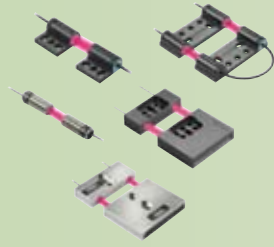


INTERLOCKING SWITCHES

PICO-GUARD™



Magnet Style



Hinge Style



Compact Plastic



Compact Metal



Locking Style



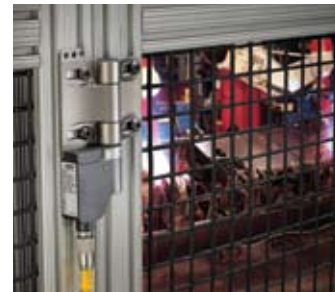
PICO-GUARD™ page 568

- Fiber optic switches for non-contact applications
- Straight, right-angle, dual-lens, extreme-duty and heavy-duty models
- Low-cost alternative to other machine guarding methods
- Rugged construction for tough environments
- Easy to install



Magnet Style page 569

- Magnet switches for non-contact applications
- Compact, 3-piece non-contact system
- Sealed to resist water and dirt
- Designed to resist intentional defeat



Hinge Style page 572

- Load-bearing, lever and rotating hinge styles
- Adjustable range of operation
- One-piece switches



Compact Plastic page 578

- Designed to minimize tampering
- Five actuator types
- Actuator engagement from different locations



Compact Metal page 584

- Rigid and flexible in-line actuators
- Rotating actuator heads



Locking Style page 587

- Two options for locking mechanisms
- Two models for different voltages
- Rigid and flexible in-line actuators
- Rotating actuator heads

Model		Catalog Page	Type	Package Style	Housing Material	Actuator Contacts	Solenoid Contacts
PICO-GUARD™	SFI-S1../R1..	568	Fiber Optic	2-Piece	Plastic	—	—
	SFI-D1../A1..				Plastic		
	SFI-M12..				Metal		
	SFI-D1E../A1E..				Metal		
	SFI-D1H../A1H..				Metal		
Magnet	SI-MAG1..	569	Magnetic	2-Piece	Plastic	1 NO & 1 NC	—
	SI-MAG2..				Plastic		
	SI-MAG3..				Plastic		
Hinge	SI-HG63..	573	Electromechanical Non-Locking	1-Piece	Metal	2 NC & 1 NO	—
	SI-HG80..	574			Metal	SPDT (Form C)	
	SI-LS31H..	575			Plastic	1 NC & 1 NO, 2 NC	
	SI-LS31R..	576			Plastic	1 NC & 1 NO, 2 NC	
Compact Plastic	SI-LS83.. SI-LS100..	578	Electromechanical Non-Locking	2-Piece	Plastic	2 NC & 1 NO, 1 NC & 1 NO, 2 NC	—
	SI-QS75.. SI-QS90..	578			Plastic	1 NC, 1 NC & 1 NO, 2 NC, 2 NC & 1 NO	
Compact Metal	SI-LM40..	584	Electromechanical Non-Locking	2-Piece	Metal	1 NO & 1 NC, 2 NC, 2 NC & 1 NO	—
Locking	SI-LS42..	587	Electromechanical Locking	2-Piece	Plastic	1 NC & 1 NO, 2 NC, 2 NC & 1 NO, 3 NC	1 NC & 1 NO, 1 NC
	SI-QM100..	590			Metal	1 NC & 1 NO, 2 NC	1 NC & 1 NO

NC = Normally Closed, NO = Normally Open

- Photoelectrics Sensors
- Fiber Optic Sensors
- Special Purpose Sensors
- Measurement & Inspection Sensors
- Vision
- Wireless
- Lighting & Indicators
- Safety Light Screens
- Safety Laser Scanners
- Fiber Optic Safety Systems
- Safety Controllers & Modules
- Safety Two-Hand Control Modules
- Safety Interlock Switches**
- Emergency Stop & Stop Control

ACCESSORIES
page 597

- INTERLOCK SWITCHES**
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

INTERLOCK SWITCHES

PICO-GUARD™ Fiber Optic

- Interlock switches interface with PICO-GUARD™ SFCDT-.. fiber optic controllers.
- Compact, non-contact and easy to install, the switches interlock doors, guards, gates and covers.
- Fiber optic interlock switches eliminate the need to run electrical wires to a hazardous area.
- Fibers connect and disconnect quickly.
- Switches meet Category 4 requirements with one switch pair per guard per ISO 13849-1 (EN 954-1) when used with a PICO-GUARD controller.
- Impact-resistant polycarbonate plastic, extreme-duty chemically resistant stainless steel or heavy-duty impact-resistant zinc die-cast models are available.
- Switches have an environmental rating of IP67 and are ATEX, FM & CSA approved for use in explosive environments when used with a PICO-GUARD controller.
- Attenuator is available for reducing excess gain in short-run applications.
- Splices are available for easily connecting two fiber sections.
- See page 508 for PICO-GUARD controllers.



ACCESSORIES
page
521

Models for a variety of applications & environments



Straight Page 515

- In-line lens housing
- Right or left side mounting flange



Right Angle Page 515

- Right-angle lens housing
- Right or left side mounting flange



Dual Lens & Actuator Page 515

- Passive U-shaped actuator for lift-off doors and removable guards
- Center mounting configuration



Straight Barrel Page 515

- Impact- and chemically resistant stainless steel
- 12 mm threaded barrel mounting



**Dual Lens & Actuator—
Extreme- & Heavy-Duty** Page 515

- Actuator with U-shaped configuration allows fiber to “enter” and “exit” from one side of the guard only
- Extreme-duty chemically resistant stainless steel or heavy-duty impact resistant zinc die-cast models.
- Center mounting configuration



Magnet Style Non-Contact Safety Interlock Switches

- Sealed components resist water, dirt and are accommodating to misalignment.
- Shifts in distance and alignment don't compromise sensing.
- Coded magnets minimize the risk of intentional defeat.
- Compact size makes it possible to conceal the switch.
- Magnets with different polarizations add security.
- Three housing styles are available for flat or 30 mm barrel mounting.
- For safety applications, switch must be used with Gate Monitoring Module GM-FA-10J, SC22-3 Safety Controller or comparable control systems.

- Photoelectrics Sensors
- Fiber Optic Sensors
- Special Purpose Sensors
- Measurement & Inspection Sensors
- Vision
- Wireless
- Lighting & Indicators
- Safety Light Screens
- Safety Laser Scanners
- Fiber Optic Safety Systems
- Safety Controllers & Modules
- Safety Two-Hand Control Modules
- Safety Interlock Switches**
- Emergency Stop & Stop Control

ACCESSORIES
page 571

- INTERLOCK SWITCHES
- FIBER OPTIC
- MAGNET**
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

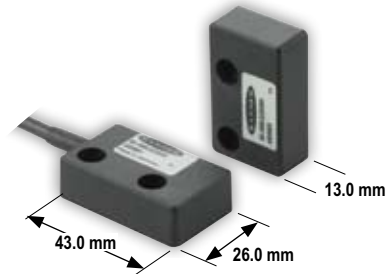
ONLINE
AUTOCAD, STEP, IGES & PDF



SI-MAG3SM and SI-MAG3MM Models



SI-MAG1SM.. and SI-MAG1MM.. Models



SI-MAG2SM and SI-MAG2MM Models

SI-MAG Magnet Style Safety Switches

Description		Contacts	Sensor Cable	Switching Distance		Models
				Min. ON	Max. OFF	
Sensor		1 NO & 1 NC	3 m	—	—	SI-MAG1SM
Coded Magnet				0-3 mm	3-14 mm	SI-MAG1SMCO†
				0-8 mm	8-16 mm	SI-MAG1MM
						SI-MAG1MM90*
						SI-MAG1MMHF

More on next page

NC = Normally Closed Output, NO = Normally Open Output

Connection options:

For 9 m cable, add suffix **W/30** to the 3 m model number (example, **SI-MAG1SM W/30**).



* Difference is in Direction of Approach. See page 468 for more information.

† Cable opposite

NOTE: The sensor and its magnet must be mounted at a minimum distance of 15 mm from any magnetized or ferrous material (example, steel) for proper operation.

SFA-IMB1 or SFA-IMB2 can be used as spacers (see page 635). Depending on the installation, multiple brackets may be required.

SI-MAG Magnet Style Safety Switches (cont'd)

Description		Contacts	Sensor Cable	Switching Distance		Models
				Min. ON	Max. OFF	
Sensor		1 NO & 1 NC	3 m	—	—	SI-MAG2SM
Coded Magnet				0-4 mm	4-8 mm	SI-MAG2MM
Sensor		1 NO & 1 NC	3 m	—	—	SI-MAG3SM
Coded Magnet				0-3 mm	3-7 mm	SI-MAG3MM

NC = Normally Closed Output, NO = Normally Open Output

 **Connection options:**

For 9 m cable, add suffix **W/30** to the 3 m model number (example, **SI-MAG2SM W/30**).

NOTE: The sensor and its magnet must be mounted at a minimum distance of 15 mm from any magnetized or ferrous material (example, steel) for proper operation. SFA-IMB1 or SFA-IMB2 can be used as spacers (see page 635). Depending on the installation, multiple brackets may be required.

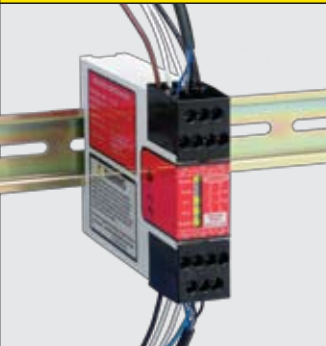

ACCESSORIES
page
571

SI-MAG Safety Switches Specifications

Switching Elements	Three pole-stable reed switches
Repeat Switching Accuracy	± 0.1 mm
Construction	Epoxy-encapsulated circuit in polyamide housing
Environmental Rating	NEMA 4X; IP67
Switching Capacity	30V dc max. @ 0.25 W
Operating Temperature	-5° to +70° C
Connections	Integral PVC-jacketed 3 m 4-wire cable. Cable O.D. is 5 mm. Wires are 24 AWG. (0.25 mm ²)
Wiring Diagrams	1-Channel Coded Magnet Switches: WD033 (p. 794) 1-Channel (Multiple Guards): WD035 (p. 795)

NOTE: See page 468 for direction of approach information.


Monitoring Control Module (required for a complete system)

	Description	Models	Product Information
	<ul style="list-style-type: none"> The gate module monitors up to 20 Banner coded magnets for contact failure or wiring fault. Two-channel operation monitors redundant switches on a single guard; one-channel operation monitors single switches on two guards. Two redundant output switching channels connect to control-reliable power interrupt circuits and are rated for up to 250V ac at up to 6 A. The reset input can be used for external device monitoring (EDM). The gate monitoring module uses 24V ac/dc at less than 150 mA. 	GM-FA-10J	Page 531
	<ul style="list-style-type: none"> One controller provides configurable monitoring of multiple safety devices. 22 input terminals can monitor both contact-based and PNP solid-state input devices. 3 pairs of independent solid-state safety outputs can be used with selectable one- or two-channel external device monitoring. Ten configurable non-safety status outputs track inputs, outputs, lockout, I/O status and other functions. All SC22-3 modules use 24V dc. 10/100 Base TX Ethernet communication option using EtherNet/IP and Modbus TCP protocols (SC22-3E models). 	SC22-3-S... SC22-3-C... SC22-3E-S... SC22-3E-C...	Page 526

- Photoelectrics Sensors
- Fiber Optic Sensors
- Special Purpose Sensors
- Measurement & Inspection Sensors
- Vision
- Wireless
- Lighting & Indicators
- Safety Light Screens
- Safety Laser Scanners
- Fiber Optic Safety Systems
- Safety Controllers & Modules
- Safety Two-Hand Control Modules
- Safety Interlock Switches**
- Emergency Stop & Stop Control

- INTERLOCK SWITCHES**
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

HINGE STYLE SWITCHES

- Three types are available—load-bearing hinge, hinged lever and rotating hinge.
- One-piece switch eliminates need for alignment, engagement and risk of breakage of a separate actuator.
- Design meets positive opening requirements for safety interlocks (IEC 60947-5-1) .



SI-HG63
Load Bearing Page 573

- Hinge operates to a full 270° range of motion with safety switching point adjustable over full operating range.
- Setpoint is $\pm 1.5^\circ$ adjustable after being set.
- In-line and right-angle hinge models are available.
- Hinge supports an axial and radial load of 1200 N.
- Safety switching point is repositional.
- Housing is constructed of corrosion-resistant stainless steel.




SI-HG80
Load Bearing Page 574

- Hinge operates to a full 180° range of motion.
- In-line and right-angle hinge models are available.
- Hinge supports an axial load of 750 N and more than 1,000 N in radial direction.
- Housing is constructed of corrosion-resistant zinc die-cast.




SI-LS31H
Hinge Lever Style Page 575

- Built-in hinge lever actuator attaches to doors or flaps which open 90° in one direction.
- Actuator head rotates in 90° increments.
- Housing is constructed of glass reinforced thermoplastic with plated steel actuator.
- All models are insulated devices (IEC 60947-5-1) .



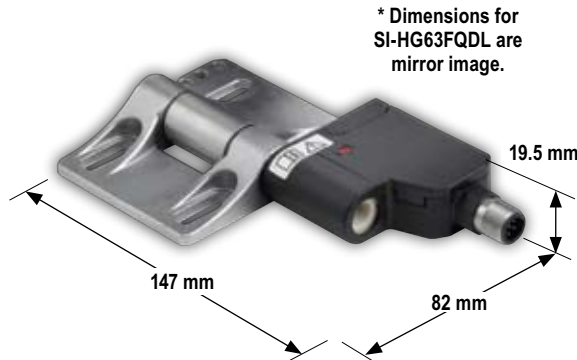
SI-LS31R
Rotary Hinge-Style Page 576

- Rotating actuator connects directly to door hinge.
- Actuator head rotates in 90° increments.
- Housing is constructed of glass reinforced thermoplastic with plated steel actuator.
- All models are insulated devices (IEC 60947-5-1) .

SI-HG63 Hinge Style Switches



SI-HG63FQDRR



SI-HG63FQDR*

* Dimensions for SI-HG63FQDL are mirror image.



- Photoelectrics
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- Fiber Optic Safety Systems
- Safety Controllers & Modules
- Safety Two-Hand Control Modules
- Safety Interlock Switches**
- Emergency Stop & Stop Control

SI-HG63 Hinge Style Switches, 63 mm

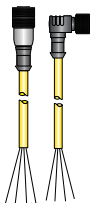
Actuator Type		Contact(s)	Connection	Models	Contact Config. & Switch Diagram
		2 NC & 1 NO	6-pin Micro QD	SI-HG63FQDR	SD001 (Page 592)
				SI-HG63FQDL	
				SI-HG63FQDRR	
		—	SI-HG63A		

Hinge 270° NC = Normally closed contact, NO = Normally open contact
 Connection options: A model with a QD requires a mating cordset (see page 573).

- INTERLOCK SWITCHES
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

Cordsets

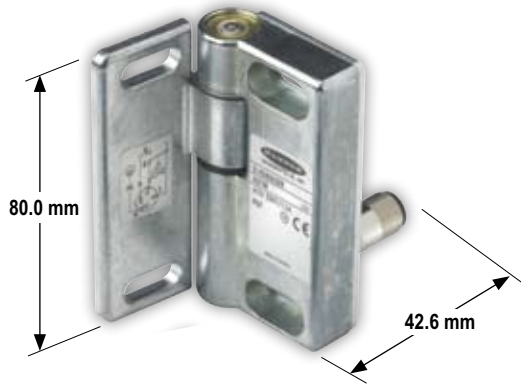
Micro QD to Flying Leads		
See page 699		
Threaded 6-Pin		
Length	Straight	Right-Angle
1.83 m	MQEAC-606	MQEAC-606RA
4.57 m	MQEAC-615	MQEAC-615RA
9.14 m	MQEAC-630	MQEAC-630RA



Additional cordset information available. See page 679.

INTERLOCK SWITCHES

SI-HG80 Hinge Style Switches



SI-HG80DQDR



SI-HG80DQD



SI-HG80 Hinge Style Switches, 80 mm

Actuator Type		Contact(s)	Connection	Models	Contact Config. & Switch Diagram
In-line Integral load bearing		SPDT (Form C)	4-pin Micro QD	SI-HG80DQD	SD002 (Page 592)
Right-angle Integral load bearing				SI-HG80DQDR	
Blank hinge		—	—	SI-HG80A	



Hinge 180°

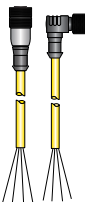
SPDT = Single-Pole, Double-Throw Contacts



Connection options: A model with a QD requires a mating cordset (see page 574).

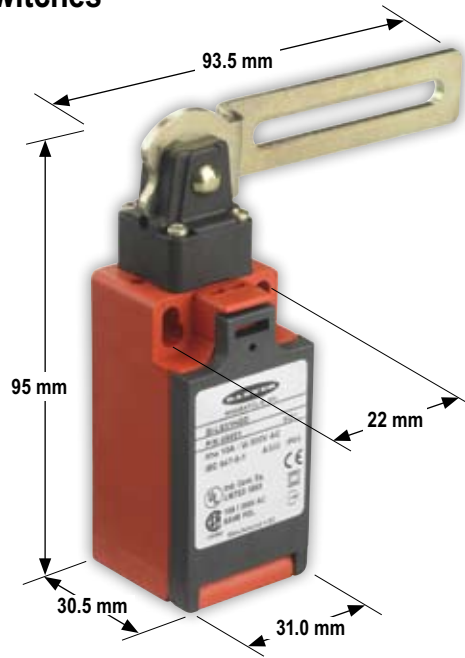
Cordsets

Micro QD to Flying Leads		
See page 698		
Threaded 4-Pin		
Length	Straight	Right-Angle
1.83 m	MQEAC-406	MQEAC-406RA
4.57 m	MQEAC-415	MQEAC-415RA
9.14 m	MQEAC-430	MQEAC-430RA




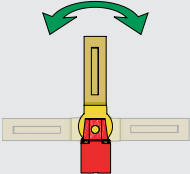

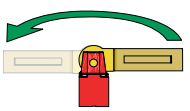

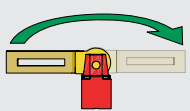
Additional cordset information available. See page 679.



SI-LS31H Hinge Lever Style Switches



- Photoelectrics
- Sensors
- Fiber Optic Sensors
- Special Purpose Sensors
- Measurement & Inspection Sensors
- Vision
- Wireless
- Lighting & Indicators
- Safety Light Screens
- Safety Laser Scanners
- Fiber Optic Safety Systems
- Safety Controllers & Modules
- Safety Two-Hand Control Modules
- Safety Interlock Switches**
- Emergency Stop & Stop Control

SI-LS31H Hinge Lever Style Switches, 31 mm

Actuator Type		Contact(s)	Models*	Contact Config. & Switch Diagram
 Vertical Hinged Lever ± 90°		1 NC & 1 NO	SI-LS31HGD	SD003 (Page 592)
		2 NC	SI-LS31HGE	SD004 (Page 592)
 Right-Hand Hinged Lever 180°		1 NC & 1 NO	SI-LS31HGRD	SD005 (Page 592)
		2 NC	SI-LS31HGRE	SD006 (Page 592)
 Left-Hand Hinged Lever 180°		1 NC & 1 NO	SI-LS31HGLD	SD007 (Page 593)
		2 NC	SI-LS31HGLE	SD008 (Page 593)

 Hinge 90°
  One-Directional 180°
  One-Directional 180°
 NC = Normally Closed Contact, NO = Normally Open Contact


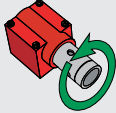
* Contact factory for integral quick-disconnect (QD) and pigtail QD options.

- INTERLOCK SWITCHES
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

SI-LS31R Rotary Hinge Style Switches



SI-LS31R Rotary Hinge Style Switches, 31 mm

Actuator Type		Contact(s)	Models*	Contact Config. & Switch Diagram
 Rotary Shaft		1 NC & 1 NO	SI-LS31RTD	SD009 (Page 593)
		2 NC	SI-LS31RTE	SD010 (Page 593)







360° Rotary

NC = Normally Closed Contact, NO = Normally Open Contact

* Contact factory for integral quick-disconnect (QD) and pigtail QD options.

SI-HG63 Hinge Style Switches Specifications

Contact Rating	3 A @ 230V ac max., 1.0 A @ 24V dc max. 2.5 kV max. transient tolerance	NEMA A300 P300
European Rating	Utilization categories: AC15 and DC13 (IEC 90497-5-1) $U_i = 250V$ ac, $I_{th} = 5A$	
Minimum Switching Speed	5 operations per minute	
Switching Angle	NC contact: $\pm 3^\circ$ NO contact: $\pm 9^\circ$ Tolerance for all angles: 1.5°	
Mechanical Life	1 million operations	
Short Circuit Protection	4 amp Slow Blow, 8 amp Fast Blow. Recommended external fusing or overload protection.	
Force Exerted by Guard per Switch	Axial and radial: 1200 N (264 lbf) max.	
Wire Connections	6-pin Micro-style quick-disconnect (QD) fitting. Cordsets are ordered separately. See page 573.	
Operating Range	0° to 270°	
Construction	Hinge: X22CrNi 17 Switch: PBT	
Environmental Rating	NEMA 4; IP67	
Operating Conditions	Temperature: -25° to $+70^\circ$ C	
Weight	0.65 kg (1.43 lb)	
Application Note	To avoid excessive radial stress in applications containing large doors, the hinge switch should be mounted either in pairs of two, or in conjunction with a blank hinge (see page 572).	
Certifications	   	
Contact configuration and Switching Diagram	SD001 (p. 592)	

SI-HG80 Hinge Style Switches Specifications			
Contact Rating	3 A @ 250V ac max., 0.5 A @ 60V dc max.	2.5 kV max. transient tolerance	NEMA A300 P300
European Rating	Utilization categories: AC15 and DC13 (IEC 90497-5-1) $U_i = 250V$ ac, $I_{th} = 3A$		
Minimum Switching Speed	20 operations per minute		
Mechanical Life	1 million operations		
Short Circuit Protection	6 amp Slow Blow, 10 amp Fast Blow. Recommended external fusing or overload protection.		
Force Exerted by Guard per Switch	Axial: 750 N max. Radial: 1000 N max.		
Operating Range	0° to 180°		
Wire Connections	4-pin Micro-style quick-disconnect (QD) fitting. Cordsets are ordered separately. See page 698.		
Construction	Zinc Die-cast (GD-Zn)		
Environmental Rating	NEMA 4; IP67		
Operating Conditions	Temperature: -25° to +70° C		
Weight	0.40 kg		
Application Notes	To avoid excessive radial stress in applications containing large doors, the hinge switch should be mounted either in pairs of two, or in conjunction with a blank hinge (see page 574).		
Certifications			
Contact Configuration and Switching Diagrams	SD002 (p. 592)		

Photoelectrics
Sensors
Fiber Optic
Sensors
Special Purpose
Sensors
Measurement &
Inspection Sensors
Vision
Wireless
Lighting &
Indicators
Safety
Light Screens
Safety
Laser Scanners
Fiber Optic
Safety Systems
Safety Controllers &
Modules
Safety Two-Hand
Control Modules
**Safety Interlock
Switches**
Emergency Stop &
Stop Control

SI-LS31 Hinge Style Switches Specifications																		
Contact Rating	10A @ 24V ac, 10A @ 110V ac, 6A @ 230V ac, 6A @ 24V dc	2.5 kV max. transient tolerance	NEMA A300 P300															
European Rating	Utilization categories: AC15 and DC13 $U_i = 500V$ ac $I_{th} = 10A$	<table border="1"> <thead> <tr> <th colspan="3">40-60 Hz</th> </tr> <tr> <th>U_i V</th> <th>I_{th} AC-15 A</th> <th>I_{th} DC-13 A</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>10</td> <td>6</td> </tr> <tr> <td>110</td> <td>10</td> <td>1</td> </tr> <tr> <td>230</td> <td>6</td> <td>.4</td> </tr> </tbody> </table>	40-60 Hz			U_i V	I_{th} AC-15 A	I_{th} DC-13 A	24	10	6	110	10	1	230	6	.4	
40-60 Hz																		
U_i V	I_{th} AC-15 A	I_{th} DC-13 A																
24	10	6																
110	10	1																
230	6	.4																
Contact Material	Silver-nickel alloy																	
Maximum Switching Speed	50 operations per minute																	
Mechanical Life	1 million operations																	
Required Actuation Force	SI-LS31R models: 10 N cm SI-LS31H models: 15 N cm																	
Short Circuit Protection	6 amp Slow Blow, 10 amp Fast Blow. Recommended external fusing or overload protection.																	
Wire Connections	Screw terminals with pressure plates accept the following wire sizes – Stranded and solid: 20 AWG (0.5 mm ²) to 16 AWG (1.5 mm ²) for one wire Stranded: 20 AWG (0.5 mm ²) to 18 AWG (1.0 mm ²) for two wires																	
Cable Entry	M20 x 1.5 threaded entrance Adapter supplied to convert from M20 x 1.5 to 1/2" - 14 NPT threaded entrance																	
Construction	Glass fiber-reinforced thermoplastic UL94-VO rating; plated steel actuator																	
Environmental Rating	IP65																	
Operating Conditions	Temperature: -30° to +80° C																	
Weight	0.09 Kg																	
Certifications																		
Contact Configuration and Switching Diagrams	SI-LS31R models: SD009 and SD010 (p. 593) SI-LS31H models: SD003, SD004, SD005, SD006, SD007 and SD008 (pp. 592-593)																	

**INTERLOCK
SWITCHES**
FIBER OPTIC
MAGNET
HINGE
COMPACT PLASTIC
COMPACT METAL
LOCKING STYLE

Compact Plastic Flat Pack and Limit Switch Styles

- Mechanically coded actuators use two independent operating elements to minimize intentional tampering or defeat.
- Rotating head requires no tools.
- Four standard actuators are available, as well as an optional high-extraction-force adapter.
- Housing is constructed of glass reinforced thermoplastic with plated steel actuator.
- IP65 switch housing rating increases to IP67 with addition of a screw to the wiring chamber door.
- Design meets positive opening requirements for safety interlocks (IEC 60947-5-1) ⊕.



ACCESSORIES
page 597



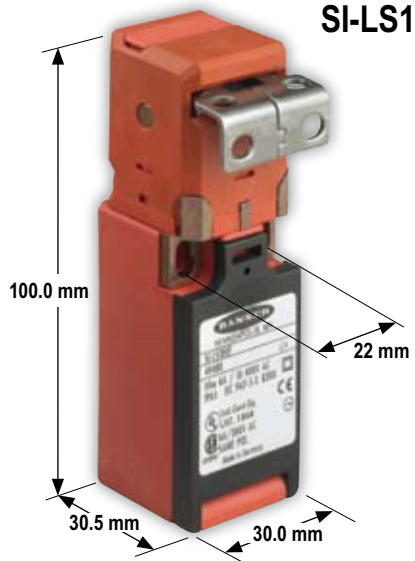
SI-LS83 and SI-LS100 Page 578

- Low profile for confined areas
- Limit switch design (EN 50047)
- In-line or right-angle actuator
- Actuator engagement from four side or four top positions
- Insulated device on all models (IEC 60947-5-1) □

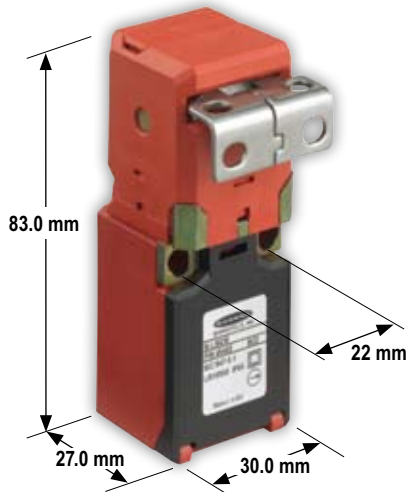
SI-QS75 and SI-QS90 Page 580

- Flat-pack design for limited space requirements
- Actuator engagement from front, back, or either of two top positions
- Insulated device on all models (IEC 60947-5-1) □

SI-LS100 and SI-LS83 Plastic Style Switches



SI-LS100 Models



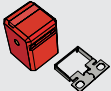
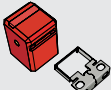

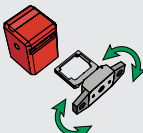
SI-LS83 Models

(both models shown with right-angle rigid in-line actuator)



Replacement actuators for safety interlock switches (page 597)

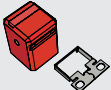
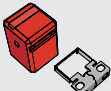

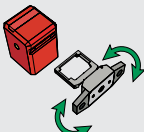
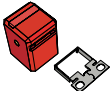
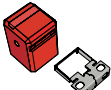

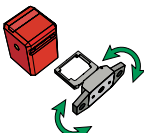
SI-LS100 Plastic Style Switches, 100 mm

Kits			Contact(s)	Contact Config. & Switch Diagram
Actuator Type	Interlock	Kit Model*		
SI-QS-SSA-2 Straight Rigid In-Line 	SI-LS100F	SI-LS100SF	2 NC & 1 NO	SD011 (Page 593)
SI-QS-SSA-3 Rigid In-Line 	SI-LS100F	SI-LS100SRAF		
 SI-QS-SSU Flexible In-Line 	SI-LS100F	SI-LS100MRFF		

- Photoelectrics Sensors
- Fiber Optic Sensors
- Special Purpose Sensors
- Measurement & Inspection Sensors
- Vision
- Wireless
- Lighting & Indicators
- Safety Light Screens
- Safety Laser Scanners
- Fiber Optic Safety Systems
- Safety Controllers & Modules
- Safety Two-Hand Control Modules
- Safety Interlock Switches**
- Emergency Stop & Stop Control

ACCESSORIES
page 597

SI-LS83 Plastic Style Switches, 83 mm

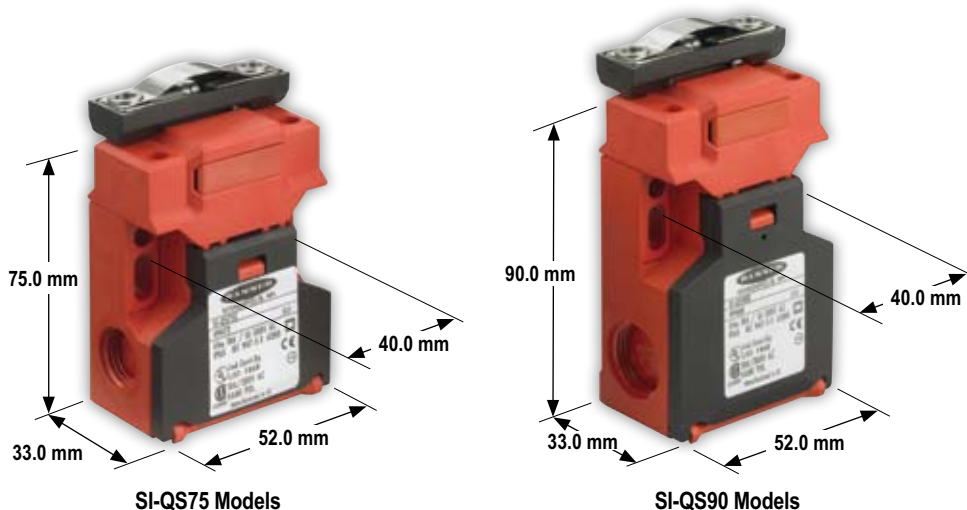
Kits			Contact(s)	Contact Config. & Switch Diagram
Actuator Type	Interlock	Kit Model*		
SI-QS-SSA-2 Straight Rigid In-Line 	SI-LS83D	SI-LS83SD	1 NC & 1 NO	SD012 (Page 593)
SI-QS-SSA-3 Rigid In-Line 	SI-LS83D	SI-LS83SRAD		
 SI-QS-SSU Flexible In-Line 	SI-LS83D	SI-LS83MRFD		
SI-QS-SSA-2 Straight Rigid In-Line 	SI-LS83E	SI-LS83SE	2 NC	SD013 (Page 594)
SI-QS-SSA-3 Rigid In-Line 	SI-LS83E	SI-LS83SRAE		
 SI-QS-SSU Flexible In-Line 	SI-LS83E	SI-LS83MRFE		

- INTERLOCK SWITCHES**
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

 Multi-Directional NC = Normally Closed Contact, NO = Normally Open Contact

* A kit contains an interlock and actuator. Individual interlocks (without actuator) are for replacement purposes only. Contact factory for integral quick-disconnect (QD) and pigtail QD options.

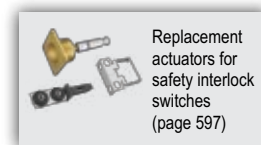
SI-QS75 and SI-QS90 Flat-Pack Style Switches



SI-QS75 Models

SI-QS90 Models

(both models shown with rigid in-line actuator)



ACCESSORIES
page
597

SI-QS75 Flat-Pack Style Switches, 75 mm

Kits				Contact	Contact Config. & Switch Diagram
Actuator Type	Interlock	Kit Model*			
SI-QS-SSA-4 Rigid In-Line		SI-QS75C	SI-QS75MC		
 SI-QS-SSU Flexible In-Line		SI-QS75C	SI-QS75MFC	1 NC	SD014 (Page 594)
SI-QS-SSA Rigid In-Line & SI-QS-100 High-force Accessory		SI-QS75C	SI-QS75MC-100 (High-Force)		

Multi-Directional NC = Normally Closed Contact, NO = Normally Open Contact

* A kit contains an interlock and actuator. Individual interlocks (without actuator) are for replacement purposes only.
Contact factory for integral quick-disconnect (QD) and pigtail QD options.

SI-QS90 Flat-Pack Style Switches, 90 mm

Actuator Type		Kits		Contact(s)	Contact Config. & Switch Diagram
		Interlock	Kit Model*		
SI-QS-SSA-4 Rigid In-Line		SI-QS90D	SI-QS90MD	1 NC & 1 NO	SD015 (Page 594)
 SI-QS-SSU Flexible In-Line		SI-QS90D	SI-QS90MFD		
SI-QS-SSA Rigid In-Line & SI-QS-100 High-force Accessory		SI-QS90D	SI-QS90MD-100 (High-Force)		
SI-QS-SSA-4 Rigid In-Line		SI-QS90E	SI-QS90ME	2 NC	SD016 (Page 594)
 SI-QS-SSU Flexible In-Line		SI-QS90E	SI-QS90MFE		
SI-QS-SSA Rigid In-Line & SI-QS-100 High-force Accessory		SI-QS90E	SI-QS90ME-100 (High-Force)		
SI-QS-SSA-4 Rigid In-Line		SI-QS90F	SI-QS90MF	2 NC & 1 NO	SD017 (Page 594)
 SI-QS-SSU Flexible In-Line		SI-QS90F	SI-QS90MFF		
SI-QS-SSA Rigid In-Line & SI-QS-100 High-force Accessory		SI-QS90F	SI-QS90MF-100 (High-Force)		

Multi-Directional NC = Normally Closed Contact, NO = Normally Open Contact




* A kit contains an interlock and actuator. Individual interlocks (without actuator) are for replacement purposes only. Contact factory for integral quick-disconnect (QD) and pigtail QD options.

Photoelectrics
Sensors
Fiber Optic
Sensors
Special Purpose
Sensors
Measurement &
Inspection Sensors
Vision
Wireless
Lighting &
Indicators
Safety
Light Screens
Safety
Laser Scanners
Fiber Optic
Safety Systems
Safety Controllers &
Modules
Safety Two-Hand
Control Modules
**Safety Interlock
Switches**
Emergency Stop &
Stop Control

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**INTERLOCK
SWITCHES**
FIBER OPTIC
MAGNET
HINGE
COMPACT PLASTIC
COMPACT METAL
LOCKING STYLE

SI-LS83 and SI-LS100 Plastic Style Switches Specifications

Contact Rating	10A @ 24V ac, 10A @ 110V ac, 6A @ 230V ac, 6A @ 24V dc 2.5 kV max. transient tolerance NEMA A300 P300																
European Rating	Utilization categories: AC15 and DC13 (IEC 60947-5-1) Switches with 1 & 2 contact pairs: $U_i = 500V$ ac, $I_{th} = 10A$ Switches with 3 contact pairs: $U_i = 400V$ ac, $I_{th} = 5A$	<table border="1"> <thead> <tr> <th colspan="3">40-60 Hz</th> </tr> <tr> <th>U V</th> <th>I_a/AC-15 A</th> <th>I_a/DC-13 A</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>10</td> <td>6</td> </tr> <tr> <td>110</td> <td>10</td> <td>1</td> </tr> <tr> <td>230</td> <td>6</td> <td>.4</td> </tr> </tbody> </table>	40-60 Hz			U V	I _a /AC-15 A	I _a /DC-13 A	24	10	6	110	10	1	230	6	.4
40-60 Hz																	
U V	I _a /AC-15 A	I _a /DC-13 A															
24	10	6															
110	10	1															
230	6	.4															
Contact Material	Silver-nickel alloy																
Maximum Switching Speed	30 operations per minute																
Maximum Actuator Speed	1 m/second																
Mechanical Life	1 million operations																
Minimum Actuator Engagement Radius	In-line actuators: 150 mm Flexible actuators: 50 mm in all directions																
Actuation Extraction Force	12 N																
Short Circuit Protection	6 amp Slow Blow, 10 amp Fast Blow. Recommended external fusing or overload protection.																
Wire Connections	Stranded and solid: 20 AWG (0.5 mm ²) to 18 AWG (1.0 mm ²) for one wire Stranded: 20 AWG (0.5 mm ²) to 18 AWG (1.0 mm ²) for two wires																
Cable Entry	M20 x 1.5 for SI-LS100 and M16 x 1.5 for SI-LS83 threaded entrance. Adapter supplied to convert to 1/2" - 14 NPT threaded entrance.																
Construction	Glass fiber-reinforced thermoplastic UL94-VO rating																
Environmental Rating	IP65 Note: Addition of a No. 3 x 1/4" screw (max) to the wiring access door increases sealing to IP67; NEMA 4X																
Operating Conditions	Temperature: -30° to +80° C																
Weight	SI-LS83 models: 0.12 kg SI-LS100 models: 0.13 kg																
Certifications	  																
Contact Configuration and Switching Diagrams	SI-LS100 models: SD011 (p. 593) SI-LS83 models: SD012 and SD013 (pp. 593-594)																

SI-QS75 and SI-QS90 Flat-Pack Style Switches Specifications

Contact Rating	10A @ 24V ac, 10A @ 110V ac, 6A @ 230V ac, 6A @ 24V dc 2.5 kV max. transient tolerance NEMA A300 P300																
European Rating	Utilization categories: AC15 and DC13 (IEC 60947-5-1) Switches with 1 & 2 contact pairs: $U_i = 500V$ ac, $I_{th} = 10A$ Switches with 3 contact pairs: $U_i = 400V$ ac, $I_{th} = 5A$	<table border="1"> <thead> <tr> <th colspan="3">40-60 Hz</th> </tr> <tr> <th>U_i V[~]</th> <th>I_{th}/AC-15 A</th> <th>I_{th}/DC-13 A</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>10</td> <td>6</td> </tr> <tr> <td>110</td> <td>10</td> <td>1</td> </tr> <tr> <td>230</td> <td>6</td> <td>.4</td> </tr> </tbody> </table>	40-60 Hz			U_i V [~]	I_{th} /AC-15 A	I_{th} /DC-13 A	24	10	6	110	10	1	230	6	.4
40-60 Hz																	
U_i V [~]	I_{th} /AC-15 A	I_{th} /DC-13 A															
24	10	6															
110	10	1															
230	6	.4															
Contact Material	Silver-nickel alloy																
Maximum Switching Speed	30 operations per minute																
Maximum Actuator Speed	1 m/second																
Mechanical Life	1 million operations																
Minimum Actuator Engagement Radius	In-line actuators: 150 mm Flexible actuators: 50 mm in all directions																
Actuation Extraction Force	High-Force models: 100 N All others: 10 N																
Short Circuit Protection	6 amp Slow Blow, 10 amp Fast Blow. Recommended external fusing or overload protection.																
Wire Connections	Screw terminals with pressure plates accept the following wire sizes – For switches with one or two contacts: Stranded and solid: 20 AWG (0.5 mm ²) to 16 AWG (1.5 mm ²) for one wire Stranded: 20 AWG (0.5 mm ²) to 18 AWG (1.0 mm ²) for two wires For switches with three contacts: Stranded and solid: 20 AWG (0.5 mm ²) to 18 AWG (1.0 mm ²) for one wire Stranded: 20 AWG (0.5 mm ²) to 18 AWG (1.0 mm ²) for two wires																
Cable Entry	M20 x 1.5 for SI-QS90 and M16 x 1.5 for SI-QS75 threaded entrance. Adapter supplied to convert to ½" - 14 NPT threaded entrance.																
Construction	Glass fiber-reinforced thermoplastic UL94-VO rating																
Environmental Rating	IP65 Note: Addition of a No. 3 x ¼" screw (max) to the wiring access door increases sealing to IEC IP67; NEMA 4X																
Operating Conditions	Temperature: -30° to +80° C																
Weight	SI-QS75 models: 0.11 kg SI-QS90 models: 0.13 kg																
Application Notes	Models with one and two contacts have three cable entry locations (bottom and two sides); models with three contacts have two cable entry locations (two sides). All entry locations are sealed with knockouts. To remove knockouts, thread the supplied M16 x 1.5 or M20 x 1.5 to ½" - 14 NPT conduit adapter or optional M16 x 1.5 or M20 x 1.5 cable gland into one of the threaded entry locations. The knockout will break open just before the adapter or cable gland bottoms out.																
Certifications																	
Contact Configuration and Switching Diagrams	SI-QS75 models: SD014 (p. 594) SI-QS90 models: SD015, SD016 and SD017 (p. 594)																

Photoelectrics
Sensors
Fiber Optic
Sensors
Special Purpose
Sensors
Measurement &
Inspection Sensors
Vision
Wireless
Lighting &
Indicators
Safety
Light Screens
Safety
Laser Scanners
Fiber Optic
Safety Systems
Safety Controllers &
Modules
Safety Two-Hand
Control Modules
**Safety Interlock
Switches**
Emergency Stop &
Stop Control

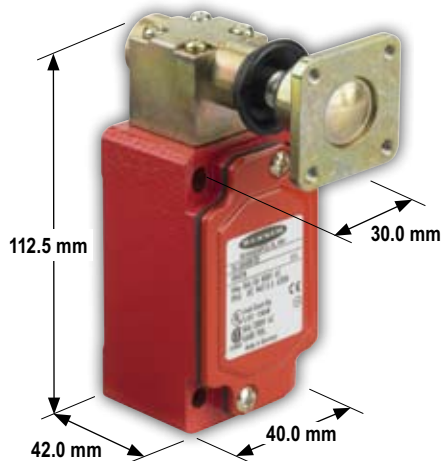
**INTERLOCK
SWITCHES**
FIBER OPTIC
MAGNET
HINGE
COMPACT PLASTIC
COMPACT METAL
LOCKING STYLE

Compact Metal Limit Switch Style with In-Line Actuator

- Rigid and flexible in-line actuators are available.
- Actuator head rotates to four possible positions, in 90° increments.
- Housing is constructed of die-cast aluminum with stainless steel actuator
- Design meets positive opening requirements for safety interlocks (IEC 60947-5-1) (→).
- All models contain protective earth terminals (IEC 60947-1) (⊕).



ACCESSORIES
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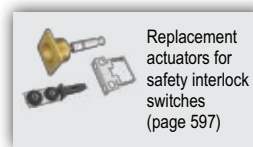


SI-LM40MKV Models
(with flexible in-line actuator)

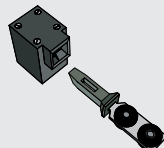

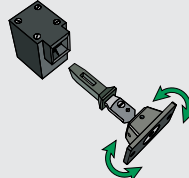


SI-LM40MKH Models
(shown with rigid in-line actuator)


ONLINE
AUTOCAD, STEP,
IGES & PDF



SI-LM40 Limit Switch Style, 40 mm

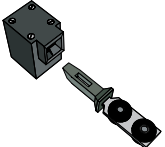

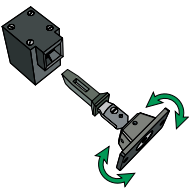
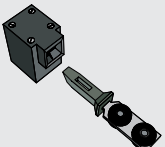

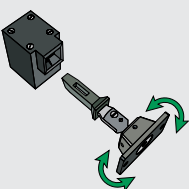

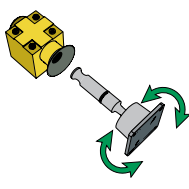
Kits			Contact(s)	Contact Config. & Switch Diagram
Actuator Type	Interlock	Kit Model*		
<p>SI-QM-SSA Straight Rigid In-Line</p> 	SI-LM40KHD	SI-LM40MKHD	1 NO & 1 NC	SD018 (Page 594)
 <p>SI-QM-SMFA Flexible In-Line</p> 	SI-LM40KHD	SI-LM40MKHFD		


More on next page

 Multi-Directional
 NC = Normally Closed Contact,
 NO = Normally Open Contact

* A kit contains an interlock and actuator. Individual interlocks (without actuator) are for replacement purposes only. Contact factory for integral quick-disconnect (QD) and pigtail QD options.

SI-LM40 Limit Switch Style, 40 mm (cont'd)

Actuator Type		Kits		Contact(s)	Contact Config. & Switch Diagram
		Interlock	Kit Model*		
SI-QM-SSA Straight Rigid In-Line		SI-LM40KHE	SI-LM40MKHE	2 NC	SD019 (Page 595)
 SI-QM-SMFA Flexible In-Line		SI-LM40KHE	SI-LM40MKHFE		
SI-QM-SSA Straight Rigid In-Line		SI-LM40KHF	SI-LM40MKHF	2 NC & 1 NO	SD020 (Page 595)
 SI-QM-SMFA Flexible In-Line		SI-LM40KHF	SI-LM40MKHFF		
 SI-QM-90A Flexible In-Line		SI-LM40KVD	SI-LM40MKVD	1 NO & 1 NC	SD021 (Page 595)
		SI-LM40KVE	SI-LM40MKVE	2 NC	SD022 (Page 595)

 Multi-Directional NC = Normally Closed Contact, NO = Normally Open Contact




* A kit contains an interlock and actuator. Individual interlocks (without actuator) are for replacement purposes only. Contact factory for integral quick-disconnect (QD) and pigtail QD options.

- Photoelectrics Sensors
- Fiber Optic Sensors
- Special Purpose Sensors
- Measurement & Inspection Sensors
- Vision
- Wireless
- Lighting & Indicators
- Safety Light Screens
- Safety Laser Scanners
- Fiber Optic Safety Systems
- Safety Controllers & Modules
- Safety Two-Hand Control Modules
- Safety Interlock Switches**
- Emergency Stop & Stop Control

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- INTERLOCK SWITCHES**
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

SI-LM40 Limit Style Switches Specifications

Contact Rating	10A @ 24V ac, 10A @ 110V ac, 6A @ 230V ac, 6A @ 24V dc 2.5 kV max. transient tolerance NEMA A300 P300																
European Rating	Utilization categories: AC15 and DC13 $U_i = 500V$ ac, $I_{th} = 10A$	<table border="1"> <thead> <tr> <th colspan="3">40-60 Hz</th> </tr> <tr> <th>U V</th> <th>I_{th}/AC-15 A</th> <th>I_{th}/DC-13 A</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>10</td> <td>6</td> </tr> <tr> <td>110</td> <td>10</td> <td>1</td> </tr> <tr> <td>230</td> <td>6</td> <td>.4</td> </tr> </tbody> </table>	40-60 Hz			U V	I_{th} /AC-15 A	I_{th} /DC-13 A	24	10	6	110	10	1	230	6	.4
40-60 Hz																	
U V	I_{th} /AC-15 A	I_{th} /DC-13 A															
24	10	6															
110	10	1															
230	6	.4															
Contact Material	Silver-nickel alloy																
Maximum Switching Speed	SI-LM40MKH models: 50 operations per minute SI-LM40MKV models: 10 operations per minute																
Maximum Actuator Speed	SI-LM40MKH models: 1.5 m/second SI-LM40MKV models: 0.5 m/second																
Mechanical Life	SI-LM40MKH models: 1 million operations SI-LM40MKV models: 25,000 operations																
Minimum Actuator Engagement Radius	Rigid actuator: 400 mm Flexible actuator: 150 mm																
Actuation Extraction Force	SI-LM40MKH models: 10 N SI-LM40MKV models: 20 N																
Short Circuit Protection	6 amp Slow Blow, 10 amp Fast Blow. Recommended external fusing or overload protection.																
Wire Connections	Screw terminals with pressure plates accept the following wire sizes – Stranded and solid: 20 AWG (0.5 mm ²) to 16 AWG (1.5 mm ²) for one wire Stranded: 20 AWG (0.5 mm ²) to 18 AWG (1.0 mm ²) for two wires																
Cable Entry	M20 x 1.5 threaded entrance Adapter supplied to convert M20 x 1.5 to 1/2" - 14 NPT threaded entrance																
Construction	Aluminum alloy die cast																
Environmental Rating	IP65																
Operating Conditions	Temperature: -30° to +80° C																
Weight	SI-LM40MKH models: 0.34 kg SI-LM40MKV models: 0.31 kg																
Certifications	  																
Contact Configuration and Switching Diagrams	SI-LM40MKH..D models: SD018 (p. 594) SI-LM40MKH..E models: SD019 (p. 595)	SI-LM40MKH..F models: SD020 (p. 595) SI-LM40MKV.. models: SD021 and SD022 (p. 595)															



Locking Style Spring or Solenoid Locking

- Two locking mechanisms are available: spring lock with energized solenoid release and energized solenoid lock with spring release.
- Rigid and flexible in-line actuators are available.
- Actuator head can be rotated in 90° increments to eight possible actuator positions: four vertical and four horizontal.
- Two models are available, based on voltage.
- Design meets positive opening requirements for safety interlocks (IEC 60947-5-1)
- Insulated device on all models with plastic housing (IEC 60947-5-1)
- Protective earth terminals on all metal models (IEC 60947-1)

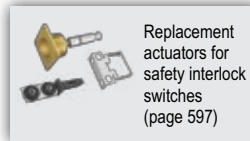
- Photoelectrics
- Sensors
- Fiber Optic
- Sensors
- Special Purpose
- Sensors
- Measurement &
- Inspection Sensors
- Vision
- Wireless
- Lighting &
- Indicators
- Safety
- Light Screens
- Safety
- Laser Scanners
- Fiber Optic
- Safety Systems
- Safety Controllers &
- Modules
- Safety Two-Hand
- Control Modules
- Safety Interlock**
- Switches**
- Emergency Stop &
- Stop Control

ACCESSORIES
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SI-LS42 Locking Style Switches

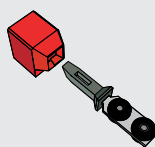
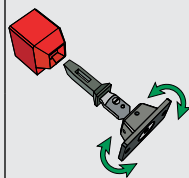


ONLINE
AUTOCAD, STEP,
IGES & PDF




- INTERLOCK**
- SWITCHES**
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

SI-LS42 Safety Switches, 42 mm - Spring Lock and Solenoid Unlock

Kits			Contact(s)	Solenoid Voltage	Contact Config. & Switch Diagram
Actuator Type	Interlock	Kit Model *			
 SI-QM-SSA Straight Rigid In-Line	SI-LS42DSG	SI-LS42DMSG	Actuator Contacts: 1 NC & 1 NO	24V ac/dc	SD023 (Page 595)
	SI-LS42WSG	SI-LS42WMSG		110V ac/ 230V ac	
 SI-QM-SMFA Flexible In-Line	SI-LS42DSG	SI-LS42DMSGF	Solenoid Monitor Contacts: 1 NC & 1 NO	24V ac/dc	
	SI-LS42WSG	SI-LS42WMSGF		110V ac/ 230V ac	

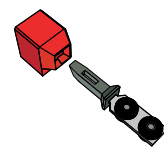
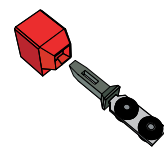

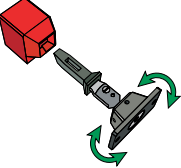
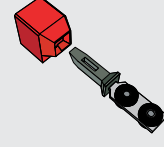
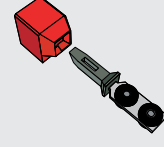

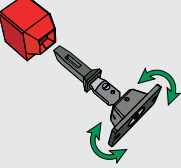
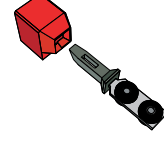
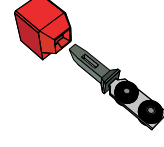

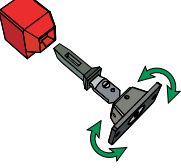
 More on next page


 Multi-Directional NC = Normally Closed Contact, NO = Normally Open Contact

* A kit contains an interlock and actuator. Individual interlocks (without actuator) are for replacement purposes only. Contact factory for integral quick-disconnect (QD) and pigtail QD options.

SI-LS42 Safety Switches, 42 mm - Spring Lock and Solenoid Unlock (cont'd)

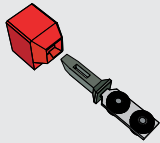
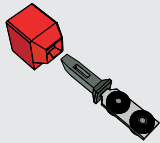
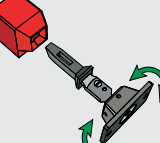
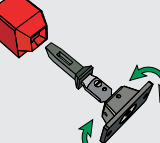
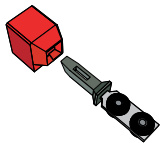
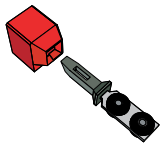
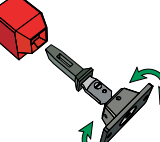
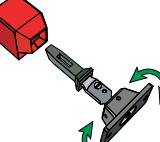
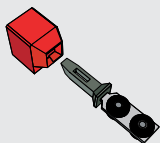
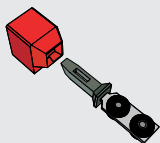
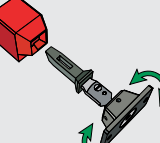
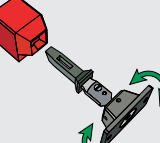
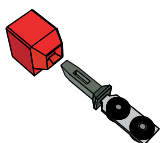
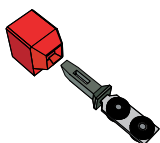
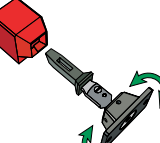
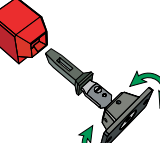
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Actuator Type		Kits		Contact(s)	Solenoid Voltage	Contact Config. & Switch Diagram	
		Interlock	Kit Model *				
SI-QM-SSA Straight Rigid In-Line 		SI-LS42DSH	SI-LS42DMSH	Actuator Contacts: 2 NC	24V ac/dc	SD024 (Page 595)	
		SI-LS42WSH	SI-LS42WMSH		110V ac/ 230V ac		
 SI-QM-SMFA Flexible In-Line		SI-LS42DSH	SI-LS42DMSHF	Solenoid Monitor Contacts: 1 NC & 1 NO	24V ac/dc		
		SI-LS42WSH	SI-LS42WMSHF		110V ac/ 230V ac		
SI-QM-SSA Straight Rigid In-Line 		SI-LS42DSI	SI-LS42DMSI	Actuator Contacts: 2 NC & 1 NO	24V ac/dc		SD025 (Page 596)
		SI-LS42WSI	SI-LS42WMSI		110V ac/ 230V ac		
 SI-QM-SMFA Flexible In-Line		SI-LS42DSI	SI-LS42DMSIF	Solenoid Monitor Contact: 1 NC	24V ac/dc		
		SI-LS42WSI	SI-LS42WMSIF		110V ac/ 230V ac		
SI-QM-SSA Straight Rigid In-Line 		SI-LS42DSJ	SI-LS42DMSJ	Actuator Contacts: 3 NC	24V ac/dc	SD026 (Page 596)	
		SI-LS42WSJ	SI-LS42WMSJ				
 SI-QM-SMFA Flexible In-Line		SI-LS42DSJ	SI-LS42DMSJF	Solenoid Monitor Contact: 1 NC			
		SI-LS42WSJ	SI-LS42WMSJF				

 Multi-Directional NC = Normally Closed Contact, NO = Normally Open Contact

* A kit contains an interlock and actuator. Individual interlocks (without actuator) are for replacement purposes only. Contact factory for integral quick-disconnect (QD) and pigtail QD options.

SI-LS42 Safety Switches, 42 mm - Solenoid Lock and Spring Unlock

Kits		Interlock	Kit Model *	Contact(s)	Solenoid Voltage	Contact Config. & Switch Diagram	
Actuator Type							
SI-QM-SSA Straight Rigid In-Line 		SI-LS42DMG	SI-LS42DMMG	Actuator Contacts: 1 NC & 1 NO	24V ac/dc	SD023 (Page 595)	
		SI-LS42WMG	SI-LS42WMMG		110V ac/ 230V ac		
		SI-LS42DMG	SI-LS42DMMGF	Solenoid Monitor Contacts: 1 NC & 1 NO	24V ac/dc		
		SI-LS42WMG	SI-LS42WMMGF		110V ac/ 230V ac		
SI-QM-SSA Straight Rigid In-Line 		SI-LS42DMH	SI-LS42DMMH	Actuator Contacts: 2 NC	24V ac/dc		SD024 (Page 595)
		SI-LS42WMH	SI-LS42WMMH		110V ac/ 230V ac		
		SI-LS42DMH	SI-LS42DMMHF	Solenoid Monitor Contacts: 1 NC & 1 NO	24V ac/dc		
		SI-LS42WMH	SI-LS42WMMHF		110V ac/ 230V ac		
SI-QM-SSA Straight Rigid In-Line 		SI-LS42DMI	SI-LS42DMMI	Actuator Contacts: 2 NC & 1 NO	24V ac/dc	SD025 (Page 596)	
		SI-LS42WMI	SI-LS42WMMI		110V ac/ 230V ac		
		SI-LS42DMI	SI-LS42DMMIF	Solenoid Monitor Contact: 1 NC	24V ac/dc		
		SI-LS42WMI	SI-LS42WMMIF		110V ac/ 230V ac		
SI-QM-SSA Straight Rigid In-Line 		SI-LS42DMJ	SI-LS42DMMJ	Actuator Contacts: 3 NC	24V ac/dc		SD026 (Page 596)
		SI-LS42DMJ	SI-LS42DMMJF	Solenoid Monitor Contact: 1 NC			

 Multi-Directional NC = Normally Closed Contact, NO = Normally Open Contact

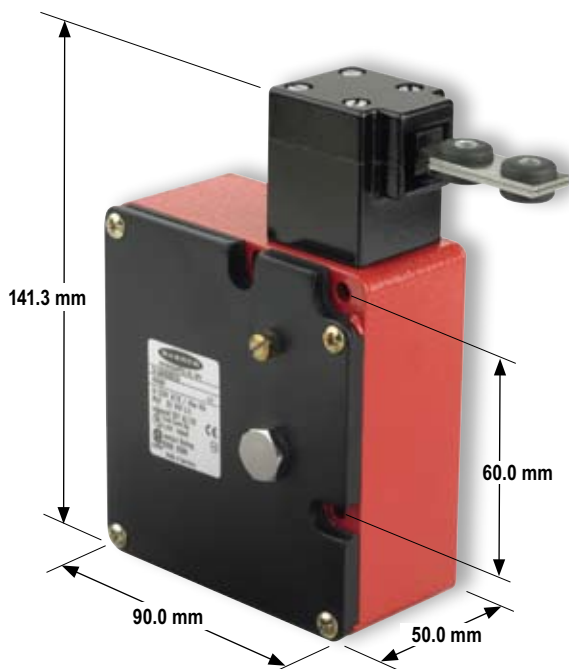
* A kit contains an interlock and actuator. Individual interlocks (without actuator) are for replacement purposes only. Contact factory for integral quick-disconnect (QD) and pigtail QD options.

- Photoelectrics Sensors
- Fiber Optic Sensors
- Special Purpose Sensors
- Measurement & Inspection Sensors
- Vision
- Wireless
- Lighting & Indicators
- Safety Light Screens
- Safety Laser Scanners
- Fiber Optic Safety Systems
- Safety Controllers & Modules
- Safety Two-Hand Control Modules
- Safety Interlock Switches**
- Emergency Stop & Stop Control

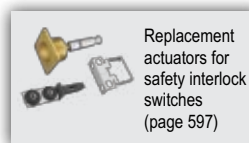
ACCESSORIES
page 597

- INTERLOCK SWITCHES**
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

SI-QM100 Locking Style Switches

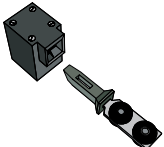


SI-QM100 Models
(shown with rigid in-line actuator)

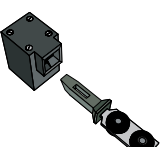



ACCESSORIES
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SI-QM100 Safety Switches, 100 mm - Spring Lock and Solenoid Unlock

		Kits		Contact(s)	Solenoid Voltage	Contact Config. & Switch Diagram
Actuator Type	Interlock	Kit Model*				
SI-QM-SSA Straight Rigid In-Line 	SI-QM100DSG	SI-QM100DMSG	Switching Contacts: 1 NC & 1 NO	24V dc	SD027 (Page 596)	
	SI-QM100ASG	SI-QM100AMSG	Solenoid Monitor Contacts: 1 NC & 1 NO	120V ac		
	SI-QM100DSH	SI-QM100DMSH	Switching Contacts: 2 NC Solenoid Monitor Contacts: 1 NC & 1 NO	24V dc	SD028 (Page 596)	

SI-QM100 Safety Switches, 100 mm - Solenoid Lock and Spring Unlock

		Kits		Contact(s)	Solenoid Voltage	Contact Config. & Switch Diagram
Actuator Type	Interlock	Kit Model*				
SI-QM-SSA Straight Rigid In-Line 	SI-QM100DMG	SI-QM100DMMG	Switching Contacts: 1 NC & 1 NO	24V dc	SD027 (Page 596)	
	SI-QM100AMG	SI-QM100AMMG	Solenoid Monitor Contacts: 1 NC & 1 NO	120V ac		

 Multi-Directional NC = Normally Closed Contact, NO = Normally Open Contact

* A kit contains an interlock and actuator. Individual interlocks (without actuator) are for replacement purposes only.
Contact factory for integral quick-disconnect (QD) and pigtail QD options.

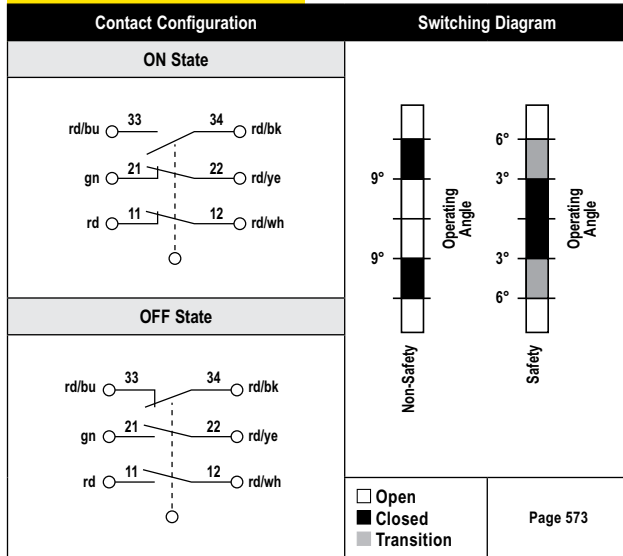
Locking Style Switches Specifications																
Contact Rating	4A @ 250V ac max. 2.5 kV max. transient tolerance NEMA A300 P300															
European Rating	<p>Utilization categories: AC15 and DC13 (IEC 60947-5-1) Switches with 1 & 2 contact pairs: $U_i = 250V$ ac SI-LS42 models: $I_{th} = 2.5$ A SI-QM100 models: $I_{th} = 10$ A</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3">40-60 Hz</th> </tr> <tr> <th>U V</th> <th>I_{θ}/AC-15 A</th> <th>I_{θ}/DC-13 A</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>4</td> <td>3</td> </tr> <tr> <td>110</td> <td>4</td> <td>0.7</td> </tr> <tr> <td>230</td> <td>4</td> <td>0.3</td> </tr> </tbody> </table>	40-60 Hz			U V	I_{θ} /AC-15 A	I_{θ} /DC-13 A	24	4	3	110	4	0.7	230	4	0.3
40-60 Hz																
U V	I_{θ} /AC-15 A	I_{θ} /DC-13 A														
24	4	3														
110	4	0.7														
230	4	0.3														
Contact Material	Silver-nickel alloy															
Solenoid Power Consumption	SI-LS42 models: 1.1 VA / Inrush 12 VA (0.2 sec) SI-QM100 models: 5.2 W															
Maximum Actuator Speed	1.5 m/second															
Mechanical Life	1 million operations															
Minimum Actuator Engagement Radius	Rigid actuator: 400 mm Flexible actuator: 150 mm															
Actuation Extraction Force	SI-LS42 models: 2000 N when locked SI-QM100 models: 1000 N when locked															
Short Circuit Protection	6 amp Slow Blow, 10 amp Fast Blow. Recommended external fusing or overload protection.															
Wire Connections	<p>SI-LS42 models: 10 cage clamp elements 1.5 mm stranded max. / 16 AWG</p> <p>SI-QM100 models: Screw terminals with pressure plates accept the following wire sizes – 16 AWG (1.5 mm²) max. solid; 14 AWG (2.5 mm²) max. stranded, 18 AWG (1 mm²) when using all 11 terminals</p>															
Cable Entry	M20 x 1.5 threaded entrance Adapter supplied to convert M20 x 1.5 to 1/2" - 14 NPT threaded entrance															
Construction	SI-LS42 models: Glass fiber-reinforced polyamide thermoplastic housing; UL 94-V0 rating SI-QM100 models: Aluminum die cast															
Environmental Rating	IP67															
Operating Conditions	<p>Temperature: SI-LS42 models: -30° to +70° C SI-QM100 models: -30° to +60° C</p>															
Weight	SI-LS42 models: 0.3 kg SI-QM100 models: 0.81 kg															
Application Notes	When rotating the actuator head, the actuator MUST BE FULLY ENGAGED . When using a model with solenoid locking, the lock mechanism will disengage upon solenoid power failure.															
Certifications																
Contact Configuration and Switching Diagrams	SI-LS42 models: SD023, SD024, SD025 & SD026 (pp. 595-596) SI-QM100 models: SD027 and SD028 (p. 596)															

Photoelectrics
Sensors
Fiber Optic
Sensors
Special Purpose
Sensors
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Indicators
Safety
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Safety
Laser Scanners
Fiber Optic
Safety Systems
Safety Controllers &
Modules
Safety Two-Hand
Control Modules
**Safety Interlock
Switches**
Emergency Stop &
Stop Control

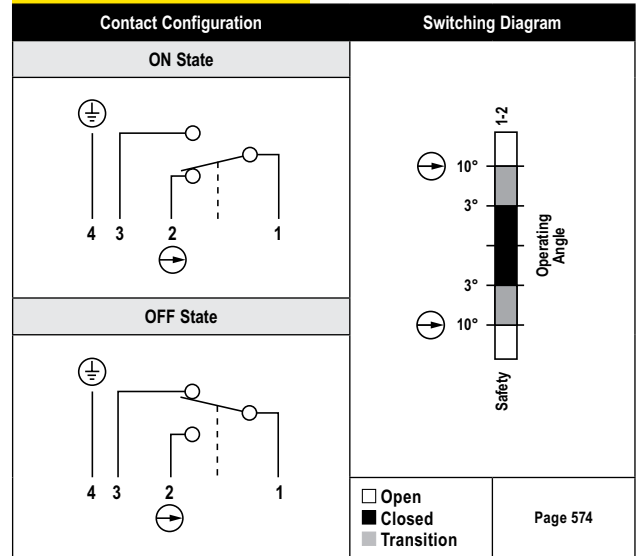
**INTERLOCK
SWITCHES**
FIBER OPTIC
MAGNET
HINGE
COMPACT PLASTIC
COMPACT METAL
LOCKING STYLE

Contact/Switching Diagrams

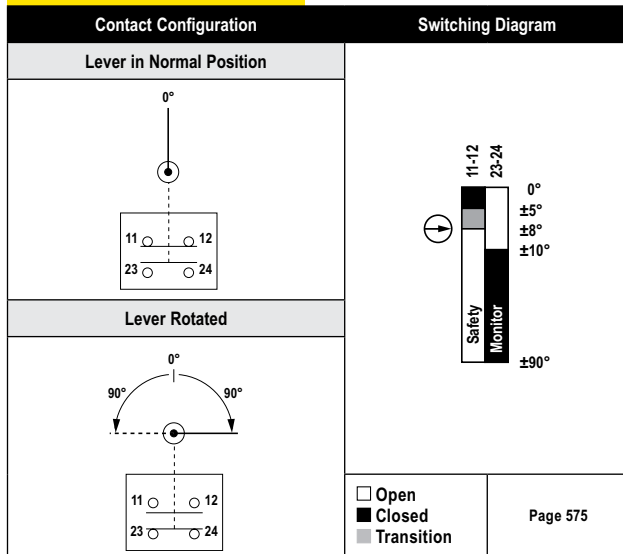
SD001 - SI-HG63 Series



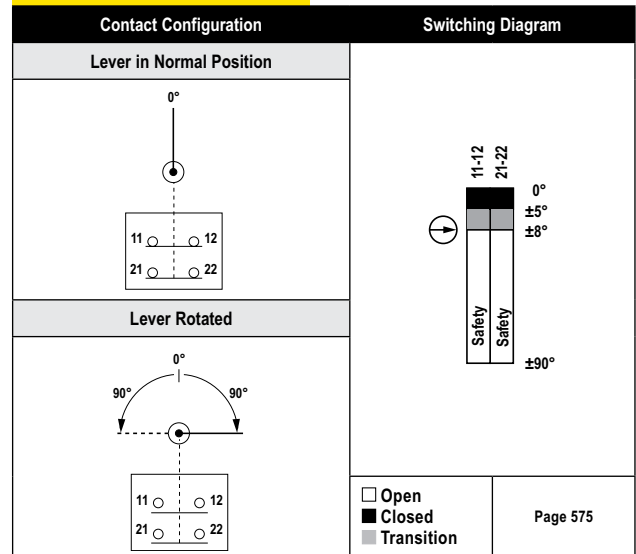
SD002 - SI-HG80 Series



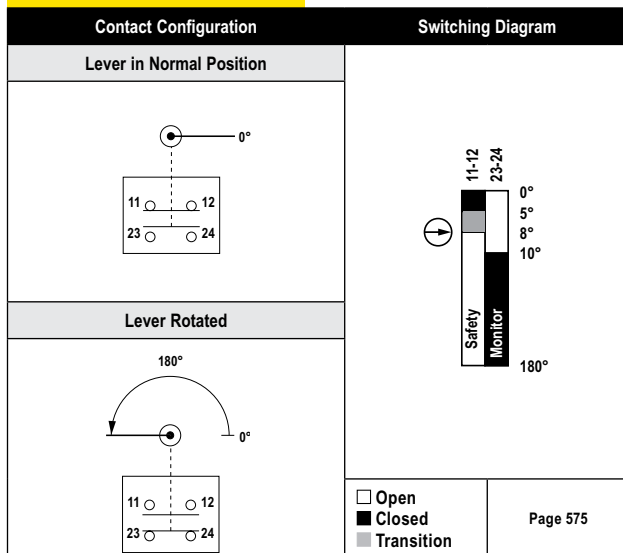
SD003 - SI-LS31HGD Series



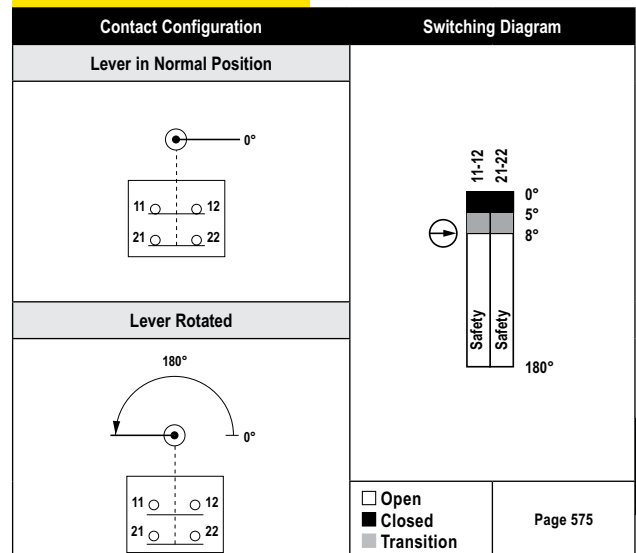
SD004 - SI-LS31HGE Series



SD005 - SI-LS31HGRD Series

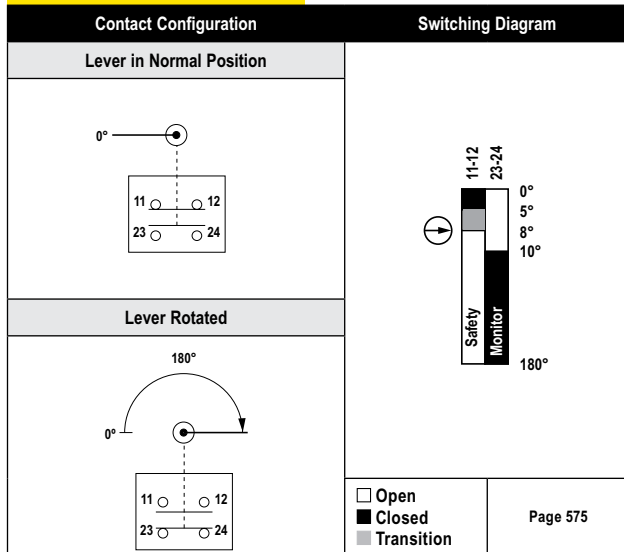


SD006 - SI-LS31HGRC Series

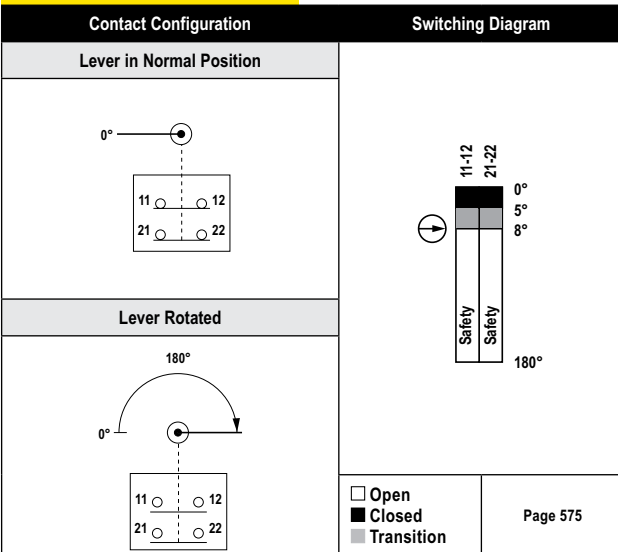


Contact/Switching Diagrams

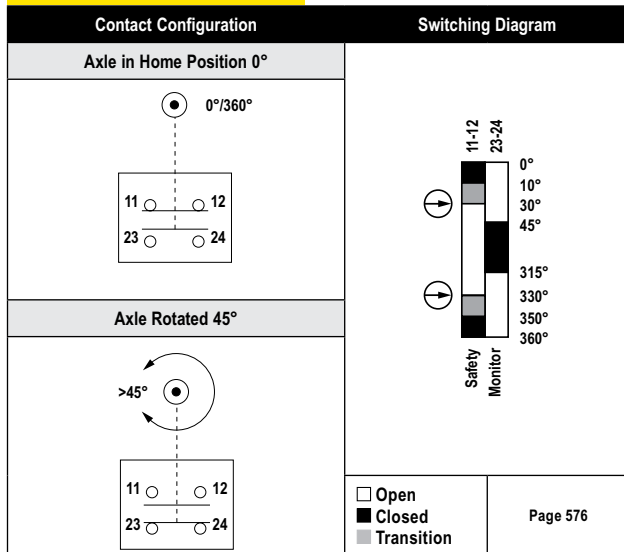
SD007 - SI-LS31HGLD Series



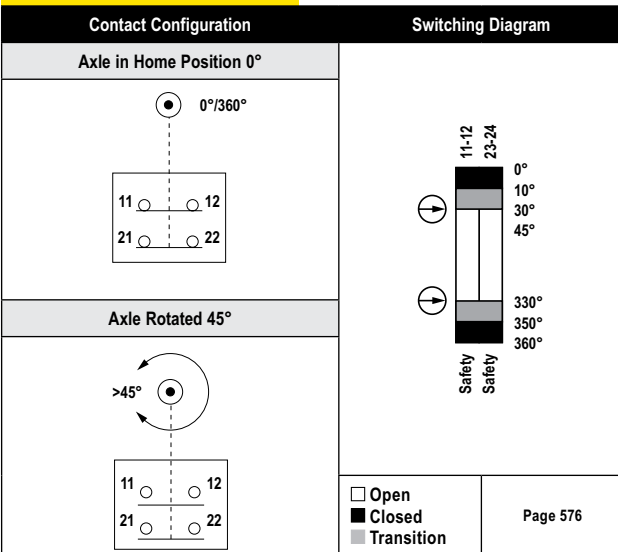
SD008 - SI-LS31HGLE Series



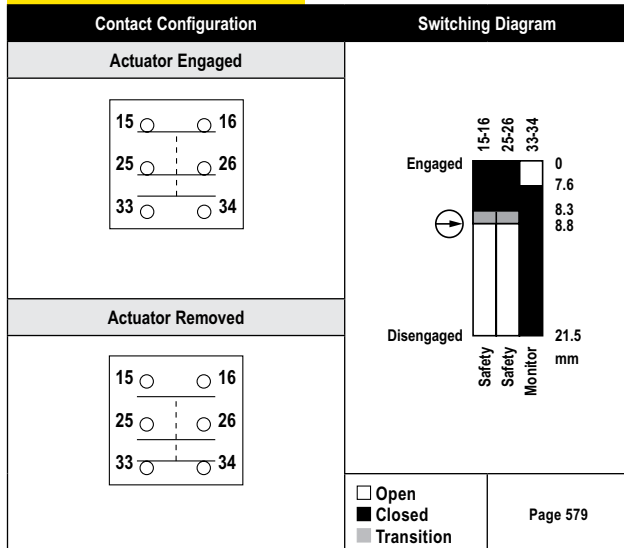
SD009 - SI-LS31RTD Series



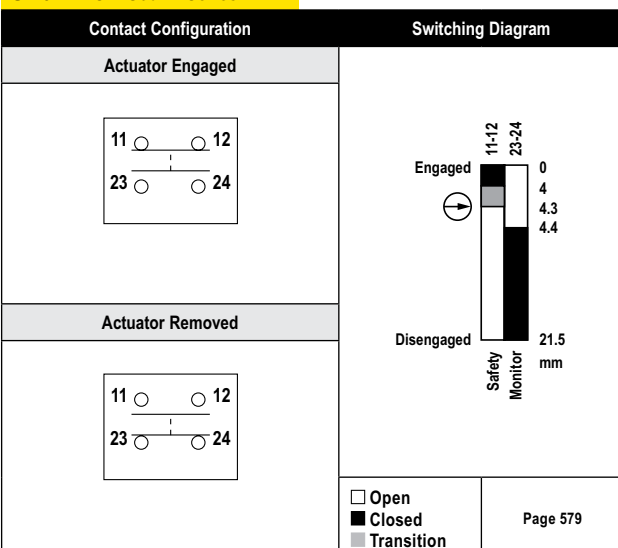
SD010 - SI-LS31RTE Series



SD011 - SI-LS100 Series



SD012 - SI-LS83..D Series



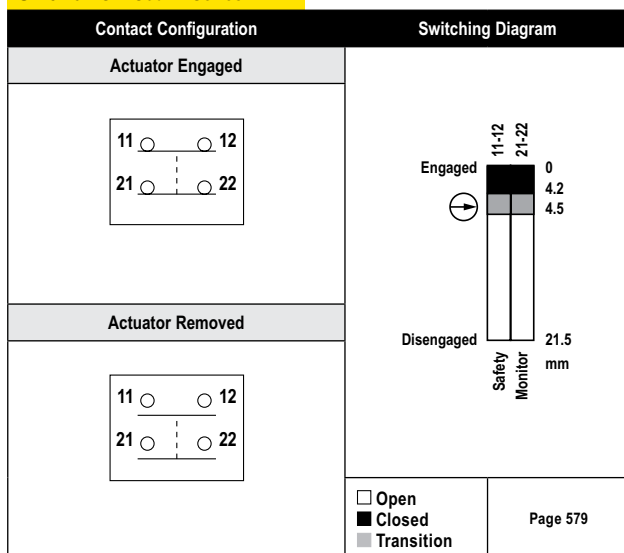
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- Photoelectrics
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- Fiber Optic
- Sensors
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- Measurement &
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- Vision
- Wireless
- Lighting &
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- Safety
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- Fiber Optic
- Safety Systems
- Safety Controllers &
- Modules
- Safety Two-Hand
- Control Modules
- Safety Interlock**
- Switches**
- Emergency Stop &
- Stop Control

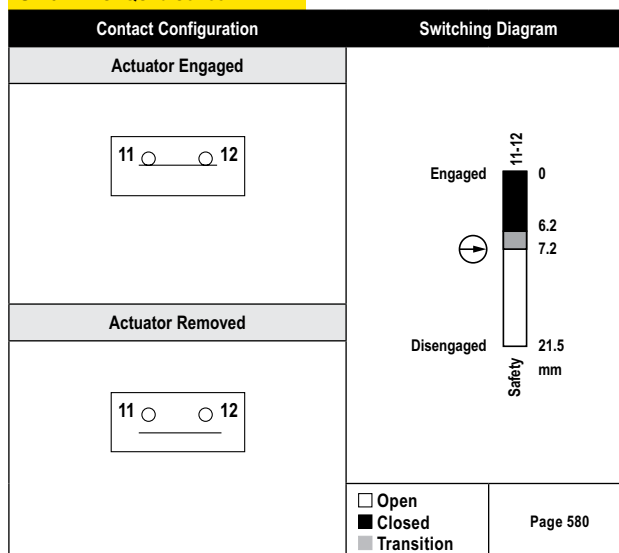
- INTERLOCK**
- SWITCHES**
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

Contact/Switching Diagrams

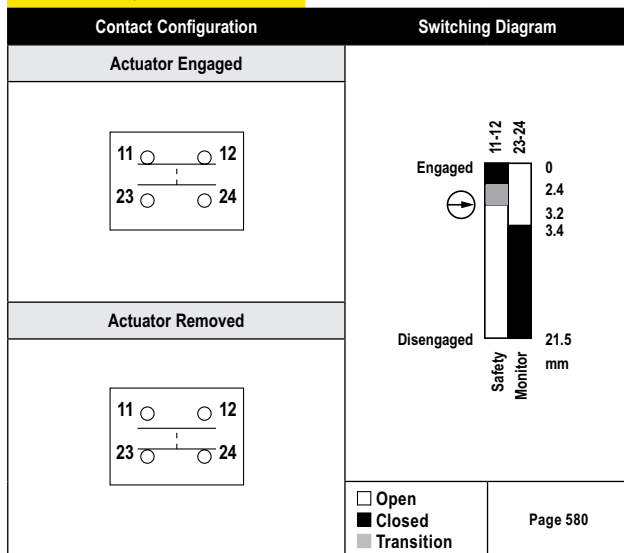
SD013 - SI-LS83..E Series



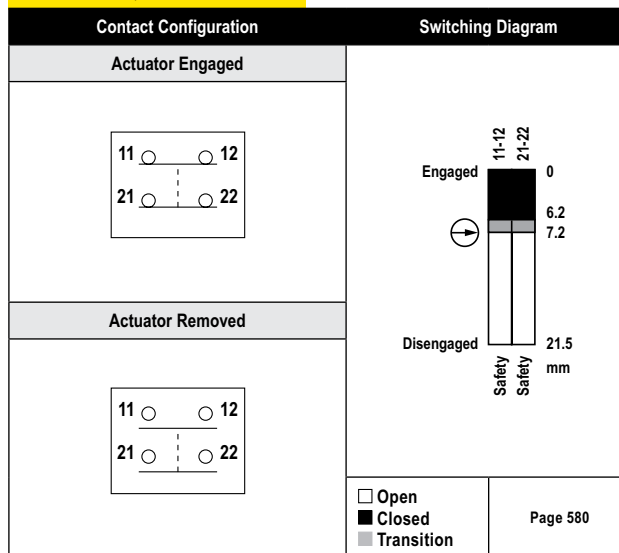
SD014 - SI-QS75 Series



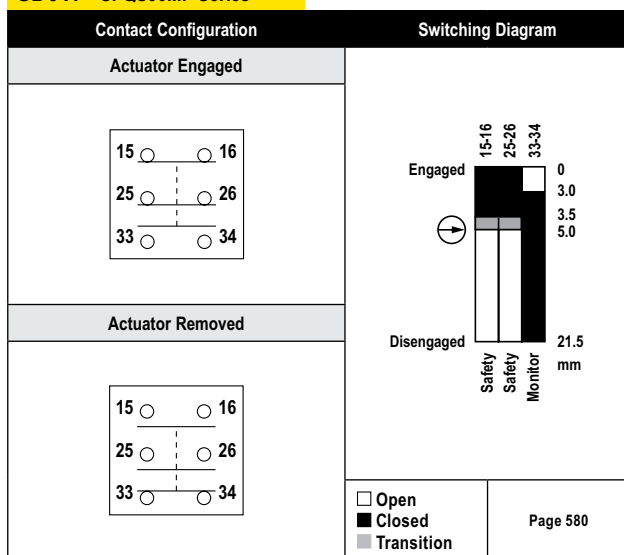
SD015 - SI-QS90MD Series



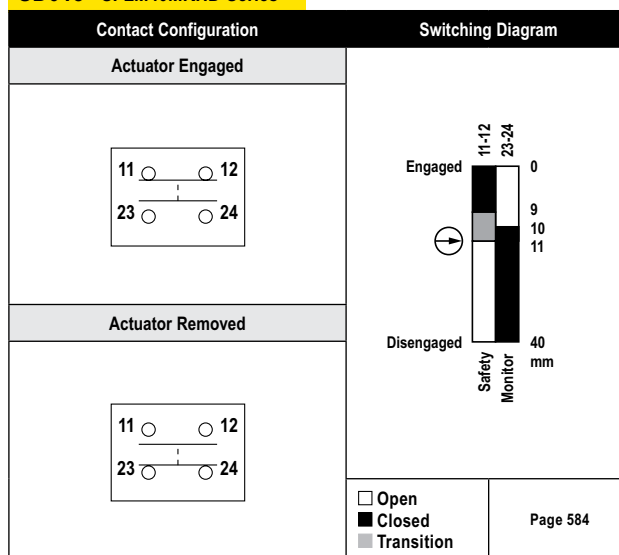
SD016 - SI-QS90ME Series



SD017 - SI-QS90MF Series

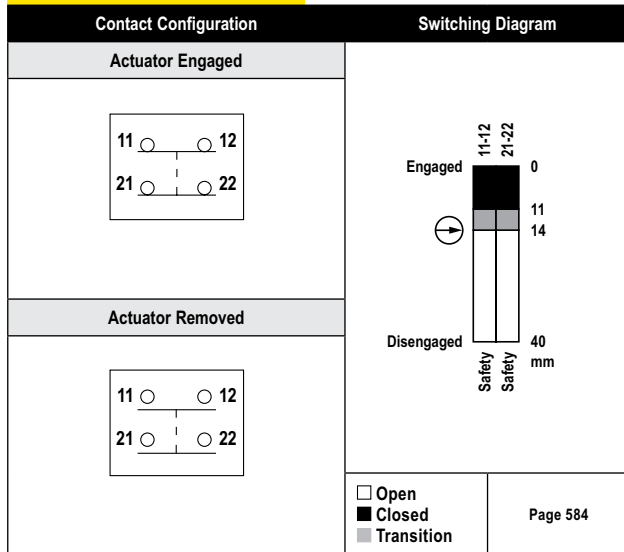


SD018 - SI-LM40MKHD Series

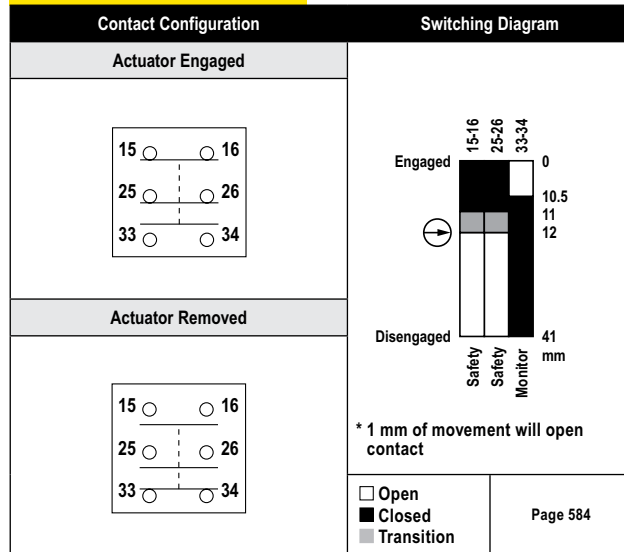


Contact/Switching Diagrams

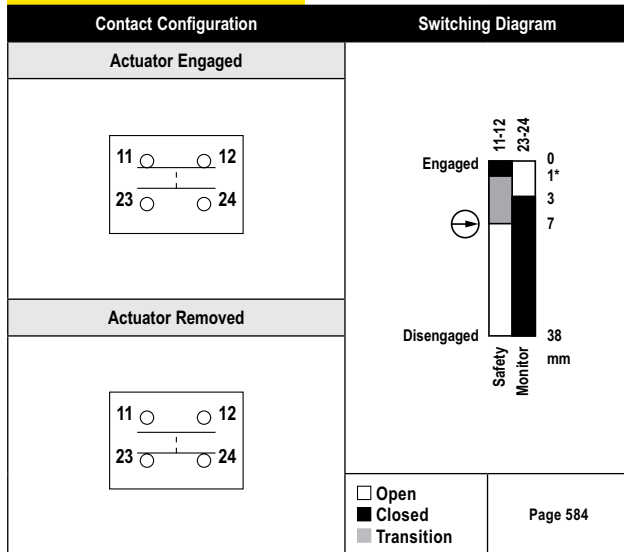
SD019 - SI-LM40MKHE Series



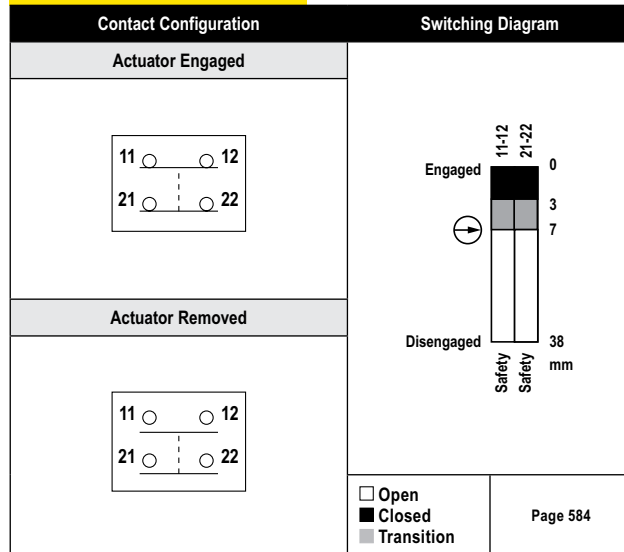
SD020 - SI-LM40MKHF Series



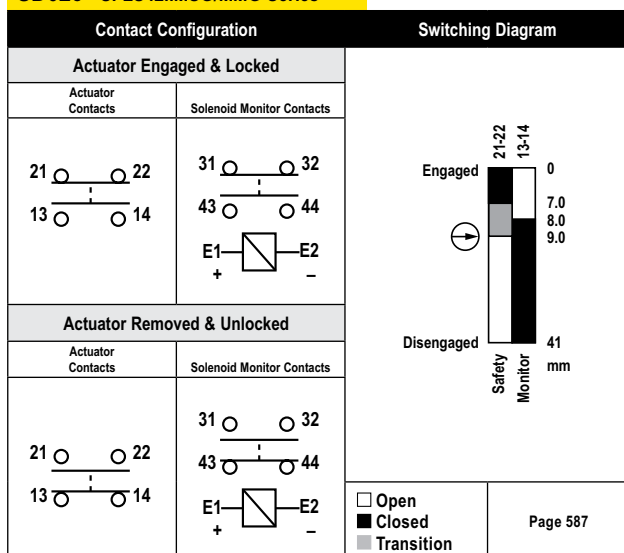
SD021 - SI-LM40MKVD Series



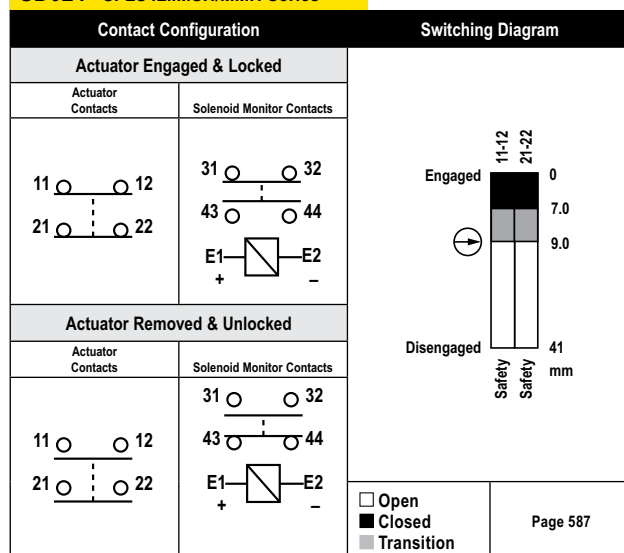
SD022 - SI-LM40MKVE Series



SD023 - SI-LS42..MSG/MMG Series



SD024 - SI-LS42..MSH/MMH Series



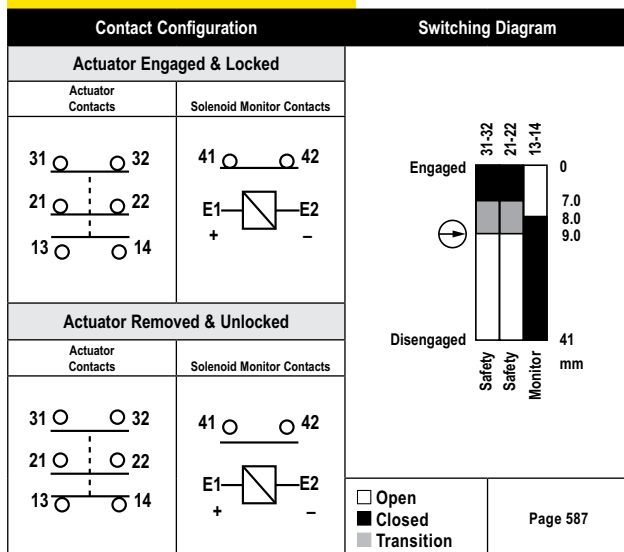
- Photoelectrics
- Sensors
- Fiber Optic
- Sensors
- Special Purpose
- Sensors
- Measurement &
- Inspection Sensors
- Wireless
- Lighting &
- Indicators
- Safety
- Light Screens
- Safety
- Laser Scanners
- Fiber Optic
- Safety Systems
- Safety Controllers &
- Modules
- Safety Two-Hand
- Control Modules
- Safety Interlock**
- Switches**
- Emergency Stop &
- Stop Control

- INTERLOCK**
- SWITCHES**
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

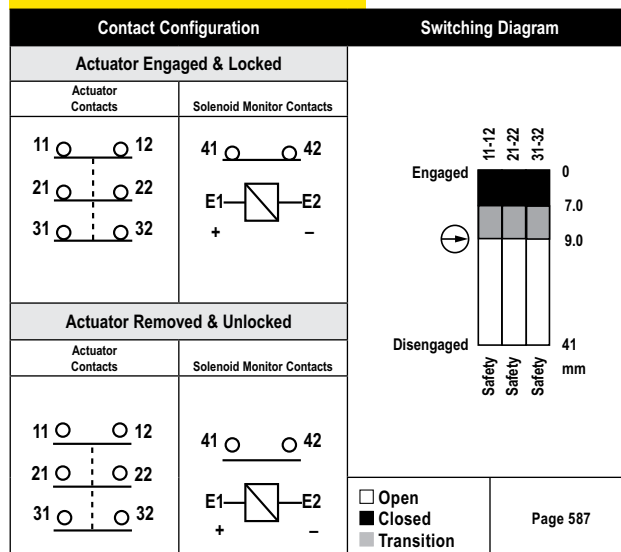


Contact/Switching Diagrams

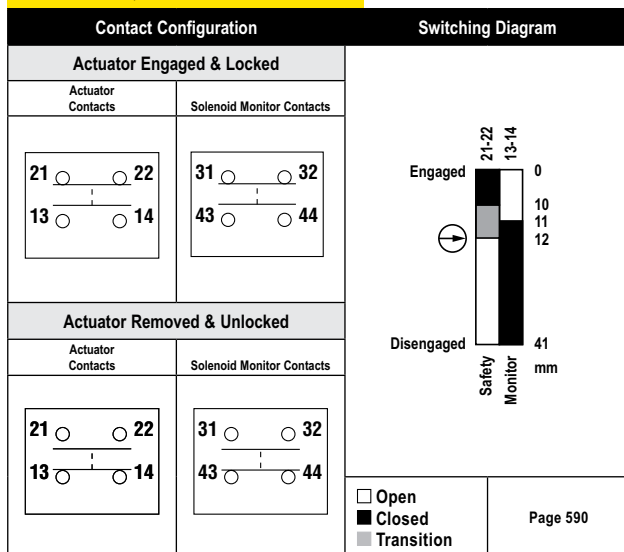
SD025 - SI-LS42...MSI/MMI Series



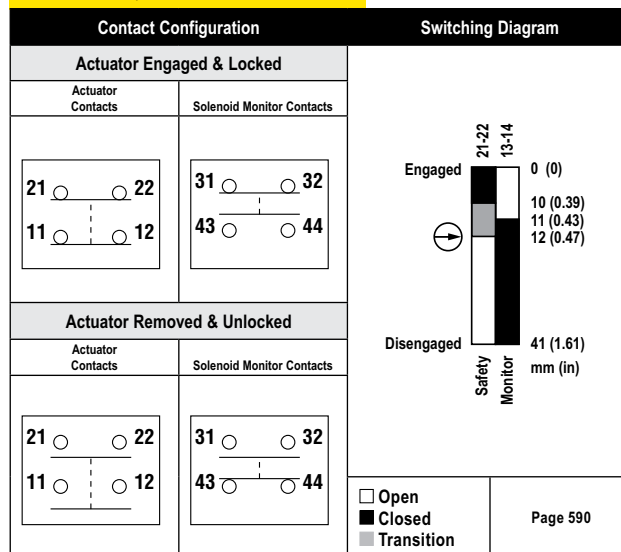
SD026 - SI-LS42...MSJ/MMJ Series













SD027 - SI-QM100...MSG/MMG Series



SD028 - SI-QM100...DMSH Series



Replacement Actuators Parts for Safety Interlock Switches

Description		Used With	Model	Description		Used With	Model
	Flexible in-line, trumpet-style, metal actuator used for doors or covers where alignment is difficult to maintain. Flexes in all directions. Minimum engagement radius for hinged closures is 150 mm.	• SI-LM40MKV	SI-QM-90A		Rigid in-line metal (die-cast steel) actuator for doors or covers with a radius of 150 mm or greater.	• SI-QS75 (high-force) • SI-QS90 (high-force)	SI-QS-SSA
	Rigid in-line metal actuator used for doors or covers. Slide-bolt design for use in heavy-duty applications where alignment is difficult to maintain.	• SI-LM40MKH • SI-LS42 • SI-QM100	SI-QM-SB		Rigid in-line metal (stamped stainless steel) actuator used for doors or covers with accurate alignment, such as sliding doors. Minimum engagement radius for hinged closures is 150 mm.	• SI-LS83 • SI-LS100	SI-QS-SSA-2
	Flexible in-line metal actuator used for doors or covers where alignment is difficult to maintain. Flexes in all directions. Minimum engagement radius for hinged closures is 150 mm.	• SI-LM40MKH • SI-LS42 • SI-QM100	SI-QM-SMFA		Rigid in-line metal (stamped stainless steel) actuator used for doors or covers with accurate alignment, such as sliding doors. Right-angle mounting flange. Minimum engagement radius for hinged closures is 150 mm.	• SI-LS83 • SI-LS100	SI-QS-SSA-3
	Rigid in-line metal actuator used for doors or covers with accurate alignment, such as sliding doors. Minimum engagement radius for hinged closures is 400 mm.	• SI-LM40MKH • SI-LS42 • SI-QM100	SI-QM-SSA		Rigid in-line metal (stamped stainless steel) actuator for doors or covers with a radius of 150 mm or greater.	• SI-QS75 • SI-QS90	SI-QS-SSA-4
	High-extraction-force adapter for particularly heavy or large doors. Adjustable from 50 to 100 Newtons (force). Used only for switches with in-line actuator SI-QS-SSA.	• SI-QS75 • SI-QS90	SI-QS-100		Flexible in-line metal (die-cast steel) actuator for hinged doors with a radius of 50 mm or greater. Flexes in all directions. Minimum engagement radius for hinged closures is 150 mm.	• SI-LS83 • SI-LS100 • SI-QS75 • SI-QS90	SI-QS-SSU
Replacement terminal cover		• SI-LS42	SI-LS42-COVER				
Tamper Proof Screw (One way)		• SI-LS42	SI-LS42-SCREW OW				

- Photoelectrics Sensors
- Fiber Optic Sensors
- Special Purpose Sensors
- Measurement & Inspection Sensors
- Vision
- Wireless
- Lighting & Indicators
- Safety Light Screens
- Safety Laser Scanners
- Fiber Optic Safety Systems
- Safety Controllers & Modules
- Safety Two-Hand Control Modules
- Safety Interlock Switches**
- Emergency Stop & Stop Control

- INTERLOCK SWITCHES**
- FIBER OPTIC
- MAGNET
- HINGE
- COMPACT PLASTIC
- COMPACT METAL
- LOCKING STYLE

Safety Interlock Switches Replacement Parts

Used In	Description	Model*
SI-LM40MKH..D kits	Individual Interlock (without actuator)	SI-LM40KHD
SI-LM40MKH..E kits		SI-LM40KHE
SI-LM40MKH..F kits		SI-LM40KHF
SI-LM40MKVD kit		SI-LM40KVD
SI-LM40MKVE kit		SI-LM40KVE
SI-LS42MSG.. kits		SI-LS42DSG
SI-LS42WMSG.. kits		SI-LS42WSG
SI-LS42DMSH.. kits		SI-LS42DSH
SI-LS42WMSH.. kits		SI-LS42WSH
SI-LS42DMSI.. kits		SI-LS42DSI
SI-LS42WMSI.. kits		SI-LS42WSI
SI-LS42DMSJ.. kits		SI-LS42DSJ
SI-LS42DMMG.. kits		SI-LS42DMG
SI-LS42WMMG.. kits		SI-LS42WMMG
SI-LS42DMMH.. kits		SI-LS42DMH
SI-LS42WMMH.. kits		SI-LS42WMH
SI-LS42DMMI.. kits		SI-LS42DMI
SI-LS42WMMI.. kits		SI-LS42WMI
SI-LS42DMMJ.. kits		SI-LS42DMJ
SI-LS100..F kits		SI-LS100F
SI-LS83..D kits		SI-LS83D
SI-LS83..E kits		SI-LS83E
SI-QM100DMSG kit		SI-QM100DSG
SI-QM100AMSG kit		SI-QM100ASG
SI-QM100DMMG kit		SI-QM100DMG
SI-QM100AMMG kit		SI-QM100AMG
SI-QS75..C kits		SI-QS75C
SI-QS90..D kits		SI-QS90D
SI-QS90..E kits		SI-QS90E
SI-QS90..F kits		SI-QS90F

* Kits with one safety interlock switch and an actuator are available (see pp. 578-590).