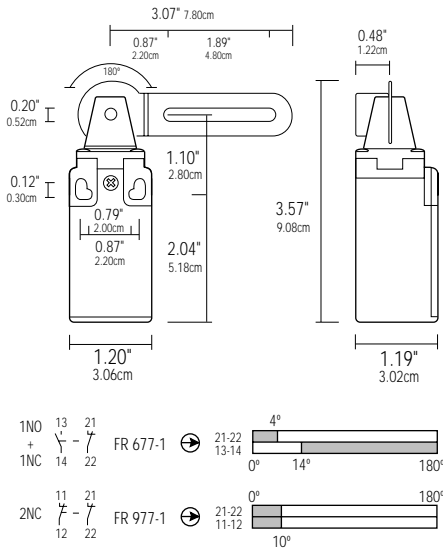


FD 677-1

Slotted-Lever Safety Switches



FR 677-1 / FR 977-1



DESCRIPTION

Sentrol Industrial Slotted-Lever Operated Safety Switches utilize a rotating slotted lever to provide a positive means of turning the control power off should an access panel, door, gate, guard, etc. be rotated open during machine operation.

The switch slotted lever is designed to use the opening force of the door to rotate the safety switch operating shaft. The slotted lever shaft allows the switch to be mounted away from the hinge point of the door minimizing door/switch alignment problems. When the door is rotated open, a follower (not furnished) slides down the slot in the lever arm rotating the lever arm to the “open” position and the normally closed contacts in the safety switch are mechanically forced open turning off the control power in the machine—disabling the machine. Since the safety switch contacts can only be closed when the shaft is rotated to the closed position, the machine cannot be re-started until the access panel, door, gate, guard, etc. is closed.

General Specifications

Enclosure Glass-reinforced, self-extinguishing, shockproof thermal-plastic providing double insulation

Compliance
 Low Voltage Directive 73/23/CEE
 Directive 93/68/CEE
 Machinery Directive 89/392/CEE
Conduit entry One entry IN 12135 (adapter furnished)

Mechanical endurance
 Life Cycle 1 million operations
 Operating temperature range - 13° to +175°F (-25° to +80° C)

Standards
 Safety Switch is in compliance with standards: UL508, CSA C22-2 nr.14, CEI EN 60947-5-1, EN 292, EN 418, EN 1088, EN 60204, EN 60947-5-1, IEC 204, IEC 337-1, IEC 947-5-1, NFC 63-140, VDE 0113, VDE 0660, BG-GS-ET-15.
 Positive Break Contacts are in compliance with standards: CEI EN 60947-5-1, EN 60947-5-1, IEC 947-5-1, VDE 0660-206.

SAFETY MECHANICAL SWITCHES

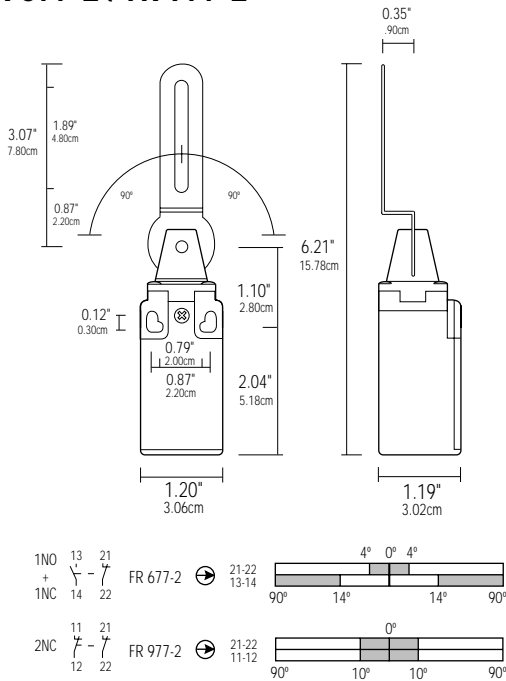
ORDER INFORMATION			ELECTRICAL SPECIFICATIONS		
Model Number	Body Material	Operating Arm	Contact Config.	Contact Operating Voltage, Max.	Short Circuit Protection, Max.
FR 677-1	Thermal Plastic	Right Hand	1 N.O.+1 N.C.	600 VAC, 300 VDC ³	10A fuse
FR 977-1	Thermal Plastic	Right Hand	2 N.C.	600 VAC, 300 VDC ³	10A fuse
FR 677-2	Thermal Plastic	Center	1 N.O.+1 N.C.	600 VAC, 300 VDC ³	10A fuse
FR 977-2	Thermal Plastic	Center	2 N.C.	600 VAC, 300 VDC ³	10A fuse
FR 677-3	Thermal Plastic	Left Hand	1 N.O.+1 N.C.	600 VAC, 300 VDC ³	10A fuse
FR 977-3	Thermal Plastic	Left Hand	2 N.C.	600 VAC, 300 VDC ³	10A fuse

CONTACT RATING ²						
UL/CSA	10A A600/Q300 ³					
IEC	AC15		DC13			
Volts	250	400	500	24	125	250
Current (A)	6	3	1	6	1.1	0.4

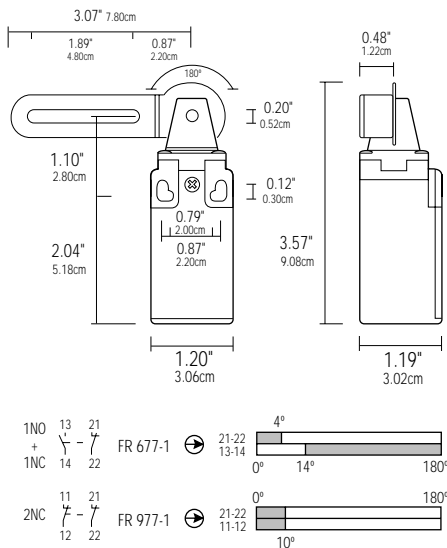
Warning— Each electrical rating is an individual maximum and cannot be exceeded!

¹ Configuration with door/gate closed
² POSITIVE DOUBLE BREAK CONTACTS. Electrically isolated contacts allow different voltages placed on contact poles.
³ UL508

FR 677-2 / FR 977-2



FR 677-3 / FR 977-3



closed contact
 opened contact

General Specifications (continued)

Protection class	IP 65 (according to IEC529)
Terminal Screws	Captive with self-lifting pressure plates
Door Operating Radius	4° to OPEN the normally closed contact 8° to CLOSE the normally open contact
	Switch is in the normal position when the door is CLOSED
Maximum Turning Angle	Extreme to Extreme = 180°

INSTALLATION

1. Safety circuits must be connected to the normally closed (NC) contact (11-12 or 21-22). The normally closed contacts are opened when the door is rotated past 4° and normally open (NO) contacts (13-14) are closed when the switch is rotated past 8°. Normally open contacts are for indicating circuits and are not for use in the safety circuit.
2. Mount the switch into the machine using tamper-resistant fasteners (not supplied). Always use washers under the switch mounting fasteners to prevent the fasteners from pulling through the switch mounting holes. See Fig. 1.

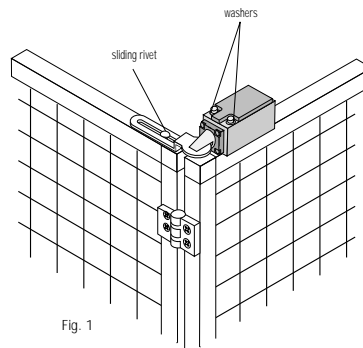
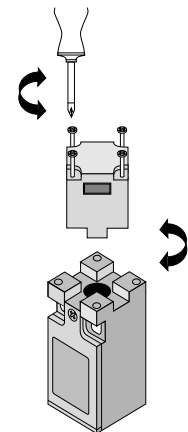


Fig. 1

3. The head of the switch can be rotated in 4 x 90 degree steps allowing 4 different shaft rotating positions. To rotate the head, remove the 4 head attachment screws, rotate the head into the proper position and reinsert the head attachment screws. It is recommended the head be locked into position by replacing the 2 of the 4 head attachment screws with tamper-resistant screws. See diagram at right.



Head Screw Tightening Torque =
7 inch lb. (0.8Nm)

4. Attach the Slotted Lever Operated Safety Switch to the body of the machine and attach the sliding follower (not furnished) to the door of the machine. The sliding follower is permanently attached to the slotted lever and slides down the length of the slotted lever as the door is opened. This action must rotate the slotted lever and operate the safety switch. Carefully position all of the components so the sliding follower operates the switch at the proper point and the travel of the follower does not exceed the length of the slot. Once the switch and follower assembly is correctly attached, aligned and positioned, check the assembly for correct operation including the operating point for the normally closed safety contact. See Fig. 1.
5. Verify proper Safety Switch operation before placing the machine in service. Safety Switches can protect areas where an operator can physically enter.

6. The switch is not to be used as a mechanical stop.

