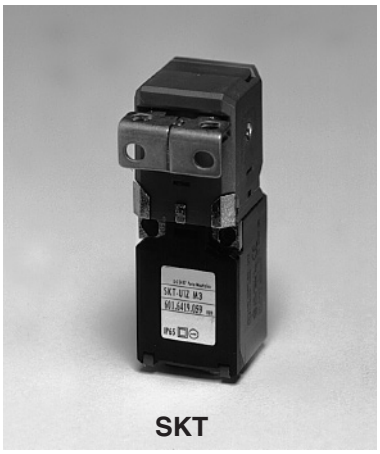
SAFELOCK

SKT and SKI Safety Interlock Switches with Separate Actuator


SKT


SKI

The SKT and SKI safety interlock switches slim compact design according to EN50047 are perfect for safety applications that require a particularly slim and compact switching device while still offering the same advantages, relating to safety, as all other products in this range. The principal function of the SKT and SKI safety interlock switches is to switch the machine drive off when a movable protective guard is opened or removed.

Common Features:

- Limit Switch Design (EN 50047)
- ⧈ Insulated device (IEC 60947-5-1) on all models with plastic housing
- ⊖ Positive Opening safety contacts (IEC 60947-5-1)
- Rotating head allows actuator engagement from four sides or four top positions; no tools are required to rotate head

Model	Part Number	Contacts	Voltage (Max.)	Current (Max.)
SKT-U1Z M3	601-6419-059	1 NO/1 NC (U1Z)	250 VAC	10A
SKT-SU1Z M3	601-6409-060	1 NO/1 NC (SU1Z)	250 VAC	10A
SKT-A2Z M3	601-6469-066	2 NC (A2Z)	250 VAC	10A
SKT-SA2Z M3	601-6469-067	2 NC (SA2Z)	250 VAC	10A
SKI-U1Z M3	601-6819-052	1 NO/1 NC (U1Z)	250 VAC	10A
SKI-SU1Z M3	601-6809-057	1 NO/1 NC (SU1Z)	250 VAC	10A
SKI-A2Z M3	601-6869-056	2 NC (A2Z)	250 VAC	10A
SKI-UV15Z M3	601-6869-058	2 NC/1 NO (UV15Z)	400 VAC	6A

Model Identification

Body Style

SKT = 3.27" tall
SKI = 3.94" tall

Contact Block

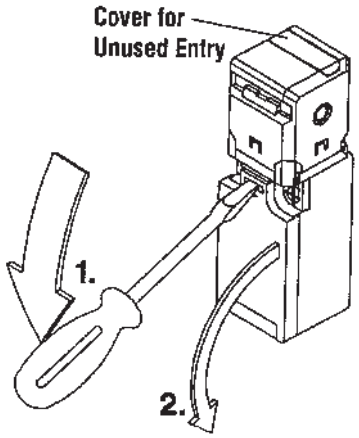
U1Z = 1 NC/1 NO Slow Action
SU1Z = 1 NC/1 NO Snap Action
A2Z = 2 NC Slow Action
SA2Z = 2 NC Snap Action
UV15Z = 2 NC/1 NO Slow Action Make before Break
Z = Forced Disconnect per IEC 60947-5-1

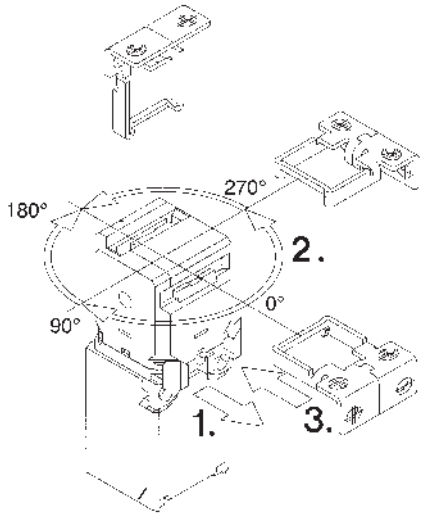
Actuator Style

M3 = Stainless Steel Actuator
For other styles contact factory

Other Specifications	
Max Switching Speed	30 operations per minute
Max Actuator Speed	1 meter per second
Minimum Actuator Radius	150 mm (6 inches)
Contact Material	Silver-nickel alloy
Actuator Extraction Force	12 Newtons (2.6 lbs.)
Mechanical Life	1 million operations
Operating Temperature	–30° to +80°C (–22° to +176°F)
Construction	Glass fiber-reinforced polyamide thermoplastic housing UL94-VO rating
Environmental Rating	NEMA 4/IP65
Certifications	CE CSA UL BG
Weight	SLT = .26 lb. SLI = .29 lb.

SKT and SKI Operational Features





Features

Easy Access

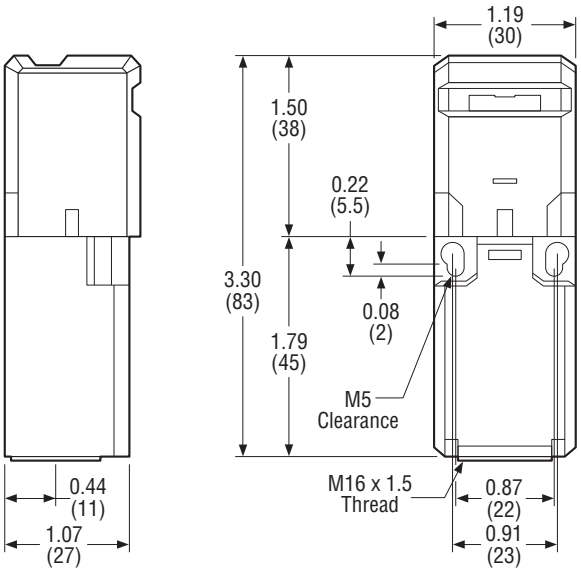
The wiring chamber is accessed via a hinged door. Simply insert a flat-blade screwdriver, as shown, and pry gently down to open.

Rotating Actuator Head

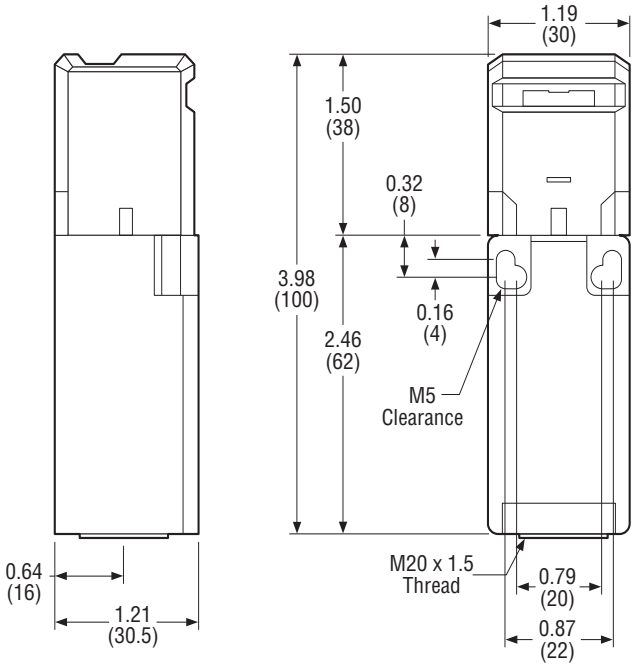
The actuator head may be rotated in 90° increments to create eight possible actuator engagement locations. To rotate the head, pull the holding clamp forward, rotate the head to the desired position, and push the holding clamp back into lock.

SKT Dimensions

inches (mm)



SKI Dimensions



SAFELOCK

SK and SKC Safety Interlock Position Switches with Separate Actuator

Description

The SK and SKC safety position switches offer outstanding performance in personal protective functions.

Constructional safety features of these models have been implemented according to DIN EN 60947-5-1 and test principle GS-ET 15.

The principle function of the SK and SKC safety position switches is to switch the machine drive off when a movable protective guard is opened or removed.

The SKC series is ideal for space limited applications since its overall length is just 2.85 inches (75 mm). A standard SK switch is 3.55 inches (90 mm) long.

Common Features

Safety Category:	4
Protection Class:	NEMA 4
Mechanical Life:	1 x 10^6 Cycles
Temperature:	-22°F to +176°F
Switch Rate:	30 per minute max.
Actuator Holding Force:	2.3 lbs. [10 N] other options available
Enclosure:	PA 6 Thermoplastic (UL 94-V0)
Approvals:	UL, CSA, and BG approved

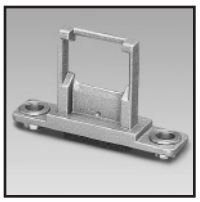
Model	Part Number	Contacts	Voltage (max.)	Current (max.)	Actuator Style	Drawing
SKC-A1Z M	601-6169-039	1 N.C.	500 VAC	10 A	M	A
SK-U1Z M	601-6119-016	1 N.C., 1 N.O.	500 VAC	10 A	M	B
SK-U1Z MRH	601-6119-041	1 N.C., 1 N.O.	500 VAC	10 A	MRH	B
SK-U1Z MRV	601-6119-040	1 N.C., 1 N.O.	500 VAC	10 A	MRV	B
SK-UV15Z M	601-6169-026	2 N.C., 1 N.O.	400 VAC	6 A	M	B
SK-UV15Z MRH	601-6169-064	2 N.C., 1 N.O.	400 VAC	6 A	MRH	B
SK-UV15Z MRV	601-6169-065	2 N.C., 1 N.O.	400 VAC	6 A	MRV	B
SK-UV15Z F	601-6169-063	2 N.C., 1 N.O.	400 VAC	6 A	F	B

Model Identification

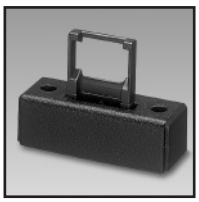
Body Style	Contact Block	Actuator Style
SK	U1Z	M

A1Z = 1 N.C., Forced Disconnect
U1Z = 1 N.C., 1 N.O., Forced Disconnect
UV15Z = 2 N.C., 1 N.O., Forced Disconnect Make Before Break

Normally Closed Contacts ⊖ Forced Disconnect per IEN EN 947-5-1 Ch. 3



Type M Metal Actuator
Cast Stainless Steel



Type F Flexible Actuator
Tolerates Misalignment of Guard Door

Type MRH Horizontal Short Radius Actuator
Hinge Distance 2" [50 mm] Or More

Type MRV Vertical Short Radius Actuator
Hinge Distance 2" [50 mm] Or More

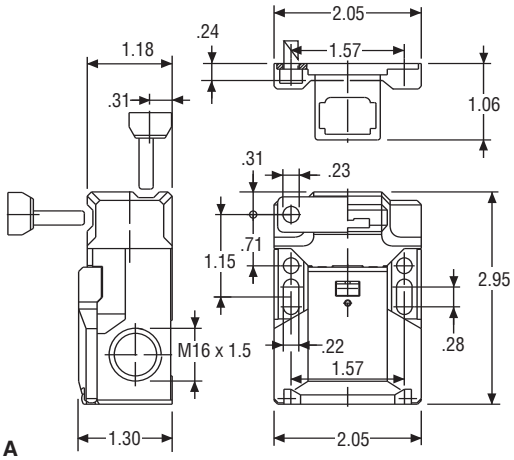
Non-Standard Options

F30: Actuator holding force of 7 lbs. [30 N]
F100: Actuator holding force of 23 lbs. [100 N]
FE10: Actuator not retained

Other contact arrangements are also available. Consult the factory for details.

Model SKC

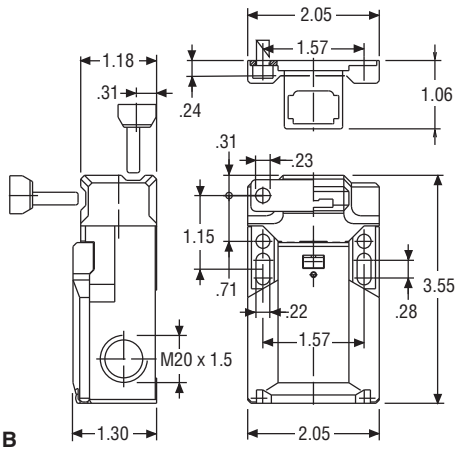
(Dimensions are in inches)



A

Model SK

(Dimensions are in inches)



B

SK and SKC Operational Features

Easy Access

The self retained snap on cover is released by a screw driver (Fig. 1) and can be opened to an angle of 135˚ providing easy access to the wiring terminals (Fig. 2).

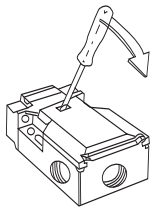


Fig. 1

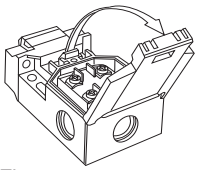
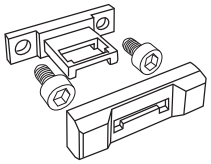


Fig. 2

Removal Protection

A cover cap with one-way latching to seal the assembly screws prevents unauthorized removal of the actuator.



Multi Directional Actuation

After opening the switch cover, the head can be removed from the top (Fig. A). After a rotation of 180˚ (Fig B) the head can be attached again on the enclosure and locked by the switch cover. This results in four directions of approach.

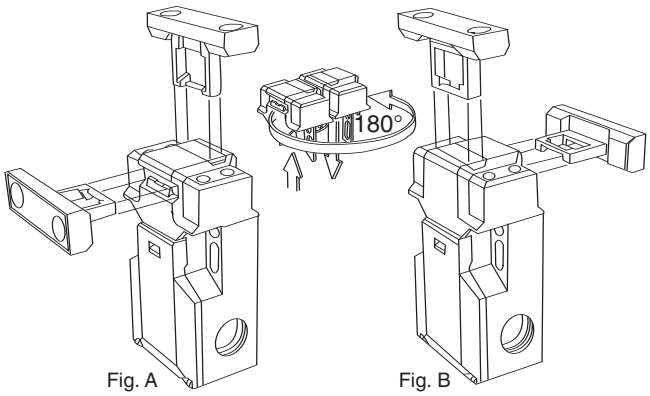


Fig. A

Fig. B

- Triple coding of the actuator for a high level of safety
- Increased functional safety through two interlocks operating independently
- Actuator mates with switch in one of four positions
- Actuator has smooth surface with no protruding sharp parts
- Forced disconnection of the N.C. contacts
- Three cable entries
- Conduit adapter provided (1/2 NPT) Cord grip available upon request
- Manufactured to DIN EN 60947-5-1, IEC 947-5-1, and test principle GS-ET 15

GC Safety Interlock Position Switch with Separate Actuator

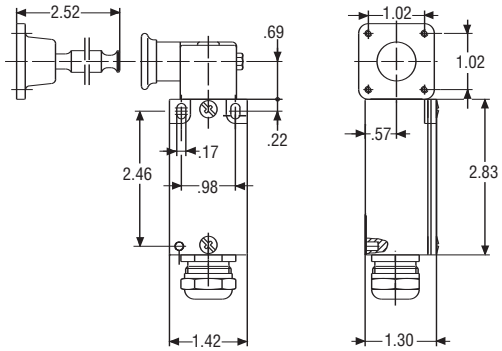
Description

The GC Style Interlock Position Switch is a unique type of switch because of its “Pole” type actuator that fits more like a plug than the other interlock switches. The head offers a flexible spring type adjustment, making it very flexible in operation.

- Rugged, heavy duty metal housing
- Positive forced disconnection of the N.C. contacts
- Contacts galvanically isolated
- Cord grip provided
- UL, CSA, and SUVA Approved

GC

(Dimensions are in inches)



Model:	**GC-U1Z VT 90˚**
Part Number:	**612-1100-555**
Enclosure:	Die Cast Aluminum
Contacts:	1 Normally Closed ⊖ Forced Disconnect per IEC 947-5-1 Ch. 3 1 Normally Open
Voltage Rating:	500 VAC (max.)
Current Rating:	10 A (max.)
Protection Class:	NEMA 4
Mechanical Life:	25 x 10^3 Cycles
Temperature:	-22°F to +176°F
Switch Rate:	10 per minute max.

SAFELOCK
Integral Safety Hinge Switch

IP 67 Metal housing

Hinged machinery guards and covers as well as safety fence doors may be found in every type of industry.

The safety hinge switch SHS is the integration of a safety switch and load bearing hinge for industrial applications.

Designed to facilitate mounting onto extruded aluminum profiles, steel or plastic doors, the slim profile of the SHS even when fully closed, allows the hinge to be readily mounted where space is constrained.

Traditional safety switches with separate actuator keys are often subject to mechanical wear, particularly when mounted on the closing edge of guards where accumulated tolerances can cause misalignment. The SHS removes this problem with the safety contact mounted internally, inaccessible to the user and therefore providing excellent tamper protection. One or more switches may be used dependent on the category of safety protection required. Matching hinges without safety contacts are also available, allowing the style to be standardized for general use. In operation, consideration must be given to the required contact operation angle, which is determined by guard size and the maximum allowable guard opening distance before actuation.

Safe:
- 2 SHS hinge switches each with a forced disconnect safety contact allow safety category 4 systems to be configured subject to the required risk analysis and safety contact monitoring.

Flexible:
- The hinge operation angle is 0-180°.
- The switch point may similarly be selected through 180°.
- AC/DC to 250 V or 60 VDC versions available.

Fast:
- Industry standard M12 x 1 connectors with axial and radial (rear) mounting available as well as fixed cable version.

Reliable:
- A cast Zinc alloy body allows the SHS a high degree of mounting freedom.
- In its hinge capacity the SHS can bear up to 750 N axially and over 1000 N radially, when the switching point has been set.
- Ingress protection to IP 67

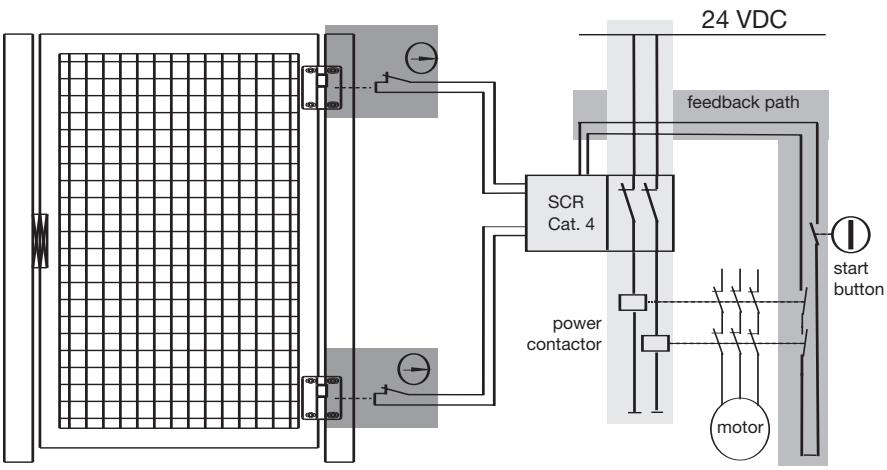
SHS Configuration Summary

Part No.	Description	Contact Function	Type DC	Type AC/DC	Quick Disconnect axial (SA)	Fixed Cable radial (SR)	Fixed Cable axial (KA)	Fixed Cable radial (KR)	BG-Type Approval
601-9261-009	SHS-A1Z-SA	A1Z	—	X	Metal	—	—	—	—
601-9261-010	SHS-A1Z-SR	A1Z	X	—	—	Plastic	—	—	—
601-9261-011	SHS-A1Z-KA5	A1Z	—	X	—	—	X	—	**BG**
601-9261-014	SHS-A1Z-KR5	A1Z	—	X	—	—	—	X	**BG**
601-9261-015	SHS-A1Z-SA	A1Z	X	—	Metal	—	—	—	—
601-9261-016	SHS-A1Z-SR	A1Z	—	X	—	Metal	—	—	—
601-9261-017	SHS-A1Z-SA-BG	A1Z	—	X	Metal	—	—	—	**BG**
601-9261-018	SHS-A1Z-SR-BG	A1Z	—	X	—	Metal	—	—	**BG**
601-9291-013	SHS-OZ	Hinge without safety contact	—	—	—	—	—	—	—

True Category 4
(EN 954-1/2)

- true electrical redundancy
- true mechanical redundant safety
- avoids mechanical common mode failure

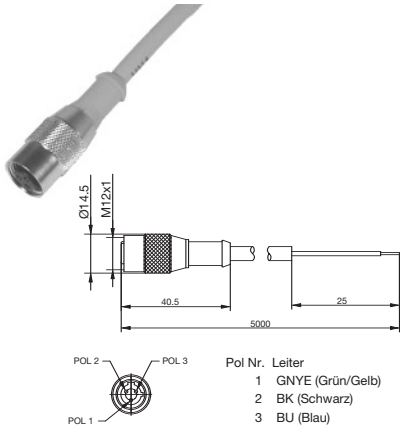
Installation example:



Plug M 12 x 1with molded cable

Terminal code,
AC/DC configuration
1 = green-yellow
2 = black
3 = blue

AC/DC Configuration

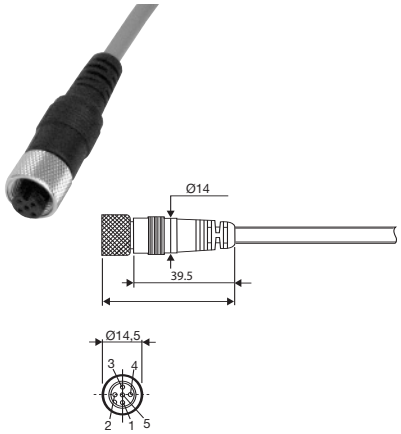


Straight line	Right-angle
on request	**on request**
AN-KAB.SHS **5M** AC	AN-KAB.SHS **5M**
325-1103-234	**325-1103-236**
—	—

Material of cable sleeve:	PVC (UL)/PVC (UL)
Material body/Contact carrier:	PUR (UL)/PUR (UL)
Rated voltage max.:	300 VAC
Current carrying capacity max.:	3 A
Temperature range min./max.:	-25 °C/+70 °C
	-13 °F/+158 °F
Cable structure mm²:	3 x 0.5
Protection class after installation:	IP 67

Terminal code,
DC configuration
1 = brown
2 = -
3 = blue
4 = black

DC Configuration

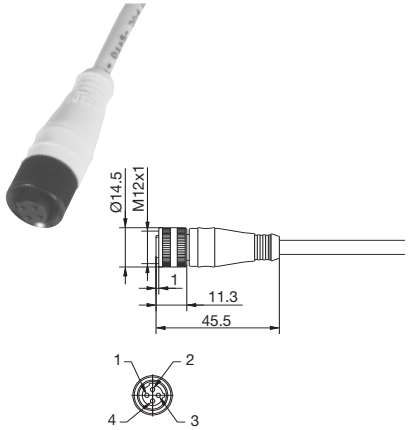


Straight line	Right-angle
AN-KAB.SHS **2M** DC	AN-KAB.SHS **2M** DC
325-1003-221	**325-1003-224**
AN-KAB.SHS **5M** DC	AN-KAB.SHS **5M** DC
325-1003-222	**325-1003-225**
AN-KAB.SHS **10M** DC	AN-KAB.SHS **10M** DC
325-1003-223	**325-1003-226**

Material of cable sleeve:	PVC/PVC
Material body/Contact carrier:	PUR/PUR
Rated voltage max.:	60 VAC/75 VDC
Current carrying capacity max.:	1.5 A
Temperature range min./max.:	-25 °C/+70 °C
	-13 °F/+158 °F
Cable structure mm²:	3 x 0.34
Protection class after installation:	IP 67

Terminal code,
AC/DC configuration
1 = brown
2 = black
3 = blue
4 = green-yellow

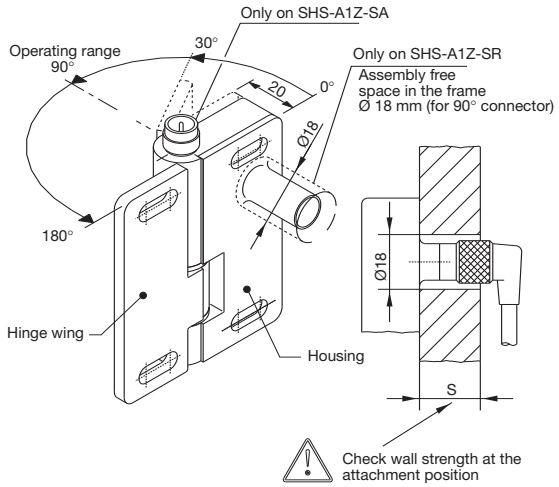
AC/DC Configuration



Straight line	Right-angle
—	—
AN-KAB.SHS **5M** AC	AN-KAB.SHS **5M** AC
325-1004-219	**325-1004-220**
—	—

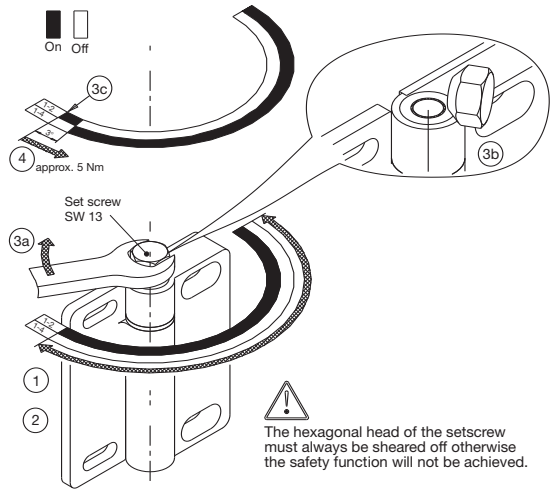
Material of cable sleeve:	PVC/PVC
Material body/Contact carrier:	PUR/Nylon 6.6
Rated voltage max.:	300 VAC
Current carrying capacity max.:	4.0 A
Temperature range min./max.:	-5 °C/+70 °C
	+23 °F/+158 °F
Cable structure mm²:	4 x 0.34
Protection class after installation:	IP 68

Safety Hinge Switch Operation and Set Point Programming



For proper installation the procedure below must be followed.

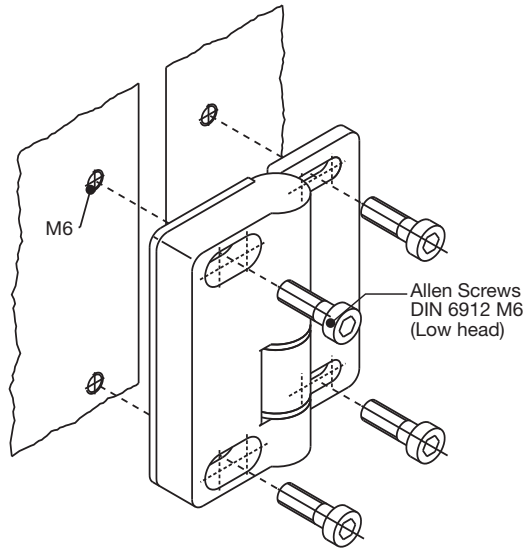
a) SHS without switching point set shall be mounted under no load condition on the guard.
b) SHS switching point shall be set in one successive procedure.
c) The guard shall be moved only after properly setting the switch point.
d) Finally, the set SHS shall be completely fixed on the guard.



1. The guard door must turn freely through the total operating range.
2. Fix the guard door in the closed position.

3.a Tighten the setscrew with a box spanner (SW13/max. 20 mm) until resistance is met.
3.b Continue until the setscrew shears. (Md = 25Nm)
3.c The set point for the switching angle is now fixed.

4. An increased actuation force (torque approx. 5 Nm) is required during the first use of the guard.

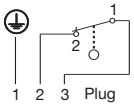
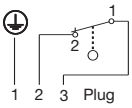


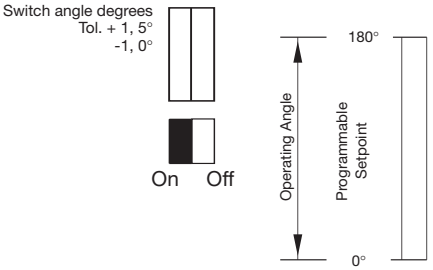
Operating angle

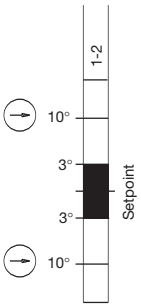
0° - 30° = Allen Screw DIN 6912 necessary without washer in the hinge wing

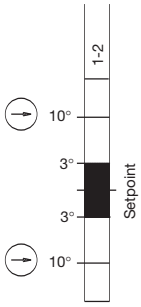
30° - 180° = Allen Screw DIN 912 permissible washer DIN 125 in the hinge wing

SAFELOCK
SHS Hinge Switches

Designation	SHS-A1Z-SA-BG	SHS-A1Z-SR-BG
Part number	**601-9261-017**	**601-9261-018**
Contact diagram		
Forced disconnect to IEC 947-5-1 annex k	1 2 3 Plug	1 2 3 Plug
Za: non-galv. separated contact	⊖ C	⊖ C
Zb: galv. separated contact	•/–	•/–
Slow make and break/snap action	iw	iw
Sealed internally (iw)/ externally (w)		



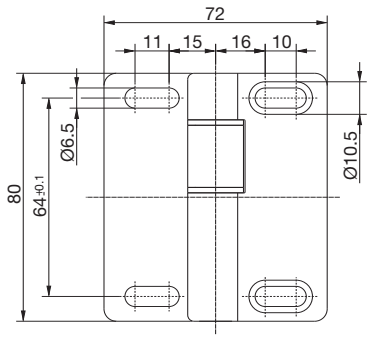


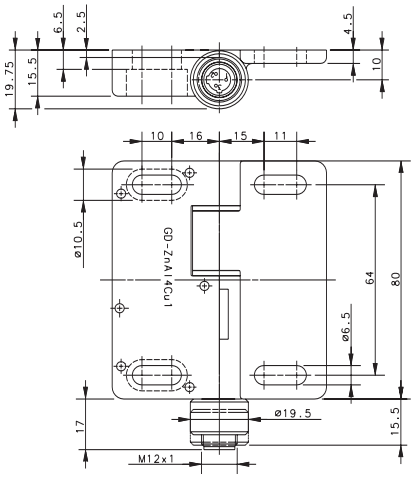


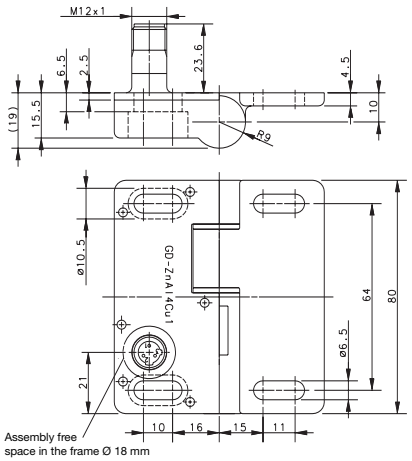
Switching hysterisis: -1.0°

Voltage	max.	250 VAC	250 VAC
Thermal current	max.	3A	3A
Utilization category per IEC 947-5-1 AC 15/DC 13		60 V / 0.5 A	60 V / 0.5 A
		230 VAC / 1.5 A	230 VAC / 1.5 A
Switching frequency	max.	1200 / h	1200 / h
Mechanical life - switching operations		1 x 10^6	1 x 10^6
Operating temperature	min./max.	–25 °C / +70 °C	–25 °C / +70 °C
		–13 °F / +158 °F	–13 °F / +158 °F
Approvals		BG, UL and CSA	BG, UL and CSA
Weight		0.4 kg	0.4 kg
Delivery: ex-stock/built to order		•/–	•/–

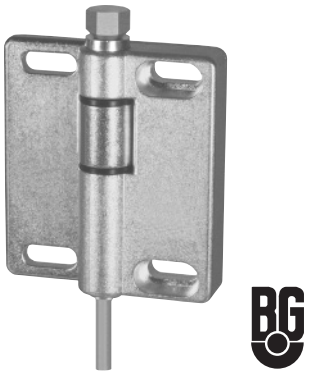
(All dimensions in mm)

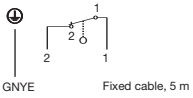
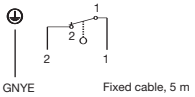


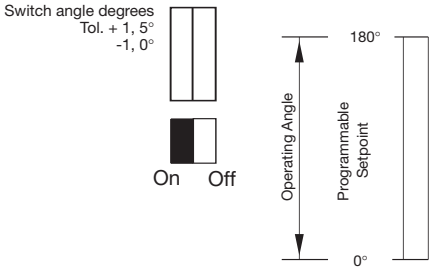


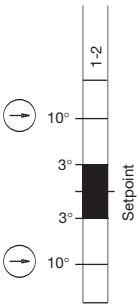


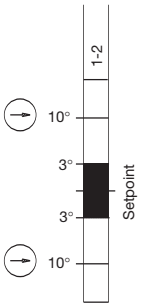
SAFELOCK
SHS Hinge Switches



Designation	SHS-A1Z-KA-5	SHS-A1Z-KR-5
Part number	**601-9261-011**	**601-9261-014**
Contact diagram		
Forced disconnect to IEC 947-5-1 annex k		
Za: non-galv. separated contact		
Zb: galv. separated contact	⊖ C	⊖ C
Slow make and break/snap action	•/–	•/–
Sealed internally (iw)/ externally (w)	iw	iw



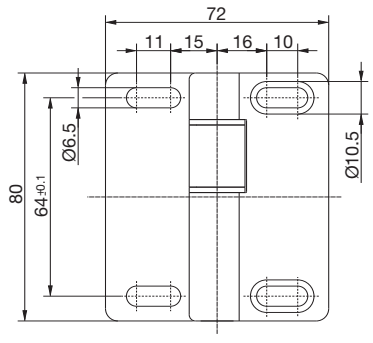


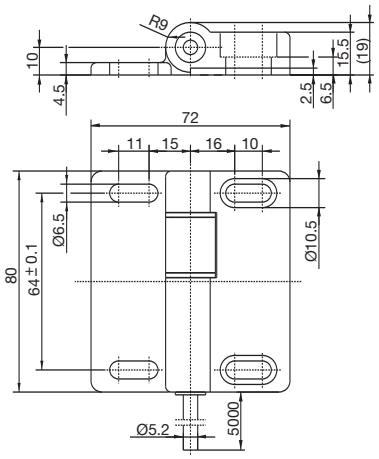


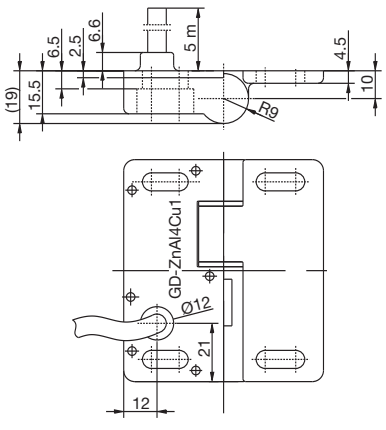
Switching hysterisis: -1.0°

Voltage	max.	250 VAC	250 VAC
Thermal current	max.	3A	3A
Utilization category per IEC 947-5-1 AC 15/DC 13		60 V/0.5 A	60 V/0.5 A
		230 VAC/1.5 A	230 VAC/1.5 A
Switching frequency	max.	1200/h	1200/h
Mechanical life - switching operations		1 x 10^6	1 x 10^6
Operating temperature	min./max.	–25 °C/+70 °C	–25 °C/+70 °C
		–13 °F/+158 °F	–13 °F/+158 °F
Approvals		BG, UL and CSA	BG, UL and CSA
Weight		0.4 kg	0.4 kg
Delivery: ex-stock/built to order		•/–	•/–

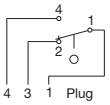
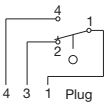
(All dimensions in mm)

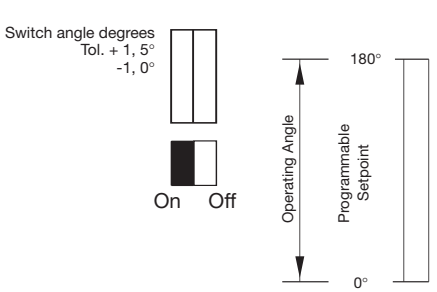


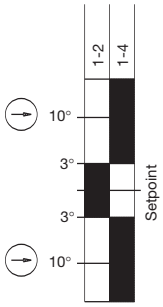


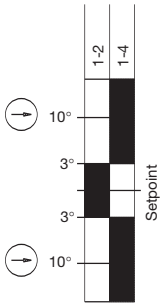


SAFELOCK
SHS Hinge Switches

Designation	SHS-A1Z-SA	SHS-A1Z-SR
Part number	**601-9261-015**	**601-9261-010**
Contact diagram		
Forced disconnect to IEC 947-5-1 annex k		
Za: non-galv. separated contact	⊖ C	⊖ C
Zb: galv. separated contact	•/–	•/–
Slow make and break/snap action	iw	iw
Sealed internally (iw)/ externally (w)		



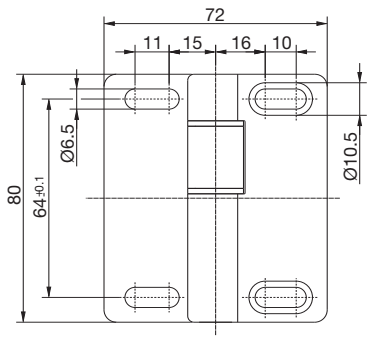


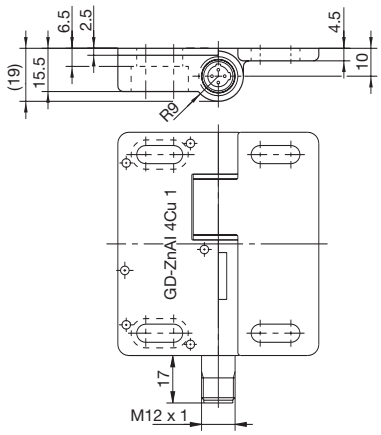


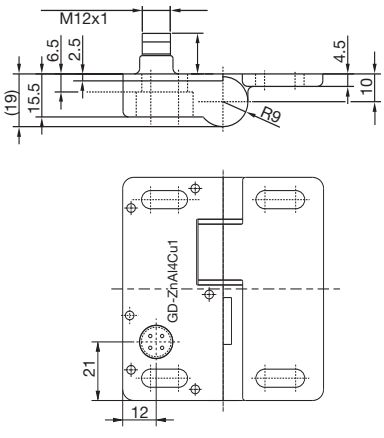
Switching hysterisis: -1.0°

Voltage	max.	250 VAC	250 VAC
Thermal current	max.	3A	3A
Utilization category per IEC 947-5-1 AC 15/DC 13		60 V / 0.5 A	60 V / 0.5 A
		—	—
Switching frequency	max.	1200 / h	1200 / h
Mechanical life - switching operations		1 x 10^6	1 x 10^6
Operating temperature	min./max.	–25 °C / +70 °C	–25 °C / +70 °C
		–13 °F / +158 °F	–13 °F / +158 °F
Approvals		UL and CSA	UL and CSA
Weight		0.4 kg	0.4 kg
Delivery: ex-stock/built to order		•/–	•/–

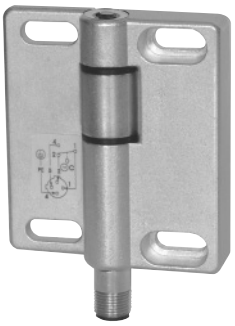
(All dimensions in mm)

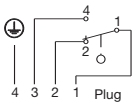
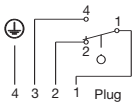


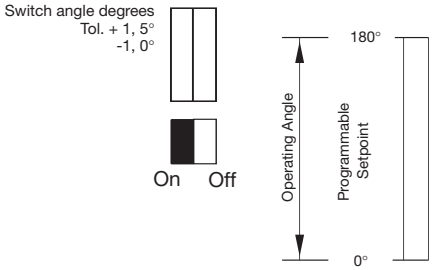


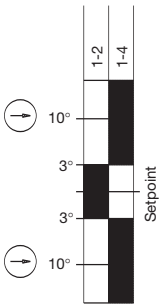


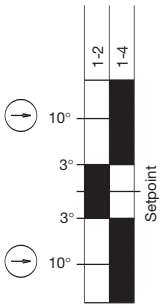
SAFELOCK
SHS Hinge Switches



Designation	SHS-A1Z-SA	SHS-A1Z-SR
Part number	**601-9261-009**	**601-9261-016**
Contact diagram		
Forced disconnect to IEC 947-5-1 annex k		
Za: non-galv. separated contact	⊖ C	⊖ C
Zb: galv. separated contact	•/–	•/–
Slow make and break/snap action	iw	iw
Sealed internally (iw)/ externally (w)		



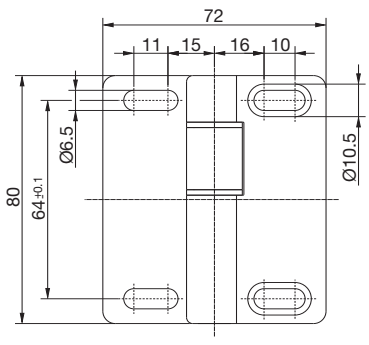


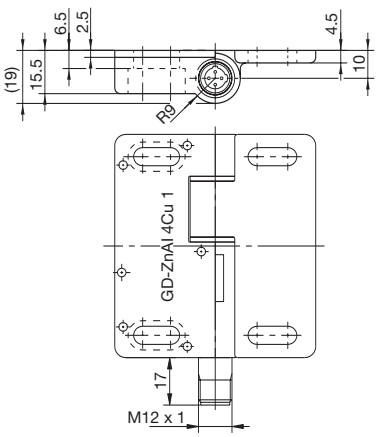


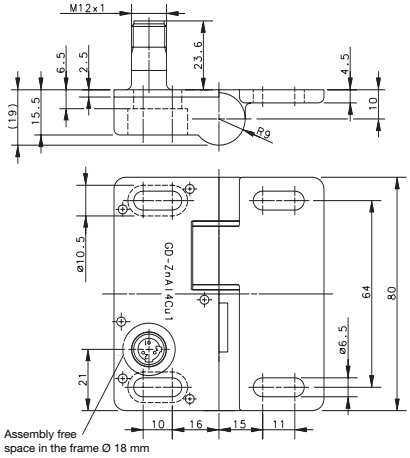
Switching hysterisis: -1.0°

Voltage	max.	250 VAC	250 VAC
Thermal current	max.	3A	3A
Utilization category per IEC 947-5-1 AC 15/DC 13		60 V/0.5 A	60 V/0.5 A
		230 VAC/1.5 A	230 VAC/1.5 A
Switching frequency	max.	1200/h	1200/h
Mechanical life - switching operations		1 x 10^6	1 x 10^6
Operating temperature	min./max.	–25 °C/+70 °C	–25 °C/+70 °C
		–13 °F/+158 °F	–13 °F/+158 °F
Approvals		UL and CSA	UL and CSA
Weight		0.4 kg	0.4 kg
Delivery: ex-stock/built to order		•/–	•/–

(All dimensions in mm)







SAFELOCK
I88 Style Position Safety Hinge Interlock Switches

The I88 style Hinge Safety Switch is available with two distinctive types of operational actuators.

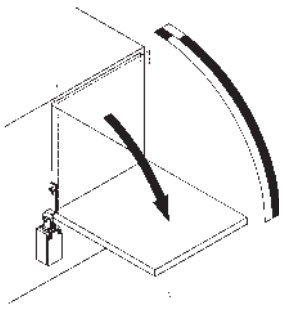
Actuator arms VKS,VKW RE and VKW LI give the user the opportunity to install them as permanently mounted operational arms on flaps and covers, as shown in the drawings below.

The AHDB styled actuator is designed to be directly connected to a hinge point of a rotating shaft. The normally closed safety contacts will open after 10 degrees of movement.

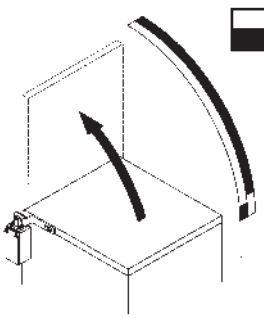
Arm/Linear

Shaft/Rotary

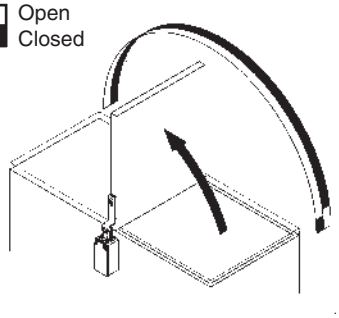
- Insulated plastic housing with hinged cover
- Forced disconnection of the N.C. contacts
- Contacts galvanically isolated
- Conduit adapter



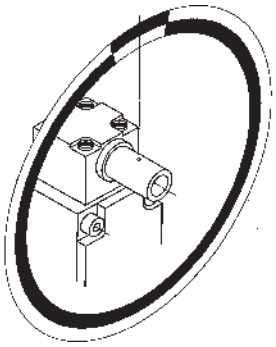
VKS (Vertical)



Hinged Arms



VKW (Horizontal)



Hinged Shaft

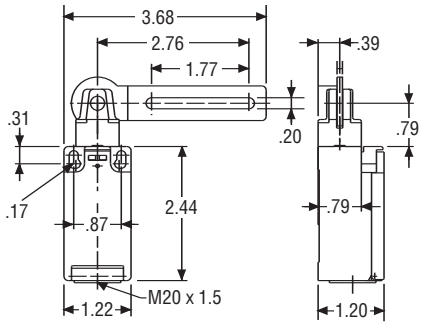
Model: **I88-U1Z VKS**
Part Number: **608-6100-093**
Operation: **Central**

Model: **I88-U1Z VKW RE**
Part Number: **608-6100-094**
Operation: **Right**

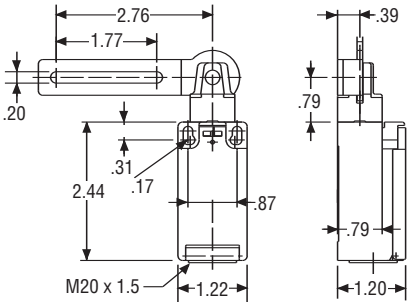
Model: **I88 -U1Z VKW LI**
Part Number: **608-6100-095**
Operation: **Left**

Enclosure: Thermoplastic
Contacts: 1 Normally Closed
⊖ Forced Disconnect per IEC 947-5-1 Ch. 3
1 Normally Open
Voltage Rating: 500 VAC (max.)
Current Rating: 10 A (max.)
Protection Class: NEMA 4
Mechanical Life: 1 x 10^6 Cycles
Temperature: -22°F to +176°F
Switch Rate: 50 per minute max.
Approvals: UL, CSA

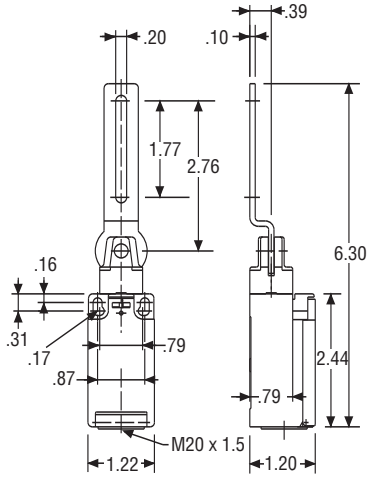
(Dimensions are in inches)



I88-U1Z VKW RE

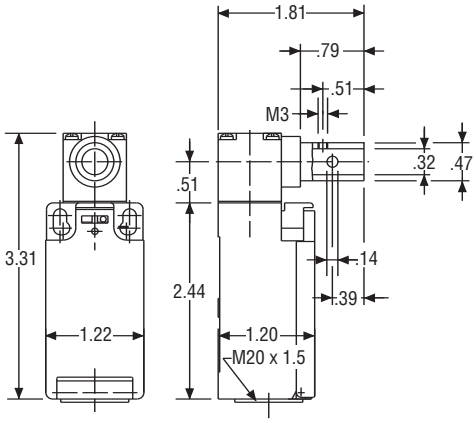


I88 -U1Z VKW LI



I88-U1Z VKS

Model: **I88-U1Z AHDB**
Part Number: **618-6100-267**
Enclosure: Thermoplastic
Contacts: 1 Normally Closed
⊖ Forced Disconnect per IEC 947-5-1 Ch. 3
1 Normally Open
Voltage Rating: 500 VAC (max.)
Current Rating: 10 A (max.)
Protection Class: NEMA 4
Mechanical Life: 1 x 10^6 Cycles
Temperature: -22°F to +176°F
Switch Rate: 50 per minute max.
Approvals: UL, CSA



I88-U1Z AHDB