






## WARNING . . .

Spare actuators must NEVER be used to bypass or otherwise defeat the protective function of a safety switch. To do so may create an unsafe situation which could lead to serious injury or death.



## Features

-  Positive opening safety contacts (IEC 60947-5-1) (not dependent upon springs)
-  Insulated device (IEC 60947-5-1)
- Choice of two locking mechanism types:
  - Spring lock with energized solenoid release
  - Energized solenoid lock with spring unlock
- Two solenoid voltages available:
  - 24V ac/dc
  - 24 to 48V dc or 24 to 230V ac
- Choose either of two stainless steel actuator types:
  - Rigid in-line
  - Flexible in-line
- Actuator head rotatable in 90° increments and can be positioned for either horizontal or vertical actuation
- Choice of four switching contact configurations (with actuator engaged):
  - 1 normally-open plus 1 normally-closed
  - 2 normally-closed
  - 2 normally-closed plus 1 normally-open
  - 3 normally-closed

NOTE:  This symbol is used in the switching diagrams to identify the point in actuator travel where the normally closed safety contact is fully open.

# Machine Safety Switches – SI-LS42 Series Locking Style Switch



## Important Information Regarding the Use of Safety Switches

In the United States, the functions that Banner safety switches are intended to perform are regulated by the Occupational Safety and Health Administration (OSHA). Whether or not any particular safety switch installation meets all applicable OSHA requirements depends upon factors that are beyond the control of Banner Engineering Corp. These factors include the details of how the safety switches are applied, installed, wired, operated, and maintained.

Banner Engineering Corp. has attempted to provide complete application, installation, operation, and maintenance instructions. This information is found in the instruction manual packaged with each safety switch. In addition, we suggest that any questions regarding the use or installation of safety switches be directed to the factory applications department at the telephone numbers or address shown below.

Banner Engineering Corp. recommends that safety switches be applied according to the guidelines set forth in international (ISO/IEC) standards listed below. Specifically, Banner Engineering Corp. recommends application of these safety switches in a configuration which meets safety category 4, per ISO 13849 (EN954-1).

In addition, the user of Banner safety switches has the responsibility to ensure that all local, state, and national laws, rules, codes, and regulations relating to the use of Banner safety switches in any particular application are satisfied. Extreme care is urged that all legal requirements have been met and that all installations and maintenance instructions are followed.

### Application Assistance

**Toll Free:** 1-888-3-SENSOR (1-888-373-6767)  
**Email:** sensors@bannerengineering.com  
**Address:** 9714 Tenth Avenue North  
Minneapolis, MN 55441

### U.S. Regulations Applicable to Use of Banner Safety Switches

OSHA Code of Federal Regulations: Title 29, Parts 1900 to 1910

Available from: Superintendent of Documents  
Government Printing Office  
P.O. Box 371954  
Pittsburgh, PA 15250-7954  
Tel: 202-512-1800

### U.S. Standards Applicable to Use of Banner Safety Switches

ANSI B11 Standards for Construction, Care, and Use of Machine Tools”  
Available from: Safety Director  
AMT—The Association for Manufacturing Technology  
7901 Westpark Drive  
McLean, VA 22102  
Tel: 703-893-2900

### Applicable European and International Standards

ISO/TR 12100-1/-2 “Safety of Machinery—Basic Concepts, General Principles for Design”  
(EN292-1/-2)  
ISO 13852 (EN 294) “Safety of Machinery—Safety Distances to Prevent Danger Zones Being Reached by the Upper Limbs”  
ISO 13853 (EN 811) “Safety of Machinery—Safety Distances to Prevent Danger Zones Being Reached by the Lower Limbs”  
ISO 13849-1 (EN 954-1) “Safety of Machinery—Safety Related Parts of Control Systems”  
ISO 13855 (EN 999) “Safety of Machinery—The Positioning of Protective Equipment in Respect to Approach Speeds of Parts of the Human Body”  
ISO 14119 (EN 1088) “Safety of Machinery—Interlocking Devices Associated with Guards—Principles for Design and Selection”  
IEC/EN 60204-1 “Safety of Machinery—Electrical Equipment of Machines”  
IEC/EN 60947-5-1 “Low Voltage Switchgear—Electromechanical Control Circuit Devices”  
Available from: Global Engineering Documents  
15 Inverness Way East  
Englewood, CO 80112-5704  
Phone: 1-800-854-7179  
Fax: 303-397-2740

# Machine Safety Switches – SI-LS42 Series Locking Style Switch

## Models

For the following models, the actuator is mechanically locked when it is fully inserted into the actuator head. The actuator is unlocked by applying voltage to the solenoid.

Kit Model†	Solenoid Voltage	Actuator Type†	Interlock Body†	Contact Configuration (Actuator Engaged and Locked)	Contact Configuration (Actuator Unlocked and Removed)	Switching Diagram*
SI-LS42DMSG	24V ac/dc	SI-QM-SSA Rigid In-Line	SI-LS42DSG	Actuator Contacts 21 ○ — ○ 22 13 ○ — ○ 14	Actuator Contacts 21 ○ — ○ 22 13 ○ — ○ 14	
SI-LS42UMSG	24-48V dc 24-230V ac		SI-LS42USG	Solenoid Monitor Contacts 31 ○ — ○ 32 43 ○ — ○ 44 E1 — E2 + — -	Solenoid Monitor Contacts 31 ○ — ○ 32 43 ○ — ○ 44 E1 — E2 + — -	
SI-LS42DMSGF	24V ac/dc	SI-QM-SMFA Flexible In-Line	SI-LS42DSG	Actuator Contacts 11 ○ — ○ 12 21 ○ — ○ 22	Actuator Contacts 11 ○ — ○ 12 21 ○ — ○ 22	
SI-LS42UMSGF	24-48V dc 24-230V ac		SI-LS42USG	Solenoid Monitor Contacts 31 ○ — ○ 32 43 ○ — ○ 44 E1 — E2 + — -	Solenoid Monitor Contacts 31 ○ — ○ 32 43 ○ — ○ 44 E1 — E2 + — -	
SI-LS42DMSH	24V ac/dc	SI-QM-SSA Rigid In-Line	SI-LS42DSH	Actuator Contacts 11 ○ — ○ 12 21 ○ — ○ 22	Actuator Contacts 11 ○ — ○ 12 21 ○ — ○ 22	
SI-LS42UMSH	24-48V dc 24-230V ac		SI-LS42USH	Solenoid Monitor Contacts 31 ○ — ○ 32 43 ○ — ○ 44 E1 — E2 + — -	Solenoid Monitor Contacts 31 ○ — ○ 32 43 ○ — ○ 44 E1 — E2 + — -	
SI-LS42DMSHF	24V ac/dc	SI-QM-SMFA Flexible In-Line	SI-LS42DSH	Actuator Contacts 31 ○ — ○ 32 21 ○ — ○ 22 13 ○ — ○ 14	Actuator Contacts 31 ○ — ○ 32 21 ○ — ○ 22 13 ○ — ○ 14	
SI-LS42UMSHF	24-48V dc 24-230V ac		SI-LS42USH	Solenoid Monitor Contacts 41 ○ — ○ 42 E1 — E2 + — -	Solenoid Monitor Contacts 41 ○ — ○ 42 E1 — E2 + — -	
SI-LS42DMSI	24V ac/dc	SI-QM-SSA Rigid In-Line	SI-LS42DSI	Actuator Contacts 31 ○ — ○ 32 21 ○ — ○ 22 13 ○ — ○ 14	Actuator Contacts 31 ○ — ○ 32 21 ○ — ○ 22 13 ○ — ○ 14	
SI-LS42UMSI	24-48V dc 24-230V ac		SI-LS42USI	Solenoid Monitor Contacts 41 ○ — ○ 42 E1 — E2 + — -	Solenoid Monitor Contacts 41 ○ — ○ 42 E1 — E2 + — -	
SI-LS42DMSIF	24V ac/dc	SI-QM-SMFA Flexible In-Line	SI-LS42DSI	Actuator Contacts 11 ○ — ○ 12 21 ○ — ○ 22 31 ○ — ○ 32	Actuator Contacts 11 ○ — ○ 12 21 ○ — ○ 22 31 ○ — ○ 32	
SI-LS42UMSIF	24-48V dc 24-230V ac		SI-LS42USI	Solenoid Monitor Contacts 41 ○ — ○ 42 E1 — E2 + — -	Solenoid Monitor Contacts 41 ○ — ○ 42 E1 — E2 + — -	
SI-LS42DMSJ	24V ac/dc	SI-QM-SSA Rigid In-Line	SI-LS42DSJ	Actuator Contacts 11 ○ — ○ 12 21 ○ — ○ 22 31 ○ — ○ 32	Actuator Contacts 11 ○ — ○ 12 21 ○ — ○ 22 31 ○ — ○ 32	
SI-LS42DMSJF		SI-QM-SMFA Flexible In-Line		Solenoid Monitor Contacts 41 ○ — ○ 42 E1 — E2 + — -	Solenoid Monitor Contacts 41 ○ — ○ 42 E1 — E2 + — -	

† A kit contains an interlock and actuator. Individual interlock bodies and actuators are for replacement purposes only. See Warning on page 12.

\*Contacts: □ Open ■ Closed ▒ Transition

# Machine Safety Switches – SI-LS42 Series Locking Style Switch

## Models

For the following models, the fully inserted actuator is locked when voltage is applied to the solenoid. The actuator is unlocked when voltage is removed from the solenoid.




Kit Model†	Solenoid Voltage	Actuator Type†	Interlock Body†	Contact Configuration (Actuator Engaged and Locked)	Contact Configuration (Actuator Unlocked and Removed)	Switching Diagram*
SI-LS42DMMG	24V ac/dc	SI-QM-SSA Rigid In-Line	SI-LS42DMG	Actuator Contacts 21 ○ ○ 22 13 ○ ○ 14	Actuator Contacts 21 ○ ○ 22 13 ○ ○ 14	
SI-LS42UMMG	24-48V dc 24-230V ac		SI-LS42UMG			
SI-LS42DMMGF	24V ac/dc	SI-QM-SMFA Flexible In-Line	SI-LS42DMG	Solenoid Monitor Contacts 31 ○ ○ 32 43 ○ ○ 44 E1- E2 + -	Solenoid Monitor Contacts 31 ○ ○ 32 43 ○ ○ 44 E1- E2 + -	
SI-LS42UMMGF	24-48V dc 24-230V ac		SI-LS42UMG			
SI-LS42DMMH	24V ac/dc	SI-QM-SSA Rigid In-Line	SI-LS42DMH	Actuator Contacts 11 ○ ○ 12 21 ○ ○ 22	Actuator Contacts 11 ○ ○ 12 21 ○ ○ 22	
SI-LS42UMMH	24-48V dc 24-230V ac		SI-LS42UMH			
SI-LS42DMMHF	24V ac/dc	SI-QM-SMFA Flexible In-Line	SI-LS42DMH	Solenoid Monitor Contacts 31 ○ ○ 32 43 ○ ○ 44 E1- E2 + -	Solenoid Monitor Contacts 31 ○ ○ 32 43 ○ ○ 44 E1- E2 + -	
SI-LS42UMMHF	24-48V dc 24-230V ac		SI-LS42UMH			
SI-LS42DMMI	24V ac/dc	SI-QM-SSA Rigid In-Line	SI-LS42DMI	Actuator Contacts 31 ○ ○ 32 21 ○ ○ 22 13 ○ ○ 14	Actuator Contacts 31 ○ ○ 32 21 ○ ○ 22 13 ○ ○ 14	
SI-LS42UMMI	24-48V dc 24-230V ac		SI-LS42UMI			
SI-LS42DMMIF	24V ac/dc	SI-QM-SMFA Flexible In-Line	SI-LS42DMI	Solenoid Monitor Contacts 41 ○ ○ 42 E1- E2 + -	Solenoid Monitor Contacts 41 ○ ○ 42 E1- E2 + -	
SI-LS42UMMIF	24-48V dc 24-230V ac		SI-LS42UMI			
SI-LS42DMMJ	24V ac/dc	SI-QM-SSA Rigid In-Line	SI-LS42DMJ	Actuator Contacts 11 ○ ○ 12 21 ○ ○ 22 31 ○ ○ 32	Actuator Contacts 11 ○ ○ 12 21 ○ ○ 22 31 ○ ○ 32	
SI-LS42DMMJF		SI-QM-SMFA Flexible In-Line		Solenoid Monitor Contacts 41 ○ ○ 42 E1- E2 + -	Solenoid Monitor Contacts 41 ○ ○ 42 E1- E2 + -	

† A kit contains an interlock and actuator. Individual interlock bodies and actuators are for replacement purposes only. See Warning on page 12.

\*Contacts: □ Open ■ Closed ▒ Transition

# Machine Safety Switches – SI-LS42 Series Locking Style Switch

## Specifications

<b>Contact Rating</b>	4A @ 250V ac max. 2.5 kV max. transient tolerance NEMA A300 P300														
<b>European Rating</b>	<b>Utilization categories:</b> AC15 and DC13 (IEC 60947-5-1)  <b>Switches with 1 and 2 contact pairs:</b> $U_i = 250V$ ac $I_{th} = 2.5A$		40-60 Hz <table border="1"> <thead> <tr> <th><math>U_e</math> V</th> <th><math>I_e/AC-15</math> A</th> <th><math>I_e/DC-13</math> A</th> </tr> </thead> <tbody> <tr> <td>24</td> <td>4</td> <td>3</td> </tr> <tr> <td>110</td> <td>4</td> <td>0.77</td> </tr> <tr> <td>230</td> <td>4</td> <td>0.3</td> </tr> </tbody> </table>	$U_e$ V	$I_e/AC-15$ A	$I_e/DC-13$ A	24	4	3	110	4	0.77	230	4	0.3
$U_e$ V	$I_e/AC-15$ A	$I_e/DC-13$ A													
24	4	3													
110	4	0.77													
230	4	0.3													
<b>Contact Material</b>	Silver-nickel alloy														
<b>Solenoid Power Consumption</b>	1.1 VA / Inrush 56 VA (0.2 sec)														
<b>Maximum Actuator Speed</b>	1.5 m/second (5'/second)														
<b>Minimum Actuator Engagement Radius</b>	<b>In-line actuators:</b> 400 mm (16") <b>Flexible actuators:</b> 150 mm (6")														
<b>Actuator Extraction Force</b>	2000 Newtons (440 lbf) when locked														
<b>Short Circuit Protection</b>	6 amp Slow Blow, 10 amp Fast Blow. Recommended external fusing or overload protection.														
<b>Mechanical Life</b>	1 million operations														
<b>Wire Connections</b>	10 cage clamp elements 1.5 mm stranded max. / 16 AWG														
<b>Cable Entry</b>	M20 x 1.5 threaded entrance. Adapter supplied to convert M20 x 1.5 to 1/2" - 14 NPT threaded entrance.														
<b>Construction</b>	Glass fiber-reinforced polyimide thermoplastic housing; UL 94-V0 rating														
<b>Environmental Rating</b>	IEC IP67														
<b>Operating Conditions</b>	<b>Temperature:</b> -30° to +70° C (-22° to +158° F)														
<b>Weight</b>	0.3 kg														
<b>Certifications</b>	  														

# Machine Safety Switches – SI-LS42 Series Locking Style Switch

## Dimensions

Model SI-LS42.. Interlock Body

