

Safety Key Selector Switch

SF2KR Series INSTRUCTION MANUAL

TCD210218AC

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.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

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

- 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.

- 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 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.

- 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.

- 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 and unstable detection.

- Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, salinity, moisture, steam or dust may be present.**

Failure to follow this instruction may result in explosion or fire.

- Do not disassemble or modify the unit.**

Failure to follow this instruction may result in personal injury or fire due to loss of safety function.

- Do not defeat, tamper, modify, the switch.**

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.

- Do not connect, repair, inspect, or replace the unit while connected to a power source.**

Failure to follow this instruction may result in fire.

- Check 'Connections' before wiring.**

Failure to follow this instruction may result in fire.

- Carefully manage the spare key.**

Failure to follow this instruction may result in loss of safety function due to insertion of the spare key.

- Mechanical Lock/Solenoid Release type switch is unlocked with power connected and is locked without power. Be cautious that the switch cannot be unlocked when the solenoid is failed to operate due to blackout.**

Failure to follow this instruction may result in personal injury.

- Keep away from high voltage lines or power lines to prevent surge and inductive noise, and make cable as short as possible.**

In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line.

Do not use near the equipment which generates strong magnetic force or high frequency noise.

Failure to follow this instruction may result in personal injury due to malfunction of the product and safety function.

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

- Use the unit within the rated specifications.**

Failure to follow this instruction may result in fire or product damage.

- Use a dry cloth to clean the unit, and do not use water or organic solvent.**

Failure to follow this instruction may result in fire.

- Keep the product away from metal chip, dust, and wire residue which flow into the unit.**

Failure to follow this instruction may result in fire, product damage or malfunction.

- When operating the key, do not use tools or apply a force of more than 1.8 N · m. Do not operate the key over the key rotation limit point (normal type) or when the lock function is activated (lock type).**

Failure to follow this instruction may result in product damage.

- Use only Autonics key.**

Failure to follow this instruction may result in product damage.

- Pay enough consideration about installing place for protecting the worker from hitting the key.**

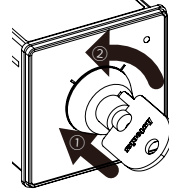
Failure to follow this instruction may result in injury.

- Do not use the switch as a door lock, guard door stopper or for stopping/starting machinery.**

Failure to follow this instruction may result in product damage.

- Press towards the product with the pushing force over 20 N and then turn the key to operate.**

Failure to follow this instruction may result in malfunction.



- Use the key removal prevention function only within the key removal prevention zone (15°).**

Failure to follow this instruction may result in malfunction.

- Use only the key with the number that matches the cam lock.**

Failure to follow this instruction may result in product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- To maintain durability and prevent unnecessary current consumption, apply rated voltage to the solenoid when rotating the key (change mode), and turn off the solenoid power when the rotation is complete.
- Durability of the product can be differed according to opening condition. Check the environment where the product is used in and machine which the product is used for, and use the product within the rated number of durability.
- When installing the product, keep the minimum installation space between units.
- The switch must be properly assembled.
- While wiring or after wiring the contact block, do not pull the cable.
- 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

Product Components

- Product
- Instruction manual
- Key × 2
- Bracket
- Spring strap for key

Sold Separately

- Name plate: SF2KR-□-NP□
- Contact block: SFEA-C□

Ordering Information

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

SF2KR - ① ② - ③ - ④

① Key lock function

No mark: General type

M: Lockable type

② Contact block

A2B: N.O. 1 + N.C. 2

3B: N.C. 3

2A2B: N.O. 2 + N.C. 2

③ Key

No mark: Basic key

01 to 09: Key number 1 to 9

④ Operation direction

General type

	Key free location	N.C. contact powered location
LL	↖	↗
RL	↗	↖
LR	↖	↗
RR	↗	↖

Lockable type

	Key free location	N.C. contact powered location	Lock location
RLR	↗	↖	↗
RLL	↗	↖	↖
RRR	↗	↖	↗
RLB	↗	↖	↖↗

Specifications

Model	SF2KR-□-□-□	SF2KR-M□-□-□
Solenoid input volatge	-	Non-polar 24 VDC± (± 10%)
Solenoid current consumption	-	38.7 mA ± 5%
Conditional short circuit current	100 A	
Indicator	-	Solenoid operation (green)
Applicable wire	Contact: AWG 18 (0.823 mm ²)	Solenoid power: AWG 24 - 18 Contact: AWG 18 (0.823 mm ²)
Allowable operation frequency ⁰¹⁾	30 times/minute	
Life cycle	Mechanical: ≥ 100,000 times, electrical: ≥ 100,000 times	
Key pushing force	≥ 20 N	
Key rotating torque	0.2 to 1.8 N·m	
Insulation resistance	≥ 100 MΩ (500 VDC± megger)	
Dielectric strength	2,500 VAC~ 50/60 Hz for 1 minute	
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours	
Vibration (malfunction)	1.5 mm double amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 10 minutes	
Shock	300 m/s ² (≈ 30 g) in each X, Y, Z direction for 3 times	
Shock (malfunction)	150 m/s ² (≈ 15 g) in each X, Y, Z direction for 3 times	
Ambient temperature	-20 to 70°C ⁰²⁾ , storage: -40 to 70°C	-10 to 55°C ⁰²⁾ , storage: -20 to 70°C (at no freezing or condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (at no freezing or condensation)	
Protection structure	IP65 (front panel, IEC standard)	
Material	PC, POM	
Approval	CE (TUV NORD) Ⓢ Ⓜ Ⓝ	
Unit weight (packaged) ⁰³⁾	≈ 130 g (≈ 192 g)	≈ 152 g (≈ 213 g)

01) Rotating and retuning once is counted as one operation.

02) UL approved ambient temperature: 55 °C

03) It is switch with contact blocks.

■ Contact capacity

- IEC (EN60947-5-1)

Rated current	10 A				
Rated voltage	24 V	110 V	220 V	380 V	
AC	Resistive load (AC-12)	10 A	10 A	6 A	3 A
	Inductive load (AC-15)	10 A	5 A	3 A	2 A
DC	Resistive load (DC-12)	10 A	2 A	0.6 A	0.2 A
	Inductive load (DC-13)	1.5 A	0.5 A	0.2 A	0.1 A

- UL / CSA (UL508, CSA C22.2 No. 14)

A300

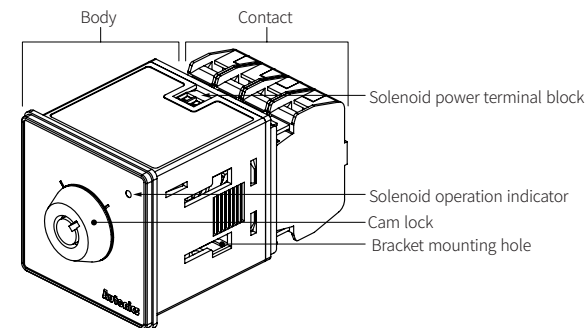
Rated voltage	Through current	Current (A)		Volt ampere (VA)	
		Making	Breaking	Making	Breaking
AC120 V	10 A	60	6	7,200	720
AC240 V		30	3		

Q300

Rated voltage	Through current	Current (A)		Volt ampere (VA)	
		Making	Breaking	Making	Breaking
DC125 V	2.5 A	0.55	0.55	69	69
DC250 V		0.27	0.27		

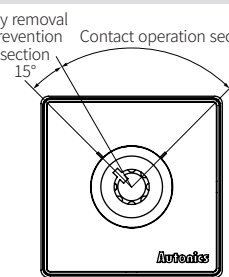
Unit Descriptions

- The below image are based on the lockable type model. There is no solenoid power terminal block and solenoid operation indicator in the general type model.



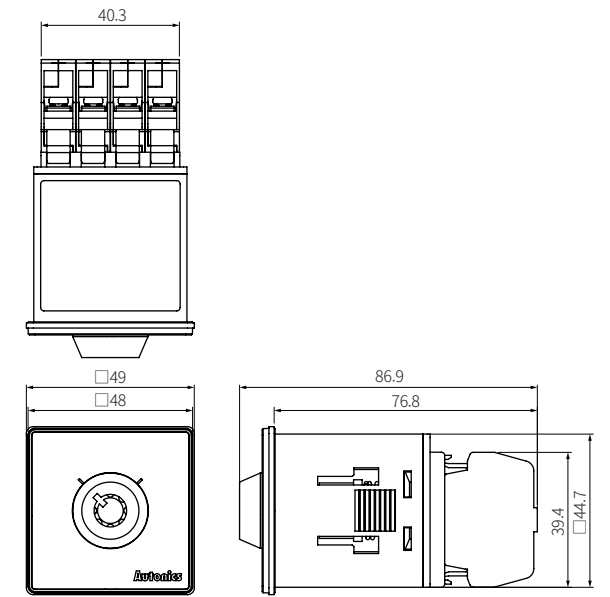
Key Operation Range and Key Removal Prevention Section

- To remove the key, turn the key to the end 90° point of key operation range.
- The image on the left side is representing the model of which the key operation direction is 'Key missing - left direction and N.C. contact powered - left direction. For the product with the opposite operation direction, the positions of the contact operation section and key removal prevention section are opposite.
- For lockable type model, the solenoid lock does not unlock when a load is applied to the key. Be sure to unlock the solenoid with the key turned to the end 90° point of key operation range.

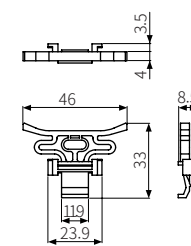


Dimensions

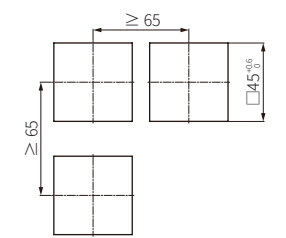
- Unit: mm, For the detailed drawings, follow the Autonics website.
- Drawings show the general type model.



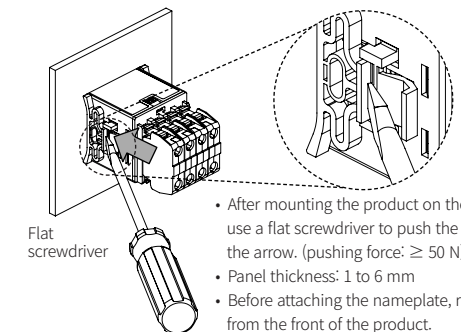
■ Bracket



■ Panel cut-out



Installation



- After mounting the product on the panel using the bracket, use a flat screwdriver to push the bracket in the direction of the arrow. (pushing force: ≥ 50 N)
- Panel thickness: 1 to 6 mm
- Before attaching the nameplate, remove the release paper from the front of the product.

Connection

■ Solenoid power

- The general type model does not have a solenoid operation indicator and a solenoid power terminal block.
- The solenoid operation indicator turned on only when the key is unlocked.
- Solenoid power has no polarity.
- Applicable wire: AWG 24 - 18
- Tightening torque: 0.2 N · m

■ Contact block

- When wiring contact block, use phillips or slotted M3.5 screws with square washer.
- Applicable wire: AWG 18 (0.823 mm²)
- Tightening torque: 0.6 to 0.8 N · m
- Unit: mm, Please use UL certified terminals.

Non-insulated terminal		Insulated terminal	
	≤ 16.0		≤ 20.2
	≤ 16.0		≤ 20.2