

Preface

Thank you for purchasing the Signal Conditioner (SF series). This manual contains instructions for the mounting, functions, operations and notes for operating the SF series. To ensure safe and correct use, thoroughly read and understand this manual before using this instrument. To prevent accidents arising from the misuse of this instrument, please ensure the operator receives this manual.

Notes

- This instrument should be used in accordance with the specifications described in the manual.
- If it is not used according to the specifications, it may malfunction or cause a fire.
- Be sure to follow the warnings, cautions and notices. If they are not observed, serious injury or accidents may occur.
- The contents of this instruction manual are subject to change without notice.
- Care has been taken to assure that the contents of this instruction manual are correct, but if there are any doubts, mistakes or questions, please inform our sales department.
- This instrument is designed to be installed on a DIN rail. Measures must be taken to ensure that power terminals or other high voltage sections cannot be touched.
- Any unauthorized transfer or copying of this document, in part or in whole, is prohibited.
- Shinko Technos Co., Ltd. is not liable for any damages or secondary damages incurred as a result of using this product, including any indirect damages.

Safety Precautions (Be sure to read this before using units)

The safety precautions are classified into 2 categories: "Warning" and "Caution". Depending on circumstances, procedures indicated by ⚠ Caution may be linked to serious results, so be sure to follow the directions for usage.

Warning Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.

Caution Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product, if not carried out properly.

Warning

- To prevent an electric shock or fire, only Shinko or other qualified service personnel may handle the inner assembly.
- To prevent an electric shock, fire or damage to the instrument, parts replacement may only be undertaken by Shinko or other qualified service personnel.

Safety precautions

- To ensure safe and correct use, thoroughly read and understand this manual before using this instrument.
- This instrument is intended to be used for industrial machinery, machine tools and measuring equipment. Verify correct usage after purpose-of-use consultation with our agency or main office. (Never use this instrument for medical purposes with which human lives are involved.)
- External protection devices must be installed, as malfunction of this product could result in serious damage to the system or injury to personnel. Also proper periodic maintenance is required.
- This instrument must be used under the conditions and environment described in this manual. Shinko Technos Co., Ltd. does not accept liability for any injury, loss of life or damage occurring due to the instrument being used under conditions not otherwise stated in this manual.

Caution with respect to Export Trade Control Ordinance

To avoid this instrument from being used as a component in, or as being utilized in the manufacture of weapons of mass destruction (i.e. military applications, military equipment, etc.), please investigate the end users and the final use of this instrument.

In the case of resale, ensure that this instrument is not illegally exported.

Installation Precautions

Caution

This instrument is intended to be used under the following environmental conditions (IEC61010-1): Overvoltage category II, Pollution degree 2. Ensure the mounting location corresponds to the following conditions:

- A minimum of dust, and an absence of corrosive gases
- No flammable or explosive gases
- No mechanical vibrations or shocks
- No exposure to direct sunlight, an ambient temperature of -5 to 55°C (23 to 131°F) that does not change rapidly, and no icing
- An ambient non-condensing humidity of 35 to 85%RH
- No large capacity electromagnetic switches or cables through which large current is flowing
- No water, oil or chemicals or where the vapors of these substances can come into direct contact with the unit
- Take note that ambient temperature of this unit must not exceed 55°C (131°F) if mounted within the control panel. Otherwise the life of electronic components (especially electrolytic capacitors) may be shortened.

Note: Avoid setting this instrument directly on or near flammable material even though the case of this instrument is made of flame-resistant resin.

Wiring Precautions

Caution

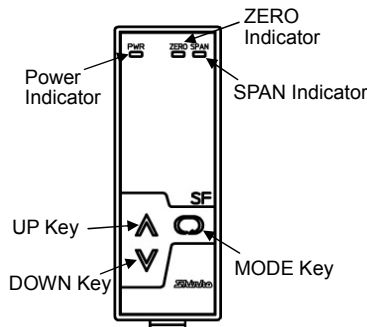
- Do not leave wire remnants in the instrument, because they could cause a fire and/or a malfunction.
- Use a solderless terminal with an insulation sleeve in which the M3 screw fits when wiring the instrument.
- Tighten the terminal screw using the specified torque.
- This instrument has no built-in power switch, circuit breaker or fuse. It is necessary to install them near the instrument. (Recommended fuse: Time-lag fuse, rated voltage 250V AC, rated current 2A)
- For AC power source, be sure to use terminals specified in this manual. If the AC power source is connected to other terminals, this unit will burn out.
- For DC power source, ensure polarity is correct.
- Do not apply a commercial power source to the sensor connected to the input terminal nor allow the power source to come into contact with the sensor, as the input circuit may burn out.
- Use a thermocouple, compensating lead wire and 3-wire type RTD in accordance with the sensor input specifications of this unit.
- When using DC voltage and current input, do not confuse polarity when wiring.
- Keep the input/output wires and power line separate.

Operation and Maintenance Precautions

Caution

- Do not touch live terminals. This may cause electric shock or problems in operation.
- Turn the power supply to the instrument OFF before cleaning. Working on or touching the terminal with the power switched ON may result in severe injury or death due to Electric Shock.
- Use a soft, dry cloth when cleaning the instrument. (Alcohol based substances may tarnish or deface the unit.)
- The indicators and key sections are vulnerable - do not strike or scratch with a hard object, nor use excessive force when using keys.

1. Name and Functions of Sections



(Fig. 1.1)

Indicators

PWR Indicator (Green):

Lit when power to the unit is turned ON. Flashes in approx. 0.5 second cycles if errors have occurred in non-volatile memory. Flashes in approx. 0.25 second cycles if input errors occur.

ZERO Indicator (Yellow):

Lit while in output Zero adjustment. For the SF1P, lit while in potentiometer input Zero adjustment.

SPAN Indicator (Yellow):

Lit while in output Span adjustment. For the SF1P, lit while in potentiometer input Span adjustment.

Keys

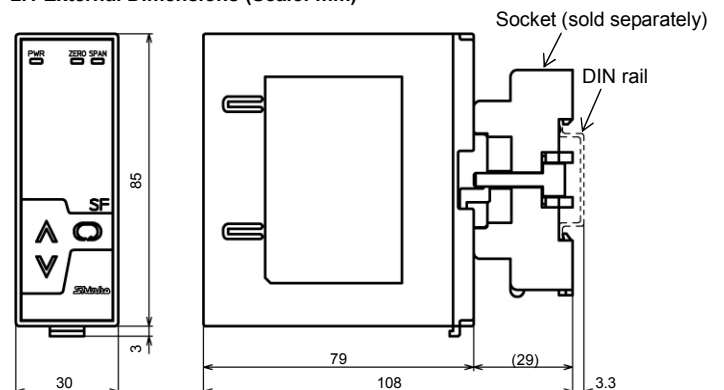
UP Key: Increases the adjustment value in the Adjustment mode. For the SF1P, pressing this key registers Span position of the potentiometer input.

DOWN Key: Decreases the adjustment value in the Adjustment mode. For the SF1P, pressing this key registers Zero position of the potentiometer input.

MODE Key: Switches from RUN mode to the Adjustment mode, and registers the adjustment value. For the SF1P, switches from RUN mode to the Adjustment mode.

2. Mounting

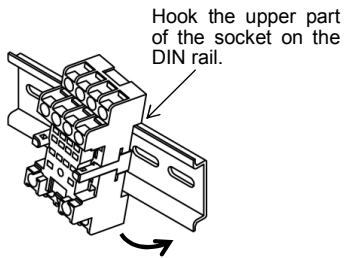
2.1 External Dimensions (Scale: mm)



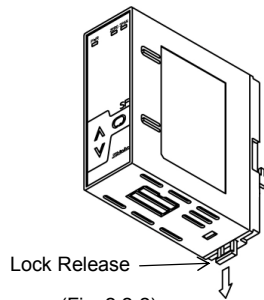
(Fig. 2.1-1)

2.2 Mounting to DIN Rail

- (1) Hook the upper part of the socket on the DIN rail, and mount it (A clicking sound is heard). (Fig. 2.2-1)
- (2) Check that the Lock Release has been lowered. (Fig. 2.2-2)



(Fig. 2.2-1)

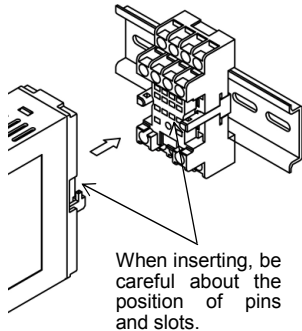


(Fig. 2.2-2)

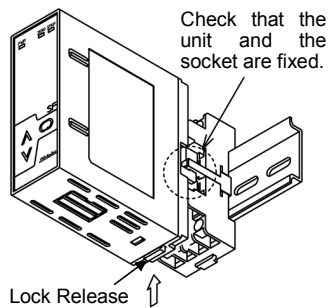
Caution

Before inserting the unit into the socket, wire the unit while referring to section "3. Wiring".

- (3) Insert the unit into the socket. (Fig. 2.2-3)
- (4) Fix the unit and the socket by pushing the Lock Release up. (Fig. 2.2-4)



(Fig. 2.2-3)



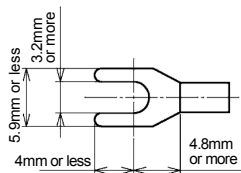
(Fig. 2.2-4)

3. Wiring

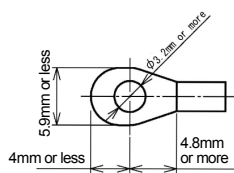
3.1 Lead Wire Solderless Terminal

Use a solderless terminal with an insulation sleeve in which an M3 screw fits as follows. For the sockets with finger-safe & screw fall prevention functions, the ring terminals are unusable. The torque should be 0.63N·m.

Solderless Terminal	Manufacturer	Model
Y Type	Nichifu Terminal Industries CO.,LTD.	TMEV1.25Y-3S
Ring Type	Nichifu Terminal Industries CO.,LTD.	TMEV1.25-3
	Japan Solderless Terminal MFG CO.,LTD.	V1.25-3



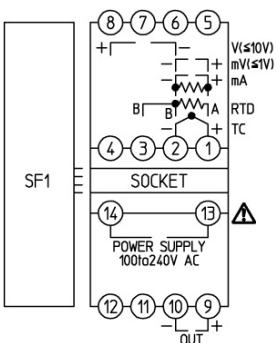
(Fig. 3.1-1)



3.2 Terminal Arrangement

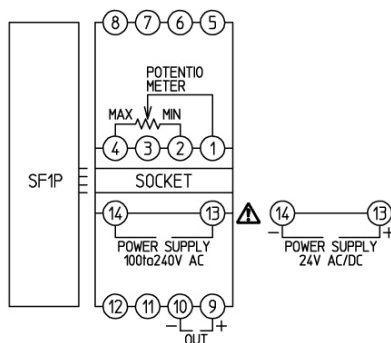
For wiring of terminals, refer to the following. (Fig. 3.2-1, Fig. 3.2-2, Fig. 3.2-3)

SF1A, SF1V, SF1E, SF1R



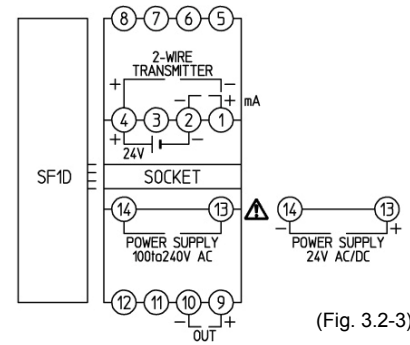
(Fig. 3.2-1)

SF1P



(Fig. 3.2-2)

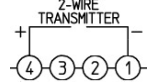
SF1D, SF1D-F



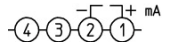
(Fig. 3.2-3)

- OUT: Output
 mA DC: DC current input (SF1A, SF1D, SF1D-F)
 mV DC(≤1V): DC voltage input 0 to 1V DC (SF1V)
 V DC(≤10V): DC voltage input 0 to 5V DC, 1 to 5V DC, 0 to 10V DC (SF1V)
 TC: Thermocouple input (SF1E)
 RTD: RTD input (SF1R)
 POTENTIO METER: SF1P
 2-WIRE TRANSMITTER: SF1D, SF1D-F

When used as a Current Loop Supply



When used as an Isolator:



4. Adjustment

The output of this unit has been already adjusted prior to shipping. Therefore, it is not required to adjust the unit if used with shipped Input/Output specifications. However, in the case of fine adjustment or calibration between connected units, adjust the value following the procedures described below. Connect an mV generator or Dial resistor to the Input terminals of this unit. Connect a digital multimeter to the Output terminals. For the SF1P, connect a potentiometer, and register the zero and span positions.

Zero and Span Adjustment: SF1A, SF1V, SF1E, SF1R, SF1D, SF1D-F

- (1) Press the MODE Key. The ZERO indicator becomes lit, and the unit moves to the Output Zero adjustment mode.
- (2) Enter the Output 0% value, then adjust the value with the UP or DOWN Key, while viewing the output value (indicated on the digital multimeter).
- (3) Press the MODE Key. The Output Zero adjustment value will be registered. After that, the SPAN indicator becomes lit, and the unit moves to the Output Span adjustment mode.
- (4) Enter the Output 100% value, then adjust the value with the UP or DOWN Key, while viewing the output value (indicated on the digital multimeter).
- (5) Press the MODE Key. The Output Span adjustment value will be registered. After that, the ZERO indicator becomes lit, and the unit will return to the Output Zero adjustment mode.
- (6) Enter the Output 0% value and 100% value again, check the output values (indicated on the digital multimeter). If the Output 0% (or 100%) value does not correspond to 0% (or 100%), repeat steps from (2) to (5). If the MODE Key is pressed for approx 3 sec, or if no operation occurs for approx. 30 sec, the unit will revert to the RUN mode.

How to Register the Zero and Span Position for the SF1P

- (1) Press the MODE Key. The ZERO indicator becomes lit, and the unit moves to the Potentiometer input Zero adjustment mode.
- (2) Set the potentiometer to any position, and press the DOWN Key once. The automatic adjustment will be performed, then the Zero position will be registered.
- (3) Press the MODE Key. The SPAN indicator becomes lit, and the unit moves to the Potentiometer input Span adjustment mode.
- (4) Set the potentiometer to any position (larger than the Zero position) of MAX side, and press the UP Key once. The automatic adjustment will be performed, then the Span position will be registered.
- (5) Press the MODE Key. The ZERO indicator becomes lit, and the unit will return to the Potentiometer input Zero adjustment mode. If the MODE Key is pressed for approx 3 sec, or if no operation occurs for approx. 30 sec, the unit will revert to the RUN mode.

Inquiry

For any inquiry about this unit, please contact the vendor where you purchased the unit or our agency after checking the following.

- (e.g.)
- Model ----- SF1A-010101-1-0
 - Serial number ----- No.123456

In addition to the above, please let us know the details of malfunction, or discrepancy, and the operating conditions.

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