AC-15, U_e /I_e 240 V / 3 A	AC-15, U_e /I_e 240 V / 3 A
Mechanical data					
Switching frequency max.		≤ 50/min.	max. 100/min.	max. 50/min.	max. 50/min.
Mechanical service life		1 x 10^6 switching cycles	1 x 10^6 switching cycles	1 x 10^6 switching cycles	1 x 10^6 switching cycles
B10d		on request	on request	on request	on request
Short-circuit protection		Fuse 10 A gL/gG	Fuse 10 A gL/gG	Fuse 10 A gL/gG	Fuse 10 A gL/gG
Protection class		II, Insulated	II, Insulated	I	I
Ambient temperature		– 30°C to + 80°C	– 30°C to + 80°C	– 30°C to + 80°C	– 30°C to + 80°C
Protection class		IP 65 conforming to IEC/EN 60529	IP 65 conforming to EN 60529	IP 65 conforming to EN 60529	IP 65 conforming to EN 60529; DIN VDE 0470 T1
Type of connection		4 Screw connections (M3, 5)	4 Screw connections (M3, 5)	4 Screw connections (M3, 5)	Screw connections
Conductor cross sections		Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2	Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2	Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2	Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2
Enclosure		Thermoplastic, glass fibre-reinforced	Thermoplastic, glass fibre-reinforced	Aluminium pressure die-casting	Aluminium pressure die-casting
Cable entry		1 x M20 x 1.5	1 x M20 x 1.5	1 x M20 x 1.5	1 x M20 x 1.5
Standards					
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1					

Technical data		SD	SiD	SIN
Electrical data				
Rated insulation voltage	U_i	400 V AC	400 V AC	400 V AC
Rated operating voltage	U_e	240 V	240 V	240 V
Conventional thermal current	I_{the}	16 A	16 A	10 A
Utilisation category	U_e / I_e	AC-15, U_e /I_e 240 V / 3 A	AC-15, U_e /I_e 240 V / 3 A	AC-15, U_e /I_e 240 V / 3 A
Mechanical data				
Switching frequency max.		≤ 20/min.	max. 20/min.	≤ 20/min.
Mechanical service life		1 x 10^6 switching cycles	1 x 10^6 switching cycles	1 x 10^6 switching cycles
B10d		on request	on request	on request
Short-circuit protection		Fuse 10 A gL/gG	Fuse 10 A gL/gG	Fuse 10 A gL/gG
Protection class		I	I	I
Ambient temperature		– 30°C to + 80°C	– 30°C to + 80°C	– 30°C to + 80°C
Protection class		IP65 conforming to EN 60529	IP65 conforming to EN 60529	IP65 conforming to EN 60529
Type of connection		Screw connections	Screw connections	Screw connections
Conductor cross sections		Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2	Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2	Single-wire 0.5 – 1.5 mm^2 or Stranded wire with ferrule 0.5 – 1.5 mm^2
Enclosure		Aluminium pressure die-casting	Aluminium pressure die-casting	Aluminium pressure die-casting
Cable entry		2 x M20 x 1.5	2 x M20 x 1.5	2 x M20 x 1.5
Standards				
VDE 0660 T100, DIN EN 60947-1, IEC 60947-1 VDE 0660 T200, DIN EN 60947-5-1, IEC 60947-5-1				

Standard Rope Pull Switches

		SIEM2 RAST	SID RAST
			
Variant 1	**Article No.** Designation Max. span	**6012831023** SIEM2-UV1Z P-RAST 6 m	**6011411868** SD-U1 P-RAST 8 m
Variant 2	**Article No.** Designation Max. span		**6111431060** SID-UV1Z P-RAST 15 m
Variant 3	**Article No.** Designation Max. span		**6011431869** SID-UV1Z P-RAST 12 m

Technical data		
Rated insulation voltage U_i max.	400 V AC	400 V AC
Rated operating voltage U_e max	240 V	240 V
Conventional thermal current I_{the}	10 A	16 A
Utilisation category U_e/I_e	AC-15, 240 V/3 A	AC-15, 240 V/3 A