SFD Series

INSTRUCTION MANUAL

DRW190180AC

Autonics

Thank you for choosing our Autonics product.

Read and understand the instruction manual and manual thoroughly before using the

For your safety, read and follow the below safety considerations before using. For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

Keep this instruction manual in a place where you can find easily. The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Follow Autonics website for the latest information.

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- Δ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death.

- 01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
 Failure to follow this instruction may result in personal injury, economic loss or fire.

 102. System manager means followings;
- a personnel who is fully aware of installation, setting, operation, and maintenance of the product
- of the product
 a personnel who well observes standard/regulation/statute on the product by type
 of machine the product installed in and nation/region the product used in Machine
 user means a personnel who is appropriately trained about using machine by the
 system manager, so that machine user can operate the machine correctly.
 System manager has duty to train the machine user about operation of the product.
 Machine user has to report directly to the system manager when unusual status has
 been found while system is operating.

ailure to follow this instruction may result in personal injury, economic loss or fire

- 03. The product has to be installed, set, and combined with machine control system by the qualified system manager.
- Failure to follow this instruction may result in personal injury due to unintended operation and unstable detection.
- 04. Before using the product, check that function of the product operates as intended while machine is turned off after installation. Failure to follow this instruction may result in personal injury due to unintended operation
- 05. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, salinity, moisture, or steam, or dust may be present.
- tion may result in explosion or fire.
- 06. Do not disassemble or modify the unit.
- ailure to follow this instruction may result in personal injury or fire due to loss of safety
- 07. Be cautious about the installing place of the operation key in order to protect worker from hitting the operation key when the door is opened.
- 08. Do not use a head of the door lock switch (SFDL Series) failure to follow this instruction may result in personal injury or fire due to loss of safety
- 09. Install separate safety device to fix door closed, or door can be opened because of
- Pailure to follow this instruction may result in personal injury.

 10. Check the installed status of the switch, operating status of the switch, and signs of damage, modification, tampering of the switch at the following situation and on a weekly basis.
- when operating the safety system at first
- when replacing component of the system
 when the system has not been operated for a long time
- Failure to follow this instruction may result in personal injury due to malfunction of the product and safety function.
- 11. Check 'Connections' before wiring.
 Failure to follow this instruction may result in fire

▲ Caution Failure to follow instructions may result in injury or product damage.

- 01. Use the unit within the rated specifications. ailure to follow this instruction may result in fire or product damage
- 02. Use a dry cloth to clean the unit, and do not use water or organic solvent.
- ${\bf 03.} \ \ Keep the door switch away from debris and tighten the screw securely when replacing$ Failure to follow this instruction may result in malfunction
- 04. Keep the product away from metal chip, dust, and wire residue which might flow into
- Failure to follow this instruction may result in fire, product damage or malfunction.

 05. Do not use the switch as a guard door stopper. Install separate mechanical stopper.
- ailure to follow this instruction may result in product dan 06. Carefully manage the spare operation key in order to prevent use of the key without
- Failure to follow this instruction may result in loss of safety function due to insertion of the spare operation key.

- 07. Use only Autonics operation key.
 Failure to follow this instruction may result in product damage.
 08. Install the operation key tightly within the range written in 'Installation' with welding, rivet, or special bolt in order not to be easily released from the switch. Failure to follow this instruction may result in product dam

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected
- Use the switch with the dedicated controller. Do not use the switch with another controller randomly.
- This unit may be used in the following environments.
 Indoors (in the environment condition rated in 'Specifications')
- Altitude max. 2,000m
- Pollution degree 3
- Installation category III - Enclosure Type I

Sold Separately

- Operation keyM12 Connector cable

Ordering Information

This is only for reference.

For selecting the specific model, follow the Autonics web site

SFD -0 0 -

• Head materials No mark: Plastic M: Metallic

AB: 1 N.O., 1 N.C.

A2R: 1 N.O. 2 N.C.

Contact composition

Connection outlet specification

No mark: 1

Connection outlet

8 4

M20: M20 thread G1/2: G1/2 thread C: M12 connecte

Contact Composition and Operation

Contact composition represents the locked status with the operation key inserted

Model	Contact	Contact composition	Contact operation
			Operation key complete insertion extrection
SFD-□AB-□□	1 N.C., 1 N.O.	⊖ 11 → 12	11-12
3, 5 _,,,5		33 – 34	33-34
050 000 00		⊖ 11 → 12	11-12
SFD-□2B-□□	2 N.C.	31 - 32	31-32
		⊖ 11 → 12	11-12
SFD-□A2B-□□	2 N.C., 1 N.O.	⊕ 21 → 22	21-22
		33 – 34	33-34
	N.C. 3	⊕ 11 → 12	11-12
SFD-□3B-□□		⊕ 21 - 22	21-22
		⊕ 31 → 32	31-32

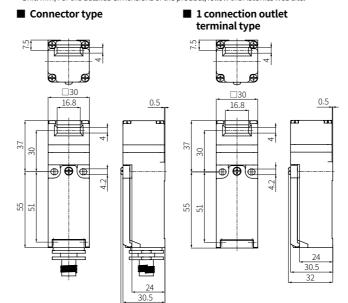
Specifications

Model	SFD-□□-□M20	SFD-□□-□G1/2	SFD-□□-C	
Rated voltage/current for load	Resistive load: 6 A/250 VAC~ . 0.6 A/250 VDC= Inductive load (IEC): AC-15 3 A/240 VAC~, DC-13 0.27 A/250 VDC= Inductive load (UL): A300, Q300			
Directing opening force	≥80 N			
Directing opening distance	≥ 10 mm			
Operating speed	0.05 to 1 m/s			
Operating frequency	≤ 20/min			
Insulation resistance	≥ 100 MΩ (500 VDC== megger)			
Contact resistance	≤ 50 mΩ (initial value)			
Impulse dielectric strength	Between the terminals: 2 kV (IEC 60947-5-1) Between each terminal and non-live part: 5 kV (IEC 60947-5-1)			
Conditional short circuit current	100 A			
Life cycle	Electrical: ≥ 100,000 operations (240 VAC~ 6 A) Machanical: ≥ 1,000,000 operations			
Vibration (malfunction)	0.75 mm amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 10 min			
Shock	1,000 m/s ² (≈ 100 G) in each X, Y, Z direction for 3 times			
Shock (malfunction)	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times			
Ambient temperature	-30 to 70°C, storage: -40 to 70°C (a) (a non freezing or condensation environment)			
Ambient humidity	35 to 90 %RH, storage: 35 to 90 %RH (a non freezing or condensation environment)			
Protection structure	IP67 02) (IEC standard, except for head)			
Material	Plastic head - polyamide 6, metallic head - zinc case: polyamide 6, operation key: stanless steel 304			
Approval	CE c® a usus zowace S			
Connection type	M20 connector cable	G1/2 connector cable	M12 connector	
Unit weight (packaged)	• 1 connection outlet plastic: $\approx 80 g (\approx 120 g)$ plastic: $\approx 85 g$ ($\approx 130 g)$) • 2 connection outlet plastic: $\approx 110 g (\approx 150 g)$ metallic: $\approx 130 g$ metallic: $\approx 130 g$ metallic: $\approx 130 g (\approx 170 g)$		(≈ 130 g)	

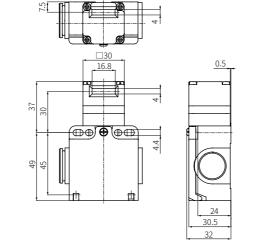
- 01) UL approved ambient temperature: 65°C
- 02) Rated protection structure is for the switch body. Be cautious about preventing the head part from entering the foreign materials such as dust and water.

Dimensions

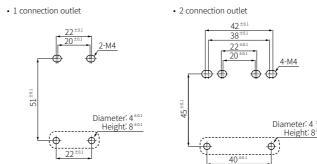
• Unit: mm, For the detailed dimensions of the product, follow the Autonics web site



2 connection outlet terminal type

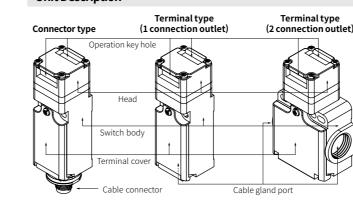


■ Mounting hole cut-out



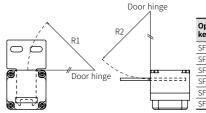
is installing spot of protrusion for fixing the switch firmly.

Unit Description



Installation

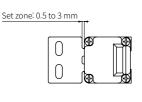
- The head of the switch can be rotated by loosening the four screws from the corners of the head and reinstalling the head in the desired orientation
- Be sure to install the switch with the minimum radius at a hinged door as shown in the

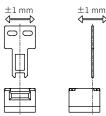


	Operation	Minimum radius		
	key	R1	R2	
	SFD-KH	300 mm	300 mm	
	SFD-KL	300 mm	300 mm	
9	SFD-KHR	300 mm	300 mm	
1	SFD-KLR	300 mm	300 mm	
4	SFD-KLF	50 mm	300 mm	
ľ	SFD-KLF2	50 mm	300 mm	
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within the set zone (0.5 to 3 mm).

- Inspect the inserted operation key remains - Install the operation key within $\pm 1 \text{mm}$ from the center of the operation key hole.



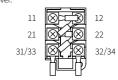


· Recommended screw tightening torque

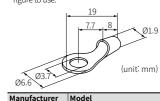
Screw	Tightening torque	
Terminal screw (M3.5)	0.6 to 0.8 N·m	
Terminal block screw (M3)	0.3 to 0.5 N·m	
Terminal cover screw (M3)	0.4 to 0.6 N·m	
Head mounting screw (M3)	0.7 to 0.9 N·m	
Cable gland	2.7 to 3.3 N·m	
M22 NUT, G1/2 NUT	1.3 to 1.5 N·m	

Connections

· When wiring with the ring crimp terminal, connect the terminals as shown in figure for the cable not to override to the case and cover

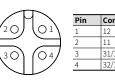


• Use the UL approved ring crimp terminal listed in below. Bend the terminal as following figure to use.

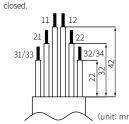




M12 connector pin arrangement



• Use lead wire sizes AWG20 (0.518 mm²) and prepare lead wires using the length given in the following diagram. If lead wires are too long or short, the cover may not be properly



• Cable gland specification and recommended product

spec	MFR	Model	
G1/2	LAPP	ST-PT1/2 5380-1002	
M20	LAPP	ST-M20X1.5 5311-1020	
• In case of using the cable gland with the Q			

 In case of using the cable gland with the 9 mm screw thread or longer, a gap between the switch and cable may affect the protection structure.

• Do not use metallic duct. Using metallic duct can result in electric shock due to the damage on the service entrance.

