HS5B Series Miniature Interlock Switch

**HS5B features:**
- 30mm x 30mm x 91mm Compact Housing
- Available with 2 Contact Configurations (1NO + 1NC or 2NC)
- Flexible Installation: By turning the head of the switch to the desired angle, the actuator can be accessed from 8 directions
- Plastic Housing: Light weight
- Direct Opening Action: Opening the door forces the contacts to disconnect even if the contacts are welded (IEC60947-5-1)
- Degree of Protection: IP67 (IEC60529)

### Part Numbers

<table>
<thead>
<tr>
<th>Contact Configuration</th>
<th>Conduit Port Size</th>
<th>Part Number (Standard Stock in bold)</th>
<th>Plastic Head Type</th>
<th>Metal Head Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1NC-1NO</td>
<td>G1/2</td>
<td>HS5B-11B</td>
<td>HS5B-11ZB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PG13.5</td>
<td>HS5B-11NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M20</td>
<td>HS5B-11BM</td>
<td>HS5B-11ZBM</td>
<td></td>
</tr>
<tr>
<td>2NC</td>
<td>G1/2</td>
<td>HS5B-02B</td>
<td>HS5B-02ZB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PG13.5</td>
<td>HS5B-02NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M20</td>
<td>HS5B-02BM</td>
<td>HS5B-02ZBM</td>
<td></td>
</tr>
</tbody>
</table>

The actuators are not included, must be ordered separately.

### Actuator Keys

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Description</th>
<th>Part Number (Package Qty 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight</td>
<td></td>
<td>HS9Z-A51</td>
</tr>
<tr>
<td>Straight w/rubber</td>
<td></td>
<td>HS9Z-A51A</td>
</tr>
<tr>
<td>Right-angle</td>
<td></td>
<td>HS9Z-A52</td>
</tr>
<tr>
<td>Right-angle w/rubber</td>
<td></td>
<td>HS9Z-A52A</td>
</tr>
<tr>
<td>Angle Adjustable</td>
<td></td>
<td>HS9Z-A55</td>
</tr>
</tbody>
</table>

### Parts Description

- M3.5 Terminal Screws
- Right-angle Actuator
- Conduit Port (Use conduits or cable glands which can maintain IP67 protection)
- Angle Adjustable Actuator (for hinged doors)
Door Interlock Switches

HS5B Series

Accessories

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Description</th>
<th>Part Number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HS5B/HS5E Plug Actuator (allows switch to be used as interlock plug unit)</td>
<td>HS92-A5P</td>
<td>35g</td>
</tr>
<tr>
<td></td>
<td>HS5B/HS5E Padlock Hasp (prevents unauthorized insertion of actuator)</td>
<td>HS92-PH5</td>
<td>35g</td>
</tr>
</tbody>
</table>

Contact Configuration & Operation Chart

<table>
<thead>
<tr>
<th>Model</th>
<th>Contact Configuration</th>
<th>Contact Operation Chart</th>
<th>Contact Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS5B-11</td>
<td>1NC-1NO</td>
<td>Actuator inserted completely</td>
<td>ON (closed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Actuator removed completely</td>
<td>OFF (open)</td>
</tr>
<tr>
<td>HS5B-02</td>
<td>2NC</td>
<td>3–4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1–2</td>
<td></td>
</tr>
</tbody>
</table>

Specifications

<table>
<thead>
<tr>
<th>Conforming to Standards</th>
<th>EN1088, IEC60947-5-1, EN60947-5-1, GS-ET-15, UL508</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>–20 to +70°C (no freezing)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>–40 to +80°C</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>85% RH maximum (no condensation)</td>
</tr>
<tr>
<td>Altitude</td>
<td>2,000m maximum</td>
</tr>
<tr>
<td>Rated Insulation Voltage (Ui)</td>
<td>300V</td>
</tr>
<tr>
<td>Impulse Withstand Voltage (Uimp)</td>
<td>4 kV</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>100MO minimum (500V DC megger)</td>
</tr>
<tr>
<td>Electric Shock Protection Class</td>
<td>Class II (IEC61140)</td>
</tr>
<tr>
<td>Pollution Degree</td>
<td>3 (IEC60664-1)</td>
</tr>
<tr>
<td>Degree of Protection</td>
<td>IP67 (IEC65029)</td>
</tr>
<tr>
<td>Vibration Resistance</td>
<td>10 to 55 Hz, amplitude 0.5 mm</td>
</tr>
<tr>
<td>Operating Extremes</td>
<td>60 m/sec² (approx. 6G)</td>
</tr>
<tr>
<td>Damage Limits</td>
<td>1,000 m/sec² (approx. 100G)</td>
</tr>
<tr>
<td>Actuator Operating Speed</td>
<td>1 m/sec maximum</td>
</tr>
<tr>
<td>Positive Opening Travel</td>
<td>8 mm minimum</td>
</tr>
<tr>
<td>Positive Opening Force</td>
<td>60N minimum</td>
</tr>
<tr>
<td>Thermal Current (Ith)</td>
<td>10A</td>
</tr>
<tr>
<td>Rated Operating Current (Ie)</td>
<td>AC: 30V: 10A, 125V: 10A, 250V: 6A</td>
</tr>
<tr>
<td></td>
<td>DC: 8A: 2.2A, 4A: 1.1A, 10A: 0.6A</td>
</tr>
<tr>
<td>Operating Frequency</td>
<td>900 operations/hour</td>
</tr>
<tr>
<td>Mechanical Life</td>
<td>1,000,000 operations</td>
</tr>
<tr>
<td>Electrical Life</td>
<td>100,000 operations (rated load)</td>
</tr>
<tr>
<td>Conditional Short-circuit Current</td>
<td>100A (IEC60947-5-1)</td>
</tr>
<tr>
<td>Recommended Short Circuit Protection</td>
<td>250V, 10A fuse (Type D01 based on IEC60269-1, 60269-2)</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 80g</td>
</tr>
</tbody>
</table>
HS5B Series

Door Interlock Switches

Application Examples and Circuit Diagrams

HS5B-11 (1NO-1NC)

<table>
<thead>
<tr>
<th>Status</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door/</td>
<td>• Door Closed</td>
<td>• Door Opened</td>
</tr>
<tr>
<td>Switch</td>
<td>• Machine ready to operate</td>
<td>• Machine cannot be started</td>
</tr>
</tbody>
</table>

Door

Circuit Diagram

- Main Circuit: 3-4: Closed 3-4: Open
- Auxiliary Circuit: 1-2: Open 1-2: Closed

Main Circuit

Aux. Circuit

Carefully read the following notes:
1. Main Circuit: used to enable the machine to start only when the main circuit is closed.
2. Auxiliary Circuit: used to indicate whether the machine circuit or door is open or closed.

HS5B-02 (2NC)

<table>
<thead>
<tr>
<th>Status</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door/</td>
<td>• Door Closed</td>
<td>• Door Opened</td>
</tr>
<tr>
<td>Switch</td>
<td>• Machine ready to operate</td>
<td>• Machine cannot be started</td>
</tr>
</tbody>
</table>

Door

Circuit Diagram

- Main Circuit: 3-4: Closed 3-4: Open
- Auxiliary Circuit: 1-2: Closed 1-2: Open

Main Circuit

Aux. Circuit

Dimensions (mm)

Plastic Head - using the straight actuator (HS9Z-A51)

- Plastic Head (black or gray)
- Conduit Port
- Actuator Stop
- 2-M4 Screws

Mounting Hole Layout

Plug the unused actuator insertion slot using the slot plug supplied with the interlock switch.

Plug the unused actuator insertion slot using the slot plug supplied with the interlock switch.
Dimensions (mm), continued

**Plastic Head – using the Right-angle actuator (HS9Z-A52)**

Note: Plug the unused actuator entry slot using the slot plug supplied with the interlock switch.

**Metal Head - using the straight actuator (HS9Z-A51A)**

Note: Plug the unused actuator insertion slot using the slot plug supplied with the interlock switch.

**Metal Head – using the Right-angle actuator (HS9Z-A52A)**

Note: Plug the unused actuator insertion slot using the slot plug supplied with the interlock switch.
HS5B Series

Door Interlock Switches

Overview

- Door Interlock Switches
- Enabling Switches
- Barriers
- AS-Interface

Safety at Work

Actuator Key Dimensions (mm)

Straight Actuator - HS9Z-A51 (mainly for sliding doors)

Right-angle Actuator - HS9Z-A52 (mainly for hinged doors)

Adjustable Actuator - HS9Z-A55

Straight Actuator with rubber bushings - HS9Z-A51A (mainly for sliding doors)

Right-angle Actuator with rubber bushings - HS9Z-A52A (mainly for hinged doors)

Actuator Orientation (Angle Adjustable)
The angle of actuator swing can be changed using the orienting insert (white plastic) installed on the back of the actuator. Do not lose the orienting insert, otherwise the actuator will not operate properly. The actuator stop is supplied with the actuator and used when adjusting the actuator position. Remove the actuator stop after the actuator position is determined.

Accessory Dimensions (mm)

HS9Z-A5P

HS9Z-PH5

• Actuator Mounting Hole Layout (Straight, Right-angle)

• The mounting center distance is set to 12 mm at factory. When 20-mm distance is required, adjust the distance by moving the rubber bushings.

• The actuator has flexibility to the directions indicated by the arrows. When 20-mm distance is selected, the actuator swings vertically.

Actuator Mounting Hole Layout (straight with rubber bushing, right-angle with rubber bushing)

Mounting centers can be widened to 20 mm by moving the rubber cushions.

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### Mounting Examples
Mount the interlock switch as shown in the examples below.

#### Mounting on Sliding Doors
- **Actuator**: HS9Z-A51
- **Door Stop**: Interlock Switch HS5B

#### Mounting on Hinged Doors
- **Actuator**: HS9Z-A52
- **Latch**: Interlock Switch HS5B

### Mounting the HS5B Head
The metal head for the HS5E interlock switch cannot be used on the HS5B. Be sure to use the plastic head or metal head for the HS5B. Take care particularly when using both HS5B and HS5E together.

#### Rotating the Head
The head of the HS5B can be rotated by removing the four screws from the corners of the HS5B head and reinstalling the head in the desired orientation. When reinstalling the head, make sure that no foreign object enters the interlock switch. Tighten the screws. If the screws are loose it may cause the switch to malfunction.

**Recommended screw tightening torque:** 1.0 ±0.1 N·m

### Applicable Crimping Terminal
When using crimping terminals, be sure to install insulation tubes on the crimping terminals to prevent electric shocks.

- **Applicable Wire Size**
  - 0.5 to 1.25 mm² (AWG20 to AWG16)

### Recommended Tightening Torque of Mounting Screws
- **Interlock Switch**: 2.0 ± 0.2 N·m (two M4 screws) *
- **Actuator Keys**
  - HS9Z-A51: 2.0 ± 0.2 N·m (two M4 screws) *
  - HS9Z-A52: 1.0 ± 0.2 N·m (two M4 Phillips screws) *
  - HS9Z-A51A/52A: 1.0 to 1.5 N·m (two M4 screws) *
  - HS9Z-A55: 1.0 to 1.5 N·m (two M4 screws) *

*The above recommended tightening torques of the mounting screws are the values confirmed with hex socket head bolts. When other screws are used and tightened to a smaller torque, make sure that the screws do not come loose after mounting.

- **Mounting bolts must be provided by user.**
- **To avoid unauthorized or unintended removal of the interlock switch and the actuator, it is recommended that the interlock switch and the actuator be installed in an unremovable manner, for example using special screws or welding the screws.**
- **When installing HS9Z-A51A or HS9Z-A52A actuator keys, use the washer (supplied with the actuator) on the hinged door, and mount tightly using two M4 screws.**

### Mounting Centers
12 mm (factory setting), adjustable to 20 mm

**M4 Screw**
- **Washer**
- **Rubber Bushing**
- **M4 Tapped Hole**

**Hinged Door**

**Note:** Choose mounting centers either 12 mm or 20 mm.

### Conduit Port Size Identification
Conduit port size is identified by the arrow on the back of the HS5B interlock switch. The following example shows the identification of the M20 conduit port size.

**Marking**
- **Conduit Port Size**
  - E: Ø1/2
  - PG: PG13.5
  - M20: M20
Actuator Angle Adjustment
- Using the screw (M3 hex socket head screw), the actuator angle can be adjusted (refer to the dimensional drawing). Adjustable angle: 0° to 20°
- The larger the adjusted angle of the actuator, the smaller the applicable radius of the door opening.

Minimum Radius of Hinged Door
- When using the interlock switch on hinged doors, refer to the minimum radius of doors shown below. When using on doors with small minimum radius, use the angle adjustable actuator (HS9Z-A55).
  Note: Because deviation or dislocation of hinged doors may occur in actual applications, make sure of the correct operation before installation.

When using the HS9Z-A52 Actuator
- When the door hinge is on the extension line of the interlock switch surface:

  ![Diagram](image)

  - When door hinge is on the extension line of the actuator mounting surface:

    ![Diagram](image)

When using the HS9Z-A55 Angle Adjustable Actuator
- When the door hinge is on the extension line of the interlock switch surface:
  - 50 mm
- When the door hinge is on the extension line of the actuator mounting surface:
  - 70 mm

Actuator Angle Adjustment for the HS9Z-A55
- Using the angle adjustment screw, the actuator angle can be adjusted (see figures on page 354). Adjustable angle: 0 to 20°
- The larger the adjusted angle of the actuator, the smaller the applicable radius of the door opening.
- After installing the actuator, open the door. Then adjust the actuator so that its edge can be inserted properly into the entry slot of the safety switch.
- Recommended tightening torque: 0.8 N-m (approx. 8.0 kgf-cm)
- After adjusting the actuator angle, apply loctite or the like to the adjustment screw to prevent it from loosening.

Applicable Cable Glands

<table>
<thead>
<tr>
<th>Conduit Port Size</th>
<th>Plastic Cable Gland</th>
<th>Metal Cable Gland</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1/2</td>
<td>SCS-10* (Seiwa Electric)</td>
<td>ALS-16** (Nihon Flex)</td>
</tr>
<tr>
<td>PG13.5</td>
<td>ST13.5 (K-MECS)</td>
<td>ABS-**PG13.5 (Nihon Flex)</td>
</tr>
<tr>
<td>M20</td>
<td>ST-M20X1.5 (K-MECS)</td>
<td>ALS-**EC20 (Nihon Flex)</td>
</tr>
</tbody>
</table>

Different cable glands are used depending on the cable sheath outside diameter. When purchasing a cable gland, confirm that the cable gland is applicable to the cable sheath outside diameter.
- When using a 1/2-14NPT cable gland, use the HS5B interlock switch with M20 conduit port (Part No.: HS5B-***BM) together with an adapter (Part No.: MA-M/NPT 20X1.5S402-0110, K-MECS) and a gasket (Part No.: GP M20, K-MECS). Install a gasket between the interlock switch and the adapter. Apply sealing tape between the cable gland and the adapter to make sure of IP67 protection for the enclosure.
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.

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 excessive shock to the switch when opening or closing the door.

- A shock to the door exceeding 1,000 m/sec² (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 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.

For Rotating Head Directions

- The heads of the HS5E/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.

- Prevent foreign objects such as dust and liquids from entering the switch while connecting 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.

Minimum Radius of Hinged Doors

- When using the interlock switch on hinged doors, refer to the minimum radius of doors shown below. When using on doors with small minimum radius, use the angle adjustable actuator (HS9Z-A55).

<table>
<thead>
<tr>
<th>Door Hinge</th>
<th>Minimum Radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>170 mm</td>
<td>190 mm</td>
</tr>
<tr>
<td>230 mm</td>
<td>260 mm</td>
</tr>
</tbody>
</table>

Note: Because deviation or dislocation of hinged doors may occur in actual applications, make sure of the correct operation before installation.

When using the HS9Z-A52 Actuator

- When the door hinge is on the extension line of the interlock switch surface:

- When door hinge is on the extension line of the actuator mounting surface:

HS2B Precautions

- 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 (Part No. HS9Z-P1).

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.
**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).

![Plug Type No. HS9Z-P1](image)

**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 actuator is unlocked (refer to the diagram on the right).

![Screwdriver](image)

---

**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 HS1E).
- The safety switch cover can be only removed with the special key wrench supplied with the switch or with the optional screwdriver (also 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).

![Screwdriver](image)

---

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.
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

<table>
<thead>
<tr>
<th>Applicable Connectors (As shown below)</th>
</tr>
</thead>
</table>
- 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)
- Actuator (HS9Z-A1/A2)
  5.0±0.5 N·m (approx. 50±5 kgf·cm)
  (2 pcs. of M6 hex socket head cap screws)
- Actuator (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 mm² (Terminals No. 1, 2, 5 to 8)
  1.0 to 1.25 mm² (Terminals No. 3, 4, and grounding terminal)
- **HS5B:** 0.5 to 1.25 mm²
- **HS1E:** 0.5 to 1.25 mm²
**Actuator Angle Adjustment**
- Using the screw (M3 hex socket head screw), the actuator angle can be adjusted (refer to the dimensional drawing). Adjustable angle: 0° to 20°
- The larger the adjusted angle of the actuator, the smaller the applicable radius of the door opening.

**Minimum Radius of Hinged Door**
- When using the interlock switch on hinged doors, refer to the minimum radius of doors shown below. When using on doors with small minimum radius, use the angle adjustable actuator (HS9Z-A55).
  
  Note: Because deviation or dislocation of hinged doors may occur in actual applications, make sure of the correct operation before installation.

**When using the HS9Z-A52 Actuator**
- When the door hinge is on the extension line of the interlock switch surface:
  - When door hinge is on the extension line of the interlock switch surface: 50 mm
  - When door hinge is on the extension line of the actuator mounting surface: 70 mm

**When using the HS9Z-A55 Angle Adjustable Actuator**
- When door hinge is on the extension line of the interlock switch surface: 50 mm
- When door hinge is on the extension line of the actuator mounting surface: 70 mm

**Applicable Cable Glands**

<table>
<thead>
<tr>
<th>Conduit Port Size</th>
<th>Plastic Cable Gland</th>
<th>Metal Cable Gland</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1/2</td>
<td>SCS-10° (Seiwa Electric)</td>
<td>ALS-18** (Nihon Flex)</td>
</tr>
<tr>
<td>PG13.5</td>
<td>ST13.5 (K-MECS)</td>
<td>ABS-**PG13.5 (Nihon Flex)</td>
</tr>
<tr>
<td>M20</td>
<td>ST-M20X1.5 (K-MECS)</td>
<td>ALS-**EC20 (Nihon Flex)</td>
</tr>
</tbody>
</table>

- Different cable glands are used depending on the cable sheath outside diameter. When purchasing a cable gland, confirm that the cable gland is applicable to the cable sheath outside diameter.
- When using a 1/2-14NPT cable gland, use the HS5B interlock switch with M20 conduit port (Part No.: HS5B-***BM) together with an adapter (Part No.: MA-M/NPT 20X1.5 5402-0110, K-MECS) and a gasket (Part No.: GP M20, K-MECS). Install a gasket between the interlock switch and the adapter. Apply sealing tape between the cable gland and the adapter to make sure of IP67 protection for the enclosure.