SFD Series **INSTRUCTION MANUAL**

TCD210163AC

Autonics

Thank you for choosing our Autonics product. Read and understand the instruction manual and manual thoroughly before using the product

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. • A 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.) ure to follow this instruction may result in personal injury, economic loss or fire.
- System manager means followings;
 a personnel who is fully aware of installation, setting, operation, and maintenance 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 output of the product in the product of the product 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.
 Failure 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 Failure to follow this instruction may result in personal injury due to unintended operation
- nd unstable detection 04. Before using the product, check that function of the product operates as intended
- while machine is turned off after installation. ailure to follow this instruction may result in personal injury due to unintended operation nd unstable detectior
- 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. may result in explosion or fire

06. Do not disassemble or modify the unit. ilure to follow this instruction may result in personal injury or fire due to loss of safety

- nction 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.
- ailure to fo instruction may result in perso
- 08. Do not use a head of the door lock switch (SFDL Series). lure 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 vibration or weight of the door. Failure to follow this instruction may result in personal injury.
- 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.

ailure 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.
- re to follow this instruction may result in fire or product damag 02. Use a dry cloth to clean the unit, and do not use water or organic solvent. ilure to follow this instruction may result in fin
- 03. Keep the door switch away from debris and tighten the screw securely when replacing the head.
- 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** the unit.
- ilure 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. Failure to follow this instruction may result in product damage.
- 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 are operation key
- 07. Use only Autonics operation key.
- ailure 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. follow this instruction may result in product damag

Cautions during Use

- · Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 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 Ĭ

Sold Separately

Operation key: SFD-K

M12 Connector cable: CID / CLD Series

Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website

SFD - 0 🛛 ·	• 3 4
Head materials	Onnection outlet
No mark: Plastic	No mark: 1
M: Metallic	2:2
Ontact composition	Connection outlet specification
AB: 1 N.O., 1 N.C.	M20: M20 thread
2B: 2 N.C.	G1/2: G1/2 thread
A2B: 1 N.O., 2 N.C.	C: M12 connecter
3B: 3 N.C.	

Contact Composition and Operation

Contact composition represents the locked status with the operation key inserted . ON, . OF

Model	Contact	Contact composition	Contact operation	
			Operation key complete insertion IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	
SFD-□AB-□□	1 N.C.,		11-12	
SFD-LIAB-LILI	1 N.O.	33 34	33-34	
			11-12	
SFD-□2B-□□ 2	2 N.C.	⊖ 31 [_] 32	31-32	
			11-12	
SFD-	2 N.C., 1 N.O.		21-22	
	1 10.0.	33 34	33-34	
SFD-[]3B-[][]	N.C. 3		11-12	
			21-22	
			31-32	

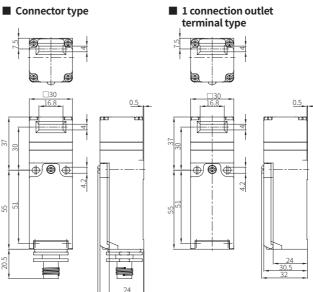
Specifications

Model	SFDM20 SFDG1/2	SFD-DD-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 (ILL): A300, 0300		
Directing opening force	≥80 N		
Directing opening distance	≥ 10 mm		
Operating speed	0.05 to 1 m/s		
Operating frequency	≤ 20/min		
Insulation resistance	\geq 100 M Ω (500 VDC= megger)		
Contact resistance	\leq 50 m Ω (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: \geq 100,000 operations (240 VAC \sim 6 A) Mechanical: \geq 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 ⁰¹⁾ (no freezing or condensation)		
Ambient humidity	35 to 90 %RH, storage: 35 to 90 %RH (no freezing or condensation)		
Protection structure	IP67 ⁽⁰²⁾ (IEC standard, except for head)		
Material	Plastic head - polyamide 6, metallic head - zinc case: polyamide 6, operation key: stainless steel 304		
Approval	CE (TUV NORD) (() () ()		
Connection type	M20 connector cable G1/2 connector cable	M12 plug connector	
Unit weight (packaged)	1 connection outlet plastic: ≈ 80 g(≈ 120 g) metallic: ≈ 110 g(≈ 150 g) 2 connection outlet plastic: ≈ 110 g(≈ 140 g) metallic: ≈ 130 g(≈ 170 g)	Plastic: ≈ 85 g (≈ 130 g) Metallic: ≈ 115 g (≈ 160 g)	
01) UL approved ambient temperat	ure: 65°C		

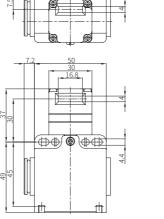
02) Rated protection structure is for the switch body. Be cautious about preventing the head part from entering the foreign materials such as dust and water.

Dimensions

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



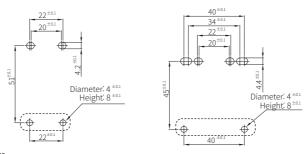
2 connection outlet terminal type





Mounting hole cut-out

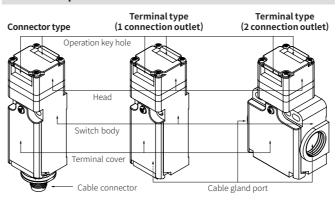
1 connection outlet



2 connection outlet

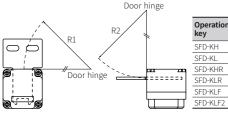
(is installing spot of protrusion for fixing the switch firmly.

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 table



	SFD-KH	300 mm	300 mm
	SFD-KL	300 mm	300 mm
	SFD-KHR	300 mm	300 mm
:= 1	SFD-KLR	300 mm	300 mm
	SFD-KLF	50 mm	300 mm
Ц	SFD-KLF2	50 mm	300 mm

R1

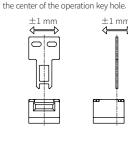
Minimum radius

R2

- Inspect the inserted operation key remains $\,$ - Install the operation key within $\pm 1\,$ mm from within the set zone (0.5 to 3 mm).

Set zone: 0.5 to 3 mm



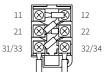


Recommended screw tightening torque

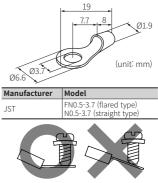
Screw	Tightening torque		
Terminal screw (M3.5)	0.6 to 0.8 N·m		
Terminal block screw (M3)	0.3 to 0.5 N·m		
Terminal cover screw (M3)	0.4 to 0.6 N·m		
Head mounting screw (M3)	0.7 to 0.9 N·m		
Cable gland	2.7 to 3.3 N·m		
M22 NUT, G1/2 NUT	1.3 to 1.5 N·m		

Connections

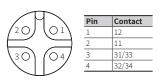
• When wiring with the ring crimp terminal, connect the terminals as shown in figure for the cable not to override to the case and cover



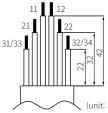
 Use the UL approved ring crimp terminal listed in below. Bend the terminal as following figure to use.



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 closed.



 Cable gland specification and recommended product

Thread spec	MFR	Model	Cable Ø
G1/2	CP SYSTEM	FCGL-G12B	4 - 8 mm
M20	LAPP	ST-M20X1.5 /5311-1020	6 - 13 mm

- 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.

