

HS1L Interlock Switches with Solenoid

Key features:

- 3,000N locking retention force
- LED indicator
- Energy-efficient solenoid
- 6 contacts with easy-to-wire terminations
- M3 terminal screws for easy wiring



Part Numbers

Mechanical Spring Lock (power solenoid to unlock)			
Contact Configuration	Conduit Size	LED	Part Number
	G1/2	Red	HS1L-R44KMSR-R
		Green	HS1L-R44KMSR-G
	PG13.5	Red	HS1L-R44KMSRP-R
		Green	HS1L-R44KMSRP-G
	M20	Red	HS1L-R44KMSRM-R
		Green	HS1L-R44KMSRM-G
	G1/2	Red	HS1L-DQ44KMSR-R
		Green	HS1L-DQ44KMSR-G
	PG13.5	Red	HS1L-DQ44KMSRP-R
		Green	HS1L-DQ44KMSRP-G
	M20	Red	HS1L-DQ44KMSRM-R
		Green	HS1L-DQ44KMSRM-G
	G1/2	Red	HS1L-DT44KMSR-R
		Green	HS1L-DT44KMSR-G
	PG13.5	Red	HS1L-DT44KMSRP-R
		Green	HS1L-DT44KMSRP-G
	M20	Red	HS1L-DT44KMSRM-R
		Green	HS1L-DT44KMSRM-G

Mechanical Spring Lock (power solenoid to unlock)			
Contact Configuration	Conduit Size	LED	Part Number
	G1/2	Red	HS1L-R7Y4KMSR-R
		Green	HS1L-R7Y4KMSR-G
	PG13.5	Red	HS1L-R7Y4KMSRP-R
		Green	HS1L-R7Y4KMSRP-G
	M20	Red	HS1L-R7Y4KMSRM-R
		Green	HS1L-R7Y4KMSRM-G
	G1/2	Red	HS1L-DQ7Y4KMSR-R
		Green	HS1L-DQ7Y4KMSR-G
	PG13.5	Red	HS1L-DQ7Y4KMSRP-R
		Green	HS1L-DQ7Y4KMSRP-G
	M20	Red	HS1L-DQ7Y4KMSRM-R
		Green	HS1L-DQ7Y4KMSRM-G
	G1/2	Red	HS1L-DT7Y4KMSR-R
		Green	HS1L-DT7Y4KMSR-G
	PG13.5	Red	HS1L-DT7Y4KMSRP-R
		Green	HS1L-DT7Y4KMSRP-G
	M20	Red	HS1L-DT7Y4KMSRM-R
		Green	HS1L-DT7Y4KMSRM-G

1. Contact configuration shows the contact status when actuator is inserted and solenoid off for spring lock.
2. Contact configuration shows the contact status when actuator is inserted and solenoid on for solenoid lock.
3. Actuators are not supplied with the interlock switch and must be ordered separately.
4. Standard stock items in bold.

Actuator Keys & Accessories (order separately)

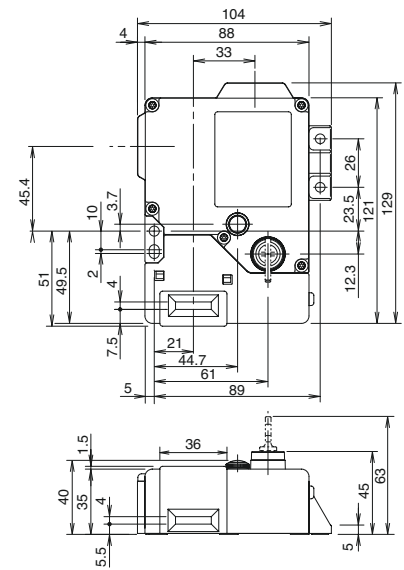
Appearance	Part Number	Description
	HS9Z-A1	Straight Actuator
	HS9Z-A2	Right-angle Actuator
	HS9Z-A3	Adjustable Actuator

Appearance	Part Number	Description
	HS9Z-T1	Key Wrench (included with switch)
	HS9Z-P1	Conduit Opening Plug (G1/2)

Specifications

Conforming to Standards	ISO14119, IEC60947-5-1, EN60947-5-1 (TÜV approval), GS-ET-19 (TÜV approval), UL508, CSA C22.2 No. 14, IEC60204-1/EN60204-1 (applicable standards for use)	
Operating Temperature	-20 to +55°C (no freezing)	
Storage Temperature	-40 to +80°C (no freezing)	
Relative Humidity	45 to 85% (no condensation)	
Rated Insulation Voltage (Ui)	300V	
Overvoltage Category	III	
Electric Shock Protection	Class II (IEC 61140)	
Degree of Protection	IP67 (IEC 60529)	
Shock Resistance	Damage limits: 1000m/s ²	
Actuator Retention Force	3000N minimum (GS-ET-19)	
Actuator Operating Speed	0.05 to 1.0m/s	
Direct Opening Travel	11mm minimum	
Direct Opening Force	50N minimum	
Thermal Current (Ith)	10A	
Operating Frequency	900 operations per hour	
Mechanical Life	1,000,000 operations minimum (GS-ET-19)	
Electrical Life	100,000 operations minimum (AC-15 3A/250V) 1,000,000 operations minimum (24V AC/DC, 100mA) (operating frequency 900 operations per hour)	
Solenoid Unit	Rated Operating Voltage	24V DC (100% duty cycle)
	Rated Current	200mA (initial value)
Indicator	Rated Operating Voltage	24V DC
	Rated Current	10mA
	Light Source	LED
	Illumination Color	Green (G), Red (R)
Weight (approx.)	450g (HS1L-DQ44)	

Dimensions (mm)



Contact Ratings

Rated Operating Current (I _g)	Rated Voltage (U _e)		30V	125V	250V
	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	0.9A	0.6A

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.

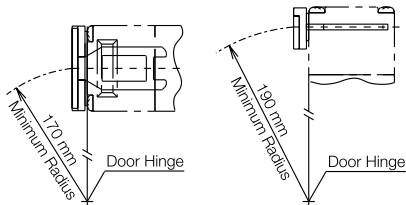
Minimum Radius of Hinged Door

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).

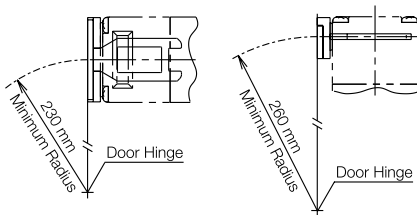
Note: Because deviation or dislocation of hinged doors may occur in actual applications, make sure of the correct operation before installation.

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 actuator mounting surface:

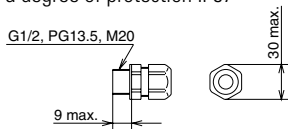


When using the HS9Z-A55 Angle Adjustable Actuator

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

Use a cable gland with a degree of protection IP67



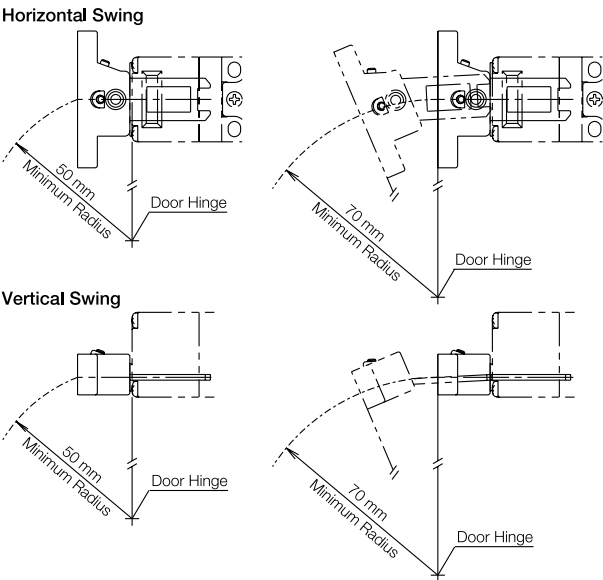
all dimensions in mm

When Using Flexible Conduits (Example)

Flexible conduit example: VF-03 (Nihon Flex)

Conduit Port Size	Plastic Cable Gland	Metal Cable Gland
G1/2	—	RLC-103 (Nihon Flex)
PG13.5	—	RBC-103PG13.5 (Nihon Flex)
M20	—	RLC-103EC20 (Nihon Flex)

- 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 so as to prevent its loosening.



Actuator Angle Adjustment for the HS9Z-A55

Using the angle adjustment screw, the actuator angle can be adjusted (see figures on page 370). 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 actuator entry slot of the interlock switch.
- After adjusting the actuator angle, apply Loctite to the adjustment screw so that the screw will not loosen.

Applicable Cable Glands

When Using Multi-core Cables (Example)

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

- 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.