Actuator / Accessory

Actuator

Description	Part No. (Ordering Part No.)	Package Quantity	Remarks
Straight with rubber bushings	HS9Z-A11T	1	Actuator retention force is Fzh=5,000N.
Right-angle with rubber bushings	HS9Z-A12T	1	
Angle adjustable	HS9Z-A15T	1	

• Above actuators can only be used for HS1T. Do not used on other models.

Note) Use dedicated actuators only. When other actuators are used, the interlock switch may be damaged.

Accessory

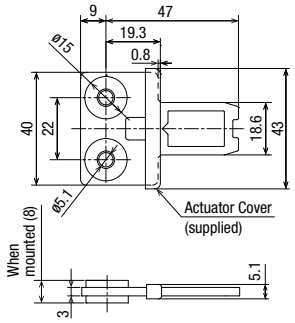
Description	Part No. (Ordering Part No.)	Package Quantity	Remarks
Manual Unlock Key (long)	HS9Z-T3	1	Material: Plastic (Used if the HS1T is installed far inside the equipment to reach to the manual lock.)

Interlock Switch Dimensions and Mounting Hole Layouts

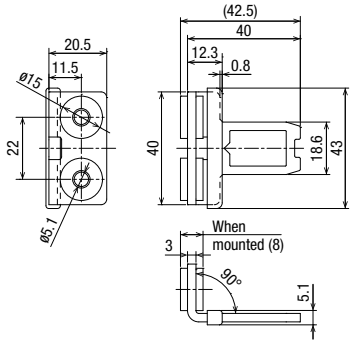
All dimensions in mm

Actuator

Straight with rubber bushings
HS9Z-A11T

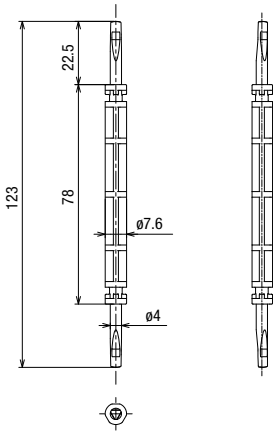


Right-angle with rubber bushings
HS9Z-A12T

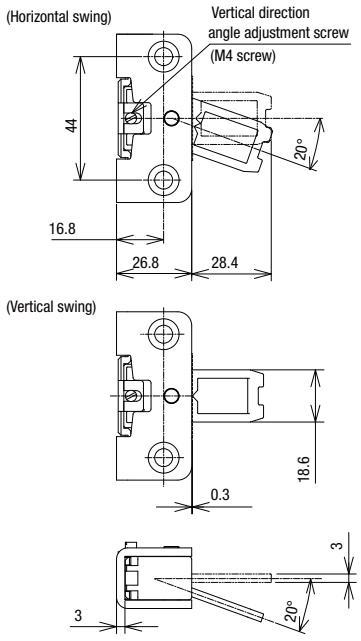


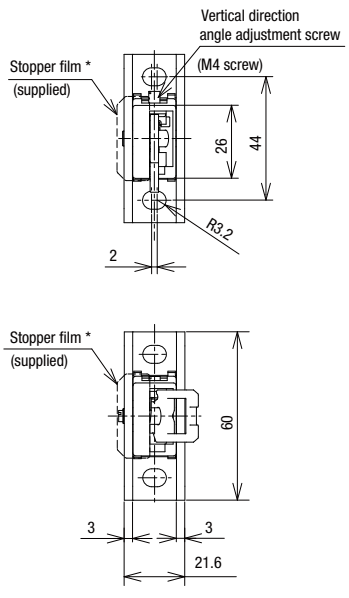
Accessory

Manual Unlock Key (long) (Plastic)
HS9Z-T3

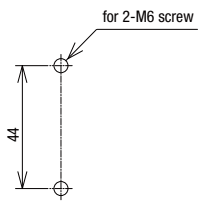


Angle adjustable
HS9Z-A15T





Mounting Hole Layout



* A stopper film is used for positioning the actuator.
After positioning is complete, remove the film.

⚠ Safety Precautions

- Turn power off before installation, removal, wiring, maintenance, or inspection of the interlock switch. Otherwise electric shock or fire may occur.
- If relays are used in the circuit between the interlock switch and the load, use only safety relays, since welded or sticking contacts of standard relays may invalidate the functions of the interlock switch. Perform a risk assessment and make a safety circuit which satisfies the requirements of the safety category.
- Do not place a PLC in the circuit between the interlock switch and the load. Safety security can be endangered in the event of a malfunction of the PLC.
- Do not disassemble or modify the interlock switch, otherwise malfunction or accident may occur.
- Do not install the actuator in a location where a human body may come into contact. Otherwise injury may occur.
- Solenoid lock is locked when energized, and unlocked when de-energized. When energization is interrupted due to wire disconnection or other failures, the interlock switch may be unlocked causing possible danger to the operators. Solenoid lock must not be used in applications where locking is strictly required for safety. Perform a risk assessment and determine whether solenoid lock is required.
- HS11T interlock switches are Type 2 low level coded interlocking devices (ISO14119). According to EN ISO/ ISO14119, the following is required to minimize defeat when installing and constructing systems:

1. Prevent dismantling or de-positioning of the elements of the interlocking device by use of non-detachable fixing (e.g. welding, gluing, one-way screws, riveting). However, use of non-detachable fixing can be an inappropriate solution in cases where a failure of the interlocking device during lifetime of the machinery can be expected and a fast change is necessary. In this case, measures mentioned below should be used to provide the required level of risk reduction.
2. Apply at least one out of the four measures below.
① Mounting out of reach.
② Physical obstruction or shielding.
③ Mounting in hidden position.
④ Integration of defeat monitoring by means of status monitoring/cyclic testing.

Instructions

For details on installation, wiring, and maintenance, see the Instruction Sheet and User's Manual from the URL.
https://product.idec.com/?product=HS1T

Installation

- Do not apply excessive shock to the interlock switch when opening or closing the door. A shock to the interlock switch exceeding 1,000 m/s^2 may cause damage to the interlock switch.
- Install a guide on the door and make sure that force is not applied in the direction other than the actuator entry direction.
- Do not pull the actuator during lock status. Do not use the interlock switch as a locking device regardless of the door type. To install a locking device, use a bracket as mentioned in page 3 of the instruction manual.
- Make sure that the installation surface of the interlock switch is flat and has sufficient strength to not deform when the interlock switch is installled. Also, do not place foreign objects between the interlock switch and the installation surface. The interlock switch may not operate properly if the surface is not flat of a foreign object is placed in between.
- If the operating atmosphere is contaminated, use a protective cover to prevent entry of foreign objects into the interlock switch through the actuator entry slots. Entry of foreign objects into the interlock switch may affect the mechanism of the interlock switch and cause a breakdown.
- Make sure that the actuator does not scape the entry of the metal head. Otherwise, damage may occur.

Install the interlock switch in a location where there is no risk of damage.
Also, perform risk assessment before use and take measures such as attaching a protective cover if necessary.

- While the solenoid is energized, the interlock switch temperature rises approximately 40°C above the ambient temperature (to approximately 95°C while the ambient temperature is 55°C). To prevent burns, do not touch. If cables come into contact with the interlock switch, use heat-resistant cables.
- The solenoid has polarity. Make sure of the correct polarity when wiring. Do not apply overvoltage, otherwise the solenoid will be burnt.
- When wiring, make sure that water or oil does not enter from the end of the cable.
Use dedicated actuators only. If other actuators are used, the interlock switch may be damaged.
- When wiring to the terminal block using a screwdriver while holding the interlock switch in the hands, be careful not to damage fingers with the tip of the screwdriver.
- Do not push in the screwdriver with excessive force when wiring to the terminal block. Internal parts may crack and cause damage.
- Regardless of door types, do not use the interlock switch as a door stop. Install a mechanical door stop at the end of the door to protect the interlock switch against excessive force.
- Safety function of the door interlock switch will be lost if a spare key is inserted into the interlock switch. Make sure that a spare key is not used on the interlock switch.
- Do not cut or modify the actuator. Otherwise, damage may occur.
- If multiple safety components are wired in series, the Performance Level to EN ISO 13849-1 will be reduced due to degradation of the failure detection function.
- Insulation of the cable should withstand environmental influences.
- The entire concept of the control system, in which the safety component is integrated, must be validated to EN ISO 13849-2.

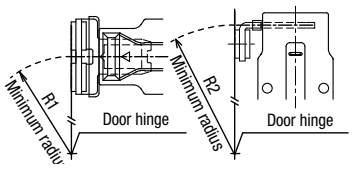
Instructions

Minimum Radius of Hinged Door

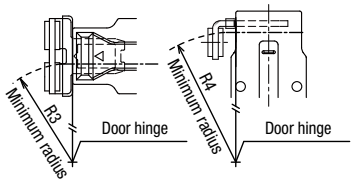
When using the interlock switch for a hinged door, refer to the minimum radius of doors shown below. For the doors with small minimum radius, use angle adjustable actuators (HS9Z-A15T).

Note: The following values apply when the actuator does not interfere with the interlock switch when opening and closing the door. Because deviation or dislocation of hinged door may occur in actual applications, make sure of the correct operation before installation.

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



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



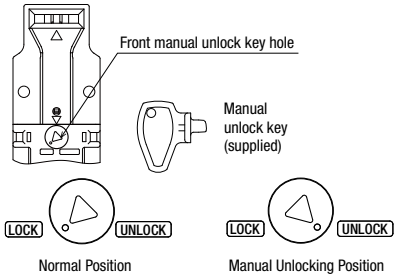
Actuator	Minimum Radius of Hinged Door			
	R1	R2	R3	R4
HS9Z-A11T	510mm	900mm	270mm	450mm
HS9Z-A12T	510mm	840mm	270mm	450mm
HS9Z-A15T	80mm	80mm	50mm	50mm

Rotating the Head

- The rotating head has an allowable movement range. Do not turn the head exceed the movement range. Otherwise, damage may occur.
- Tightening the head stopper screw withoug aligning the △ marks indicated on the head and body and may cause damage
- After installing the rear unlocking button, apply thread-locking adhesive to the screw so that the screw does not loosen.
- Make sure that foreign objects do not enter between the head and body when rotating the head.
- Make sure to tighten the head stopper screw securely. Loose screws may cause malfunction.
- Do not loosen the head stopper screw other than when rotating the head.

Manual Unlocking

- When locking or unlocking the interlock switch manually, turn the key fully using the manual unlock key supplied with the interlock switch as shown below. Using the interlock switch with the key not fully turned (less than 90°) may cause damage to the interlock switch or operation failures.
- When manually unlocked, the interlock switch will keep the main circuit disconnected and the door unlocked. Main circuit and lock monitor circuit remain open.



HS1T-□4

The HS1T-□4 allows manual unlocking of the actuator to pre-check proper door operation before wiring or turning power on, as well as for emergency use such as a power failure.

HS1T-□7Y

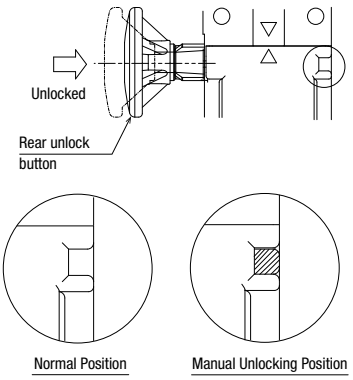
The solenoid interlock switch does not unlock even when the solenoid is de-energized. However, the interlock switch can be unlocked manually in emergency cases.

Notes

- Before manually unlocking the interlock switch, make sure that the machine has come to a complete stop. Manual unlocking during operation may unlock the interlock switch before the machine stops, and the function of interlock switch with solenoid is lost.
- On solenoid lock models, do not manually unlock while the solenoid is energized.
- Do not apply excessive force (0.45 N·m or more) to the manual unlock key hole, otherwise the hole will be damaged.
- Do not leave the manual unlock key attached to the interlock switch during operation. This is dangerous because the interlock switch can be unlocked while the machine is in operation.

Rear Unlock Button and Mechanical Indicator

HS1T-□L



- Use the rear unlock button when a worker is locked inside a safety fence (hazard area). (Compliant with escape release described in EN ISO/ ISO 14119 [2003] and GS-ET-19)
- When the rear unlock button is pressed, the interlock switch is unlocked and the door can be opened.
- To lock the interlock switch, pull back the button. When the button remains pressed, the interlock switch cannot be locked even if the door is closed, and the main circuit remains open.
- When the rear unlock button is pressed, the mechanical indicator is displayed on the side of the interlock switch. The lock status can be identified from outside the safety fence.
- Install the rear unlock mechanical indicator on either side of the interlock switch.

Notes

- Install the rear unlock button inside the safety fence (hazardous area) where only the operator is accessible. Do not install where the rear unlock button can be reached by an operator outside the safety fence (hazardous area). Otherwise, the interlock switch may be unlocked during machine operation, causing danger.
- Operate the rear unlock button by hand only. Do not use a tool or with excessive force. Do not apply force to the button from the direction other than the proper direction, otherwise the button will be damaged.