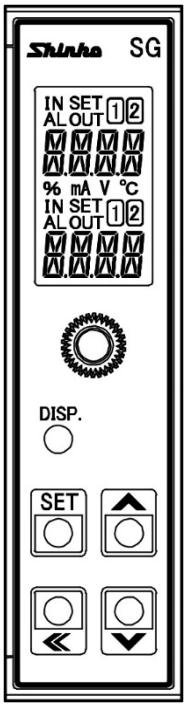
UNIVERSAL ALARM UNIT
SGAU
INSTRUCTION MANUAL



Shinko

Preface

Thank you for purchasing our SGAU, Universal Alarm Unit. This manual contains instructions for the mounting, functions, operations and notes when operating the SGAU. 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.
- The contents of this instruction manual are subject to change without notice.
- Care has been taken to ensure 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 damage or secondary damage(s) incurred as a result of using this product, including any indirect damage.

SAFETY PRECAUTIONS (Be sure to read these precautions before using our products.)

The safety precautions are classified into categories: "Warning" and "Caution".
Depending on circumstances, procedures indicated by ⚠ Caution may result in serious consequences, 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 electrical shock or fire, only Shinko or qualified service personnel may handle the inner assembly.
- To prevent an electrical 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 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 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. Proper periodic maintenance is also 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, explosive gases
- No mechanical vibrations or shocks
- No exposure to direct sunlight, an ambient temperature of -10 to 55℃ (14 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 the vapors of these substances can come into direct contact with the unit.
- When installing this unit within a control panel, please 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.

Wiring Precautions

⚠ Caution

- Do not leave wire remnants in the instrument, as they could cause a fire and malfunction.
- When wiring, use a crimping pliers and a solderless terminal with an insulation sleeve in which an M3 screw fits.
- 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 250 V AC, rated current 2 A)
- For wiring of the AC power source, be sure to use terminals as described in this manual. If the AC power source is connected to incorrect terminals, the unit will be burnt out.
- For a 24 V 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.

Operation and Maintenance Precautions

⚠ Caution

- Do not touch live terminals. This may cause an electrical 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 electrical 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, be careful not to put pressure on, scratch or strike it with a hard object.

Characters used in this manual [: No character is indicated (unlit).]

Indication	-1	0	1	2	3	4	5	6	7	8	9	℃	℉
Number, ℃/℉	-1	0	1	2	3	4	5	6	7	8	9	℃	℉
Indication	A	b	C	d	E	F	G	H	I	J	K	L	M
Alphabet	A	B	C	D	E	F	G	H	I	J	K	L	M
Indication	N	o	P	Q	R	S	T	U	V	W	X	Y	Z
Alphabet	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

CONTENTS

1. Model

1.1 Model

SGAU - □ □ □ □ - 0 - □

- Option
  - 0: No option ordered 2: Moisture-proof treatment
- Power supply
  - 100 to 240 V AC
- Output
  - 2A: 2-outputs (a contact) 2B: 2-outputs (b contact)
  - 4A: 4-outputs (a contact) 4B: 4-outputs (b contact)
- Input *1
- Series name

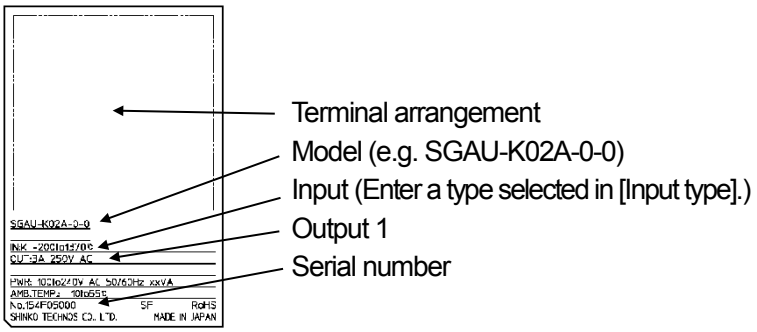
***1: Input**

Code	Input Type		Code	Input Type	
K0	**K thermocouple**	-200 to 1370 °C (-328 to 2498 °F)	T0	**T thermocouple**	-200 to 400 °C (-328 to 752 °F)
K1		-200 to 200 °C (-328 to 392 °F)	T1		-100 to 100 °C (-148 to 212 °F)
K2		0 to 400 °C (32 to 752 °F)	N	**N thermocouple**	-200 to 1300 °C (-328 to 2372 °F)
J0	**J thermocouple**	-200 to 1000 °C (-328 to 1832 °F)	PL	**PL-Ⅱ thermocouple**	0 to 1390 °C (32 to 2534 °F)
J1		-200 to 200 °C (-328 to 392 °F)	W5	**W5Re/W26Re thermocouple**	0 to 2315 °C (32 to 4199 °F)
J2		0 to 400 °C (32 to 752 °F)	W3	**W3Re/W25Re thermocouple**	0 to 2315 °C (32 to 4199 °F)
R	**R thermocouple**	-50 to 1760 °C (-58 to 3200 °F)	P0	**Pt100 RTD**	-200 to 650 °C (-328 to 1202 °F)
S	**S thermocouple**	-50 to 1760 °C (-58 to 3200 °F)	P1		-100 to 100 °C (-148 to 212 °F)
B	**B thermocouple**	0 to 1820 °C (32 to 3308 °F)	P2	**JPt100 RTD**	-200 to 500 °C (-328 to 932 °F)
E	**E thermocouple**	-200 to 800 °C (-328 to 1472 °F)	P3		-100 to 100 °C (-148 to 212 °F)

Code	Input Type		Code	Input Type	
A0	Direct current	4 to 20 mA (Built-in 50 Ω shunt resistor)	V0	DC voltage	0 to 10 mV (1 MΩ input resistance)
A1		4 to 20 mA (250 Ω shunt resistor)	V1		0 to 50 mV (1 MΩ input resistance
A2		4 to 20 mA (50 Ω shunt resistor)	V2		0 to 60 mV (1 MΩ input resistance)
A3		0 to 20 mA (250 Ω shunt resistor)	V3		0 to 100 mV (1 MΩ input resistance)
A4		0 to 16 mA (62.5 Ω shunt resistor)	V4		0 to 1 V (1 MΩ input resistance)
A5		2 to 10 mA (250 Ω shunt resistor)	V5		0 to 5 V (1 MΩ input resistance)
A6		0 to 10 mA (100 Ω shunt resistor)	V6		1 to 5 V (1 MΩ input resistance)
A7		1 to 5 mA (100 Ω shunt resistor)	V7		-5 to 5 V (1 MΩ input resistance)
A8		0 to 1 mA (1000 Ω shunt resistor)	V8		0 to 10 V (1 MΩ input resistance)
A9		10 to 50 mA (10 Ω shunt resistor)	V9		-10 to 10 V (1 MΩ input resistance)

1.2 How to Read the Model Label

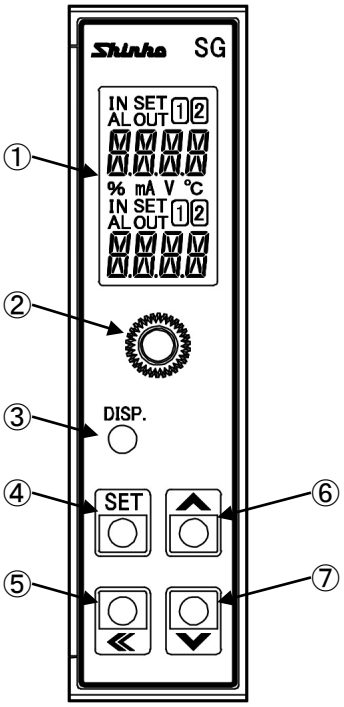
The model label is attached to the right side of the case.



(Fig. 1.2-1)

2. Name and Functions

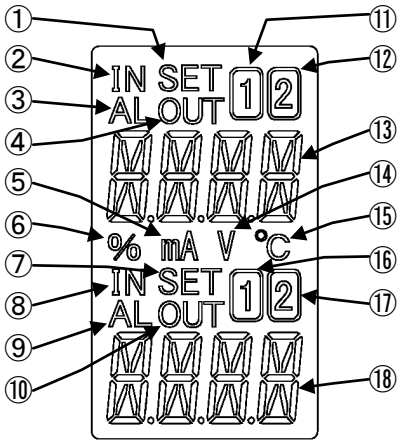
2.1 Front Panel



(Fig. 2.1-1)

①	**Display section**	Indicates setting contents, input value, alarm value, etc.
②	**Mounting screw**	Used for fixing the instrument to the socket or removal from it.
③	**DISP key**	Switches the displays, and moves to the next setting item. In manual mode, each alarm output can be selected. Releases the lock status of the DISP key by pressing for 3 seconds.
④	**SET key**	Selects the setting mode. Shifts the digit in Custom display setting mode. Enters the setting mode by pressing and holding for 5 seconds.
⑤	**SHIFT key**	Shifts the digit of setting value.
⑥	**UP key**	Increases the numerical value. Contents of Multi-Display A and B can be changed alternately when Default Display is RUN display mode 1, 2, 3, 4, 5, 6 and 7.
⑦	**DOWN key**	Decreases the numerical value. Enters Manual mode by pressing for 3 seconds.

2.2 Display Section



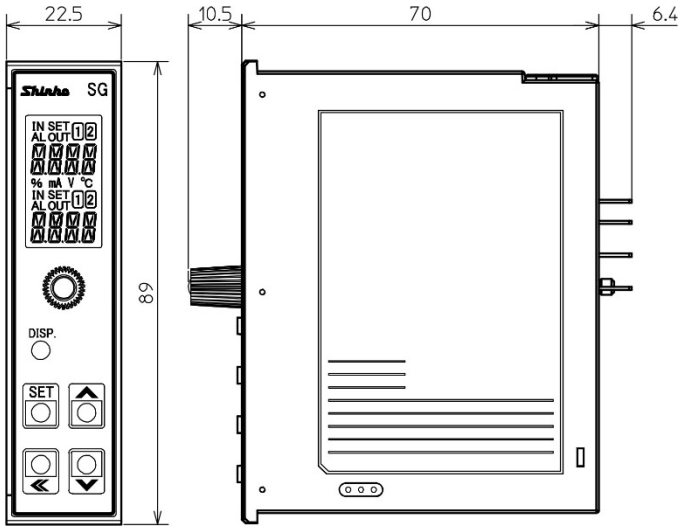
(Fig. 2.2-1)

①	**Setting display indicator A**	Lights up when setting value is indicated.
②	**Input indicator A**	Lights up when Multi-Display A indicates an input value.
③	**Alarm indicator A**	Lights up when alarm action is activated, or if an input error, input burnout or input disconnection occurs.
④	**Output indicator A**	Lights up when alarm output is ON.
⑤	**mA indicator**	Lights up when mA is selected in [Indication unit].
⑥	**% indicator**	Lights up when % is selected in [Indication unit].
⑦	**Setting display indicator B**	Lights up when setting value is indicated.
⑧	**Input indicator B**	Lights up when Multi-Display B indicates an input value.
⑨	**Alarm indicator B**	Lights up when alarm action is activated, or if an input error or input burnout or input disconnection occurs.
⑩	**Output indicator B**	Lights up when alarm output is ON.
⑪	**1 indicator A**	Lights up when Multi-Display A indicates Alarm 1 value. Flashes when Multi-Display A indicates Alarm 3 value.
⑫	**2 indicator A**	Lights up when Multi-Display A indicates Alarm 2 value. Flashes when Multi-Display A indicates Alarm 4 value.
⑬	**Multi-Display A**	Indicates the following in accordance with the display indication: Input value, alarm value, custom characters, setting item, active alarm number (AL1 to AL4) when each alarm output is ON (when ENABLED is selected in [Alarm indication Enabled/Disabled])
⑭	**V indicator**	Lights up when V is selected in [Indication unit].
⑮	**°C indicator**	Lights up when °C is selected in [Indication unit].
⑯	**1 indicator B**	Lights up when Multi-Display B indicates Alarm 1 value. Flashes when Multi-Display B indicates Alarm 3 value.
⑰	**2 indicator B**	Lights up when Multi-Display B indicates Alarm 2 value. Flashes when Multi-Display B indicates Alarm 4 value.
⑱	**Multi-Display B**	Indicates the following in accordance with the display indication: Input value, alarm value, custom characters, setting value

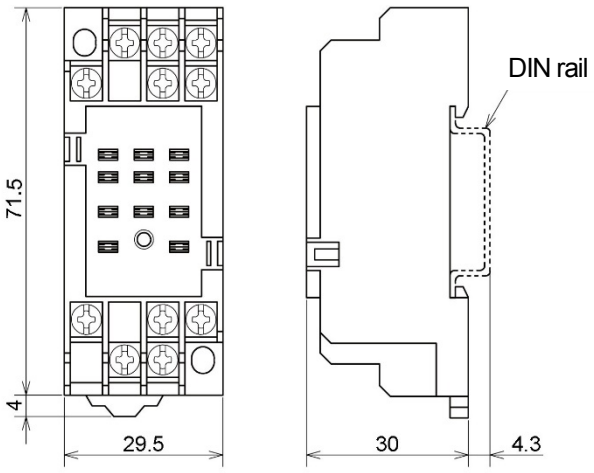
Output indicators A and B, Alarm indicators A and B: Red
Other indicators: White

3. Mounting

3.1 External Dimensions (Scale: mm)



11P socket



(Fig. 3.1-1)

3.2 Mounting to, and Removal from the DIN Rail

⚠ Caution

- Mount the DIN rail horizontally.
- To remove the socket, a flat blade screwdriver is required.
  Never turn the screwdriver when inserting it into the Lock lever. If excessive power is applied to the lever, it may break.
- If the instrument is mounted in a position susceptible to vibration or shock, mount commercially available fastening plates at both ends of the instrument.

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)

① Separate the instrument from the socket by loosening the mounting screw on the front panel.

② Make sure the lock lever of the socket is located in the lower part of the socket.
Hook the upper side of the socket onto the DIN rail, then fit the lower part of the socket onto the DIN rail (A clicking sound should be heard when done properly).

⚠ Caution

- Before inserting the instrument to the socket, make sure the cable is wired properly. (Refer to "4. Wiring".)
- When inserting or removing the socket, make sure the socket is oriented vertically. If force is applied in any other direction than vertically, a malfunction may occur.
- If the mounting screw is fastened too tightly, a malfunction may occur.

③ Insert the SGAU into the socket.

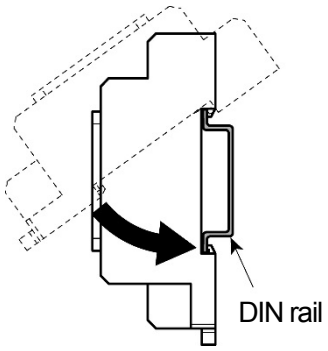
④ Fasten the mounting screw by turning it clockwise, to secure the SGAU onto the socket. Tighten the screw lightly.

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

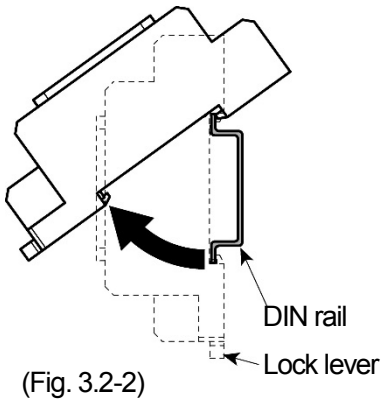
① Turn the power to the instrument OFF.

② Separate the instrument from the socket by loosening the mounting screw on the front panel.

③ Insert a flat blade screwdriver into the Lock lever (lower part of the socket), and remove the socket from the DIN rail while pulling the lever down.



(Fig. 3.2-1)



(Fig. 3.2-2)

4. Wiring

⚠ Warning

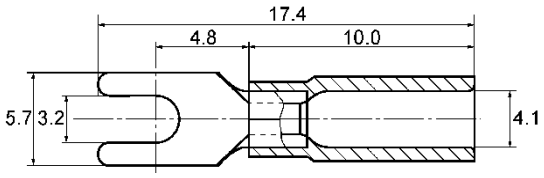
Turn the power supply to the instrument off before wiring or checking. Working on or touching the terminal with the power switched on may result in severe injury or death due to electrical shock.

4.1 Lead Wire Solderless Terminal

Use a solderless terminal with an insulation sleeve in which an M3 screw fits as shown below.
The torque should be 0.63 N•m.

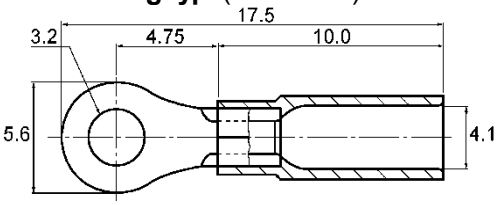
Solderless Terminal	Manufacturer	Model
Y-type	Nichifu Terminal Industries Co., Ltd.	TMEV1.25Y-3
	Japan Solderless Terminal MFG Co., Ltd.	VD1.25-B3A
Ring-type	Nichifu Terminal Industries Co., Ltd.	TMEV1.25-3
	Japan Solderless Terminal MFG Co., Ltd.	V1.25-3

Y-type(Scale: mm)



(Fig. 4.1-1)

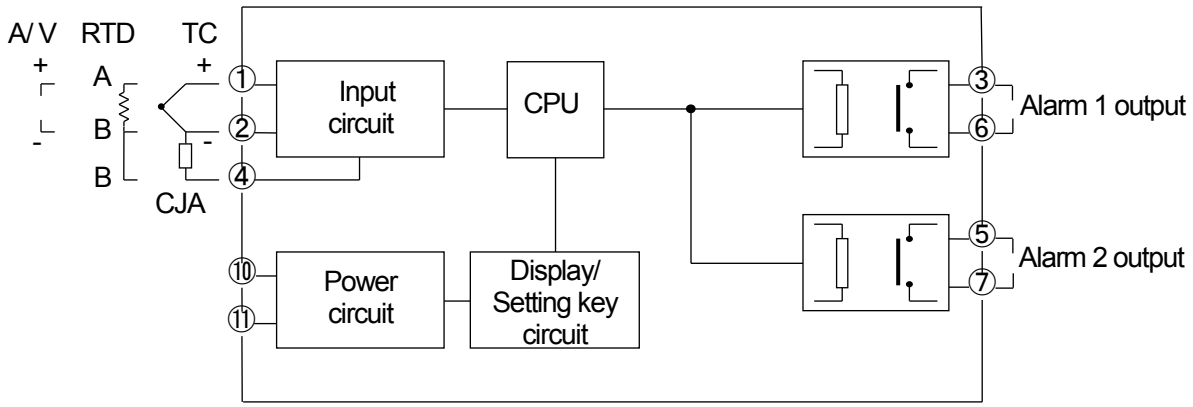
Ring-type(Scale: mm)



(Fig. 4.1-2)

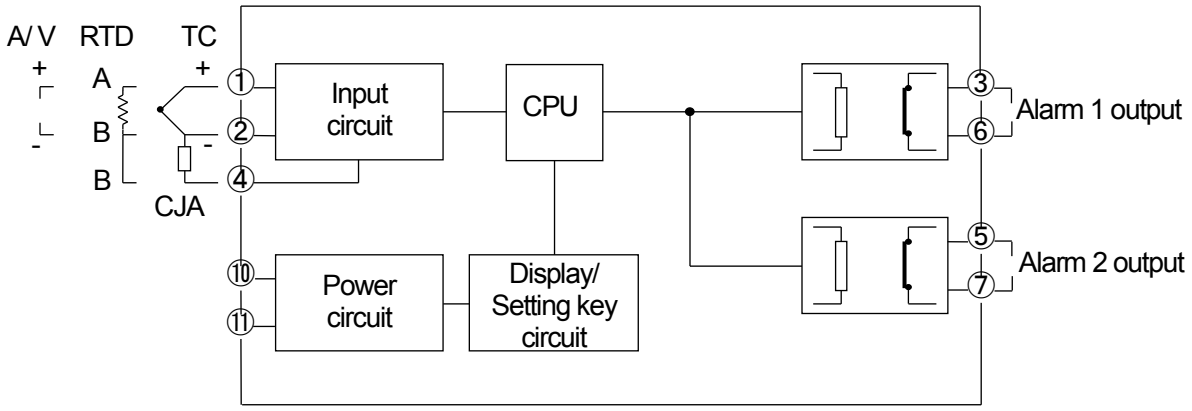
4.2 Circuit Configuration

2-outputs (a contact)



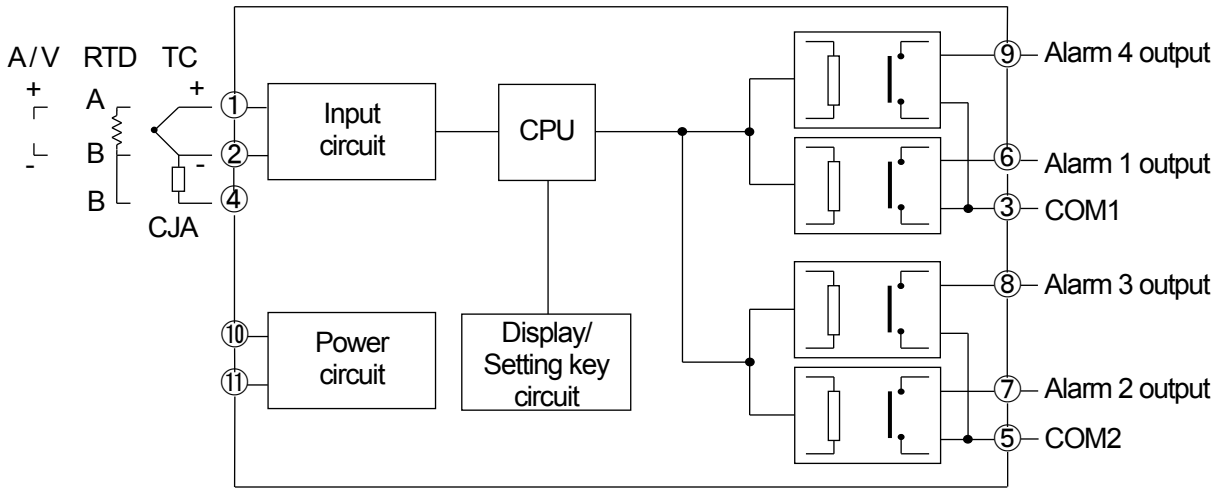
(Fig. 4.2-1)

2-outputs (b contact)



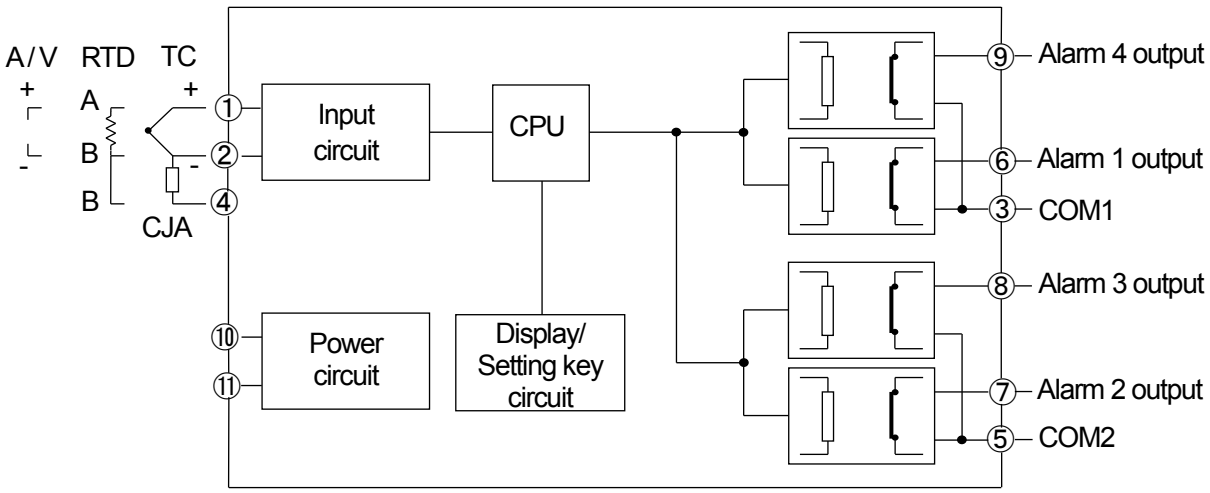
(Fig. 4.2-2)

4-outputs (a contact)



(Fig. 4.2-3)

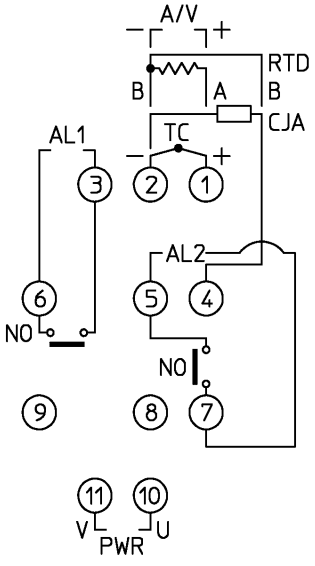
4-outputs (b contact)



(Fig. 4.2-4)

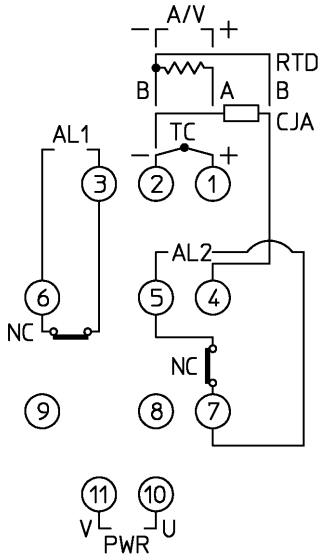
4.3 Terminal Arrangement

2-outputs (a contact)



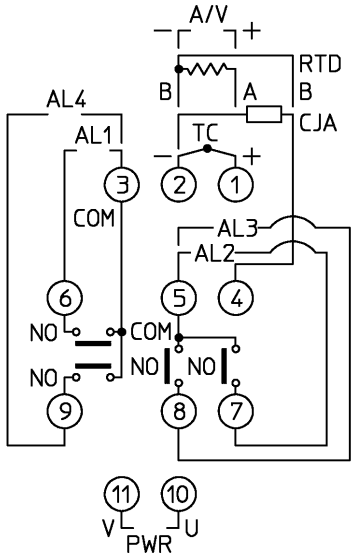
(Fig. 4.3-1)

2-outputs (b contact)



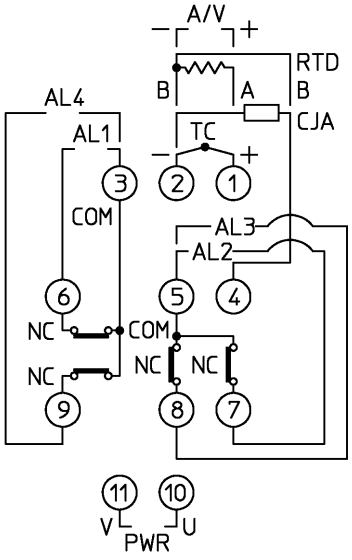
(Fig. 4.3-2)

4-outputs (a contact)



(Fig. 4.3-1)

4-outputs (b contact)



(Fig. 4.3-2)

PWR	Power supply 100 to 240 V AC
TC	Thermocouple input
RTD	RTD input
A	Direct current input
V	DC voltage input
CJA	Cold junction compensator input
AL1	Alarm 1 output
AL2	Alarm 2 output
AL3	Alarm 3 output(only for 4-outputs spec)
AL4	Alarm 4 output(only for 4-outputs spec)

4.4 Wiring

⚠ Warning

• For 100 to 240 V AC, if the AC power source is connected to incorrect terminals, the instrument will be burnt out.

(1) Power Source Wiring

Use terminals ⑩, ⑪ for the power supply to the instrument.

(2) Output Wiring

2-outputs: Alarm 1 output: Use terminals ③, ⑥.
Alarm 2 output: Use terminals ⑤, ⑦.

4-outputs: Alarm 1 output: Use terminals ③, ⑥.
Alarm 2 output: Use terminals ⑤, ⑦.
Alarm 3 output: Use terminals ⑤, ⑧.
Alarm 4 output: Use terminals ③, ⑨.

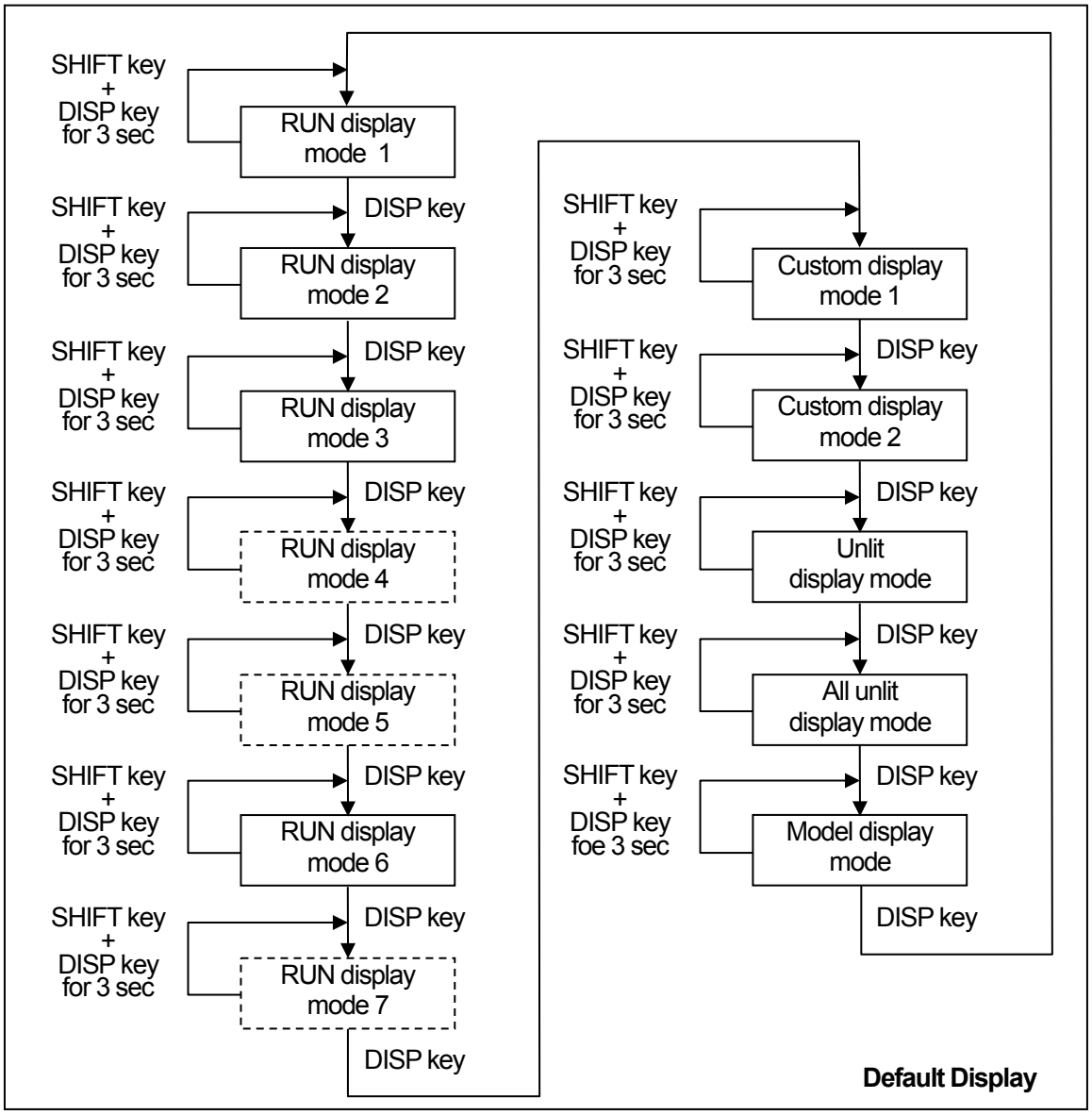
(3) Input Wiring

Use terminals ①, ②, ④ for the input wiring.

For thermocouple, connect a cold junction compensator (CJA) between terminals ② and ④.

For direct current - except input code A0, connect a shunt resistor between terminals ① and ②, which are also used for input wiring.

5. Display Mode



- ⋯⋯ : Available only for 4-outputs spec.

Default Display:

- If the SHIFT and DISP keys (in that order) are pressed together for approx. 3 seconds in any display mode, the display mode will become Default Display.
- Once the Default Display is set, the DISP key will be in lock status.
- If the DISP key is pressed for approx. 3 seconds on the Default Display, the key lock status will be cancelled.
- If the DISP key is pressed while the DISP key is in lock status, Multi-Display A indicates LOCK.

RUN display mode 1:

- Multi-Display A indicates an input value, and Multi-Display B is unlit.
- If an alarm is activated, the Alarm indicator A and the Output indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]: An active alarm (AL.M1 to AL.MH) is indicated on Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

RUN display mode 2:

- Multi-Display A indicates an input value, Multi-Display B indicates Alarm 1 value, and **1** indicator B lights up.
- By pressing the SET key, the unit enters Simple setting mode (see p.18), and the alarm value can be set.
- If Alarm 1 is activated, the Alarm indicator A and the Output indicator A will light up.
- If any of Alarm 2, 3 or 4 is activated, only Alarm indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]: An active alarm (AL.M1 to AL.MH) is indicated on Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

RUN display mode 3:

- Multi-Display A indicates an input value, and Multi-Display B indicates Alarm 2 value. **2** indicator B lights up.
- By pressing the SET key, the unit enters Simple setting mode (see p.18), and the alarm value can be set.
- If Alarm 2 is activated, Alarm indicator A and the Output indicator A will light up.
- If any of Alarm 1, 3 or 4 is activated, only Alarm indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]: An active alarm (AL.M1 to AL.MH) is indicated on Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

RUN display mode 4:
(only for 4-outputs spec)

- Multi-Display A indicates an input value, Multi-Display B indicates Alarm 3 value, and **1** indicator B flashes.
- By pressing the SET key, the unit enters Simple setting mode, (see p.18), and the alarm value can be set.
- If Alarm 3 is activated, the Alarm indicator A and the Output indicator A will light up.
- If any of Alarm 1, 2 or 4 is activated, only Alarm indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]: An active alarm (AL.M1 to AL.MH) is indicated on the Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

RUN display mode 5:
(only for 4-outputs spec)

- Multi-Display A indicates an input value, and Multi-Display B indicates Alarm 4 value. **2** indicator B flashes.
- By pressing the SET key, the unit enters Simple setting mode (see p.18), and alarm value can be set.
- If Alarm 4 is activated, the Alarm indicator A and the Output indicator A will light up.
- If any of Alarm 1, 2 or 3 is activated, only Alarm indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]:
  An active alarm (AL.M1 to AL.M4) is indicated on the Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

RUN display mode 6:

- Multi-Display A indicates Alarm 1 value, and Multi-Display B indicates Alarm 2 value. **1** indicator A and **2** indicator B light up.
- By pressing the SET key, the unit enters Simple setting mode (see p.18), and the alarm value can be set.
- If Alarm 1 is activated, the Alarm indicator A and the Output indicator A will light up.
- If Alarm 2 is activated, the Alarm indicator A and the Output indicator B will light up.
- If Alarm 3 or 4 is activated, only Alarm indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]:
  An active alarm (AL.M1 to AL.M4) is indicated on the Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

RUN display mode 7:
(only for 4-outputs spec)

- Multi-Display A indicates Alarm 3 value, and Multi-Display B indicates Alarm 4 value. **1** indicator A and **2** indicator B flashes.
- By pressing the SET key, the unit enters Simple setting mode (see p.18), and the alarm value can be set.
- If Alarm 3 is activated, the Alarm indicator A and the Output indicator A will light up.
- If Alarm 4 is activated, the Alarm indicator A and the Output indicator B will light up.
- If Alarm 1 or 2 is activated, only Alarm indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]:
  An active alarm (AL.M1 to AL.M4) is indicated on the Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

Custom display mode 1:

- Multi-Display A indicates characters set in [Multi-Display A].
  Multi-Display B indicates characters set in [Multi-Display B].
- If an alarm is activated, the Alarm indicator A and the Output indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]:
  An active alarm (AL.M1 to AL.M4) is indicated on the Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

Custom display mode 2:
- Multi-Display A indicates an input value, and Multi-Display B indicates characters set in [Multi-Display B].
- If an alarm is activated, the Alarm indicator A and the Output indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]: An active alarm (AL1 to AL1H) is indicated on the Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

Unlit display mode:
- Multi-Display A and B are unlit, and the Input indicator A lights up.
- If an alarm is activated, the Alarm indicator A and the Output indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]: An active alarm (AL1 to AL1H) is indicated on the Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

All unlit display mode:
- All displays and indicators are unlit.
- Alarm indicator A does not light up even though it is under conditions of lighting.

Model display mode:
- Multi-Display A indicates a model name, and Multi-Display B indicates an input code and output code.
- If an alarm is activated, the Alarm indicator A and the Output indicator A will light up.
- When ENABLED is selected in [Alarm indication Enabled/Disabled]: An active alarm (AL1 to AL1H) is indicated on the Multi-Display A.
- If multiple alarms are activated, the smallest alarm number will be displayed.

6. Simple Setting Mode

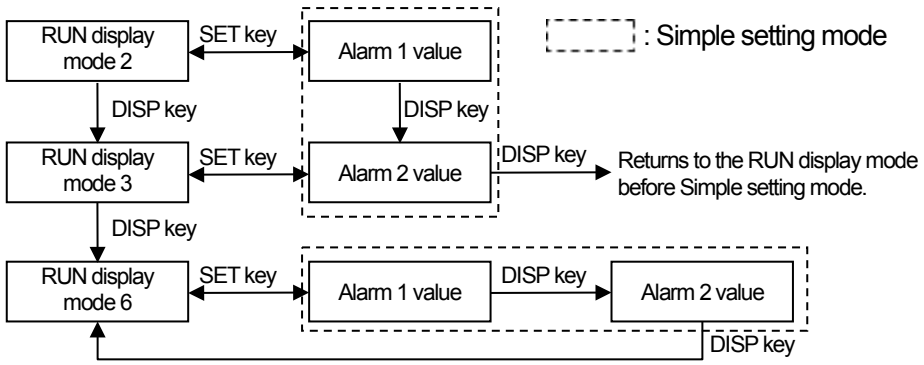
If the SET key is pressed in RUN display mode 2 to 7, any one (from AL1H to AL4H) is indicated on the Multi-Display A, an alarm value on the Multi-Display B flashes, and it is possible to change the alarm value.

Change the value, then press the SET or DISP key to save (register) it. The unit returns to the following status:

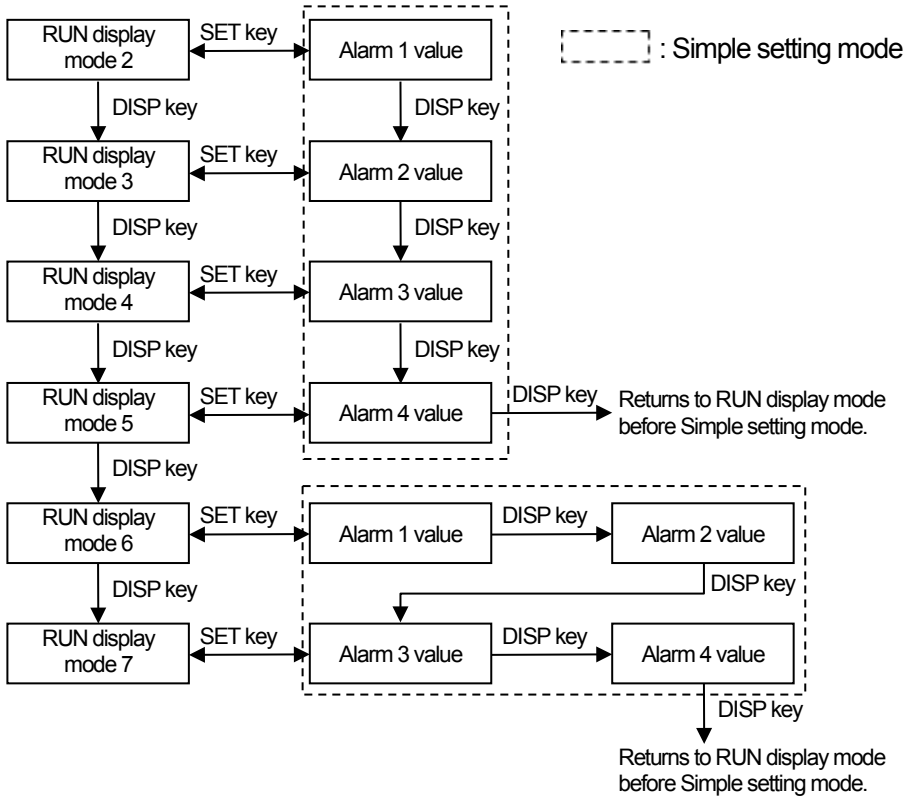
Multi-Display A indicates an input value, and Multi-Display B indicates an alarm value.

Note: The unit cannot move to RUN display mode for which the alarm value has not been set.

6.1 Display Transition for 2-outputs



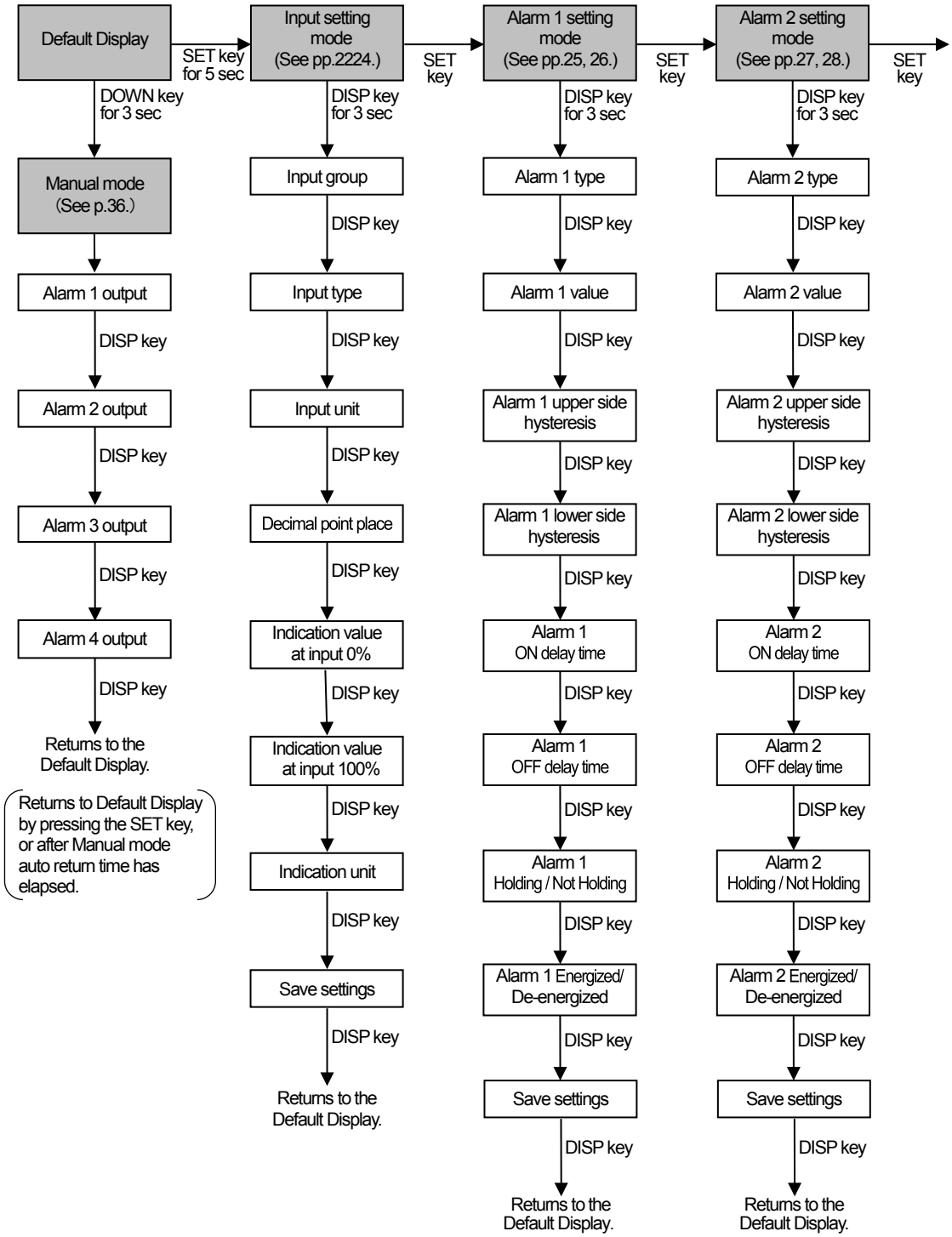
6.2 Display Transition for 4-outputs

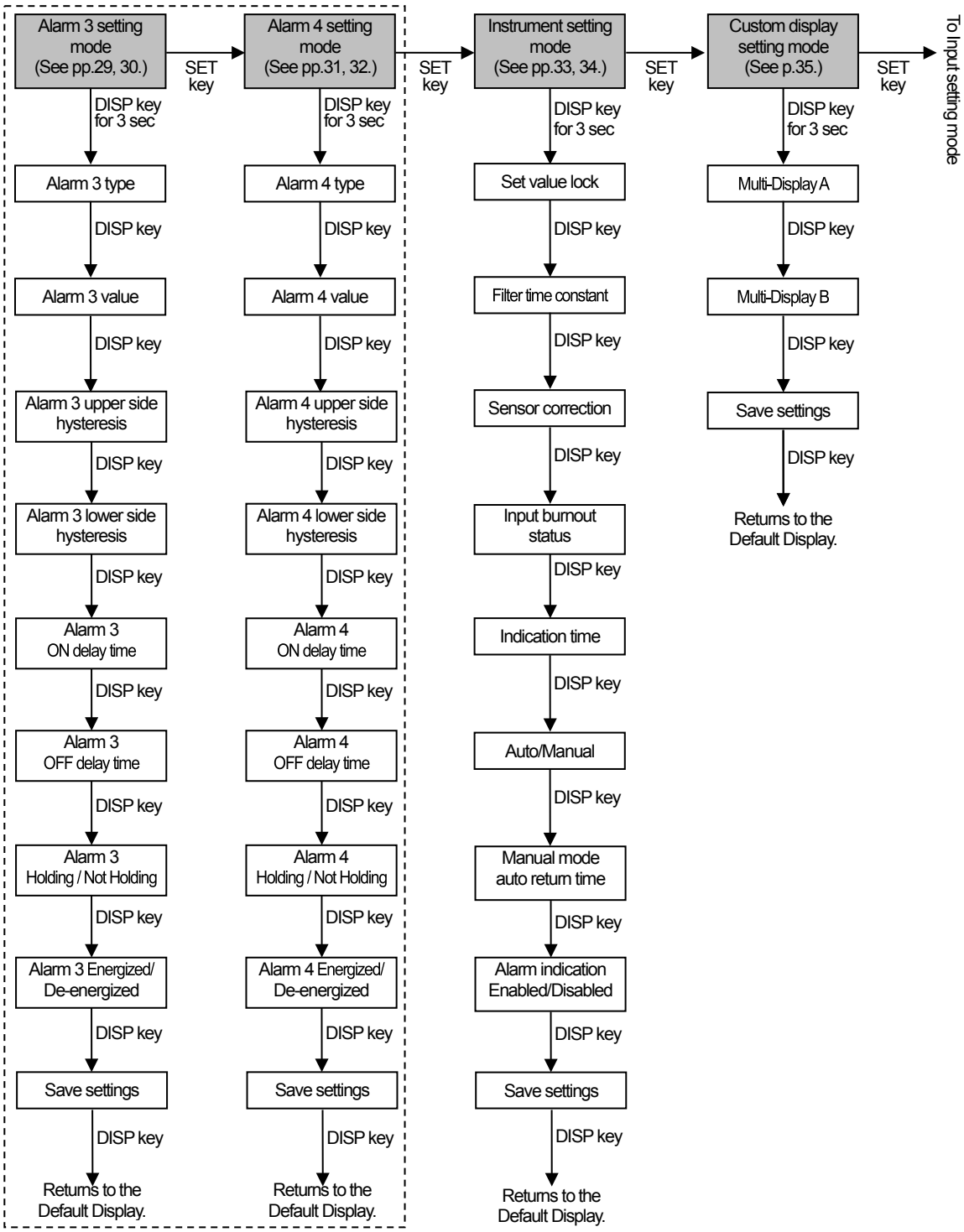


7. Setting Mode

7.1 Display Transition in Setting Mode

- : Available only for 4-outputs spec.
- If the SET key is pressed and held down for approx. 5 seconds in each setting mode, the unit will move to the Default Display.




Alarm 3 setting mode (See pp.29, 30.)
SET key
Alarm 4 setting mode (See pp.31, 32.)
SET key
Instrument setting mode (See pp.33, 34.)
SET key
Custom display setting mode (See p.35.)
SET key
To Input setting mode
DISP key for 3 sec
Alarm 3 type
DISP key
Alarm 3 value
DISP key
Alarm 3 upper side hysteresis
DISP key
Alarm 3 lower side hysteresis
DISP key
Alarm 3 ON delay time
DISP key
Alarm 3 OFF delay time
DISP key
Alarm 3 Holding / Not Holding
DISP key
Alarm 3 Energized/ De-energized
DISP key
Save settings
DISP key
Returns to the Default Display.
DISP key for 3 sec
Alarm 4 type
DISP key
Alarm 4 value
DISP key
Alarm 4 upper side hysteresis
DISP key
Alarm 4 lower side hysteresis
DISP key
Alarm 4 ON delay time
DISP key
Alarm 4 OFF delay time
DISP key
Alarm 4 Holding / Not Holding
DISP key
Alarm 4 Energized/ De-energized
DISP key
Save settings
DISP key
Returns to the Default Display.
DISP key for 3 sec
Set value lock
DISP key
Filter time constant
DISP key
Sensor correction
DISP key
Input burnout status
DISP key
Indication time
DISP key
Auto/Manual
DISP key
Manual mode auto return time
DISP key
Alarm indication Enabled/Disabled
DISP key
Save settings
DISP key
Returns to the Default Display.
DISP key for 3 sec
Multi-Display A
DISP key
Multi-Display B
DISP key
Save settings
DISP key
Returns to the Default Display.

7.2 Input Setting Mode

Input Group

Selects an input group.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
DC input	SENS	HDW	DC input SENS HDW
Thermocouple input		TCW	
RTD input		PtW	

Input Type

Selects an input type.

Setting Range		Indication		Factory Default
		Multi-Display A	Multi-Display B	
K	-200 to 1370 °C	TCW	K W E	K -200 to 1370 °C TCW K W E
K	-200 to 200 °C *1, *2		K W 2E	
K	0 to 400 °C *1		K W 4E	
J	-200 to 1000 °C		J W E	
J	-200 to 200 °C *1, *2		J W 2E	
J	0 to 400 °C *1		J W 4E	
R	-50 to 1760 °C		R W E	
S	-50 to 1760 °C		S W E	
B	0 to 1820 °C		b W E	
E	-200 to 800 °C		E W E	
T	-200 to 400 °C		t W E	
T	-100 to 100 °C *1		t W 1E	
N	-200 to 1300 °C		N W E	
PL-Ⅱ	0 to 1300 °C		PL2E	
W5Re/W26Re	0 to 2315 °C		W5 W E	
W3Re/W25Re	0 to 2315 °C		W3 W E	
Pt100	-200 to 650 °C	PtW	Pt W E	Pt100 PtW Pt W E
Pt100	-100 to 100 °C *1		Pt W 1E	
JPt100	-200 to 500 °C		JPtE	
JPt100	-100 to 100 °C *1		JPt1E	
4 to 20 mA (Built-in 50 Ω shunt resistor)		HDW	42_A	4 to 20 mA (Built-in 50 Ω shunt resistor) HDW 42_A
4 to 20 mA (Externally mounted 250Ω shunt resistor)			42_W1	
4 to 20 mA (Externally mounted 50 Ω shunt resistor)			42_W2	
0 to 20 mA			020A	
0 to 16 mA			016A	
2 to 10 mA			210A	
0 to 10 mA			010A	

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
1 to 5 mA			
0 to 1 mA			
10 to 50 mA			
0 to 10 mV			
0 to 50 mV			
0 to 60 mV			4 to 20 mA (Built-in 50 Ω shunt resistor)
0 to 100 mV			
0 to 1 V			
0 to 5 V			
1 to 5 V			
-5 to 5 V			
0 to 10 V			
-10 to 10 V			

*1: [No decimal point] or [1 digit after decimal point] can be selected in [Decimal point place].
*2: If [1 digit after decimal point] is selected in [Decimal point place], the input low limit value is -199.9.

Input Unit

Selects an input temperature unit °C or °F.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
°C			°C
°F			

Decimal Point Place

For DC input, decimal point place can be selected.
If the following range is selected in [Input type], then [No decimal point] or [1 digit after decimal point] can be selected.
[K -200 to 200°C], [K 0 to 400°C], [J -200 to 200°C], [J 0 to 400°C],
[T -100 to 100°C], [Pt100 -100 to 100°C], [JPt100 -100 to 100°C]

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
No decimal point			2 digits after decimal point
1 digit after decimal point			
2 digits after decimal point			
3 digits after decimal point			

Indication Value at Input 0%

Sets an indication value at the time of input 0%.
Values change in accordance with the input temperature unit.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Low limit of each input type to [Indication value at input 100%]	SCLL	Set value	4.00 SCLL 0400

Indication Value at Input 100%

Sets an indication value at the time of input 100%.
Values change in accordance with the input temperature unit.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
[Indication value at input 0%] to High limit of each input type	SCLH	Set value	20.00 SCLH 2000

Indication Unit

Selects a unit for indication.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
No unit	UNIT	NONE	No unit UNIT NONE
%		PER	
mA		MA	
V		VOLT	
°C		DEG	

Save Settings

Selects whether the settings are saved (registered) or not.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Save	SAVE	YES	Save SAVE YES
Not save		NO	

7.3 Alarm 1 Setting Mode

Alarm 1 Type

Selects Alarm 1 type.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
No alarm action	AL1F	----	No alarm action AL1F ----
High limit alarm		H	
Low limit alarm		L	
High limit with standby alarm		HSW	
Low limit with standby alarm		LSW	

Alarm 1 Value

Sets Alarm 1 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
[Indication value at input 0%] to [Indication value at input 100%]	[ ]	Set value	[Indication value at input 0%] [ ] 400

Alarm 1 Upper Side Hysteresis

Sets Alarm 1 upper side hysteresis from Alarm 1 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999 (The placement of the decimal point follows the selection)	A1HY	Set value	0.00 A1HY 0.00

Alarm 1 Lower Side Hysteresis

Sets Alarm 1 lower side hysteresis from Alarm 1 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999 (The placement of the decimal point follows the selection)	A1HL	Set value	0.00 A1HL 0.00

Alarm 1 ON Delay Time

Sets delay time when Alarm 1 is ON.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999	A1DY	Set value	0 A1DY 0

Alarm 1 OFF Delay Time

Sets delay time when Alarm 1 is OFF.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999	A1dY	Set value	0 A1dY 0

Alarm 1 Holding/Not Holding

Selects either Holding or Not holding for Alarm 1.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Not Holding	A1SL	NONE	Not Holding A1SL NONE
Holding		HOLd	

Alarm 1 Energized/De-energized

Selects Alarm 1 action Energized/De-energized.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Energized	ALMS	NOML	Energized ALMS NOML
De-energized		REVS	

Save Settings

Selects whether the settings are saved (registered) or not.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Save	SAVE	YES	Save SAVE YES
Not save		NO	

7.4 Alarm 2 Setting Mode

Alarm 2 Type

Selects Alarm 2 type.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
No alarm action			 No alarm action
High limit alarm			
Low limit alarm			
High limit with standby alarm			
Low limit with standby alarm			

Alarm 2 Value

Sets Alarm 2 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
[Indication value at input 0%] to [Indication value at input 100%]		Set value	[Indication value at input 0%] 

Alarm 2 Upper Side Hysteresis

Sets Alarm 2 upper side hysteresis from Alarm 2 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999 (The placement of the decimal point follows the selection)		Set value	0.00 

Alarm 2 Lower Side Hysteresis

Sets Alarm 2 lower side hysteresis from Alarm 2 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999 (The placement of the decimal point follows the selection)		Set value	0.00 

Alarm 2 ON Delay Time

Sets delay time when Alarm 2 is ON.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999		Set value	0 

Alarm 2 OFF Delay Time

Sets delay time when Alarm 2 is OFF.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999	A2DY	Set value	0 A2DY 0

Alarm 2 Holding/Not Holding

Selects either Holding or Not holding for Alarm 2.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Not Holding	A2SL	NONE	Not Holding A2SL NONE
Holding		HOLD	

Alarm 2 Energized/De-energized

Selects Alarm 2 action Energized/De-energized.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Energized	ALMS	NOML	Energized ALMS NOML
De-energized		REVS	

Save Settings

Selects whether the set contents are saved (registered) or not.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Save	SAVE	YES	Save SAVE YES
Not save		NO	

7.5 Alarm 3 Setting Mode

Available only for 4-outputs spec.

Alarm 3 Type

Selects Alarm 3 type.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
No alarm action	AL3F	----	No alarm action AL3F ----
High limit alarm		H	
Low limit alarm		L	
High limit with standby alarm		HW	
Low limit with standby alarm		LW	

Alarm 3 Value

Sets Alarm 3 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
[Indication value at input 0%] to [Indication value at input 100%]	AL3	Set value	[Indication value at input 0%] AL3 400

Alarm 3 Upper Side Hysteresis

Sets Alarm 3 upper side hysteresis from Alarm 3 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999 (The placement of the decimal point follows the selection)	HYU	Set value	0.00 HYU 000

Alarm 3 Lower Side Hysteresis

Sets Alarm 3 lower side hysteresis from Alarm 3 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999 (The placement of the decimal point follows the selection)	HYL	Set value	0.00 HYL 000

Alarm 3 ON Delay Time

Sets delay time when Alarm 3 is ON.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999	ONDY	Set value	0 ONDY 0

Alarm 3 OFF Delay Time

Sets delay time when Alarm 3 is OFF.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999		Set value	0 

Alarm 3 Holding/Not Holding

Selects either Holding or Not holding for Alarm 3.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Not Holding			Not Holding 
Holding			

Alarm 3 Energized/De-energized

Selects Alarm 3 action Energized/De-energized.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Energized			Energized 
De-energized			

Save Settings

Selects whether the set contents are saved (registered) or not.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Save			Save 
Not save			

7.6 Alarm 4 Setting Mode

Available only for 4-outputs spec.

Alarm 4 Type

Selects Alarm 4 type.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
No alarm action	AL4F	-----	No alarm action AL4F -----
High limit alarm		H	
Low limit alarm		L	
High limit with standby alarm		HW	
Low limit with standby alarm		LW	

Alarm 4 Value

Sets Alarm 4 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
[Indication value at input 0%] to [Indication value at input 100%]	AL4	Set value	[Indication value at input 0%] AL4 0400

Alarm 4 Upper Side Hysteresis

Sets Alarm 4 upper side hysteresis from Alarm 4 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999 (The placement of the decimal point follows the selection)	HYU	Set value	0.00 HYU 0.00

Alarm 4 Lower Side Hysteresis

Sets Alarm 4 lower side hysteresis from Alarm 4 value.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999 (The placement of the decimal point follows the selection)	HYL	Set value	0.00 HYL 0.00

Alarm 4 ON Delay Time

Sets delay time when Alarm 4 is OFF.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999	ONDY	Set value	0 ONDY 0

Alarm 4 OFF Delay Time

Sets delay time when Alarm 4 is OFF.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 9999		Set value	0 

Alarm 4 Holding/Not Holding

Selects either Holding or Not holding for Alarm 4.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Not Holding			Not Holding 
Holding			

Alarm 4 Energized/De-energized

Selects Alarm 4 action Energized/De-energized.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Energized			Energized 
De-energized			

Save Settings

Selects whether the set contents are saved (registered) or not.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Save			Save 
Not save			

7.7 Instrument Setting Mode

Set Value Lock

Unlock, Lock 1, Lock 2 can be selected for the set values.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Unlock	LOCK	NONE	Unlock LOCK NONE
Lock 1 *1		LOC1	
Lock 2 *2		LOC2	

*1: Locks all set values.
*2: Locks all set values except alarm value.

Filter Time Constant

Sets input filter time constant.
Input fluctuation due to noise can be decreased.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0.0 to 10.0 sec	FILE	Set value	0.0 sec FILE 0.0

Sensor Correction

Sets sensor correction value.
Input value = Current input value + (Sensor correction value)

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
-1000 to 1000 *	SOFS	Set value	0.00 SOFS 0.00

* The placement of the decimal point follows the selection.

Input Burnout Status

Selects either overscale or underscale if input is burnt out.
Available only when thermocouple or RTD is selected in [Input type].

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Overscale	BURN	UP	Overscale BURN UP
Underscale		DOWN	

Indication Time

Sets duration from no operation until indication (of Multi-Display A, Multi-Display B, and each action indicator) turns off.

They remain lit during a setting mode, active alarm action, input errors, input burnout or input disconnection.

When the value is set to 00.00, they remain lit.

After indication time has elapsed, and if any key is pressed while they are unlit, they will light up again.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
00 : 00 to 60 : 00 (Minutes : Seconds) 00 : 00 ..... Continuous 00 : 01 to 60 : 00..... Indication time	LIME	Set value	30 : 00 (Minutes : Seconds) LIME 3000

Auto/Manual

If AUTO is selected, the alarm will be output corresponding to the alarm value.

When MANUAL is selected, the unit enters Manual mode. Any alarm (from Alarm 1 to Alarm 4 output) selected in Manual mode will be output.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Auto	MARS	AUTO	Manual MARS MANU
Manual		MANU	

Manual Mode Auto Return Time

Sets duration from manual mode until the unit automatically returns to Default Display.

If set to 0 (zero), automatic return will not occur.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
0 to 60 minutes	MORE	Set value	30 minutes MORE 0030

Alarm Indication Enabled/Disabled

In any display mode except All unlit display mode, when any alarm is active, alarm (from ALM1 to ALM4) indication Enabled/Disabled can be selected.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Disabled	ALOS	NONE	Disabled ALOS NONE
Enabled		DISP	

Save Settings

Selects whether the set contents are saved (registered) or not.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Save	SAVE	YES	Save SAVE YES
Not save		NO	

7.8 Custom Display Setting Mode

Customizes characters to be indicated on the Multi-Display A and B (*).
Use alphanumeric characters and symbols.

(e.g.) FLOW, TEMP, No.1, No.2

(*) Number of characters which can be indicated differs depending on the display mode. Refer to Section '5. Display Mode'.

- If Custom display mode 1 is selected:
  Up to 8 characters can be displayed in total for both Multi-Display A and B.
- If Custom display mode 2 is selected:
  Up to 4 characters can be displayed on the Multi-Display B.

Can be set from the thousands digit of the display.
Digits can be selected with the SET key.

Multi-Display A

Characters for the Multi-Display A can be customized.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
A - Z, 0 - 9, /, –, . , (Blank)		Set value	AAAA 

Multi-Display B

Characters for the Multi-Display B can be customized.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
A - Z, 0 - 9, /, –, . , (Blank)		Set value	AAAA 

Save Settings

Selects whether the set contents are saved (registered) or not.

Setting Range	Indication		Factory Default
	Multi-Display A	Multi-Display B	
Save			Save 
Not save			

7.9 Manual Mode

If MANUAL is selected in [Auto/Manual] in Instrument setting mode, and if ON is selected in [Alarm 1 output] to [Alarm 4 output], then the alarm output will be activated.
By using the DISP key, each alarm output can be selected.
Only when MANUAL is selected in [Auto/Manual] in Instrument setting mode, the unit can enter Manual mode.

① Press the DOWN key for 3 seconds in Default Display. The unit enters Manual mode. [Alarm 1 output] (A1ON) appears.
② ON/OFF can be switched by the UP or DOWN key.
③ Press the DISP key to enter [Alarm 2 output] (A2ON).
④ ON/OFF can be switched by the UP or DOWN key.
⑤ Press the DISP key to enter [Alarm 3 output] (A3ON).
⑥ ON/OFF can be switched by the UP or DOWN key.
⑦ Press the DISP key to enter [Alarm 4 output] (A4ON).
⑧ ON/OFF can be switched by the UP or DOWN key.
⑨ Press the DISP key to return to Default Display.
The unit returns to Default Display by pressing the SET key, or after Manual mode auto return time has elapsed.

8. Operation

8.1 Indication after power is turned ON

After the power is turned ON, the unit enters warm-up status for approx. 3 seconds.
Multi-Display A indicates a model name, and Multi-Display B indicates the Input and Output code.

(e.g.) SGAU-K02A-0-0
Multi-Display A: SGAU
Multi-Display B: K02A

8.2 Alarm 1 to Alarm 4 Value Setting

Sets Alarm 1 value to Alarm 4 value.

8.2.1 Basic Operation for Setting Alarm 1 to Alarm 4 Value

Alarm 1 value to Alarm 4 value can be set in Simple setting mode.
These setting items are the same as those in Alarm 1 to Alarm 4 setting mode.
To enter Simple setting mode, follow the procedure below.

(e.g.) Any alarm type (except No alarm action) is selected in [Alarm 1 type] to [Alarm 4 type].
Default Display is RUN display mode 1.

① Press the DISP key.
The unit enters RUN display mode 2.
Multi-Display A indicates an input value, and Multi-Display B indicates Alarm 1 value.
② Press the SET key.
The unit enters Simple setting mode.
Multi-Display A indicates [------], and Multi-Display B flashes Alarm 1 value.
③ Set the alarm value with the SHIFT, UP, or DOWN key, and press the DISP key.
Alarm 1 value will be saved (registered), and the unit moves to [Alarm 2 value].
④ Set Alarm 2 to Alarm 4 value in the same manner.
⑤ Press the DISP key at [Alarm 4 value].
The unit reverts to RUN display mode 2.

8.2.2 Alarm 1 to Alarm 4 Value

Alarm 1 to Alarm 4 value are shown below.
Refer to the following to set alarm values.

Indication		Setting Item, Function, Setting Range
Multi-Display A	**Multi-Display B**	
[------]	Alarm 1 value flashes.	**Alarm 1 value** Sets Alarm 1 value. Setting Range: [Indication value at input 0%] to [Indication value at input 100%]
AL2	Alarm 2 value flashes.	**Alarm 2 value** Sets Alarm 2 value. Setting Range: [Indication value at input 0%] to [Indication value at input 100%]
AL3	Alarm 3 value flashes.	**Alarm 3 value** Sets Alarm 3 value. Setting Range: [Indication value at input 0%] to [Indication value at input 100%]
AL4	Alarm 4 value flashes.	**Alarm 4 value** Sets Alarm 4 value. Setting Range: [Indication value at input 0%] to [Indication value at input 100%]

8.3 Operation

8.3.1 Alarm Output Indication

Alarm output indication differs depending on display mode.

Refer to '5. Display Mode'.

When ENABLED is selected in [Alarm indication Enabled/Disabled], the following characters are displayed when each alarm output is ON.

Indication		Setting Item, Function, Setting Range
Multi-Display A	Multi-Display B	
	Follows the display mode.	Alarm 1 output ON
	Follows the display mode.	Alarm 2 output ON
	Follows the display mode.	Alarm 3 output ON
	Follows the display mode.	Alarm 4 output ON

When multiple alarms are ON, the smallest alarm number will be displayed.

8.3.2 Input Indication Range

The input value is displayed within the following range:

[Indication value at input 0% – (Indication value at input 100% – Indication value at input 0%) x 10%]
to
[Indication value at input 100% + (Indication value at input 100% – Indication value at input 0%) x 10%]

For a value lower than (and including) -2000, the minus (-) sign and the input value light up alternately.

For a value higher than (and including) 10000, the lower 4 digits flash.

(The placement of the decimal point follows the selection.)

When the input value exceeds the indication range:  flashes.

When the input value drops below the indication range:  flashes.

8.3.3 Input Burnout or Disconnection

If thermocouple or RTD input is burnt out, overscale or underscale can be selected.

If overscale is selected, the output is forcibly limited to 110%.

If underscale is selected, the output is forcibly limited to 0%.

If overscale is selected and input is burnt out, the Alarm indicator lights up, and  flashes as an input value.

If underscale is selected and input is burnt out, the Alarm indicator lights up, and  flashes as an input value.

For direct current or DC voltage input, if its input is disconnected, the input status will be different depending on the input type.

Input Range	Input Status
4 to 20 mA (Built-in 50 Ω shunt resistor)	Equals 0 mA input.
4 to 20 mA (Externally mounted 250 Ω shunt resistor)	Equals 0 mA input.
4 to 20 mA (Externally mounted 50 Ω shunt resistor)	Equals 0 mA input. *1
0 to 20 mA	Equals 0 mA input.
0 to 16 mA	Equals 0 mA input. *1
2 to 10 mA	Equals 0 mA input.
0 to 10 mA	Equals 0 mA input. *1
1 to 5 mA	Equals 0 mA input. *1
0 to 1 mA	Equals 0 mA input. *1
10 to 50 mA	Equals 0 mA input. *1
0 to 10 mV	Overscale *2
0 to 50 mV	Overscale *2
0 to 60 mV	Overscale *2
0 to 100 mV	Overscale *2
0 to 1 V	Overscale *2
0 to 5 V	Equals 0 V input.
1 to 5 V	Equals 0 V input.
-5 to 5 V	Equals 0 V input.
0 to 10 V	Equals 0 V input.
-10 to 10 V	Equals 0 V input.

*1: Will be overscale in case of shunt resistor disconnection.

*2: If the indication becomes overscale, the Alarm indicator lights up, and  flashes as an input value.

8.3.4 Indication Time Setting

After preset indication time has elapsed, Multi-Display A, Multi-Display B and each action indicator are turned OFF.

They will light up again if any alarm is activated, or if any key is pressed.

They remain lit during a setting mode, when an alarm action is ON, or if input errors, input burnout or input disconnection occurs.

If the indication time is set to 00:00, they will remain lit.

9. Specifications

Input Specifications

Thermocouple input

K, J, R, S, B, E, T, N, PL-Ⅱ, W5Re/W26Re, W3Re/W25Re
External resistance: 100 Ω max. (For thermocouple B: 40 Ω or less)
Input:

Thermocouple	Input Range *1	Indication Resolution
K	-200 to 1370°C (-328 to 2498°F)	1°C (1°F)
	-200 to 200°C *2, *3 (-328 to 392°F) *2, *3	1°C (1°F) *2
	0 to 400°C *2 (32 to 752°F) *2	1°C (1°F) *2
J	-200 to 1000°C (-328 to 1832°F)	1°C (1°F)
	-200 to 200°C *2, *3 (-328 to 392°F) *2, *3	1°C (1°F) *2
	0 to 400°C *2 (32 to 752°F) *2	1°C (1°F) *2
R	-50 to 1760°C (-58 to 3200°F)	1°C (1°F)
S	-50 to 1760°C (-58 to 3200°F)	1°C (1°F)
B	0 to 1820°C (32 to 3308°F)	1°C (1°F)
E	-200 to 800°C (-328 to 1472°F)	1°C (1°F)
T	-200 to 400°C (-328 to 752°F)	1°C (1°F)
	-100 to 100°C *2 (-148 to 212°F) *2	1°C (1°F) *2
N	-200 to 1300°C (-328 to 2372°F)	1°C (1°F)
PL-Ⅱ	0 to 1390°C (32 to 2534°F)	1°C (1°F)
W5Re/W26Re	0 to 2315°C (32 to 4199°F)	1°C (1°F)
W3Re/W25Re	0 to 2315°C (32 to 4199°F)	1°C (1°F)

*1: °C/ °F can be selected in [Input unit].
*2: [No decimal point] and [1 digit after decimal point] can be selected in [Decimal point place].
*3: If [1 digit after decimal point] is selected, the low limit value will be -199.9.

RTD input

Pt100, JPt100
3-wire type
Input detection current: Approx. 200 μA
Allowable lead wire resistance: 200 Ω max. per wire
Input:

RTD	Input Range *1	Indication Resolution
Pt100	-200 to 650°C (-328 to 1202°F)	1°C (1°F)
	-100 to 100°C *2 (-148 to 212°F) *2	1°C (1°F) *2
JPt100	-200 to 500°C (-328 to 932°F)	1°C (1°F)
	-100 to 100°C *2 (-148 to 212°F) *2	1°C (1°F) *2

*1: °C/ °F can be selected in [Input unit].
*2: [No decimal point] and [1 digit after decimal point] can be selected in [Decimal point place].

Direct current input

Input Range	Shunt Resistor	Indication Resolution
4 to 20 mA DC	50 Ω *	1
	250 Ω	1
	50 Ω	1
0 to 20 mA DC	250 Ω	1
0 to 16 mA DC	62.5 Ω	1
2 to 10 mA DC	250 Ω	1
0 to 10 mA DC	100 Ω	1
1 to 5 mA DC	100 Ω	1
0 to 1 mA DC	1000 Ω	1
10 to 50 mA DC	10 Ω	1

* Built-in shunt resistor

DC voltage input

Input Range	Input Resistance	Indication Resolution
0 to 10 mV	1 MΩ	1
0 to 50 mV		1
0 to 60 mV		1
0 to 100 mV		1
0 to 1 V		1
0 to 5 V		1
1 to 5 V		1
-5 to 5 V		1
0 to 10 V		1
-10 to 10 V		1

Output 1, Output 2 Specifications

Relay contact	1a or 1b
Control capacity	3 A 250 V AC (Resistive load) 1 A 250 V AC (Inductive load cos ϕ=0.4) Electrical life: 100,000 cycles Minimum applicable load: 10 mA 5 V DC

Performance

Base accuracy (at 25°C)	±0.1% of each input span Thermocouple input: When input is 0°C or less: Base accuracy + (±0.1% of each input span) For the input with a decimal point: Base accuracy + (±0.05% of each input span) Thermocouple R, S input 0 to 200°C (32 to 392°F): ±0.3% of each input span Thermocouple B input: 0 to 300°C (32 to 572°F): Accuracy is not guaranteed.
Cold junction compensation accuracy	±0.5°C (1.0°F) at 20±10°C
Temperature coefficient	±0.015 %/°C
Effect of allowable lead wire resistance	RTD input: Less than 20 Ω per wire: Base accuracy 20 Ω or more per wire: Base accuracy + 0.005 %/Ω
Response time	500 ms max. (0→90%)
Indication update cycle	125 ms
Indication accuracy	±0.1% of each input span±1 digit

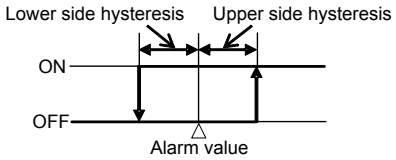
General Structure

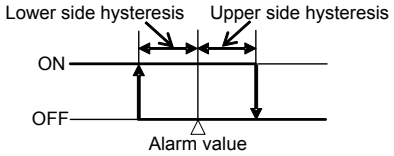
Dimensions	22.5 x 89 x 70 mm (W x H x D)
Weight	2-outputs: Approx. 88 g (Excluding socket) 4-outputs: Approx. 96.2 g (Excluding socket)
Mounting method	DIN rail
Case	Flame-resistant resin, Color: Black
Front panel	Polycarbonate

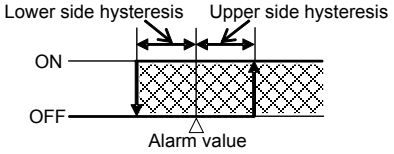
Installation Specifications

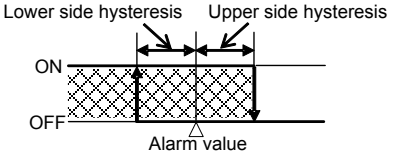
Power supply	100 to 240 V AC 50/60 Hz
Allowable voltage range	85 to 264 V AC
Power consumption	2-outputs: Approx. 8 VA max. 4-outputs: Approx. 10 VA max.
Ambient temperature	-10 to 55°C (Non-condensing, no icing)
Ambient humidity	35 to 85 %RH (Non-condensing)

Standard Function

<table>
<tr><td>Power failure countermeasure</td><td>The setting data is backed up in the non-volatile IC memory.</td></tr>
<tr><td>Self-diagnosis</td><td>The CPU is monitored by a watchdog timer, and if an abnormal status occurs, the unit is switched to warm-up status, turning all outputs OFF.</td></tr>
<tr><td>Alarm 1 type
Alarm 2 type
Alarm 3 type
Alarm 4 type</td><td>High limit alarm, Low limit alarm, High limit with standby alarm, Low limit with standby alarm, No alarm action can be selected.
(Factory default: No alarm action)
If High limit alarm is selected in [Alarm 1 type], and Energized is selected in [Alarm 1 Energized/De-energized], alarm output will be turned ON when input exceeds Alarm 1 value.
If De-energized is selected in [Alarm 1 Energized/De-energized], alarm output will be turned OFF.
<table>
<tr><th></th><th></th><th>Energized</th><th>De-energized</th></tr>
<tr><td rowspan="2">a contact</td><td>Alarm indicator</td><td>Lights</td><td>Lights</td></tr>
<tr><td>Alarm 1 output</td><td>ON</td><td>OFF</td></tr>
<tr><td rowspan="2">b contact</td><td>Alarm indicator</td><td>Lights</td><td>Lights</td></tr>
<tr><td>Alarm 1 output</td><td>OFF</td><td>ON</td></tr>
</table>
• High limit alarm
 

• Low limit alarm
 

• High limit with standby alarm
 

• Low limit with standby alarm
 

Setting accuracy: Same as Base accuracy
Output action: ON/OFF action</td></tr>
<tr><td>Set value lock</td><td>Lock 1: None of the set values can be changed.
Lock 2: Only alarm value can be changed. The others cannot be changed.</td></tr>
</table>

Automatic cold junction temperature compensation	When thermocouple input is selected, 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°C (32°F). If the cold junction connected to terminals is burnt out, the Multi-Display A indicates E.ER, and the Multi-Display B is turned OFF. At this time, the instrument status follows the selection in [Input burnout status]. (Either overscale or underscale selected in [Input burnout status] will be indicated.)

10. Troubleshooting

10.1 Indication

Problem	Possible Cause	Solution
Multi-Display A or B flashes ---- or ++++ when it indicates an input value.	The sensor may be burnt out or disconnected.	Replace with a new sensor.
	Check whether the sensor is securely mounted to the input terminals of this instrument.	Connect the sensor terminals to the instrument input terminals securely.
	Check the input signal source.	Ensure that the input signal source works normally.
	Check if polarity of thermocouple or compensating lead wire is correct. Check whether codes (A, B, B) of RTD agree with the instrument terminals.	Wire them correctly.
Multi-Display A or B is irregular or unstable when it indicates an input value.	Check whether sensor input or unit (°C or °F) is correct.	Select the same sensor type and unit (°C/°F) as those of currently used sensor.
	Sensor correction value is unsuitable.	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 instrument.	Keep the instrument clear of any potentially disruptive equipment.
Displays and indicators are unlit. If any key is pressed, they will light up.	The Indication Time (p.34) is set to any value other than 00 : 00. (Factory default is 30 : 00.)	To indicate continuously, set the Indication Time (p.34) to “00 : 00”.

10.2 Key Operation

Problem	Possible Cause	Solution
If the DISP key is pressed, Multi-Display A shows LOCK, and the display mode cannot be switched.	The DISP key is in locked status.	Press the DISP key for approx. 3 seconds to release the key lock.

10.3 Operation

Problem	Possible Cause	Solution
When Multi-Display A or B indicates an input value, the 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 of the instrument.
	Check whether the wiring of input and output are correct.	Wire them correctly.
No alarm output	Check whether Alarm 1 to Alarm 4 value are suitable. (p.37)	Set them to suitable values.

11. Character Table

Please use the following factory default values for your reference.

Display Mode

Setting Item	Multi-Display A	Multi-Display B	Data
Default Display mode	Follows currently indicated display mode.		
RUN display mode 1	Input value	Unlit	
RUN display mode 2	Input value	Alarm 1 value	
RUN display mode 3	Input value	Alarm 2 value	
RUN display mode 4 *	Input value	Alarm 3 value	
RUN display mode 5 *	Input value	Alarm 4 value	
RUN display mode 6	Alarm 1 value	Alarm 2 value	
RUN display mode 7 *	Alarm 3 value	Alarm 4 value	
Custom display mode 1	AAAA	AAAA	
Custom display mode 2	Input value	AAAA	
Unlit display mode	Unlit	Unlit	
All unlit display mode	Unlit	Unlit	
Model display mode	Model	Input, Output code	

* Available only for 4-outputs spec.

Setting Mode

Setting Item	Multi-Display A	Multi-Display B	Data
Input setting mode	INN	Unlit	
Alarm 1 setting mode	ALM1	Unlit	
Alarm 2 setting mode	ALM2	Unlit	
Alarm 3 setting mode *	ALM3	Unlit	
Alarm 4 setting mode *	ALM4	Unlit	
Instrument setting mode	ANE	Unlit	
Custom display setting mode	CUSE	Unlit	

* Available only for 4-outputs spec.

Input Setting Mode

Setting Item		Multi-Display A	Multi-Display B	Data
Input group		SENS	HO	
Input type *	DC input	DC	4-2LA	
	Thermocouple input	TC	K	
	RTD input	Pt	Pt	
Input unit		CFSL		
Decimal point place		DP	0000	
Indication value at input 0%		SCLL	0400	
Indication value at input 100%		SCLH	2000	
Indication unit		UNIT	NONE	
Save settings		SAVE	YES	

* Indication differs depending on the selection in [Input group].

Alarm 1 Setting Mode

Setting Item	Multi-Display A	Multi-Display B	Data
Alarm 1 type	AL1F	----	
Alarm 1 value		400	
Alarm 1 upper side hysteresis	HY1U	000	
Alarm 1 lower side hysteresis	HY1L	000	
Alarm 1 ON delay time	ON1Y	0	
Alarm 1 OFF delay time	OF1Y	0	
Alarm 1 Holding/Not Holding	HOL1	NONE	
Alarm 1 Energized/De-energized	AL1M	NORM	
Save settings	SAVE	YES	

Alarm 2 Setting Mode

Setting Item	Multi-Display A	Multi-Display B	Data
Alarm 2 type	AL2F	----	
Alarm 2 value	AL2	400	
Alarm 2 upper side hysteresis	HY2U	000	
Alarm 2 lower side hysteresis	HY2L	000	
Alarm 2 ON delay time	ON2Y	0	
Alarm 2 OFF delay time	OF2Y	0	
Alarm 2 Holding/Not Holding	HOL2	NONE	
Alarm 2 Energized/De-energized	AL2M	NORM	
Save settings	SAVE	YES	

Alarm 3 Setting Mode (Available only for 4-outputs spec)

Setting Item	Multi-Display A	Multi-Display B	Data
Alarm 3 type	AL3F	----	
Alarm 3 value	AL3	400	
Alarm 3 upper side hysteresis	HY3U	000	
Alarm 3 lower side hysteresis	HY3L	000	
Alarm 3 ON delay time	ON3Y	0	
Alarm 3 OFF delay time	OF3Y	0	
Alarm 3 Holding/Not Holding	HOL3	NONE	
Alarm 3 Energized/De-energized	AL3M	NORM	
Save settings	SAVE	YES	

Alarm 4 Setting Mode (Available only for 4-outputs spec)

Setting Item	Multi-Display A	Multi-Display B	Data
Alarm 4 type	AL4F	----	
Alarm 4 value	AL4	400	
Alarm 4 upper side hysteresis	HY4U	000	
Alarm 4 lower side hysteresis	HY4L	000	
Alarm 4 ON delay time	ON4Y	0	
Alarm 4 OFF delay time	OF4Y	0	
Alarm 4 Holding/Not Holding	HOL4	NONE	
Alarm 4 Energized/De-energized	AL4M	NORM	
Save settings	SAVE	YES	

Instrument Setting Mode

Setting Item	Multi-Display A	Multi-Display B	Data
Set value lock	LOCK	NONE	
Filter time constant	FILT	00	
Sensor correction	SCRS	000	
Input burnout status	BURN	UP	
Indication time	TIME	3000	
Auto/Manual	MANS	MANU	
Manual mode auto return time	MRET	30	
Alarm indication Enabled/Disabled	ALDS	NONE	
Save settings	SAVE	YES	

Custom Display Setting Mode

Setting Item	Multi-Display A	Multi-Display B	Data
Multi-Display A	DSPA	PPPP	
Multi-Display B	DSPB	PPPP	
Save settings	SAVE	YES	

Manual Mode

Setting Item	Multi-Display A	Multi-Display B	Data
Alarm 1 output	A1ON	OFF	
Alarm 2 output	A2ON	OFF	
Alarm 3 output	A3ON	OFF	
Alarm 4 output	A4ON	OFF	

***** Inquiries *****

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

[Example]

- Model ---------- SGAU-K02A-0-0
- Serial number ---------- No. 154F05000

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

SHINKO TECHNOS CO., LTD.

OVERSEAS DIVISION

Head Office: 2-5-1, Senbahigashi, Minoo, Osaka, Japan

URL: http://www.shinko-technos.co.jp/e/ Tel : +81-72-727-6100

E-mail: overseas@shinko-technos.co.jp Fax: +81-72-727-7006

No. SGAU11E3 2019.06