

**HS6B Series Sub-Miniature Interlock Switch**

HS6B

Key features include:

- Only 30mm x 15mm x 78mm
- Allows highest level of safety by having 3 contacts: dual load contacts + monitoring contact (ISO13849-1, EN954-1)
- Two key entrances provide flexibility for installation options
- Integral molded cable reduces wiring time
- IP67 (IEC60529) watertight sealing (contact is sealed, housing allows drainage)
- Direct Opening Action: Opening the door forces the contacts to disconnect even if the contacts are welded (IEC/EN60947-5-1)
- Keys comply with ISO14119 and EN1088



Safety Products

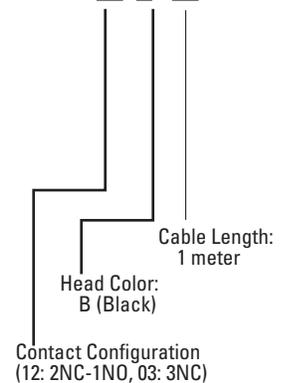
B



<b>Conforming to Standards</b>		EN1088, IEC60947-5-1, EN60947-5-1, GS-ET-15, IEC60664-1, IEC60204-1, EN60204-1				
<b>Operating Temperature</b>		-25 to +70°C (no freezing)				
<b>Storage Temperature</b>		-40 to +80°C (no freezing)				
<b>Operating Humidity</b>		45 to 85% RH (no condensation)				
<b>Storage Humidity</b>		95% RH maximum (no condensation)				
<b>Altitude</b>		2,000m maximum				
<b>Pollution Degree</b>		3				
<b>Rated Insulation Voltage (Ui)</b>		300V				
<b>Impulse Withstand Voltage (Uimp)</b>		4kv				
<b>Insulation Resistance</b>		Between live & dead metal parts: 100MΩ maximum (at 500VDC mega) Between positive & negative live parts: 100MΩ minimum (at 500VDC mega)				
<b>Electric Shock Protection Class</b>		Class II				
<b>Degree of Protection</b>		IP67 (IEC60529)				
<b>Vibration Resistance</b>	<b>Operating Extremes</b>	5 to 55 Hz, half amplitude 0.5 mm				
	<b>Damage Limits</b>	30Hz, half amplitude 1.5mm				
<b>Contact Resistance</b>		300mΩ maximum				
<b>Shock Resistance</b>	<b>Operating Extremes</b>	300m/s <sup>2</sup>				
	<b>Damage Limits</b>	1000m/s <sup>2</sup>				
<b>Direct Opening Travel</b>		8 mm minimum				
<b>Direct Opening Force</b>		60N minimum				
<b>Thermal Current (Ith)</b>		2.5A				
<b>Rated Operating Current (Ie)</b>		Rated operating voltage (Ue)		30V	125V	250V
		AC	Resistive load (AC12)	-	2.5A	1.5A
			Inductive load (AC15)	-	1.5A	0.75A
		DC	Resistive load (DC12)	2.5A (2A)	1.1A (0.4)A	0.55A (0.2A)
Inductive load (DC13)	2.3A (1A)		0.55A (0.22A)	0.27A (0.1A)		
<b>Maximum Actuation Frequency</b>		1200 operations/hour				
<b>Mechanical Life</b>		1,000,000 operations (at full rated load)				
<b>Recommended Actuation Speed</b>		0.05 to 1.0m/s				
<b>Wire Tensile Strength</b>		50N minimum				
<b>Electrical Life</b>		100,000 operations (at full rated load)				
<b>Conditional Short-Circuit Current</b>		50A 250V (IEC60947-5-1, IEC60269-1, -2)				
<b>Weight</b>		120g				

**Ordering Information**

HS6B - 12 B 01



## Part Numbers

### Part Numbers: Body

Part Number	Contact Configuration	Cable Length
HS6B-12B01	2NC-1NO	1m
HS6B-03B01	3NC	



1. The keys are not included, must be ordered separately.
2. Longer cables can be obtained, contact IDEC for details.

### Part Numbers: Keys

Part Number	Shape
HS9Z-A61	Straight (Mainly for sliding doors)
HS9Z-A62	L-shaped (Mainly for hinged doors)
HS9Z-A65	adjustable key 90° angle
HS9Z-A66	adjustable key 180° angle

## Installation Notes

### Recommended Screw Torque

- Safety switch body installation (M4 screw): 1.0~1.5N-m
- Actuator installation (M4 screw): 1.0~1.5N-m

### Handling Cables

- Do not tighten or loosen the fastened cable conduit of the safety switch
- Minimum bend radius of installed cable: 40mm

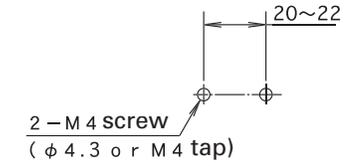
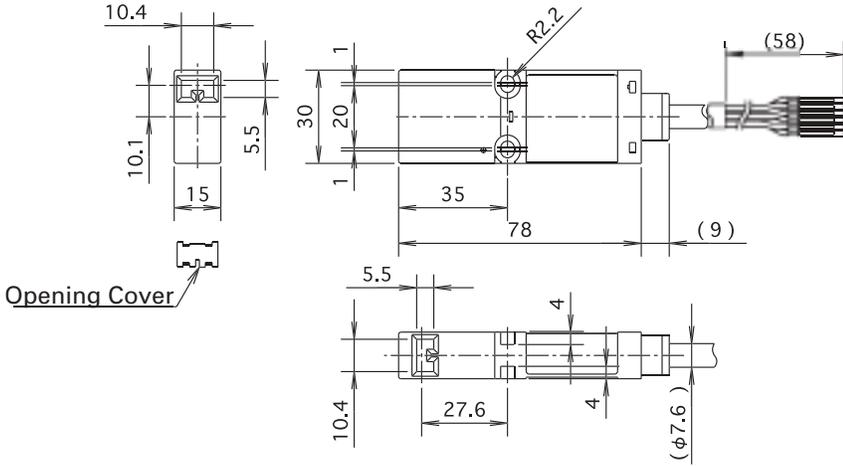
### Wiring Designations

Part Number	Color	Contact
HS6B-12 (2NC-1NO)	blue-blue/white	NC
	brown-brown/white	NC
	orange-orange/white	NO
HS6B-03 (3NC)	blue-blue/white	NC
	brown-brown/white	NC
	orange-orange/white	NC

Dimensions

HS6B

Installation



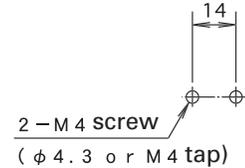
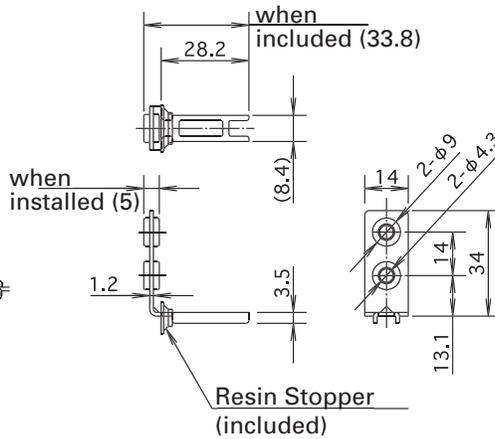
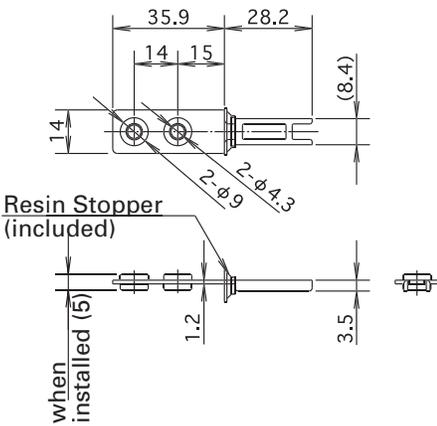
Can be installed either frontwards or backwards.

Cover the unused key opening with cover provided.

HS6B - using straight key (HS9Z-A61)

HS6B - using the L-shaped key (HS9Z-A62)

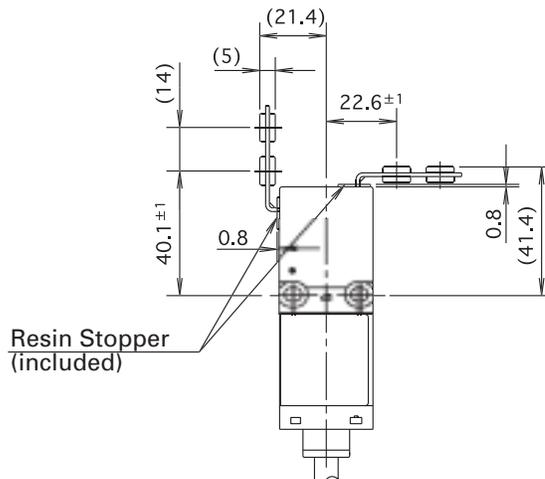
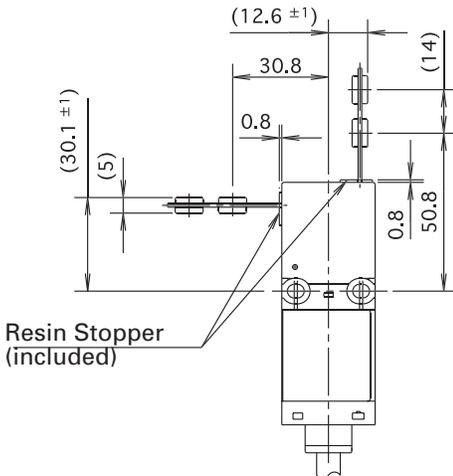
Key Installation



Remove resin stopper after key installation. It is only used for positioning.

HS6B Standard Key Installation - straight key (HS9Z-A61)

HS6B Standard Key Installation - L-shaped key (HS9Z-A62)



**Interlock Switch Safety Precautions**

- In order to avoid electric shock or a fire, turn the power off before installation, removal, wire connection, maintenance, or inspection of the switch.
- If relays are used in the circuit between the safety switch and the load, consider degrees of the danger and use safety relays, since welded or sticking contacts of standard relays may invalidate the functions of the safety switch.
- Do not place a PLC in the circuit between the safety switch and the load. The safety security can be endangered in the event of a malfunction of the PLC.
- Do not disassemble or modify the switch. It may cause a breakdown or an accident.

**B**

**Operation Precautions - for all series**

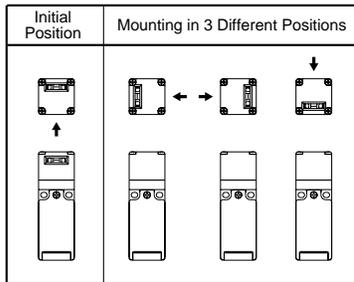
- Regardless of door types, do not use the safety switch as a door stop. Install a mechanical door stop at the end of the door to protect the safety switch against excessive force.
- Do not apply an excessive shock to the switch when opening or closing the door.
- A shock to the door exceeding 1,000 m/sec<sup>2</sup> (approx. 100G) may cause the contacts of the switch to chatter, and a malfunction of the switch may occur.
- For connection of wires, unscrew the cover. Unnecessary loosening of other screws may cause a malfunction of the switch.
- Prevent foreign objects such as dust and liquids from entering the switch while connecting a conduit or wiring.
- If the operating atmosphere is contaminated, use a protective cover to prevent the entry of foreign objects into the switch through the actuator entry slots.
- Entry of a considerable amount of foreign objects into the switch may affect the mechanism of the switch and cause a breakdown.
- Do not store the switches in a dusty, humid, or organic-gas atmosphere.

**Safety Products**

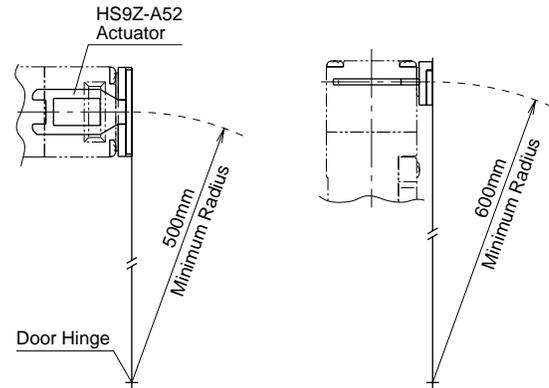
**HS5B Precautions**

**For Rotating Head Directions**

- The head of the HS5B can be rotated in 90° increments after removing the 4 screws on the corners of the head. Prevent entry of foreign objects into the switch during removal of the head. Tighten these screws with torque designated in the instruction sheet. Improper torque may cause errors.



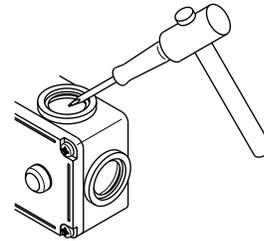
**Minimum Radius of Hinged Doors**



**HS2B Precautions**

**Wire Connection**

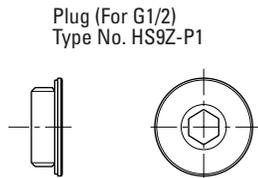
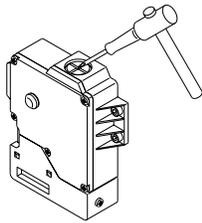
- The HS2B has 3 conduit ports, which are closed as a part of the molded switch housing.
- Make an opening for wire connection by breaking one of the conduit-port knockouts on the switch housing using a screwdriver.
- When breaking the conduit port, take care not to damage the contact block or other parts inside the switch.
- Cracks or burrs on the conduit entry may deteriorate the housing protection against water.
- When changing to another conduit port, close the unused opening with an optional plug (Type No. HS9Z-P1).



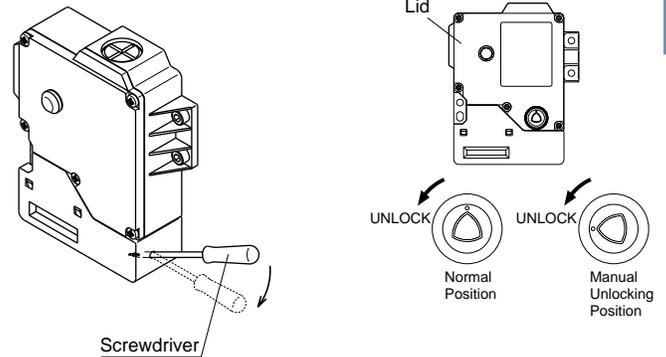
## HS1E Precautions

### Wire Connection

- Make an opening for wire connection by breaking one of the conduit-port knockouts on the switch housing using a screwdriver.
- Before breaking the knockout, temporarily remove the connector-fixing lock nut from the switch.
- When breaking the knockout, take care not to damage the contact block or other parts inside the switch.
- Cracks or burrs on the conduit entry may deteriorate the housing protection.
- When changing to the other conduit port, close the unused opening with an optional plug (accessory).

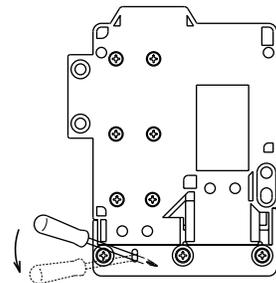


1. This unlocking method is intended for an escape from a machine when a person is locked in. For access to the unlocking entry, an access hole should be opened on the mounting panel. When opening the hole, apply proper protection against water or other foreign objects.
2. Caution: After the unlocking operation, put the screw back into the unlocking entry for safety.



### Manual Unlocking

- Remove the screw located on the unlocking entry at the side of the switch using the key wrench included with the switch. Then insert a small screwdriver into the switch to push the lever inside of the switch toward the indicator until the actuator is unlocked (refer to the diagram on the right).
- Insert a small screwdriver into the elliptical hole on the back of the switch, then push the lever inside of the switch toward the indicator until the key is unlocked (refer to the diagram on the right).

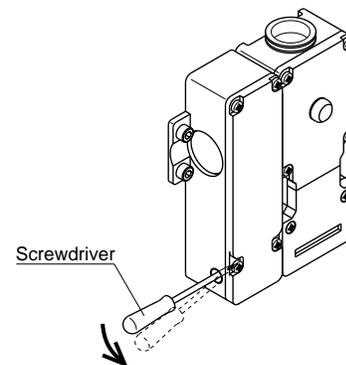


## HS1C Precautions

- Regardless of door type, do not use the safety switch as a locking device. Install a locking device independently, for example, using a metal latch (also applicable to Type HS1E).
- The safety switch cover can be only removed with the special key wrench supplied with the switch or with the optional screwdriver (applicable to HS1B and HS1E).
- Remove the screw located on the unlocking entry at the side of the switch using the key wrench included with the switch. Then insert a small screwdriver into the switch to push the lever inside of the switch toward the indicator until the actuator is unlocked (refer to the diagram on the right).



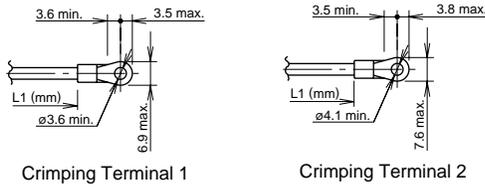
Caution: After the unlocking operation, put the screw back into the unlocking entry for safety.



**Operation Precautions**

**Applicable Crimping Terminals**

- (Refer to the Crimping Terminal 1 or 2 shown in the drawing below.)
- HS1C  
Terminals No. 1 to 6: Use solid or stranded wires only (crimping terminals not applicable).  
Terminals No. 7 and 8: Crimping Terminal 1  
Ground Terminal: Crimping Terminal 2
- HS1B  
Ground Terminal: Crimping Terminal 2  
Other Terminals: Crimping Terminal 1  
HS2B, HS5B, and HS1E  
Crimping Terminal 1

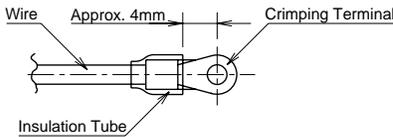


Crimping Terminal 1

Crimping Terminal 2

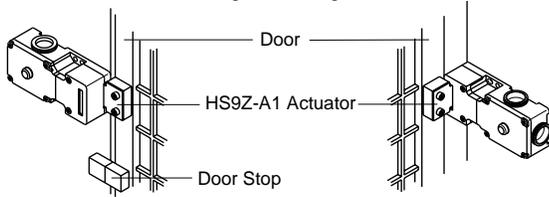


Use an insulation tube on the crimping terminal.

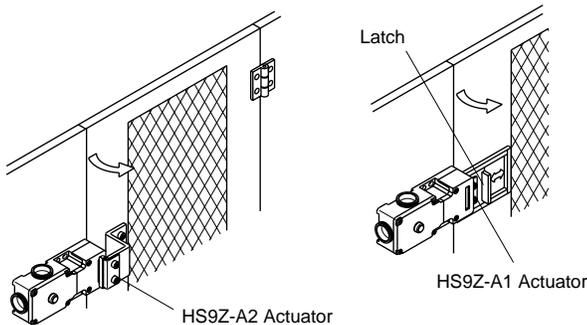


**Installation Examples (see the diagrams below)**

Mounting on Sliding Doors

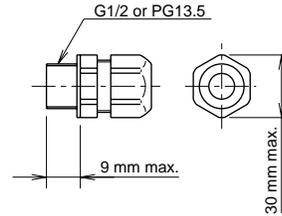


Mounting on Hinged Doors



**Applicable Connectors (As shown below)**

- Use connectors which maintain the IP67 protection.
- Applicable Connector Dimensions
- Flex Conduit: VF03 (Japan Flex) [www.nipolex.co.jp](http://www.nipolex.co.jp)
- Steel Connector (G1/2): ALC-103 (PF13.5): RBC-103PG13.5



**Recommended Screw Tightening Torque**

- HS1C: 5.0±0.5 N-m (approx. 50±5 kgf-cm)  
(4 or 6 pcs of M5 hex socket head cap screws)
- HS1B: 5.0±0.5 N-m (approx. 50±5 kgf-cm)  
(2 or 4 pcs. of M5 hex socket head cap screws)
- HS2B: 5.0±0.5 N-m (approx. 50±5 kgf-cm)  
(2 pcs of M5 hex socket head cap screws)
- HS5B: 4.0±0.4 N-m (approx. 40±4 kgf-cm)  
(2 pcs of M4 hex socket head cap screws)
- HS1E: 5.0±0.5 N-m (approx. 50±5 kgf-cm)  
(4 or 6 pcs of M5 hex socket head cap screws)
- Key (HS9Z-A1/A2)  
5.0±0.5 N-m (approx. 50±5 kgf-cm)
- (2 pcs. of M6 hex socket head cap screws)  
Key (HS9Z-A51/A52)
- 2.0±0.2 N-m (approx. 20±2 kgf-cm)  
(2 pcs of M4 hex socket head cap screws)
- 1.0±0.2 N-m (approx. 10±2 kgf-cm)  
(2 pcs of M4 Phillips screws)



The screws are supplied by the user.

**Applicable Wire Size**

- HS1C: 0.5 to 0.75 mm<sup>2</sup> (Terminals No.1, 2, 5 to 8)  
1.0 to 1.25 mm<sup>2</sup> (Terminals No.3, 4, and grounding terminal)
- HS5B: 0.5 to 1.25 mm<sup>2</sup>
- HS1E: 0.5 to 1.25 mm<sup>2</sup>