# PROGRAMMABLE SIGNAL CONDITIONER

SA SERIES
SAW SERIES

INSTRUCTION MANUAL
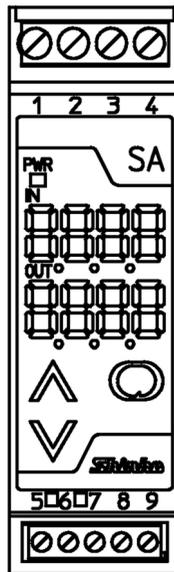
Shinko

Preface

Thank you for purchasing the Programmable Signal Conditioner SA series and SWA series.
This manual contains instructions for the mounting, functions, operations and notes when operating the SA series and SWA series. 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 malfunction may occur.
- Specifications of the SA series and SWA series and 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 within a control panel. If it is not, measures must be taken to ensure that the operator does not touch power terminals or other high voltage sections.
- 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 these precautions before using our products.)

The safety precautions are classified into categories: "Warning" and "Caution".
Depending on the 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 qualified service personnel may handle the inner assembly.
- To prevent an electric shock, fire or damage to instrument, parts replacement may only be undertaken by Shinko or 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 consulting purpose of use with our agency or main office. (Never use this instrument for medical purposes with which human lives are involved.)
- External protection devices such as protection equipment against excessive temperature rise, etc. 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.

1. 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, explosive gases
• No mechanical vibrations or shocks
• No exposure to direct sunlight, an ambient temperature of -5 to 55℃ (23 to 131℉) 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
• When installing this unit within a control panel, take note that ambient temperature of this unit – not the ambient temperature of the control panel – must not exceed 55℃ (131℉). Otherwise the life of electronic components (especially electrolytic capacitor) 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.**

2. Wiring Precautions

⚠ Caution

• Do not leave bits of wire in the instrument, because they could cause a fire and malfunction.
• When wiring terminals, use ferrules with an insulation sleeve and crimping pliers made by Phoenix Contact GMBH & CO. applicable to terminals.
• Tighten the terminal screw using the specified torque. If excessive force is applied to the screw when tightening, the screw or case may be damaged.
• This instrument does not have a built-in power switch, circuit breaker and fuse. It is necessary to install a power switch, circuit breaker and fuse near the instrument. (Recommended fuse: Time-lag fuse, rated voltage 250V AC, rated current 2A)
• For wiring of AC power source, be sure to use terminals as described in this manual. If AC power source is connected to incorrect terminals, the unit will burn out.
• For a 24V DC power source, do not confuse polarity.
• Do not apply a commercial power source to the sensor which is connected to the input terminal nor allow the power source to come into contact with the sensor.
• Use a thermocouple, compensating lead wire and 3-wire 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.

3. Operation and Maintenance Precautions

⚠ Caution

• Do not touch live terminals. This may cause an electric shock or problems in operation.
• Turn the power supply to the instrument OFF when retightening the terminal or 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.)
• As the display section is vulnerable, do not strike or scratch it with a hard object or put pressure on it.

Characters used in this manual

Indication	⊣	☐	ı	౽	౩	५	5	6	7	8	9	౮	F
Number, ℃/℉	-1	0	1	2	3	4	5	6	7	8	9	℃	℉
Indication	月	ხ	౬	ძ	E	F	౬	H	ı	┘	Ł	L	⊓̄
Alphabet	A	B	C	D	E	F	G	H	I	J	K	L	M
Indication	⊓	౦	P	౯	౬	5	Γ	౮	出	౮̄	౬	౮	三
Alphabet	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

☐ means that no character is indicated (unlit) on the display.

⸺ CONTENTS ⸺

1. Model

1.1 Model

SA series

SA ☐ – ☐			Series name: SA
Signal conditioner type	U		Universal/DC (*1), (*2)
	E		Thermocouple/DC
	R		RTD/DC
	A		DC current/DC (*2)
	V		DC voltage/DC
	P		Potentiometer/DC
	D		Current loop supply/DC
Power supply	0		100 to 240V AC
	1		24V AC/DC

(*1) SAU (Universal transmitter) accepts all types of inputs (thermocouple, RTD, DC current, DC voltage and potentiometer) and outputs (DC current and DC voltage).

(*2) For SAU (DC current input) and SAA, a shunt resistor (sold separately) is required. See (Table 4.3.3-1) on page 9.

(e.g.) SAU-0
      Type: Universal transmitter,   Power supply: 100 to 240V AC
      Default value: Input: K -200 to 1370℃
                    Output: 4 to 20mA DC

SAW series

SAW ☐ – ☐ ☐				Series name: SAW
Signal conditioner type	U			2-output universal/DC (*1), (*2)
	E			2-output thermocouple/DC
	R			2-output RTD/DC
	A			2-output DC current/DC (*2)
	V			2-output DC voltage/DC
	D			2-output current loop supply/DC
Power supply		0		100 to 240V AC
		1		24V AC/DC
Output 2			0	4 to 20mA DC
			1	0 to 20mA DC

(*) SAWU (2-output universal transmitter) accepts input types (thermocouple, RTD, DC current and DC voltage) and Output 1 (DC current and DC voltage).

(*2) For SAWU (DC current input) and SAWA, a shunt resistor (sold separately) is required. See (Table 4.3.3-1) on page 9.

(e.g.) SAWU-00
   Type: 2-output universal transmitter,   Power supply: 100 to 240V AC
      Default value: Input: K -200 to 1370℃
   Output 1: 4 to 20mA DC
                    Output 2: 4 to 20mA DC (Depending on model)

1.2 How to read the model label

The model label is attached to left side of the case.

Model (e.g. SAU-O)

Input (Enter a range selected during Input range selection.)
Output (Enter a range selected during Output selection.)

Serial number

(Fig. 1.2-1)

5
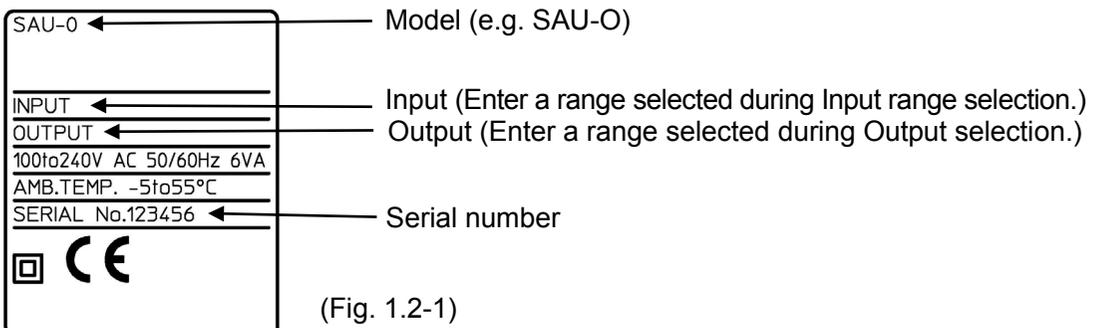
2. Name and functions of sections
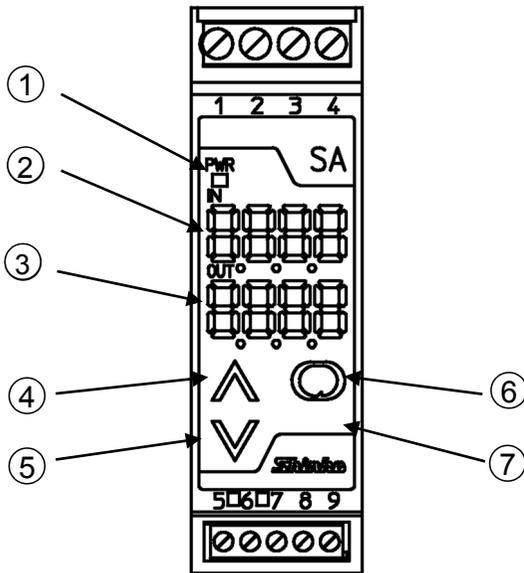
①**Power indicator** (Green)
Lights when the power to the instrument is turned on.

②**Input display** (Red)
Indicates the input value during Run mode.
Indicates characters of setting (or adjustment) item during Setup and Adjustment mode.

③**Output display** (Green)
Indicates the output value (%) during Run mode.
Indicates set (or adjusted) value during Setup and Adjustment mode.

④**Up key** (∧)
Increases the numeric value, or switches the selection items.

⑤**Down key** (∨)
Decreases the numeric value, or switches the selection items.

⑥**Mode key** (○)
Switches the setting mode and registers the set (or selected) value.
By holding down this key for approx. 3 seconds, the unit proceeds to the Adjustment mode.

⑦**Sub-mode key (Unmarked)**
If the Mode key is pressed while holding down this key, the unit proceeds to the Setup mode.

(Fig.2.1)

3. Mounting

3.1 External dimensions (Scale: mm)
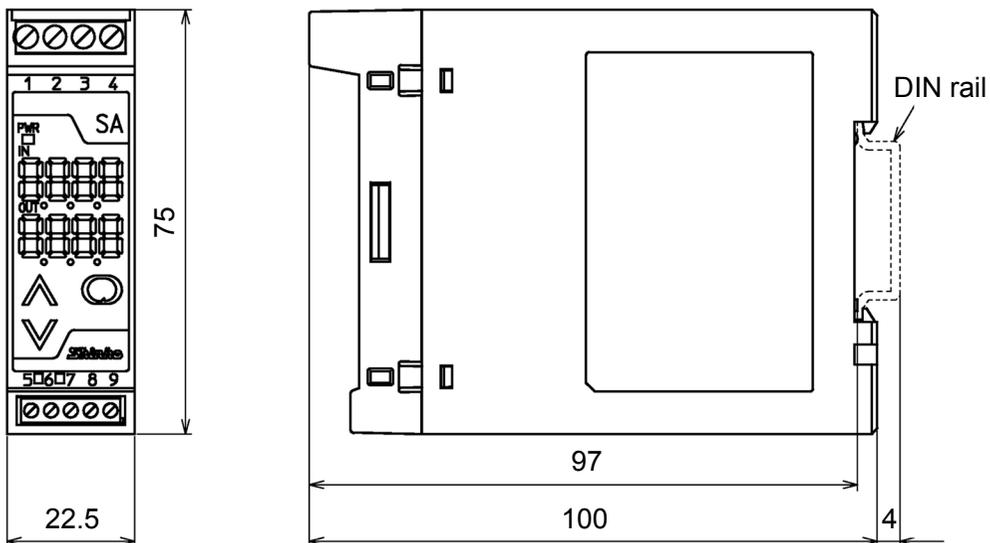
(Fig. 3.1-1)

3.2 Mounting and removal to/from the DIN rail

> ### ⚠ Caution
>
> - **Mount the DIN rail horizontally.**
> - **To remove this instrument, a flat blade screwdriver is required for pulling down the lever.**
>   **Never turn the screwdriver when inserting it into the release lever.**
>   **If excessive power is applied to the lever, it may break.**
> - **Be sure to use commercially available fastening plates at both ends of the unit if it is in a position susceptible to vibration or shock.**
>
> **Recommended fastening plate**
>
> | Manufacturer | Model |
> |---|---|
> | Omron Corporation | End plate   PFP-M |
> | IDEC Corporation | Fastening plate BNL6 |
> | Panasonic Electric Works Co., Ltd. | Fastening plate ATA4806 |

Mounting to the DIN rail (Fig. 3.2-1)

First, hook ① of the instrument on the upper side of the DIN rail.

Second, making ① part of the instrument as a support, fit the lower part ② of the instrument to the DIN rail.

The unit will be completely fixed to the DIN rail when a "Click" sound is heard.

Removal from the DIN rail (Fig.3.2-2)

First, insert a flat blade screwdriver into the release lever (①).

Second, remove the instrument from the DIN rail by pulling down the lever (②).
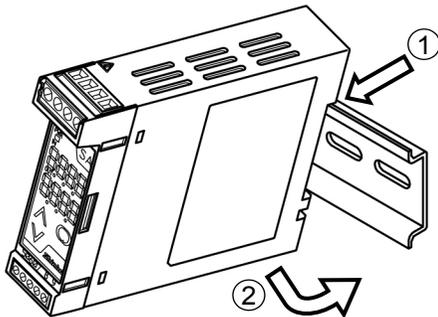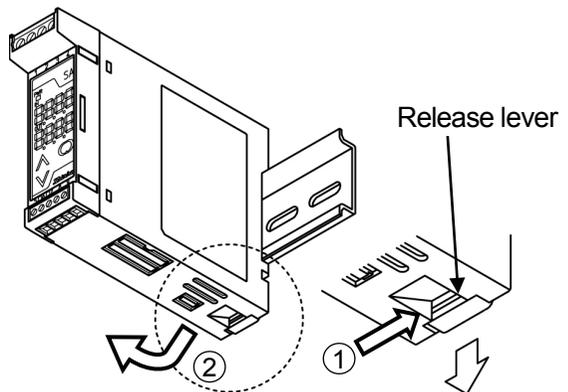
(Fig. 3.2-1) Mounting   (Fig. 3.2-2) Removal

4. Wiring

> ### ⚠ Warning
>
> **Turn the power supply to the instrument off before wiring.**
> **Working on or touching the terminal with the power switched on may result in severe injury or death due to electric shock.**

4.1 Recommended ferrules

When using ferrules, use the following recommended ferrules and crimping pliers made by Phoenix Contact GMBH &CO. See (Table 4.1-1) on page 8.

Take note that screw size and tightening torque differ depending on the terminal number.
(Table 4.1-1)

Terminal number	Terminal screw	Ferrules with insulation sleeve	Conductor cross sections	Tightening torque	Crimping pliers
1 to 4	M2.6	AI 0.25-8 YE	0.2 to 0.25mm^2	0.5 to 0.6N•m	CRIMPFOX ZA 3
		AI 0.34-8 TQ	0.25 to 0.34mm^2		
		AI 0.5-8 WH	0.34 to 0.5mm^2		CRIMPFOX UD 6
		AI 0.75-8 GY	0.5 to 0.75mm^2		
		AI 1.0-8 RD	0.75 to 1.0mm^2		
		AI 1.5-8 BK	1.0 to 1.5mm^2		
5 to 9	M2.0	AI 0.25-8 YE	0.2 to 0.25mm^2	0.22 to 0.25N•m	
		AI 0.34-8 TQ	0.25 to 0.34mm^2		
		AI 0.5-8 WH	0.34 to 0.5mm^2		

4.2 Terminal arrangement and circuit configuration

SAU, SAE, SAR, SAA, SAV, SAP
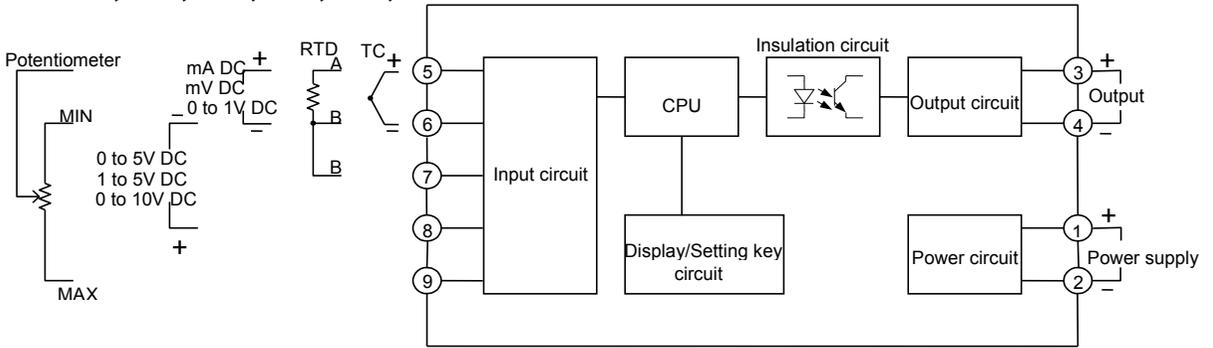
(Fig. 4.2-1)

SAD
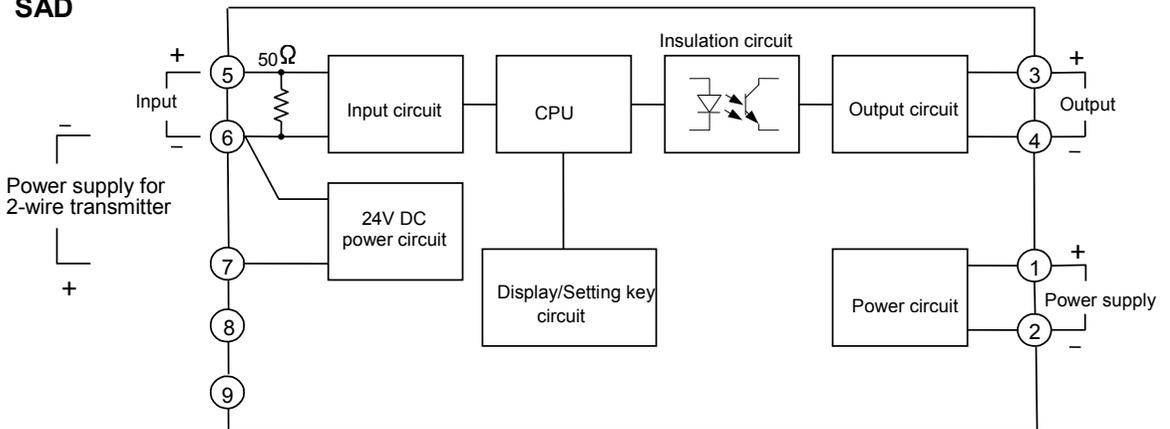
(Fig. 4.2-2)

SAWU, SAWE, SAWR, SAWA, SAWV
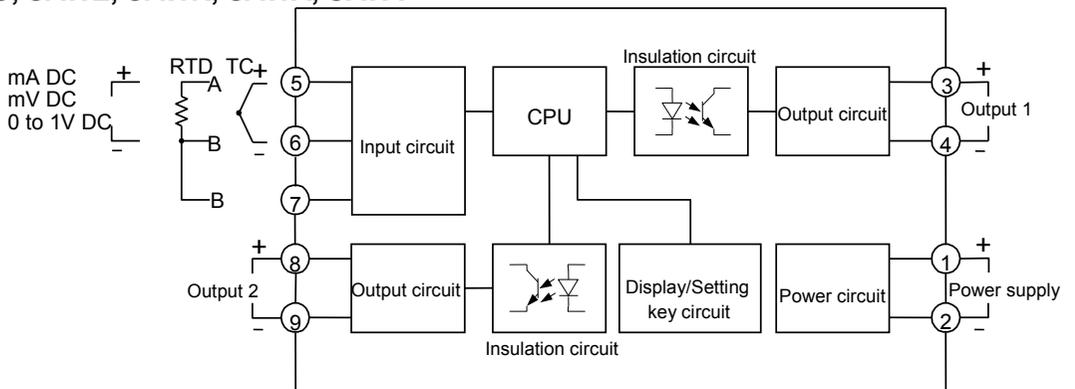
8 (Fig. 4.2-3)

SAWD
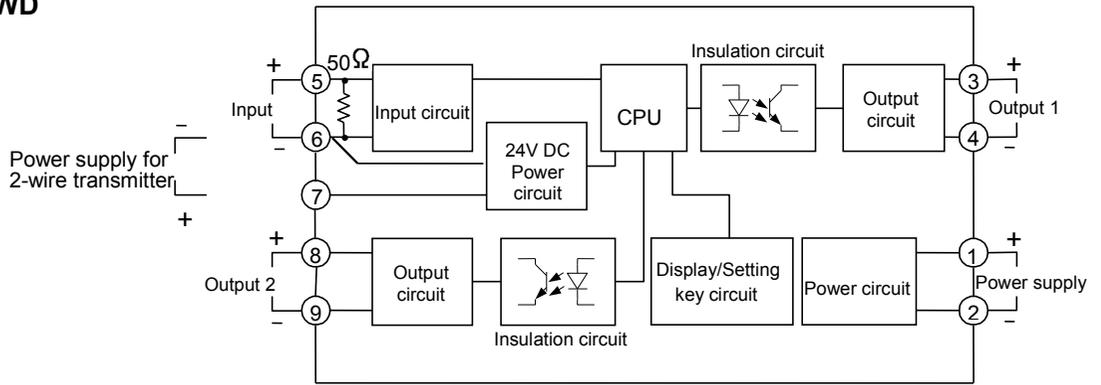
(Fig. 4.2-4)

4.3 Wiring of terminals

> ## ⚠ **Warning**
> • For 100 to 240V AC, if AC power source is connected to incorrect terminals, this instrument will burn out.
> • For a 24V DC power source, do not confuse polarity when wiring.

4.3.1 Power source wiring

Use terminals ①(+) and ②(-) for the power supply to the instrument.

4.3.2 Output wiring

SA series   : Use terminals ③(+) and ④(-) for the output wiring.

SAW series : Use terminals ③(+) and ④(-) for Output 1.

Use terminals ⑧(+) and ⑨(-) for Output 2.

4.3.3 Input wiring

**Terminals for wiring differs depending on the input specifications.**
Refer to (Fig. 4.2-1), (Fig. 4.2-2), (Fig. 4.2-3) and (Fig. 4.2-4).

SAU/SAWU (DC current input), SAA, SAWA: Use terminals ⑤(+), ⑥(-) for input wiring and shunt resistor (sold separately) connection. (See Table 4.3.3-1.)

(Table 4.3.3-1)

Input	Shunt resistor	
	Model	Specification
4 to 20mA DC, 0 to 20mA DC, 0 to 16mA DC	RES-S02-050	50Ω ±0.1%
2 to 10mA DC, 0 to 10mA DC	RES-S02-100	100Ω ±0.1%
1 to 5mA DC	RES-S02-200	200Ω ±0.1%
0 to 1mA DC	RES-S02-01K	1kΩ ±0.1%

SAD and SAWD: When using the SAD and SAWD as a current loop supply or as an isolator, be sure to wire the unit as follows.
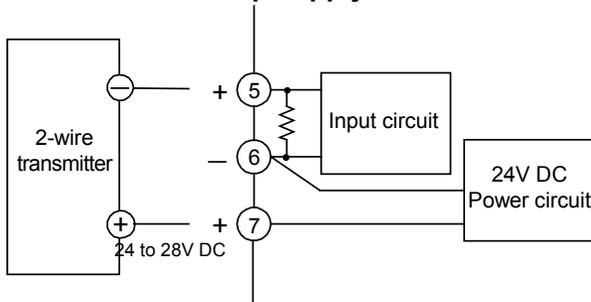
As a current loop supply   **As an isolator**

(Fig. 4.3.3-1)   (Fig. 4.3.3-2)

9
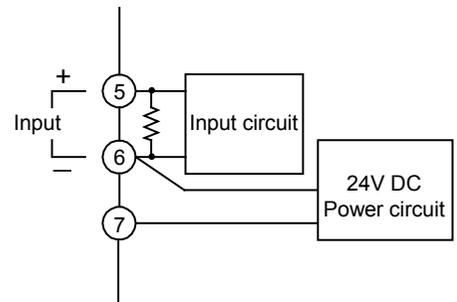
5. Operation flowchart

| Power ON | Warm-up indication (Approx. 3sec.) |

Run mode

```
PWR
IN
[      ] 25
OUT
[      ] 14.3
∧ ◎
∨
Shinko
```
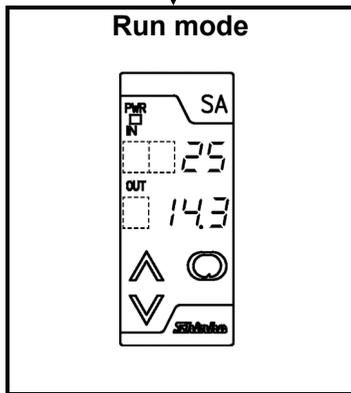
- ⌐⎼⎼⎼⎼⌐ The items with dotted lines are not indicated depending on the specification.
- To return from Adjustment to Run mode, press ◎ key for approx. 3sec. From any setting item in Adjustment mode, it is possible to return to Run mode.

(*1): For SAW series, Output 1 zero or Output 1 span adjustment
(*2): Available only for SAW series.
(*3): Differs depending on Input selection.
(*4): Selects Output 1 for SAW series.

Hold down the ◎ key for approx. 3sec.

Press the ◎ key while holding down the Sub-mode key.

Adjustment mode

| IN `oEr1` OUT `0.00` | Output zero adjustment (*1) |

Press the ◎ key.

| IN `o4P1` OUT `0.00` | Output span adjustment (*1) |

Press the ◎ key.

| IN `oEr2` OUT `0.00` | Output 2 zero adjustment (*2) |

Press the ◎ key.

| IN `o4P2` OUT `0.00` | Output 2 span adjustment (*2) |

Press the ◎ key.

| IN `1SEr` OUT `-1999` | Potentiometer input zero adjustment |

Press the ◎ key.

| IN `14PA` OUT `9999` | Potentiometer input span adjustment |

Press the ◎ key.

Setup mode

| IN `Lock` OUT `- - - -` | Set value lock |

Press the ◎ key.

| IN `SEnS` OUT `rc` | Input |

Press the ◎ key.

| IN `rc` OUT `t  C` | Input range (*3) |

Press the ◎ key.

| IN `dP` OUT `0` | Decimal point place |

Press the ◎ key.

| IN `SrLL` OUT `-200` | Output 0% value |

Press the ◎ key.

| IN `SrLH` OUT `1370` | Output 100% value |

Press the ◎ key.

| IN `FILr` OUT `0.0` | Filter time constant |

Press the ◎ key.

| IN `So` OUT `0.0` | Sensor correction |

Press the ◎ key.

| IN `ourP` OUT `420A` | Output (*4) |

Press the ◎ key.

| IN `our4` OUT `noAL` | Output Normal/Reverse |

Press the ◎ key.

| IN `bUrn` OUT `UP` | Burnout |

Press the ◎ key.

| IN `diSP` OUT `dUAL` | Display |

Press the ◎ key.

| IN `TinE` OUT `00.00` | Indication time |

Press the ◎ key.

6. Setup

Setup should occur before using this unit, to set the Input type (for the SAU, SAWU only), Input range, Output 0% value, Output 100% value, Output etc. according to the users' conditions. If the users' specifications are the same as the default value of the instrument, or if setup has already been completed, it is not necessary to set up the instrument. Proceed to Chapter "7. Adjustment". (Table 6-1)

Setting item	Default value		
Set value lock	Unlock		
Input	Thermocouple (only for SAU, SAWU)		
Input range	K	-200 to 1370℃	SAU, SAE, SAWU, SAWE
	Pt100	-200 to 850℃	SAR, SAWR
	4 to 20mA DC	-1999 to 9999	SAA, SAWA
	1 to 5V DC	-1999 to 9999	SAV
	0 to 10mV DC	-1999 to 9999	SAWV
	SAP, SAD, SAWD: Not available		
Decimal point place	No decimal point		
Output 0% value	-200℃ : SAU, SAE, SAR, SAWU, SAWE, SAWR		
	-1999 : SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD		
Output 100% value	1370℃ : SAU, SAE, SAWU, SAWE		
	850℃ : SAR, SAWR		
	9999 : SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD		
Filter time constant	0.0 seconds		
Sensor correction	0.0℃ : SAU, SAE, SAR, SAWU, SAWE, SAWR		
	0 : SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD		
Output	4 to 20mA DC (Output 1 for SAW series)		
Output Normal/Reverse	Normal		
Burnout	Upscale: SAU/SAWU (thermocouple, RTD input), SAE, SAR, SAWE, SAWR		
Display	Input/Output indication		
Indication time	00.00 (Continuous)		

6.1 Indication after power-on

After power-on, warm-up status below (Fig. 6.1-1) is indicated for approx. 3sec.

Lights when power-on.

Indicates the input range.
Indicates $\boxed{\text{t}\ \square\ \square\ \text{C}}$ for the SAU (Default, K: -200 to 1370℃).

Indicates the output type.
Indicates $\boxed{\text{420A}}$ for the default value 4 to 20mA DC.
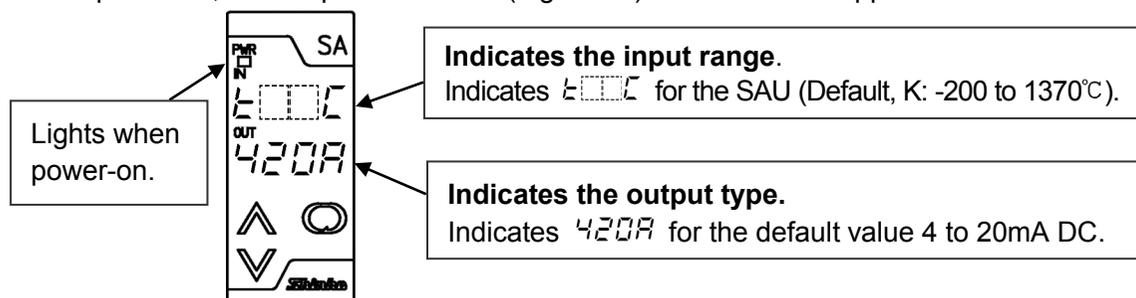
(Fig. 6.1-1)

After that, the unit switches to the Run mode as shown below (Fig. 6.1-2).

Indicates the input value.
Indicates the input value from the thermocouple for the SAU (Default, K: -200 to 1370℃).
Indicates $\overline{}$ when nothing is connected to the input terminals.

Indicates the output value corresponding to the input value in a percentage form (%).
Indicates $\boxed{\text{110.0}}$ (110.0%) when nothing is connected to the input terminals.
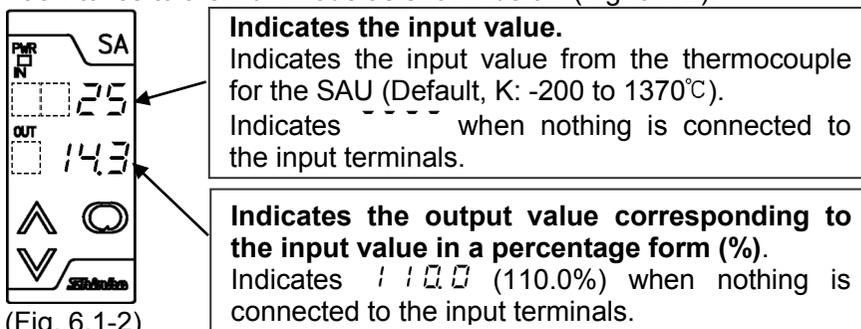
(Fig. 6.1-2)

6.2 Basic operation of setup

Setup is conducted in the Setup mode.

To enter the Setup mode, press the ◎ key while holding down the Sub-mode key in the Run mode. (Fig. 6.2-1)

To set (select) each item, use the ⋀ or ⋁ key, and register the value with the ◎ key. (Fig. 6.2-2)

(1) Run mode
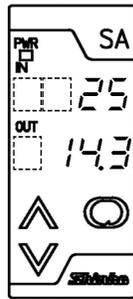
To enter the Setup mode, press the ◎ key ② while holding down the Sub-mode key ① in the Run mode.

(Fig. 6.2-1)

(2) Setup mode

To set (or select) each item, use these keys.

To proceed to each setting item and to register the set (selected) value, use this key.

(Fig. 6.2-2)

6.3 Setup of the unit

The following shows all setup items. Set up the unit referring to the explanation of each item.

Display	Name, Function, Setting range	Default value
IN Lock OUT – – – –	**Set value lock**	Unlock
	Locks the set values to prevent setting errors. – – – –: Unlock Lock: Lock (None of the set values and adjusted values can be changed.)	
IN SEnS OUT � Tc	**Input**	Thermocouple
	Selects an input type. Available only for the SAU and SAWU. Tc: Thermocouple input rTd: RTD input dcA: DC current input dcV: DC voltage input PoT: Potentiometer input (Input range selection items are not indicated.) The SAWU has no potentiometer input.	
IN Tc OUT t C	**Thermocouple input range**	K: -200 to 1370℃
	Selects the input range of thermocouple. Available for the SAU/SAWU (thermocouple input), SAE, SAWE. t C: K -200 to 1370℃ t2C: K (*) -200 to 200℃ t4C: K (*) 0 to 400℃ J C: J -200 to 1000℃ J2C: J (*) -200 to 200℃ J4C: J (*) 0 to 400℃ r C: R -50 to 1760℃ S C: S -50 to 1760℃ b C: B 0 to 1820℃ E C: E -200 to 800℃	

12

		$\lceil\square\square\square\square: T$ (*)	-200 to 400℃
		$n\square\square\square: N$	-200 to 1300℃
		$PL2C: PL-II$	0 to 1390℃
		$c\square\square\square: W5Re/W26Re$	0 to 2315℃
		$d\square\square\square: W3Re/W25Re$	0 to 2315℃
		$t\square\square F: K$	-328 to 2498℉
		$t\square2F: K$ (*)	-328 to 392℉
		$t\square4F: K$ (*)	32 to 752℉
		$J\square\square F: J$	-328 to 1832℉
		$J\square2F: J$ (*)	-328 to 392℉
		$J\square4F: J$ (*)	32 to 752℉
		$\lceil\square\square F: R$	-58 to 3200℉
		$5\square\square F: S$	-58 to 3200℉
		$b\square\square F: B$	32 to 3308℉
		$E\square\square F: E$	-328 to 1472℉
		$\lceil\square\square F: T$ (*)	-328 to 752℉
		$n\square\square F: N$	-328 to 2372℉
		$PL2F: PL-II$	32 to 2534℉
		$c\square\square F: W5Re/W26Re$	32 to 4199℉
		$d\square\square F: W3Re/W25Re$	32 to 4199℉

IN $r\lceil d\square$ OUT $Pr\square c$	**RTD input range**		Pt100: -200 to 850℃
	Selects RTD input range. Available for the SAU/SAWU (RTD input), SAR, SAWR.		
	$Pr\square C: Pt100$	-200 to 850℃	
	$Pr 1C: Pt100$ (*)	-100 to 100℃	
	$JPrC: JPt100$	-200 to 500℃	
	$Pr\square F: Pt100$	-328 to 1562℉	
	$Pr 1F: Pt100$ (*)	-148 to 212℉	
	$JPrF: JPt100$	-328 to 932℉	

IN $dcA\square$ OUT $420A$	**DC current input range**		4 to 20mA DC: -1999 to 9999
	Selects DC current input range. Available for the SAU/SAWU (DC current input), SAA, SAWA.		
	$420A$: 4 to 20mA DC	-1999 to 9999	
	$020A$: 0 to 20mA DC	-1999 to 9999	
	$0 16A$: 0 to 16mA DC	-1999 to 9999	
	$2 10A$: 2 to 10mA DC	-1999 to 9999	
	$0 10A$: 0 to 10mA DC	-1999 to 9999	
	$1\square5A$: 1 to 5mA DC	-1999 to 9999	
	$0\square 1A$: 0 to 1mA DC	-1999 to 9999	

IN $dc8\square$ OUT $1\square58$ or $0 108$	**DC voltage input range**	1 to 5V DC : -1999 to 9999 (SAV) 0 to 10mA DC: -1999 to 9999 (SAWV)
	Selects DC voltage input range. Available for the SAU/SAWU (DC voltage input), SAV, SAWV.	
	$0 1A8$: 0 to 10mV DC	-1999 to 9999
	$-1 1A8$: -10 to 10mV DC	-1999 to 9999
	$05A8$: 0 to 50mV DC	-1999 to 9999
	$06A8$: 0 to 60mV DC	-1999 to 9999
	00.18: 0 to 100mV DC	-1999 to 9999
	$0\square 18$: 0 to 1V DC	-1999 to 9999
	$0\square58$: 0 to 5V DC	-1999 to 9999 (only for SAU, SAV)
	$1\square58$: 1 to 5V DC	-1999 to 9999 (only for SAU, SAV)
	$0 108$: 0 to 10V DC	-1999 to 9999 (only for SAU, SAV)

IN *dP▢▢* OUT *▢▢▢0*	**Decimal point place**	No decimal point

	• Selects the decimal point place.
	• Available for the SAU/SAWU (DC current, voltage, potentiometer input), SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD
	• Available when (*) range is selected during Input range selection for the SAU/SAWU (thermocouple, RTD input), SAE, SAR, SAWE, SAWR (p.12, 13)
	For thermocouple and RTD input, "No decimal point" or "1 digit after decimal point" can be selected.
	    ▢▢▢0: No decimal point
	    ▢▢0.0: 1 digit after decimal point
	    ▢0.00: 2 digits after decimal point
	    0.000: 3 digits after decimal point	

IN *SrLL* OUT *-200*	**Output 0% value**	-200℃ : SAU, SAE, SAR, SAWU, SAWE, SAWR -1999 : SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD

	• SAU/SAWU (thermocouple, RTD input), SAE, SAR, SAWE, SAWR:
	    Sets the temperature (indicated on the Input display) at 0% output.
	• SAU (DC current, DC voltage, potentiometer input), SAWU (thermocouple, RTD input), SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD:
	    Sets the value (indicated on the Input display) at 0% output.
	Setting range: -1999 to Output 100% value	

IN *SrLH* OUT *1370*	**Output 100% value**	1370℃: SAU, SAE, SAWU, SAWE 850℃ : SAR, SAWR 9999 : SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD

	• SAU/SAWU (thermocouple, RTD input), SAE, SAR, SAWE, SAWR:
	    Sets the temperature (indicated on the Input display) at 100% output.
	• SAU (DC current, DC voltage, potentiometer input), SAWU (DC current, DC voltage input), SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD:
	    Sets the value (indicated on the Input display) at 100% output.
	Setting range: Output 0% value to 9999	

IN *FILr* OUT *▢▢0.0*	**Filter time constant**	0.0 seconds
	Sets the filter time constant. Reduces input fluctuation caused by noise. Setting range: 0.0 to 10.0 seconds	
IN *So▢▢* OUT *▢▢0.0*	**Sensor correction**	0.0℃: SAU, SAE, SAR, SAWU, SAWE, SAWR 0 : SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD
	Sets the sensor correction value. Input value = Current input value + Sensor correction value Setting range: Thermocouple, RTD: -100.0 to 100.0℃(℉) DC current, DC voltage, potentiometer, current loop supply: -1000 to 1000	
IN *oUrP* OUT *420A*	**Output**	4 to 20mA DC

	Selects the output type. Selects Output 1 for the SAW series.
	    420A: 4 to 20mA DC *0▢1V*: 0 to 1V DC
	    020A: 0 to 20mA DC *0▢5V*: 0 to 5V DC
	    012A: 0 to 12mA DC *1▢5V*: 1 to 5V DC
	    010A: 0 to 10mA DC *010V*: 0 to 10V DC
	    1▢5A: 1 to 5mA DC	

IN o∐⌐↳ OUT ∩o∩L	**Output Normal/Reverse**	Normal

	Selects either Normal mode (0.0 to 100.0%) or Reverse mode (100.0 to 0.0%) for output status.
	   ∩o∩L : Normal
	   ⌐E∀↳: Reverse	

IN b∐⌐∩ OUT ∐P☐	**Burnout**	Upscale

	Selects Upscale (110.0%) or Downscale (-10.0%) output when input indicates burnout.
	Available for the SAU/SAWU (thermocouple, RTD input), SAE, SAR, SAWE, SAWR.
	   ∐P☐: Upscale
	   do∐∩: Downscale	

IN di ↳P OUT d∐RL	**Display**	Input/Output indication

	Selects an indication type on the display.
	   d∐RL : Input/Output indication
	   i ∩☐: Input indication
	   o∐⌐☐: Output indication
	   ∩o∩E: No indication (Only power indicator is lit.)	

IN ⌐i ∩E OUT 00.00	**Indication time**	00.00 (Continuous)

	Sets the indication time of the display after the final key operation.
	Not available if No indication (Only the power indicator is lit) is selected during Display selection.
	After the indication time has elapsed, the displays go off (Only the power indicator is lit.).
	If power is turned on again, or if any of the keys $\mathbb{A}$, $\mathbb{V}$, $\mathbb{O}$ or Sub-mode key is pressed while displays are unlit, the displays will light again.
	Setting range:
	   00.00: Continuous
	   00.01 (1 second) to 60.00 (60 minutes) [Minutes.Seconds]	

6.3.1 When using this unit as a signal converter

Set the filter time constant to 0.0 seconds, and
set the Output Normal/Reverse selection to "Normal".

6.3.2 When using the Reverse function

This function reverses the output (100 to 0%)
that corresponds to the input (0 to 100%).
Set the Output Normal/Reverse selection to "Reverse".

6.3.3 When using the first order lag filter function

The value is outputted by performing the first
order lag computation using the filter time
constant "T". (Fig. 6.3.3-1)
Set the filter time constant to a random value
(0.0 to 10.0 seconds).
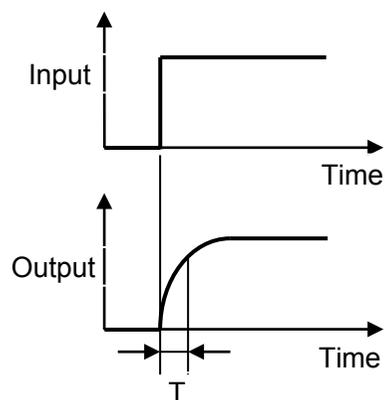
(Fig. 6.3.3-1)

7. Adjustment

Performs the output zero and span adjustments.
For the SAP and SAU (potentiometer input), perform potentiometer input zero and span adjustments as well.
Connect an mV generator or Dial resistor to the input terminals of this instrument.
Connect a digital multimeter to output terminals.

7.1 Basic operation of adjustment

Perform adjustment in the Adjustment mode.

To enter Adjustment mode, hold down the ◎ key for approx. 3 seconds in the Run mode. (Fig. 7.1-1)

For output adjustment, use the ⋀ or ⋁ key, and register the value with the ◎ key. (Fig. 7.1-2)

For the SAP and SAU (potentiometer input), potentiometer input adjustment is operable. For potentiometer input zero adjustment, the value is automatically adjusted with the ⋁ key. Pressing the ◎ key registers the value. (Fig. 7.1-2)

For potentiometer input span adjustment, the value is automatically adjusted with the ⋀ key. Pressing the ◎ key registers the value. (Fig. 7.1-2)

To revert to the Run mode, press the ◎ key again for approximately 3 seconds.

(1) Run mode
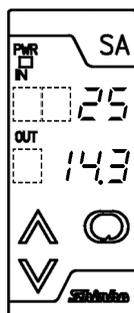
To enter Adjustment mode, please hold down the ◎ key for approx. 3 seconds.

(Fig. 7.1-1)

(2) Adjustment mode

Please use these keys for adjustment.

To proceed to each adjustment item in the Adjustment mode and to register the adjusted value, please use this key.
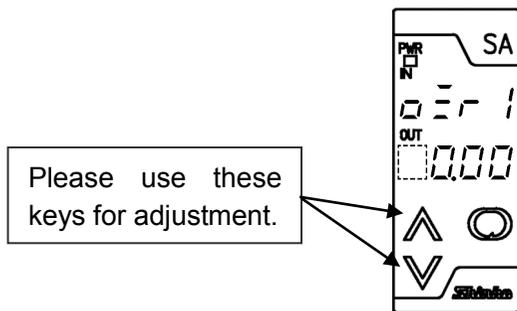
(Fig. 7.1-2)

7.2 Adjustment

The following shows all adjustment items. Adjust values referring to explanation of each item below.

Display	Name, Function, Setting range	Default value
IN o͞ir 1 OUT ☐0.00	**Output zero adjustment**	0.00%

	Adjusts output zero.
	For SAW series, adjusts Output 1 zero.
	Input the value corresponding to 0% output, then adjust the value with the
	△ or ▽ key while viewing the output value (on the digital multimeter).
	When the output range lower limit is zero, (even if zero adjustment results
	in a negative value), the output value will not be negative.
	Setting range: -5.00 to 5.00%
	Effective range of adjustment differs depending on the output types.
	    4 to 20mA DC: -5 to 5% 0 to 1V DC : 0 to 5%
	    0 to 20mA DC: 0 to 5% 0 to 5V DC : 0 to 5%
	    0 to 12mA DC: 0 to 5% 1 to 5V DC : -5 to 5%
	    0 to 10mA DC: 0 to 5% 0 to 10V DC: 0 to 5%
	    1 to 5mA DC : -5 to 5%	

IN o4P 1 OUT ☐0.00	**Output span adjustment**	0.00%
	Adjusts output span. For SAW series, adjusts Output 1 span. Input the value corresponding to 100% output, then adjust the value with the △ or ▽ key while viewing the output value (on the digital multimeter). Setting range: -5.00 to 5.00% Effective range of adjustment is 95 to 105%.	
IN o͞ir2 OUT ☐0.00	**Output 2 zero adjustment**	0.00%

	Adjusts Output 2 zero.
	Available only for SAW series.
	Input the value corresponding to 0% output, then adjust the value with the
	△ or ▽ key while viewing the Output 2 value (on the digital multimeter).
	When the output range lower limit is zero, (even if zero adjustment results
	in a negative value), Output 2 value will not be negative.
	Setting range: -5.00 to 5.00%
	Effective range of adjustment differs depending on the output types.
	    4 to 20mA DC: -5 to 5%
	    0 to 20mA DC: 0 to 5%	

IN o4P2 OUT ☐0.00	**Output 2 span adjustment**	0.00%
	Adjusts Output 2 span. Available only for SAW series. Input the value corresponding to 100% output, then adjust the value with the △ or ▽ key while viewing the Output 2 value (on the digital multimeter). Setting range: -5.00 to 5.00% Effective range of adjustment is 95 to 105%.	
IN 1 ͞iEr OUT -1999	**Potentiometer input zero adjustment**	-1999
	Performs potentiometer input zero adjustment. Available for the SAU (potentiometer input), SAP. Set the potentiometer to the MIN (Minimum) side, and press the ▽ key once. Automatic adjustment is performed.	
IN 1 4PA OUT 9999	**Potentiometer input span adjustment**	9999
	Performs potentiometer input span adjustment. Available for the SAU (potentiometer input), SAP. Set the potentiometer to the MAX (Maximum) side, and press the △ key once. Automatic adjustment is performed.	

8. Running

8.1 Indication after power-on

After power-on, the following warm-up status is indicated for 3 seconds (Fig. 8.1-1).

Lights after power-on.

Indicates the input type (Table 8.1-1).
Indicates $t\square\square\complement$ for the SAU (Default, K: -200 to 1370℃).

Indicates the output type (Table 8.1-2).
Indicates $420R$ when default value is 4 to 20mA DC.

(Fig. 8.1-1)
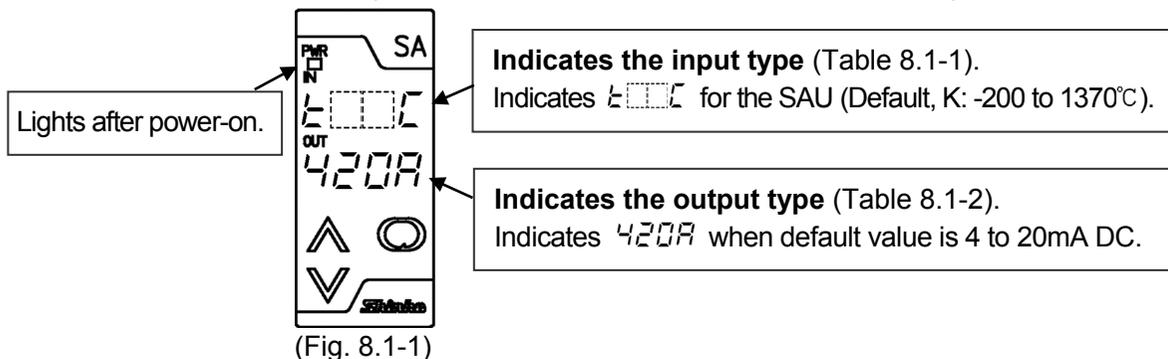
(Table 8.1-1)

Input	Input display	
	℃	℉
K	$t\square\square\complement$: -200 to 1370℃	$t\square\square F$: -328 to 2498℉
K	$t\square 2\complement$: -200 to 200℃	$t\square 2F$: -328 to 392℉
K	$t\square 4\complement$: 0 to 400℃	$t\square 4F$: 32 to 752℉
J	$J\square\square\complement$: -200 to 1000℃	$J\square\square F$: -328 to 1832℉
J	$J\square 2\complement$: -200 to 200℃	$J\square 2F$: -328 to 392℉
J	$J\square 4\complement$: 0 to 400℃	$J\square 4F$: 32 to 752℉
R	$r\square\square\complement$: -50 to 1760℃	$r\square\square F$: -58 to 3200℉
S	$5\square\square\complement$: -50 to 1760℃	$5\square\square F$: -58 to 3200℉
B	$b\square\square\complement$: 0 to 1820℃	$b\square\square F$: 32 to 3308℉
E	$E\square\square\complement$: -200 to 800℃	$E\square\square F$: -328 to 1472℉
T	$\Gamma\square\square\complement$: -200 to 400℃	$\Gamma\square\square F$: -328 to 752℉
N	$n\square\square\complement$: -200 to 1300℃	$n\square\square F$: -328 to 2372℉
PL-Ⅱ	$PL2\complement$: 0 to 1390℃	$PL2F$: 32 to 2534℉
W5Re/W26Re	$c\square\square\complement$: 0 to 2315℃	$c\square\square F$: 32 to 4199℉
W3Re/W25Re	$d\square\square\complement$: 0 to 2315℃	$d\square\square F$: 32 to 4199℉
Pt100	$Pr\square\complement$: -200 to 850℃	$Pr\square F$: -328 to 1562℉
Pt100	$Pr\ 1\complement$: -100 to 100℃	$Pr\ 1F$: -148 to 212℉
JPt100	$JPr\complement$: -200 to 500℃	$JPr F$: -328 to 932℉
4 to 20mA DC	$420R$: -1999 to 9999	
0 to 20mA DC	$020R$: -1999 to 9999	
0 to 16mA DC	$0\ 16R$: -1999 to 9999	
2 to 10mA DC	$2\ 10R$: -1999 to 9999	
0 to 10mA DC	$0\ 10R$: -1999 to 9999	
1 to 5mA DC	$1\square 5R$: -1999 to 9999	
0 to 1mA DC	$0\square\ 1R$: -1999 to 9999	
0 to 10mV DC	$0\ 1\bar{n}\forall$: -1999 to 9999	
-10 to 10mV DC	$-1\bar{n}\forall$: -1999 to 9999	
0 to 50mV DC	$05\bar{n}\forall$: -1999 to 9999	
0 to 60mV DC	$06\bar{n}\forall$: -1999 to 9999	
0 to 100mV DC	$00.\ 1\forall$: -1999 to 9999	
0 to 1V DC	$0\square\ 1\forall$: -1999 to 9999	
0 to 5V DC	$0\square 5\forall$: -1999 to 9999	
1 to 5V DC	$1\square 5\forall$: -1999 to 9999	
0 to 10V DC	$0\ 10\forall$: -1999 to 9999	

(Table 8.1-2)

Output	Output display
4 to 20mA DC	$420R$
0 to 20mA DC	$020R$
0 to 12mA DC	$0\ 12R$
0 to 10mA DC	$0\ 10R$
1 to 5mA DC	$1\square 5R$
0 to 1V DC	$0\square\ 1\forall$
0 to 5V DC	$0\square 5\forall$
1 to 5V DC	$1\square 5\forall$
0 to 10V DC	$0\ 10\forall$

8.2 Running

The unit enters the Run mode after 3-second warm-up as shown in (Fig. 8.2-1). The input selected during Input selection is converted to the output selected during Output selection.
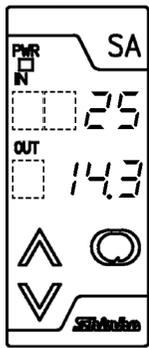
(Fig. 8.2-1)

Indicates the input value.
For the SAU (Default, K: -200 to 1370℃), an input value from the thermocouple is indicated.
If Upscale is selected during Burnout selection, and if nothing is connected to the input terminals, then ¯ ¯ ¯ ¯ is indicated.

Indicates the output value in a percentage form (%).
Output value corresponding to the input value is indicated in a percentage form (%).
If Upscale is selected during Burnout selection, and if nothing is connected to the input terminals, then *1100* (110.0%) is indicated.

• **Indication when input value is -200.0 (-2000) or less**
When the range has a decimal point: For the indication of -200.0 or less (up to –10% output), the input value and the minus (-) sign are indicated alternately.
For DC current or voltage input, the indication of -2000 or less is the same as the above.
(e.g.) Indication of -200.0   IN -□□□ ⟷ IN *2000*

• **Indication when input value is 10000 or more**
When DC current or voltage input is selected: For the indication of 10000 or more (up to 110% output), the lower 4 digits of input value are flashing.
(e.g.) Indication of 10020   IN *0020* ← **Flashes.**

• **Underrange, Overrange and Sensor burnout alarm indication**
The following will be indicated whatever setting item is selected during "Display selection".
 Underrange : "₋ ₋ ₋ ₋" flashes on the Input display.
 Overrange : "¯ ¯ ¯ ¯" flashes on the Input display.

• **Indication time setting**
If indication time is set, the displays will go off after the indication time has elapsed. (Only the power indicator is lit.)
If power is turned on again, or if any of the keys ∧, ∨, ◎ or the Sub-mode key is pressed while displays are unlit, the displays will light again.

9. Specifications

Input specifications

SAU/SAWU (thermocouple input), SAE, SAWE

Input resistance: 1MΩ or more
External resistance: 100Ω or less, However, B: 40Ω or less
Burnout: Upscale, Downscale

Input:

Thermocouple	Input range	
K	-200 to 1370℃	-328 to 2498℉
J	-200 to 1000℃	-328 to 1832℉
R	-50 to 1760℃	-58 to 3200℉
S	-50 to 1760℃	-58 to 3200℉
B	0 to 1820℃	32 to 3308℉
E	-200 to 800℃	-328 to 1472℉
T	-200 to 400℃	-328 to 752℉
N	-200 to 1300℃	-328 to 2372℉
PL-Ⅱ	0 to 1390℃	32 to 2534℉
W5Re/W26Re	0 to 2315℃	32 to 4199℉
W3Re/W25Re	0 to 2315℃	32 to 4199℉

Minimum input span is 50℃ (100℉).

SAU/SAWU (3-wire RTD input), SAR, SAWR

Input detection current: Approx. 0.2mA
Allowable lead wire resistance: 10Ω or less per wire
Burnout: Upscale, Downscale

Input:

RTD	Input range	
Pt100	-200 to 850℃	-328 to 1562℉
JPt100	-200 to 500℃	-328 to 932℉

Minimum input span is 50℃ (100℉).

SAU/SAWU (DC current input), SAA, SAWA

Input	Shunt resistor
4 to 20mA DC	50Ω
0 to 20mA DC	
0 to 16mA DC	
2 to 10mA DC	100Ω
0 to 10mA DC	
1 to 5mA DC	200Ω
0 to 1mA DC	1kΩ

Connect shunt resistor (sold separately) between input terminals.

SAU (DC voltage input), SAV

Input	Input resistance	Allowable signal source resistance
0 to 10mV DC	1MΩ	20Ω or less
-10 to 10mV DC		40Ω or less
0 to 50mV DC		200Ω or less
0 to 60mV DC		
0 to 100mV DC		
0 to 1V DC		2kΩ or less
0 to 5V DC		1kΩ or less
1 to 5V DC		
0 to 10V DC		

SAWU (DC voltage input), SAWV

Input	Input resistance	Allowable signal source resistance
0 to 10mV DC		20Ω or less
-10 to 10mV DC		40Ω or less
0 to 50mV DC	1MΩ	
0 to 60mV DC		200Ω or less
0 to 100mV DC		
0 to 1V DC		2kΩ or less

SAU (potentiometer input), SAP

Whole resistance value: 100Ω to 10kΩ
Reference voltage: 1.0V DC

SAD, SAWD

Input	Shunt resistor
4 to 20mA DC	50Ω built-in

Output specifications

DC current (SAW series: Output 1)

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 (SAW series: Output 1)

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%

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

Output 2 (Fixed range, SAW series)

Output	Allowable load resistance	Zero adjustment range	Span adjustment range
4 to 20mA DC	300Ω or less	-5 to 5%	95 to 105%
0 to 20mA DC	300Ω or less	0 to 5%	95 to 105%

Power supply for 2-wire transmitter (SAD, SAWD)

Output voltage : 24 to 28V DC (when load current is 20mA DC)
Ripple voltage : Within 200mV DC (when load current is 20mA DC)
Max load current: 25mA DC

Performance

Basic accuracy (at 23℃)

SAU/SAWU (thermocouple input), SAE, SAWE: Within ±0.1% of each input span
        R, S input, -50 to 200℃ (-58 to 392℉): Within ±6℃ (12℉)
        B input, 0 to 300℃ (32 to 572℉): Accuracy is not guaranteed.
        K, J, E, T, N input, 0℃ (32℉) or less: Within ±0.4% of each input span
SAU/SAWU (RTD input), SAR, SAWR: Within ±0.1% of each input span
SAU/SAWU (DC voltage, current, potentiometer input), SAA, SAV, SAP, SAD,
SAWA, SAWV, SAWD: Within ±0.1%
Output   : Within ±0.1%
SAW series Output 1 : Within ±0.1%
            Output 2 : Within ±0.15%

Cold junction compensation accuracy: Within ±1℃ at -5 to 55℃ [SAU/SAWU (thermocouple input), SAE]

Indication accuracy	: Within Basic input accuracy ±1 digit
Response time	: 0.5 seconds (typical) (0 → 90%)
	SAW series:
	Output 1: 0.5 seconds (typical) (0 → 90%)
	Output 2: 1.0 seconds (typical) (0 → 90%)
Temperature coefficient	: ±0.015%/℃
Insulation resistance	: Input – Output – Power: 10MΩ or more, at 500V DC
	SAW series:
	Input – Output 1 – Output 2 – Power: 10MΩ or more, at 500V DC
Dielectric strength	: Input – Output – Power: 2.0kV AC for 1 minute
	SAW series:
	Input – Output 1 – Power : 2.0kV AC for 1 minute
	Output 1 – Output 2 – Power : 2.0kV AC for 1 minute
	Input – Output 2 : 1.35kV AC for 1 minute
	For the input of SAD and SAWD, terminals 5, 6 and 7 (including power supply for 2-wire transmitter) are used.

General structure

Case	: Flame-resistant resin, Color: Light gray
Front panel	: Membrane sheet
Setting	: Setting by the front keypad
Displays	: Input display : 7 segments Red LED display 4 digits
	Character size: 7.4 x 4.0mm (H x W)
	Output display : 7 segments Green LED display 4 digits
	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. 6VA (SAD, SAWD: Approx. 7VA)
Ambient temperature	: -5 to 55℃ (23 to 131℉)
Ambient humidity	: 35 to 85%RH (Non-condensing)
Weight	: Approx. 120g
Mounting	: DIN rail
External dimensions	: W22.5 x H75 x D100mm

Attached function

• **Power failure countermeasure**: The setting data is backed up in the non-volatile IC memory.

• **Self-diagnosis**: The CPU is monitored by a watchdog timer, and when an abnormal status occurs, the instrument is switched to warm-up status, turning all outputs OFF.

• **Cold junction compensation**:
Available only for the SAU/SAWU (thermocouple input), SAE, SAWE.
This detects the temperature at the connecting terminal between the thermocouple and the instrument, and always maintains it at the same status as if the reference junction location temperature was at 0℃ (32℉).

10. Troubleshooting

10.1 Indication

Problem	Possible Cause	Solution
Input display is flashing "- - - -" or "‾ ‾ ‾ ‾"	The sensor may be burnt out.	Replace with a new sensor.
	Check whether the sensor is securely connected to the instrument input terminals.	Ensure that the sensor terminals are securely connected to the instrument input terminals.
	Check the input signal source.	Ensure that the input signal source works normally.
	Check whether polarity of thermocouple or compensating lead wire is correct. Check whether codes (A, B, B) of the RTD agree with the instrument terminals.	Wire them correctly.
The indication of the Input display is irregular or unstable	Check whether the sensor input and temperature unit (℃/℉) settings are correct.	Ensure that sensor type and temperature unit (℃/℉) are set properly.
	Check whether the sensor correction value is suitable.	Set it to a suitable value.
	AC leaks into the sensor circuit.	Use an ungrounded type sensor.
	There may be equipment that interferes with or makes noise near the unit	Keep the instrument clear of any potentially disruptive equipment.

10.2 Key operation

Problem	Possible Cause	Solution
Setting or adjustment is not possible.	"Lock" is selected during Set value lock selection.	Select "Unlock".

10.3 Running

Problem	Possible Cause	Solution
Input value does not change.	The sensor may be out of order.	Replace with the new sensor.
	Check whether input and output wires are securely connected to the I/O terminals of the instrument.	Ensure that input and output wires are securely connected to the I/O terminals.
	Check whether the wiring of input and output is correct.	Wire them correctly.
Does not output anything.	Check whether Output 100% and Output 0% values have been set to suitable values.	Set Output 100% and Output 0% values to suitable values.
	Check whether Output and Output Normal/Reverse have been selected correctly during Output selection and Output Normal/Reverse selection.	Select Output and Output Normal/Reverse correctly during Output selection and Output Normal/Reverse selection.

11. Character table

All setting items are indicated in the following tables, however, some items will not be indicated depending on the specifications.

Setup mode

Display	Setting Item	Default Value	Data
Loct	Set value lock	Unlock	
SEnS	Input	Thermocouple (SAU, SAWU)	
rc□	Thermocouple input range	K : -200 to 1370℃ (SAU, SAE, SAWU, SAWE)	
rrd□	RTD input range	Pt100 : -200 to 850℃ (SAR, SAWR)	
dcA□	DC current input range	4 to 20mA DC : -1999 to 9999 (SAA, SAWA)	
dcb□	DC voltage input range	1 to 5V DC : -1999 to 9999 (SAV) 0 to 10mV DC: -1999 to 9999 (SAWV)	
dP□	Decimal point place	No decimal point	
SrLL	Output 0% value	-200℃ : SAU, SAE, SAR, SAWU, SAWE, SAWR -1999 : SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD	
SrLH	Output 100% value	1370℃: SAU, SAE, SAWU, SAWE 850℃ : SAR, SAWR 9999 : SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD	
FILr	Filter time constant	0.0 seconds	
So□	Sensor correction	0.0℃ : SAU, SAE, SAR, SAWU, SAWE, SAWR 0 : SAA, SAV, SAP, SAD, SAWA, SAWV, SAWD	
oUrP	Output	4 to 20mA DC (Output 1 for SAW series)	
oUrS	Output Normal/Reverse	Normal	
bUrn	Burnout	Upscale [SAU/SAWU (thermocouple, RTD input), SAE, SAR, SAWE, SAWR]	
diSP	Display	I/O indication	
rinE	Indication time	00.00 (Continuous)	

Adjustment mode

Display	Setting Item	Default Value	Data
ozr1	Output zero adjustment	0.00% (Output 1 zero adjustment for SAW series)	
oSP1	Output span adjustment	0.00% (Output 1 span adjustment for SAW series)	
ozr2	Output 2 zero adjustment	0.00% (SAW series)	
oSP2	Output 2 span adjustment	0.00% (SAW series)	
izEr	Potentiometer input zero adjustment	-1999 [SAU (potentiometer input), SAP]	
iSPA	Potentiometer input span adjustment	9999 [SAU (potentiometer input), SAP]	

******* Inquiry *******

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

(e.g.)

• Model ....………. SA□-□
• Serial number …..................... No. xxxxxx

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