

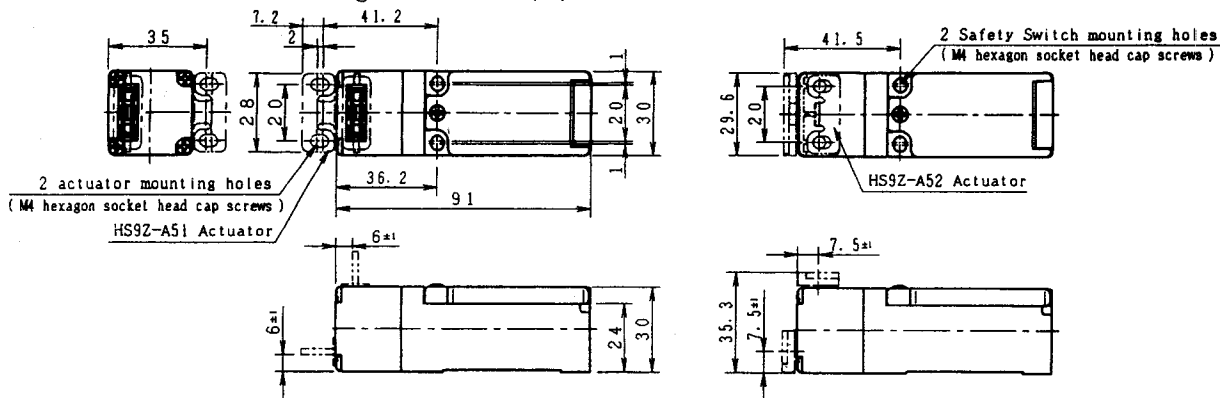
Type: HS5B-11** / HS5B-02**

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·m. Loose terminal screws will cause unexpected heating and fire hazard during operation.

(1) External and Mounting Dimensions (mm)

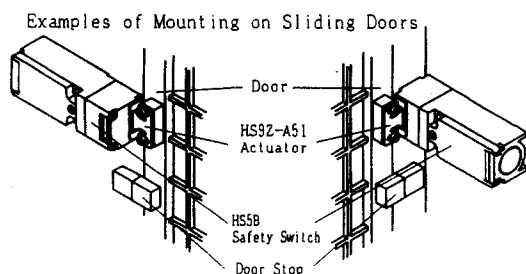


(2) Circuit Configuration and Operation Cycle

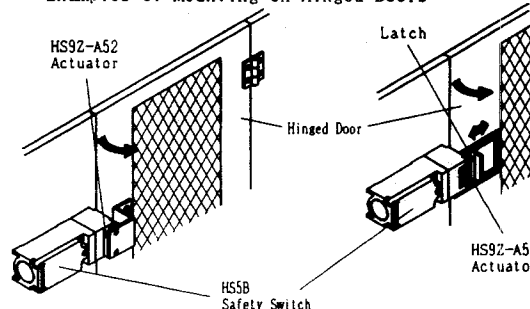
Type	HS5B-11**		HS5B-02**	
Door States	Closed	Open	Closed	Open
Main Circuit	·3-4: Closed	·3-4: Open	·3-4: Closed	·3-4: Open
Auxiliary Circuit	·1-2: Open	·1-2: Closed	·1-2: Closed	·1-2: Open
	The machine can be operated.	The machine can not be operated.	The machine can be operated.	The machine can not be operated.

(3) Mounting Examples

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

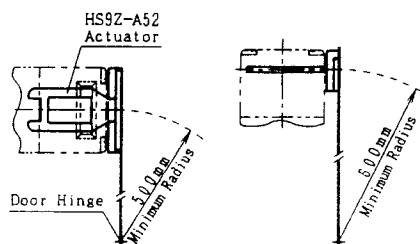


Examples of Mounting on Hinged Doors



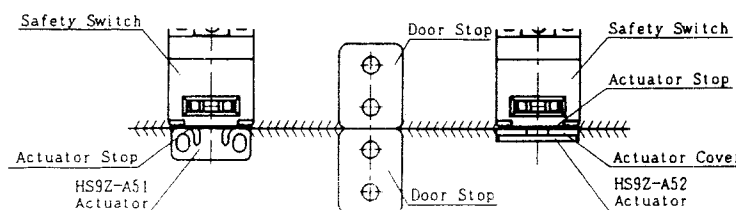
(4) Minimum Radius of Hinged Door

- See the figure below.



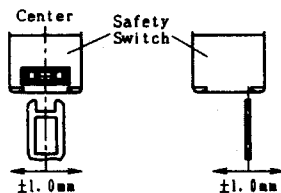
(5) Actuator Mounting Reference Position

- As shown below, the mounting reference position of the actuator inserted into the safety switch is:
For HS9Z-A51 — The actuator touches the actuator stop placed on the safety switch lightly.
For HS9Z-A52 — The actuator cover touches the actuator stop placed on the safety switch lightly.
(After mounting the actuator, remove the actuator stop from the safety switch.)

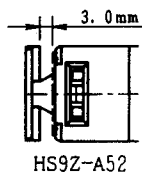
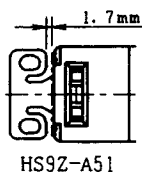


(6) Actuator Mounting Tolerance

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



- Contact operation is not affected when the HS9Z-A51 actuator is moved 1.7mm at the maximum from the reference position.
(Actuator deviation) + (Door movement) ≤ 1.7mm
- Contact operation is not affected when the HS9Z-A52 actuator is moved 3.0mm at the maximum from the reference position.
(Actuator deviation) + (Door movement) ≤ 3.0mm



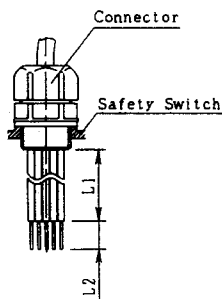
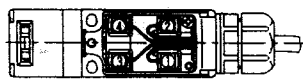
(7) Specifications and Ratings

Applicable Standards	IEC60947-5-1, EN60947-5-1 EN1088, GS-ET-15, 73/23/EEC			
Thermal Current <Ith>	10 A			
Contact Ratings (Reference Values)		30V	125V	250V
<Ue, Ie>	AC Resistive load (AC12)	10A	10A	6A
	Inductive load (AC15)	10A	5A	3A
	DC Resistive load (DC12)	8A	2.2A	1.1A
	Inductive load (DC13)	4A	1.1A	0.6A
Operating Frequency	900 operations/hour			
Operating Speed	1000 mm/sec maximum			
Positive Opening Travel	8 mm minimum			
Positive Opening Force	60 N minimum			
Contact Resistance	50 mΩ maximum (Initial value)			
Degree of Protection	IP67 (IEC60529)			
Short-Circuit Protective Device	250V AC, 10A Fuse			

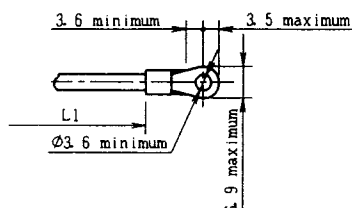
(8) Wire Lengths

- Wire Length inside the Safety Switch

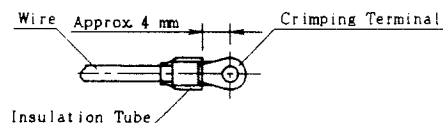
Screw Terminal No.	1 to 4
Wire Length: L1 (mm)	When using crimping terminal: 32 ± 2 When using without crimping terminal: 35 ± 2
Wire Stripping Length: L2 (mm)	7 ± 2



- Recommended Wire Core Size: 0.5 to 1.25 mm²
- Applicable Crimping Terminal



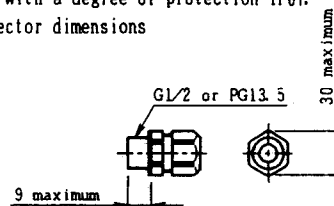
Note: Make sure to use an insulation tube on the crimping terminal.



(9) Combinations of Applicable Connector

Use a connector with a degree of protection IP67.

- Applicable connector dimensions



- When using flexible conduit and metal connector
Applicable Flexible Conduit Example: Type VF-03 (made by Nihon Flex)
Applicable Metal Connector Example: (GL/2) Type RLC-103 (made by Nihon Flex)
(PG13.5) Type RBC-103PG13.5 (made by Nihon Flex)
 - When using plastic connector, metal connector and multi-core cable (GL/2)
Applicable Plastic Connector Example: Type SCS-10□ (made by Seiwa Electric)
Applicable Metal Connector Example: Type ALS-16□□ (made by Nihon Flex) (PG13.5)
Applicable Plastic Connector Example: Type ST13.5 (made by K-MCS)
Applicable Metal Connector Example: Type ABS-□□ PG13.5 (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.

(10) Recommended Screw Tightening Torque

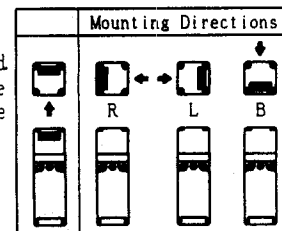
Name or Use	Screw Tightening Torque
For mounting the safety switch (M4 screw) *1	2.0 ± 0.2 N·m
For mounting the actuator (HS9Z-A51: M4 screw) *1 (HS9Z-A52: M4 Phillips screw)	2.0 ± 0.2 N·m 1.0 ± 0.2 N·m
For mounting the HS5B lid (M3)	0.3 ± 0.1 N·m
Terminal screw (M3.5)	1.0 ± 0.1 N·m
Connector	3.0 ± 0.3 N·m
For mounting the HS5B head (M3)	1.3 ± 0.1 N·m

*1: The above recommended tightening torque of the mounting screw is the value confirmed with hex socket head bolts.

When other screws are used and tightened to a smaller torque, make sure that the screws do not become loose after mounting.

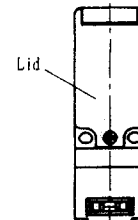
(11) Changing the mounting directions of the HS5B head

The head of HS5B can be mounted in four directions by removing the four screws on the corners of the HS5B head. When replaing the HS5B head, make sure that no foreign object enters into the safety switch. Tighten the screws tightly, otherwise the safety switch may malfunction.



(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 or more is applied to the safety switch, the contacts may bounce, causing contact malfunction.
- 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.
- When wiring or installing a conduit, make sure that no foreign objects, dust, and water enter into the safety switch.
- Use a slot-plug attached to the safety switch to close the unused actuator entry slot.



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