

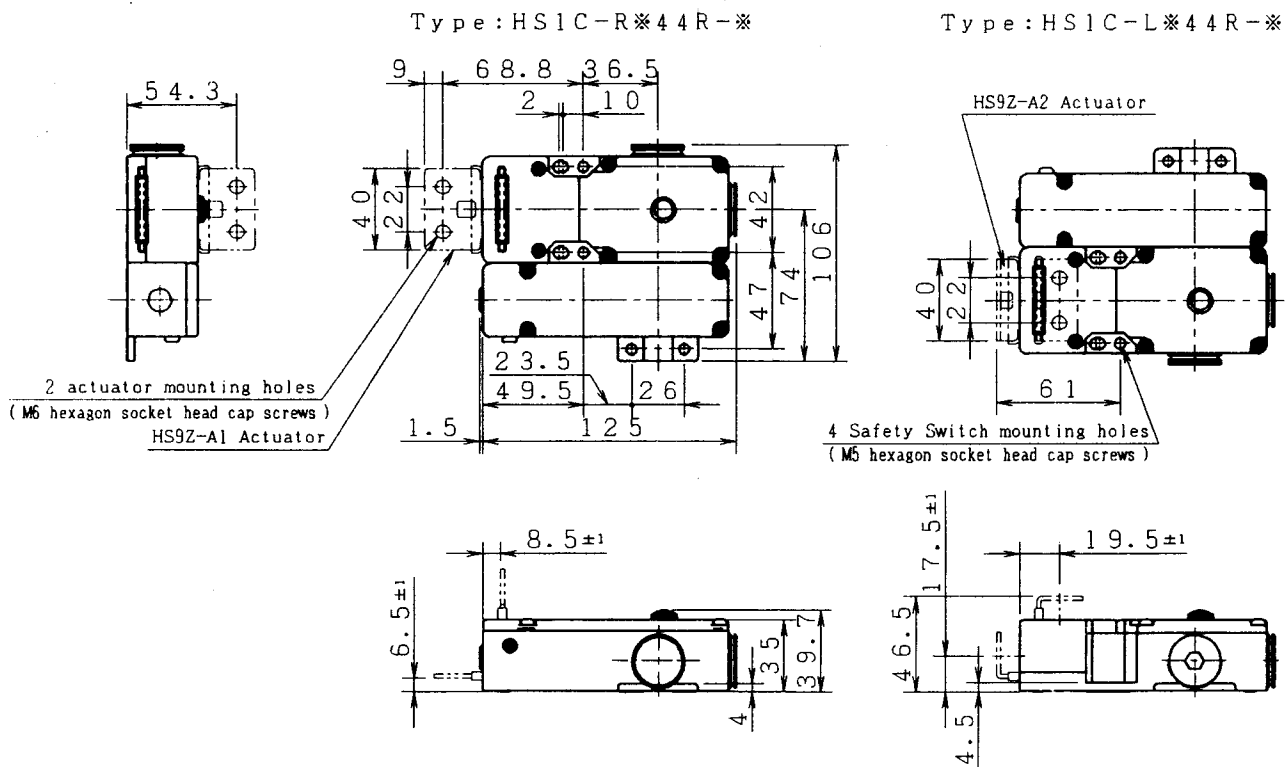
Type: HS1C-R*44R-*
HS1C-L*44R-*

Use the safety switch according to the following instructions after confirming that the product is what you have ordered

Precautions for Safety

- Read this instruction sheet to make sure of correct operation before starting installation, wiring, operation, maintenance, and inspection. Also, keep this instruction sheet at the end user.
- Turn power off to the safety switch before starting installation, removal, wiring, maintenance, and inspection on the safety switch. Failure to turn power off may cause electrical shocks or fire hazard.
- Use wires of a proper size to meet voltage and current requirements. Tighten the terminal to a recommended tightening torque of 1.0N. Loose terminal screws will cause unexpected heating and fire hazard during operation.

(1) External and Mounting Dimensions (mm)



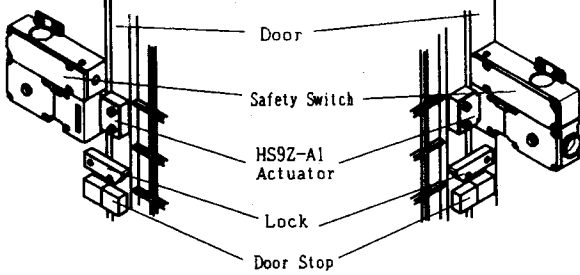
(2) Circuit Configuration

Type	HS1C-R44R-* HS1C-L44R-*	HS1C-R144R-* HS1C-L144R-*	HS1C-R244R-* HS1C-L244R-*	HS1C-R344R-* HS1C-L344R-*
Circuit Configuration	<p>Diagram showing terminal connections for HS1C-R44R-* and HS1C-L44R-*. Contact block 1 (terminals 1-4) is connected to the Main Circuit. Contact block 2 (terminals 5-6) is connected to the Solenoid Power. Terminal 7 is connected to the Auxiliary Circuit. Terminal 8 is connected to the Main Circuit.</p> <p>The solenoid and contact block 2 are linked together mechanically.</p>	<p>Diagram showing terminal connections for HS1C-R144R-* and HS1C-L144R-*. Contact block 1 (terminals 1-4) is connected to the Main Circuit. Contact block 2 (terminals 5-6) is connected to the Solenoid Power. Terminal 7 is connected to the Auxiliary Circuit. Terminal 8 is connected to the Main Circuit.</p> <p>The solenoid and contact block 2 are linked together mechanically.</p>	<p>Diagram showing terminal connections for HS1C-R244R-* and HS1C-L244R-*. Contact block 1 (terminals 1-4) is connected to the Main Circuit. Contact block 2 (terminals 5-6) is connected to the Solenoid Power. Terminal 7 is connected to the Auxiliary Circuit. Terminal 8 is connected to the Main Circuit.</p> <p>The solenoid and contact block 2 are linked together mechanically.</p>	<p>Diagram showing terminal connections for HS1C-R344R-* and HS1C-L344R-*. Contact block 1 (terminals 1-4) is connected to the Main Circuit. Contact block 2 (terminals 5-6) is connected to the Solenoid Power. Terminal 7 is connected to the Auxiliary Circuit. Terminal 8 is connected to the Main Circuit.</p> <p>The solenoid and contact block 2 are linked together mechanically.</p>

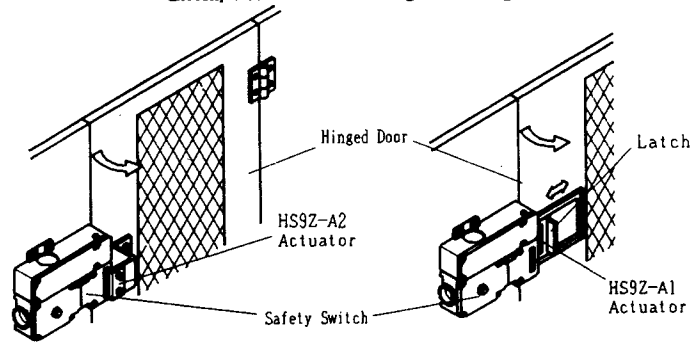
3) Mounting Examples

- Mount the HS5B safety switch on the equipment body.
- Mount the actuator on the moving door.
- See the figure below

Examples of Mounting on Sliding Doors

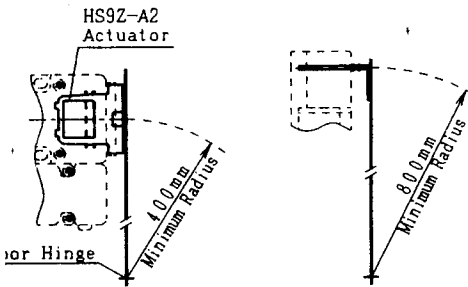


Examples of Mounting on Hinged Doors



4) Minimum Radius of Hinged Door

- See the figure below

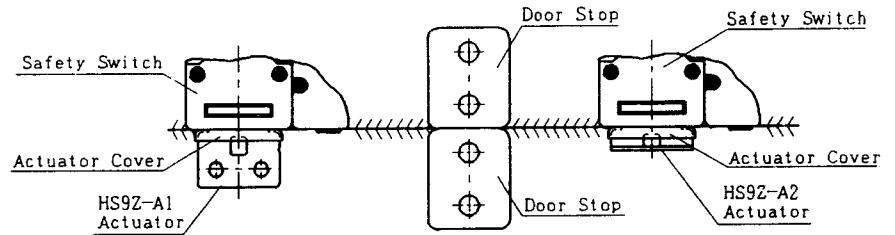


(5) Actuator Mounting Reference Position

- As shown below, the mounting reference position of the actuator inserted into the safety switch is:

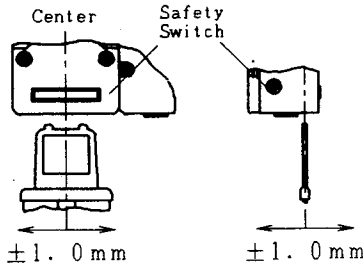
The actuator cover touches the safety switch lightly.

(After mounting the actuator, remove the actuator stop from the safety switch.)

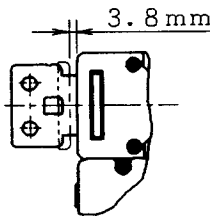


6) Actuator Mounting Tolerance

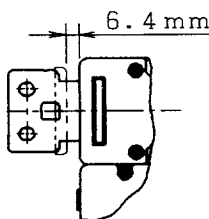
- Mounting tolerance of the actuator is 1.0mm in the four lateral directions.



- Contact operation is not affected when the actuator is moved 3.8mm at the maximum from the reference position. (Actuator deviation) + (Door movement) ≤ 3.8mm



- When Closing the door, Install the door lock (latch) and lock the solenoid at a position such that the gap between the safety switch and the actuator is approx. 6.4mm



(7) Specifications and Ratings

Applicable Standards	IEC60947-5-1, EN60947-5-1 GS-ET-15, 73/23/EEC	
Thermal Current <Ith>	Main Circuit: 10A, Auxiliary Circuit: 3A	
Contact Ratings (Reference Values) < Ue, Ie >	Main Circuit	AC12 6A/250V (Resistive load)
		AC15 3A/250V (Inductive load)
		DC12 6A/30V (Resistive load)
Auxiliary Circuit	AC12 3A/250V (Resistive load)	
	AC15 3A/250V (Inductive load)	
	DC12 3A/30V (Resistive load)	
Operating Frequency	900 operations/hour	
Operating Speed	1000 mm/sec maximum	
Actuator Tensile Strength when Locked	1000 N minimum	
Positive Opening Travel	11 mm minimum	
Positive Opening Force	20 N minimum	
Contact Resistance	100 mΩ maximum (Initial value)	
Degree of Protection	IP67 (IEC60529)	
Short-Circuit Protective Device	250V AC, 10A Fuse (Type D01 based on IEC60269-1, 60269-2)	
Solenoid Rated Operating Voltage	24VDC	
Solenoid Rated Current	415mA	
Solenoid Turn ON Voltage	Rated Voltage x 85% maximum (at 20°C)	
Solenoid Turn OFF Voltage	Rated Voltage x 10% minimum (at 20°C)	
Solenoid Rated Power Consumption	Approx. 10W	
Illuminated Part Rated Operating Voltage	24VDC	
Illuminated Part Rated Current	10mA	
Illuminated Part Light Source	LED lamp	
Lens Color	R (Red), G (Green) (φ12 Lens)	

HS1C Safety Switch Operating Instructions

·Read the reverse side

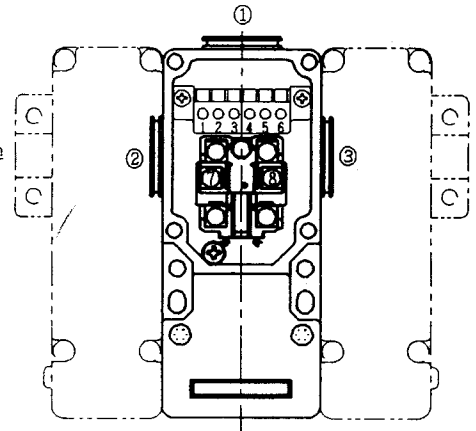
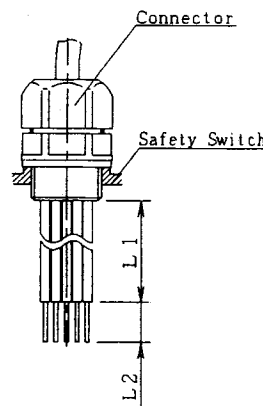
(8) Operation Cycle

Door States		Closed	Closed	Open
Type HS1C- \times 44R- \times	Main Circuit	·3-4: Closed	·3-4: Open	·3-4: Open
	Auxiliary Circuit	·1-2: Open	·1-2: Closed	·1-2: Closed
	Solenoid Power	·5-6: Off	·5-6: On	·5-6: Off
Type HS1C- \times 144R- \times	Main Circuit	·3-4: Closed	·3-4: Open	·3-4: Open
	Auxiliary Circuit	·1-2: Open	·1-2: Open	·1-2: Closed
	Solenoid Power	·5-6: Off	·5-6: On	·5-6: Off
Type HS1C- \times 244R- \times	Main Circuit	·3-4: Closed	·3-4: Open	·3-4: Open
	Auxiliary Circuit	·1-2: Closed	·1-2: Open	·1-2: Open
	Solenoid Power	·5-6: Off	·5-6: On	·5-6: Off
Type HS1C- \times 344R- \times	Main Circuit	·3-4: Closed	·3-4: Open	·3-4: Open
	Auxiliary Circuit	·1-2: Closed	·1-2: Closed	·1-2: Open
	Solenoid Power	·5-6: Off	·5-6: On	·5-6: Off
		Door is locked	Door is unlocked	
		The machine can be operated	The machine can not be operated	The machine can not be operated

(9) Wire Lengths

- Wire Length inside the Safety Switch

Screw Terminal No.	Through Conduit Hole		
	①	②	③
1	30 \pm 2	45 \pm 2	70 \pm 2
2	30 \pm 2	50 \pm 2	65 \pm 2
3	25 \pm 2	55 \pm 2	60 \pm 2
4	25 \pm 2	60 \pm 2	55 \pm 2
5	30 \pm 2	65 \pm 2	50 \pm 2
6	30 \pm 2	70 \pm 2	45 \pm 2
7	65 \pm 2	35 \pm 2	110 \pm 2
8	65 \pm 2	110 \pm 2	35 \pm 2
E	85 \pm 2	45 \pm 2	45 \pm 2
Wire Stripping Length: L2 (mm)		7 \pm 1	

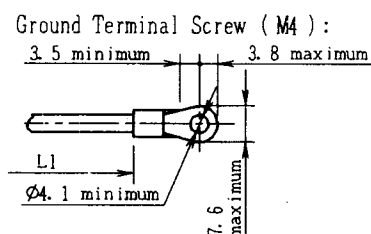
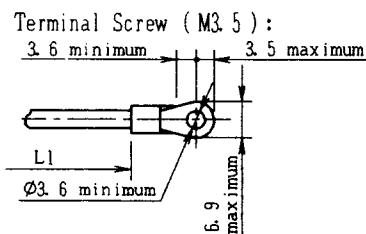


- Recommended Wire Core Size

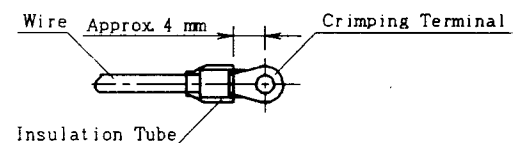
Screw Terminal No. 1, 2, 5, 6, 7, 8 : 0.5 to 0.75 mm²
 Screw Terminal No. 3, 4, E : 1.0 to 1.25 mm²

- Applicable Crimping Terminal

Screw Terminal No. 1 to 6 : Direct Wiring Using a solid or stranded wire
 Screw Terminal No. 7, 8, E : See the figure below



Note: Make sure to use an insulation tube on the crimping terminal.

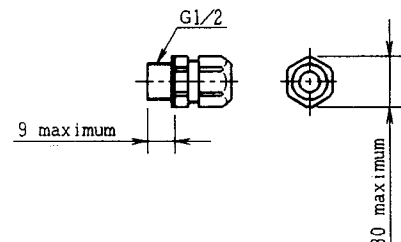


(10) Combinations of Applicable Connector

Use a connector with a degree of protection IP67.

- Applicable connector dimensions: See the figure on the right.
- When using flexible conduit and metal connector
 Applicable Flexible Conduit Example: Type VF-03 (made by Nihon Flex)
 Applicable Metal Connector Example: (G1/2) Type RLC-103 (made by Nihon Flex)
- When using plastic connector, metal connector and multi-core cable (G1/2)
 Applicable Plastic Connector Example: Type SCS-10□ (made by Seiwa Electric)
 Applicable Metal Connector Example: Type ALS-16□□ (made by Nihon Flex)

Note : Make sure the outside diameter of multi-core cable because connector type is decided depending on the outside diameter of multi-core cable

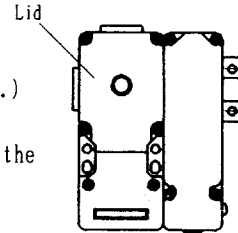


(11) Recommended Screw Tightening Torque

Name or Use	Screw Tightening Torque
For mounting the safety switch (M5 hexagon socket head cap screw)	5.0 \pm 0.5 N·m
For mounting the actuator (M6 hexagon socket head cap screw)	5.0 \pm 0.5 N·m
For mounting the lid (M4)	1.2 \pm 0.1 N·m
Connector (G1/2)	3.0 \pm 0.3 N·m
Plug for Unused Conduit Hole (G1/2)	2.0 \pm 0.2 N·m
Screw Terminal No. 1 to 6 (M3)	0.5 \pm 0.1 N·m
Screw Terminal No. 7, 8 (M3.5)	1.0 \pm 0.1 N·m
Ground Terminal screw (M4)	1.0 \pm 0.1 N·m

(12) Precautions for Operation

- Do not use the safety switch as a door stop on any type of doors.
Install mechanical door stops on the door ends to protect the safety switch from excessive force.
- When the door is opened and closed, make sure that excessive shocks are not applied to the safety switch.
If a shock of 1000 m/sec² (100G) or more is applied to the safety switch, the contacts may bounce, causing contact malfunction.
- Do not use the safety switch as a door lock on any type of doors.
Install a separated lock as (3).
- When opening the safety switch lid to wire, open the lid only. (See the figure on the right.)
Never remove other screws, otherwise the safety switch may be damaged.
- The safety switch lid can be only removed with the L wrench with the safety switch or with the optional screwdriver.
- When wiring or installing a conduit, make sure that no foreign object, dust, water, and oil enter into the safety switch.
- Foreign objects enter into the safety switch will cause failure.
When the operating atmosphere is contaminated, use a protective cover to prevent the entry of foreign objects into the safety switch through the actuator entry slots.
- Use a slot-plug attached to the safety switch to close the unused actuator entry slot.



(13) For Manual Unlocking

- The actuator can be unlocked manually to check the door operation before wiring or supplying power and to open the door in an emergency such as a power failure.

Remove the screw from the side of the safety switch using the wrench for mounting the lid. Push the lever inside the safety switch towards the pilot light using a small screwdriver until the actuator is unlocked.

See the figure on the right.

Note: Manual unlock after confirmation of complete machinery stop.
If do manual unlock during the machinery operation, Solenoid is danger of being unlocked before complete machinery stop, then the proper function of safety switches with solenoid is lost.

Note: After the unlocking operation, be sure to turn the screw to the original position for safety.

