



Take Control of Your Safety Safety Controllers

SFC/SFC-R Series

The SFC series safety controllers are used together with safety input devices (switches, sensors, etc.) to provide safe working environments. The controllers feature self-diagnosis function and safety integrity to meet international safety standards.

Safety Standards

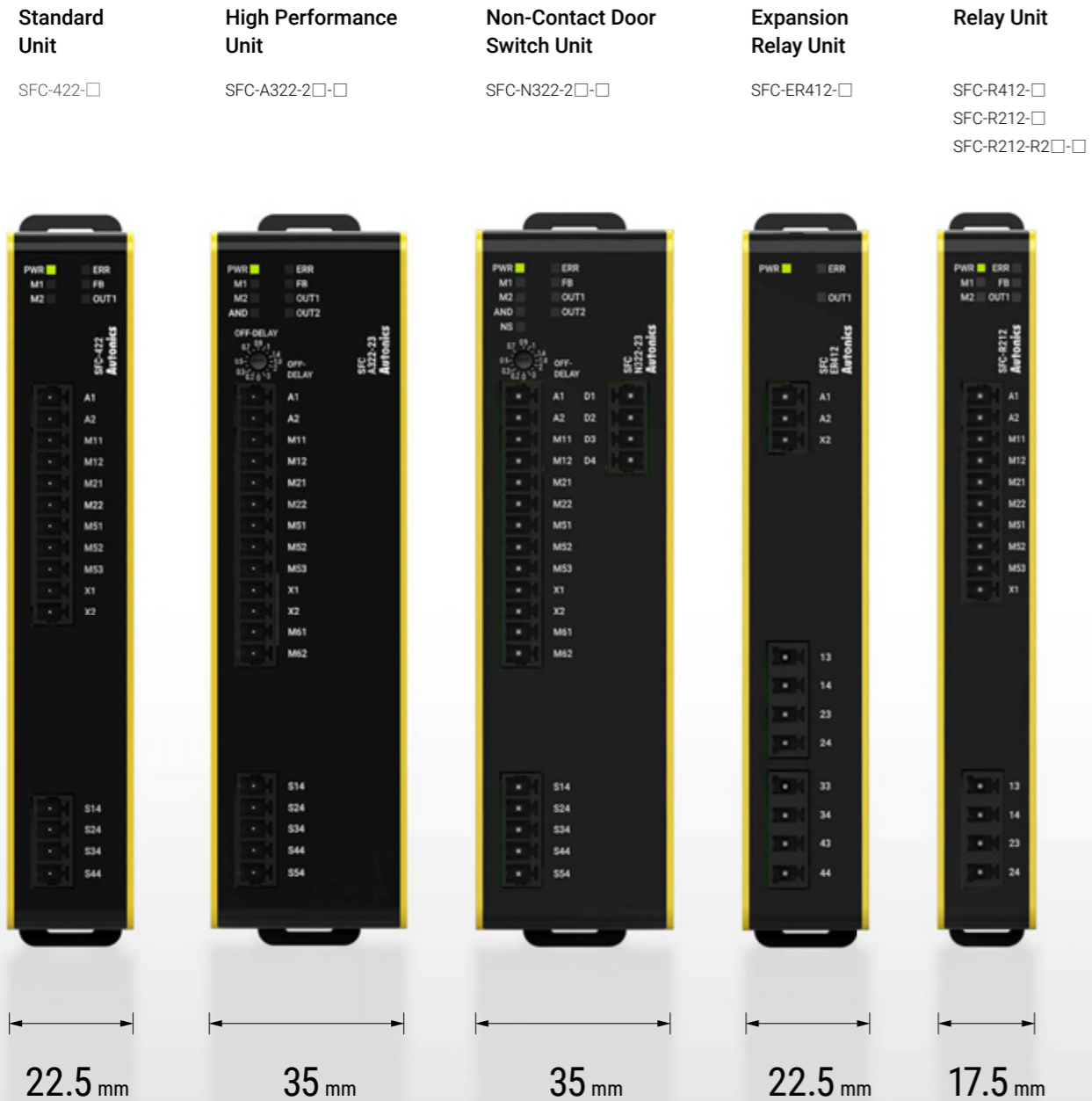
- IEC/EN 61508 (SIL 3)
- IEC/EN 62061 (SIL CL 3)
- ISO 13849-1/2 (Cat. 4, PL e)
- IEC/EN 60947-5-1 (SRC-R)
- IEC/EN 61000-6-2/4 (SFC, SFC-A/N)
- EN 50178

Certifications



Various User-Friendly Features

The SFC series features various user-friendly features including slim size, operation indicators, front facing terminals, multiple logic inputs and more.



1. Slim Space-Saving Design

The slim space-saving design (minimum width 17.5 mm) allows flexible installation in tight or limited spaces.



2. Operation Indicators

Users can easily check various operation and connection status with the operation indicators.



3. Front Terminal Design

Socket type terminal is located on the front for easy wiring and maintenance.



4. 16-Level Time Setting

The OFF-delay output models allow up to 16 different OFF-delay time settings.

* Available models : 0 to 3 s / 0 to 30 s / 0 to 300 s

Safety-Oriented Product Design

The SFC series utilizes force guided contact relays to protect from contact welding and ventilation holes are present to reduce heating.



5. Flexible OFF-Delay Output

On high performance units (SFC-A) and non-contact door switch units (SFC-N), users can set to 1 instantaneous output and 4 OFF-delay outputs using the DIP switch (default: 3 instantaneous, 2 OFF-delay). Auxiliary output is also available to check various error status.

* 4 safety outputs are available on standard unit controllers.

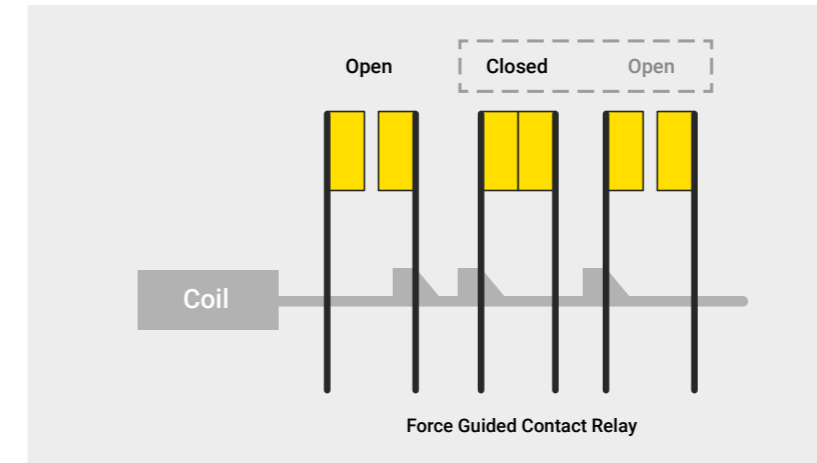


6. Expansion Relay Unit

The expansion relay units (SFC-ER) can be connected to high performance units (SFC-A) and non-contact door switch units (SFC-N) to increase the number of relay type safety output. (Connect up to 5 expansion relay units per 1 controller)

7. Up to 20 Logic Inputs

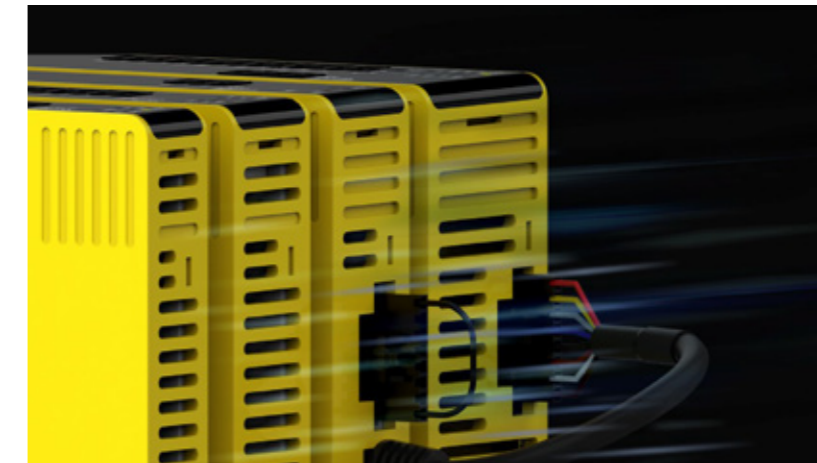
The SFC series can be expanded up to 20 units using logic input offering wider control of safety devices. Safer operation is possible with multiple logic connections.



1. Safety Circuit Design

TUV SIL certified force guided contact relays are used to detect failures including contact welding and circuit damage.

* Contact welding: welding of contacts due to high inrush current or overload.



2. Ventilation Holes

Ventilation holes are located on the top and bottom of the product to reduce heating.

Controllers

SFC Series

Technical Overview

Ordering Information

This is only for reference. For selecting the specific model, follow the Autonics web site.

SFC - ① ② ③ ④ - ⑤ ⑥ ⑦ - ⑧

① Function

No-mark: Basic unit
 A: Advanced unit
 N: Non-contact door switch unit
 (for Autonics SFN Series)
 ER: Expansion relay unit
 R: Relay unit

② No. of safety instantaneous outputs

Number: Number of outputs

③ No. of auxiliary outputs

Number: Number of outputs

④ Power supply

2: 24 VDC

⑤ Off-delay output elements

No-mark: P channel FET
 R: Relay (Relay unit)

⑥ No. of Off-delay outputs

No-mark: None
 2: 2

⑦ Max. Off-delay time

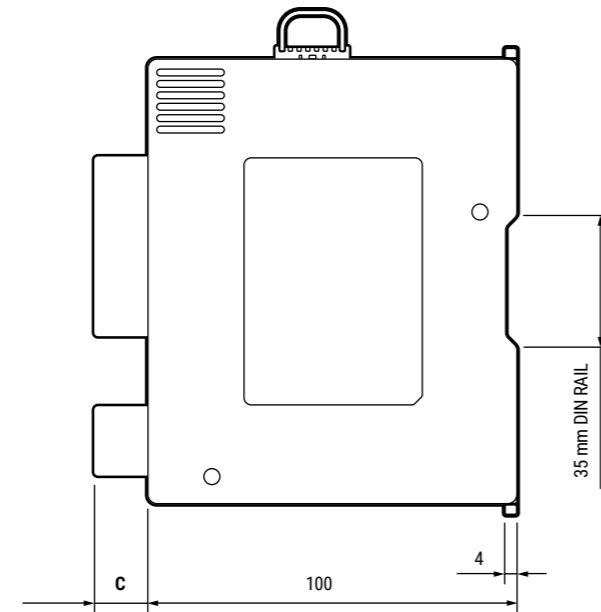
Number: Time (unit: sec)

⑧ Terminal type

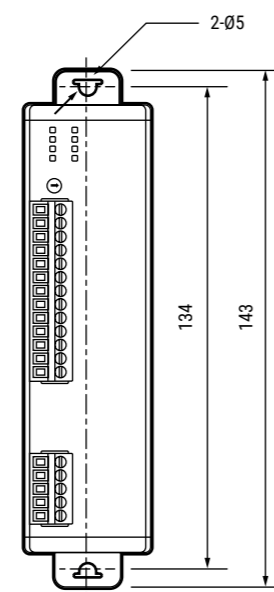
No-mark: Screw
 L: Screwless

Dimensions

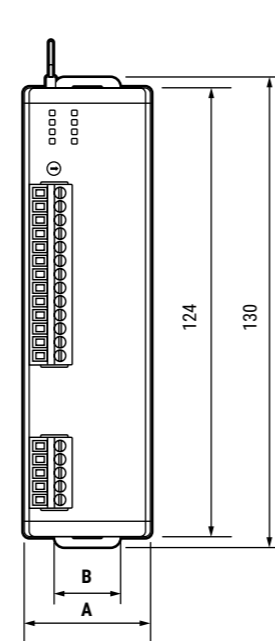
Unit: mm, For the detailed dimensions of the product, follow the Autonics web site. The below is based on SFC-A (screw type) model.



• Mounting with bolts

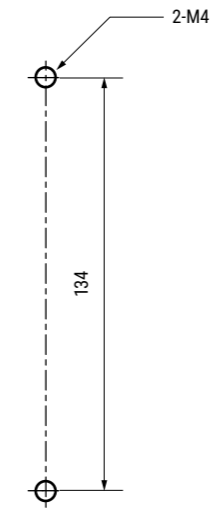


• Mounting on DIN rail



Model		A	B	C
Basic unit	SFC-422-□	22.5	18.3	Screw type: 15.3 Screwless type: 15.5
Advanced unit	SFC-A322-□-□	35	18.3	
Non-contact door switch unit	SFC-N322-□-□	35	18.3	
Expansion relay unit	SFC-ER412-□	22.5	18.3	
	SFC-R412-□	22.5	18.3	
	SFC-R212-□	17.5	13.3	
Relay unit	SFC-R212-R□-□	22.5	18.3	

■ Panel cut-out



Specifications

Unit	Basic	Advanced	Non-contact door switch
Model	SFC-422-□	SFC-A322-2□-□	SFC-N322-2□-□
Power supply	24 VDC≒		
Allowable voltage range	85 to 110% of rated voltage		
Power consumption ⁰¹⁾	≤ 2.5 W	≤ 3.0 W	≤ 3.5 W
Input	ON: ≥ 11 VDC≒ ≥ 5 mA, OFF: ≤ 5 VDC≒ ≤ 1 mA		
Input time	≥ 50 ms, feedback start (manual) : ≥ 100 ms		
Cable	≤ 100 m (≤ 100Ω, ≤ 10nF)		
Safety output	P channel FET ⁰²⁾		
Instantaneous	4 X	3 X ⁰³⁾	3 X ⁰³⁾
Off-delay ⁰⁴⁾	-	2 X ⁰³⁾	2 X ⁰³⁾
Time accuracy	-	≤ ± 5%	≤ ± 5%
Load current	Below 2-point output: ≤ DC 1 A Over 3-point output: ≤ DC 0.8 A		
Leakage current	≤ 0.1 mA		
Operating time (OFF → ON) ⁰⁵⁾	Safety Input : ≤ 50 ms		Logic input: ≤ 200 ms
	-		Non-contact door switch input: ≤ 100 ms
Response (return) time (ON → OFF) ⁰⁵⁾	≤ 15 ms, non-contact door switch input or logic input: ≤ 20 ms		
Auxiliary output	2 x PNP transistor: X1, X2 (error)		
Load current	≤ 100 mA		
Leakage current	≤ 0.1 mA		
Logical AND connections	No. of connections: max. 4 units, no. of total connections: max. 20 units No. of layers: max. 5 layers, cable length: ≤ 100 m		
SFN connections ⁰⁶⁾	-	-	Max. 30 units
Approval	IEC/EN 61508 (SIL3), IEC/EN 62061 (SILCL3) IEC/EN 60947-5-1, EN ISO 13849-1 (Category 4, PLc) UL listed E249635		
Certification	CE (TUV NORD) ENEC (TUV NORD) ENEC (TUV NORD) ENEC (TUV NORD)		
Unit weight (package)	≈ 70 g (≈ 120 g)	≈ 90 g (≈ 140 g)	≈ 100 g (≈ 150 g)

01) Not include the power consumption of loads.
 (SFC-N exclude the power supplied to the non-contact door switch.)
 02) Includes a diagnostic pulse (max. 600 μs). Be cautious when using the output signal as an input signal for the control device.
 03) Available changing via setting switch on the back side of the product.
 04) Available to set Off-delay time (max. 3 sec. / 300 sec., depends on model)
 05) The operation (response) time of each model. The time increases when a logical connection or expansion relay unit is connected.
 06) SFC-N units can only be connected to Autonics non-contact door switch units SFN Series.

Unit	Expansion relay	Relay		
Model	SFC-ER412-□	SFC-R412-□	SFC-R212-□	SFC-R212-R2□-□
Power supply	24 VDC≒			
Allowable voltage range	85 to 110% of rated voltage			
Power consumption ⁰¹⁾	≤ 2.5 W	≤ 4.0 W	≤ 4.0 W	≤ 6.0 W
Input	ON: ≥ 11 VDC≒ ≥ 5 mA, OFF: ≤ 5 VDC≒ ≤ 1 mA			
Input time	≥ 50 ms, feedback start (manual) : ≥ 100 ms			
Cable	≤ 100 m (≤ 100Ω, ≤ 10nF)			
Safety output	Relay (A contact)	Relay (A contact)		
Instantaneous	4 X	4 X	2 X	2 X
Off-delay ⁰²⁾	-	-	-	2 X
Time accuracy	-	-	-	≤ ± 5%
Capacity	240 VAC~ 5 A resistance load, 30 VDC≒ 5 A resistance load			
Life expectancy	Mechanical: ≥ 10,000,000 operations, Malfunction: ≥ 50,000 operations			
Contact resistance	≤ 100 mΩ			
Inductive load switching	IEC60947-5-1: AC15: 230V~ 3A, DC13: 24V≒ 3A, UL508: B300/R300			
Conditional short-circuit current	100 A ⁰³⁾			
Operating time (OFF → ON) ⁰⁴⁾	≤ 30 ms ⁰⁵⁾	≤ 100 ms		
Response (return) time (ON → OFF) ⁰⁵⁾	≤ 10 ms	≤ 15 ms		
Auxiliary output	1 x PNP transistor: X2 (error)	1 x PNP transistor: X1		
Load current	≤ 100 mA	≤ 100 mA		
Leakage current	≤ 0.1 mA			
Expansion units connections	Max. 5 units	-		
Approval	IEC/EN 61508 (SIL3), IEC/EN 62061 (SILCL3) IEC/EN 60947-5-1, EN ISO 13849-1 (Category 4, PLc) UL listed E249635			
Certification	CE (TUV NORD) ENEC (TUV NORD) ENEC (TUV NORD) ENEC (TUV NORD)			
Unit weight (package)	≈ 100 g (≈ 150 g)	≈ 110 g (≈ 160 g)	≈ 80 g (≈ 130 g)	≈ 110 g (≈ 150 g)

01) Not include the power consumption of loads.
 02) Available to set Off-delay time (max. 3 sec. / 300 sec., depends on model)
 03) Use 6A fast-blow fuse under the IEC 60127 standard as a short-circuit protection device.
 04) The operation (response) time of each model. The time increases when a logical connection or expansion relay unit is connected.
 05) Except operation time of advanced unit, non-contact door switch unit

Pollution	3
Overvoltage category	III
Impulse withstand volt for relay unit (IEC/EN 60947-5-1)	Input terminals and relay output terminals: 6 kV Relay contacts between 13-14 / 23-24 and 33-34 / 43-44 (37-38 / 47-48): 6 kV between 13-14 and 23-24: 4 kV between 33-34 and 43-44 (37-38 and 47-48): 4 kV
Dielectric strength	[Basic / Advanced / Non-contact door switch unit] Between all terminals and case: 500 VAC~ 50/60 Hz for 1 min. [Expansion relay / Relay unit] Between all terminals and case: 1,500 VAC~ 50/60 Hz for 1 min. Between input terminals and output terminals 01): 2,500 VAC~ 50/60 Hz for 1 min.
Insulation resistance	≥ 100 MΩ (500 VDC≒ megger)
Vibration ⁰²⁾	0.75 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 1 hour
Vibration (malfunc.) ⁰¹⁾	0.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 10 minutes
Shock ⁰¹⁾	300 m/s ² (≈ 30 G) in each X, Y, Z direction for 3 times
Shock (malfunc.) ⁰¹⁾	100 m/s ² (≈ 10 G) in each X, Y, Z direction for 3 times
Protection structure	IP20 (IEC standard)
Ambient temperature	-10 to 55 °C, storage: -25 to 65 °C (rated at no freezing or condensation)
Ambient humidity	25 to 85 %RH, storage: 25 to 85 %RH (rated at no freezing or condensation)

01) In case of relay unit, output terminals between 13-14, 23-24 and 33-34, 43-44 (37-38, 47-48)
 02) This data based on the product is mounted with bolts. When installing DIN rail, use the product in an environment with small vibration(condition: less than 0.4 mm double amplitude).