



INSTRUCTION SHEET

Original Instructions
Solenoid Type Safety Switch
HS5E Series



Thank you for purchasing this IDEC product. Confirm that the delivered product is what you have ordered. Read this instruction sheet to make sure of correct operation.

* In order to verify if the product you are interested in is certified with the S mark, please check the following section on our website: "List of type numbers certified with the S mark"

SAFETY PRECAUTIONS

In this operation instruction sheet, safety precautions are categorized in order of importance to Warning and Caution :

WARNING

Warning notices are used to emphasize that improper operation may cause severe personal injury or death.

CAUTION

Caution notices are used where inattention might cause personal injury or damage to equipment.

1 Type

| Circuit Code | | | HS5E-A44L01-G | |
|--------------|----------------------|----------------------|-----------------------------------|--|
| Main circuit | Door monitor circuit | Lock monitor circuit | | |
| A : 1NC+1NC | 1NO | 1NO | Pilot Light Color | G : Green |
| B : 1NC+1NC | 1NO | 1NC | Cable Length | 01 : 1m 03 : 3m 05 : 5m |
| C : 1NC+1NC | 1NC | 1NO | For Rear Unlock | Blank : Without Rear Manual Unlock L : Push Button [K] : Manual Unlock Key |
| D : 1NC+1NC | 1NC | 1NC | Pilot Light | 4 : With pilot light 0 : Without pilot light |
| F : 1NC+1NC | 2NC | - | Solenoid Voltage / Lock Mechanism | 4 : 24V DC / Spring Lock 7Y : 24V DC / Solenoid Lock |
| G : 1NC+1NC | 1NC,1NO | - | | |
| H : 1NC+1NC | - | 2NC | | |
| J : 1NC+1NC | - | 1NC,1NO | | |
| DD : 1NC+1NC | - | - | | |
| VA : - | 1NC,1NO | 1NC,1NO | | |
| VB : - | 1NC,1NO | 2NC | | |
| VC : - | 2NC | 1NC,1NO | | |
| VD : - | 2NC | 2NC | | |
| [VF] : - | 3NC | 1NC | | |
| [VG] : - | 2NC,1NO | 1NC | | |
| [VH] : - | 1NC | 3NC | | |
| [VJ] : - | 1NC | 2NC,1NO | | |

*1 Type Nos. in [] are not supplied as standard. Contact IDEC if required.

CAUTION

Solenoid lock type

- This safety switch is designed to lock the actuator while the solenoid is energized and to release it when deenergized.
- When the power to the solenoid is interrupted by accident, such as disconnection, the lock is released before a machine stops completely. Then, the worker may be exposed to hazards.
- This safety switch can be used only for limited applications which do not especially need to be locked for safety.

2 Specifications and Ratings

| | | | | | |
|---|---|-------------------------------|------|-------|-------|
| Applicable Standards | EN ISO / ISO14119 IEC60947-5-1, EN60947-5-1 GS-ET-19, UL508, CSA C22.2 No.14, GB 14048. 5 | | | | |
| Standards for Use | IEC60204-1/EN60204-1 | | | | |
| Interlocking device Type / the level of coded | Type 2 Interlocking device / low level coded actuator (EN ISO / ISO14119) | | | | |
| Applicable Directives | Low Voltage Directive, Machinery Directive | | | | |
| Operating Condition | Operating Temperature | -25 to +50°C (no freezing) | | | |
| | Operating Humidity | 45 to 85%RH (no condensation) | | | |
| | Pollution Degree | 3 (Inside 2) | | | |
| | Altitude | 2,000m maximum | | | |
| Inpulse withstand voltage (Uimp) | 2.5kV (Between ground and LED, solenoid circuit : 0.5kV) | | | | |
| Raed Insulation voltage (Ui) | 250V (Between ground and LED, solenoid circuit : 30V) *2 | | | | |
| Thermal Current (Ith) | 2.5A | | | | |
| Type HS5E-V | -25°C ≤ Operating temperature < 35°C 2.5A (≤ 2 circuits) 1.0A (≥ 3 circuits) | | | | |
| | 35°C ≤ Operating temperature ≤ 50°C 1.0A (1 circuit) 0.5A (≥ 2 circuits) | | | | |
| | | | | | |
| Contact Ratings (Reference Values) (Ue, Ie) | AC | Resistive load (AC12) | - | 2.5A | 1.5A |
| | | Inductive load (AC15) | - | 1.5A | 0.75A |
| | DC | Resistive load (DC12) | 2.5A | 1.1A | 0.55A |
| | | Inductive load (DC13) | 2.3A | 0.55A | 0.27A |
| | | | | | |
| Class of Protection | Class II (IEC61140) *3 | | | | |
| Operating Frequency | 900 operations/hour | | | | |
| Operating Speed | 0.05 to 1.0 m/s | | | | |
| B10d | 2,000,000 (EN ISO 13849-1 Annex C Table C.1) | | | | |

| | | |
|---------------------------------------|---|---------------------------------------|
| Mechanical durability | 1,000,000 operations minimum (GS-ET-19) the Rear Unlock Button: 3,000 operations minimum (Type HS5E-□L) | |
| Electrical Durability | 100,000 operations min. (AC-12 250V*1A) 1,000,000 operations min. (AC/DC 24V 100mA) (900 operations / hour) | |
| Shock Resistance | Operating Extremes: 100m/s ² , Damage Limits: 1,000m/s ² | |
| Vibration Resistance | Operating Extremes: 10 to 55 Hz, half amplitude 0.35mm Damage Limits: 30 Hz, half amplitude 1.5mm | |
| Actuator Tensile Strength when Locked | Fzh=1,400N minimum F1max.=1,820N minimum (GS-ET-19) *4, *5 (Fzh=500N minimum : HS9Z-A55 actuator) | |
| Direct Opening Travel | 11 mm minimum (actuator: HS9Z-A51,A5P) 12 mm minimum (for other actuators) | |
| Direct Opening Force | 80N minimum | |
| Contact Resistance | 300 mΩ maximum (initial value, 1m cable) | |
| Degree of Protection | IP67 (IEC60529), Type 4X Indoor Use Only | |
| Conditional short circuit current | 50A(250V) | |
| Short-circuit Protective Device | Use 250V / 10A fast acting type fuse *6 | |
| Solenoid | Rated Operating Voltage | DC24V 100% duty cycle |
| | Rated Current | 266 mA (initial value) |
| | Turn ON Voltage | Rated voltage x 85% maximum (at 20°C) |
| | Turn OFF Voltage | Rated voltage x 10% minimum (at 20°C) |
| Indicator | Rated Power Consumption | Approx. 6.4W |
| | Rated Operating Voltage | DC24V 100% duty cycle |
| | Rated Current | 10 mA |
| | Light Source | LED |
| | Illumination Color | Green |

Ratings approved by safety agencies

- (1) TÜV / CCC rating AC-15 250V/0.75A DC-13 125V/0.22A DC-13 30V/2.3A
 (2) UL , c-UL rating 1.5A, 125V ac, Pilot Duty 0.22A, 125V dc, Pilot Duty
 (3) KOSHA rating AC-15 250V, 0.5A DC-13 125V, 0.22A

*2 Ratings approved by UL,c-UL:125V

*3 Basic insulation of 2.5kV impulse withstand voltage is ensured between different contact circuits and between contact circuits and LED or solenoid in the enclosure. When both SELV (safety extra low voltage) or PELV (protective extra low voltage) circuits and other circuits (such as 230V AC circuits) are used for the solenoid power and contact circuits at the same time, the SELV or PELV requirements are not met any more.

*4 The actuator locking strength is rated at 1400N of static load . Do not apply a load higher than the rated value. When a higher load is expected to work on the actuator, provide an additional system consisting of another safety switch without lock (such as the HS5D safety switch) or a sensor to detect door opening and stop the machine.

*5 F1max. is maximum force. The actuator's guard-locking force Fzh is calculated in accordance with GS-ET-19 :

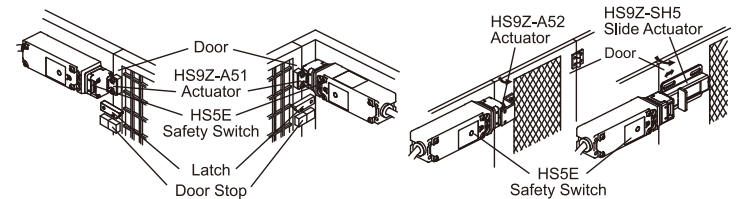
$$F_{zh} = \frac{\text{maximum force (F1max.)}}{\text{Safety coefficient (=1.3)}}$$

*6 Make sure that a fast acting fuse for short-circuit protection trips before overheating of the wires.

3 Mounting Examples

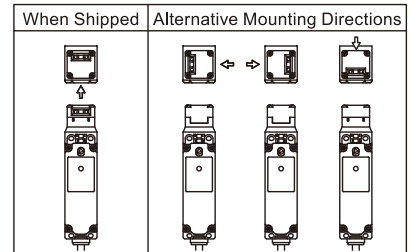
- Install the interlock switch on the immovable machine or guard, and install the actuator on the movable door. Do not install both interlock switch and actuator on the movable door, otherwise the angle of insertion of the actuator to the safety switch may become inappropriate, and failure will occur.

(Examples of Mounting on Sliding Doors) (Examples of Mounting on Hinged Doors)



The HS5E Head

- Changing the Mounting Directions of the HS5E Head. The head of the HS5E can be mounted in four directions by removing the four screws from the corners of the HS5E head.



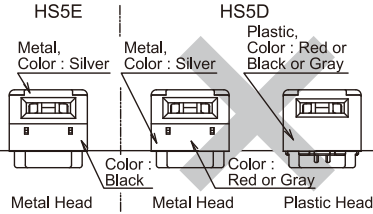
⚠ WARNING

Mounting Directions of the HS5E Head

- Before changing the mounting direction of the HS5E head, turn the manual unlock to UNLOCK using the attached manual unlock key or disconnect wiring from the HS5E.
- If the head position is changed after wiring without taking the above action, the machine may start to operate and the worker may face danger.
- When replacing the HS5E head, make sure that no foreign object enters into the safety switch. Tighten the screws tightly, without leaving space between the head and body, otherwise the safety switch may malfunction.

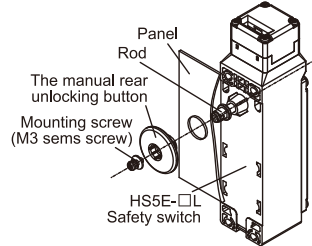
Mounting the Head

- **Do not use the metallic or plastic head for the HS5D (without lock type). Be sure to use the head for the HS5E and mount the correct head.**
Take care particularly when using with the HS5D (without lock type).



Installing the manual Rear Unlocking Button (Type HS5E-□L)

- After installing the interlock switch on the panel, put the manual rear unlocking button (supplied) on the rod on the back of the interlock switch, and fasten using the mounting screw. When installing on the aluminum frame of the thickness of 6mm or more, use the rear unlocking button for frame kit (HS9Z-FL5□) sold separately.



⚠ CAUTION

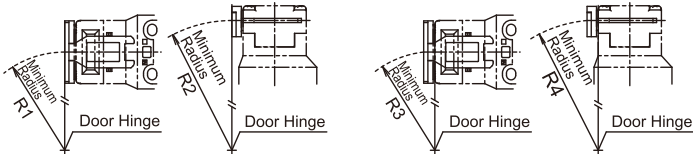
After installing the manual rear unlocking button, apply Loctite to the screw so that the screw does not become loose. The base is made of glass-reinforced PA66 (66 nylon). The mounting screw is iron. Take the compatibility of plastic material and Loctite into consideration.

Minimum Radius of Hinged Door

- When using the safety switch for a hinged door, the minimum radius of the applicable door is shown in the following figures.

When the center of the hinged door is on the extension line of the actuator mounting surface.

When the center of the hinged door is on the extension line of the contact surface of actuator and safety switch.



| | Minimum Radius | | | |
|-----------|------------------------|------------------|--------------------|------------------|
| | R1 | R2 | R3 | R4 |
| HS9Z-A52 | 230 mm | 260 mm | 170 mm | 190 mm |
| HS9Z-A52A | Mounting centers:12 mm | 230 mm | 120 mm | 140 mm |
| | Mounting centers:20 mm | 310 mm | 170 mm | |
| HS9Z-A53 | | 80 mm | 50 mm | 50 mm |
| | | (Vertical Swing) | | (Vertical Swing) |
| HS9Z-A55 | 70 mm | 70 mm | 50 mm | 50 mm |
| HS9Z-A55S | (Horizontal Swing) | (Vertical Swing) | (Horizontal Swing) | (Vertical Swing) |

⚠ CAUTION

The values shown above are based on the condition that the actuator enters and exits the actuator entry slot smoothly when the door is closed or opened. Since there may be deviation or dislocation of the hinged door, make sure of correct operation in the actual application before installation.

Adjusting the Angle Adjustable (vertical/horizontal) Actuator (Type HS9Z-A53/A55/A55S)

- Using the angle adjustment screw (M3 hexagon socket set screw), the actuator angle can be adjusted up to 20°(refer to dimensions).
- The larger the actuator angle, the smaller the applicable radius of the door swing. After installing the actuator, open the door. Then adjust the actuator angle so that the actuator enters the entry slot of the safety switch properly.
- After adjusting the actuator angle, apply loctite or the like on the adjustment screw to prevent loosening.

(Type HS9Z-A53)

Tightening torque of angle adjustment screw: 0.8 N•m.

(Type HS9Z-A55)

Use screw locking agent that is compatible with the base material.

Base: PA66 (66 nylon) of glass reinforced grade

Angle adjustment screws: stainless steel

(Type HS9Z-A55S)

Use screw locking agent that is compatible with the base material.

Plate: stainless steel

Base : PA66 (66 nylon) of glass reinforced grade

Angle adjustment screws : stainless steel

Actuator Mounting Reference Position

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

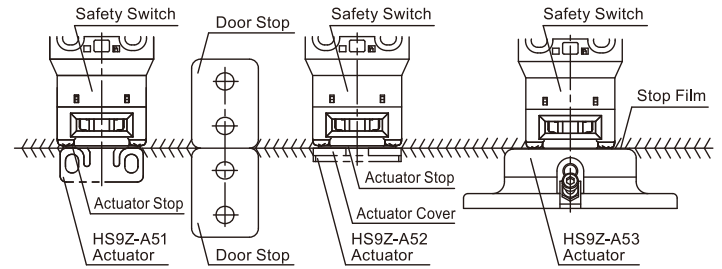
(Type HS9Z-A53)

The actuator stop film placed on the actuator touches the safety switch lightly.

(Except Type HS9Z-A53)

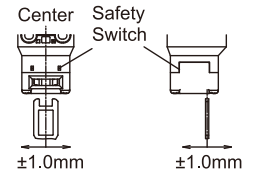
The actuator and actuator cover touches the actuator stop placed on the safety switch lightly.

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

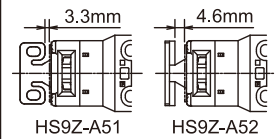


Actuator Mounting Tolerance

- Mounting tolerance of the actuator is 1.0 mm in the four lateral directions.
- Make sure the actuator can be inserted into the entry slot without any issue.
- When closing the door, the actuator is inserted and locked within a certain distance from the reference position. After the actuator has been locked, the contact operation is not affected by the actuator movement in the locked state.



| | (Actuator deviation)+ (Door movement) |
|-----------|---------------------------------------|
| HS9Z-A51 | ≤ 3.3mm |
| HS9Z-A52 | |
| HS9Z-A51A | ≤ 4.6mm |
| HS9Z-A52A | |
| HS9Z-A53 | ≤ 5.6mm |
| HS9Z-A55 | |
| HS9Z-A55S | ≤ 4.6mm |



For Type HS9Z-A51A/A52A actuator

- When there is a displacement of safety switch and actuator, the actuator may hit the entry slot of safety switch hardly, thus damaging the entry slot and actuator. The rubber cushions on the HS9Z actuator prevent the actuator from damaging the entry slot by absorbing the shock with movement flexibility. Do not, however, exert excessive shocks, otherwise the failure of safety switch may be caused.
- The rubber cushions may deteriorate depending on the operating environment and conditions. Immediately replace the deformed or cracked rubber cushions with new ones.

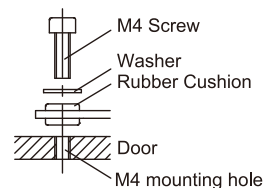
Recommended Screw Tightening Torque

| Name or Use | Screw Tightening Torque |
|--|-------------------------|
| For mounting the safety switch (M4 screw) *7 | 1.8 to 2.2 N•m |
| For mounting the actuator (HS9Z-A51: two M4 screws) *7 | 1.8 to 2.2 N•m |
| (HS9Z-A52: two M4 Phillips screws) | 0.8 to 1.2 N•m |
| (HS9Z-A51A/A52A: two M4 screws) *7*8 | 1.0 to 1.5 N•m |
| (HS9Z-A53: two M6 screws) *7 | 4.5 to 5.5 N•m |
| (HS9Z-A55/A55S: two M4 screws) *7 | 1.0 to 1.5 N•m |
| For mounting the HS5E head (M3) | 0.9 to 1.1 N•m |
| For mounting the manual rear unlocking button(M3 sems screw) | 0.5 to 0.7 N•m |

⚠ CAUTION

*7 When the torque is not enough to recommended screw tightening torque, make sure that the screw do not become loose by using adhesive sealants etc. to keep right operation and mounting positioning.

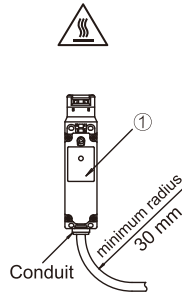
*8 In the case of HS9Z-A51A and HS9Z-A52A, using two M4 screws and two attached washers, fasten the actuator securely on the door.



4 Precautions for Operation

For Mounting

- Do not apply an excessive shock to the safety switch when opening or closing the door. A shock to the safety switch exceeding 1,000 m/s² may cause failure.
- Provide a door guide, and ensure that force is applied on the safety switch only in the actuator insertion direction.
- Do not pull the actuator while it is locked. Also, regardless of door types, do not use the safety switch as a door lock. Install a separate lock as shown in 3.
- Do not open the lid ① of the switch. Loosening the screws may cause damage to the switch.
- Entry of foreign objects in the actuator entry slot may affect the mechanism of the switch and cause a breakdown. 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.
- Make sure to install the product in a place where it cannot be damaged. Make sure to conduct a proper risk assessment evaluation before using the product, and use a shield or a cover to protect the product if need be.
- While the solenoid is energized, the switch temperature rises approximately 40°C above the ambient temperature (to approximately 90°C while the ambient temperature is 50°C). Keep hands off to prevent burns. If cables come into contact with the switch, use heat-resistant cables.
- Solenoid has polarity. Be sure to wire correctly. Do not apply voltage that exceed the rated voltage, otherwise the solenoid will be burnt out.
- Do not fasten and loosen the conduit at the bottom of the safety switch.
- When wiring, make sure that liquid such as water and oil does not intrude from the tip of cable.
- When bending the cable during wiring, secure the cable radius of 30 mm at the minimum.
- Use the dedicated actuators only. Other actuators will cause damage to the switch.



WARNING

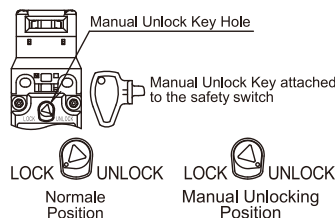
- Turn off the power to the safety switch before starting installation, removal, wiring, maintenance, and inspection on the safety switch. Failure to turn power off may cause electrical shocks or fire hazard.
- Do not disassemble or modify the switch. Also do not attempt to disable the interlock switch function, otherwise a breakdown or an accident will result.

CAUTION

- HS5E Series Safety Switches are Type 2 low-level coded interlocking devices (EN ISO / ISO14119). The following system installation & mounting instructions are EN ISO / ISO14119 requirements to prevent function failure from the interlock switch.
 - Using permanent fixing methods (e.g. welding, rivets, special screws...etc) to prevent dismantling or de-positioning of the interlock device. However, permanent fixing methods are not an adequate solution if you expect the interlock device to fail during the machinery lifetime, or if you need to replace the product in quick manner. In these situations, other measures (see 2.) should be put in place to reduce the risks of function failure.
 - At least one of the following measures should be applied to prevent function failure.
 - Mounting the interlock device in a place out of reach from workers
 - Using shielding protection to prevent physical obstruction of the device
 - Mounting the interlock device in a hidden position
 - Integrate status monitoring & cycling testing of the device to the control system to prevent product failure.
- Regardless of door types, do not use the safety switch as a door stop. Install a mechanical door stop to the end of the door to protect the safety switch against excessive force.
- Mount the actuator so that it will not hit the operator when the door is open, otherwise injury may be caused.
- Pay attention to the management of spare actuator. Safety function of door interlock switch will be lost in case the spare actuator is inserted into the interlock switch. Ensure that the actuator is firmly fastened to the door (welding, rivet, special screw) in the appropriate location, so that the actuator cannot be removed easily.
- Do not cut or remodel the actuator, otherwise failure will occur.
- If multiple safety components are wired in series, the Performance Level to EN ISO 13849-1 will be reduced due to the restricted error detection under certain circumstance.
- The entire concept of the control system, in which the safety component is integrated, must be validated to EN ISO 13849-2.

For Manual Unlocking

- Using the switch with the key being not fully turned (less than 90 degrees) may cause damage to the switch or errors.
- When manually unlocked, the switch will keep the main and lock monitor circuit disconnected and the door unlocked.



(Type HS5E-□4)

- The HS5E allows manual unlocking of the actuator to precheck proper door operation before wiring or turning power on, as well as for emergency use such as a power failure.

(Type HS5E-□7Y)

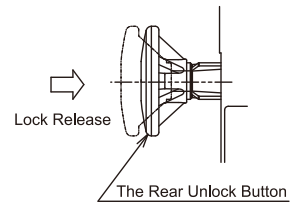
- If the actuator is not unlocked although the solenoid is deenergized, the actuator can be unlocked manually.
- To change the normal position to the manual unlocking position as shown above, turn the key fully (90 degrees) using the special key included with the switch.

CAUTION

- Before manually unlocking the safety switch, make sure the machine has come to a complete stop. Manual unlocking during operation may unlock the switch before the machine stops, and the function of safety switch with solenoid is lost.
- While the solenoid is energized, do not unlock the actuator manually (solenoid lock type).
- Do not apply excessive force (0.45 N•m or more) to the manual unlock key. Otherwise the manual unlock switch will be damaged. Do not attach the key to the switch intentionally (the key is designed to fall off when the operator's hand is off the key).
- Do not leave the manual unlock key attached to the switch during operation. This is dangerous because the switch can always be unlocked while the machine is in operation.

For the Rear Unlock Button (Type HS5E-□L)

- The rear unlock button is used for an emergency escape when the worker is confined in the safety hedge (the dangerous area).
- The lock is released when the rear unlock button is pressed, and the door can be opened.
- To return to locked status, pull back the button. While the rear unlock button is depressed, the main circuit remains open and the door is unlocked.



CAUTION

- Install the HS5E to ensure that a worker can operate the Rear Unlock Button from inside the safety hedge (the dangerous area). It is dangerous to install the HS5E in the position where the Rear Unlock Button can be operated from outside the safety hedge (the dangerous area), because it is possible to unlock while the machine is operating.
- Use hand to press the button, and do not use a tool. Do not apply excessive force to the Rear Unlock Button.

5 Contact Operation

Contact Configuration and Operation

| Type | Contact Configuration *10 | Contact Operation (reference) |
|----------|---------------------------|-------------------------------|
| HS5E-A□ | | |
| HS5E-B□ | | |
| HS5E-C□ | | |
| HS5E-D□ | | |
| HS5E-F□ | | |
| HS5E-G□ | | |
| HS5E-H□ | | |
| HS5E-J□ | | |
| HS5E-DD□ | | |
| HS5E-VA□ | | |
| HS5E-VB□ | | |
| HS5E-VC□ | | |
| HS5E-VD□ | | |
| HS5E-VF□ | | |
| HS5E-VG□ | | |
| HS5E-VH□ | | |
| HS5E-VJ□ | | |

CAUTION

*9 This locking monitoring marking has been newly described in section 9.2.1 of EN ISO / ISO14119. It indicates that any devices with this marking meet the following EN ISO / ISO 14119 requirements:

- General (- General requirements for guard locking devices) (Section 5.7.1) *
- Locking monitoring (- Locking monitoring for guard locking devices) (Section 5.7.2.2)

When a lock monitor circuit (contact) has the locking monitoring marking, it means that one circuit (contact) can monitor the position and the locking function of the protective door. (The locking monitoring circuit (contact) turns ON only when the protective door is closed and locked.)

*note Both types of HS5E safety switches - spring lock type switches and solenoid lock type switches - have obtained the locking monitoring certification marking. Based on risk assessment results, solenoid lock type switches can be used only for limited applications which do not especially need to be locked for safety.

*10 The Actuator is inserted, and HS5E is locked.

- Contact operation is based on the condition that the actuator is inserted into the center of the safety switch slot.
- Contact operation shows the HS9Z-A51 actuator. (For other actuators, add 1.3 mm to contact operation.)
- Terminals 12-41 are connected together internally. Use terminals 11-42 for safety circuit inputs.
- Use main circuit or monitor circuit with for the input to safety circuit.
- Indicator turns on when solenoid is energized.
- (Type HS5E-DD) Terminals 12-41,22-51 are connected together internally. Use terminals 11-42,21-52 for safety circuit inputs.

Operation Cycle

- Spring Lock Type (HS5E-□4)

| Door States | Closed | Closed | Open | Closed |
|---------------------------------------|---|--|---|---|
| Main Circuit | 11-42 21-52 | Closed | Open | Open |
| Monitor Circuit | 11-12 21-22 21-22 31-32 | Closed | Closed | Open |
| Monitor Circuit | 23-24 33-34 | Open | Open | Closed |
| Monitor Circuit | 41-42 51-52 61-62 | Closed | Open | Open |
| Monitor Circuit | 53-54 63-64 | Open | Closed | Closed |
| Solenoid Power A1-A2 | Off | On | Off/On | Off |
| Manual Unlock Key /Rear Unlock Button | Turn the key to lock position. /Returned status | Turn the key to lock position. /Returned status | Turn the key to lock position. /Returned status | Turn the key to unlock position. /When operating the Button |
| | Door is locked. The machine can be operated. | Door is unlocked. The machine can not be operated. | The machine can not be operated. | Door is unlocked. The machine can not be operated. |

- Solenoid Lock Type (HS5E-□7Y)

| Door States | Closed | Closed | Open | Closed |
|----------------------|--|--|----------------------------------|--|
| Main Circuit | 11-42 21-52 | Closed | Open | Open |
| Monitor Circuit | 11-12 21-22 31-32 | Closed | Closed | Open |
| Monitor Circuit | 23-24 33-34 | Open | Open | Closed |
| Monitor Circuit | 41-42 51-52 61-62 | Closed | Open | Open |
| Monitor Circuit | 53-54 63-64 | Open | Closed | Closed |
| Solenoid Power A1-A2 | On | Off | Off/On *12 | Off *11*12 |
| Manual Unlock Key | Turn the key to lock position. | Turn the key to lock position. | Turn the key to lock position. | Turn the key to unlock position. |
| | Door is locked. The machine can be operated. | Door is unlocked. The machine can not be operated. | The machine can not be operated. | Door is unlocked. The machine can not be operated. |

CAUTION

- *11 Do not attempt manual unlocking when the solenoid is energized.
- *12 Do not energize the solenoid for a long time while the door is open or when the door is unlocked manually.

6 Wiring

Wiring

- Cable specifications UL style 2464 (80°C 300V)
(Type HS5E-□,DD) 8c × No.21 AWG
(Type HS5E-V□) 12c × No.22 AWG

- Wire identification

Wires are identified by the color and white line printed on the wire.

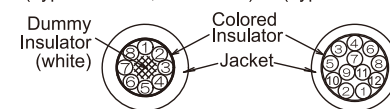
(Type HS5E-V□)

Do not use wire which is Gray, Gray / White.

(Type HS5E-DD)

Do not use wire which is Brown, Brown / White.

(Type HS5E-□, HS5E-DD) (Type HS5E-V□)



| No. | Insulator Color | No. | Insulator Color |
|-----|-----------------|-----|-----------------|
| 1 | White | 7 | Blue / White |
| 2 | Black | 8 | Orange / White |
| 3 | Brown | 9 | Pink |
| 4 | Blue | 10 | Pink / White |
| 5 | Brown / White | 11 | Gray |
| 6 | Orange | 12 | Gray / White |

Terminal Number Identification

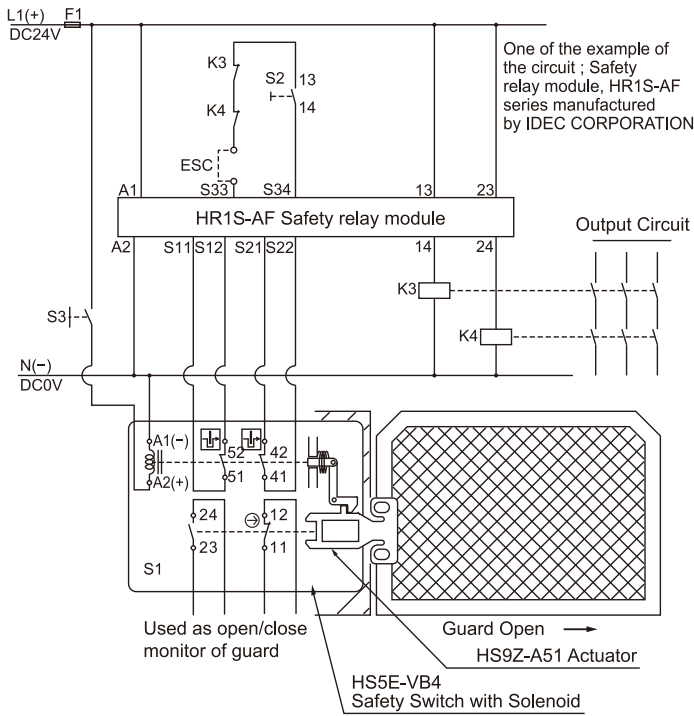
- When wiring, the terminal number on each contact is identified by wire color.
- The following shows the identification of terminal number.
- When wiring, cut unnecessary wires such as dummy insulator (white) and/or unused wires to avoid incorrect wiring.

| Circuit No. | Insulator Color |
|----------------------|-----------------|
| 11 | Blue |
| (12), 42 | Blue / White |
| 21, 23, 61, 63 | Orange |
| 22, 24, [52], 62, 64 | Orange / White |
| 31, 33, 51, 53 | Brown |
| 32, 34, 52, 54 | Brown / White |
| 41 | Pink |
| 42 | Pink / White |
| A1 (-) | Black |
| A2 (+) | White |

7 Example of wiring Diagram realizing Safety Category

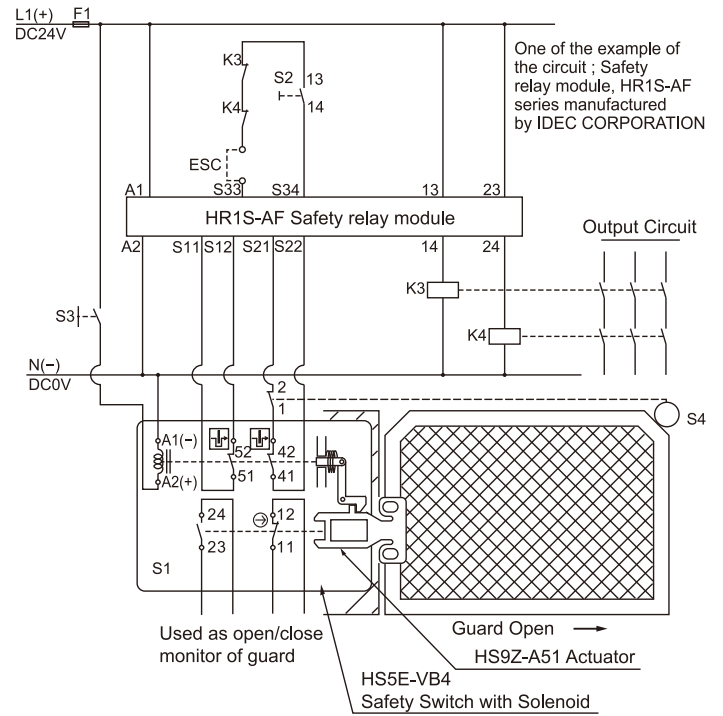
Example of a circuit diagram for Safety Category 3 (attainable PL = d)

(Condition 1: To apply the fault exclusion of mechanical structural parts including the actuator → Make sure to use the product within the product specification range described in this manual and the version of the manual provided with the product.)
(Condition 2: Documentation of the reason for the machine/equipment manufacturer to have applied the fault exclusion based on ISO13849-1, ISO13849-2 or IEC62061.)



- S1: HS5E-VB4 Safety Switch with Solenoid
- S2: Starting Switch (HW Series Momentary)
- S3: Unlocking Enabling Switch
- S4: Safety limit Switch
- ESC: Outside start condition
- K3, 4: Safety Contactor
- F1: Outside fuse of safety relay module at power supply line

Example of a circuit diagram for Safety Category 4 (attainable PL = e)

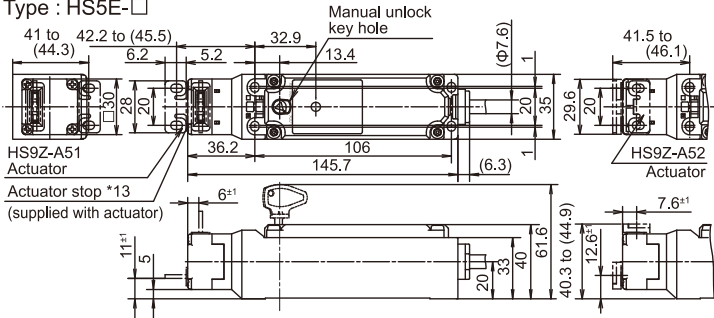


Note: Use the monitoring device(Safety relay module) provided the capability to detect a cross short circuit. The insulation of the cable has to withstand environmental influences. If a control device other than the one shown in the draft is used, the used control device has to be equipped with a cross short circuit monitor.

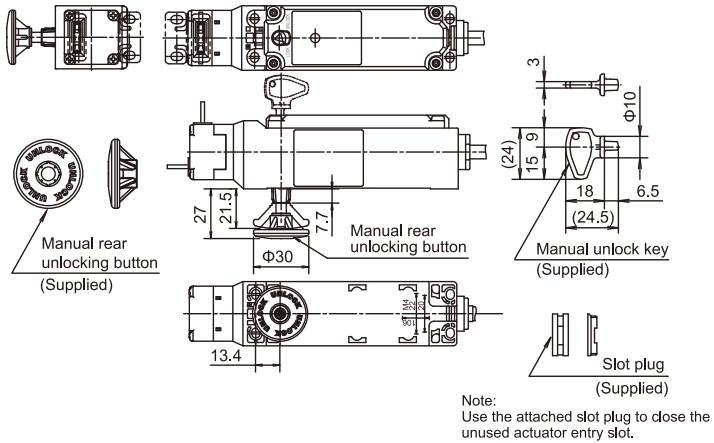
8 Dimensions (mm)

Dimensions

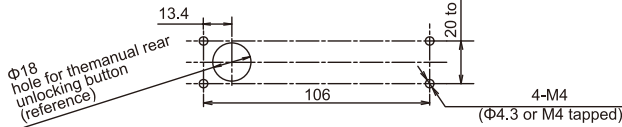
Type : HS5E-□



Type : HS5E-□L

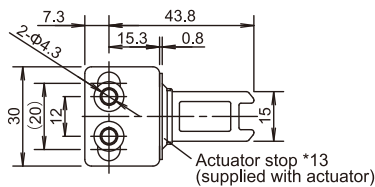


Main body mounting hole layout

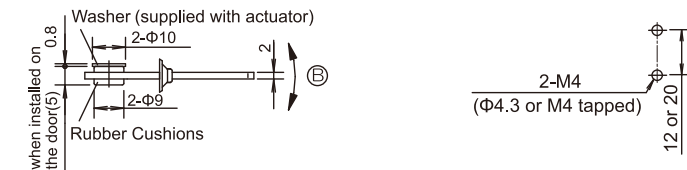


Accessories dimensions

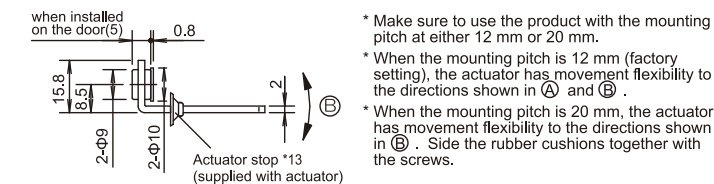
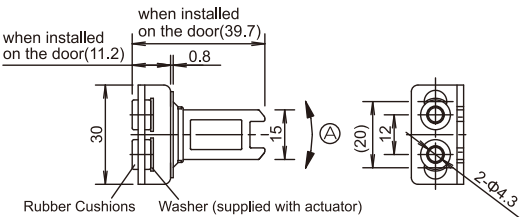
Type : HS9Z-A51A Actuator with Rubber Cushions



- * Make sure to use the product with the mounting pitch at either 12 mm or 20 mm.
- * Mounting pitch is set to 12 mm in factory. When setting the mounting pitch to 20 mm, widen the pitch of rubber cushions to 20 mm.
- * The actuator has movement flexibility to the directions shown in (A) and (B).

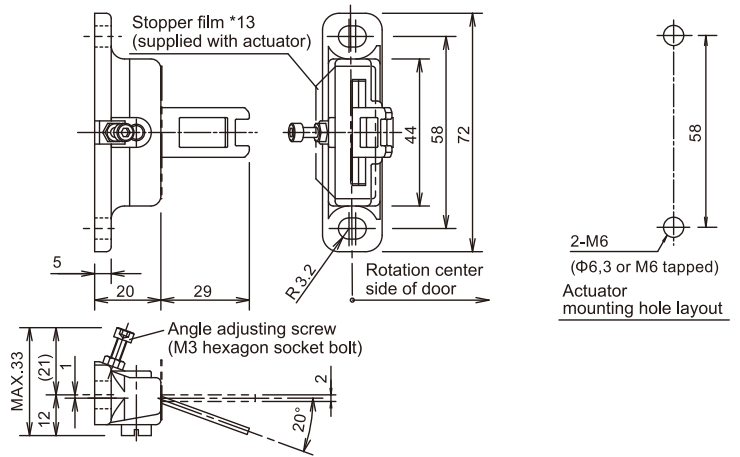


Type : HS9Z-A52A Actuator with Rubber Cushions

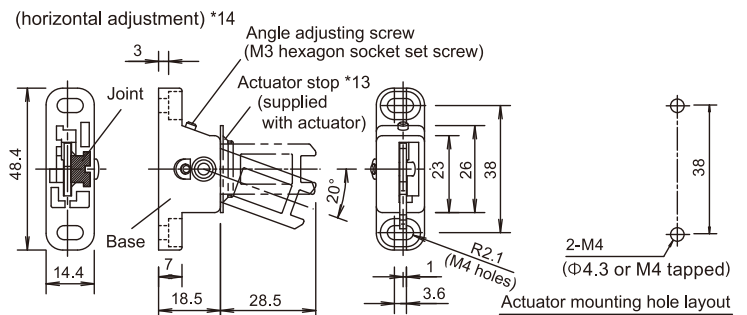


- * Make sure to use the product with the mounting pitch at either 12 mm or 20 mm.
- * When the mounting pitch is 12 mm (factory setting), the actuator has movement flexibility to the directions shown in (A) and (B).
- * When the mounting pitch is 20 mm, the actuator has movement flexibility to the directions shown in (B). Side the rubber cushions together with the screws.

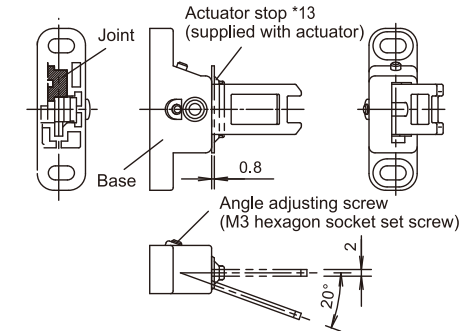
Type : HS9Z-A53 Angle Adjustable (vertical) Actuator



Type : HS9Z-A55 Angle Adjustable (vertical / horizontal) Actuator

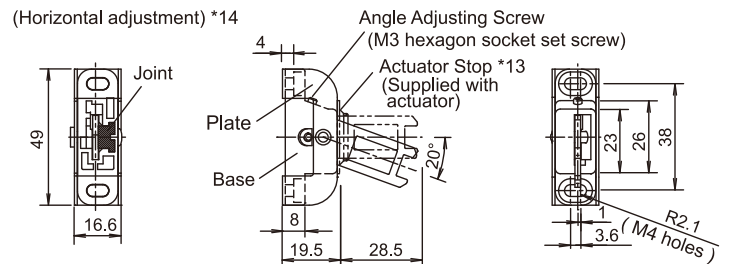


(vertical adjustment) *14

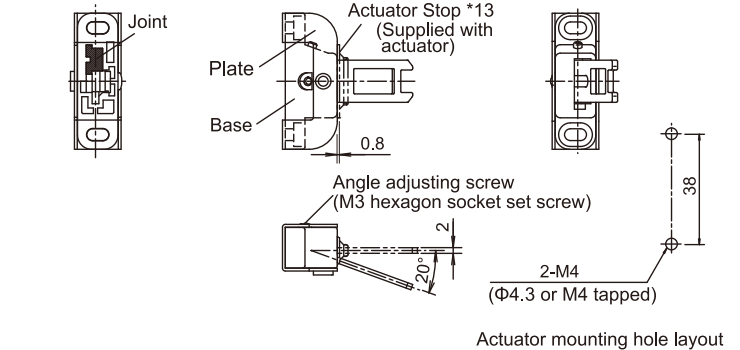


Type : HS9Z-A55S

Angle Adjustable (vertical/horizontal) Actuator with plate

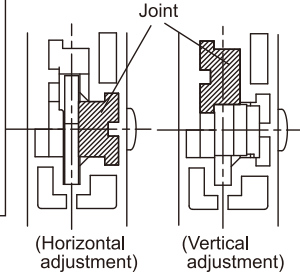


(Vertical adjustment) *14



Actuator mounting hole layout

- *13 The actuator stop and The Stopper film are used when adjusting the actuator position. Remove after the actuator position is determined.
- *14 The direction of adjustable angle can be changed (vertical or horizontal) by changing the insertion direction of the joint (white plastic part).
Do not lose the joints. Actuators do not operate normally without a joint.



9 Precaution for Disposal

Dispose of the HS5E safety switch as an industrial waste.

IDEC CORPORATION <http://www.idec.com>

Manufacturer: IDEC CORP.
2-6-64 Nishimiyahara Yodogawa-ku, Osaka 532-0004, Japan
EU Authorized Representative: IDEC Elektrotechnik GmbH
Heselerstuecken 8, D-22453 Hamburg, Germany

DECLARATION OF CONFORMITY
We, IDEC CORPORATION 2-6-64, Nishimiyahara Yodogawa-ku, Osaka 532-0004, Japan declare under our sole responsibility that the product:

Description: Safety Switch
Model No: HS5E

to which this declaration relates is in conformity with the EC Directive on the following standard(s) or other normative document(s). In case of alteration of the product, not agreed upon by us, this declaration will lose its validity.

Applicable EC Directive : Low Voltage Directive (2014/35/EU)
Machinery Directive (2006/42/EC)

Applicable Standard(s) : EN 60947-5-1, GS-ET-19