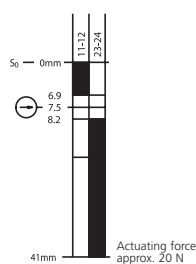
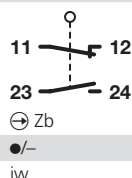






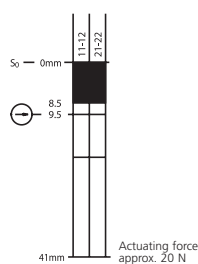
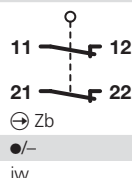
ENK-U1Z VTU  
601.6619.132



250 VAC  
10 A  
240 V/3 A  
(AC 15) A300  
30/min.  
1 x 10<sup>6</sup>  
-30 °C/+80 °C  
-22 °F/+176 °F

-  
BG  
0.2 kg  
●/-

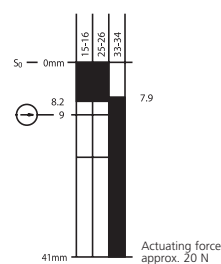
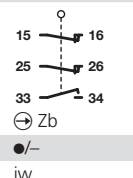
ENK-A2Z VTU  
601.6669.133



250 VAC  
10 A  
240 V/3 A  
(AC 15) A300  
30/min.  
1 x 10<sup>6</sup>  
-30 °C/+80 °C  
-22 °F/+176 °F

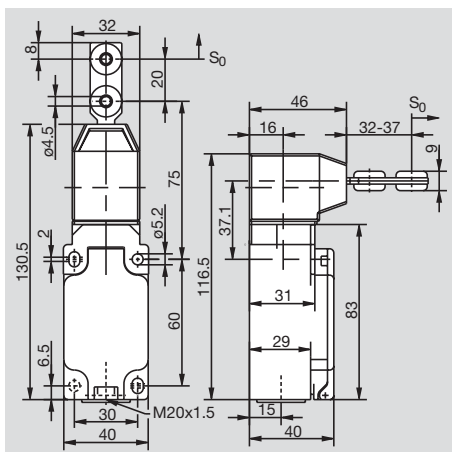
-  
BG  
0.2 kg  
●/-

ENK-UV15Z VTU  
601.6669.154



400 VAC  
6 A  
240 V/1,5 A  
(AC 15) A300  
30/min.  
1 x 10<sup>6</sup>  
-30 °C/+80 °C  
-22 °F/+176 °F

-  
BG  
0.2 kg  
●/-



All dimensions in mm



# Plastic-bodied interlocking safety switch

**SKC  
SK**

Protection class IP 65

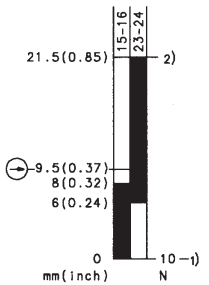
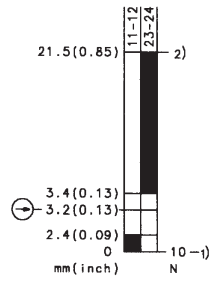
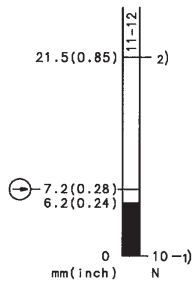
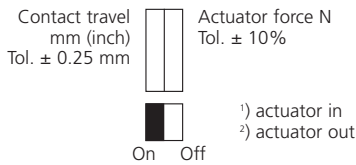


Designation  
**Part number**  
 Circuit diagram  
 ⊕ Forced disconnect to IEC 947-5-1 chapter 3  
 Za: not galvanically separated contacts  
 Zb: galvanically separated contacts  
 Slow make & break/snap-action  
 Internal seal (iw)/external seal (w)

SKC-A1Z M  
**601.6169.039**  
  
 ⊕ Zb  
 ●/-  
 iw

SK-U1Z M  
**601.6119.016**  
  
 ⊕ Zb  
 ●/-  
 iw

SKC-UV1Z M  
**601.6139.034**  
  
 ⊕ Zb  
 ●/-  
 iw



Voltage max.  
 Permanent current max.  
 In-rush current complies with standards  
 IEC 947-5-1 AC 15/DC 13  
 Switching frequency max.  
 Mechanical life – number of switching actions  
 Operating temperature min./max.

Approvals  
 Weight  
 Delivery: ex-stock/built to order

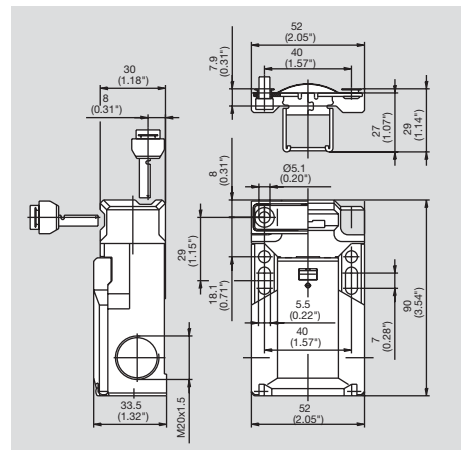
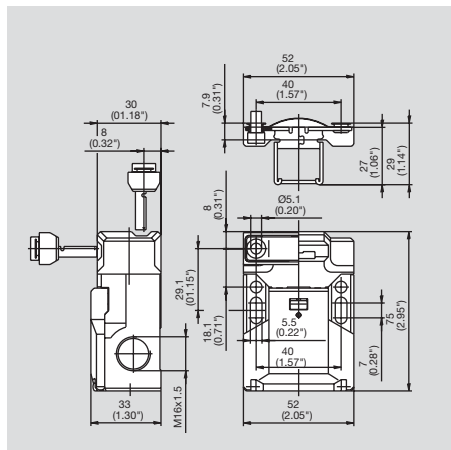
500 V AC  
 10 A  
 ●  
 30/min.  
 1 x 10<sup>6</sup>  
 -30 °C/+80 °C  
 -22 °F/+176 °F

BG, UL, CSA  
 0.11 kg/0.24 lb  
 ●/-

500 V AC  
 10 A  
 ●  
 30/min.  
 1 x 10<sup>6</sup>  
 -30 °C/+80 °C  
 -22 °F/+176 °F

BG, UL, CSA  
 0.13 kg/0.29 lb  
 ●/-

All dimensions in mm (inch)



SK-UV15Z M	SK-UV16Z M	SK-A2Z M
<b>601.6169.026</b>	<b>601.6169.027</b>	<b>601.6169.036</b>
●/-	●/-	●/-
iw	iw	iw
400 V AC	400 V AC	500 V AC
6 A	6 A	10 A
●	●	●
30/min.	30/min.	30/min.
1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>
-30 °C/+80 °C	-30 °C/+80 °C	-30 °C/+80 °C
-22 °F/+176 °F	-22 °F/+176 °F	-22 °F/+176 °F
BG, UL, CSA	BG, UL, CSA	BG, UL, CSA
0.13 kg/0.29 lb	0.13 kg/0.29 lb	0.13 kg/0.29 lb
●/-	●/-	●/-

# Actuator selection table

## SKC/SK

Safety switch  
DIN EN 60947-5-1

- Forced disconnection of NC contacts
- Galvanically separated contacts according to Zb form

### Approvals

- UL, CSA
- BG



### Actuator M

- Metal
- Stainless steel



### Actuator P

- Thermoplastic
- Polyamide

Standard models	Actuator retention force	Contact diagram
Single & double poles		
SKC-A1Z	10N	
SKC-A1Z F30	30N	
SKC-A1Z Fi100	100N	
SK-U1Z	10N	
SK-U1Z F30	30N	
SK-U1Z Fi100	100N	
SK-UV1Z	10N	
SK-UV1Z F30	30N	
SK-UV1Z Fi100	100N	
SK-A2Z	10N	
SK-A2Z F30	30N	
SK-A2Z Fi100	100N	
SK-SU1Z	10N	
SK-SU1Z F30	30N	
SK-SU1Z Fi100	100N	

Part number	Part number
Designation	Designation
<b>601.6169.039</b>	<b>601.6169.054</b>
SKC-A1Z M	SKC-A1Z P
○	○
<b>601.6169.003</b>	-
SKC-A1Z Fi100 M	
<b>601.6119.016</b>	<b>601.6119.035</b>
SK-U1Z M	SK-U1Z P
<b>611.6119.109</b>	○
SK-U1Z F30 M	
<b>601.6119.001</b>	-
SK-U1Z Fi100 M	
<b>601.6139.034</b>	○
SK-UV1Z M	
○	○
○	-
<b>601.6169.036</b>	○
SK-A2Z M	
<b>601.6169.053</b>	○
SK-A2Z F30 M	
<b>601.6169.024</b>	-
SK-A2Z Fi100 M	
○	○
○	○
○	-

Standard models	Actuator retention force	Contact diagram
Three poles		
SK-UV15Z	10N	
SK-UV15Z F30	30N	
SK-UV15Z Fi100	100N	
SK-UV16Z	10N	
SK-UV16Z F30	30N	
SK-UV16Z Fi100	100N	

Part number	Part number
Designation	Designation
<b>601.6169.026</b>	○
SK-UV15Z M	
<b>601.6169.061</b>	○
SK-UV15Z F30 M	
<b>601.6169.025</b>	-
SK-UV15Z Fi100 M	
<b>601.6169.027</b>	○
SK-UV16Z M	
○	○
○	-

○ Technically possible (on request)  
- Not available



### Actuator F

- Spring loaded to accommodate over-travel
- Stainless steel or polyamide



### Actuator MRU

- Adjustable horizontally & vertically
- Flexible
- Stainless steel
- Spring loaded to accommodate overtravel

Part number	Part number
Designation	Designation
○	<b>601.6169.087</b>
○	SKC-A1Z MRU
○	○
○	○
<b>601.6119.074</b>	<b>601.6119.084</b>
SK-U1Z PF	SK-U1Z MRU
○	○
○	○
○	○
○	○
○	○
○	<b>601.6169.085</b>
○	SK-A2Z MRU
○	○
○	<b>601.6169.032</b>
○	SK-A2Z Fi100 MRU
○	○
○	○
○	○

Part number	Part number
Designation	Designation
<b>601.6169.063</b>	<b>601.6169.086</b>
SK-UV15Z MF	SK-UV15Z MRU
○	○
○	○
○	○
○	○
○	○
○	○
○	○

#### Technical data Standard models single & double poles

Insulation voltage:  
 $U_i = 500 \text{ V}$

Thermal constant current:  
 $I_{th} = 10 \text{ A}$

Switching frequency:  
Max. 30/min.

Mechanical life:  
 $1 \times 10^6$  cycles

Operating temperature:  
 $-30 \text{ }^\circ\text{C}/+80 \text{ }^\circ\text{C}$   
 $-22 \text{ }^\circ\text{F}/+176 \text{ }^\circ\text{F}$

Weight:  
0.13 kg/0.29 lbs

#### Technical data Standard models three poles

Insulation voltage:  
 $U_i = 400 \text{ V}$

Thermal constant current:  
 $I_{th} = 6 \text{ A}$

Switching frequency:  
Max. 30/min.

Mechanical life:  
 $1 \times 10^6$  cycles

Operating temperature:  
 $-30 \text{ }^\circ\text{C}/+80 \text{ }^\circ\text{C}$   
 $-22 \text{ }^\circ\text{F}/+176 \text{ }^\circ\text{F}$

Weight:  
0.13 kg/0.29 lbs

- **Forced Ejection (FE):**  
The actuator mechanism is spring loaded to forcibly eject the actuator.
- **Actuator Retention (F 30, Fi 100)**  
This model retains the actuator with the indicated force in Newtons.
- **MRU Actuator:**  
This actuator is spring mounted to accommodate some misalignment as well as over travel.

#### Important note:

To ensure safety integrity, actuators should only be purchased together with the safety switch.

# Interlocking safety switches

## SKI

Protection class IP 65



The slim design and dimensions of the SKI (according to EN 50047) allow it to be mounted onto narrow profile systems and in confined spaces. Operation can be performed both horizontally and vertically. This flexible form of mounting is supported by the ability to position the actuating head in 4 x 90° increments.

The SKI has the option of two new built-in operating functions.

- Integrated forced ejection function (FE):  
The actuator is ejected from the switch:  
– preventing unauthorized use of a spare actuator to defeat the safety function  
– ensuring the guard must be closed securely to enable the machine to run
- Integrated actuator holding force (FI 50 = 50 N):  
Guard doors which may open due to vibration can be held shut by using the SKI with increased actuator holding force of 50 N, without the need for bulky external latches. In addition several doors mounted in a straight line on one machine are kept closed.

The SKI is equipped with positive-break and galvanically-isolated contacts.

Available are:

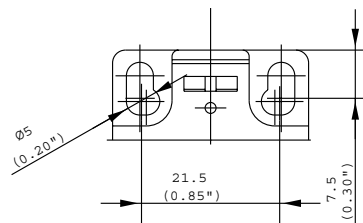
- 1 NC  $\leftrightarrow$ /1 NO slow-action device
- 1 NC  $\leftrightarrow$ /1 NO snap-action device
- 2 NC  $\leftrightarrow$  slow-action device
- 2 NC  $\leftrightarrow$ /1 NO slow-action device

### Mechanical data

- Enclosure and lid made from glass-fibre reinforced PA 6 (UL 94-V0)
- Switching device made from PA/St and stainless steel
- Actuator made from stainless steel
- Cable entry M 20 x 1.5 (optional: M 16 x 1.5)

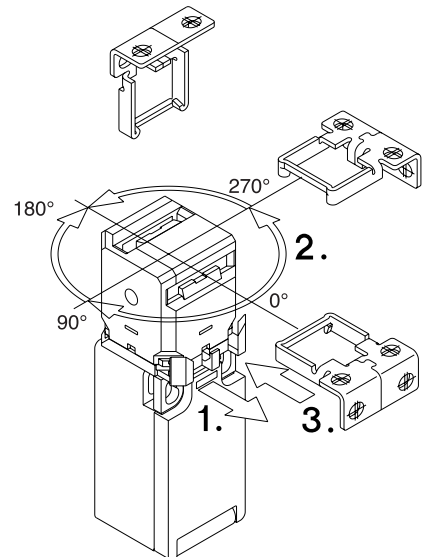
### Mounting and installation

- The safety switch is mounted using 2 x M5 screws in the locating and mounting holes.
- The separate actuator is mounted using 2 x M4 screws. The safety switch and the actuator should be secured well, in order to prevent unintentional loosening (one-way and break-off screws, rivets etc.).



### Positioning the actuator head

- Rotation in 4 x 90° increments: when mounted, the head is fixed into position by the clasp
- Horizontal or vertical operation



### Warning

- **The safety switch must not be used as a mechanical end stop.**
- To preserve the level of safety, the safety switch must only be used in conjunction with the correct actuator.

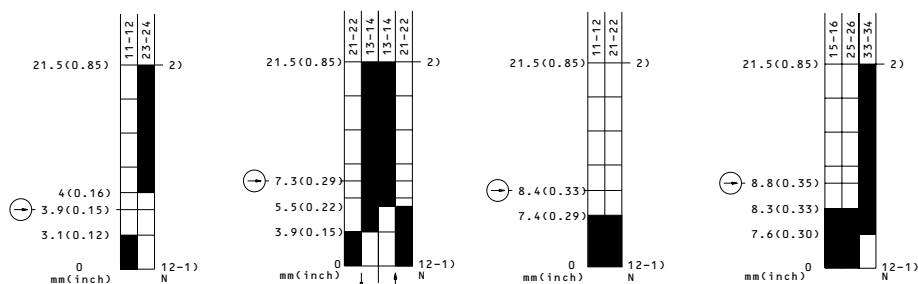
### Contact configuration

Switching element	Function	Contacts	Designation	Voltage	Continuous current
Slow-action	changeover	1 NC/1 NO	U1Z	250 V	10 A
Snap-action	changeover	1 NC/1 NO	SU1Z	250 V	10 A
Slow-action	normally-closed	2 NC	A2Z	250 V	10 A
Slow-action	changeover, overlapping	2 NC/1 NO	UV15Z	400 V	6 A



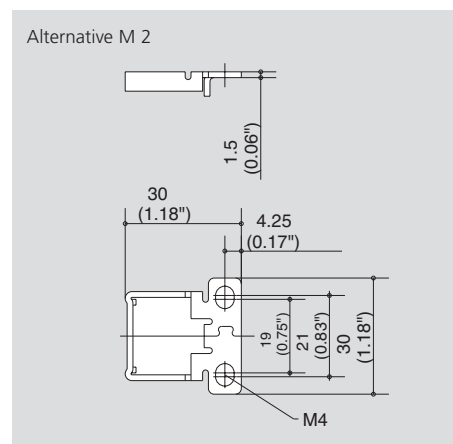
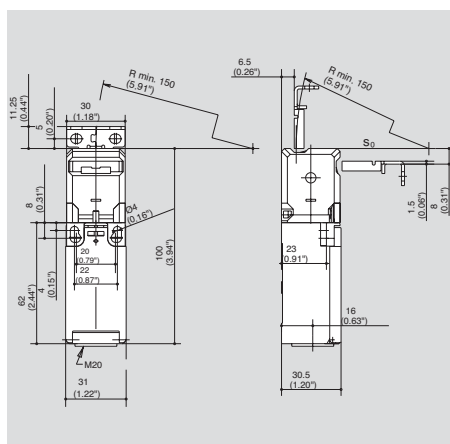
Designation	SKI-U1Z M3	SKI-SU1Z M3	SKI-A2Z M3	SKI-UV15Z M3
<b>Part number</b>	<b>601.6819.052</b>	<b>601.6809.057</b>	<b>601.6869.056</b>	<b>601.6869.058</b>
Switching diagram				
⊕ positive break according to IEC 947-5-1 Chap. 3				
Za: changeover contact is not galvanically isolated				
Zb: changeover contact is galvanically isolated				
Slow-action contact/snap-action contact				
Gasket inside (iw)/outside (w)				

Contact travel mm (inch) Tol. ± 0.25 mm		Actuating force N Tol. ± 10%
Switch angle degree Tol. ± 3.5°		Actuating torque Ncm Tol. ± 10%
		1) actuator in 2) actuator out
	In Out	



Voltage	max.	250 V AC	250 V AC	250 V AC	400 V AC
Continuous current	max.	10 A	10 A	10 A	6 A
Making current, acc. to IEC 947-5-1 AC 15/DC 13		●	●	●	●
Switching frequency	max.	30/min.	30/min.	30/min.	30/min.
Mech. operational life – number of switching cycles		1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>
Ambient temperature	min./max.	-30 °C/+80 °C -22 °F/+176 °F	-30 °C/+80 °C -22 °F/+176 °F	-30 °C/+80 °C -22 °F/+176 °F	-30 °C/+80 °C -22 °F/+176 °F
Approvals		BG, UL, CSA	BG, UL, CSA	BG, UL, CSA	BG, UL, CSA
Weight		0.13 kg/0.29 lb	0.13 kg/0.29 lb	0.13 kg/0.29 lb	0.13 kg/0.29 lb
Delivery: ex-stock/built to order		●/-	●/-	●/-	●/-

All dimensions in mm (inch)



# Interlocking safety switches

## SKT

Protection class IP 65



The SKT is the smallest safety switch with a separate actuator offering the same features, relating to safety, as all other products in this range. The SKT is perfect for applications that require a particularly slim and compact switching device. The rotating head, two actuator openings and different switching functions are proof of its versatility.

The SKT offers further options enabling it to suit a wide variety of applications.

- Integrated forced ejection function (FE): The actuator is ejected from the switch:
  - preventing unauthorized use of a spare actuator to defeat the safety function
  - ensuring the guard must be closed securely to enable the machine to run
- Integrated actuator holding force (FI50 = 50 N):

Guard doors which may open due to vibration can be held shut by using the SKT with increased actuator holding force up to 50 N, without the need for bulky external latches. In addition several doors mounted in a straight line on one machine are kept closed.

- Universal radius actuator (MRU): In addition to the standard straight-on actuator made from stainless steel (operating radius 150 mm), the universal radius actuator offers an adjustable operating radius to a minimum 50 mm both horizontally and vertically.

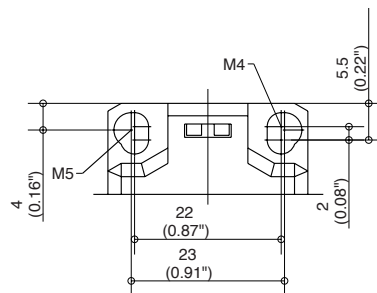
The SKT offers a variety of different switching functions in a highly compact enclosure. All systems are fitted with galvanically isolated contacts, the normally-closed being positive break. Snap-action contacts have been designed for control systems that require a simultaneous signal.

Available are:

- 1 NC  $\leftrightarrow$ /1 NO slow-action device
- 1 NC  $\leftrightarrow$ /1 NO snap-action device
- 2 NC  $\leftrightarrow$  slow-action device
- 2 NC  $\leftrightarrow$  snap-action device

### Mechanical data

- Enclosure and lid made from highly durable fiberglass reinforced thermoplastic (UL 94-VO)
- Operating mechanism: head made from PA, clasp from Zn, rivets from stainless steel
- Actuator made from stainless steel
- Cable entry M 16 x 1.5



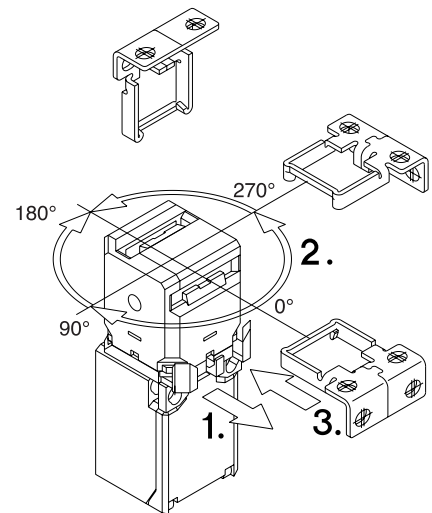
### Mounting and installation

- The safety switch is mounted using 2 x M5 screws in the provided locating and mounting holes (23 mm centres).
- The separate actuator is attached using 2 x M4 screws (20 mm centres).

The safety switch and the actuator should be secured well, in order to prevent unintentional loosening (one-way and break-off screws, rivets etc.)

### Positioning the actuator head

- Rotation in 4 x 90° increments: when mounted, the head is fixed into position by the clasp
- Horizontal or vertical operation



### Warning

- **The safety switch must not be used as a mechanical end stop.**
- To preserve the level of safety, the safety switch must only be used in conjunction with the correct actuator.

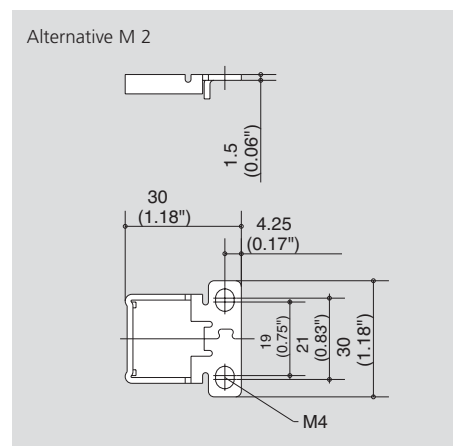
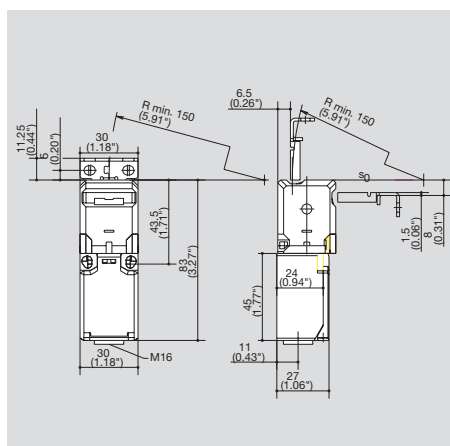
### Contact configuration

Switching element	Switch function	Switch contact	Designation	Voltage	Continuous current
Slow-action	changeover	1 NC/1 NO	U1Z	250 V	10 A
Snap-action	changeover	1 NC/1 NO	SU1Z	250 V	10 A
Slow-action	normally-closed	2 NC	A2Z	250 V	10 A
Snap-action	normally-closed	2 NC	SA2Z	250 V	10 A



Designation	SKT-U1Z M3	SKT-SU1Z M3	SKT-A2Z M3	SKT-SA2Z M3
<b>Part number</b>	<b>601.6419.059</b>	<b>601.6409.060</b>	<b>601.6469.066</b>	<b>601.6469.067</b>
Switching diagram				
⊕ positive break according to IEC 947-5-1 Chap. 3				
Za: changeover contact is not galvanically isolated				
Zb: changeover contact is galvanically isolated				
Slow-action contact/snap-action contact				
Gasket inside (iw)/outside (w)				
Contact travel mm (inch) Tol. ± 0.25 mm Actuating force N Tol. ± 10% Switch angle degree Tol. ± 3.5° Actuating torque Ncm Tol. ± 10% In Out 1) actuator in 2) actuator out				
Voltage	max. 250 V AC	max. 250 V AC	max. 250 V AC	max. 250 V AC
Continuous current	max. 10 A	max. 10 A	max. 10 A	max. 10 A
Making current, acc. to IEC 947-5-1 AC 15/DC 13	●	●	●	●
Switching frequency	max. 30/min.	max. 30/min.	max. 30/min.	max. 30/min.
Mech. operational life – number of switching cycles	1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>
Ambient temperature	min./max. -30 °C/+80 °C -22 °F/+176 °F	min./max. -30 °C/+80 °C -22 °F/+176 °F	min./max. -30 °C/+80 °C -22 °F/+176 °F	min./max. -30 °C/+80 °C -22 °F/+176 °F
Approvals	BG, UL, CSA	BG, UL, CSA	BG, UL, CSA	BG, UL, CSA
Weight	0.13 kg/0.29 lb	0.13 kg/0.29 lb	0.13 kg/0.29 lb	0.13 kg/0.29 lb
Delivery: ex-stock/built to order	●/-	●/-	●/-	●/-

All dimensions in mm (inch)



## Interlocking solenoid safety switches with plastic body

### SLK

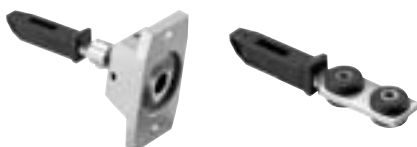
Safelock *Family*  
Plastic body  
Protection class IP 67  
Power to lock or unlock



#### Product advantages

- **Safety** built into the system through two independent safety circuits, flexible contact assembly with max. 4 NC →
- **Universal** integration into system due to multiple voltage supply 24 V DC and 24/110/230 V AC (Standard: 24 V AC/DC)
- **Flexible** integration due to rotatable actuating head (4 x 90°) and horizontal or vertical operation
- **Compact** design with slim dimensions with total length of 170 mm
- **Innovative** installation due to cage-clamp connection technology.
- **Function** according to GS ET 19, EN 60 204-1 and EN 60 947-5-1.

#### Safe application



The actuator made from stainless steel guarantees reliable operation. The coding prevents manipulation and bypassing in the "simplest possible way". The optional radius actuator allows smaller safety doors to be monitored. It can be installed horizontally or vertically, and is also made from stainless steel.

#### Innovative installation



The electrical connection of the SLK is safe and reliable. A terminal block with cage-clamp terminal connectors is used. The terminal compartment is separate from all working parts ensuring that the connections are safely made. A terminal block with conventional screw-type connections is available as an option.

The terminal compartment is designed according to protection class IP 67.

The LED indicator showing the actual status is optional.

#### Flexible application



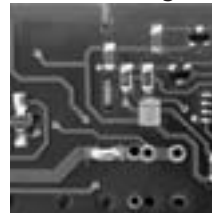
The SLK can be operated both horizontally and vertically. The necessary pre-setting is carried out before mounting by simply adjusting the actuating head. This flexible method of mounting is supported by the ability to position the actuating head in 4 x 90° increments.

#### Safety in demanding environmental conditions



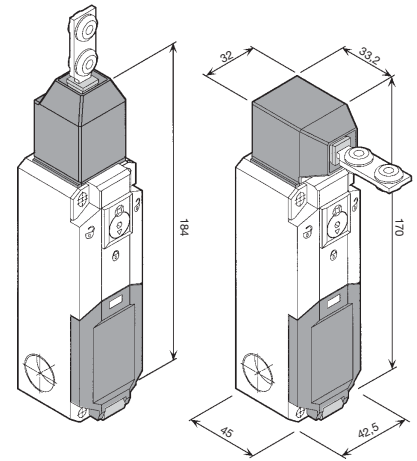
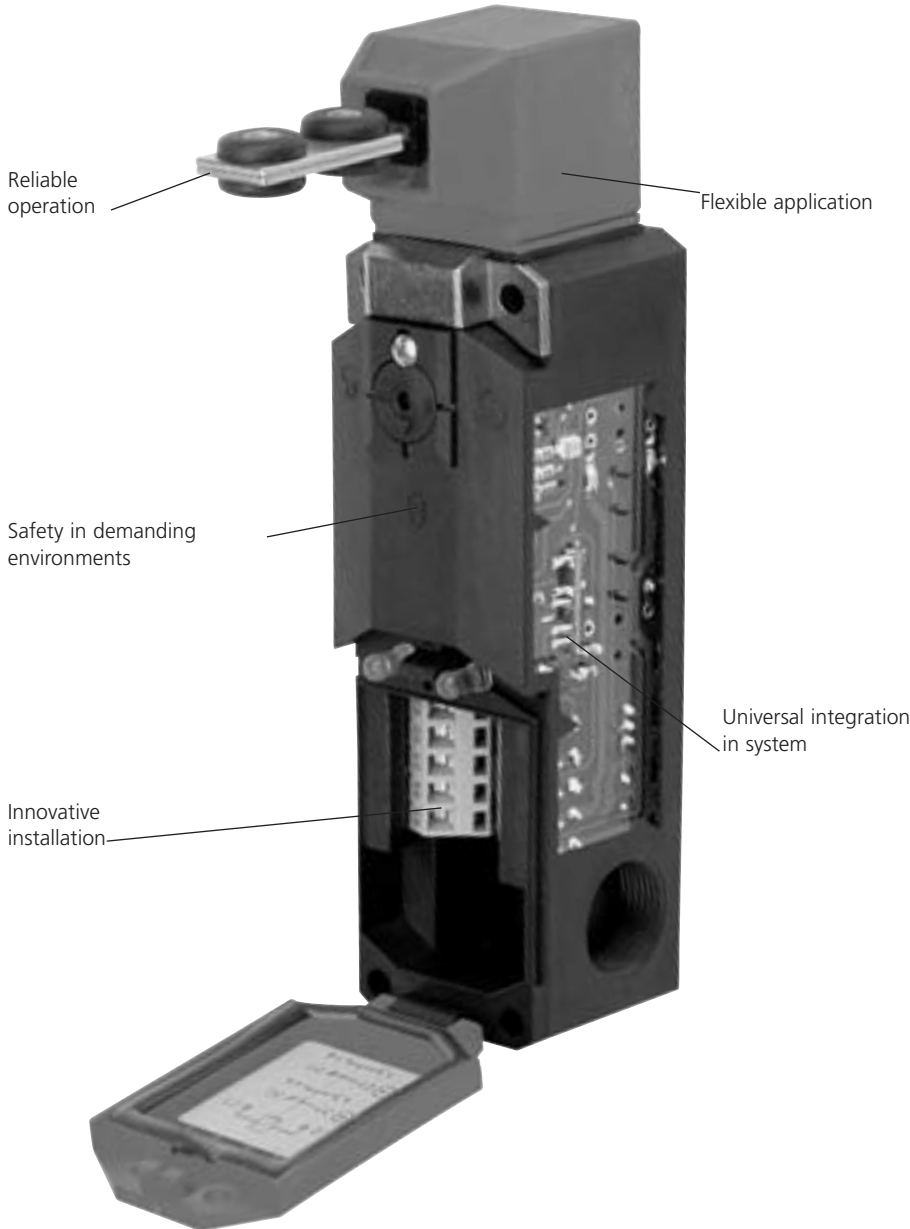
The use of an innovative electromechanical system (Bernstein patent) consisting of a solenoid actuator, electro-magnetic retention system and electronic controller, results in a very low power consumption. This allows reliable continuous operation even in high ambient temperatures.

#### Universal integration in system



In the multiple voltage version, the SLK can be connected to all control voltages from 24 V DC as well as from 24/110/230 V AC. The standard SLK is equipped for a control voltage of 24 V DC/AC.

## High-level safety at low cost



### Mounting

- The safety switch is mounted using a minimum of two M5 screws in the mounting holes.
- The separate actuator is to be suitably secured to prevent unintentional loosening (one-way and break-off screws, rivets).
- The user sets the actuating head to either horizontal or vertical operation before installation.
- This is achieved by changing the alignment of the actuating head and the upper and lower parts are then secured together using a security screw.
- The four operating directions are selected by pulling forward the clasp and turning the actuating head.

### Warning

- **The safety switch must not be used as a mechanical end stop.**
- The interlock of the safety device is maintained on power failure only with the types SLK-FVTU... (spring-locking).
- To operate the auxiliary release, first loosen the screw and turn the actuating lever.
- To maintain the safety level, the safety switch may only be used in conjunction with the corresponding actuator.

### Product designation system for SLK safety switches

Switch	Locking principle	Actuating device	Operating voltage	Two-digit contact code: 1st digit = Actuator contact(s) 2nd digit = Solenoid contact(s)	Release function	Additional function
<b>SLK</b>	<b>F</b> Spring force <b>M</b> Magnet force	<b>VTU</b>	<b>24DC-24-230MC</b>	0 = free 1 = 1NC ⊕ 2 = 2NC ⊕ 3 = 1NO ⊕ 4 = 2NO ⊕ 5 = 1NC ⊕/1NO 6 = 1NC ⊕/2NO 7 = 2NC ⊕/1NO 8 = 3NC ⊕ 9 = 4NC ⊕	<b>AR</b> Auxiliary release <b>ER</b> Emergency release	<b>R</b> = Radius actuator <b>S</b> = Plug-in connector <b>L2</b> = 2 LED <b>A</b> = Adaptor <b>X</b> = Special design

Example : SLK FVTU24UC-55-ARR = type F, 24 V AC/DC, 1 NC ⊕ 1 NO on the interlock, 1 NC ⊕ 1 NO on the safety equipment, auxiliary release, radial actuator

## Table of standard products

### SLK

Part number	Designation	Locking	Connection assembly		Control voltage	Add. functions		Actuator
		Spring force Magnet force	Safety equipment	Locking		Auxiliary release (AR)	LED Standard Radius actuator (L)	
601.8119.001	SLK-FVTU24UC-55-AR	Spring force	1NF ⊕ 1NO	1NF ⊕ 1NO	24 V AC/DC	AR	–	Standard
601.8119.002	SLK-FVTU24-230MC-55-AR	Spring force	1NF ⊕ 1NO	1NF ⊕ 1NO	24 V DC + 24/110/230 V AC	AR	–	Standard
601.8119.003	SLK-MVTU24UC-55	Magnet force	1NF ⊕ 1NO	1NF ⊕ 1NO	24 V AC/DC	–	–	Standard
601.8119.004	SLK-MVTU24-230MC-55	Magnet force	1NF ⊕ 1NO	1NF ⊕ 1NO	24 V DC + 24/110/230 V AC	–	–	Standard
601.8169.005	SLK-FVTU24UC-21-AR	Spring force	2NF ⊕	1NF ⊕	24 V AC/DC	AR	–	Standard
601.8169.006	SLK-FVTU24-230MC-21-AR	Spring force	2NF ⊕	1NF ⊕	24 V DC + 24/110/230 V AC	AR	–	Standard
601.8119.009	SLK-FVTU24UC-55-ARL	Spring force	1NF ⊕ 1NO	1NF ⊕ 1NO	24 V AC/DC	AR	L	Standard
601.8169.010	SLK-FVTU24UC-21-ARL	Spring force	2NF ⊕	1NF ⊕	24 V AC/DC	AR	L	Standard
601.8119.012	SLK-FVTU24-230MC-55-ARL	Spring force	1NF ⊕ 1NO	1NF ⊕ 1NO	24 V DC + 24/110/230 V AC	AR	L	Standard
601.8169.013	SLK-FVTU24-230MC-21-ARL	Spring force	2NF ⊕	1NF ⊕	24 V DC + 24/110/230 V AC	AR	L	Standard
601.8119.015	SLK-FVTU24UC-55-ARR	Spring force	1NF ⊕ 1NO	1NF ⊕ 1NO	24 V AC/DC	AR	–	Radius actuator
601.8169.016	SLK-FVTU24UC-21-ARR	Spring force	2NF ⊕	1NF ⊕	24 V AC/DC	AR	–	Radius actuator
601.8119.018	SLK-FVTU24-230MC-55-ARR	Spring force	1NF ⊕ 1NO	1NF ⊕ 1NO	24 V DC + 24/110/230 V AC	AR	–	Radius actuator
601.8169.019	SLK-FVTU24-230MC-21-ARR	Spring force	2NF ⊕	1NF ⊕	24 V DC + 24/110/230 V AC	AR	–	Radius actuator
601.8119.021	SLK-MVTU24UC-55-L	Magnet force	1NF ⊕ 1NO	1NF ⊕ 1NO	24 V AC/DC	–	L	Standard
601.8169.022	SLK-MVTU24UC-21-L	Magnet force	2NF ⊕	1NF ⊕	24 V AC/DC	–	L	Standard
601.8119.024	SLK-MVTU24UC-55-R	Magnet force	1NF ⊕ 1NO	1NF ⊕ 1NO	24 V AC/DC	–	–	Radius actuator
601.8169.025	SLK-MVTU24UC-21-R	Magnet force	2NF ⊕	1NF ⊕	24 V AC/DC	–	–	Radius actuator

According to the part designation systematic, customer specific versions (i.e. different contacts) are possible (see page 76)

## Electrical characteristics

### Switching devices

Rated isolated voltage $U_i$ :	250 V
Application category:	AC 15 230 V/2,5 A
Thermal current $I_{th}$ :	2,5 A
Short-circuit protection:	4 A slow blow fuse

### Electronic magnets

Duration of current:	100% ED
Temperature class:	B (130 °C)
Pulse power:	56 VA (0.2 s)
Holding power:	1.1 VA (constant)
Switching frequency:	600 / h max.

## Mechanical characteristics

Enclosure:	PA 6 GV (UL94-V0)
Lid:	PA 6 GV (UL94-V0)
Actuating device:	PA 6 GV / ZN-GD
Separate actuator:	St/PA
Ambient temperature:	–25 °C/+70 °C –13 °F/+158 °F
Switching function:	2 NC; 2 NO (Standard)
Switching principal:	4 push-button devices
Mechanical life:	1 million cycles at 600 cycles/h
Actuating radius:	R = 400 mm min.
Approach speed:	V = 0.5 m/s max.
Mounting:	4 x M5 screws
Connection cross section:	1.5 mm <sup>2</sup> flex. max.
Connection type:	cage clamp
Cable entries:	3x M 20 x 1.5
Weight:	approx. 0.3 kg
Protection class:	IP 67
Mounting position:	variable
Locking:	Power to lock or unlock
Locking force:	2 000 N max., acc. GSET-19
Isolated:	☐

# Interlocking solenoid safety switches with metal body

## SLM

Protection class IP 67



Machines, which have a "run down time" after they have been switched off, are often part of automatic production processes.

Safety devices should prevent access by the operator and must be kept locked until the dangerous movement has stopped. The safety-position switch (with suitable control) will ensure that safety guards, doors and other covers are kept closed as long as there is danger.

The safety switch has three main functions:

- Allowing the machine to operate while the guard is closed and locked
- Isolating the machine when the guard is open
- Monitoring the position of the guard and the actuator (open or closed)

With the safety switch SLM the user has a position switch with separate actuator and built in locking device, which meets the criteria of interlocking devices, according to EN 1088, the EN 292 part I and 2 are also valid since 01.01.1995 complying to the necessary machine guide-lines.

### System description

The safety switch SLM with lock is available in spring and solenoid interlocking design. The separate actuator is securely mounted to the closing guard. When the actuator is inserted into the switch the guard door position is then monitored and either locked or released (dependant on control system/status of machine).

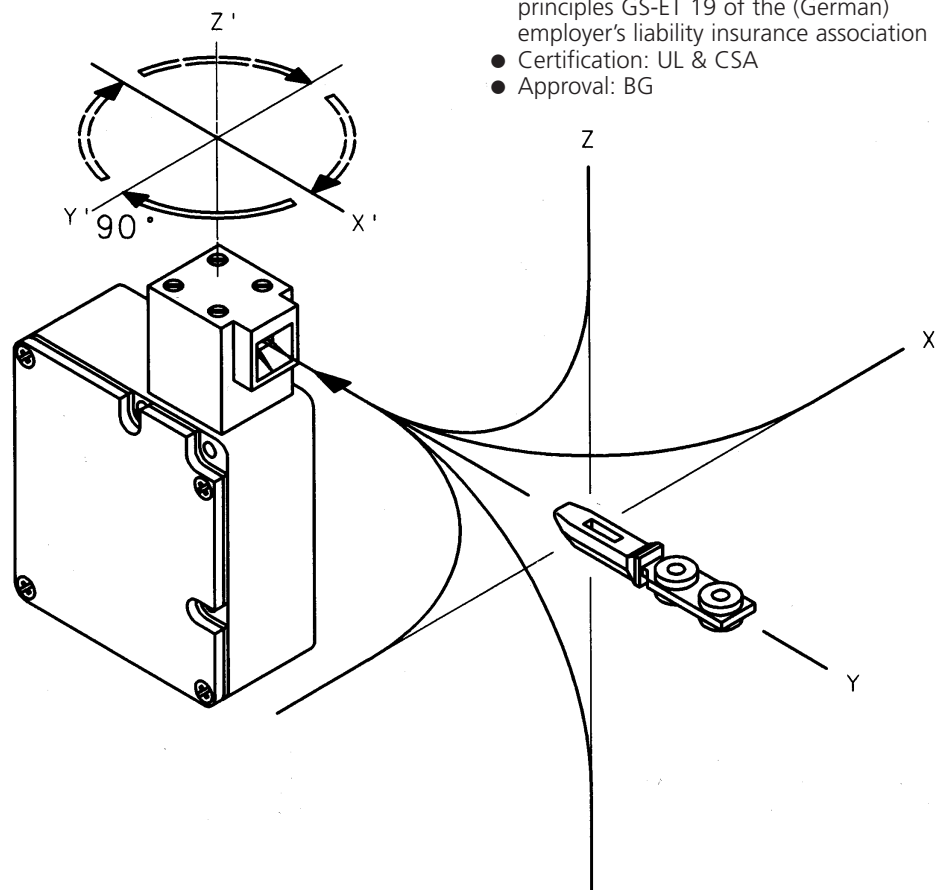
The separate actuator provides a very high level of "operator interference" protection because of its triple coding.

The locking device in the safety switch SLM is integrated into the switch housing. In the spring latch version locking is achieved with a spring mechanism, in the solenoid latch version locking is achieved by energizing an electromagnet. Both types link the actuator with a switch mechanism for position indication.



### Benefits of this system

- All elements are enclosed in one metal housing
- High resistance to heavy industrial use
- Compact housing for space saving installation
- Triple coded actuator with high interference protection
- Simple alteration of actuator approach direction in 90° positions (adjust only with actuator fitted)
- All switch functions enclosed in inner module
- Safe and easy wiring due to terminals in separate connection area.
- Individual contact configurations possible
- Integrated safety circuit protects against voltage peaks and incorrect termination
- Mounting with M 5 screws according to DIN EN 50041
- Construction design according to VDE 0660 part 200 IEC 947-5-1 control principles GS-ET 19 of the (German) employer's liability insurance association
- Certification: UL & CSA
- Approval: BG

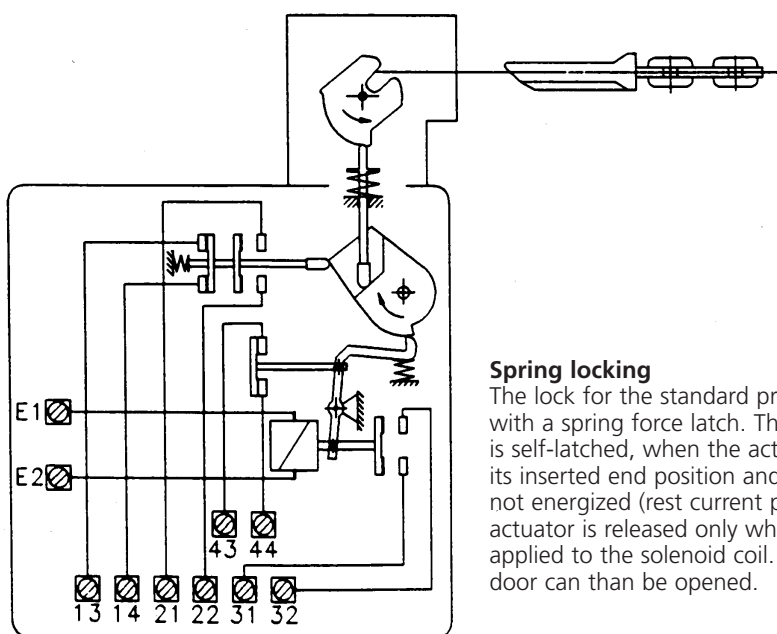


### Important note:

The actuator head position may only be changed with the actuator inserted.

### Locking systems

SLM metal-bodied safety switches with separate actuators are available with spring locking as well as solenoid locking.



#### Spring locking

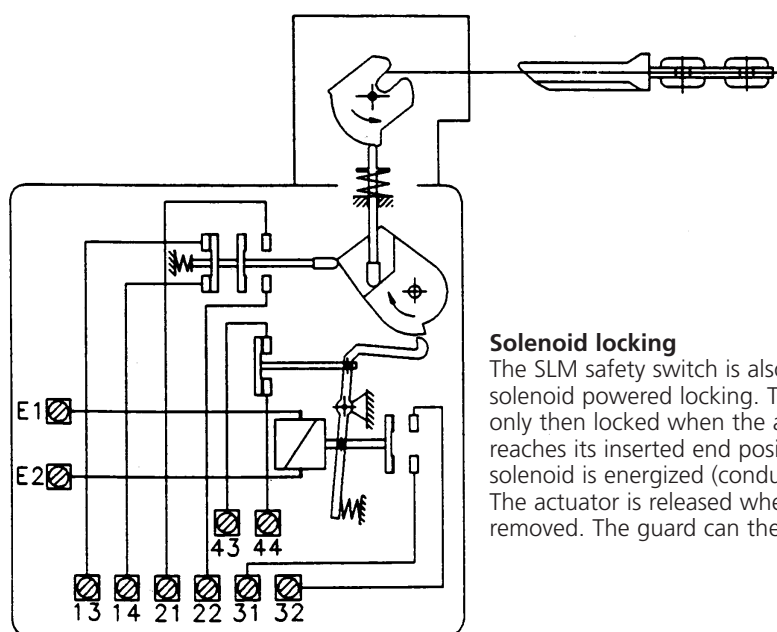
The lock for the standard product operates with a spring force latch. The safety device is self-latched, when the actuator reaches its inserted end position and the solenoid is not energized (rest current principle). The actuator is released only when current is applied to the solenoid coil. The guard door can then be opened.

### Options

- Individual contact configurations possible
- Radius actuator for actuating radius lower than 400 mm
- Auxiliary unlock
- Key override
- Emergency stop override
- Visual indication of operating status of the guard and lock
- Actuator for operating with head rotated 180° from standard
- Customised solutions

#### Important note:

Safety switch model SLM with emergency stop override must be installed **inside** the guarded (dangerous) area. The emergency stop should only be able to be activated to ensure escape from a dangerous area in case of a system error.



#### Solenoid locking

The SLM safety switch is also available with solenoid powered locking. The guard is only then locked when the actuator reaches its inserted end position and the solenoid is energized (conducting). The actuator is released when power is removed. The guard can then be opened.

## Interlocking solenoid safety switch SLM selection table: standard models

Type	Locking type		Actuator head	Operating voltage							Contact type: Actuator (guard) position			Contact type: Solenoid status			
	Spring locking	Solenoid locking		12 V DC	24 V DC	24 V AC	24 V UC	48 V AC	120 V AC	230 V AC	1NC	2NC	1NC 1NO	1NC	2NC	1NC 1NO	
SLM			VTW														
●	●	–	●	–	●	–	–	–	–	–	–	–	–	●	–	–	●
●	●	–	●	–	–	–	–	–	●	–	–	–	–	●	–	–	●
●	●	–	●	–	–	–	–	–	–	●	–	–	–	●	–	–	●
●	●	–	●	–	●	–	–	–	–	–	–	–	–	●	●	–	–
●	●	–	●	–	–	–	–	–	–	●	–	–	–	●	–	–	●
●	●	–	●	–	–	–	–	–	–	●	–	–	–	●	–	–	●
●	●	–	●	–	–	–	–	–	–	●	–	–	–	●	–	–	●
●	●	–	●	–	–	–	–	–	–	●	–	–	–	●	–	–	●
●	●	–	●	–	–	–	–	–	–	●	–	–	–	●	–	–	●
●	–	●	●	–	●	–	–	–	–	–	–	–	–	●	●	–	–
●	–	●	●	–	–	–	–	–	–	●	–	–	–	●	●	–	–

### Description/Reference

SLM	F	M	VTW	12 DC	24 DC	24 DC	24 UC	48 AC	120 AC	230 AC	1	2	5	1	2	5
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### Example for Type description: Spring lock mechanism (F)

●	●	–	●	○	○	○	○	●	○	○	○	○	○	●	○	●	○	○
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

### Example for Type description: Solenoid lock mechanism (M)

●	–	●	●	●	○	○	○	○	○	○	○	○	○	●	○	○	●	○
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- Standard functions
- Technically possible function combination
- Not available

Auxiliary unlock function				Additional functions	Additional functions	Additional functions	Additional functions	Additional functions	Designation	Part number	Page
– without	AR Auxiliary unlock	KR Key override	ER Emergency stop override								
–	●	–	–	–	–	–	–	–	SLM-FVTW 24DC-55-AR	<b>601.7119.020</b>	82
–	●	–	–	–	–	–	–	–	SLM-FVTW 120AC-55-AR	<b>601.7119.032</b>	82
–	●	–	–	–	–	–	–	–	SLM-FVTW 230AC-55-AR	<b>601.7119.022</b>	83
–	●	–	–	–	–	–	–	–	SLM-FVTW 24DC-51-AR	<b>601.7119.028</b>	83
–	●	–	–	–	–	–	–	–	SLM-FVTW 230AC-51-AR	<b>601.7119.029</b>	83
–	–	●	–	–	–	–	–	–	SLM-FVTW 230AC-55-KR	<b>601.7119.057</b>	84
–	–	–	● *)	–	–	–	–	–	SLM-FVTW 230AC-55-ER	<b>601.7119.058</b>	84
–	●	–	–	●	–	–	–	–	SLM-FVTW 120AC-55-ARL	<b>601.7119.051</b>	85
–	●	–	–	–	–	–	–	●	SLM-FVTW 230AC-55-AR180	<b>601.7119.060</b>	85
●	–	–	–	–	–	–	–	–	SLM-MVTW 24DC-55	<b>601.7119.023</b>	86
●	–	–	–	–	–	–	–	–	SLM-MVTW 120AC-55	<b>601.7119.033</b>	86
●	–	–	–	–	–	–	–	–	SLM-MVTW 230AC-55	<b>601.7119.024</b>	87
●	–	–	–	–	–	–	–	–	SLM-MVTW 24DC-51	<b>601.7119.030</b>	87
●	–	–	–	–	–	–	–	–	SLM-MVTW 230AC-51	<b>601.7119.031</b>	87
–	AR	KR	ER	L	R	S	A	180			
–	○	●	○ *)	○	○	●	○	○	SLM-FVTW 48AC-21-KRS	<b>on request</b>	
●	–	–	○ *)	○	●	○	○	○	SLM-MVTW 12DC-22-R	<b>on request</b>	

\*) Important note: Safety switch model SLM with emergency stop override must be installed **inside** the guarded (dangerous) area. The emergency stop should only be able to be activated to ensure escape from a dangerous area in case of a system error.

# Interlocking solenoid safety switch – spring force version –

## SLM

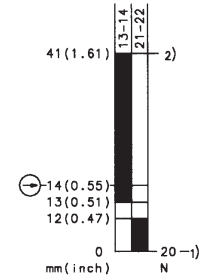
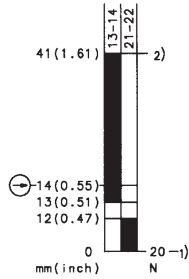
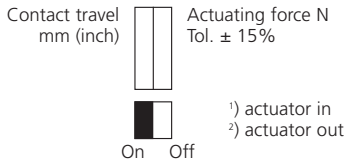
Protection class IP 67



Designation	SLM-FVTW 24DC-55-AR	SLM-FVTW 120AC-55-AR
<b>Part number</b>	<b>601.7119.020</b>	<b>601.7119.032</b>
Circuit diagram		
⊕ Forced disconnect to IEC 947-5-1 chapter 3		
Za: not galvanically separated contacts		
Zb: galvanically separated contacts		
Slow make & break/snap-action		
Internal seal (iw)/external seal (w)		

⊕ Zb	●/-	1000 N
⊕ Zb	●/-	1000 N

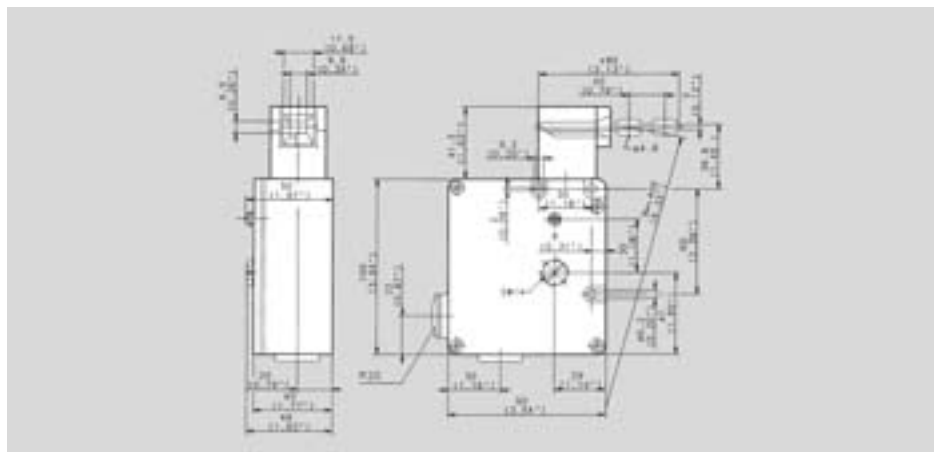
⊕ Zb	●/-	1000 N
⊕ Zb	●/-	1000 N



Voltage	max.	250 V
Permanent current	max.	10 A
In-rush current complies with standards IEC 947-5-1 AC 15/DC 13		
Mechanical life – number of switching actions		1 x 10 <sup>6</sup>
Operating temperature	min./max.	-30 °C/+60 °C -22 °F/+140 °F
Approvals		BG, UL, CSA
Weight		0.81 kg/1.79 lb
Delivery: ex-stock/built to order		●/-

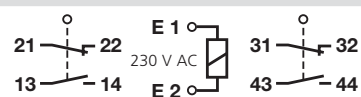
Voltage	max.	250 V
Permanent current	max.	10 A
In-rush current complies with standards IEC 947-5-1 AC 15/DC 13		
Mechanical life – number of switching actions		1 x 10 <sup>6</sup>
Operating temperature	min./max.	-30 °C/+60 °C -22 °F/+140 °F
Approvals		BG, UL, CSA
Weight		0.81 kg/1.79 lb
Delivery: ex-stock/built to order		●/-

All dimensions in mm (inch)



SLM-FVTW 230AC-55-AR

601.7119.022



⊖ Zb

⊖ Zb

●/-

●/-

1000 N

SLM-FVTW 24DC-51-AR

601.7119.028



⊖ Zb

⊖ Zb

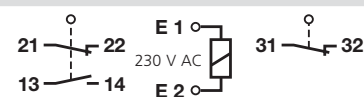
●/-

●/-

1000 N

SLM-FVTW 230AC-51-AR

601.7119.029



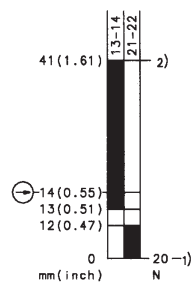
⊖ Zb

⊖ Zb

●/-

●/-

1000 N



250 V

10 A

●

1 x 10<sup>6</sup>

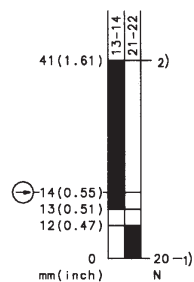
-30 °C/+60 °C

-22 °F/+140 °F

BG, UL, CSA

0.81 kg/1.79 lb

●/-



250 V

10 A

●

1 x 10<sup>6</sup>

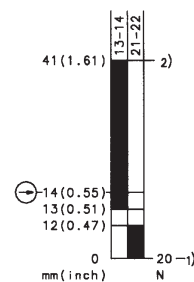
-30 °C/+60 °C

-22 °F/+140 °F

BG, UL, CSA

0.81 kg/1.79 lb

-/●



250 V

10 A

●

1 x 10<sup>6</sup>

-30 °C/+60 °C

-22 °F/+140 °F

BG, UL, CSA

0.81 kg/1.79 lb

-/●

# Interlocking solenoid safety switch – spring force version –

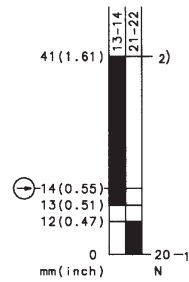
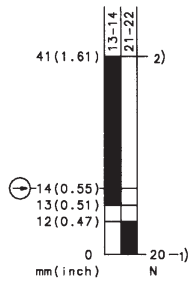
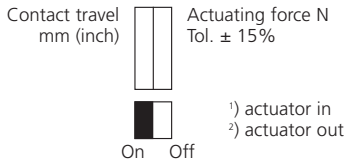
## SLM

Protection class IP 67



Designation	SLM-FVTW 230AC-55-KR
<b>Part number</b>	<b>601.7119.057</b>
Circuit diagram	
⊕ Forced disconnect to IEC 947-5-1 chapter 3	
Za: not galvanically separated contacts	
Zb: galvanically separated contacts	
Slow make & break/snap-action	
Internal seal (iw)/external seal (w)	

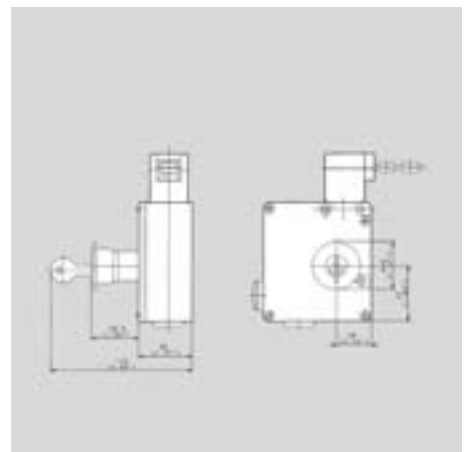
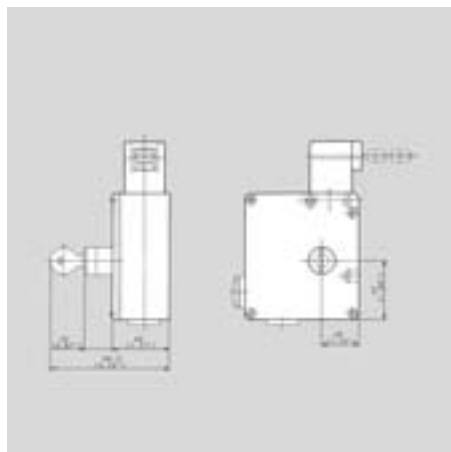
Designation	SLM-FVTW 230AC-55-ER
<b>Part number</b>	<b>601.7119.058</b>
Circuit diagram	
⊕ Zb	⊕ Zb
●/-	●/-
1000 N	1000 N



Voltage	max.	250 V
Permanent current	max.	10 A
In-rush current complies with standards IEC 947-5-1 AC 15/DC 13		
Mechanical life – number of switching actions		1 x 10 <sup>6</sup>
Operating temperature	min./max.	-30 °C/+60 °C -22 °F/+140 °F
Approvals		BG, UL, CSA
Weight		0.88 kg/1.49 lb
Delivery: ex-stock/built to order		●/-

Voltage	max.	250 V
Permanent current	max.	10 A
In-rush current complies with standards IEC 947-5-1 AC 15/DC 13		
Mechanical life – number of switching actions		1 x 10 <sup>6</sup>
Operating temperature	min./max.	-30 °C/+60 °C -22 °F/+140 °F
Approvals		BG, UL, CSA
Weight		0.94 kg/2.08 lb
Delivery: ex-stock/built to order		●/-

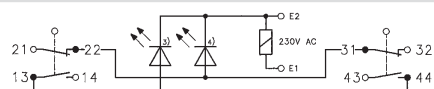
All dimensions in mm (inch)





SLM-FVTW 120AC-55-ARL

601.7119.051



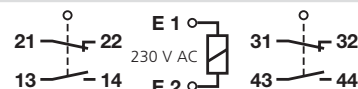
⊖ Zb                      ⊖ Zb

●/-                        ●/-

1000 N

SLM-FVTW 230AC-55-AR180

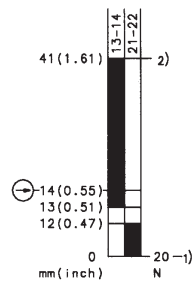
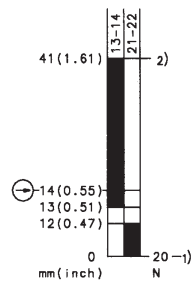
601.7119.060



⊖ Zb                      ⊖ Zb

●/-                        ●/-

1000 N



250 V

10 A

●

1 x 10<sup>6</sup>

-30 °C/+60 °C

-22 °F/+140 °F

250 V

10 A

●

1 x 10<sup>6</sup>

-30 °C/+60 °C

-22 °F/+140 °F

BG, UL, CSA

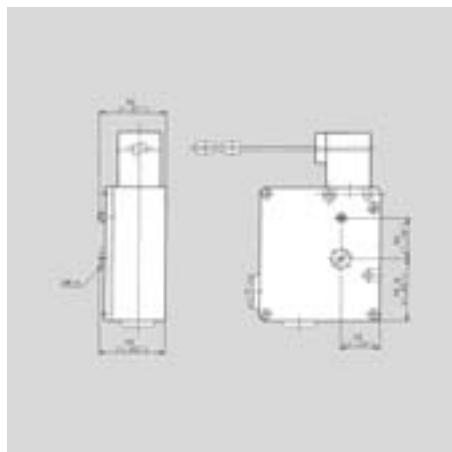
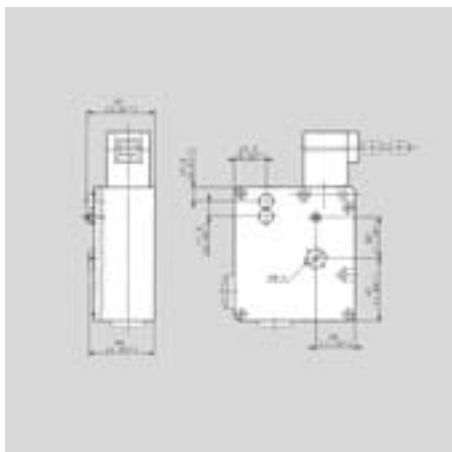
0.83 kg/1.83 lb

●/-

BG, UL, CSA

0.83 kg/1.83 lb

●/-



# Metal bodied safety switches with separate actuator and solenoid latch interlocking

## SLM

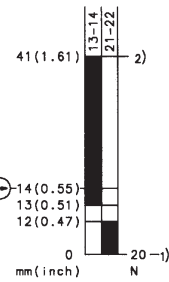
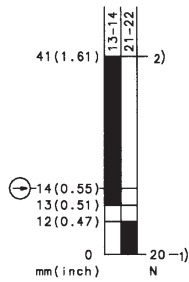
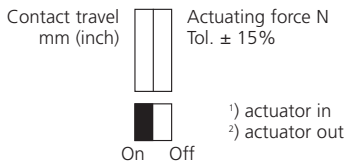
Protection IP 67



Reference type
<b>Part number</b>
Circuit diagram
⊕ Forced disconnect to IEC 947-5-1 chapter 3
Za: not galvanically separated contacts
Zb: galvanically separated contacts
Slow make & break/snap-action
Internal seal (iw)/external seal (w)

SLM-MVTW 24DC-55
<b>601.7119.023</b>
⊕ Zb
●/-
1000 N

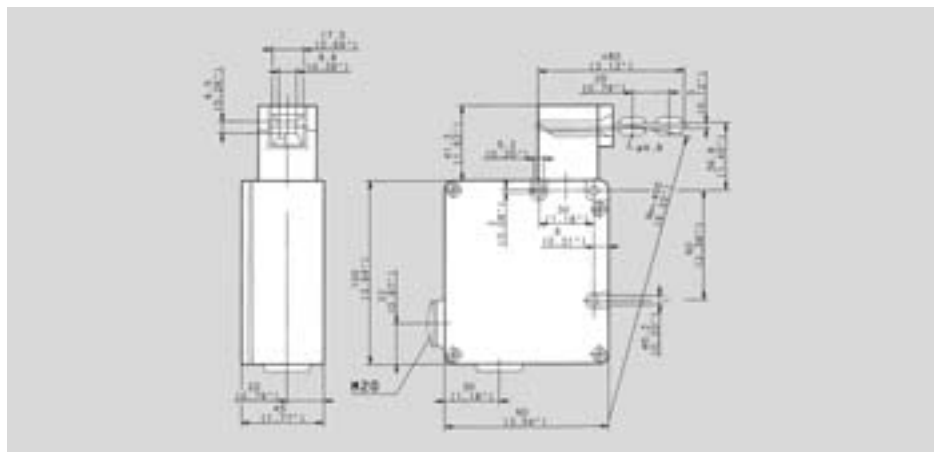
SLM-MVTW 120AC-55
<b>601.7119.033</b>
⊕ Zb
●/-
1000 N



Voltage	max.
Permanent current	max.
In-rush current complies with standards	
IEC 947-5-1 AC 15/DC 13	
Mechanical life – number of switching actions	
Operating temperature	min./max.
Approvals	
Weight	
Stock status: Ex stock/Built to order	

250 V	250 V
10 A	10 A
●	●
1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>
-30 °C/+60 °C	-30 °C/+60 °C
-22 °F/+140 °F	-22 °F/+140 °F
UL, CSA	UL, CSA
BG	BG
0.81 kg/1.79 lb	0.81 kg/1.79 lb
●/-	●/-

All dimensions in mm (inch)



SLM-MVTW 230AC-55

601.7119.024



⊖ Zb

⊖ Zb

●/-

●/-

1000 N

SLM-MVTW 24DC-51

601.7119.030



⊖ Zb

⊖ Zb

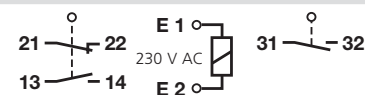
●/-

●/-

1000 N

SLM-MVTW 230AC-51

601.7119.031



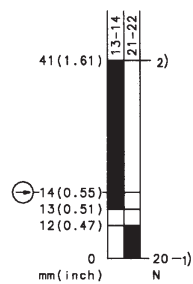
⊖ Zb

⊖ Zb

●/-

●/-

1000 N



250 V

10 A

●

1 x 10<sup>6</sup>

-30 °C/+60 °C

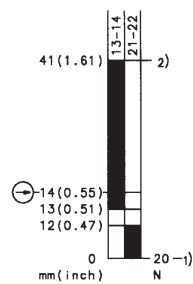
-22 °F/+140 °F

UL, CSA

BG

0.81 kg/1.79 lb

●/-



250 V

10 A

●

1 x 10<sup>6</sup>

-30 °C/+60 °C

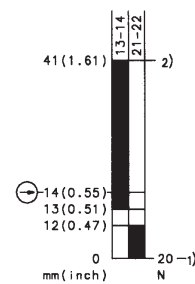
-22 °F/+140 °F

UL, CSA

BG

0.81 kg/1.79 lb

●/-



250 V

10 A

●

1 x 10<sup>6</sup>

-30 °C/+60 °C

-22 °F/+140 °F

UL, CSA

BG

0.81 kg/1.79 lb

-/●