

# SAF series

SPEC.SHEET

50Hz Minimum

## Low Frequency Transmitter

Model : **SAFU**

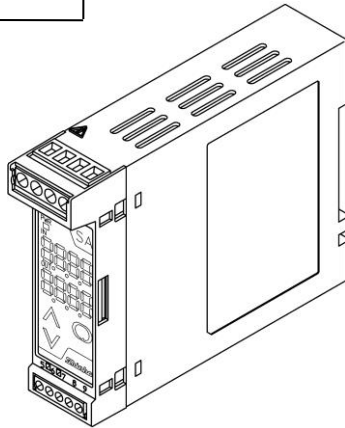
(With indication function & sensor power)

### Model

SAFU-3□-□

Input  
0 : Open collector  
1 : Voltage pulse  
2 : Line driver

Power supply  
0 : 100 to 240V AC  
1 : 24V AC/DC



### How to order

Specify a model, input frequency, scaling value & Output.  
(e.g.) SAFU-30-0 (Input frequency: 1000Hz, Scaling value: 0 to 1000, Output: 1 to 5V DC)

Default value (If not specified, shipped as the following default value)

Input frequency	9999Hz
Output	4 to 20mA DC
Scaling value	0 to 9999

### Input specifications

#### Open collector

Frequency range : 0.001 to 50Hz  
0.001 to 9999Hz  
Minimum pulse width : 4μs or more (for ON and OFF)  
Input detection voltage/current: ON: Max. 30mA (30V or less)  
OFF: Residual voltage 0.5V or less  
Operation input conditions : ON: 200Ω or less  
OFF: 100kΩ or more

#### Voltage pulse

Frequency range : 0.001 to 50Hz  
0.001 to 9999Hz  
Minimum pulse width : 4μs or more (for High and Low)  
Waveform : Rectangular, sine waveform or similar  
Detection level : Low: 1V DC or less  
High: 2V DC or more  
Input impedance : 100kΩ or more  
Input amplitude : 2 to 50V<sub>p-p</sub>

#### Line driver

AM26LS31 or equivalent  
Receiver: AM26LS32 or equivalent  
Terminal resistor : 120Ω

### Output Specifications

When the output range lower limit is zero, (even if zero adjustment results in a negative value), the output value will not be negative.

#### DC Current

Output	Allowable load resistance	Zero adjustment range	Span adjustment range
4 to 20mA DC	700Ω or less	-5 to 5%	95 to 105%
0 to 20mA DC	700Ω or less	0 to 5%	95 to 105%
0 to 12mA DC	1.2kΩ or less	0 to 5%	95 to 105%
0 to 10mA DC	1.2kΩ or less	0 to 5%	95 to 105%
1 to 5mA DC	2.4kΩ or less	-5 to 5%	95 to 105%

#### DC Voltage

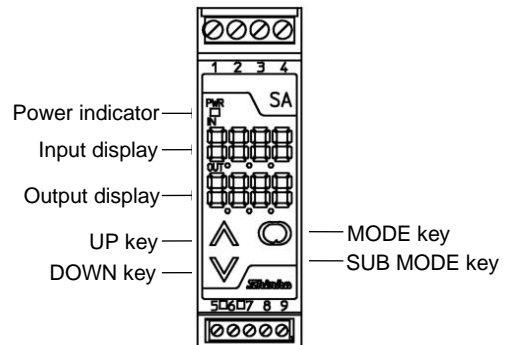
Output	Allowable load resistance	Zero adjustment range	Span adjustment range
0 to 1V DC	100Ω or more	0 to 5%	95 to 105%
0 to 5V DC	500Ω or more	0 to 5%	95 to 105%
1 to 5V DC	500Ω or more	-5 to 5%	95 to 105%
0 to 10V DC	1kΩ or more	0 to 5%	95 to 105%

### Performance

Basic accuracy : Within ±0.1% (At 23°C of ambient temperature)  
Output accuracy : Within ±0.1%  
Display accuracy : Within Basic accuracy ±1 digit  
Frequency sampling period: 500ms  
Response time : 700ms+ Frequency sampling period or less  
Temperature coefficient: ±0.015%/°C  
Insulation resistance : 10MΩ or more, at 500V DC (Input - Output - Power)  
Dielectric strength : 2.0kV AC for 1 minute (Input - Output - Power)

### General structure

Case : Flame-resistant resin, Color: Light gray  
Front panel : Membrane sheet  
Setting : By the front keypad  
Indication : Input display:  
7-segment, Red LED display 4-digit  
Character size, 7.4 x 4.0mm (H x W)  
Output display:  
7-segment, Green LED display 4-digit  
Character size, 7.4 x 4.0mm (H x W)  
Power indicator: Green LED



## ■ Installation specifications

Power supply : 100 to 240V AC, 50/60Hz  
 24V AC/DC, 50/60Hz  
 Allowable voltage range: 85 to 264V AC  
 20 to 28V AC/DC  
 Power consumption : Approx. 9VA  
 Power supply for sensor: 12V DC ±5%, 25mA  
 Ambient temperature : -5 to 55°C (23 to 131°F)  
 Ambient humidity : 35 to 85%RH (non-condensing)  
 Weight : Approx. 120g  
 Mounting : DIN rail mounting  
 External dimensions : 22.5 (W) x 75 (H) x 100 (D)mm

## ■ Attached functions

Power failure countermeasure:  
 The data is backed up in non-volatile IC memory.  
 Self diagnosis:  
 The CPU is monitored by a watchdog timer, and when an abnormal status is found on the CPU, the unit is switched to warm-up status after turning all outputs off.  
 Detecting unconnected sensor:  
 If pulse is not detected for a constant period (1sec), the unit will revert to the initial status (0Hz).

## ■ Settings

### Function keys

- (1) UP key : Increases the numeric value.
- (2) DOWN key : Decreases the numeric value.
- (3) MODE key : Switches the setting mode.
- (4) SUB MODE key : Press with the MODE key to proceed to the Setup mode.

### Setting items

Setting by pressing the MODE key for 3 seconds

- (1) Output zero adjustment
- (2) Output span adjustment

Setting by the MODE key and SUB MODE key

- (1) Set value lock
- (2) Frequency high limit value
- (3) Output 0% value
- (4) Output 100% value
- (5) Decimal point place
- (6) Output type
- (7) Output Normal/Reverse
- (8) Shutdown threshold value
- (9) Output volume during shutdown
- (10) Display selection
- (11) Indication time

## ■ Displays and indicators

Input display: Indicates the input value.

Indication of 10000 or more: The lower 4 digits flash. 0 flashes when shutting down or pulse is absent.

When input frequency is lower than shutdown threshold value, the input value flashes.

Over range: “ ” flashes on the Input display.  
 (1.1 times frequency high limit value)

Warm-up indication: For approx. 2 seconds after power-on, the input type is indicated on the Input display, and the output type is indicated on the Output display.

Output display: Indicates the output volume in percentage form (%).

Power indicator: The green LED lights when power-on.

## ■ Ferrules

Terminals from 1 to 4

Insulation sleeve attached (Phoenix Contact GMBH & CO.)

AI0.25-8YE	0.2—0.25mm <sup>2</sup>
AI0.34-8TQ	0.25—0.34mm <sup>2</sup>
AI0.5-8WH	0.34—0.5mm <sup>2</sup>
AI0.75-8GY	0.5—0.75mm <sup>2</sup>
AI1.0-8RD	0.75—1.0mm <sup>2</sup>
AI1.5-8BK	1.0—1.5mm <sup>2</sup>

Crimping pliers (Phoenix Contact GMBH & CO.)

CRIMPFOX ZA3  
 CRIMPFOX UD6

Terminals from 5 to 9

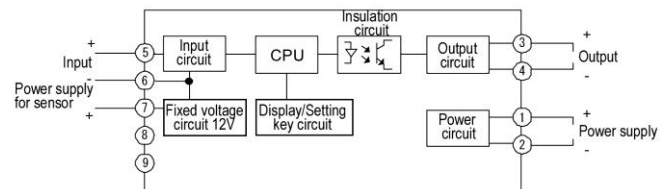
Insulation sleeve attached (Phoenix Contact GMBH & CO.)

AI0.25-8YE	0.2—0.25mm <sup>2</sup>
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AI0.5-8WH	0.34—0.5mm <sup>2</sup>

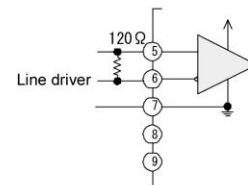
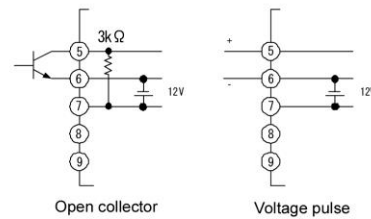
Crimping pliers (Phoenix Contact GMBH & CO.)

CRIMPFOX ZA3  
 CRIMPFOX UD6

## ■ Circuit configuration and Terminal arrangement



Input connection example



## ■ External Dimensions (Scale: mm)

