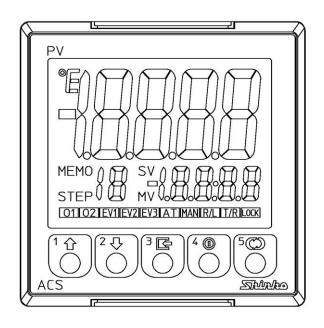
ACS2 INSTRUCTION MANUAL





Preface

Thank you for purchasing our digital indicating controller ACS2. This manual contains instructions for the mounting, functions, operations and notes when operating the BCx2. To prevent accidents arising from the misuse of this controller, please ensure the operator receives this manual.

Abbreviations used in this manual

Abbreviation	Term
PV	Process variable
SV	Desired value
MV	Manipulated variable
DV	Deviation
OUT1	Control output OUT1
OUT2	Control output OUT2
AT	Auto-tuning

Characters used in this manual

Indication	⊣	<i>D</i>	1	2	3	4	5	5	7	8	3	Ε	F
Number, ೕ/್	-1	0	1	2	3	4	5	6	7	8	9	ပ့	F
Indication	Ħ	Ь	Ĺ	ជ	Ε	F	E.	Н	1	J	E	L	ìς
Alphabet	Α	В	O	О	Е	F	G	Н		っ	K	L	М
Indication	Ç	0	P	9	,-	7	Γ	IJ	B	ני	1.0	IJ	111
Alphabet	N	0	Р	Q	R	S	Т	U	V	W	Х	Υ	Z

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 through a control panel indoors. If it is not, measures must be taken to ensure that the operator cannot 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 \triangle Caution may result in serious consequences, so be sure to follow the directions for usage.



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



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 protective 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.

Warning on Model Label



Caution

Failure to handle this instrument properly may result in minor or moderate injury or property damage due to fire, malfunction, malfunction, or electric shock. Please read this manual before using the product to ensure that you fully understand the product.



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.

Precautions for Use

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 -10 to 55°c (14 to 131°F) that does not change rapidly, and no icing
- An ambient non-condensing humidity of 35 to 85 %RH
- No large capacity electromagnetic switches or cables through which large current is flowing
- No water, oil or chemicals or where the vapors of these substances can come into direct contact with
- Please note that the ambient temperature of this unit not the ambient temperature of the control panel must not exceed 55°c (131°F) if mounted through the face of a control panel, otherwise the life of electronic components (especially electrolytic capacitors) may be shortened.

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

2. Wiring Precautions



Caution

- Do not leave wire remnants in the instrument, as they could cause a fire or malfunction.
- Use the solderless terminal with an insulation sleeve in which the M3 screw fits when wiring the instrument.
- The terminal block of this instrument is designed to be wired from the left side. The lead wire must be inserted from the left side of the terminal, and fastened with the terminal screw.
- Tighten the terminal screw using the specified torque. If excessive force is applied to the screw when tightening, the terminal screw or case may be damaged.
- Do not pull or bend the lead wire on the terminal side when wiring or after wiring, as it could cause malfunction.
- When using a terminal cover for the BCS2, pass terminal wires numbered 7 to 12 into the holes of the terminal cover.
- 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 controller. (Recommended fuse: Time-lag fuse, rated voltage 250 V AC, rated current 2 A)
- For a 24 V AC/DC power source, do not confuse polarity when using direct current (DC).
- 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 and compensating lead wire according to the sensor input specifications of this controller.
- Use the 3-wire RTD according to the sensor input specifications of this controller.
- For DC voltage input, (+) side input terminal number of 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC differs from that of 0 to 1 V DC.
 - For the input terminal number, the (+) side for 0 to 5 V DC, 1 to 5 V DC, and 0 to 10 V DC is (9), and the (+) side for 0 to 1 V DC is (10).
- When using a relay contact output type, externally use a relay according to the capacity of the load to protect the built-in relay contact.
- When wiring, keep input wires (thermocouple, RTD, etc.) away from controller AC power sources or load wires.

3. Operation and Maintenance Precautions



Caution

- It is recommended that AT be performed on the trial run.
- Do not touch live terminals. This may cause 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.

4. Compliance with Safety Standards



Caution

- Always install the recommended fuse described in this manual externally.
- If the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.
- Use a device with reinforced insulation or double insulation for the external circuit connected to this product.

Contents

1.	Model	
1.1	Model	8
1.2	How to Read the Model Label	9
2.	Names and Functions of Controller	
3.	Mounting to the Control Panel	
3.1	-	
3.2	· · · · · · · · · · · · · · · · · · ·	
3.3		
3.4	·	
	3.4.1 How to Mount the Unit	
_	3.4.2 How to Remove the Mounting Frame and Unit	
4.	Wiring	
4.1	Terminal Arrangement	16
4.2		
4.3		
4.4		
	4.4.1 Power Supply	
	1.4.2 Control Output OUT1, OUT2	
4	1.4.3 Input	
4	1.4.4 Event Output 1, Event Output 2, Event Output 3	19
4	1.4.5 Insulated Power Output	
	1.4.6 CT Input	
	1.4.7 Serial Communication	
	4.4.8 Event Input	
	4.4.10 Transmission Output	
5.	Outline of Key Operation and Each Mode	
5.1	• •	
5.2	• •	
5.2		
6.	Initial Setting	
	-	
6.1		
6.2		
6.3	<u> </u>	
	5.3.1 Input Setting Group	
	5.3.2 EVT Input Setting Group	
	5.3.4 Transmission Output Setting Group	
	6.3.5 External Setting Input Setting Group	
	5.3.6 Main Setting Group	
7.	Settings	
7.1	Main Setting Group	57
7.2	Program Settings Group	59

7.3	AT Settings Group	62
7.4	PID Settings Group	64
7.5	Alarm Setting Group	68
7.6	Input Setting Group	71
7.7	Output Setting Group	76
7.8	EVT Input Setting Group	80
7.9	EVT Output Setting Group	83
7.10	Communication Setting Group	90
7.11	Transmission Output Setting Group	92
7.12	External Setting Input Setting Group	93
7.13	Control Function Setting Group	94
7.14	Program Function Setting Group	96
7.15	Wait Setting Group	98
7.16	Other Setting Group	100
7.17	Maintenance Group	105
8. (Operation and Settings of Standard Functions	107
8.1	Selecting an input type	107
8.2	Selecting Fast-PID Control	108
8.3	Selecting Direct/Reverse Action	110
8.4	Performing Fixed Value Control	111
8.5	Setting PID Constants (by Performing AT)	112
8.6	Performing Program Control	117
8.7	Event Output EV□ Allocation	129
8.8	Indicating MV, Remaining Time (Program Control)	131
8.9	Items to be Initialized by Changing Settings	132
9. <i>A</i>	Attached Function	134
9.1	Input Value Correction	134
9.2	Set Value Lock	136
9.3	Control Output OFF Function	137
9.4	Switching Auto/Manual Control (Auto/Manual Control Function)	138
9.5	Data Clear and Program Clear	140
10. <i>A</i>	Action Explanation	141
10.1	OUT1 Action	141
10.2	OUT1 ON/OFF Action	142
10.3	Heater Burnout Alarm Action	143
10.4	Alarm Action	144
10.5	OUT2 (Heating/Cooling Control) Action	146
10.6	OUT2 (Heating/Cooling Control) Action (When Setting Dead Band)	146
10.7	OUT2 (Heating/Cooling Control) Action (When Setting Overlap Band)	148
11.	Specifications	149
11.1	Standard Specifications	149
11 2	Ontional Specifications	164

12.	Troub	oleshooting	168
12.1	Ind	ication	168
12.2	Key	y Operation	170
12.3	Coi	ntrol	171
13.	Chara	acter Table	172
13.1	Dis	play Mode	172
13	3.1.1	PV/SV Display Mode	172
		MV Display Mode	
13	3.1.3	Remaining Time Display Mode	172
13.2	Set	ttings	173
13	3.2.1	Manual Control Mode	173
13	3.2.2	SV Setting (Direct Setting for Fix Value Control)	174
13	3.2.3	Setting Group	175
14.	Key C	Operation Flowchart	199

1. Model

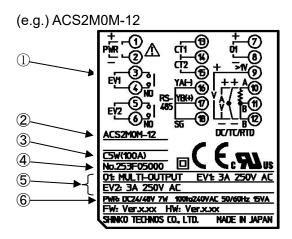
1.1 Model

ACS2						Series name: ACS2 (W48×H48×D68 m	nm)				
	R(*5)					Relay contact: 1a					
						Non-contact voltage (for SSR drive) 12 \	/ DC±15%				
	M(*1)					Direct current: 4 to 20mA DC					
Control						Direct current: 0 to 20mA DC					
output	V					DC voltage: 0 to 1V					
output	1					DC voltage: 0 to 5V					
	2					DC voltage: 1 to 5V					
	3 C					DC voltage: 0 to 10V					
	С					Open collector					
Power sup	ply	0				100 to 240V AC, 24V DC, 48V DC					
voltage			М			Multi rango					
Input			IVI	0		Multi-range No options					
				1		Event output EV2 (*1)	EV2				
Option ①				2		Event output EV3 (*2)	EV3				
Option (i)				3		Heating/Cooling control O2(SSR/A) (*4)	O2(SSR/A)				
				4		Insulated power output (*6)	P24				
				4	0	No options	FZ4				
					1	Serial communication + Heater burnout alarm (20A)	C5W(20A)				
					2	Serial communication + Heater burnout alarm (100A)	C5W(100A)				
					3	Heater burnout alarm (20A) (*3)	W(20A)				
Option ②					4	Heater burnout alarm (100A) (*3)	W(100A)				
'					5	Transmission output (4-20mA) (*3)	TA				
					6	Transmission output (0-1V) (*3)	TV				
					7	Transmission output (0-10V) (*3)	TV				
					8	External setting input (*3)	EA				
					9	Serial communication (*3)	C5				
					Α	Event input 4 points	El				

- (*1): When OUT1 is selected in [Event 2 allocation selection], the output becomes multi-output and SSR output, current output, and relay output can be selected.
- (*2): Event output 3 points is common.
- (*3): Options other than C5W and EI will simultaneously add Event input 2 points.
- (*4): When O2 is selected, the output of cooling side can be selected SSR output and current output. However, cooling output of relay output is not possible.When cooling output is desired for relay output, it can be used by selecting OUT2 in [Event 2 allocation selection].
- (*5): To use the heating side as a relay output in heating/cooling control, select R.
- (*6): To use the insulated power output for relay output, select R.

1.2 How to Read the Model Label

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

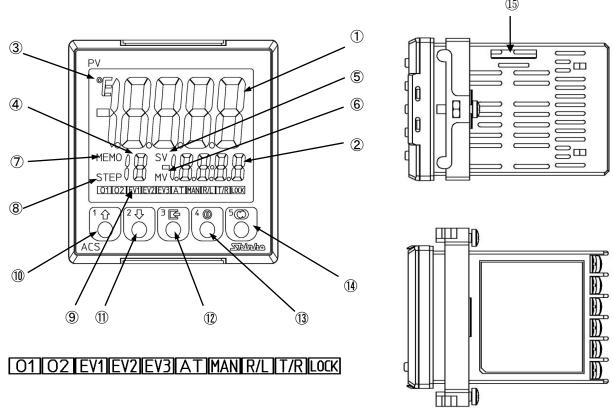


(Fig. 1.2-1)

No.	Description	Example
1	Terminal arrangement	ACS2M0M-12 (*1)
2	Model	ACS2M0M-12
3	Option	C5W(100A) [Serial communication + Heater burnout
		alarm (100 A)] (*2)
4	Serial number	No. 253F05000
5	Control output,	O1: MULTI-OUTPUT (Control output OUT1)
	Event output	EV1: 3 A 250 V AC(Event output EV1)
		EV2: 3 A 250 V AC(Event output EV2)
6	Power supply voltage,	DC 24V/48V 7W, 100 to 240 V AC 50/60Hz 15 VA
	Power consumption	

- (*1): Terminal arrangement diagram differs depending on the model.
- (*2): For Heater burnout alarm output (C5W, EIW, W options), CT rated current is entered in bracket ().

2. Names and Functions of Controller



(Fig. 2-1)

Display

No.	Name	Description
1	PV display	Indicates PV.
		Indicates setting characters in each setting mode.
2	SV display	Indicates SV.
		Indicates the set data in each setting mode.
		In monitor mode, indicates the MV or remaining time (program
		control).
3	Temperature unit	Displays the temperature unit. (Displayed only for thermocouple and
	display	RTD ranges)
4	MEMO/STEP	Indicates Set value memory number (Fixed value control) or Program
	display	step number.

Action Indicators

No.	Name	Description
5	SV indicator	Lit when SV display shows the set value.
6	MV indicator	Lit when SV display shows the MV.
7	MEMO	Lit when set value memory function is enabled during fixed value control
	indicator	selection.
8	STEP indicator	Lit when program control is selected.
9	01	Lit when control output is ON or when heating output (optional: EV2, O2
		(SSR/A)) is ON.
		For direct current current or DC voltage outputs, flashes corresponding to
		the MV in 250 ms cycles.
	O2	Lit when cooling output (optional: EV2, O2 (SSR/A)) is ON.
		For direct current current or DC voltage outputs, flashes corresponding to
		the MV in 250 ms cycles.
	EV1	Lit when Event output 1 is ON.
	EV2	Lit when Event output 2 (optional: EV2) is ON.
	EV3	Lit when Event output 3 (optional: EV3) is ON.
	AT	Flashes while AT or 'AT on startup' is performing.
	MAN	Lit when manual control is performed.
	R/L	Lit when remote is selected for external setting input.
	T/R	Lit during Serial communication (C5W, C5 options) TX (transmitting)
		output.
	LOCK	Lit when set value lock mode is enabled.

Key

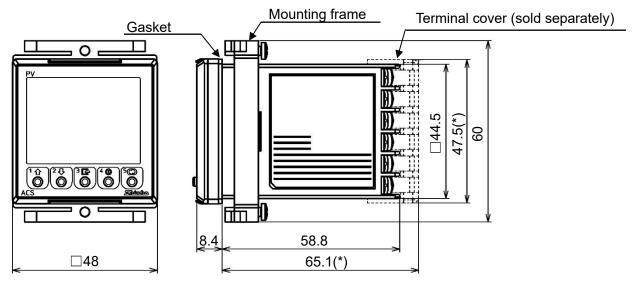
No.	Name	Description
10	UP key	Increases the numeric value. During program control, pressing for 1
		second activates the advance function.
11)	DOWN key	Decreases the numeric value. During program control, pressing for 1
		second activates the hold function.
12	PF key	Operate the selected function in the PF key function selection.
		In setting mode, select the number of digits to be entered.
13	OUT/OFF key	Operate the selected function in the OUT/OFF key function selection.
14)	MODE key	Switches a setting mode, and registers the set data.
		By pressing this key for 3 seconds during RUN mode, the unit enters
		Monitor mode.

Console Connector

No.	Name	Description
15	Console	By connecting the tool cable (CMD-001, sold separately), the following
	connector	operations can be conducted from an external computer using the Console
		software SWC-ACS201M.
		 Reading and setting of SV, PID and various set values
		Reading of PV and action status
		Function change

3. Mounting to the Control Panel

3.1 External Dimensions (Scale: mm)

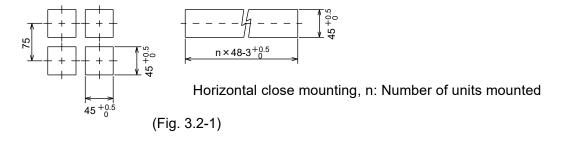


(*): When the terminal cover is used. (Fig. 3.1-1)

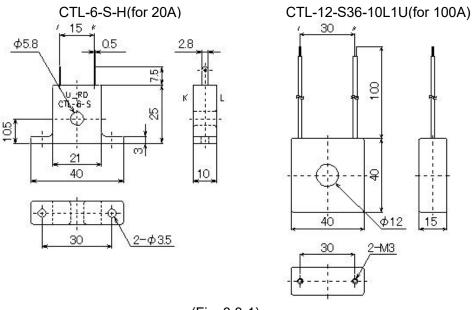
3.2 Panel Cutout (Scale: mm)



If horizontal close mounting is used for the controller, IP66 specification (Drip-proof/Dust-proof) may be compromised, and all warranties will be invalidated.



3.3 CT External Dimensions (Scale: mm)



(Fig. 3.3-1)

3.4 Mounting to, and Removal from, the Control Panel

A Warning

As the mounting frame of the ACS2 is made of resin, do not use excessive force while tightening screws, or the mounting frame could be damaged.

Tighten screws with one rotation upon the screw tips touching the panel.

The torque is 0.05 to 0.06 N·m.

3.4.1 How to Mount the Unit

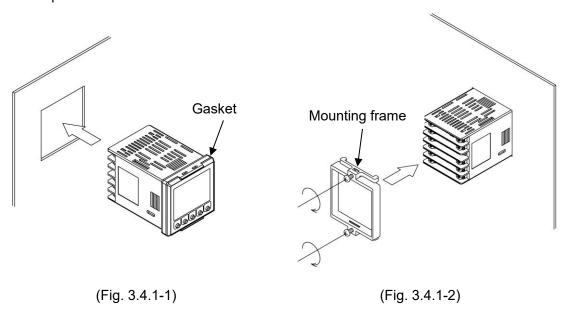
Mount the controller vertically to the flat, rigid panel to ensure it adheres to the Drip-proof/Dust-proof specification (IP66).

If the lateral close mounting is used for the controller, IP66 specification (Drip-proof/Dust-proof) may be compromised, and all warranties will be invalidated.

Mountable panel thickness: 1 to 5 mm

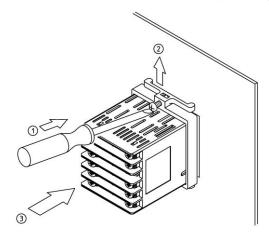
- (1) Insert the controller from the front side of the control panel. (Fig. 3.4.1-1)

 If the Drip-proof/Dust-proof specification (IP66) is not necessary, the gasket may be removed (Please keep in mind the warranty is void if gasket is removed).
- (2) Insert the mounting frame until it comes into contact with the panel, and fasten with screws. Tighten screws with one rotation upon the screw tips touching the panel. (Fig. 3.4.1-2) The torque is 0.05 to 0.06 N•m.



3.4.2 How to Remove the Mounting Frame and Unit

- (1) Turn the power to the unit OFF, and disconnect all wires before removing the mounting frame.
- (2) Insert a flat blade screwdriver between the mounting frame and unit (1).
- (3) Slowly push the frame upward using the screwdriver (②), while pushing the unit toward the panel (③).
- (4) Repeat step (2) and slowly push the frame downward using the screwdriver for the other side. The frame can be removed little by little by repeating these steps.



(Fig. 3.4.2-1)

4. Wiring

⚠ Warning

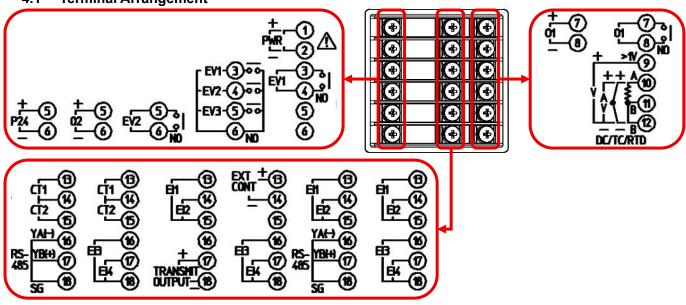
Turn the power supply to the instrument off before wiring or checking.

Working on or touching the terminal with the power switched on may result in severe injury or death due to electrical shock.

⚠ Caution

- Do not leave wire remnants in the instrument, as they could cause a fire or malfunction.
- Use the solderless terminal with an insulation sleeve in which the M3 screw fits when wiring the instrument.
- The terminal block of this instrument is designed to be wired from the left side. The lead wire must be inserted from the left side of the terminal, and fastened with the terminal screw.
- Tighten the terminal screw using the specified torque. If excessive force is applied to the screw when tightening, the terminal screw or case may be damaged.
- Do not pull or bend the lead wire on the terminal side when wiring or after wiring, as it could cause malfunction.
- When using a terminal cover for the BCS2, pass terminal wires numbered 7 to 12 into the holes of the terminal cover.
- 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 controller. (Recommended fuse: Time-lag fuse, rated voltage 250 V AC, rated current 2 A)
- For a 24 V AC/DC power source, do not confuse polarity when using direct current (DC).
- 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 and compensating lead wire according to the sensor input specifications of this controller.
- Use the 3-wire RTD according to the sensor input specifications of this controller.
- For DC voltage input, (+) side input terminal number of 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC differs from that of 0 to 1 V DC.
 - For the input terminal number, the (+) side for 0 to 5 V DC, 1 to 5 V DC, and 0 to 10 V DC is (9), and the (+) side for 0 to 1 V DC is (10).
- When using a relay contact output type, externally use a relay according to the capacity of the load to protect the built-in relay contact.
- When wiring, keep input wires (thermocouple, RTD, etc.) away from controller AC power sources or load wires.

4.1 Terminal Arrangement



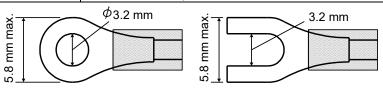
(Fig. 4.1-1)

Terminal	Description			
PWR	Power supply voltage			
EV1	Event output 1			
EV2	Event output 2 (optional: EV2)			
EV3	Event output 3 (optional: EV3)			
O2	Control output OUT2 (Cooling output) [optional: EV2, O2(SSR/A)]			
P24	24 V DC insulated power output (optional: P24)			
01	Control output OUT1 or heating output [optional: EV2, O2(SSR/A)]			
TC	Thermocouple input			
RTD	RTD input			
DC	Direct current input or DC voltage input			
CT1	CT input 1 (optional: C5W, W)			
CT2	CT input 2 (optional: C5W, W)			
RS-485	Serial communication RS-485 (optional: C5W, C5)			
EVENT INPUT	El1 (optional: other than C5W)			
	El2 (optional: other than C5W)			
	El3 (optional: other than El, W or C5W)			
	El4 (optional: other than El, W or C5W)			
EXT CONT	External setting input (optional: EA)			
TRANSMIT OUTPUT	Transmission output (optional: TA, TV)			

4.2 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 $0.63~\text{N} \cdot \text{m}$.

Solderless Terminal	Manufacturer	Model	Tightening Torque
Y-type	NICHIFU TERMINAL INDUSTRIES CO., LTD.	TMEX1.25Y-3	
1-type	J.S.T.MFG.CO., LTD.	VD1.25-B3A	0.63 N•m
Ding type	NICHIFU TERMINAL INDUSTRIES CO., LTD.	TMEX1.25-3	0.03 11411
Ring-type	J.S.T.MFG.CO., LTD.	V1.25-3	

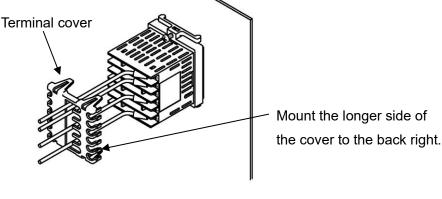


(Fig. 4.2-1)

4.3 Terminal Cover

When using a terminal cover (sold separately), make sure the longer side is on the back right side of the case.

Pass the wires from terminals 7 to 12 into the holes of the terminal cover.



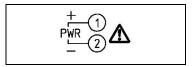
(Fig. 4.3-1)

4.4 Wiring

For the terminal arrangement, refer to Section '4.1 Terminal Arrangement' (p.16).

4.4.1 Power Supply

Power supply voltage is 100 to 240 V AC or 24 V DC, 48 V DC. For 24 V DC or 48 V DC, ensure polarity is correct.



4.4.2 Control Output OUT1, OUT2

When EV2 or , O2(SSR/A) option is ordered, control output OUT2 is available. Specifications of Control output OUT1, OUT2 are shown below.

Control output OUT1			
Relay contact	1a		
	Control capacity: 3 A 250 V AC (resistive load)		
	1 A 250 V AC (inductive load $\cos\phi$ =0.4)		
	Electrical life: 100, 000 cycles		
	Minimum applicable load: 10 mA 5 V DC		
Non-contact voltage	12 V DC±15%		
(for SSR drive)	Max. 40 mA (short circuit protected)		
Direct current	4 to 20 mA DC, 0 to 20mA DC		
	(Resolution: 12000)		
	Allowable load resistance: Max. 550 Ω		
DC voltage 0 to 1 V DC, 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC			
	(Resolution: 12000)		
	Allowable load resistance: Max. 1 kΩ		
Open collector (NPN) Allowable load current: Max. 100 mA			
	Load voltage: Max. 30 V DC		
	Residual voltage: Max. 1.2 V DC		
	Leakage current when OFF: Max. 0.1 mA		
Control output OUT2			
Relay contact	1a		
	Control capacity: 3 A 250 V AC (resistive load)		
	1 A 250 V AC (inductive load $\cos\phi$ =0.4)		
	Electrical life: 100, 000 cycles		
	Minimum applicable load: 10 mA 5 V DC		
Non-contact voltage	12 V DC±15%		
(for SSR drive)	Max. 40 mA (short circuit protected)		
Direct current 4 to 20 mA DC, 0 to 20mA DC			
	(Resolution: 12000)		
	Allowable load resistance: Max. 550 Ω		
DC voltage	0 to 1 V DC, 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC		
	(Resolution: 12000)		
	Allowable load resistance: Max. 1 kΩ		

Relay contact	Non-contact voltage Direct current DC voltage	Open collector
	[²]+ [⁸]+ (3) (4)	(8)

Number of Shinko SSR units when connected in parallel (for Non-contact voltage output):

SA-400 series: 5 unitsSA-500 series: 2 units

4.4.3 Input

Each input wiring is shown below.

For DC voltage input, (+) side input terminal number of 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC differs from that of 0 to 1 V DC.

Thermocouple	RTD	Direct current, DC voltage (0 to 1 V)	DC voltage (0 to 5 V, 1 to 5 V, 0 to 10 V)
+(0) (1) (1) (2) TC	A 10 B 11 B 12 RTD	+(10) A (11) L (12) DC	+ (9) (10) (11) (12) (12) (12)

4.4.4 Event Output 1, Event Output 2, Event Output 3

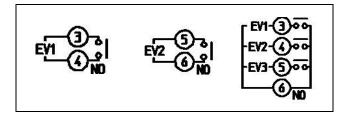
Event output EV1 is a standard feature.

If EV2 option is ordered, Event output EV2 is available.

If EV3 option is ordered, Event output EV3 is available.

Specifications of Event output 1, Event output 2 and Event output 3 are shown below.

Relay contact	1a	
	Control capacity: 3 A 250 V AC (resistive load)	
	1 A 250 V AC (inductive load $\cos\phi$ =0.4)	
	Electrical life: 100, 000 cycles	
	Minimum applicable load: 10 mA 5 V DC	

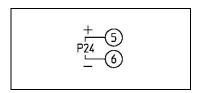


4.4.5 Insulated Power Output

If P24 option is ordered, the Insulated power output is available.

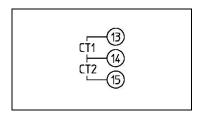
Specifications of Insulated power output are shown below.

Output voltage	24±3 V DC (at load current 30 mA DC)	
Ripple voltage	Within 200 mV DC (at load current 30 mA DC)	
Max load current	30 mA DC	

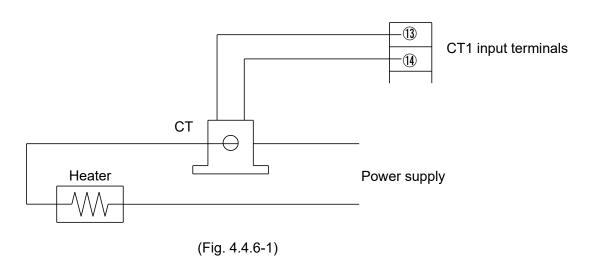


4.4.6 CT Input

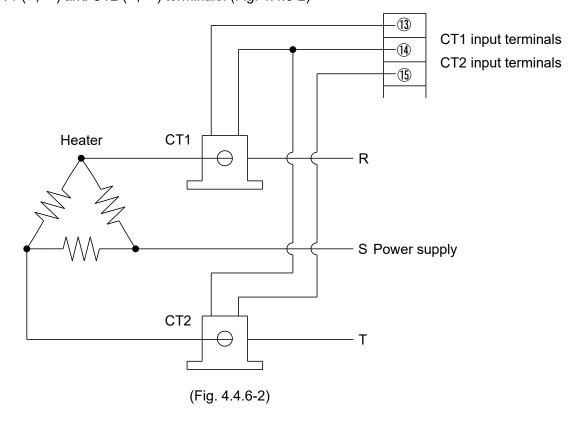
CT input is available when Heater burnout alarm (C5W, W options) is ordered.



Pass one lead wire of the heater circuit into the hole of the CT. (Fig. 4.4.6-1) When wiring, keep the CT wire away from AC sources or load wires to avoid the external interference.

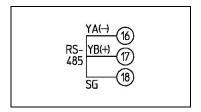


If using 3-phase, pass any 2 lead wires of R, S, T into the CT, and connect them to CT1 (9, 9) and CT2 (9, 5) terminals. (Fig. 4.4.6-2)



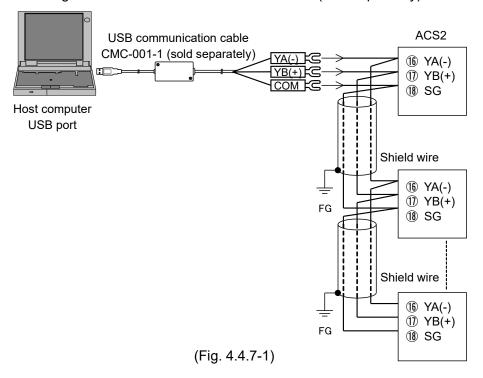
4.4.7 Serial Communication

If the C5, C5W (20A) or C5W (100A) option is ordered, Serial communication is available.

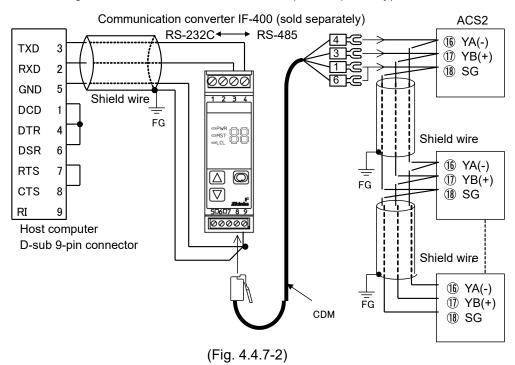


(1) Serial Communication

When using USB communication cable CMC-001-1 (sold separately)



When using communication converter IF-400 (sold separately)



(2) SV digital transmission

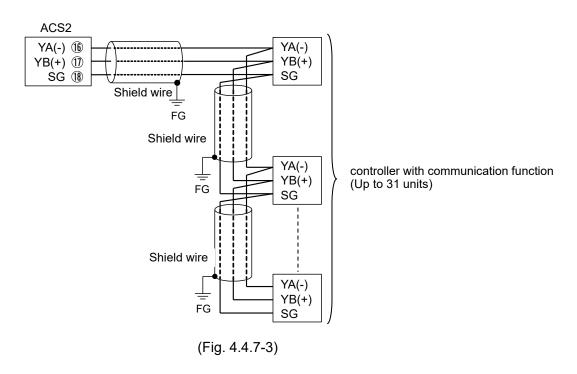
Selecting SV digital transmission in the serial communication protocol selection allows digital transmission of the SV when combined with a controller with communication function [Serial Communication (OP: C5, C5W)].

Wiring

For the SV digital transmission, connect YA (-) to YA (-), YB (+) to YB (+), SG to SG terminal respectively.

Up to 31 units can be connected.

Wiring example of controller with communication function and ACS2



Shield wire

Connect only one end of the shield to the FG to avoid a ground loop. If both ends of the shield wire are connected to the FG, the circuit will be closed, resulting in a ground loop. This may cause noise. Be sure to ground the FG.

Recommended cable: OTSC-VB 2PX0.5SQ (made by Onamba Co., Ltd.) or equivalent (Use a twisted pair cable.)

4.4.8 Event Input

4 points (EI1 to EI4) are added as event inputs.

For options other than C5W and EI, 2 points (EI1 and EI2) are added simultaneously.

The event allocated via the event input allocation selection is executed based on whether the allocated event is in the ON (closed) or OFF (open) state.

Specifications of Event input are shown below.

Circuit current when closed Approx. 2.3 mA	Circuit current when closed	Approx. 2.3 mA
--	-----------------------------	----------------

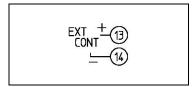
EI1, EI2	EI3, EI4
B1 (8)	B (9)

4.4.9 External Setting Input

If the EA option is ordered, External setting input is available.

Specifications of External setting input are shown below.

Setting signal	Direct current 4 to 20 mA DC
Allowable input	50 mA DC max.
Input impedance	50 Ω max.
Input sampling period	100 ms

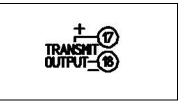


4.4.10 Transmission Output

If the TA and TV options are ordered, Transmission output is available.

Specifications of Transmission output are shown below.

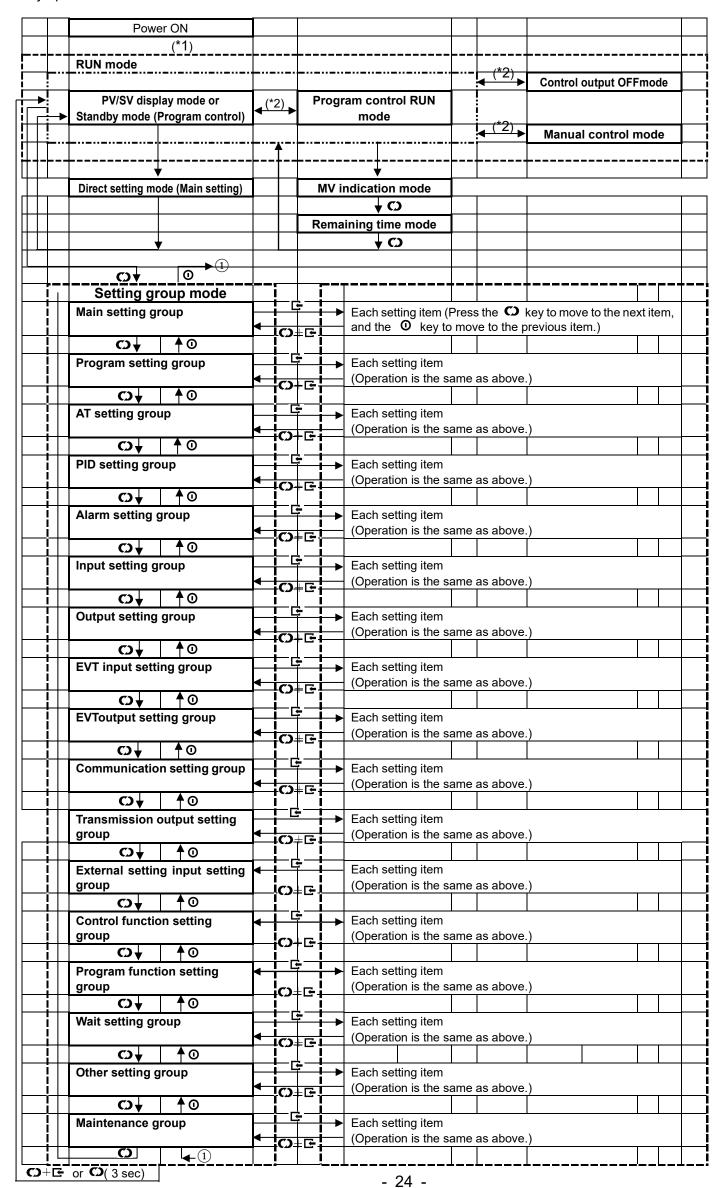
Resolution	12000
Output	4 to 20 mA DC
	Load resistance: Max 550 Ω
	0 to 1V DC
	Load resistance: Max 1 kΩ
	0 to 10V DC
	Load resistance: Max 1 kΩ
Output accuracy	Within ±0.3% of Transmission output span



5. Outline of Key Operation and Each Mode

5.1 key Operation

The key operations outline is shown below.



- (*1): Control starts from previous status (last shutdown).
- (*2): To switch from PV/SV display mode to control output OFF mode or manual control mode, use the ⊙ or ເ key.
- (*3): No operation for 2 seconds or pressing the $\mathbf{\Omega}$ key will return to the PV/SV display mode.

[Key Operation]

 $\mathbf{CO}(3 \text{ sec})$: Press and hold the \mathbf{CO} key for approx. 3 seconds.

 $\mathbf{O}^{+}\mathbf{E}$: Press and hold the \mathbf{O} and \mathbf{E} keys together.

Settings for each setting item: Use the 🛊 and 🗣 keys to change the value, the 🕒 key to select the digit for numerical input, and the 🗘 key to register it.

Selection of each selection item: Use the ↑ and ↓ keys for settings or selections, and register them by pressing the ♥ key.

5.2 Modes

The descriptions of each mode are shown below.

Mode	de are shown below.	Description	
RUN mode	The PV Display indicates PV,	and the SV Display indicates SV.	
PV/SV display mode or	When the standby mode is active (program control), the PV display		
Standby mode (Program	indicates the PV. The SV display is off.		
control)	Control starts from previous status (last shutdown).		
	To switch from PV/SV display	mode to control output OFF mode or manual	
	control mode, use the ① or	Ŀ key.	
	Depending on the function se	lection for the 0 key or 🕒 key, the	
	operation will be as follows:		
	Function selection for	Description	
	O key or Œ key	Description	
	No function	It will become no function.	
	Auto/Manual control	Switches the Auto/Manual control.	
	Control output OFF function	Turns the control output ON or OFF.	
	Remote/Local selection	Switches the Remote/Local.	
	RUN/STOP function	Switches the RUN/STOP.	
Direct setting mode	In PV/SV display mode, press	sing the	
(Main setting)	setting mode (only during Fix	control) to set the SV.	
	When selecting the set value	memory function in Event input allocation	
	setting, configure SV1 to SV8		
	After switching to Direct setting mode, the first digit flashes.		
	Press the 🕒 key to advance	e the digit.	
	No operation for No operation for	Operations within each setting item	
		C- key Displayed alternately Displayed alternately Displayed alternately	
		⊑ key	
MV indication mode		s and hold the 🗘 key for approximately 3	
	seconds to enter MV indicatio		
	The PV display shows PV, an		
	The decimal point in the first of		
Remaining time mode	·	ing the C key switches to Remaining time	
	mode (only during program co	,	
	' '	value, and the SV display shows the	
	remaining time.		

Mode	Description
Setting group mode	In PV/SV display mode or Standby mode (Program control), pressing the
	key switches to Setting group mode.
	After switching to Setting group mode, press the 🗘 key to move to each
	setting group, and press the 0 key to move in the opposite direction.
	Pressing the 🕒 key in each setting group item moves to items within that
	group.
	After moving to items within the group, press the 🗘 key to move to each
	setting item, and press the 0 key to move in the opposite direction.
	Press and hold the 🗘 key while pressing the 🕒 key to move to each
	setting group item within the group.
	When changing the selection items for Input type selection, Temperature
	unit selection, Event output EV□ allocation setting, Transmission output
	type selection, Control action selection, or Integral/Derivative decimal point
	position selection within the group, or when executing Date clear setting or
	Program clear setting, the PV display will turn off and [᠘ロ무섭] will appear
	on the SV display due to the large number of items requiring update. Key
	operations are disabled while [뉴ㅁ무료] is displayed.
	Standby mode can transition to Setting group mode in the same manner
	as PV/SV display mode from Program control RUN mode. When
	transitioning from Setting group mode, it will transition to the mode
	immediately preceding the transition.

5.3 Basic Operation after Power-ON

After the unit is mounted to the control panel and wiring is completed, operate the unit following the procedure below.

(1) Turn the power supply to the unit ON

The control output turns OFF (4 mA for current output), and the transmission output is 4 mA.

Control will then start, indicating the PV on the PV Display and SV on the SV Display. (Table 5.3-1)

Concer Innut	c		F	
Sensor Input	PV Display	SV Display	PV Display	SV Display
K	E	1370	E	2498
	Ł8 .C	8000	£8 .F	1472.0
	E4 .E	Yoaa	E4 F	752.0
J	J	1000	J∭F	1832
	J. DL	Yoao	J□ .F	752.0
R	$r \square \square \mathcal{L}$	1750	r IIIF	3200
S	5 <u></u> [1750	5 F	3200
В	$b \square \mathcal{L}$	1820	ЬШЕ	3308
E	$\mathcal{E} \square \mathcal{L}$	<u> </u>	ELLF	1472
Т	$\Gamma\square$. Γ	4000	ſ□ .F	7520
N	$\cap \Box \Box \mathcal{L}$	1300	$\cap \square \mathcal{F}$	2372
PL-Ⅱ	PL 20	1390	PL2F	2534
C(W/Re5-26)	c L C	23 /5	⊆∏F	4 199
Pt100	PC .C	85QD	PC F	156 <i>2.</i> 0
Pt100	PTC	<u></u> 850	PTDF	/58 <i>2</i>
Pt100	PC 15	laaa	PC (F	2 12.0
4 to 20 mA DC (*1) (*2)	4201			
0 to 20 mA DC (*1) (*2)	0201			
4 to 20 mA DC (*1) (*3)	420E			
0 to 20 mA DC (*1) (*3)	020E	Scaling high limit value		
0 to 1 V DC	O \square IB		ıııı valu c	
0 to 5 V DC	05 <i>8</i>			
1 to 5 V DC	<i>I</i> □5 <i>B</i>			
0 to 10 V DC	0 108			

- (*1): Selectable input range and decimal point position.
- (*2): It has a built-in receiving resistor (50 Ω).
- (*3): The separately sold receiving resistor (50 Ω) is attached externally.

When power is turned ON, if an error occurs, the following error will be displayed on the PV Display.

Error	PV Display
Non-volatile IC memory error	[Err /] is lit
Internal bus error in the instrument	Periodic reset of the instrument (malfunction)
Sensor error (outside high limit range)	[] is flashing
Sensor error (outside low limit range)	[] is flashing

(2) Enter each value

Refer to Sections '6. Initial Setting' (p.34) to '8. Operation and Settings of Standard Functions' (p.107): Enter each value: Input type, Control method, Direct/Reverse action, SV, PID constants, Event output EV1 allocation, etc.

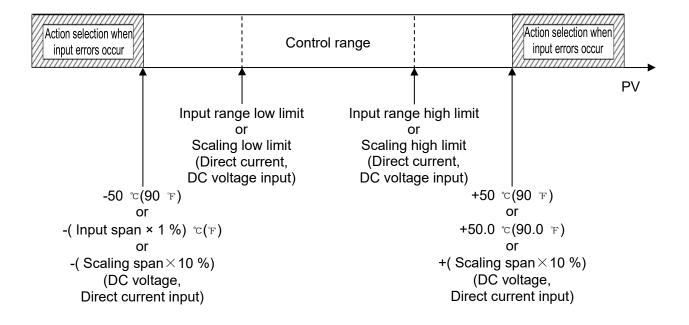
(3) Turn the load circuit power ON

Control starts, so as to reach, and then maintain the control target at the SV.

· Indication Range and Control Range

The indication range and control range for each input are as follows.

Input Type	Indication Range and Control Range
Thermocouple (no	[Input range low limit – 50℃ (90)]
decimal point)	to [Input range high limit + 50℃ (90೯)]
Thermocouple (with	[Input range low limit – (Input span × 1 %) ℃(₮)]
decimal point), RTD	to [Input range high limit + 50.0 ೀ(90.0 ೯)]
DC voltage,	[Scaling low limit – Scaling span x 10%]
Direct current	to [Scaling high limit + Scaling span x 10%]



(Fig. 5.3-1)

Overscale and Underscale

Overscale

The following input range is overscale, and the overscale status flag is set.

However, control operation continues during overscale.

Thermocouple (no decimal point)

Input range high limit to Input range high limit + 50 °c(90 °F)

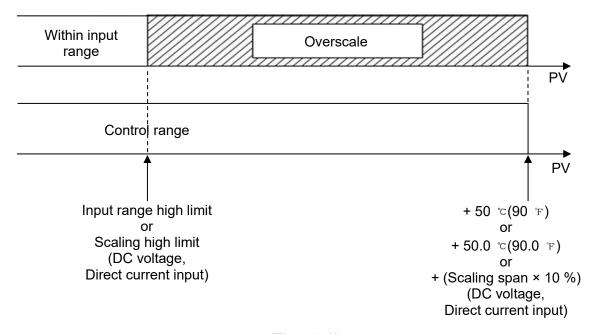
Thermocouple (with decimal point), RTD

Input range high limit to Input range high limit + 50.0 ℃(90.0 ₮)

DC voltage, Direct current

Scaling high limit to Scaling high limit + (Scaling span × 10 %)

※ If the scaling high limit is 19999 or higher, [⁻⁻⁻] is displayed, and the control range extends
up to the scaling high limit + (scaling span × 10%).



(Fig. 5.3-2)

Underscale

The following input range is underscale, and the underscale status flag is set.

However, control operation continues during underscale.

Thermocouple (no decimal point)

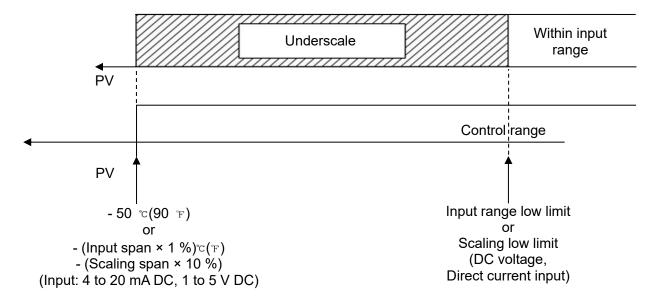
Input range low limit - 50 °c(90 °F) to Input range low limit

Thermocouple (with decimal point), RTD

Input range low limit - (Input span ×1 %) °C(₮) to Input range low limit

Direct current (4 to 20mA) , DC voltage (1 to 5V) input

Scaling low limit - (Scaling span × 10 %) to Scaling low limit



(Fig. 5.3-3)

· Sensor error

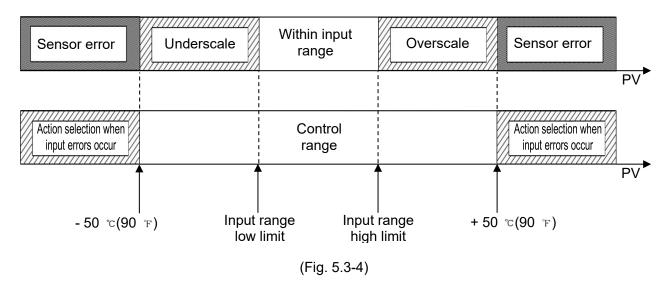
Thermocouple input (no decimal point) burnout condition

Below Input range low limit - 50 ℃(90 ℉)

The PV Display will flash [---], and the action selected in Action selection when input errors occur will be performed.

Above Input range high limit + 50 °c(90 °F)

The PV Display will flash [---], and the action selected in Action selection when input errors occur will be performed.



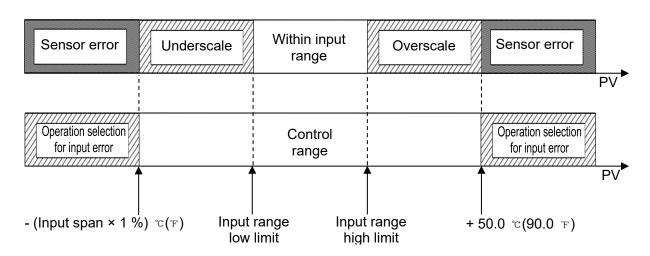
Thermocouple input (with decimal point) and RTD input burnout condition

Below Input range low limit - (Input span × 1 %)℃(೯)

The PV Display will flash $[___]$, and the action selected in Action selection when input errors occur will be performed.

Above Input range high limit + 50.0 ℃(90.0 ℉)

The PV Display will flash [---], and the action selected in Action selection when input errors occur will be performed.



(Fig. 5.3-5)

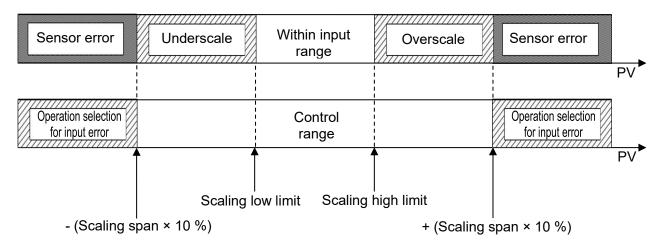
DC voltage, Direct current input burnout condition

Below Scaling low limit - (Scaling span × 10 %)

The PV Display will flash $\begin{bmatrix} - & - & - \end{bmatrix}$, and the control output turns OFF.

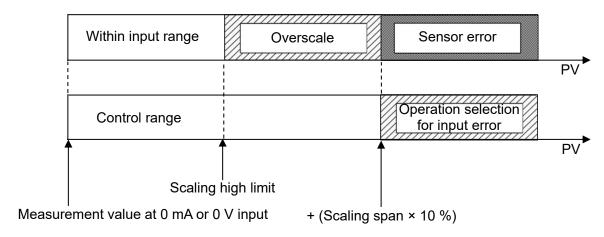
Above Scaling high limit + (Scaling span × 10 %)

The PV Display will flash [---], and the control output turns OFF.



(Fig. 5.3-6)

However, for 0 to 20 mA, 0 to 1 V, 0 to 5 V, and 0 to 10 V, the measured value corresponds to the input at 0 mA or 0 V.



(Fig. 5.3-7)

· Cold junction error

If the internal cold junction temperature falls below -10 $\,^{\circ}$ (14 $\,^{\circ}$ F) or exceeds 55 $\,^{\circ}$ C (131 $\,^{\circ}$ F), a cold junction error occurs.

(When thermocouple input is selected)

· Internal bus error

If there is a fault or other abnormality in the internal circuitry, the control output will turn OFF.

6. Initial Setting

Setup (setting the Input type, Event output allocation, SV, etc.) should be done before using this controller, according to the user's conditions.

Initial settings are configured in the Setting group mode.

The Setting group mode includes setting groups such as Main setting group, AT setting group, PID setting group, Input setting group, Output setting group, EVT input setting group, EVT output setting group, and Other setting group.

The factory default settings for the Setting group mode are as follows.

If the user's specification is the same as the factory default value of this instrument, or if user's instrument has already been installed in a system, initial settings are not necessary.

Proceed to Section '7. Settings' (p.57).

· Main setting group

Setting Item	Factory Default
SV1 setting	0

AT setting group

Setting and Selection Item	Factory Default
AT perform/cancel selection	AT cancel
AT action model selection	Normal AT
AT bias setting	20
AT gain setting	1.0
AT hysteresys setting	0.5

PID setting group

Setting Item	Factory Default
Block1 OUT1 Proportional band setting	10
Block1 OUT1 Integral time setting	200
Block1 OUT1 Derivative time setting	50
Block1 OUT2 Proportional band setting [Option1: EV2, O2(SSR/A)]	10
Block1 OUT2 Integral time setting [Option1: EV2, O2(SSR/A)]	200
Block1OUT2 Derivative time setting [Option1: EV2, O2(SSR/A)]	50
Block1 MV bias setting	0.0
Block1 Overlap/Dead band setting [Option1: EV2, O2(SSR/A)]	0.0
The same applies up to block number 8.	
Block8 OUT1 Proportional band setting	10
Block8 OUT1 Integral time setting	200
Block8 OUT1 Derivative time setting	50
Block8 OUT2 Proportional band setting [Option1: EV2, O2(SSR/A)]	10
Block8 OUT2 Integral time setting [Option1: EV2, O2(SSR/A)]	200
Block8 OUT2 Derivative time setting [Option1: EV2, O2(SSR/A)]	50
Block8 MV bias setting	0.0
Block8 Overlap/Dead band setting [Option1: EV2, O2(SSR/A)]	0.0

Input setting group

Setting and Selection Item	Factory Default
Input type selection	K -200 to 1370 ℃
Temperature unit selection	Celsius
Scaling high limit setting	1370
Scaling low limit setting	-200
Decimal point position selection	No decimal point
Input sampling selection	125 ms
Number of moving average setting	1
Sensor correction coefficient setting	1.000
Sensor correction setting	0.0
PV filter time constant setting	0.0

Output setting group

Setting and Selection Item	Factory Default	
OUT2 output type selection	SSR output	
OUT1 proportional cycle setting	Relay contact output: 30.0 sec Non-contact voltage output: 3.0 sec	
	Open collector output: 3.0 sec	
OUT1 ON/OFF hysteresis setting	1.0	
OUT1 high limit setting	100.0	
OUT1 low limit setting	0.0	
OUT1 rate of change limit setting	0.00	
OUT2 output type selection [Option1: EV2, O2(SSR/A)]	SSR output	
OUT2 cooling method selection [Option1: EV2, O2(SSR/A)]	Air cooling	
OUT2 proportional cycle setting [Option1: EV2, O2(SSR/A)]	Relay contact output: 30.0 sec	
	Non-contact voltage output: 3.0 sec	
	Open collector output: 3.0 sec	
OUT2 ON/OFF hysteresis setting [Option1: EV2, O2(SSR/A)]	1.0	
OUT2 high limit setting [Option1: EV2, O2(SSR/A)]	100.0	
OUT2 low limit setting [Option1: EV2, O2(SSR/A)]	0.0	
Direct/Reverse action selection	Reverse action	
Pre-set output setting 1 (Option2: except EI or C5W)	0.0	
Pre-set output setting 2 [Option1: EV2, O2(SSR/A)] (Option2: except EI or C5W)	0.0	
Operation selection when input error occur	MV when input error occur	
OUT1 MV setting when input error occur	0.0	
OUT2 MV setting when input error occur Option1: EV2, O2(SSR/A)]	0.0	

• EVT input setting group (Option 2: except C5W)

Selection Item	Factory Default
Event input EI1 allocation setting	No operation
Event input El2 allocation setting	No operation
Event input El3 allocation setting	No operation
Event input El4 allocation setting	No operation

EVT output setting group

Selection Item	Factory Default
Event output EV1 allocation setting	No operation
Event output EV2 allocation setting (Option1: EV2) (Option1: EV3)	No operation
Event output EV3 allocation setting (Option1: EV3)	No operation

• Communication setting group (Option 2: C5 or C5W)

Setting and Selection Item	Factory Default
Communication protocol selection	Shinko protocol
Instrument number setting	0
Communication speed selection	9600 bps
Data bit/Parity selection	7 bits/Even
Stop bit selection	1 bit
応答時間遅延設定	0
SVTC バイアス設定	0

• Transmission output setting group (Option 2: TA)

Setting and Selection Item	Factory Default
Transmission output type selection	PV transmission
Transmission output high limit setting	1370
Transmission output low limit setting	-200

• External setting input setting group (Option 2: EA)

Setting and Selection Item	Factory Default
Remote/Local selection	Local
External setting input high limit setting	1370
External setting input low limit setting	-200
Remote bias setting	0

Control function setting group

Setting and Selection Item	Factory Default
Control action selection	2 DOF PID control
Proportional gain 2 DOF coefficient setting	0.40
Integral 2 DOF coefficient setting	1.35
Derivative 2 DOF coefficient setting	0.00
Desired value proportional coefficient setting	1.00
Gap width setting item	0.0
Gap coefficient setting item	1.0
Integral/Derivative decimal point position selection	No decimal point

• Program function setting group

Selection Item	Factory Default	
Fix control/program control selection	Fix control	

Other setting group

Setting and Selection Item	Factory Default
Set value lock selection	Unlock
SV Rise/Fall rate action selection	PV start
SV Rise/Fall rate time unit selection	Minute
SV rise rate setting	0
SV fall rate setting	0
LCD display part selection	All parts
SV display method selection	Setting SV
Indication when control output OFF selection	OFF indication
OUT/OFF key function selection	No function
PF key function selection	No function
Auto/Manual control after power ON selection	Automatic control
Indication time setting	00:00
Non-volatile IC memory saving selection	Save

Maintenance group

<u> </u>	
Setting and Selection Item	Factory Default
EVT input indication	No input
EVT output ON setting	OFF
OUT1 output setting	0.0
OUT2 output setting [Option1 : EV2, O2(SSR/A)]	0.0
Transmission output setting	0.0
Data clear Yes/No setting	No
Program clear Yes/No setting	No

6.1 Power-ON

After power-on, the PV Display shows $[\Box R \vdash E]$ and the SV Display shows $[\Box R \vdash E]$ for approximately 3 seconds. Subsequently, the PV Display shows Input type selection and Temperature unit selection, while the SV Display shows the Input range high limit value (for thermocouple or RTD inputs) or the Scaling high limit value (for DC voltage or direct current inputs). (Table 6.1-1)

The control output turns OFF (4 mA for current output), and the transmission output is 4 mA. Control will then start, indicating the PV on the PV Display and SV on the SV Display. (Table 6.1-1)

Companisment	್		F		
Sensor Input	PV Display	SV Display	PV Display	SV Display	
K	ELLE	1370	Ł □□F	2498	
	Ł8 .C	8oao	£8 .F	14720	
	E4 .E	Yoao	E4 F	752.0	
J	J	1000	JUF	1832	
	⊒. □	Yoao	J□ .F	752.0	
R	$\Gamma \square \Gamma$	1750	r IIIF	3200	
S	5 <u></u> [1750	5□F	3200	
В	ЬШС	1820	ЬШЕ	3308	
E	ΕΠΙΕ	<i>⊞800</i>	ELLF	1472	
Т	Γ□ .Ε	4000	r□ .F	752.0	
N	\cap \Box \Box	1300	$\cap \square \mathcal{F}$	2372	
PL-II	PL20	1390	PL2F	2534	
C(W/Re5-26)	c L L	23 15	c F	4 199	
Pt100	פר ב	85QD	PC F	156 <i>2.</i> 0	
Pt100	PTUE	<i>⊞850</i>	PTOF	/S62	
Pt100	פר וב	laaa	PC IF	2 I2.0	
4 to 20mA DC(*1)(*2)	4201				
0 to 20mA DC(*1)(*2)	0201				
4 to 20mA DC(*1)(*3)	420E				
0 to 20mA DC(*1)(*3)	020E	Scaling high limit value			
0 to 1V DC	O IA				
0 to 5V DC	05 <i>8</i>				
1 to 5V DC	<i>I</i> □5 <i>B</i>				
0 to 10V DC	0 108				

- (*1): Selectable input range and decimal point position.
- (*2): It has a built-in receiving resistor (50 Ω).
- (*3): The separately sold receiving resistor (50 Ω) is attached externally.

6.2 Basic Operation of Settings

To enter each setting mode, refer to the respective setting mode.

In the PV/SV display mode, pressing the C key will enter the setting group mode.

After entering the setting group mode, press the key to enter to each setting group and the key to enter in the opposite direction.

Pressing the F key in each setting group item will move to items within that group.

When entering to items within a group, press the key to enter to each setting item and the key to move in the opposite direction.

Within a group, press the \(\mathbf{O}\) key while holding down the \(\mathbf{E}\) key to enter to each setting group item.

6.3 Initial Setting

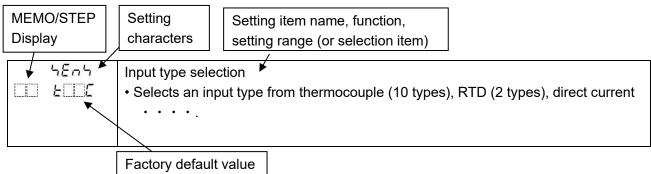
6.3.1 Input Setting Group

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the Input Settings group, follow the steps below.

	/ .n	In PV/SV display mode, press the © key several times until the character of the input setting group is displayed.
2	5875 600	Press the 🕒 key. Enter the Input type selection.

01 1					
Characters,					
Factory	Setting Item, Function, Setting Range				
Default					
hEnh	Input type	selection			
	Selects a	in input type from thermocouple (10 types), RTD (1 types), direct current			
	(4 types)	and DC voltage (4 type).			
		anging the input from DC voltage to other inputs, remove the sensor			
		d to this controller first, then change the input. If the input is changed			
		ensor connected, the input circuit may break.			
		anging an input type, refer to Section "8.9 Items to be Initialized by			
		Changing Settings" (p.131).			
		ction item:			
	ELL	K -200 to 1370 ℃			
	£8 .C	K -200.0 to 800.0 ℃			
	E4 .E	K -200.0 to 400.0 °c			
	JULE	J -200 to 1000 ℃			
	J□ E	J -200.0 to 400.0 ℃			
	$r \square \square \mathcal{E}$	R 0 to 1760 ℃			
	5 L	S 0 to 1760 ℃			
	ЬШС	B 0 to 1820 ℃			
	$E \square \square \mathcal{E}$	E -200 to 800 ℃			
	Γ□ .Ε	T -200.0 to 400.0 °c			
	n L	N -200 to 1300 ℃			
	PL2E	PL-II 0 to 1390 ℃			
	σ IIII E	C(W/Re5-26) 0 to 2315 ℃			

Characters, Factory Default	Setting Item, Function, Setting Range			
5E05	<i>PГ .</i>			
	<i>PT□L</i> Pt100 -200 to 850 ℃			
	<i>PΓ \L</i> Pt100 -100.0 to 100.0 ℃			
	부근되 4 to 20 mA DC (*1) -19999 to 19999			
	☐ ☐ ☐ ☐ 0 to 20 mA DC (*1) -19999 to 19999			
	4 to 20 mA DC (*2) -19999 to 19999			
	□ ⊇ □ E 0 to 20 mA DC (*2) -19999 to 19999			
	□□ IB 0 to 1 V DC -19999 to 19999			
	□□5			
	/□58 1 to 5 V DC -19999 to 19999			
	☐ I☐			
Lorf IIII ELL	Temperature unit selection			
	Select the temperature sensor units: Celsius or Fahrenheit.			
	Selection item:			
	Celsius Celsius			
	FIII Fahrenheit			
45 L H	Scaling high limit setting			
□□ l∋¬O	Sets scaling high limit value.			
, ,- , ,	Setting range: Scaling low limit value to Input range high limit value			
57 <u>L</u> L	Scaling low limit setting			
-200	Sets scaling low limit value. Setting range: Input range low limit value to Scaling high limit value.			
ap	Setting range: Input range low limit value to Scaling high limit value Decimal point position selection			
	Decimal point position selection Selects decimal point place.			
[][] [Selection item:			
	No decimal point			
	1 digit after decimal point			
	2 digits after decimal point			
	□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□			
	₹₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽			
	Available only for DC voltage and current inputs			
4 <i>P</i> 4	Input sampling selection			
□□ □ 125	Selects sampling period.			
	Selection item:			
	☐ <i>12</i> 5 125 ms			
	□□5 <i>□</i> 50 ms			
	10 ms			
88-G	Number of moving average setting			
	Sets number of times to average fluctuations in input values.			
	Setting range: 1 to 10			

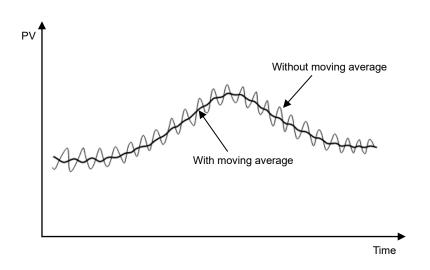
Characters,			
Factory	Setting Item, Function, Setting Range		
Default			
hot	Sensor correction coefficient setting		
	Sets sensor correction coefficients.		
	• Setting range: 0.000 to 10.000		
5 0□□	Sensor correction setting		
	Sets sensor correction values.		
	• Setting range: -100.0 to 100.0 ℃(-180.0 to 180.0 ℉)		
	DC voltage, current inputs: -1000 to 1000		
FILF	PV filter time constant setting		
	Sets PV filter time constant.		
	Setting range: 0.0 to 10.0 seconds		

(*1): It has a built-in receiving resistor (50 Ω).

(*2): The separately sold receiving resistor (50Ω) is attached externally.

[Number of moving average setting]

By averaging values that fluctuate due to noise, the display value is stabilized. Moving average count: 1 to 10 times



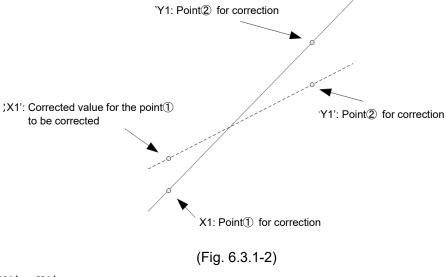
(Fig. 6.3.1-1)

[Sensor correction coefficient setting]

The slope of the sensor input value can be set.

The slope is set to the value calculated using formula ①.

Correction range: 0.000 to 10.000



$$\frac{Y1' - X1'}{Y1 - X1}$$
 = Sensor correction coefficient setting ①

[Sensor correction setting]

When the temperature at the control point differs from the temperature at the sensor installation point, the PV is shifted to compensate.

(This is effective within the input rating range, regardless of the sensor correction value.)

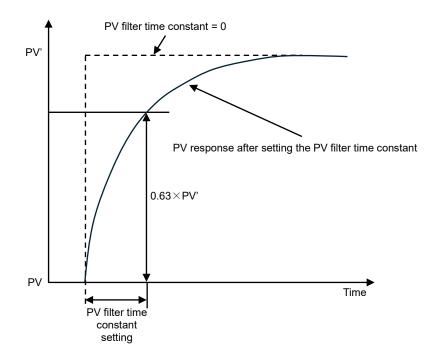
Correction range: -100.0 to 100.0 ℃(-180.0 to 180.0 ℉)

DC voltage, current inputs: -1000 to 1000

[PV filter time constant setting]

A digital 1st low pass filter reduces fluctuations in input values caused by noise.

PV filter time constant: 0.0 to 10.0 seconds



(Fig. 6.3.1-3)

6.3.2 EVT Input Setting Group

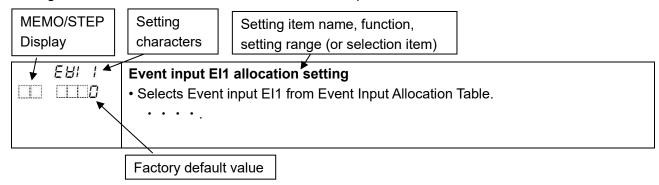
If (Option2: except C5W) is not added, this setting group will not be displayed.

Explanation of setting items:

The upper section of the left column shows the PV Display setting character, while the lower right section shows the factory default value for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the selection item name, description, and the selected item.



To enter the EVT input setting group, follow the steps below.

	In PV/SV display mode, press the CO key several times until the character of the EVT input setting group is displayed.
	Press the 🕒 key. Enter the Event input EI1 allocation setting.

Characters, Factory Default	Setting Item, Function, Setting Range				
EBI I	Event inpu	ıt El1 allocation s	etting		
	Selects E	vent input EI1 fron	n Event Input Allo	ocation Table.	
	Selection	item:			
	Event In	out Allocation Table			
	Selection	Event input	Input ON	Input OFF	Remarks
	value	function	(Closed)	(Open)	Remarks
		No event			
		Set value	2 ⁿ	1	n: 1 to 3(*1)
	(*4)	memory			
		Control	Control OFF	Control ON	Control output OFF
	(*4)	ON/OFF			function
		Direct/Reverse	Direct	Reverse	Always effective
		action	action	action	
	<u> </u>	Preset output 1	Preset output	Usual control	If sensor is burnt out,
		ON/OFF	(*2)		the unit maintains
					control with the
					preset MV.
		Preset output 2	Preset output	Usual control	The unit maintains
		ON/OFF	(*2)		control with the
					preset MV. (*3)
	III.5	Auto/Manual	Manual	Automatic	
		control	control	control	

Characters, Factory	Oatting Home Franchism Catting Dance				
Default	Setting Item, Function, Setting Range				
E#I I	7	Remote/Local	Remote	Local	Option 2: Adapting to EA
	III 8	Program	RUN	STOP	Level action when
		control RUN/STOP			power is turned on
		Program control Holding/Not holding	Holding	Not holding	
	II 10	Program control Advance	Advance function	Usual control	
		function Integral action	Integral action	Usual	Control continues
		Holding	Holding	integral	with the integral
	,			action	value being held.
	II 12	EV(x) output latch selection	Latch release	Usual operation	
	 (*1): The MEMO Display shows the value obtained by adding 2ⁿ and then incrementing by 1. If EI1=OFF and EI2=ON, the display shows 3. Event input numbers are assigned sequentially starting from the smallest number: 20, 21, and so on. For (Option2: EI), the maximum is 8 points; for (Option2: except C5W), the maximum is 4 points. (*2) Output Group Settings: "Preset Output Settings 1, 2". (Edge Operation) When multiple event inputs select the same function, an OR determination is made. (*3) If [Option1: EV2, O2(SSR/A)] is not added, this selection item will not be displayed. (*4) When control operation is OFF, only event input assignment selections 				
EBI 2	· -	ıt El2 allocation s			
	 Selects Event input El2 from Event Input Allocation Table. Selection item: Same as the Event input El1 allocation selection. 				
EBI 3	Event input El3 allocation setting				
	 Selects Event input El3 from Event Input Allocation Table. Selection item: Same as the Event input El1 allocation selection. 				
EBI 4	Event input El4 allocation setting				
		vent input EI4 fron item: Same as the	•		tion.

[Event input]

4 points (EI1 to EI4) will be added as event inputs.

For (Option2: EI), the maximum is 8 points; for (Option2: except C5W), the maximum is 4 points. When adding (Option2: EI)

When the setting value memory function is set for Event input El1 allocation setting and Event input El2 allocation setting

Connection te	Set value memory	
①3-①5 (EI1)	(EI2)	number
Open	Open	SV1
Short	Open	SV2
Open	Short	SV3
Short	Short	SV4

When the setting value memory function is set for Event input EI1 allocation setting and Event input EI4 allocation setting

Connection terminal number		Set value memory
①3-①5 (EI1)	①7-18 (EI4)	number
Open	Open	SV1
Short	Open	SV2
Open	Short	SV3
Short	Short	SV4

6.3.3 EVT Output Setting Group

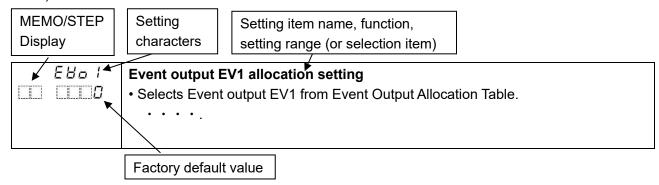
Only items selected in the Event output EV□ allocation setting will be displayed.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the EVT output setting group, follow the steps below.

	In PV/SV display mode, press the © key several times until the character of the EVT output setting group is displayed.
② E80 !	Press the 🕒 key. Enter the Event output EV1 allocation setting.

Characters, Factory Default	Setting Item, Function, Setting Range		
EBol E	Event output EV1 allocation setting		
•	Selects Event output EV1 from Event Output Allocation Table.		
•	Selection item:		
	Event Output Allocation Table		
	Setting value	Event output function	Remarks
		No event	
		Alarm output, High limit alarm	Set in the alarm setting mode.
		Alarm output, Low limit alarm	
	1113	Alarm output, High/Low limits alarm	
	ШЧ	Alarm output, High/Low limits independent alarm	
	1115	Alarm output, High/Low limit range alarm	
	11.5	Alarm output, High/Low limit range independent alarm	
	1117	Alarm output, Process high alarm	
	118	Alarm output, Process low alarm	
	111.9	Alarm output, High limit with standby alarm	
	II 10	Alarm output, Low limit with standby alarm	
	11	Alarm output, High/Low limits with standby alarm	
	□ 12	Alarm output, High/Low limits with standby independent alarm	
	13	Heater burnout alarm output	Set in the alarm setting mode.
	114	Loop break alarm output	Set in the alarm setting mode.
	∷ 15	Time signal output	Turns OFF or ON during Program control, by setting OFF and ON time within the step set in [Step number].
	II 15	Output during AT	Turns ON during AT.
	17	Pattern end output	Turns ON when Program control ends, and remains ON until turned OFF.
	18	Remote output	During serial communication, use bit manipulation of communication command 00D6H to turn it OFF or ON. 2º EV1 output 0: OFF
			1: ON 2 ¹ EV2 output 0: OFF 1: ON
			2 ² EV3 output 0: OFF 1: ON
	II 19	Output added when errors occur	Alarm, heater burnout alarm, sensor error, input error, etc., turns ON when error occurs.
	120	Main output	Selectable when Option1:EV2 is attached
	I2:	Cooling output	Selectable when Option1:EV2 is attached

Characters,		
Factory Default	Setting Item, Function, Setting Range	
R I = R	EV4 anabled/disabled selection when clarm sets 0	
	EV1 enabled/disabled selection when alarm sets 0	
	 When setting value is 0 (zero), alarm action can be Enabled or Disabled. Selection item: 	
	Disabled Disabled	
	リロップ Disabled	
	Displays when selecting \(\begin{align*} \lambda & \text{to} & \begin{align*} \lambda & \text{if} & \text{in the Event output EV1 allocation setting.} \end{align*}	
R IHY	EV1 hysteresis setting	
	Sets EV1 alarm hysteresis.	
	• Setting range: 0.1 to 1000.0 ℃(0.1 to 1800.0 ℉)	
	DC voltage, current inputs: 1 to 10000	
	Displays when selecting \(\sum \) to \(\sum \) \(\beta \) in the Event output EV1 allocation setting.	
8 197	EV1 action delay timer setting	
	Sets EV1 alarm action delay time.	
	Setting range: 0 to 10000 seconds	
	Displays when selecting \(\text{\text{\$\subset\$}} \) to \(\text{\text{\$\subset\$}} \) in the Event output EV1 allocation setting.	
RILA	EV1 action Energized/De-energized setting	
D noñL	Selects Energized/De-energized status for EV1 alarm.	
	Selection item:	
	nañL Energized	
	r E 出っ De-energized	
	Displays when selecting to fig. 14 in the Event output EV1 allocation setting.	
A ILc	EV1 output latch selection	
	Select the hold setting when the EV1 output is ON.	
	Selection item:	
	<i>□</i> Disabled	
	<i>当</i> E与□ Enabled	
	Displays when selecting to in the Event output EV1 allocation setting.	
F 5 15	TS1 output step number	
	Set the TS1 output step.	
	Setting range: 1 to 16	
<u> </u>	Displays when selecting 15 in the Event output EV1 allocation setting.	
Γ' 1F	TS1 OFF time setting	
	• Set the TS1 OFF time.	
	• Setting range: 00:00 to 99:59	
	Displays when selecting 5 in the Event output EV1 allocation setting.	

Characters,		
Factory	Setting Item, Function, Setting Range	
Default		
[5 lo	TS1 ON time setting	
	Set the TS1 ON time.	
	• Setting range: 00:00 to 99:59	
	Displays when selecting 15 in the Event output EV1 allocation setting.	
E802	Event output EV2 allocation setting	
	Selects Event output EV2 from Event Output Allocation Table.	
	Selection item: Same as the Event output EV1 allocation selection.	
	When (Option1: EV2) is attached, it will be displayed during EVT2 and EVT3.	
A2EA	EV2 enabled/disabled selection when alarm sets 0	
	When setting value is 0 (zero), alarm action can be Enabled or Disabled.	
	Selection item:	
	Disabled	
	모든니 Enabled	
	Displays when selecting to in the Event output EV2 allocation setting.	
82HY	EV2 hysteresis setting	
	Sets EV2 alarm hysteresis.	
	• Setting range: 0.1 to 1000.0 ℃(0.1 to 1800.0 ℉)	
	DC voltage, current inputs: 1 to 10000	
	Displays when selecting \(\text{L} \) to \(\text{L} \) in the Event output EV2 allocation setting.	
8284 	EV2 action delay timer setting	
	Sets EV2 alarm action delay time.	
	Setting range: 0 to 10000 seconds	
	Displays when selecting to i i i in the Event output EV2 allocation setting.	
AZLĀ	EV2 action Energized/De-energized setting	
□□ noñL	Selects Energized/De-energized status for EV2 alarm.	
	• Selection item:	
	nonL Energized	
	ァモビト De-energized	
יוב מ	Displays when selecting to if in the Event output EV2 allocation setting.	
A2Lc	EV2 output latch selection	
noll noll	Select the hold setting when the EV2 output is ON. Selection item:	
	• Selection item:	
	Disabled	
	<i>当</i> E≒□ Enabled	
	Displays when selecting \(\sum \) to \(\sum \) \(\text{II} \) in the Event output EV2 allocation setting.	

Characters,		
Factory	Setting Item, Function, Setting Range	
Default		
F 525	TS2 output step number	
	Set the TS2 output step.	
	Setting range: 1 to 16	
	Displays when selecting 15 in the Event output EV2 allocation setting.	
Γ 5 2 F	TS2 OFF time setting	
	Set the TS2 OFF time.	
	• Setting range: 00:00 to 99:59	
	Displays when selecting 🗀 /5 in the Event output EV2 allocation setting.	
r 42a	TS2 ON time setting	
	Set the TS2 ON time.	
	• Setting range: 00:00 to 99:59	
	Displays when selecting 15 in the Event output EV2 allocation setting.	
E803	Event output EV3 allocation setting	
	Selects Event output EV3 from Event Output Allocation Table.	
	Selection item: Same as the Event output EV1 allocation selection.	
	When (Option1: EV3) is attached, it will be displayed during EVT3.	
ABER	EV3 enabled/disabled selection when alarm sets 0	
	When setting value is 0 (zero), alarm action can be Enabled or Disabled.	
	Selection item:	
	Disabled	
	当Ehabled Enabled	
	Displays when selecting to in the Event output EV3 allocation setting.	
R3HY	EV3 hysteresis setting	
	Sets EV3 alarm hysteresis.	
	• Setting range: 0.1 to 1000.0 ೀ(0.1 to 1800.0 ೯)	
	DC voltage, current inputs: 1 to 10000	
	Displays when selecting \(\tag{ } \) to \(\) in the Event output EV3 allocation setting.	
834Y	EV3 action delay timer setting	
	Sets EV3 alarm action delay time.	
	Setting range: 0 to 10000 seconds	
	Displays when selecting \(\tag{1} \) to \(\tag{1} \) in the Event output EV3 allocation setting.	
	日日に	
□□ noñL	Selects Energized/De-energized status for EV3 alarm.	
	Selection item:	
	nonL Energized	
	ァ E 出っ De-energized	
	Displays when selecting to to I'H in the Event output EV3 allocation setting.	

Characters, Factory Default	Setting Item, Function, Setting Range	
83Lc	EV3 output latch selection	
	Select the hold setting when the EV3 output is ON.	
	Selection item:	
	Disabled	
	<i>当</i> とつ Enabled	
	Displays when selecting to to the Event output EV3 allocation setting.	
F 5 35	TS3 output step number	
	Set the TS3 output step.	
	Setting range: 1 to 16	
	Displays when selecting 15 in the Event output EV3 allocation setting.	
Γ '-3F	TS3 OFF time setting	
	Set the TS3 OFF time.	
	• Setting range: 00:00 to 99:59	
	Displays when selecting 15 in the Event output EV3 allocation setting.	
Γ53o	TS3 ON time setting	
	Set the TS3 ON time.	
	• Setting range: 00:00 to 99:59	
	Displays when selecting 15 in the Event output EV3 allocation setting.	

[Energized/De-energized]

When pool (Energized) is selected, each event output is conductive (ON) while each event output indicator is lit.

Each event output is not conductive (OFF) while each event output indicator is not lit.

When $r \not\in B'$ (De-energized) is selected, each event output is not conductive (OFF) while each event output indicator is lit.

Each event output is conductive (ON) while each event output indicator is not lit.

	Energized	De-energized
Event output indicator	Lit	Lit
Event output	ON	OFF

[Loop Break Alarm]

Detects control terminal errors (heater burnout, sensor disconnection).

When allocated to multiple EVT outputs, the set value is common.

The loop break alarm is evaluated for each loop break alarm time setting; if a normal condition is detected after an abnormal condition is detected, the alarm is cleared.

Loop break alarm time setting: 0 to 200 min

Loop break alarm band setting: 0 to 150 $^{\circ}$ (0 to 270 $^{\circ}$)

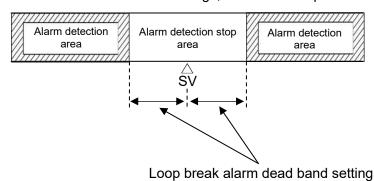
or 0.0 to 150.0 ℃ (0.0 to 270.0 ℉)

DC voltage, direct current input: 0 to 1500

Loop break alarm dead band setting:

0 to 150 °c (0 to 270 °F) or 0.0 to 150.0 °c (0.0 to 270.0 °F)

DC voltage, direct current input: 0 to 1500



(Fig. 6.3.3-1)

Output: Event output allocated to alarm output in event output setting mode

Selection item	Selection
Event output EV□ allocation setting	ार्म । Loop break alarm output

[Time Signal Output]

When Time signal output is selected in the Event output allocation setting, during program operation, when the TS output step occurs, the event output turns ON during the period where TS OFF time \leq elapsed time \leq (TS OFF time + TS ON time).

Selection item	Selection
Event output EV□ allocation setting	□□ /5: Time signal output

[Pattern end output]

When Pattern end output is selected in the Event output allocation setting, the Pattern end output is generated after program completion, and [P.End] flashes on the SV Display. The output turns OFF when the STOP operation is performed.

Selection item	Selection
Event output EV□ allocation setting	☐☐ / 7: Pattern end output

[Remote output]

When Remote output is selected in the Event output allocation setting, the host can forcibly turn the output ON or OFF.

Selection item	Selection
Event output EV□ allocation setting	☐☐ /B: Remote output

6.3.4 Transmission Output Setting Group

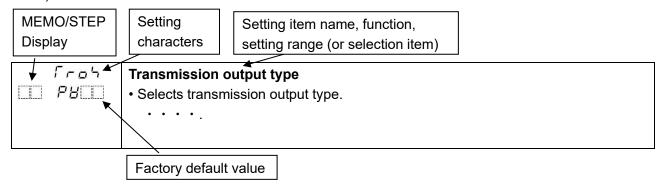
If (Option2: TA, TV) is not added, this setting group will not be displayed.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the transmission output setting group, follow the steps below.

Enter the transmission output setting.

①	In PV/SV display mode, press the O key several times until the character of the transmission output setting group is displayed.
[[5]	Press the Fe key

Characters,	
Factory	Setting Item, Function, Setting Range
Default	
5-05	Transmission output type
PB	Selects transmission output type.
	Selection item:
	PB PV transmission
	SV transmission
	multiple MV transmission
r-LH	Transmission output high limit setting (for PV and SV transmission)
II 1370	Sets the Transmission output high limit value.
	Setting range:
	Transmission output low limit setting to High limit input range
Γ – L L	Transmission output low limit setting (for PV and SV transmission)
CC -200	Sets the Transmission output low limit value.
	Setting range:
	Low limit input range to Transmission output high limit setting
$\Gamma - LH$	Transmission output high limit setting (for MV transmission)
	Sets the Transmission output high limit value.
	Setting range:
	Transmission output low limit setting to 105.0 %
$\Gamma - L L$	Transmission output low limit setting (for MV transmission)
	Sets the Transmission output low limit value.
	Setting range:
	-5.0 % to Transmission output high limit setting

6.3.5 External Setting Input Setting Group

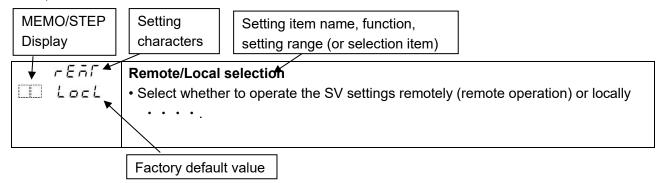
If (Option2: EA) is not added, this setting group will not be displayed.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the external setting input setting group, follow the steps below.

Enter the remote/Local selection.

	In PV/SV display mode, press the © key several times until the character of the external setting input setting group is displayed.
rEāſ	Press the 🕒 key.

Characters,	
	Oction Hom. Fraction Oction Bonne
Factory	Setting Item, Function, Setting Range
Default	
rEAF	Remote/Local selection
Lock	• Select whether to operate the SV settings remotely (remote operation) or locally
	(key operation).
	Selection item:
	Local Local
	r E ⊼ Γ Remote
- T L H	External setting input high limit setting
□□ I37Ø	Set the external setting input high limit value (value when 20 mA DC is input).
	Setting range:
	External setting input low limit setting to High limit input range
- [[[External setting input low limit setting
-200	Set the external setting input low limit value (value when 4 mA DC is input).
	Setting range:
	Low limit input range to External setting input high limit setting
-	Remote bias setting
	During remote action, SV includes the remote bias value.
	(External setting input low limit to External setting input high limit)
	• Setting range: ±20% of input span

6.3.6 Main Setting Group

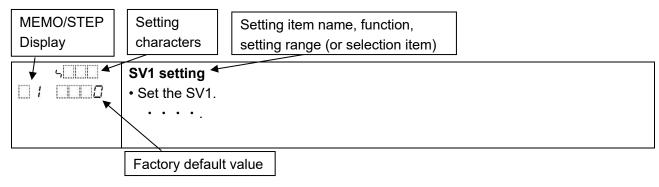
Explanation of setting items:

The upper section of the left column is the PV Display showing the process value.

The lower right section is the SV Display showing the factory default value.

The lower left section is the MEMO/STEP Display showing the setpoint memory number.

The right column shows the setting item name, description, and setting range.



To enter the main setting group, follow the steps below.

	In PV/SV display mode, press the CO key several times until the character of the main setting group is displayed.
2	Press the 🕒 key. Enter the SV1 setting.

Characters,	
Factory	Setting Item, Function, Setting Range
Default	
٠,[]]	SV1 setting
	• Set the SV1.
	Setting range:
	Scaling low limit to Scaling high limit
4	SV2 setting (*1)
	• Set the SV2.
	Setting range:
	Scaling low limit to Scaling high limit
5	SV3 setting (*1)
	• Set the SV3.
	Setting range:
	Scaling low limit to Scaling high limit
4	SV4 setting (*1)
U4	• Set the SV4.
	Setting range:
	Scaling low limit to Scaling high limit
5 [][][]	SV5 setting (*2)
S 200	• Set the SV5.
	Setting range:
	Scaling low limit to Scaling high limit

Characters,	
Factory	Setting Item, Function, Setting Range
Default	
4	SV6 setting (*2)
6 6	• Set the SV6.
	Setting range:
	Scaling low limit to Scaling high limit
4	SV7 setting (*2)
7	• Set the SV7.
	Setting range:
	Scaling low limit to Scaling high limit
5	SV8 setting (*2)
	• Set the SV8.
	Setting range:
	Scaling low limit to Scaling high limit

- (*1): If (Option2: C5W) is selected, or if the set value memory function is not selected in the Event input allocation setting, this setting item will not be displayed.
- (*2): If (Option2: EI) is selected, or if the set value memory function is not selected in the Event input allocation setting, this setting item will not be displayed.

7. Settings

In this section, each setting group will be explained.

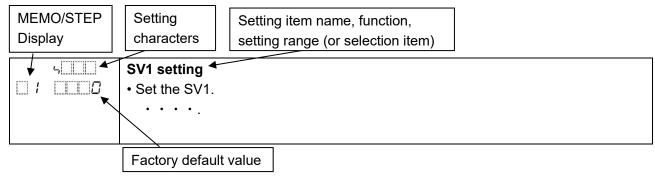
7.1 Main Setting Group

Explanation of setting items:

The upper section of the left column shows the PV value on the PV Display, while the lower right section shows the factory default value on the SV Display.

The lower left section shows the MEMO/STEP Display, indicating the setpoint memory number.

The right column shows the setting item name, description, and setting range.



To enter the main setting group, follow the steps below.

		In PV/SV display mode, press the © key several times until the character of the main setting group is displayed.
2 1	5	Press the 🕒 key. Enter the SV1 setting.

Characters,	
Factory	Setting Item, Function, Setting Range
Default	
- ,[SV1 setting
	• Set the SV1.
	Setting range:
	Scaling low limit to Scaling high limit
4	SV2 setting (*1)
	• Set the SV2.
	Setting range:
	Scaling low limit to Scaling high limit
4	SV3 setting (*1)
	• Set the SV3.
	Setting range:
	Scaling low limit to Scaling high limit
5 [][][]	SV4 setting (*1)
	• Set the SV4.
	Setting range:
	Scaling low limit to Scaling high limit
٢,[]	SV5 setting (*2)
os oda	• Set the SV5.
	Setting range:
	Scaling low limit to Scaling high limit

Characters,	
Factory	Setting Item, Function, Setting Range
Default	
4	SV6 setting (*2)
O5 COO	• Set the SV6.
	Setting range:
	Scaling low limit to Scaling high limit
5	SV7 setting (*2)
7 000	• Set the SV7.
	Setting range:
	Scaling low limit to Scaling high limit
5	SV8 setting (*2)
	• Set the SV8.
	Setting range:
	Scaling low limit to Scaling high limit

- (*1): If (Option2: C5W) is selected, or if the set value memory function is not selected in the Event input allocation setting, this setting item will not be displayed.
- (*2): If (Option2: EI) is selected, or if the set value memory function is not selected in the Event input allocation setting, this setting item will not be displayed.

7.2 Program Settings Group

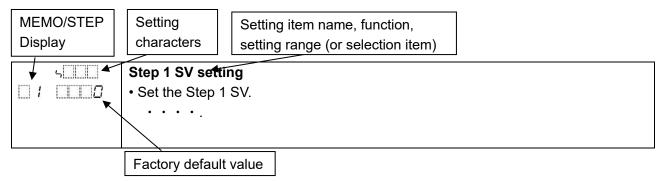
If program control is selected in the control/program control selection, this setting group will be displayed.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the program step number for the MEMO/STEP Display.

The right column shows the setting item name, description, and setting range.



To enter the program setting group, follow the steps below.

	P.r.o.G 0000	In PV/SV display mode, press the wey several times until the character of the program setting group is displayed.
2 1	'	Press the 🕒 key. Enter the Step 1 SV setting item.

	aracters, actory	Setting Item, Function, Setting Range
I	Default	
	<u> </u>	Step 1 SV setting
		Set the Step 1 SV.
		Setting range:
	-,	Scaling low limit to Scaling high limit
	FLAE	Step 1 time setting
	0000	• Set the Step 1 time.
		• Setting range:
	⊒R! F	Step 1 weight block No. setting
		Set the weight block No. to be used in Step 1.
		Setting range:
	—	1 to 8
- I	PI d[]	Step 1 PID block No. setting
	——	Set the PID block No. to be used in Step 1. Setting range:
		• Setting range: 1 to 8
	5[]]	Step 2 SV setting
		• Set the Step 2 SV.
		• Setting range:
		Scaling low limit to Scaling high limit
	ri ae	Step 2 time setting
<i>□2</i>	0000	Set the Step 2 time.
		Setting range:
		======, 00:00 to 99:59
	JRI F	Step 2 weight block No. setting
		• Set the weight block No. to be used in Step 2.
		• Setting range:
	PI d	1 to 8 Step 2 PID block No. setting
		• Set the PID block No. to be used in Step 2.
i	liii •	• Setting range:
		1 to 8
	5[]]	Step 3 SV setting
$\square 3$		Set the Step 3 SV.
		Setting range:
		Scaling low limit to Scaling high limit
	ri ae	Step 3 time setting
3	0000	Set the Step 3 time.
		• Setting range:
	-016	, 00:00 to 99:59
	JRI F	Step 3 weight block No. setting
□∃	<u> </u>	Set the weight block No. to be used in Step 3. Setting range:
		Setting range: 1 to 8
	PI d	Step 3 PID block No. setting
□ 3		• Set the PID block No. to be used in Step 3.
		• Setting range:
		1 to 8
		The same applies up to program step No. 16.

Characters,				
Factory	Setting Item, Function, Setting Range			
Default	g tamig			
5	Step 16 SV setting			
is IIIO	Set the Step 16 SV.			
	Setting range:			
	Scaling low limit to Scaling high limit			
ri ae	Step 16 time setting			
ls 0000	• Set the Step 16 time.			
	Setting range:			
	=====, 00:00 to 99:59			
JRI F	Step 16 weight block No. setting			
ls IIII l	Set the weight block No. to be used in Step 16.			
	Setting range:			
	1 to 8			
P! d□	Step 16 PID block No. setting			
ls IIII	Set the PID block No. to be used in Step 16.			
	Setting range:			
	1 to 8			

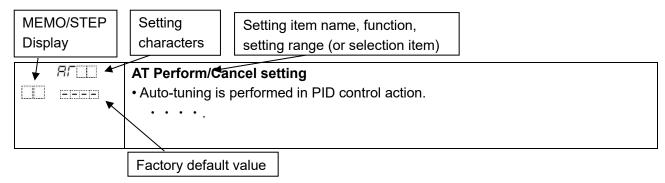
7.3 AT Settings Group

Explanation of setting items:

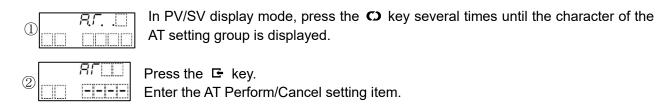
The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the AT setting group, follow the steps below.



Cotting Item Function Cotting Dange			
Setting Item, Function, Setting Range			
AT Perform/Cancel setting			
• Auto-tuni	ng is performed in PID control action.		
Press th	e up key to start auto-tuning, and the down key to cancel it.		
	uning does not finish within 4 hours after starting, it will be forcibly		
	ed. (This is invalid for operations other than PID control action.)		
	AT cancel		
HILL	AT perform		
	model selection		
	ormal AT, AT on startup, or Fast AT.		
	Normal AT		
FRΓ□ Fast AT			
AT bias setting			
Set the bias value that automatically determines the AT point based on the PV/SV			
deviation (invalid for no PID control action and DC voltage/direct current input).			
• Setting range:			
0 to 50 ℃ (0 to 90 ℉) or 0.0 to 50.0 ℃ (0.0 to 90.0 ℉)			
AT gain setting			
Set the ratio of the proportional band calculated during AT perform.			
• Setting range:			
AT hysteresis setting			
_	_		
	nreshold for switching AT from ON to OFF and from OFF to ON.		
	ਗਾge. ਹ °c (0.0 to 9.0 °F)		
	ge, direct current input: 0 to 50		
	• Auto-tuning Press the If auto-to terminate • Selection Fraction • Selection Fraction • Selection Fraction • Set the bodeviation • Setting ration • Setting ra		

7.4 PID Settings Group

Set the parameters for PID blocks 1 to 8.

In the case of fix control, the PID block for SVn is the nth block.

%n : 1 to 8

Fix control SVn	PID block n
SV1	PID block1
SV2	PID block2
SV8	PID block8

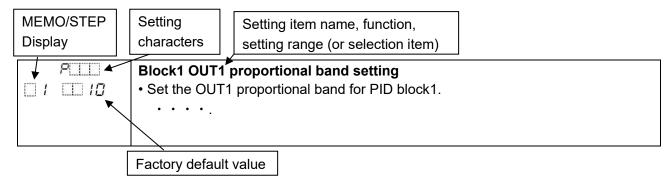
(1)	OUT1 proportional band setting (block n)	Set the OUT1 proportional band for PID block n.
(2)	OUT1 integral time setting (block n)	Set the OUT1 integral time for PID block n.
(3)	OUT1 derivative time setting (block n)	Set the OUT1 derivative time for PID block n.
(4)	OUT2 proportional band setting (block n)	Set the OUT2 proportional band for PID block n.
(5)	OUT2 integral time setting (block n)	Set the OUT2 integral time for PID block n.
(6)	OUT2 derivative time setting (block n)	Set the OUT2 derivative time for PID block n.
(7)	MV bias setting (block n)	Set the OUT2 MV bias for PID block n.
(8)	Overlap and deadband setting (block n)	Set the OUT2 overlap and deadband for PID block n.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the PID block number for the MEMO/STEP Display.

The right column shows the setting item name, description, and setting range.



To enter the PID setting group, follow the steps below.

	.d[]	In PV/SV display mode, press the \mathbf{O} key several times until the character of the PID setting group is displayed.
2 P		Press the 🕒 key. Enter the Block1 OUT1 proportional band setting item.

Characters,			
Factory Default	Setting Item, Function, Setting Range		
P	Block1 OUT1 proportional band setting		
	Set the OUT1 proportional band for PID block1.		
	Setting range:		
	Except when Fast-PID control is selected		
	Input without decimal point: 1 to input span ℃ (೯)		
	Input with decimal point: 0.1 to input span $^\circ\!\!\!\!\!\!\!\!\!\!\!\!^\circ$ ($_{\mathbb F}$)		
	DC voltage, direct current input: 0.1 to 1000.0 %		
	When Fast-PID control is selected		
	Input without decimal point: 0 to input span °c (¬r)		
	Input with decimal point: 0.0 to input span °C (F)		
, III	DC voltage, direct current input: 0.0 to 1000.0 %		
	Block1 OUT1 integral time setting		
	Set the OUT1 integral time for PID block1. Setting range:		
	Setting range: Except when Slow DID control is collected.		
	Except when Slow-PID control is selected 0 to 10000 sec or 0.0 to 1999.9 sec		
	When Slow-PID control is selected		
	1 to 10000 sec or 0.1 to 1999.9 sec		
d	Block1 OUT1 derivative time setting		
	Set the OUT1 derivative time for PID block1.		
	• Setting range:		
	0 to 10000 sec or 0.0 to 1999.9 sec		
P_6	Block1 OUT2 proportional band setting		
	• Set the OUT2 proportional band for PID block1.		
	Setting range:		
	0 to input span ீ (ஈ) or 0.0 to input span ீ (ஈ)		
	DC voltage, direct current input: 0.0 to 1000.0 %		
	This setting item will not be displayed except when selecting \(\subseteq \textstyle \) (OUT2) in the Event output EV2		
	allocation setting for [Option1: EV2, O2(SSR/A)].		
/ _b	Block1 OUT2 integral time setting		
	Set the OUT2 integral time for PID block1.		
	Setting range:		
	Except when Slow-PID control is selected		
	0 to 10000 sec or 0.0 to 1999.9 sec		
	When Slow-PID control is selected		
, , , , , , , , , , , , , , , , , , , ,	1 to 10000 sec or 0.1 to 1999.9 sec		
d_b□	Block1 OUT2 derivative time setting		
	Set the OUT2 derivative time for PID block1.		
	• Setting range:		
_	0 to 10000 sec or 0.0 to 1999.9 sec		
-585	Block1 MV bias setting		
	• Set the MV bias for PID block1.		
	• Setting range:		
	0.0 to 100.0 %		

Characters,				
Factory Default	Setting Item, Function, Setting Range			
db 🗆	Block1 Overlap and deadband setting			
□ / □□Q <i>0</i>	Set the overlap and deadband for PID block1.			
	Setting range:			
	-100.0 to 100.0 ℃ (-180.0 to 180.0 ℉)			
	DC voltage, direct current input: -1000 to 1000			
	This setting item will not be displayed except when selecting \(\textstyle{\textstyle{1}} \)? (OUT2) in the Event output EV2 allocation setting for [Option1: EV2, O2(SSR/A)].			
	The same applies up to block No. 8.			
PIII	Block8 OUT1 proportional band setting			
□a □□ IO	• Set the OUT1 proportional band for PID block8.			
	• Setting range:			
	Except when Fast-PID control is selected			
	Input without decimal point: 1 to input span ℃ (₮)			
	Input with decimal point: 0.1 to input span ℃ (೯)			
	DC voltage, direct current input: 0.1 to 1000.0 %			
	When Fast-PID control is selected			
	Input with decimal point: 0 to input span ℃ (₮)			
	Input with decimal point: 0.0 to input span ເຕັ (೯) DC voltage, direct current input: 0.0 to 1000.0 %			
1	Block8 OUT1 integral time setting			
Os 0200	Set the OUT1 integral time for PID block8.			
	Setting range:			
	Except when Slow-PID control is selected			
	0 to 10000 sec or 0.0 to 1999.9 sec			
	When Slow-PID control is selected			
	1 to 10000 sec or 0.1 to 1999.9 sec			
d. . ∏8	Block8 OUT1 derivative time setting			
La LL50	Set the OUT1 derivative time for PID block8. Setting range:			
	• Setting range: 0 to 10000 sec or 0.0 to 1999.9 sec			
P_ b	Block8 OUT2 proportional band setting			
□8 □□ 10	• Set the OUT2 proportional band for PID block8.			
2	• Setting range:			
	0 to input span ී (ஈ) or 0.0 to input span ீ (ஈ)			
	DC voltage, direct current input: 0.0 to 1000.0 %			
	This setting item will not be displayed except when selecting \(\subseteq 2 \) (OUT2) in the Event output EV2			
, , , , , , , , , , , , , , , , , , , ,	allocation setting for [Option1: EV2, O2(SSR/A)].			
	Block8 OUT2 integral time setting			
□s □200	Set the OUT2 integral time for PID block8.Setting range:			
	Except when Slow-PID control is selected			
	0 to 10000 sec or 0.0 to 1999.9 sec			
	When Slow-PID control is selected			
	1 to 10000 sec or 0.1 to 1999.9 sec			

Characters,			
Factory Setting Item, Function, Setting Range			
Default			
d_b□	Block8 OUT2 derivative time setting		
□s □□5 <i>0</i>	Set the OUT2 derivative time for PID block8.		
	Setting range:		
	0 to 10000 sec or 0.0 to 1999.9 sec		
- 585	Block8 MV bias setting		
□s □□QO	Set the MV bias for PID block8.		
	Setting range:		
	0.0 to 100.0 %		
d b	Block8 Overlap and deadband setting		
□s □□QO	Set the overlap and deadband for PID block8.		
	Setting range:		
	-100.0 to 100.0 ℃ (-180.0 to 180.0 ℉)		
	DC voltage, direct current input: -1000 to 1000		
	This setting item will not be displayed except when selecting T2 (OUT2) in the Event output EV2		
	allocation setting for [Option1: EV2, O2(SSR/A)].		

7.5 Alarm Setting Group

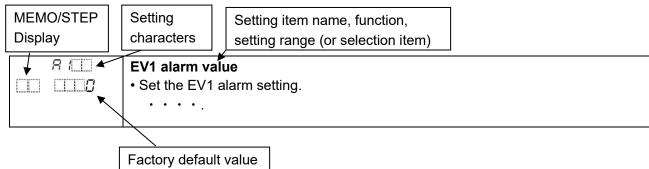
If selecting alarm	n actions (📖 📒	to □□ /ਟ), heate	er burnout alarm ($(\square\square : \exists)$, and	loop break alarm
(□□ /坮) in the f	Event output EV□	allocation setting	, this setting grou	p will be displa	yed.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting item name, description, and setting range.



To enter the alarm setting group, follow the steps below.

RL.Ā.()	In PV/SV display mode, press the © key several times until the character of the alarm setting group is displayed.

(D)		Press the 🕒 key.
		Enter the EV1 alarm value item.

Characters, Factory Default	Setting Item, Function, Setting Range			
R (EV1 alarm value			
	Set the EV1 alarm setting.			
	This is displayed when selecting an ala	arm action in the Event output EV1		
	allocation setting.			
		t High/Low limits independent alarm) in the		
	Event output EV1 allocation setting, se	et the low limit action point for the EV1		
	alarm.			
	Selection item:			
	No action (144)			
	High limit alarm -(Input span) to Input span (*1)			
	Low limit alarm -(Input span) to Input span (*1)			
	High/Low limits alarm 0 to Input span (*1)			
	High/Low limits independent alarm 0 to Input span (*1)			
	High/Low limit range alarm	0 to Input span (*1)		
	High/Low limit range independent alarm	0 to Input span (*1)		
	Process high alarm Input range low limit to Input range high limit (*2)			
	Process low alarm Input range low limit to Input range high limit (*2)			
	High limit with standby alarm -(Input span) to Input span (*1)			
	Low limit with standby alarm -(Input span) to Input span (*1)			
	High/Low limits with standby alarm	0 to Input span (*1)		
	High/Low limits with standby independent alarm	0 to Input span (*1)		

- (*1): For DC voltage and direct current inputs, this is the scaling range. (Maximum setting: -19999 to 19999)
- (*2): For DC voltage and direct current inputs, this is the scaling low limit (high limit). (Maximum setting: -19999 to 19999)

Characters,	
Factory	Setting Item, Function, Setting Range
Default	
R IH□	EV1 high limit alarm value
	Set the EV1 high limit alarm value.
	When selecting ☐☐☐坮 (Alarm output High/Low limits independent alarm) in the
	Event output EV1 allocation setting, set the low limit action point for the EV1
	alarm.
	Selection item: Same as those of EV1 alarm value.
R2	EV2 alarm value
	• Set the EV2 alarm setting.
	This is displayed when selecting an alarm action in the Event output EV2 allocation setting.
	When selecting 교교다 (Alarm output High/Low limits independent alarm) in the
	Event output EV2 allocation setting, set the low limit action point for the EV2
	alarm.
	Selection item: Same as those of EV1 alarm value.
	This setting item will be displayed, when adding (Option1: EV2, EV3) and selecting alarm actions
	to ☐☐ /ᢓ in the Event output EV☐ allocation setting.
R2H□	EV2 high limit alarm value
	Set the EV2 high limit alarm value.
	When selecting (Alarm output High/Low limits independent alarm) in the
	Event output EV2 allocation setting, set the low limit action point for the EV2
	alarm.
	Selection item: Same as those of EV1 alarm value.
	This setting item will be displayed, when adding (Option1: EV2, EV3) and selecting alarm actions
	to ☐ /2 in the Event output EV☐ allocation setting.
R3	EV3 alarm value Set the EV3 alarm setting.
	This is displayed when selecting an alarm action in the Event output EV3
	allocation setting.
	When selecting (Alarm output High/Low limits independent alarm) in the
	Event output EV3 allocation setting, set the low limit action point for the EV3
	alarm.
	• Selection item: Same as those of EV1 alarm value.EVT3Alarm action 点設定
0.3v.(***)	This setting item will be displayed, when adding (Option1: EV3).
R3HO	EV3 high limit alarm value
	• Set the EV3 high limit alarm value.
	When selecting (Alarm output High/Low limits independent alarm) in the
	Event output EV3 allocation setting, set the low limit action point for the EV3 alarm.
	Selection item: Same as those of EV1 alarm value.
	This setting item will be displayed, when adding (Option1: EV3).
н Ш	Heater burnout alarm 1 value
	Set the heater current value for Heater burnout alarm 1.
Mode character and	Mode characters and CT1 current value are indicated alternately.
CT1 current value	Setting range:
are alternately indicated (0.5 sec	0.0 to 20.0 A (Option: W20)
cycle).	0.0 to 100.0 A (Option: W100)
	This setting item will be displayed, when adding [Option2: C5W(20A), C5W(100A), W(20A), W(100A)] and
	selecting heater burnout alarm \square $!3$ in the Event output EV \square allocation setting.
	selecting heater burnout alarm ☐ /3 in the Event output EV☐ allocation setting.

Characters,			
Factory	Setting Item, Function, Setting Range		
Default			
H2III	Heater burnout alarm 2 value		
	Se the heater current value for Heater burnout alarm 2.		
Mode character and	Mode characters and CT2 current value are indicated alternately.		
CT2 current value	Setting range:		
are alternately indicated (0.5 sec	0.0 to 20.0 A (Option: W20)		
cycle).	0.0 to 100.0 A (Option: W100)		
	This setting item will be displayed, when adding [Option2: C5W(20A), C5W(100A), W(20A), W(100A)] and		
	selecting heater burnout alarm □□ /∃ in the Event output EV□ allocation setting.		
LP_F	Loop break alarm time setting		
	Set the time to assess the Loop break alarm.		
	• Setting range: 0 to 200 min		
	This setting item will be displayed, when adding [Option2: C5W(20A), C5W(100A), W(20A), W(100A)] and		
1011	selecting loop break alarm ☐ 'l' in the Event output EV☐ allocation setting.		
LP_H	Loop break alarm band setting Set the temperature to assess the Loop break alarm.		
	Setting range:		
	0 to 150 ℃ (0 to 270 ℉) or 0.0 to 150.0 ℃ (0.0 to 270.0 ℉)		
	DC voltage, current inputs: 0 to 1500		
	This setting item will be displayed, when selecting loop break alarm ☐ / in the Event output EV☐		
	allocation setting.		
LP_d	Loop break alarm dead band setting		
	Set the temperature to assess the Loop break alarm dead band.		
	Setting range:		
	0 to 150 °c (0 to 270 ஈ) or 0.0 to 150.0 °c (0.0 to 270.0 ஈ)		
	DC voltage, current inputs: 0 to 1500		
	This setting item will be displayed, when selecting loop break alarm ☐ /Ч in the Event output EV☐		
	allocation setting.		

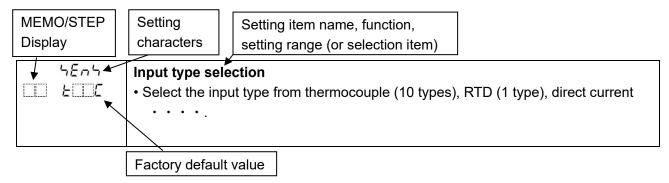
7.6 Input Setting Group

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, where is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the input setting group, follow the steps below.

	In PV/SV display mode, press the input setting group is displayed.	key several times until the character of the
('2)	Press the 🕒 key.	

Characters, Factory	Setting Item, Function, Setting Range				
Default					
hEnh	Input type selection				
	• Select the input type from thermocouple (10 types), RTD (1 type), direct curr				
		and DC voltage (4 type), and the unit °c/r.			
	When changing the input from DC voltage to other inputs, remove the sensor connected to this controller first, then change the input. If the input is changed				
	with the sensor connected, the input circuit may break. • When changing an input type, refer to Section "8.9 Items to be Initialized by				
	Changing Settings" (p.131). • Selection item:				
	E L	K -200 to 1370 ℃			
	£8 E	K -200.0 to 800.0 ℃			
	E4 [K -200.0 to 400.0 ℃			
	JULE	J -200 to 1000 ℃			
	J I	J -200.0 to 400.0 °c			
	<u>-</u> [_[_[R 0 to 1760 ℃			
	5 II E	S 0 to 1760 °c			
	ьшс	B 0 to 1820 ℃			
	ELLE	E -200 to 800 ℃			
	Γ□ .C	T -200.0 to 400.0 ℃			
		N -200 to 1300 ℃			
	PL2E	PL-II 0 to 1390 ℃			
	<u>-</u> Ε Ε Ε	C(W/Re5-26) 0 to 2315 °c			
	PF .E	Pt100 -200.0 to 850.0 °c			
	PTUE	Pt100 -200 to 850 ℃			
	PT UE	Pt100 -100.0 to 100.0 ℃			
	4201	4 to 20 mA DC (*1) -19999 to 19999			
	0201	0 to 20 mA DC (*1) -19999 to 19999			
	4208	4 to 20 mA DC (*2) -19999 to 19999			
	0208	0 to 20 mA DC (*2) -19999 to 19999			
	0 18	0 to 1 V DC -19999 to 19999			
	0058	0 to 5 V DC -19999 to 19999			
	1058	1 to 5 V DC -19999 to 19999			
	0 108	0 to 10 V DC -19999 to 19999			

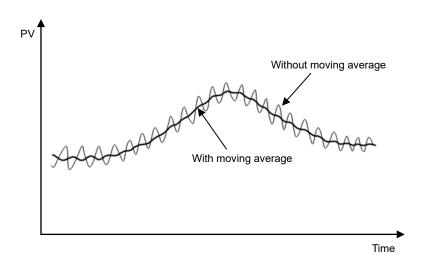
^{(*1):} It has a built-in receiving resistor (50 Ω).

^{(*2):} The separately sold receiving resistor (50 Ω) is attached externally.

Select the temperature sensor units: Celsius or Fahrenheit. Selection item: CI Celsius FILT Fahrenheit Scaling high limit setting Scaling low limit setting Scaling low limit setting Sets scaling low limit value to Input range high limit value Scaling low limit setting Sets scaling low limit value to Scaling high limit value Scaling low limit setting Sets scaling low limit value Scaling low limit setting Sets scaling low limit value to Scaling high limit value Decimal point position selection Selects decimal point place Selection item: □□□□ 1 digit after decimal point □□□□□ 2 digits after decimal point □□□□□ 3 digits after decimal point □□□□□ 4 digits after decimal point □□□□□ 4 digits after decimal point □□□□□ 5 elects sampling period. Selection item: □□□□ 1 25 ms □□□□ 1 10 ms Number of moving average setting Sets number of times to average fluctuations in input values. Sets number of times to average fluctuations in input values. Sets ensor correction coefficients. Sets sensor correction coefficients. Sets sensor correction coefficients. Sets sensor correction values. Setting range: 1.00.0 to 10.00 ∞ (-180.0 to 180.0 ▼)	Characters, Factory Default	Setting Item, Function, Setting Range			
Selection item: Clician Celsius Filt Fahrenheit Scaling high limit setting Scaling high limit setting Scaling low limit value Scaling low limit setting Scaling low limit setting Scaling low limit value to Scaling high limit value Decimal point position selection Selects decimal point place Selects decimal point Selects decimal point Selection item: Selection item: Scaling low limit setting Selection item: Selection item: Selection item: Selection item: Selection item: Selection Selection Selection Selection Selection Selection Selection Selection S	<u> Corf</u>	Temperature unit selection			
Celsius File Fahrenheit Scaling high limit setting Seting range: Scaling low limit value to Input range high limit value Setting range: Scaling low limit value to Input range high limit value Setting range: Scaling low limit value to Scaling high limit value Setting range: Input range low limit value to Scaling high limit value Decimal point position selection Selects decimal point place Selects decimal point place Selects decimal point Decimal point place Selects decimal point Decimal		Select the temperature sensor units: Celsius or Fahrenheit.			
File Fahrenheit Scaling high limit setting Sets scaling high limit value. Setting range: Scaling low limit value to Input range high limit value Scaling low limit setting Scaling low limit setting Scaling low limit value. Setting range: Input range low limit value to Scaling high limit value Setting range: Input range low limit value to Scaling high limit value Decimal point position selection Selects decimal point place. Selection item: GGGG 1 digit after decimal point GGGG 2 digits after decimal point GGGG 3 digits after decimal point Available only for DC voltage and current inputs Input sampling selection Selects ampling period. Selects ampling period. Selection item: 125 125 ms 150 50 ms 160 10 ms Number of moving average setting Sets number of times to average fluctuations in input values. Setting range: 1 to 10 Sensor correction coefficient setting Sets sensor correction setting Sets sensor correction setting Sets sensor correction values. Setting range: -100.0 to 100.00 %(-180.0 to 180.0 ர)					
Scaling high limit setting Sets scaling high limit value. Setting range: Scaling low limit value to Input range high limit value Scaling low limit setting Scaling low limit value. Scaling low limit value. Scaling low limit value. Scaling low limit value. Setting range: Input range low limit value to Scaling high limit value Decimal point position selection Selects decimal point place. Selection item:					
Sets scaling high limit value. Setting range: Scaling low limit value to Input range high limit value Scaling low limit setting Sets scaling low limit value. Sets scaling low limit value. Setting range: Input range low limit value to Scaling high limit value Setting range: Input range low limit value to Scaling high limit value Decimal point position selection Selects decimal point place. Selection item:		FIII Fahrenheit			
Setting range: Scaling low limit value to Input range high limit value Scaling low limit setting Sets scaling low limit value. Sets scaling low limit value. Setting range: Input range low limit value to Scaling high limit value Decimal point position selection Selects decimal point position selection Selects decimal point point Decimal point position selection Selects decimal point position selection Decimal point position selec					
Scaling low limit setting Sets scaling low limit value. Setting range: Input range low limit value to Scaling high limit value Decimal point position selection Selects decimal point place. Selection item:		Sets scaling high limit value.			
Sets scaling low limit value. Setting range: Input range low limit value to Scaling high limit value Decimal point position selection Selects decimal point place. Selection item:		Setting range: Scaling low limit value to Input range high limit value			
Setting range: Input range low limit value to Scaling high limit value Decimal point position selection Selects decimal point place. Selection item:					
Decimal point position selection Selects decimal point place. Selection item: DECIMAL POINT DECIMAL POINT	-200				
- Selects decimal point place Selection item: □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□	, ,=,;,;,				
*Selection item: Selection item: Selection No decimal point Selection 1 digit after decimal point Selection 2 digits after decimal point Selection 4 digits after decimal point Available only for DC voltage and current inputs Input sampling selection Selects sampling period. Selection item: 125		•			
No decimal point 1 digit after decimal point 2 digits after decimal point 2 digits after decimal point 2 digits after decimal point 4 digits after decimal point Available only for DC voltage and current inputs Input sampling selection • Selects sampling period. • Selection item: 1 2 5 125 ms 5 0 ms 1 10 10 ms Number of moving average setting • Sets number of times to average fluctuations in input values. • Setting range: 1 to 10 Sensor correction coefficients • Setting range: 0.000 to 10.000 Sensor correction setting • Sets sensor correction values. • Setting range: -100.0 to 100.0 rc(-180.0 to 180.0 r)		•			
1 digit after decimal point 2000 2 digits after decimal point 2000 3 digits after decimal point 4 digits after decimal point 4 digits after decimal point 4 Available only for DC voltage and current inputs Input sampling selection Selects sampling period. Selects sampling period. Selection item: 125 125 ms 125 ms 10 ms Number of moving average setting Sets number of times to average fluctuations in input values. Setting range: 1 to 10 Sensor correction coefficients setting Sets sensor correction coefficients. Setting range: 0.000 to 10.000 Sensor correction setting Sets sensor correction values. Setting range: -100.0 to 100.0 to 180.0 to 1					
2 digits after decimal point 2000 3 digits after decimal point 4 digits after decimal point Available only for DC voltage and current inputs Input sampling selection • Selects sampling period. • Selection item: 125 125 ms 150 50 ms 10 10 ms Number of moving average setting • Sets number of times to average fluctuations in input values. • Setting range: 1 to 10 Sensor correction coefficients setting • Sets sensor correction coefficients. • Setting range: 0.000 to 10.000 Sensor correction setting • Sets sensor correction values. • Setting range: -100.0 to 100.0 °c(-180.0 to 180.0 °F)					
CODD 3 digits after decimal point					
LODD 4 digits after decimal point		and the same of th			
Available only for DC voltage and current inputs Input sampling selection Selects sampling period. Selection item: 125 125 ms 125 50 ms 10 10 ms Number of moving average setting Sets number of times to average fluctuations in input values. Setting range: 1 to 10 Sensor correction coefficient setting Sets sensor correction coefficients. Setting range: 0.000 to 10.000 Sensor correction setting Sets sensor correction values. Setting range: -100.0 to 100.0 rc(-180.0 to 180.0 r)					
Input sampling selection Selects sampling period. Selection item: 125 125 ms 50 ms 10		1 - 3-3-1 3-1-			
Selects sampling period. Selection item: 125 125 ms 50 ms 10 10 ms Number of moving average setting Sets number of times to average fluctuations in input values. Setting range: 1 to 10 Sensor correction coefficient setting Sets sensor correction coefficients. Setting range: 0.000 to 10.000 Sensor correction setting Sets sensor correction values. Sets sensor correction values. Setting range: -100.0 to 100.0 °c(-180.0 to 180.0 °F)					
Selection item: 125 125 ms 50 ms 10 ms	TOTAL CONTROL OF THE PARTY OF THE PARTY.				
125 125 ms 50 ms 10 ms Number of moving average setting Sets number of times to average fluctuations in input values. Setsing range: 1 to 10 Sensor correction coefficient setting Sets sensor correction coefficients. Sets sensor correction coefficients Sets sensor correction coefficients Sets sensor correction setting Sensor correction setting Sensor correction setting Sets sensor correction values. Sets sensor correction values. Sets sensor correction values. Setting range: -100.0 to 100.0 %(-180.0 to 180.0 %)					
Sets number of times to average fluctuations in input values. Sets number of times to average fluctuations in input values. Setting range: 1 to 10 Sensor correction coefficient setting Sets sensor correction coefficients. Setting range: 0.000 to 10.000 Sensor correction setting Sets sensor correction values. Setting range: -100.0 to 100.0 ℃(-180.0 to 180.0 ₮)					
### 10 ms ### 5 Number of moving average setting • Sets number of times to average fluctuations in input values. • Setting range: 1 to 10 • Sensor correction coefficient setting • Sets sensor correction coefficients. • Setting range: 0.000 to 10.000 • Sensor correction setting • Sets sensor correction values. • Setting range: -100.0 to 100.0 ♥(-180.0 to 180.0 ♥)					
Number of moving average setting Sets number of times to average fluctuations in input values. Setting range: 1 to 10 Sensor correction coefficient setting Sets sensor correction coefficients. Setting range: 0.000 to 10.000 Sensor correction setting Sensor correction setting Sensor correction values. Setting range: -100.0 to 100.0 °c(-180.0 to 180.0 °F)					
Sets number of times to average fluctuations in input values. Setting range: 1 to 10 Sensor correction coefficient setting Sets sensor correction coefficients. Setting range: 0.000 to 10.000 Sensor correction setting Sensor correction values. Setting range: -100.0 to 100.0 °c(-180.0 to 180.0 °F)	9H-C	1.5.11.5			
Setting range: 1 to 10 Sensor correction coefficient setting Sets sensor correction coefficients. Setting range: 0.000 to 10.000 Sensor correction setting Sensor correction values. Setting range: -100.0 to 100.0 °c(-180.0 to 180.0 °F)					
Sensor correction coefficient setting Sets sensor correction coefficients. Setting range: 0.000 to 10.000 Sensor correction setting Sets sensor correction values. Setting range: -100.0 to 100.0 °c(-180.0 to 180.0 °F)	L	·			
Setting range: 0.000 to 10.000 Sensor correction setting Sets sensor correction values. Setting range: -100.0 to 100.0 °c(-180.0 to 180.0 °F)	50E[]	· · ·			
Sensor correction setting • Sets sensor correction values. • Setting range: -100.0 to 100.0 °c(-180.0 to 180.0 °F)	(000				
• Sets sensor correction values. • Setting range: -100.0 to 100.0 ℃(-180.0 to 180.0 ℉)		ů ů			
• Setting range: -100.0 to 100.0 °c(-180.0 to 180.0 °F)					
,					
DC Voltage current inputs: -1000 to 1000		,			
·	C' ' C	DC voltage, current inputs: -1000 to 1000			
• Sets PV filter time constant.		PV filter time constant setting			
• Setting range: 0.0 to 10.0 seconds					

[Number of moving average setting]

By averaging values that fluctuate due to noise, the display value is stabilized. Moving average count: 1 to 10 times



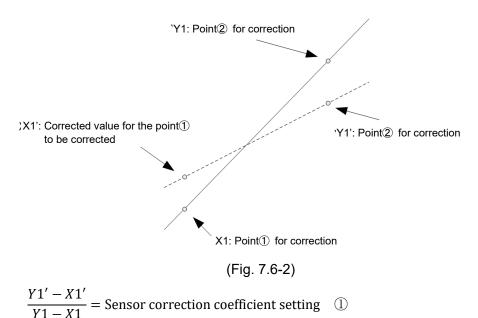
(Fig. 7.6-1)

[Sensor correction coefficient setting]

The slope of the sensor input value can be set.

The slope is set to the value calculated using formula ①.

Correction range: 0.000 to 10.000



[Sensor correction setting]

When the temperature at the control point differs from the temperature at the sensor installation point, the PV is shifted to compensate.

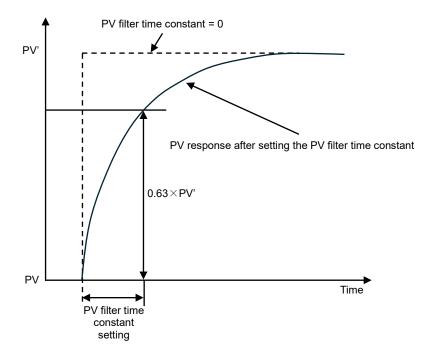
(This is effective within the input rating range, regardless of the sensor correction value.)

Correction range: -100.0 to 100.0 ℃(-180.0 to 180.0 ℉)

DC voltage, current inputs: -1000 to 1000

[PV filter time constant setting]

A digital 1st low pass filter reduces fluctuations in input values caused by noise. PV filter time constant: 0.0 to 10.0 seconds



(Fig. 7.6-3)

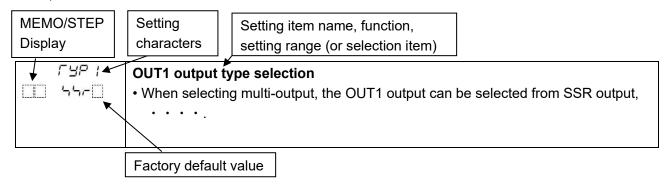
7.7 Output Setting Group

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the output setting group, follow the steps below.

	In PV/SV display mode, press the © key several times until the character of the output setting group is displayed.
2 <u> </u>	Press the 🕒 key. Enter the input type selection item.

Characters,				
Factory	Setting Item, Function, Setting Range			
Default				
LRD !	OUT1 output type selection			
- 55-C	When selecting multi-output, the OUT1 output can be selected from SSR output,			
	direct current output 4 to 20mA, or 0 to 20mA.			
	Selection item:			
	〜〜〜 SSR output			
	니구 Direct current output (4 to 20 mA DC)			
	□2□R Direct current output (0 to 20 mA DC)			
c III	OUT1 proportional cycle setting			
	Set the OUT1 proportional cycle.			
Factory default setting	Setting range: 0.1 to 120.0 sec			
For relay contact output type: 30.0 sec	This item is not displayed when the direct current/DC voltage output type is set/selected.			
For solid-state voltage output type,				
open collector type:				
3.0 sec	OUT1 ON/OFF hysteresis setting			
L	• Set the OUT1 ON/OFF hysteresis. • Setting range: 0.1 to 1000.0 ℃ (0.1 to 1800.0 ℉)			
	DC voltage, current inputs: 1 to 10000			
oLH[]	OUT1 high limit setting			
1000	• Set the OUT1 high limit.			
	Set the OOT High limit. Setting range: Output low limit setting to 100.0 %			
	DC voltage, current inputs: Output low limit setting to 105.0 %			
aLL .	OUT1 low limit setting			
	• Set the OUT1 low limit.			
	Setting range: 0.0 to OUT1 high limit setting DC voltage, current inputs: -5.0 % to OUT1 high limit setting			
or AC	OUT1 rate of change limit setting			
	Set the changing value of OUT1 MV for 1 second.			
	• Setting range: 0.00 to 100.00 %/sec			
LAbS	OUT2 output type selection			
<u> </u>	When selecting multi-output, the OUT2 output can be selected from SSR output,			
	direct current output 4 to 20mA, or 0 to 20mA.			
	Selection item:			
	「トー」 SSR output			
	니구마다 Direct current output (4 to 20 mA DC)			
	Direct current output (0 to 20 mA DC) This selection item will not be displayed, when [Option 1: O2(SSR/A)] is not added.			

Characters,				
Factory	Setting Item, Function, Setting Range			
Default				
cRcr	OUT2 cooling method selection			
□□ Ri -□	Select the OUT2 cooling method from air, oil or water cooling.			
	Selection item:			
	RI - Air cooling			
	Oil cooling			
	This selection item will not be displayed, when [Option 1: EV2, O2(SSR/A)] is not added.			
c_b[]	OUT2 proportional cycle setting			
	• Set the OUT2 proportional cycle.			
Factory default setting				
For relay contact	• Setting range: 0.1 to 120.0 sec This item is not displayed, when [Option 1: EV2, O2(SSR/A)] is not added.			
output type: 30.0 sec • For solid-state	This item is not displayed, when the direct current/DC voltage output type is set/selected.			
voltage output type,				
open collector type: 3.0 sec				
HY56	OUT2 ON/OFF hysteresis setting			
	Set the OUT2 ON/OFF hysteresis.			
	• Setting range: 0.1 to 1000.0 ℃ (0.1 to 1800.0 ₮)			
	DC voltage, current inputs: 1 to 10000			
00 00 000	This selection item will not be displayed, when [Option 1: EV2, O2(SSR/A)] is not added.			
oL Hb	OUT2 high limit setting			
	• Set the OUT2 high limit.			
	Setting range: Output low limit setting to 100.0 %			
	DC voltage, current inputs: Output low limit setting to 105.0 % This selection item will not be displayed, when [Option 1: EV2, O2(SSR/A)] is not added.			
oLLb	OUT2 low limit setting			
	Set the OUT2 low limit.			
	Setting range: 0.0 to OUT2 high limit setting			
	DC voltage, current inputs: -5.0 % to OUT2 high limit setting			
	This selection item will not be displayed, when [Option 1: EV2, O2(SSR/A)] is not added.			
conf	Direct/Reverse action selection			
□□ HERF	Selects either Reverse (Heating) or Direct (Cooling) control action.			
	• Selection item:			
	HERF Reverse (Heating) action			
P5F :	Pre-set output setting 1			
	• Set the OUT1 MV output when selecting Pre-set output setting 1 or 2 in the Event			
	input allocation setting.			
	• Setting range: -5.0 to 105.0 %			
	This selection item will not be displayed, when [Option 1: except EI or C5W] is not added.			

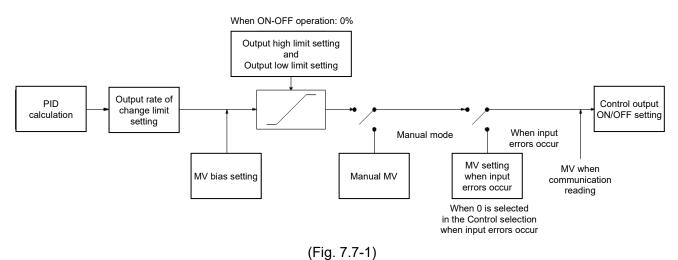
Characters,				
Factory	Setting Item, Function, Setting Range			
Default				
P5F2	Pre-set output setting 2			
	Set the OUT2 MV output when selecting Pre-set output setting 1 or 2 in the Event			
	input allocation setting.			
	• Setting range: -5.0 to 105.0 %			
	This item is not displayed, when [Option 1: EV2, O2(SSR/A)] is not added. This item will not be displayed, when [Option 2: except EI or C5W] is not added.			
ERan	Action selection when input errors occur			
□□ ЕоИГ	Select the output state for OUT1 and OUT2 when input error occurs.			
	Selection item:			
	Eall MV setting when input errors occur			
	Control operation continues			
Eoñ t	OUT1 MV setting when input errors occur			
	Set the MV to output when an input error occurs.			
	• Setting range: -5.0 to 105.0 % This item is displayed when MV setting when input errors occur is selected in Action selection when input errors occur.			
Eoñ2	OUT1 MV setting when input errors occur			
	Set the MV to output when an input error occurs.			
	Setting range: -5.0 to 105.0 % This item is displayed when MV setting when input errors occur is selected in Action selection when input errors occur. This item is not displayed, when [Option 1: EV2, O2(SSR/A)] is not added.			

[Action selection when input errors occur]

Select whether to continue control operation when input becomes a sensor error, or to output the fixed MV set in MV setting when input errors occur.

Setting range 0: Output MV when input errors occur -5.0 to 105.0 %

1: Control operation continues



(.)

7.8 EVT Input Setting Group

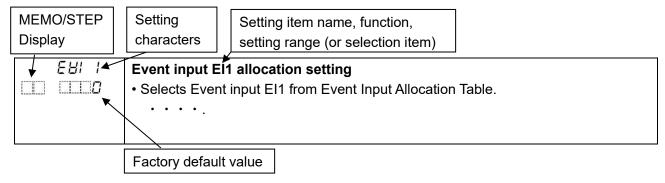
If (Option 2: except C5W) is not added, this setting group will not be displayed.

Explanation of setting items:

The upper section of the left column shows the PV Display setting character, while the lower right section shows the factory default value for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the selection item name, description, and the selected item.



To enter the EVT input setting group, follow the steps below.

① E/ .~□	In PV/SV display mode, press the CO key several times until the character of the EVT input setting group is displayed.
② E81 1	Press the 🕒 key. Enter the Event input EI1 allocation setting item.

Characters, Factory Default	Setting Item, Function, Setting Range				
EBI I	Event inpu	ut El1 allocation	setting		
	Selects E	vent input EI1 fro	m Event input all	ocation table.	
	 Selection 	item:			
	Event in	put allocation ta	ble		
	Selection value	Event input function	Input ON (Closed)	Input OFF (Open)	Remarks
		No event			
		Set value	2 ⁿ	1	n: 1 to 3(*1)
	(*4)	memory			
		Control	Control OFF	Control ON	Control output OFF
	(*4)	ON/OFF (*2)			function
		Direct/Reverse	Direct action	Reverse	Always effective
		action		action	
	H	Preset output	Preset output	Usual control	If sensor is burnt out,
		1	(*2)		the unit maintains
		ON/OFF			control with the
					preset MV.
	1115	Preset output	Preset output	Usual control	The unit maintains
		2	(*2)		control with the
		ON/OFF			preset MV. (*3)
EBI I	<u> </u>	Auto/Manual	Manual	Automatic	
		control	control	control	

Characters, Factory Default	Setting Item, Function, Setting Range				
	7	Remote/Local	Remote	Local	Adapt to Option2: EA
	8	Program control RUN/STOP	RUN	STOP	Level action when power is turned on
		Program control Holding/Not holding	HOLD	Not holding	
	III 10	Program control Advance function	ADVANCE	Usual control	
		Integral action Holding	Integral action Holding	Usual integral action	Control continues with the integral value being held.
	<u> </u>	EV(x) output latch selection	Latch cancel	Usual control	
	 (*1): The MEMO Display shows the value obtained by adding 2ⁿ and then incrementing by 1. If EI1=OFF and EI2=ON, the display shows 3. Event input numbers are assigned sequentially starting from the smallest number: 20, 21, and so on. For (Option 2: EI), the maximum is 8 points. For (Option 2: except C5W), the maximum is 4 points. (*2): This corresponds to "Preset Output Settings 1 and 2" in the output group settings. (Edge operation) If multiple event inputs select the same function, an OR determination will be made. (*3): If [Option 1: EV2, O2(SSR/A)] is not added, this selection item will not be displayed. 				
EB! 2		ontrol operation is OFF		cation setting	and are enabled.
	_	vent input El2 fro	•	ocation Table.	
	Selection item: Same as Event input EI1 allocation setting.				
E81 3	Event input EI3 allocation setting				
	Selects Event input El3 from Event Input Allocation Table.				
	Selection item: Same as Event input EI1 allocation setting.				
EBI 4	Event input EI4 allocation setting				
	Selects Event input El4 from Event Input Allocation Table.				
	Selection item: Same as Event input EI1 allocation setting.				

[Event input]

4 points (EI1 to EI4) will be added as event inputs.

For (Option 2: EI), the maximum is 8 points; for (Option 2: C5W, except EI), the maximum is 4 points.

When adding (Option 2: EI)

When Set value memory is set for Event input El1 allocation setting and Event input El2 allocation setting

Connection	Catting value manage Na	
①3-①5 (EI1)	①4)-①5 (EI2)	Setting value memory No.
Open	Open	SV1
Short	Open	SV2
Open	Short	SV3
Short	Short	SV4

When Set value memory is set for Event input El1 allocation setting and Event input El4 allocation setting

Connection	Setting value memory No.	
①3-①5 (EI1)		
Open	Open	SV1
Short	Open	SV2
Open	Short	SV3
Short	Short	SV4

7.9 EVT Output Setting Group

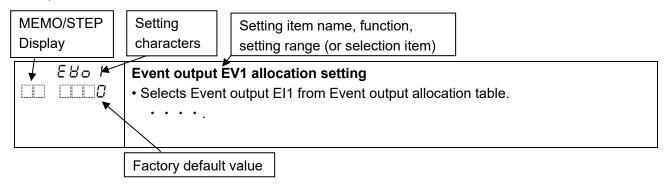
Only items selected in the Event output EV□ allocation setting will be displayed.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the EVT output setting group, follow the steps below.

① <i>E.a.U.F</i>	In PV/SV display mode, press the \mathbf{C} key several times until the character of the EVT output setting group is displayed.
2 E80 /	Press the 🕒 key. Enter the Event input El2 allocation setting item.

Characters, Factory Default	Setting Item, Function, Setting Range				
E801	Event output EV1 allocation setting				
	-	vent output EV1 from Event outp	out allocation table		
	Selection				
		out allocation table			
-	Selection				
	value	Event output function	Remarks		
		No event			
-		Alarm output, High limit alarm	Set in alarm setting mode.		
-		Alarm output, Low limit alarm	Cot in diam sotting mode.		
-		Alarm output, High/Low limits alarm			
-		Alarm output, High/Low limits			
	LI	independent alarm			
-	III 5	Alarm output, High/Low limit range			
	iiii.—'	alarm			
	<u> </u>	Alarm output, High/Low limit range independent alarm			
	1117	Alarm output, Process high alarm			
	118	Alarm output, Process low alarm			
	1119	Alarm output, High limit with			
		standby alarm			
	<i> </i>	Alarm output, Low limit with standby alarm			
		Alarm output, High/Low limits with standby alarm			
	III 12	Alarm output, High/Low limits with standby independent alarm			
	II /3	Heater burnout alarm output	Set in alarm setting mode.		
	14	Loop break alarm output	Set in alarm setting mode.		
	III /5	Time signal output	Turns OFF or ON during Program		
			control, by setting OFF and ON times		
			within the step set in [Step number].		
	II 15	Output during AT	Turns ON during AT.		
	17	Pattern end output	Turns ON when Program control ends,		
			and remains ON until turned OFF.		
	Ⅲ 18	Remote output	Turns OFF or ON by communication command 00D6H during Serial communication.		
			2º EV1 output 0: OFF 1: ON 2¹ EV2 output 0: OFF 1: ON 22 EV3 output 0: OFF 1: ON		
	III 18	Additional output when error occurs	Alarm, heater burnout alarm, sensor error, input error, etc., turns ON when		
			error occurs.		
		Main output	Selectable when Option1: EV2 is added		
	<u> </u>	Cooling output	Selectable when Option1: EV2 is added		

Characters,	
Factory	Setting Item, Function, Setting Range
Default	
A IEA	EV1 enabled/disabled selection when alarm sets 0
00	When alarm value is 0 (zero), alarm action can be Enabled or Disabled.
	Selection item:
	Disabled
	모드니 Enabled
	This setting item will be displayed, when selecting alarm actions to to the Event output EV1 allocation setting.
A IHA	EV1 hysteresis setting
	Sets EV1 alarm hysteresis.
	• Setting range: 0.1 to 1000.0℃ (0.1 to 1800.0 ℉)
	DC voltage, current inputs: 1 to 10000
	This setting item will be displayed, when selecting \(\begin{align*} \lambda & t \\ \equiv & \equiv & \equiv \equiv \equiv \equiv \\ \equiv \equiv & \equiv
8 189	EV1 action delay timer setting
	Sets EV1 alarm action delay time.
	• Setting range: 0 to 10000 秒
	This setting item will be displayed, when selecting \(\ldots \) to \(\ldots \) t\(\rangle \) in the Event output EV1 allocation
A ILā	EV1 action Energized/De-energized setting
noñL	Selects Energized/De-energized status for EV1 alarm.
	Selection item:
	nonL Energized
	r E 当っ De-energized
	This setting item will be displayed, when selecting \(\begin{align*} \text{! to } \begin{align*} \text{! to the Event output EV1 allocation} \end{align*} \)
	setting.
A ILc	EV1 output latch selection
	Selects hold when EV1 output is ON.
	• Selection item:
	Disabled
	<u> </u>
	This setting item will be displayed, when selecting alarm actions \(\begin{align*} \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
17 15	TS1 output step number
	Sets TS1 output step number.
	Setting range: 1 to 16
	This setting item will be displayed, when selecting 15 in the Event output EV1 allocation setting.
Γ5 IF	TS1 OFF time setting
	Sets TS1 OFF time setting.
	• Setting range: 00:00 to 99:59
	This setting item will be displayed, when selecting 15 in the Event output EV1 allocation setting.
[TS1 ON time setting
	Sets TS1 ON time setting.
	• Setting range: 00:00 to 99:59
	This setting item will be displayed, when selecting 15 in the Event output EV1 allocation setting.

Characters,	
Factory Default	Setting Item, Function, Setting Range
E802	Event output EV2 allocation setting
	Selects Event output EV2 from Event output allocation table.
	Selection item: Same as the Event output EV1 allocation setting
	When (Option 1: EV2) is attached, it will be displayed during EVT2 and EVT3.
R2ER	EV2 enabled/disabled selection when alarm sets 0
70	When alarm value is 0 (zero), alarm action can be Enabled or Disabled.
	Selection item:
	Disabled
	<i>当</i> E¬□ Enabled
	This setting item will be displayed, when selecting alarm actions \(\begin{align*} 1 \\ 1 \end{align*} to \(\begin{align*} 1 \\ 2 \end{align*} in the Event output EV2 allocation setting.
R2H9	EV2 hysteresis setting
	• Sets EV2 alarm hysteresis.
	• Setting range: 0.1 to 1000.0℃ (0.1 to 1800.0 ₮)
	DC voltage, current inputs: 1 to 10000
	This setting item will be displayed, when selecting / to /2 in the Event output EV2 allocation setting.
824Y	EV2 action delay timer setting
	Sets EV2 alarm action delay time.
	• Setting range: 0 to 10000 秒
	This setting item will be displayed, when selecting ☐☐ / to ☐☐ /☐ in the Event output EV2 allocation setting.
R2LA	EV2 action Energized/De-energized setting
□□ noñL	Selects Energized/De-energized status for EV2 alarm.
	Selection item:
	nonL Energized
	ァ E 日 っ De-energized
	This setting item will be displayed, when selecting \(\begin{align*} \begin{align*} \text{to } \begin{align*} \begin{align*} \begin{align*} \text{to } \begin{align*} \begin{align*} \begin{align*} \text{to } \begin{align*} \begin{align*} \begin{align*} \begin{align*} \text{to } \begin{align*} align
A2Lc	EV2 output latch selection
	Selects hold when EV2 output is ON.
	Selection item:
	Disabled Disabled
	当E≒□ Enabled
	This setting item will be displayed, when selecting \(\begin{aligned} !
F 525	TS2 output step number
	Sets TS2 output step number.
	Setting range: 1 to 16
r 52F	This setting item will be displayed, when selecting 15 in the Event output EV2 allocation setting.
0000	TS2 OFF time setting
	• Sets TS2 OFF time setting.
	• Setting range: 00:00 to 99:59 This setting item will be displayed, when selecting 5 in the Event output EV2 allocation setting.
F 42a	TS2 ON time setting
	Sets TS2 ON time setting.
	• Setting range: 00:00 to 99:59
	This setting item will be displayed, when selecting 15 in the Event output EV2 allocation setting.

Characters, Factory Default	Setting Item, Function, Setting Range	
E803	Event output EV3 allocation setting	
	Selects Event output EV3 from Event output allocation table.	
	Selection item: Same as the Event output EV1 allocation setting	
	When (Option 1: EV3) is attached, it will be displayed during EVT3.	
RBER	EV3 enabled/disabled selection when alarm sets 0	
no III	When alarm value is 0 (zero), alarm action can be Enabled or Disabled.	
	Selection item:	
	Disabled	
	보트님 Enabled	
	This setting item will be displayed, when selecting alarm actions \(\begin{align*} \lambda \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
R3HY	EV3 hysteresis setting	
	Sets EV3 alarm hysteresis.	
	• Setting range: 0.1 to 1000.0℃ (0.1 to 1800.0 ℉)	
	DC voltage, current inputs: 1 to 10000	
	This setting item will be displayed, when selecting \(\begin{aligned} \lambda & \lambda & \lambda & \end{aligned} \) in the Event output EV3 allocation setting.	
R389	EV3 action delay timer setting	
	Sets EV3 alarm action delay time.	
	• Setting range: 0 to 10000 秒	
	This setting item will be displayed, when selecting \(\sum_{l} \) to \(\sum_{l} \) in the Event output EV3 allocation setting.	
R3L A	EV3 action Energized/De-energized setting	
□□ noñL	Selects Energized/De-energized status for EV3 alarm.	
	Selection item:	
	nonL Energized	
	ァ E は ら De-energized	
	This setting item will be displayed, when selecting \(\begin{aligned} \lambda & to \(\begin{aligned} \lambda & t \\ \ext{in} & t \\ \ext{to} \\ \ext	
R3Lc	EV3 output latch selection	
	Selects hold when EV3 output is ON.	
	Selection item:	
	Disabled Disabled	
	<i>当</i> E与□ Enabled	
	This setting item will be displayed, when selecting \(\begin{aligned} \lambda & \text{to} & \begin{aligned} \lambda & \text{to} & \begin{aligned} \lambda & \text{to} & \text	
F 5 35	TS3 output step number	
	Sets TS3 output step number.	
	• Setting range: 1 to 16 This setting item will be displayed, when selecting 15 in the Event output EV3 allocation setting.	
Γ '- 3F	TS3 OFF time setting	
	Sets TS3 OFF time setting.	
	• Setting range: 00:00 to 99:59	
	This setting item will be displayed, when selecting 15 in the Event output EV3 allocation setting.	
F 4 3 o	TS3 ON time setting	
	Sets TS3 ON time setting.	
	• Setting range: 00:00 to 99:59	
	This setting item will be displayed, when selecting 15 in the Event output EV3 allocation setting.	

[Energized/De-energized]

When pand (Energized) is selected, each Event output is conductive (ON) while each indicator is lit. Each event output is not conductive (OFF) while each indicator is not lit.

When $r \xi \sharp \Box$ (De-energized) is selected, each Event output 1 or 2 is not conductive (OFF) while each indicator is lit.

Each event output is conductive (ON) while each indicator is not lit.

	Energized	De-energized
Event output indicator	点灯	点灯
Event output	ON	OFF

[Loop Break Alarm]

Detects operating end error (heater burnout, sensor break)

When allocated to multiple EVT outputs, the set value is common.

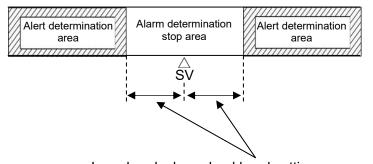
Loop error alarms are evaluated at each loop break alarm time setting; if a normal condition is detected after an error is detected, the error is cleared.

Loop break alarm time setting: 0 to 200 min

Loop break alarm band setting: 0 to 150 °c (0 to 270 °F)

or 0.0 to 150.0 $^{\circ}$ (0.0 to 270.0 $^{\circ}$ F) DC voltage, current inputs: 0 to 1500

Loop break alarm dead band setting:



Loop break alarm dead band setting

(Fig. 7.9-1)

Output: Event outputs allocated to alarm outputs in event output setting mode

Selection item	Selection
Event output EV□ allocation setting	때 남: Loop break alarm output

[Time Signal Output]

When selecting the time signal output in the event output allocation selection, during program operation, when the TS output execution step is reached, the event output turns ON for a duration where TS OFF time \leq elapsed time \leq (TS OFF time + TS ON time).

Selection item	Selection
Event output EV□ allocation setting	☐☐ /5: Timing signal output

[Pattern end output]

When pattern end output is selected in the event output allocation setting, the pattern end output is generated after program completion, and the SV Display flashes []. The output turns off with the STOP operation.

Selection item	Selection
Event output EV□ allocation setting	☐☐ / 7: Pattern end output

[Remote output]

When remote output is selected in the event output allocation setting, it becomes possible to forcibly turn output ON/OFF from the host.

Selection item	Selection
Event output EV□ allocation setting	□□ /B: Remote output

7.10 Communication Setting Group

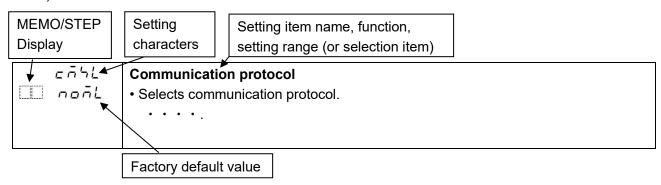
If (Option 2: C5, C5W) is not added, this setting group will not be displayed.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the communication setting group, follow the steps below.

	In PV/SV display mode, press the CO key several times until the character of the communication setting group is displayed.
2 cāhl Doāl	Press the 🕒 key. Enter the communication protocol setting item.

Characters, Factory	Setting Item, Function, Setting Range		
Default			
c ñ 5 L	Communication protocol		
□□ noñL	Selects communication protocol.		
	Selection item:		
	Shinko protocol		
	nadr MODBUS RTU		
	☐☐ MC protocol		
	<i>≒出「□</i> SVTC		
cāna	Instrument number		
	Sets the instrument number.		
	The instrument numbers should be set one by one	e when multiple instruments are	
	connected in Serial communication, otherwise co	mmunication is impossible.	
	Setting range: 0 to 95		
	When using the MC protocol, set the device num	ber to 1 for the master and 2 to	
	8 for the slaves.		
c 55P	Communication speed		
	• Selects a communication speed equal to that of the	he host computer.	
	Selection item:		
	9600 bps		
	☐ /92 19200 bps		
	□ <i>38</i> ⁴ 38400 bps		
	575 57600 bps		
	/ /5 <i>2</i> 115200 bps		
EAFF	Data bit/Parity		
□□ 7 <i>EB</i>	Selects data bit and parity.		
	Selection item:		
	8 bits/No parity		
	วิกอก 7 bits/No parity		
	8EBn 8 bits/Even		
	7 bits/Even		
	විතර්ත් 8 bits/Odd		
	ੀਕਰੀਰ 7 bits/Odd		
	Stop bit		
	Selects the stop bit.		
	• Selection item:		
	1 bit		
is with	2 bits		
eñd4	Response delay time		
	Response from the controller can be delayed after	er receiving command from the	
	host computer.		
7 70 P	Setting range: 0 to 1000 ms		
58_b	SVTC bias		
	Control desired value (SV) adds SVTC bias value	e to the value received by the	
	SVTC command.		
	 Setting range: ±20% of input span Displayed when selecting the Shinko protocol. However, within to the scaling high limit setting. 	he range from the scaling low limit setting	

7.11 Transmission Output Setting Group

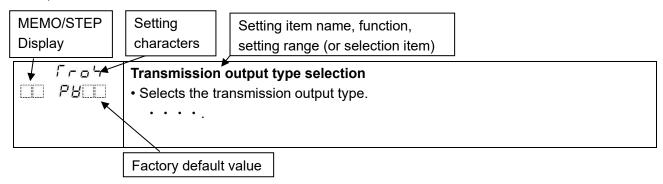
If (Option 2: TA, TV) is not added, this setting group will not be displayed.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the transmission output setting group, follow the steps below.

	In PV/SV display mode, press the CO key several times until the character of the transmission output setting group is displayed.
	Press the 🕒 key. Enter the transmission output type selection item.

Characters			
Characters,			
Factory	Setting Item, Function, Setting Range		
Default			
[roh	Transmission output type selection		
PB	Selects the transmission output type.		
	Selection item:		
	PB PV transmission		
	SV transmission		
	¬B		
$\Gamma - LH$	Transmission output high limit setting (For PV, SV transmission)		
□□ <i>13</i> 70	Sets the Transmission output high limit value.		
	Setting range:		
	Transmission output low limit setting to Input range high limit value		
$\Gamma - L L$	Transmission output low limit setting (For PV, SV transmission)		
-200	Sets the Transmission output low limit value.		
	Setting range:		
	Input range low limit to Transmission output high limit setting		
$\Gamma - LH$	Transmission output high limit setting (For MV transmission)		
III 10 Q0	Sets the Transmission output high limit value.		
	Setting range:		
	Transmission output low limit setting to 105.0 %		
$\Gamma - L L$	Transmission output low limit setting (For MV transmission)		
	Sets the Transmission output low limit value.		
	Setting range:		
	-5.0 % to Transmission output high limit value		

7.12 External Setting Input Setting Group

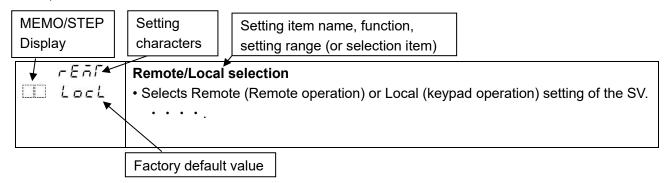
If (Option 2: EA) is not added, this setting group will not be displayed.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the external setting input setting group, follow the steps below.

① E.\& □	In PV/SV display mode, press the CO key several times until the character of the external setting input setting group is displayed.
2 ⊏ LocL	Press the 🕒 key. Enter the Remote/Local selection item.

Characters,			
Factory	Setting Item, Function, Setting Range		
Default	Setting item, Function, Setting Range		
rEAL	Remote/Local selection		
Lock	Selects Remote (Remote operation) or Local (keypad operation) setting of the SV.		
	Selection item:		
	Local Local		
	r E n̄ Γ Remote		
- T L H	External setting input high limit setting		
□□ lanO	Sets External setting input high limit value.		
	(This value corresponds to 20 mA in direct current input.)		
	Setting range: External setting input low limit to Input range high limit		
$-\Gamma L L$	External setting input low limit setting		
-200	Sets External setting input low limit value.		
	(This value corresponds to 4 mA in direct current input.)		
	Setting range: Input range low limit to External setting input high limit		
-r_b	Remote bias setting		
	During remote action, SV includes the remote bias value.		
	(However, within the range from the external setting input low limit to the external		
	setting input high limit.)		
	Setting range: ±20% of input span		

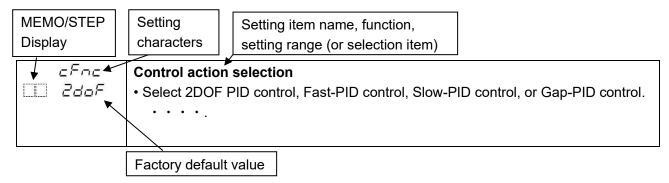
7.13 Control Function Setting Group

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the control function setting group, follow the steps below.

1		In PV/SV display mode, press the CO key several times until the character of the control function setting group is displayed.

2	cFnc	Press the 🕒 key.
	2doF	Enter the Control action selection item.

Charastara			
Characters,			
Factory		Setting Item, Function, Setting Range	
Default			
cFnc	Control a	action selection	
□□ 2doF	Select the	ne 2DOF PID control, Fast-PID control, Slow-PID control, or Gap-PID	
	control.		
	When progra	am control is selected in the fix control/program control selection, it automatically becomes	
		O control regardless of which control action is selected in the control action selection.	
	 Selectio 	n item:	
	2doF	2DOF PID control	
	FPI d	Fast-PID control	
	hPI d	Slow-PID control	
	GRP.	Gap-PID control	
F_R	Proportional gain 2 DOF coefficient setting		
	• Set the proportional gain 2 DOF coefficient (α). However, if program control is		
	selected	I in the fix control/program control selection, the set value becomes invalid.	
	Setting i	range:	
	0.00 to 1.00		
F_b	Integral 2 DOF coefficient setting		
	Set the i	ntegral 2 DOF coefficient setting (eta). However, if program control is	
	selected	I in the fix control/program control selection, the set value becomes invalid.	
	Setting i	range:	
	0.00 to	10.00	

Characters,				
Factory	Setting Item, Function, Setting Range			
Default				
F_G[Derivative 2 DOF coefficient setting			
	$ullet$ Set the derivative 2 DOF coefficient setting (γ). However, if program control is			
	selected in the fix control/program control selection, the set value becomes invalid.			
	Setting range:			
	0.00 to 1.00			
F_cP	Desired value proportional coefficient			
	Set the desired value proportional coefficient (Cp).			
	Setting range:			
	0.00 to 1.00			
GRPb	Gap width setting item			
	Set the region where gap operation becomes active when Gap-PID control is			
	selected.			
	• Setting range:			
	0.0 to 10.0 %			
GRPE	Gap coefficient setting item			
	Set the strength of the gap function within the region where Gap-PID control			
	operates. Lowering the setting value increases the effect.			
	Setting range:			
	0.0 to 1.0			
F_dP_	Integral/Derivative decimal point position selection			
	Select the Integral/Derivative decimal point position. (No decimal point/ First			
	decimal place)			
	Selection item:			
	□□□□□□□ No decimal point			
	□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□			

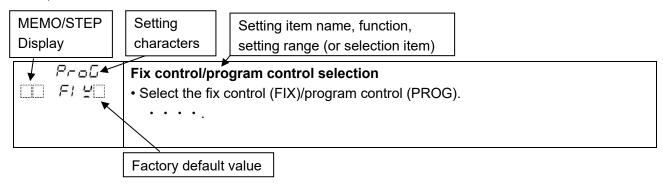
7.14 Program Function Setting Group

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the program function setting group, follow the steps below.

1 Pr.a.F	In PV/SV display mode, press the $\mathbf{\Omega}$ key several times until the character of the program function setting group is displayed.
05	Press the 🕒 key

Enter the Fix control/program control selection.

Characters, Factory Default	Setting Item, Function, Setting Range			
Pro5	Fix contro	Fix control/program control selection		
□□ F! ¥□		e fix control (FIX)/program control (PROG).		
	Selection			
	FI Y	Fix control		
	ProD	Program control		
ñ_ h	Step time	unit selection		
□□ āl n□	Select the	e step time unit in program control.		
	 Selection 	item:		
	ñ¦ n⊞	Hours:Minutes		
	4Ec[]	Minutes:Seconds		
	If program of	control is not selected, this item will not be displayed.		
PrEF	Power res	tore action selection		
S STOP	Select the	e program status if a power failure occurs mid-program and it is restored.		
	 Selection 	item:		
	45 oP	Stops after power is restored.		
	conf	Continues (resumes) after power is restored.		
	HoLd	Suspends (on hold) after power is restored.		
	If program	control is not selected, this item will not be displayed.		
5_58	Program start temperature setting			
	Sets the step temperature when program control starts.			
	Setting ra			
	1	ow limit value to Scaling high limit value		
T . T . T		control is not selected, this item will not be displayed.		
5_5L	_	control start type selection		
D PHOD	Selects the Selection	ne program control start type.		
	PB	PV start		
	P8-	PVR start		
	48	SV start		
	If program of	control is not selected, this item will not be displayed.		
- EPT	Number o	f repetitions setting		
	Sets the	number of repetitions for program control.		
	Setting ra	ange:		
	0 to 100			
	If program of	control is not selected, this item will not be displayed.		

7.15 Wait Setting Group

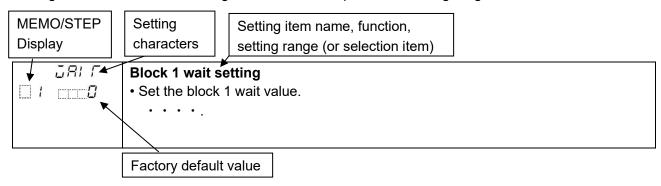
If the program control is selected in the fix control/program control selection, this setting group will not be displayed.

Explanation of setting items:

The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the wait block number for the MEMO/STEP Display.

The right column shows the setting item name, description, and setting range.



To enter the wait setting group, follow the steps below.

	In PV/SV display mode, press the © key several times until the character of the wait setting group is displayed.
ja r	Press the 🕒 key.

Enter the Fix control/program control selection.

Characters,	
Factory	Setting Item, Function, Setting Range
Default	
jai r	Block 1 wait setting
	Set the block 1 wait value.
	Setting range:
	0 to 20% of input span
JRI F	Block 2 wait setting
	Set the block 2 wait value.
	Setting range:
	0 to 20% of input span
БRI Г	Block 3 wait setting
	Set the block 3 wait value.
	Setting range:
	0 to 20% of input span
SRI F	Block 4 wait setting
□Y	Set the block 4 wait value.
	Setting range:
	0 to 20% of input span
JRI F	Block 5 wait setting
□5 <i>0</i>	Set the block 5 wait value.
	Setting range:
	0 to 20% of input span

Characters,	
Factory	Setting Item, Function, Setting Range
Default	
JRI ſ	Block 6 wait setting
□5 <u> </u>	Set the block 6 wait value.
	Setting range:
	0 to 20% of input span
JRI Г	Block 7 wait setting
□7	Set the block 7 wait value.
	Setting range:
	0 to 20% of input span
JRI ſ	Block 8 wait setting
	Set the block 8 wait value.
	Setting range:
	0 to 20% of input span

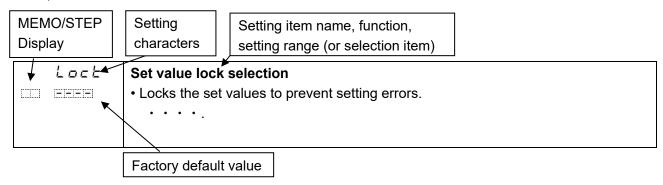
7.16 Other Setting Group

Explanation of setting items:

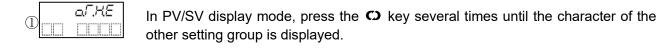
The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the other setting group, follow the steps below.



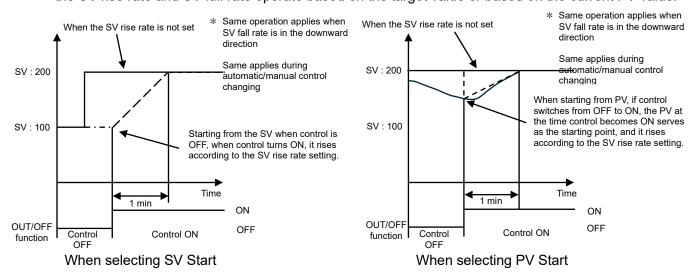
Characters,		
Factory		Setting Item, Function, Setting Range
Default		Jetting Rem, Function, Jetting Range
Last	Set value	lock selection
		e set values to prevent setting errors.
		ng item to be locked depends on the selection.
	Selection	item:
	EEEE	Unlock (All set values can be changed.)
	Loci	Lock 1 (All settings cannot be changed by key operation.)
	Loc2	Lock 2 (Only the main setting mode can be changed. Other setting
		modes cannot be changed.)
- A 5 5	SV Rise/Fall rate action selection	
PB55	Select the operating conditions for the set value ramp function.	
	 Selection 	item:
	585F	SV start
	PBS	PV start
- AF 5	SV Rise/Fall rate time unit selection	
	Select the	e SV Rise/Fall rate time unit.
	 Selection 	item:
	āl n	Minutes
	4Ec[]	Seconds

Characters,				
Factory	Setting Item, Function, Setting Range			
Default				
-85U	SV rise rate setting			
	ts the SV rise rate.			
	• Setting range:			
	0 to 10000 ℃/min (0 to 18000 ஈ/min) or 0.0 to 1000.0 ℃/min (0.0 to 1800.0 ஈ/min)			
	DC voltage, current inputs: 0 to 10000/min			
	The SV rise rate setting is 0 at factory default; however, setting it to 0 disables this function.			
rRFd	SV fall rate setting			
	Sets the SV fall rate.			
	Setting range:			
	0 to 10000 °c/min (0 to 18000 °r/min) or			
	0.0 to 1000.0 °c/min (0.0 to 1800.0 °F/min)			
	DC voltage, current inputs: 0 to 10000/min			
d1 5P	The SV fall rate setting is 0 at factory default; however, setting it to 0 disables this function.			
RLL	LCD display part selection Select whether to illuminate all LCD sections or only the lower section (including			
[][] //- []	the operation indicator).			
	Selection item:			
	RLL All LCD sections			
	Lower section (including the operation indicator)			
- A 58	SV display method selection			
	Select the target value displayed during setting value display/ramp for rising and			
, —	falling.			
	Selection item:			
	누분 Set target value			
	ァウゼ Target value fluctuating during ramp function (*)			
	(*) Rise rate, fall rate, target values during program operation.			
P58	Indication when control output OFF selection			
D off	Select the indication when control output is OFF.			
	election item:			
	□ F F □ OFF indication			
	R _D FF No indication			
	PB PV indication			
	PBBL PV indication + Any Alarm active			
oF5L	OUT/OFF key function selection			
OD nanE	Select the OUT/OFF key function.			
	Selection item:			
	nanE No function			
	Auto/Manual control			
	□FF□ Control output OFF function			
	r E 示 「 Remote/Local selection			
	RUN/STOP function (enabled during program control)			

Characters, Factory Default	Setting Item, Function, Setting Range			
PF5L	PF key function selection			
nonE	Select the PF key function.			
	Selection item:			
	nanE No function			
	ลีลิธีน์ Auto/Manual control			
	□ FF Control output OFF function			
	r E 示 「 Remote/Local selection			
	ァリュー RUN/STOP function (enabled during program control)			
	Auto/Manual control after power ON selection			
□□ RUFa	When the power to the controller is turned ON, selects whether the unit starts using			
	Automatic control or Manual control.			
	Selection item:			
	RUF D Automatic control			
	585U Manual control			
d_FA	Indication time setting			
	Set the time until the display turns off when no operation is performed.			
	It will turn back on when any key is pressed or when the input error occurs.			
	Setting range: 0:00 to 60:00 Minutes:Seconds			
	0:00 Consecutively 0:01 to 60:00 Indication time			
588E	Non-volatile IC memory saving selection			
S SABE	Select whether to save data to non-volatile IC memory when changing settings by			
	key operation or during communication setting.			
	(The value reverts to the previous setting upon power-on.)			
	• Selection item:			
	<i>≒RBE</i> Saving			
	Not saving			

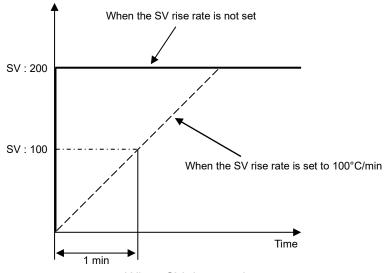
[SV Rise/Fall rate action selection]

When the OUT/OFF function selection changes from OFF to ON, or when the manual/automatic control function selection switches from manual control to automatic control, you can choose whether the SV rise rate and SV fall rate operate based on the target value or based on the current PV value.



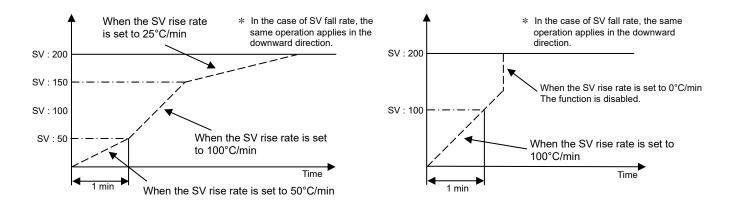
(Fig. 7.16-1)

[SV rise rate setting]



When SV rise rate is set

(Fig. 7.16-2)

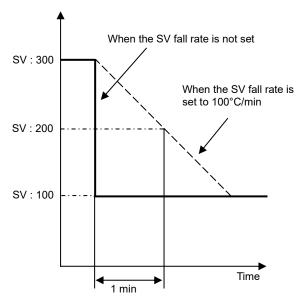


If the SV rise rate fluctuates during SV rise

If the SV rise rate fluctuates to 0 during SV rise

(Fig. 7.16-3)

[SV fall rate setting]



When SV fall rate is set

(Fig. 7.16-4)

[Auto/Manual control after power ON selection]

Select the recovery operation upon power-on.

If manual control is selected in Auto/Manual control after power ON selection, recovery occurs using the manual MV setpoint. However, if _______5:: Auto/Manual Switch is selected in Event input allocation setting, recovery occurs based on the event input status.

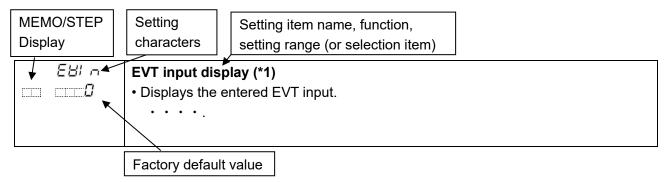
7.17 Maintenance Group

Explanation of setting items:

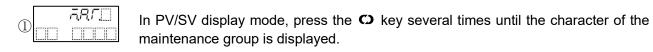
The upper section of the left column shows the setting item characters for the PV Display, while the lower right section shows the factory default values for the SV Display.

The lower left section shows the MEMO/STEP Display, which is off.

The right column shows the setting (selection) item name, description, and setting range (selection items).



To enter the maintenance group, follow the steps below.



② EHI ☐ Press the ☐ key.
Enter the EVT input display.

Characters,						
•	Outlier Harry English Outlier Branch					
Factory	Setting Item, Function, Setting Range					
Default						
EBI n	EVT input display (*1)					
	Displays the entered EVT input.					
	If multiple inputs are entered, the displayed value is the total sum.					
	Selection item:					
		No input				
		EI1 ON				
	Z	EI2 ON				
	Ч	EI3 ON				
	B	EI4 ON				
EROL	EVT output ON setting					
	EVT output will be forced to output.					
	Selection item:					
		OFF				
		EV1 output ON				
	Z	EV2 output ON				
	3	EV3 output ON				

Factory Setting Item, Function, Setting Range Default					
Default					
	OUT1 output setting (*2)				
	When the control is OFF, the OUT1 output is set to any desired output level.				
Setting range:					
0.0 to 100.0 % DC voltage, current outputs: -5.0 to 105.0 % (*3)					
OUT2 output setting (*2)					
• When the control is OFF, the OUT2 output is set to any desired output					
• Setting range:					
0.0 to 100.0 %					
DC voltage, current outputs: -5.0 to 105.0 % (*3)					
If [Option 1: EV2, O2(SSR/A)] is not added, this selection item will not be displayed.					
•	Transmission output				
	Transmission output is output at any desired output level.				
	Setting range:				
	0.0 to 100.0 % (*4)				
d c 上 ┌ Date clear setting	Date clear setting				
• Selecting [ˈʒɛ ː-] will reset all settings to their factory defaults.	• Selecting [님든 뉴트] will reset all settings to their factory defaults.				
Selection item:					
Cancel					
当E与□ Execute					
Pcと Program clear setting	Program clear setting				
• Selecting [ˈ님ㅌ'] will reset only program setting group to their factor	y defaults.				
Selection item:	Selection item:				
Cancel	n □ Cancel				
」 当E与□ Execute					

- (*1): If duplicated, it will be the total value.
- (*2): Can be set to 0.0 to 100.0 % or -5.0 to 105.0 %, but the output depends on the OUT \square high/low limit settings.
- (*3): For outputs other than 4 to 20 mA DC or 1 to 5 V DC, values below 0% MV are not output.
- (*4): For 0 to 1 V DC or 0 to 10 V DC outputs, values below 0% are not output.

8. Operation and Settings of Standard Functions

This section explains the settings required for operation and the main standard functions.

8.1 Selecting an input type

Select the input type.

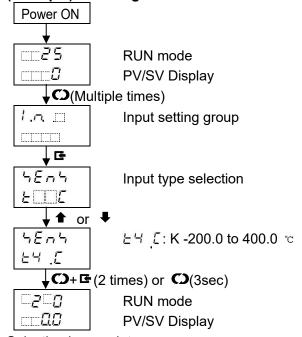
Input type selection is performed in the input type selection section of the input setting group.

Selection item:

EULE	K -200 to 1370 ℃	4201	4 to 20 mA DC -19999 to 19999	
£8 .E	K -200.0 to 800.0 ℃		Built-in receiving resistor	
1. P3	K -200.0 to 400.0 ℃	0201	0 to 20 mA DC -19999 to 19999	
JIIIE	J -200 to 1000 ℃		Built-in receiving resistor	
J. UL	J -200.0 to 400.0 ℃	420E	4 to 20 mA DC -19999 to 19999	
r [][[[E	R 0 to 1760 ℃		Separately sold receiving resistor	
5 E	S 0 to 1760 ℃	020E	0 to 20 mA DC -19999 to 19999	
6 E	B 0 to 1820 ℃		Separately sold receiving resistor	
EUUE	E -200 to 800 ℃	O□ IB	0 to 1 V DC -19999 to 19999	
Γ□ .Ε	T -200.0 to 400.0 ℃	a sa	0 to 5 V DC -19999 to 19999	
n III E	N -200 to 1300 ℃	/□5 <i>8</i>	1 to 5 V DC -19999 to 19999	
PL 2E	PL-Ⅱ 0 to 1390 °c	0 108	0 to 10 V DC -19999 to 19999	
EE	C(W/Re5-26) 0 to 2315 °c			
PF .E	Pt100 -200.0 to 850.0 ℃			
PΓ□c	Pt100 -200 to 850 ℃			
PT LE	Pt100 -100.0 to 100.0 °c			

Factory default value is K -200 to 1370 $^\circ$ c.





Selection is complete.

8.2 Selecting Fast-PID Control

From the control action, select any control type: 2DOF PID control, Fast-PID control, Slow-PID control, or Gap-PID control. Selecting the control type according to the application and process enables optimal control.

Control action selection is performed in the control action selection of the control function setting group. The factory default setting is 2DOF PID control.

2DOF PID control

It exhibits disturbance response characteristics similar to Fast-PID control while performing control operations that reduce overshoot.

Fast-PID control

Differential-leading PID control is a common control method where the derivative action operates based on the rate of change of the measured value.

Selecting Fast-PID control allows you to modify the control behavior by configuring the following settings.

P control: When the integral time and derivative time are set to 0

PI control: When the derivative time is set to 0 PD control: When the integral time is set to 0

Deviation PID control: When varying the target value over time, select Fast-PID control in the

control action selection. Set the proportional gain 2DOF coefficient (α) to 1.00 and the derivative 2DOF coefficient (γ) to 1.00 to enable derivative

action based on deviation.

ON/OFF control: When the proportional band setting is set to 0 (or 0.0)

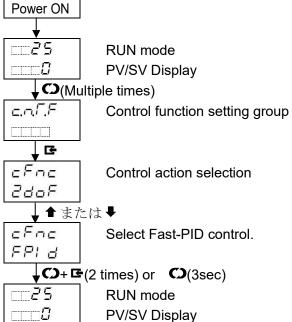
Slow-PID control

Proportional-Derivative Lead PID Control Method: A control method where the proportional action operates based on the measured value, and the derivative action operates based on the rate of change of the measured value. It is used when overshoot is to be avoided.

Gap-PID control

When measurement values contain excessive noise or control components exhibit hysteresis, slight fluctuations may persist near zero deviation. In such cases, a deadband is typically employed. However, since control does not occur within the deadband, measurement values change during disturbances. Therefore, deviation characteristics are introduced within the deadband to enable response to disturbances.

(Example) Selecting Fast-PID control



Selection is complete.

Additional Notes

- Setting the OUT1 proportional band to 0 in the PID settings group enables ON/OFF control.
- Setting both the integral time and derivative time to 0 in the PID settings group enables P control.
- Setting the integral time to 0 in the PID settings group enables PD control.
- Setting the derivative time to 0 in the PID settings group enables PI control.

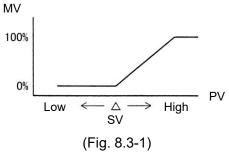
8.3 Selecting Direct/Reverse Action

Selects Direct or Reverse control action.

Select Direct or Reverse control action in [Direct/Reverse action] in output setting group. Factory default value is Reverse action.

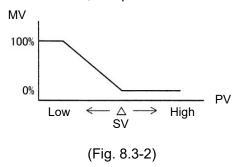
Direct action

In Direct action, MV is increased when PV is higher than SV (positive deviation). Refrigerators, etc. perform Direct action.

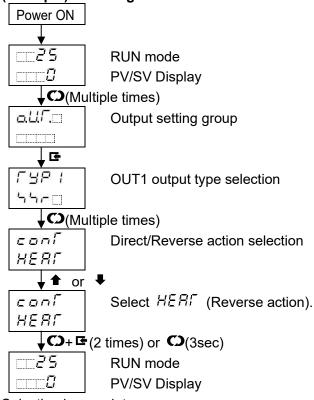


Reverse action

In Reverse action, MV is increased when SV is higher than PV (negative deviation). Electric furnaces, etc. perform Reverse action.



(Example) Selecting Reverse action



Selection is complete.

8.4 Performing Fixed Value Control

Fixed value control is a typical temperature control action, which reduces deviation from a single SV by comparing with PV.

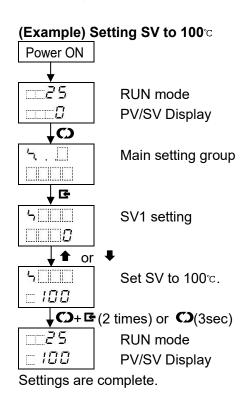
To perform Fixed value control, set the SV.

Settings can be configured in two ways: through the main setting group or through direct SV setting.

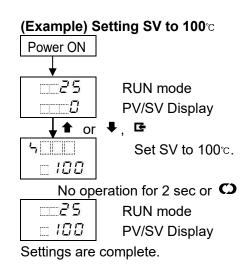
Settings by the main setting group

SV setting are performed in the SV1 setting of the main setting group.

The factory default value is 0.



Settings by the direct SV setting



$\sqrt{\mathbb{N}}$

Caution

- Perform the AT during the trial run.
- During the AT, none of the setting items can be set.
- If power failure occurs during the AT, the AT stops.
- If AT is cancelled during the process, P, I, D and ARW values revert to the values before AT was performed.
- AT will be forced to stop if it has not been completed within 4 hours.
- Sometimes the AT process will not fluctuate if AT is performed at or near room temperature. Therefore, AT might not finish normally.

To set PID constants, perform AT.

There are 3 types of AT: Normal AT (Usual AT), 'AT on Startup' and Fast AT.

●Normal AT (Usual AT)

AT is a function that automatically calculates the optimal values for P, I, and D settings by forcibly introducing fluctuations into the process.

For DC voltage and direct current inputs, fluctuations are applied via the SV regardless of whether the process is during startup, stable operation, or shutdown.

During AT execution, AT will continue even if input is burned out.

When executing AT using Gap-PID control, the derivative time is calculated as 0 seconds.

Based on the deviation between SV and PV, AT is automatically executed in one of the following three ways.

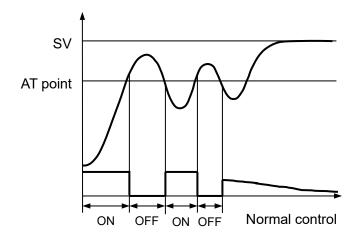
[When executed below the AT point]

If the SV-PV at the start of AT is greater than the AT bias setting value, the AT point becomes the SV-AT bias, and limit cycling occurs at the AT point.

When the AT point exceeds the AT hysteresis setpoint, the output turns OFF. When it falls below the AT hysteresis setpoint, the output turns ON.

This process repeats twice.

At the point where the process changes from OFF to ON for the second time, AT ends and control returns to normal operation.



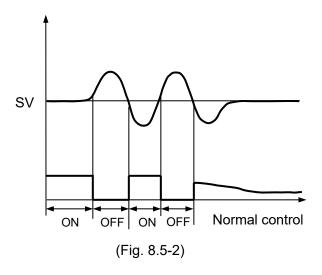
(Fig. 8.5-1)

[When executed near the SV]

The AT point becomes the set value (SV). When AT is executed, it starts from ON. If the AT hysteresis setting value becomes higher than the SV, the output turns OFF until the AT hysteresis setting value becomes lower than the SV.

This process repeats twice.

At the point where the process changes from OFF to ON for the second time, AT ends and control returns to normal operation.



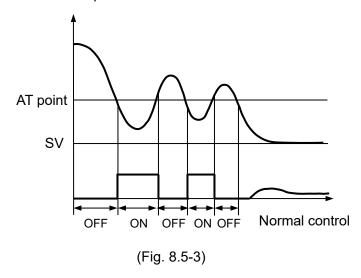
[When executed above the AT point]

When the PV-SV at AT start is greater than the AT bias setting value, the AT point becomes SV + AT bias, and limit cycling occurs at the AT point.

Output remains OFF until the value falls below the AT hysteresis setting value relative to the AT point. Parameter measurement begins at the point where output changes from ON to OFF after the next ON cycle.

When the output rises above the AT hysteresis setting value relative to the AT point, it turns OFF. When the output falls below the AT hysteresis setting value relative to the AT point, it turns ON. This process repeats twice.

At the point where the process changes from OFF to ON for the second time, AT ends and control returns to normal operation.

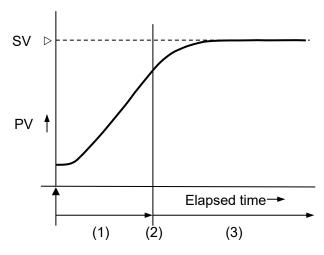


●AT on startup

'AT on startup' calculates the P, I, and D settings during the heating phase only when normal AT cannot be performed due to temperature interference.

The selected value for executing 'AT on startup' is stored internally, so AT runs every time the power is turned on.

To stop 'AT on startup', select AT Stop in the AT Run/Stop selection.



- (1) Calculates AT
- (2) PID constants calculated
- (3) Controls with PID constants set by 'AT on startup'.

(Fig. 8.5-4)

[Conditions of Performing 'AT on startup']

• When starting 'AT on startup', if deviation between PV and SV exceeds the proportional band by 2 times or more, 'AT on startup' will perform.

When power is turned ON (*), or when the unit reverts to RUN mode after canceling control output OFF, 'AT on startup' performs.

Even after 'AT on startup' is successfully finished, 'AT on startup' has been still selected in [AT/Auto-reset Perform/Cancel].

When power is turned ON again, or when the unit reverts to RUN mode by cancelling Control output

OFF, 'AT on startup' performs again under the above performance conditions.

To stop 'AT on startup', select 'AT/AT on startup/Auto-reset Cancel' in [AT/Auto-reset Perform/Cancel].

(*) For Fixed value control, 'AT on startup' can be performed when power is turned ON. It cannot be performed for Program control.

However, if PV slope and delay time cannot be measured normally for P, I, D calculation, the error code below will be indicated on the PV Display, and automatically 'AT on startup' will stop. If an error has occurred, P, I, D and ARW values revert to the previous value at which 'AT on startup' is performed.

[Conditions of Cancelling 'AT on startup']

- When Control output OFF is enabled
- When input is burnt out
- When the derivative time setting is 0

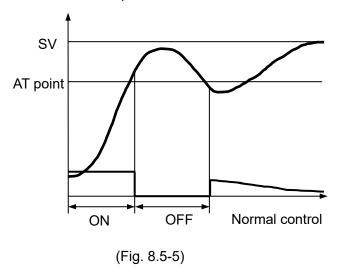
● Fast AT

Fast AT is an AT that significantly reduces the time required to calculate PID compared to normal AT. It is effective for processes where temperature takes a long time to decrease when overshoot occurs. During AT execution, it continues even if the input burns out.

When executing AT with Gap-PID control, the derivative time is calculated as 0 seconds.

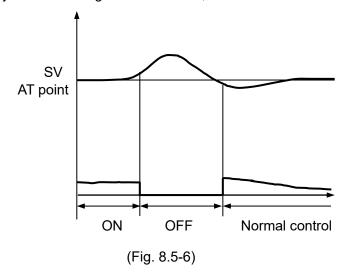
[When executed below the AT point]

When the SV-PV at AT start is greater than the AT bias setting value, the AT point becomes SV-AT bias. If the value exceeds the AT hysteresis setting value above the AT point, the output turns OFF. If the value falls below the AT hysteresis setting value below the AT point, AT ends and control transitions to normal operation.



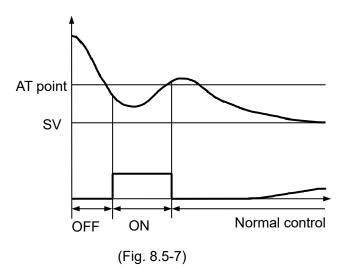
[When executed near the SV]

The AT point becomes the set value (SV). When AT is executed, it starts from ON. When the output exceeds the AT hysteresis setting value above SV, it turns OFF. When the output falls below the AT hysteresis setting value below SV, AT ends and control returns to normal operation.

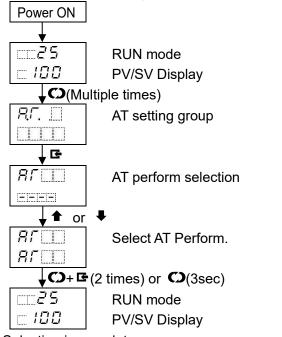


[When executed above the AT point]

If the PV-SV at the start of AT is greater than the AT bias setting value, the AT point becomes SV + AT bias. When the AT hysteresis setting value falls below the AT point, the output turns ON. When the AT hysteresis setting value rises above the AT point, AT ends and control transitions to normal operation.



(Example) Performing Normal AT (Usual AT)



Selection is complete.

The AT indicator flashes while AT is performing.

After AT is complete, the AT indicator turns off, and control is performed using PID constants calculated by the AT.

If AT does not finish after 4 hours, AT will automatically stop.

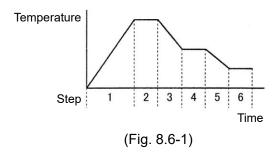
8.6 Performing Program Control

In Program control, SV changes as time elapses, and PV is controlled in order to reach each SV. SV and time can be set for every step, and a maximum of 16 steps can be repeatedly controlled. SV can be set as (Fig. 8.6-1).

Program control is performed using the values set in the program setting group.

When program control is selected, regardless of which control mode is chosen in the control mode selection, it automatically becomes deviation PID control. The proportional gain 2DOF coefficient (α), integral 2DOF coefficient (β), and derivative 2DOF coefficient (γ) become invalid. However, for constant value control when the program time is set to in program control, the control action selected in the control action selection will be used, and the proportional gain 2DOF coefficient (α), integral 2DOF coefficient (α), and derivative 2DOF coefficient (γ) will be enabled.

(e.g.) Program control of electric furnaces in ceramic manufacture, food machinery, etc.



Major functions of Program control are shown below.

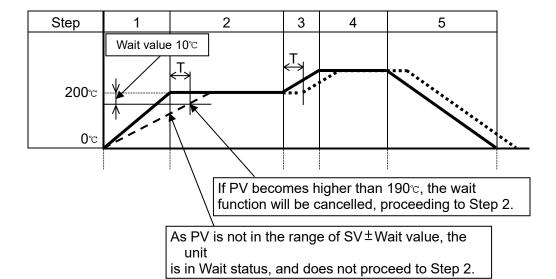
Number of patterns and steps: 1 pattern; 16 steps

Wait function

While Program control is running, the program does not proceed to the next step until the deviation between PV and SV enters $SV \pm Wait$ value at the end of step. The STEP Display flashes while the Wait function is working.

The Wait function is cancelled on the condition that:

- When program pattern is rising: PV is higher than SV- Wait value
- When program pattern is falling: PV is lower than SV+ Wait value



---: PV

----- : Program pattern

:---::: Program pattern delayed by T due to the Wait function

(Fig. 8.6-2)

Program control Holding/Not holding

During Program control, progress of current step is suspended, and then

Fixed value control is performed using the SV from the point of suspension.

To cancel the hold function, press and hold the down key for approximately one second, or turn the EVT input OFF. During manual control, the pause cannot be canceled.

Advance function

During program control execution, this function interrupts the currently executing step and advances to the beginning of the next step.

During program control execution, the advance function activates when the up key is held down for approximately one second or when the EVT input is turned ON.

The advance function can be selected in the event input allocation selection.

Pattern end output

When pattern end output is selected in the event output allocation selection, the pattern end output is generated after program control ends, and the SV Display flashes PEnd.

The output turns OFF with the STOP operation.

Step time unit

Step time unit can be selected: Hours:Minutes, Minutes:Seconds

Factory default value is Hours:Minutes.

Power Restore Action (Program control after power is restored)

If power fails during Program control, selects a status after the power is restored.

Factory default value is 'Stops after power is restored'.

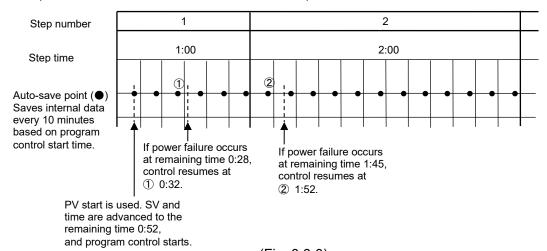
Power Restore Action	Description
Operation stops	Stops Program control, and returns to Standby (Program control waiting)
	mode.
Operation continues (*)	Continues (resumes) Program control.
Operation suspends (*)	Suspends (on hold) current program, and performs Fixed value control using the SV from the point of suspension.
	Press and hold the down key for about one second to resume operation
	and continue program control.

^(*) Progressing time error when power is restored: 10 minutes

This controller saves internal status every 10 minutes after Program control starts.

Internal status is also saved when step is changed.

When power is restored, the unit starts from the last auto-save point.



(Fig. 8.6-3)

Program start temperature

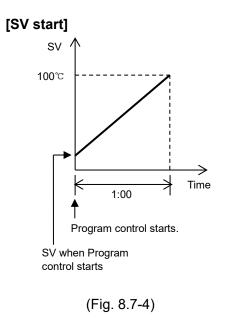
When Program control starts, it starts from the value set in [Program start temperature]. Factory default value is 0° c.

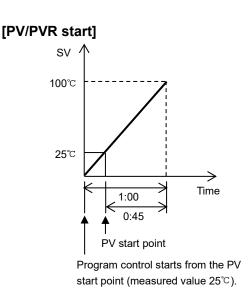
Program control start type

One type can be selected: PV start, PVR start, SV start.

Factory default value is PV start.

Program control start type	Description
PV start	When Program control starts, the SV and step time are advanced to the PV, then Program control starts.
	However, if [Program start temperature] at the time of Program control start is
	higher than the PV (when PV start is initiated), then Program control will start
	from the SV set in [Program start temperature].
PVR start	In pattern repeating, the SV and step time are advanced to the PV, then the Program control starts.
C\/ otort	Program control starts from the SV which has been set in [Program start
SV start	temperature].





(Fig. 8.7-5)

Repeat function

Step 1 through 16 is counted as one cycle. The operation repeats the number of times specified in the repeat count setting.

Factory default value is 0 (zero).

The RUN/STOP function selection is made in the Other Settings group under [OUT/OFF key function selection] or [PF key function selection].

The factory default setting is no function.

Step time unit selection, power failure recovery operation selection, start temperature setting, program control starts method selection, and repeat count setting are made in the Program Function Settings group.

Configure as needed.

Program pattern settings are configured in the Program Settings group.

Example of program pattern setting

Step	1	2	3	4	5
SV(℃)	200	200	300	300	0
Time	1:00	2:00	0:30	1:00	2:00
Wait block number	2	1	2	1	1
PID block number	2	2	3	3	2
300°c 200°c 0°c					
1	< → 1:00 —Prograr	2:00 n control starts	0:30	1:00	2:00

(Fig. 8.7-6)

Block setting example

Since each block number in steps without a program pattern set is 1, it is clearer and more convenient to leave block number 1 in each block setting group at its factory default value and start setting from block number 2.

Setting group	Setting item	Setting example		
PID setting group (*)	Block 1 OUT1 Proportional band setting	10 ℃		
	Block 1 OUT1 Integral time setting	200 second		
	Block 1 OUT1 Derivative time setting	50 second		
	Block 2 OUT1 Proportional band setting 10 ℃			
	Block 2 OUT1 Integral time setting	200 second		
	Block 2 OUT1 Derivative time setting	50 second		
	Block 3 OUT1 Proportional band setting 10 °c			
	Block 3 OUT1 Integral time setting	200 second		
	Block 3 OUT1 Derivative time setting	50 second		
Wait setting group	Block 1 Wait setting	0 ℃		
	Block 2 Wait setting	10 °c		

^{(*):} The PID setting group is left at its factory default values to perform AT and determine the PID constants.

- 122 -

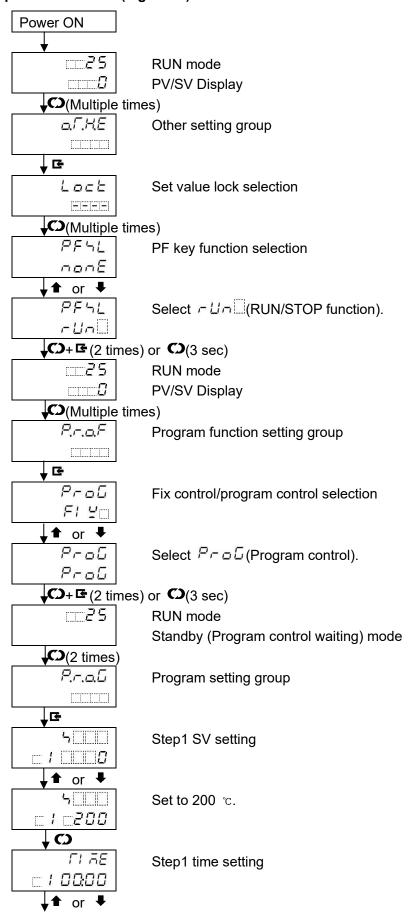
Program pattern explanation

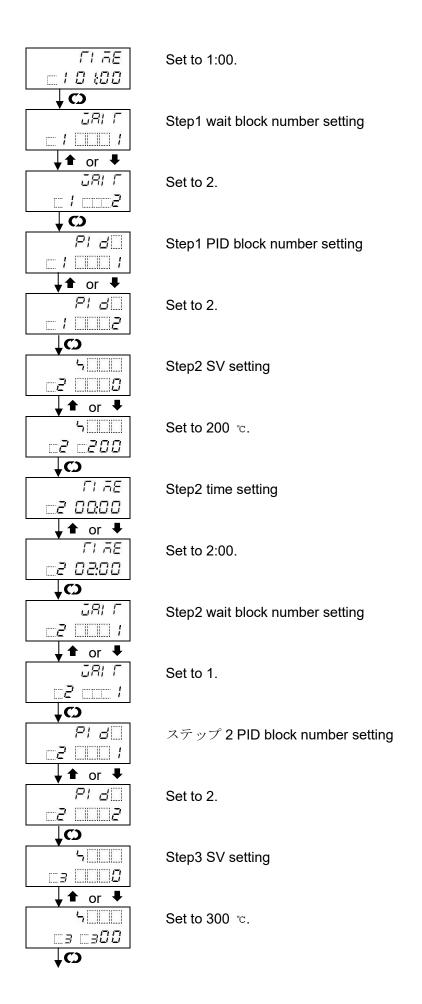
In the above program pattern, control is performed at each step as follows.

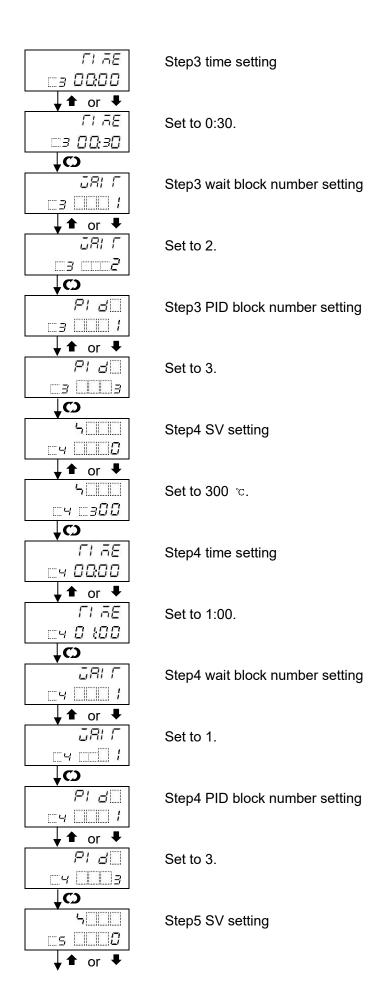
- Step 1: The SV gradually rises to $200^\circ c$ for 1 hour. When the step ends, Wait function works so that control cannot proceed to the next step until PV reaches $190^\circ c$ when step ends.
- Step 2: Fixed value control is performed to keep SV at 200℃ for 2 hours.
- Step 3: Control is performed so that the SV gradually rises to 300℃ for 30 minutes. When the step is finished, Wait function works so that control cannot proceed to the next step until PV reaches 290℃.
- Step 4: Fixed value control is performed to keep SV at 300°c for 1 hour.
- Step 5: Control is performed so that the SV gradually falls to 0℃ for 2 hours.

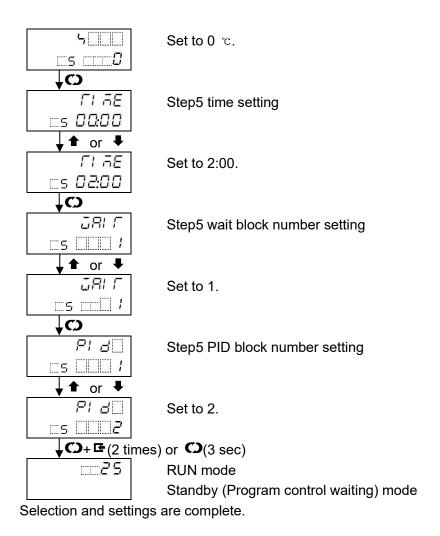
(Example)

When selecting the RUN/STOP function via the PF key function selection and setting the program pattern shown in (Fig. 8.7-6)









- 127 -

Program control RUN

To execute program control, press and hold the OUT/OFF key or PF key for approximately 1 second while in Standby (program control waiting) mode, or turn the EVT input ON.

Program control will start using the start method selected in Program control start type selection. When the wait function activates, the PV Display will flash.

Program control STOP

To stop program control, press and hold the OUT/OFF key or PF key for approximately 1 second during program control execution, or set the EVT input to OFF in the EVT input allocation settings. Program control will stop and return to Standby (program control waiting) mode.

Proceeding to the next step during Program control (Advance function)

During program control execution, press and hold the up key for approximately one second or turn on the EVT input to proceed to the next step.

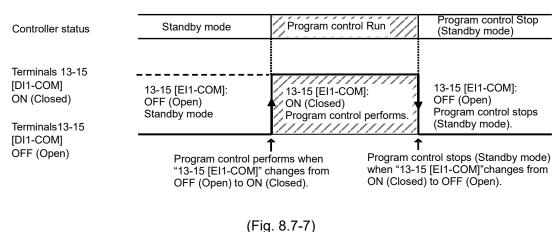
This interrupts the currently executing step and advances to the next step.

If the wait function is active, it cancels the wait function and proceeds to the next step.

If 'ENER' (Program control RUN/STOP)' is selected in [Event input EI1 allocation], Program control RUN/STOP can be switched by terminals 13 and 15 [EI1-COM]:

Signal edge action from OFF to ON / ON to OFF is engaged.

However, for the action when power is turned ON, Level action [ON (Closed) or OFF (Open)] is engaged.



8.7 Event Output EV□ Allocation

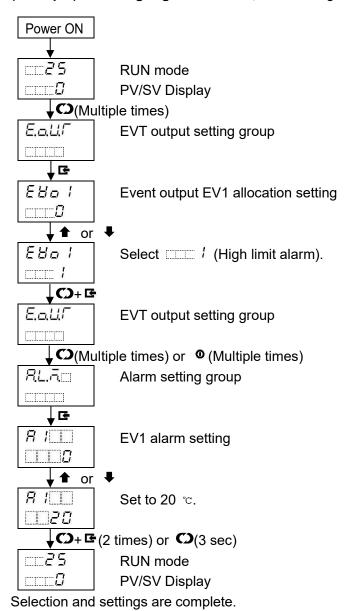
Selects Event output EV \square allocation.

Selecting the EV \square allocation for event output is done in the EVT output settings group under Event output EV \square allocation selection. Factory default value is No event.

Selection item:

Selection item:		
	No event	
	Alarm output, High limit alarm	
	Alarm output, Low limit alarm	
[]] 3	Alarm output, High/Low limits alarm	
	Alarm output, High/Low limits independent	
	alarm	
5	Alarm output, High/Low limit range alarm	
	Alarm output, High/Low limit range	
	independent alarm	
7	Alarm output, Process high alarm	
	Alarm output, Process low alarm	
	Alarm output, High limit with standby alarm	
	Alarm output, Low limit with standby alarm	
	Alarm output, High/Low limits with standby	
	alarm	
□□ i≥	Alarm output, High/Low limits with standby	
	independent alarm	
[][] 13	Heater burnout alarm output	
14	Loop break alarm output	
[][] /S	Time signal output	Turns OFF or ON during Program
		control, by setting OFF time and ON
		time within the step set in [Step
		number].
III is	Output during AT	Turns ON during AT.
□□ <i>1</i> 7	Pattern end output	Turns ON when Program control
		ends, and remains ON until turned
		OFF.
	Remote output	Turns OFF or ON by communication
		command 00D6H during Serial communication.
		20 EV1 output 0: OFF
		1: ON
		21 EV2 output 0: OFF
		1: ON
		22 EV3 output 0: OFF
		1: ON
19	Additional output when error occurs	Alarm, heater burnout alarm, sensor
	, tagasiai saipat mion onoi sosais	error, input error, etc., turns ON when
		error occurs.
□□∂B	Main output	Selectable when EV2 is added in OP1
	Cooling output	Selectable when EV2 is added in OP1
·	Cooming output	CONTRACTOR LAST TO ACCOUNT OF T

(Example) Selecting High limit alarm, and setting EV1 alarm value to 20℃



8.8 Indicating MV, Remaining Time (Program Control)

In Fixed value control and Program control, MV and remaining time are indicated.

To indicate MV, press and hold the \(\mathbf{O}\) key for approx. 3 seconds on the PV/SV Display.

The unit enters Monitor mode, and indicates MV.

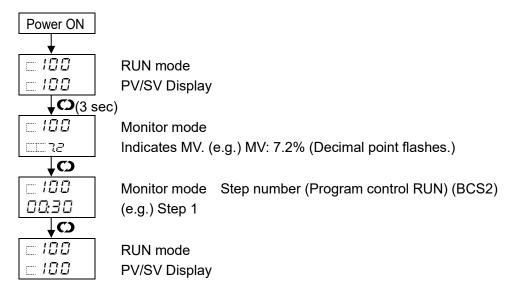
While MV is indicating, the decimal point flashes.

While in Standby (Program control waiting) mode of Program control, the unit cannot move to Monitor mode.

In monitor mode, depending on the control state, pressing the key will cycle through the following displays:

Control State	Indicated Contents
Fixed value control	Indicates only MV.
Program control	Indicates MV, Remaining time (in that order).

Indicating MV, Remaining time



8.9 Items to be Initialized by Changing Settings

If settings are changed, the following items will be initialized.

O: Initialized

-: Not initialized

Setting item to be Changed Item to be	Input type selection Temperature	Event output EV1 allocation	Event output EV2 allocation	Event output EV3 allocation	Transmission output type
initialized	unit selection	setting	setting	setting	selection
SV1 to SV8 setting	0	_	_		_
Step1 to 16 SV setting	0		_	_	_
Step1 to 16 time setting	0	_	_	_	_
Step1 to 16 wait block	0		_	_	_
number setting					
Step1 to 16 PID block	0	_	_	_	_
number setting	_				
AT bias setting	0	_	_		_
AT hysteresys setting	0	_	<u> </u>	_	_
Block1 to 8 OUT1 proportional band setting	0	_	_		_
Block1 to 8					
OUT1 Integral time setting	0	_	_	_	_
Block1 to 8	0	_	_	_	_
OUT1 Derivative time setting					
Block1 to 8	0	_	_	_	_
OUT2 proportional band setting)				
Block1 to 8	0	_	_	_	_
OUT2 Integral time setting					
Block1 to 8	0	_	_	_	_
OUT2 Derivative time setting	<u> </u>				
Block1 to 8	0	_	_	_	_
MV bias setting)				
Block1 to 8	0	_	_	_	_
Overlap/dead band setting)				
EV1 alarm setting	0	0	_	_	_
EV1 high limit alarm setting	0	0	_	_	_
EVT2 alarm setting	0	_	0	_	_
EVT2 high limit alarm setting	0	_	0	-	_
EVT3 alarm setting	0	_	_	0	_
EVT3 high limit alarm setting	0	_	_	0	_
Loop break alarm time setting	0	_	_	_	_
Loop break alarm band setting	0	_	_	_	_
Loop break alarm dead band setting	0	_	_	_	_
Scaling high limit setting	0	_	_	_	_
Scaling low limit setting	0	_	_	_	_
Sensor correction	<u> </u>			_	
coefficient setting	0	_	_		_
Sensor correction setting	0	_	_	_	

Setting item to be Changed Item to be initialized	Input type selection Temperature unit selection	Event output EV1 allocation setting	Event output EV2 allocation setting	Event output EV3 allocation setting	Transmission output type selection
OUT1 ON/OFF hysteresis setting	0	_	_	_	_
OUT2 ON/OFF hysteresis setting	0	_	_	_	_
EV1 hysteresis setting	0	_	_	_	_
EV2 hysteresis setting	0	_	_	_	_
EV3 hysteresis setting	0	_	_	_	_
SVTC bias setting	0				_
Transmission output high					
limit setting	0	_	_	_	0
(except for MV transmission)					
Transmission output low					
limit setting	0	_	_	_	0
(except for MV transmission)					
External setting input high limit setting	0	_	_	_	_
External setting input low limit setting	0	_	_	_	_
Remote bias setting	0	_	_	_	_
Program start temperature setting	0	_	_	_	_
Block1 to 8 wait setting	0	_	_	_	_
SV rise rate setting	0	_	_	_	_
SV fall rate setting	0	_	_	_	_

9. Attached Function

This section explains the settings for the main attached functions.

9.1 Input Value Correction

Input value can be corrected in [Sensor correction coefficient] and [Sensor correction] in Input setting group.

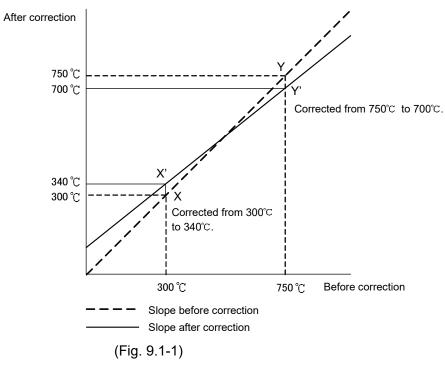
In [Sensor correction coefficient], set the slope of temperature change.

In [Sensor correction], set the difference between temperatures before correction and after correction.

PV after input correction is expressed by the following formula.

PV after input correction = Current PV x Sensor correction coefficient + (Sensor correction value)

The following shows an example of input value correction using 'Sensor correction coefficient' and 'Sensor correction value'.



(1) Select any 2 points of PV to be corrected, and determine the PV after correction.

PV before correction: 300°c → PV after correction: 340°c

PV before correction: 750°c → PV after correction: 700°c

(2) Calculate Sensor correction coefficient from Step (1).

$$(Y'-X')/(Y-X) = (700-340)/(750-300) = 0.8$$

- (3) Enter a PV value of 300℃ using an mV generator or dial resistor.
- (4) Set Step (2) value as a Sensor correction coefficient.
- (5) Read the PV.

240[°]c will be indicated.

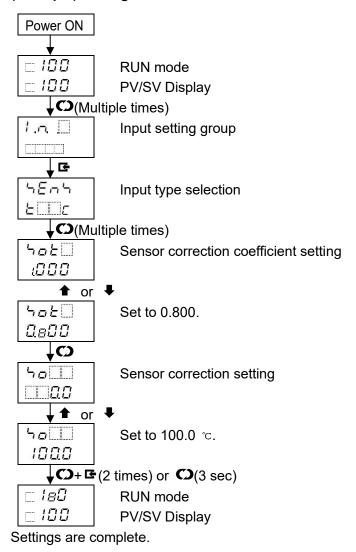
(6) Calculate the sensor correction value.

Calculate the difference between 'PV after correction' and Step (5) PV.

340℃ - 240℃ = 100℃

- (7) Set Step (6) value as a Sensor correction value.
- (8) Enter an electromotive force or resistance value equivalent to 750°c using an mV generator or dial resistor.
- (9) Read the PV, and confirm that 700°C is indicated.

(Example) Setting Sensor correction coefficient to 0.800, and Sensor correction to 100.0℃



9.2 Set Value Lock

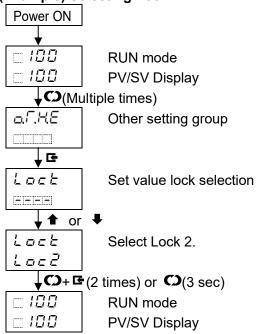
Locks the set values to prevent setting errors.

Make a selection in [Set value lock] in other setting group.

The setting item to be locked depends on the selection.

Selection Item	Change via Keypad	Change via Software Communication
Unlock	All set values can be changed.	All set values can be changed.
Lock 1	None of the set values can be changed.	
Lock 2	Only the main settings group can be	
	changed.	

(Example) Selecting Lock 2



Selection is complete.

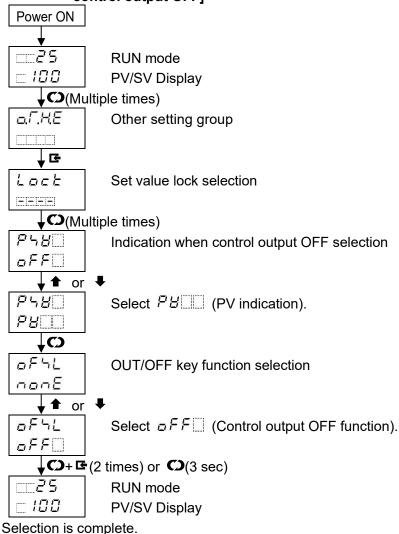
9.3 Control Output OFF Function

The control action and output of an instrument (or instruments) can be turned OFF without turning OFF their power supplies using this function.

Select 'Control output OFF function' in [OUT/OFF key function] or [PF key function selection] in other setting group.

Factory default value is Control output OFF function.

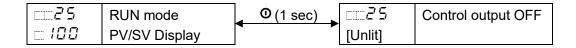
(Example) Selecting 'Control output OFF function', and 'PV indication' in [Indication when control output OFF]



To turn the control output OFF, press the ® key for approximately 1 second on the PV/SV Display. PV is indicated on the PV Display. Indication differs depending on the selection in [Indication when control output OFF].

Once the control output OFF function is enabled, the function cannot be cancelled even if the power to the instrument is turned OFF and ON again.

To cancel the function, press the @ key again for approx. 1 second.



9.4 Switching Auto/Manual Control (Auto/Manual Control Function)

Control action can be switched from automatic to manual and vice versa.

When switching from automatic control to manual control, or from manual control to automatic control, the balance-less bump-free function activates to prevent sudden changes in the operating amount. Switching to manual control illuminates the MAN indicator light. Set the operating amount using the up or down keys. After changing the manual operating amount, the data is saved after 2 seconds.

Additionally, when the instrument power is turned on, you can choose whether to restore via automatic control or manual control.

If manual control is selected in the Auto/Manual Control Restore Selection, restoration occurs using the manual setpoint. However, if 6: Auto/Manual Switch is selected in the event input allocation selection, restoration occurs based on the event input status.

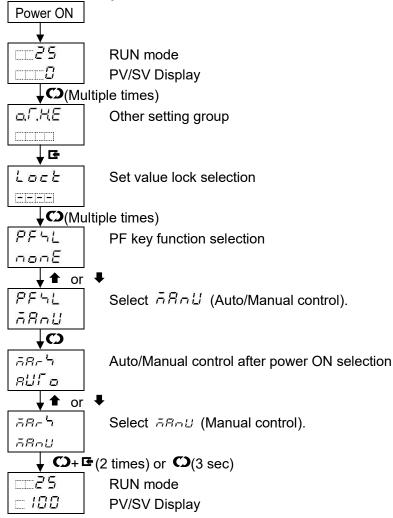
The selection of automatic/manual control functions is performed via the OUT/OFF key function selection or PF key function selection in the other setting group.

The factory default setting is no function.

The selection for automatic/manual control recovery is made in the Automatic/Manual Control Recovery Selection within the other setting group.

The factory default setting is automatic control.

(Example) When Auto/Manual control is selected in PF key function selection and Manual control after power ON is selected in Auto/Manual control after power ON selection

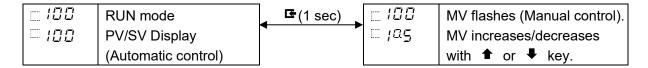


Selection is complete.

When Manual control is selected in Auto/Manual control after power ON selection, the instrument will resume at the manual MV set value when the power is turned on.

However, if $\square \mathcal{I} \mathcal{I} \mathcal{I}$ (Auto/Manual control) is selected in Event input allocation setting, it will resume based on the event input status.

Pressing the key again for approximately 1 second will return it to automatic control.



9.5 Data Clear and Program Clear

If data is cleared, data will revert to factory default values.

There are two types: Data Clear and Program Clear.

Data clear: Resets all settings to factory default values.

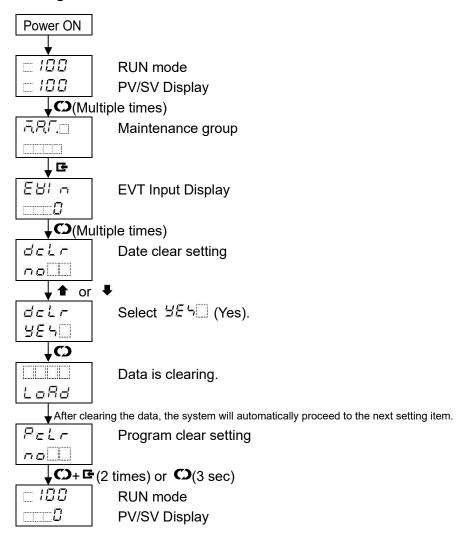
• Program clear: Resets only the settings within the program setting group to factory default values.

Data Clear and Program Clear are performed via the maintenance group's Date Clear Yes/No and Program Clear Yes/No settings.

Select Yes and press the \(\Omega\) key to execute data clear.

During data clear execution, the PV Display will turn off and the SV Display will show $L \Box R \Box$.

Clearing Data



10. Action Explanation

10.1 OUT1 Action

Action	Reverse (Heating) Actio	on Direct (Cooling) Action
Control action	ON P-band OFF Δ SV	P-band ON OFF
Relay contact output	© Type action is performed according to deviation.	To the second se
Non-contact voltage output		V DC 0 V DC 0/12 V DC 12 V DC 8 Cycle action is performed according to deviation.
Direct Current Output DC Voltage Output	+ ⑦	
Open-collector output	7 ¬ 7 7 8 ¬ N 8 ¬ N 6 Cycle action is performed according to deviation.	OFF OFF OFF ON OFF/ON ON O
Indicator (O1) Orange	Lit	Unlit Unlit Lit

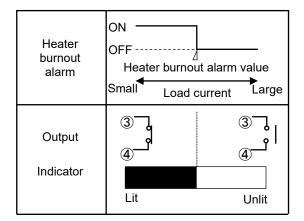
: Turns ON (lit) or OFF (unlit).

10.2 OUT1 ON/OFF Action

Action	Reverse (Heating) Action	Direct (Cooling) Action		
Control action	ON Hysteresi	SV	S	Hysteresis	ON OFF
Relay contact output	7 8	77	7 7		⑦ T ⑧ 】
Non-contact voltage output	+ ⑦¬¬ 12 V DC - ⑧¬	+⑦¬ 0 ∨ DC -®¬	+⑦ ¬ 0 V DC -® ¬		+⑦ ¬ 12 ∨ DC -® →
Direct Current Output DC Voltage Output	+ ⑦	+⑦ ¬ 4 mA DC -® ¬	+⑦¬¬ 4 mA DC -®¬¬		+⑦一 20 mA DC _8—
Open-collector output	7 o l	⑦ ¬ OFF 8 ¬	⑦		⑦
Indicator (O1) Orange	Lit	Unlit	Unlit		Lit

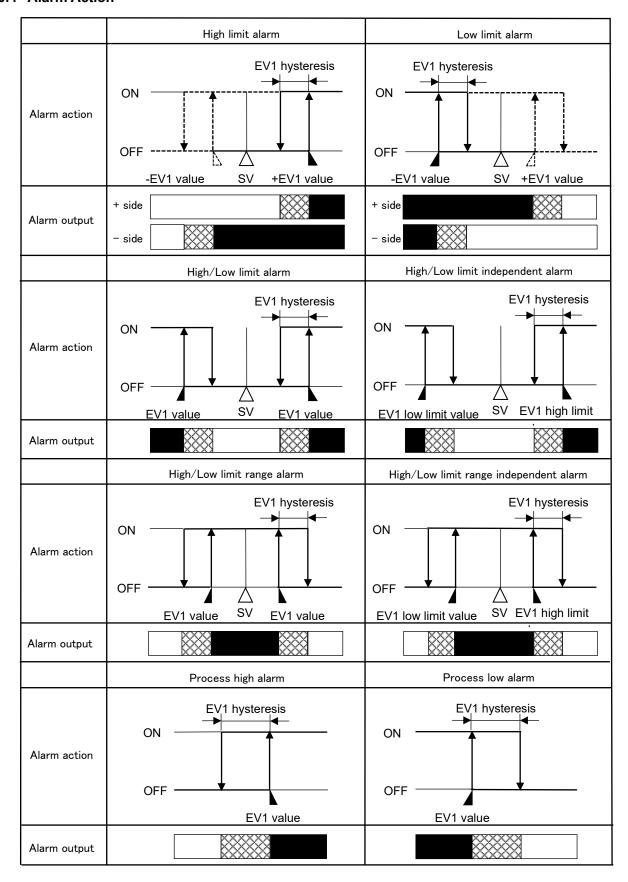
: Turns ON (lit) or OFF (unlit).

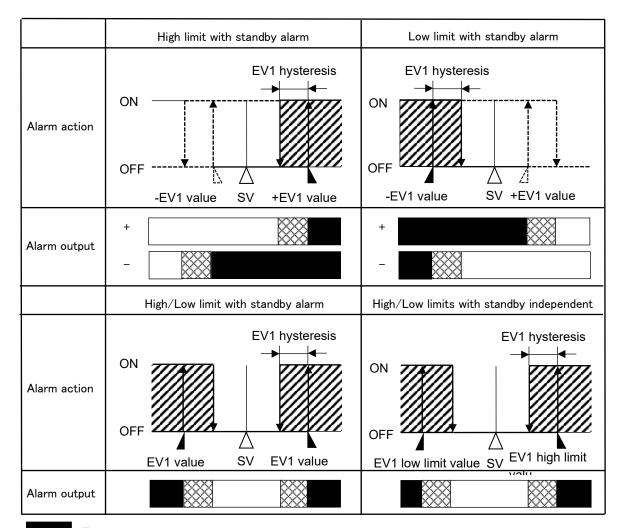
10.3 Heater Burnout Alarm Action



- Event output 1 terminal numbers: 3, 4,
 - Option EV2: Event output 2 terminal numbers: 5, 6
- Option EV3: Event output 1 terminal numbers: 3, 6
 - Event output 2 terminal numbers: 4, 6
 - Event output 3 terminal numbers: 5, 6

10.4 Alarm Action





: Event output EV1 terminals 3, 4: ON

Event output EV1 terminals 3, 4: ON or OFF

: Event output EV1 terminals 3, 4: OFF

Alarm output is in standby.

• EV1 value, EV1 high limit value and EV1 hysteresis represent EV1 alarm value, EV1 high limit alarm value and EV1 alarm hysteresis respectively.

For EV2 and EV3, read "EV2" and "EV3" for "EV1".

- EV1 indicator lights when Event output 1 terminals 3 and 4 are ON, and turns off when their output terminals 3 and 4 are OFF.
- When option: EV2,

EV2 indicator lights when Event output 2 terminals 5 and 6 are ON, and turns off when their output terminals 5 and 6 are OFF.

· When option: EV3,

EV1 indicator lights when Event output 1 terminals 3 and 6 are ON, and turns off when their output terminals 3 and 6 are OFF.

EV2 indicator lights when Event output 2 terminals 4 and 6 are ON, and turns off when their output terminals 4 and 6 are OFF.

EV3 indicator lights when Event output 3 terminals 5 and 6 are ON, and turns off when their output terminals 5 and 6 are OFF.

10.5 OUT2 (Heating/Cooling Control) Action

Control action	ON ————————————————————————————————————	Heating P-band	(Cooling P-band)	ON (Cooling control) —— OFF
Relay contact output (OUT1)	®Cycle action	® 🚽	⑦ーー ⑧ 』 ing to deviation.	
Non-contact voltage output (OUT1)	_8	+⑦¬¬ 12/0 V DC -⑧¬¬ is performed accord	+⑦一 0 V DC -⑧一 ling to deviation.	
Direct current output (OUT1) DC voltage output (OUT1)	+⑦ ¬¬ 20 mA DC -8 ¬¬ Changes co	+⑦¬¬ 20 to 4 mA DC -®¬¬ ontinuously accordir	-8-	
Open collector output (OUT1)	⑦ ¬ ON 8 ¬ Cycle action	⑦ ¬ ON/OFF ⑧ ¬ s performed accord	⑦ ̄ OFF ⑧ ̄ ing to deviation.	
Relay contact output (OUT2)		⑤	5 - 1 6 - 1 performed according	⑤
Non-contact voltage output (OUT2)		+⑤¬¬ 0 V DC -⑥¬ Cycle action is p	+5— 0/12 V DC -6— performed according	+⑤¬¬ 12 V DC -⑥¬¬ 15 to deviation.
Direct current output (OUT2) DC voltage output (OUT2)		+ ⑤—— 4 mA DC - ⑥—— Changes conti	+⑤一 4 to 20 mA DC -⑥—I nuously according to	+⑤— 20 mA DC –⑥— o deviation.
Open collector output (OUT2)		⑤	⑤	SON 6 on to deviation.
Indicator (O1)	Lit			Unlit
Indicator (O2)	Unlit			Lit

: Turns ON (lit) or OFF (unlit).

---- : Represents Heating control action.

--- : Represents Cooling control action.

10.6 OUT2 (Heating/Cooling Control) Action (When Setting Dead Band)

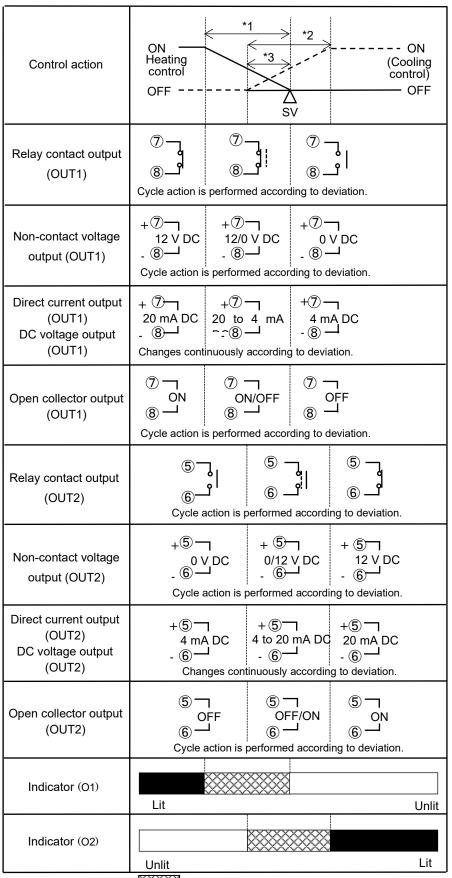
Control action	Heating control (Cocon	ON oling trol) OFF
Relay contact output (OUT1)	© 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
Non-contact voltage output (OUT1)	+ \bigcirc	
Direct current output (OUT1) DC voltage output (OUT1)	+ ⑦¬¬ + ⑦¬¬ + ⑦¬¬ 20 mA DC 20 to 4 mA ADC - ® — 1 - ® — 1 - ® — 1 Changes continuously according to deviation.	
Open collector output (OUT1)	ON ON/OFF OFF S — 8 — 8 — 8 — Cycle action is performed according to deviation.	
Relay contact output (OUT2)	5 5 5 6 6 6 6 6 6 6	viation.
Non-contact voltage output (OUT2)	+5¬ +5¬ +5 0 V DC 0/12 V DC 12 -6¬ -6¬ -6 Cycle action is performed according to de	VDC
Direct current output (OUT2) DC voltage output (OUT2)	+ ⑤	nA DC
Open collector output (OUT2)	S	ON J
Indicator (O1)	Lit	Unlit
Indicator (O2)	Unlit	Lit

: Turns ON (lit) or OFF (unlit).

: Represents Heating control action.

: Represents Cooling control action.

10.7 OUT2 (Heating/Cooling Control) Action (When Setting Overlap Band)



*1: Heating P-band

: Turns ON (lit) or OFF (unlit).

*2: Cooling P-band

: Represents Heating control action.

*3: Overlap

-----: Represents Cooling control action.

11. Specifications

11.1 Standard Specifications

Rating

Rated scale		Input	Input Input Range Resolution		Resolution
			-200 to 1370 ℃	-328 to 2498 °F	1 ℃(೯)
		V	-200.0 to 800.0 ℃	-328.0 to 1472.0	0.1 ℃(℉)
		K		°F	
			-200.0 to 400.0 °c	-328.0 to 752.0 ℉	0.1 ℃(ੂਿ)
		J	-200 to 1000 ℃	-328 to 1832 °F	1 ℃(೯)
		3	-200.0 to 400.0 °c	-328.0 to 752.0 ℉	0.1 ℃(ੂਿ)
		R	0 to 1760 ℃	32 to 3200 °F	1 ℃(℉)
		S	0 to 1760 ℃	32 to 3200 °F	1 ℃(ൂ
		В	0 to 1820 ℃	32 to 3308 °F	1 ℃(℉)
		Е	-200 to 800 ℃	-328 to 1472 °F	1 ℃(℉)
		Т	-200.0 to 400.0 °c	-328.0 to 752.0 ℉	0.1 ℃(೯)
		N	-200 to 1300 ℃	-328 to 2372 °F	1 ℃(೯)
		PL-II	0 to 1390 ℃	32 to 2534 °F	1 ℃(೯)
		C(W/Re5-26)	0 to 2315 °c	32 to 4199 F	1 ℃(೯)
			-200.0 to 850.0 ℃	-328.0 to 1562.0	0.1 ℃(℉)
		Pt100		F	
		1 1100	-200 to 850 ℃	-328 to 1562 °F	1 ℃(℉)
			-100.0 to 100.0 °c	-148.0 to 212.0 ℉	0.1 ℃(೯)
		4 to 20 mA(*2)	-19999 to 19999(*1)		1
		0 to 20 mA(*2)			1
		4 to 20 mA(*3)			1
		0 to 20 mA(*3)			1
		0 to 1 V	-19999 to	19999(*1)	1
		0 to 5 V	-19999 to	19999(*1)	1
		1 to 5 V	-19999 to	19999(*1)	1
		0 to 10 V -19999 to 19999(*1) 1			
		(*1): Scaling and decimal point place selection are possible.			
		(*2): It has a built-in receiving resistor (50 Ω).			
		. ,		sistor (50Ω) is attache	
Input Thermocouple		K, J, R, S, B, E, T, N, PL-II(ASTM E1751M-15), C(W/Re5-26)			
			tance: 100 Ω max.		
			B input, External resis		
	RTD		ype (JIS C1604-2013	•	
				e: 10 Ω max. per wir	e
	Direct current	0 to 20 mA DC,		50.0 /	
		Input impeda		50 Ω (receiving res	sistor)
		Allowable inpu		50 mA DC max.	
	DC voltage	0 to 1 V DC	cuit forward voltage:	0.9 V DC max.	
	DC voltage		200.	1 M Ω min.	
		Input impedar Allowable inp		5 V DC max.	
		-	ut voltage. nal source resistance		
			o 5 V DC, 0 to 10 V D		
		Input impedal		100 kΩ min.	
		I inhar impedal	100.	TOO NJE TIIIII.	

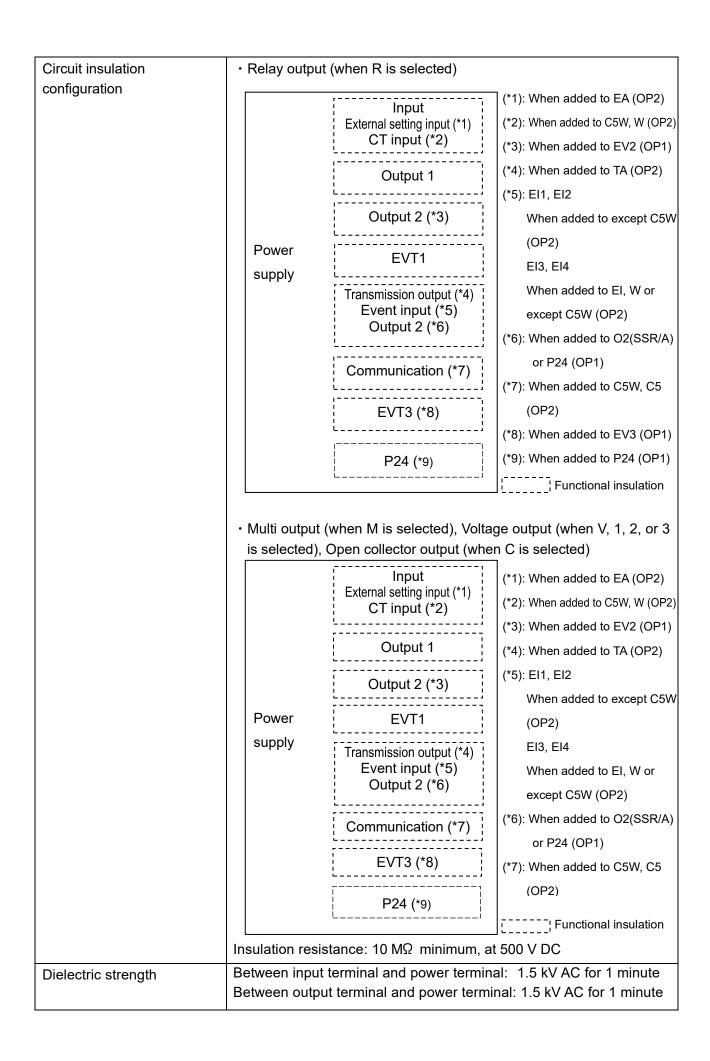
Allowable input voltage:	15 V DC max.
Allowable signal source resistance:	100 Ω max.

Output

Output				
Control	Relay contact	Control capacity: 3 A 250 V AC (resistive load)		
output	1a	1 A 250 V AC (inductive load cos <i></i> ∕0=0.4)		
		Electrical life: 100,000 cycles		
		Minimum applicable load: 10 mA 5 V DC		
	Non-contact	12 V DC±15%		
	voltage (For SSR drive)	Max. 40 mA (short circuit protected)		
	Direct current	4 to 20 mA DC, 0 to 20 mA DC		
		Resolution: 12000		
		Load resistance: Max. 550 Ω		
Open collector (NPN)		0 to 1 V DC, 0 to 5 V DC, 1 to 5 V DC, 0 to 10 V DC		
		Resolution: 12000		
		Load resistance: Min. 1 kΩ		
		Allowable load current: Max. 100 mA		
		Load voltage: Max. 30 V DC Residual voltage: Max. 1.2 V DC		
		Leakage current when OFF: Max. 0.1 mA		
Event outp	ut	Output point: 1 point		
		Relay contact: 1a		
		Control capacity: 3 A 250 V AC(resistive load)		
		1 A 250 V AC(inductive load $\cos\phi$ =0.4)		
		Electrical life: 100,000 cycles		
		Minimum applicable load: 10 mA 5 V DC		

Power supply

24 V DC, 48 V DC, 100 to 240 V AC	
Allowable voltage fluctuation range 24 V DC: 24 V ±10 %	
	48 V DC: 48 V ±10 %
	100 to 240 V AC: 85 to 264 V AC
24 V DC	Approx. 5 W max.
48 V DC	Approx. 5 W max.
100 to 240 V AC	Approx. 11 VA max.
	Allowable voltage 24 V DC 48 V DC



Environmental conditions

Ambient temperature	-10 to 55℃ (Non-condensing, No icing)	
Ambient humidity	35 to 85 %RH (Non-condensing)	
Altitude	Below 2,000 m	
Environmental specification	RoHS Directive compliant	
Corrosion resistance	No corrosive gases	

Performance

Base accuracy	At ambient temperature 23℃ (for a single unit mounting)
Thermocoup input	
RTD input	Within ±0.1% of each input span±1 digit
Direct currer DC voltage input	t, Within ±0.2% of each input span±1 digit
Direct currer DC voltage output	Within ±0.3% of each output span
Cold junction compensat	ion -10 to 55°C within 1°C
Effect of ambient temperature	Thermocouple input (no decimal point) Within ±100 ppm/c of each input span Below 0 ℃(32 ₮), within ±200 ppm/c of each input span Thermocouple Input (with decimal point) Within ±200 ppm/c of each input span Below 0 ℃(32 ₮), within ±400 ppm/c of each input span Others Within ±100 ppm/c of each input span
Effect of electromagnetic	10/ 6 11
interference	
Input sampling period	10 ms (Direct current, DC voltage input only), 50 ms, 125 ms

General Structure

ocheral ollac	taro		
Weight Approx. 120 g		Approx. 120 g	
External dimensions		48 x 48 x 68 mm (W x H x D) (Depth of control panel interior: 60 mm)	
Mounting Control panel flush-mounting type (compatible panel thickness: 1 to 5		Control panel flush-mounting type (compatible panel thickness: 1 to 5 mm)	
Case		Flame-resistant resin, Black	
Front panel Polycarbonate sheet		Polycarbonate sheet	
Drip-proof/Dust-proof		Front panel: IP66	
Compliant	LVD	EN61010-1 (Pollution degree 2, Overvoltage category II)	
standards	EMC	EMI: EN61326-1	
		CISPR11 Group1 ClassA	
		EMS: EN61326-1	
		· ·	

Indication structure

ndication st					
Indication structure	PV Display	Indicates PV. In setting mode, indicates setting characters. 7-segment LCD display (White) Character size: 15.2 × 6.0 mm (H x W)			
		Unaracter si	Character size: 15.2×6.0 mm (H x W)		
	SV Display	Indicates SV	/. In setting mode, indicates setting value.		
		7-segment L	CD display (Green)		
		Character si	Character size: 5.8×2.8 mm (H x W)		
	MEMO/STEP	Indicates the	e program execution step or the set value memory number.		
	Display	7-segment LCD display (Green)			
		Character size: 5.8×2.8mm (H x W)			
	Temperature	Indicates the	e temperature unit. (Indicates only for thermocouple and		
	unit indicator	RTD ranges	.)		
		-	e unit segment LCD display (White)		
			ze: 4.0×3.4mm (H x W)		
	Operation	SV	Lit when set value is displayed on the SV Display.		
	indicator	MV	Lit when output control value is displayed on the SV		
	(Orange)		Display.		
		MEMO	Lit when setpoint memory function (fixed value control)		
		0.755	is enabled.		
		STEP	Lit when program control is selected.		
		01	Lit when control output OUT1 is ON, or when the		
			heating output (Option 1: EV2, O2 (SSR/A)) is ON.		
			For direct current output type, flashes corresponding to		
		O2	the MV in 250 ms cycles.		
		02	Lit when cooling output (Option 1: EV2, O2 (SSR/A)) is ON.		
			For direct current output type, flashes corresponding to the MV in 250 ms cycles.		
		EV1	Lit when Event output 1 is ON.		
		EV2	Lit when Event output 2 is ON.		
			(Option1: EV2)		
		EV3	Lit when Event output 3 is ON.		
			(Option1: EV3)		
		AT	Flashes during auto tuning.		
		MAN	Lit during manual control.		
		R/L	Lit when remote selection is selected for external		
			settings input.		
		T/R	Lit during Serial communication (Option2: C5W, C5) TX		
			(transmitting) output.		
		LOCK	Lit when in setting value lock mode.		
Terminal arrangement			Refer to 'Terminal arrangement'. (p.16)		
Console connector		By connecting to the tool cable (CMD-001, sold separately), the following operations can be conducted from an external computer using the Console software SWC-ACS201M.			
		 Reading and setting of SV, PID and various set values Reading of PV and action status 			
		Function change			
			- ق-		

Setting Structure

Function key	UP key	Increase the setting value. During program control, press for 1 second to activate the advance			
Key		function.			
	DOWN key	Decrease the setting value.			
		During program control, press for 1 second to activate the hold function.			
	PF key	· •	nction selection, it operates as follows.		
		PF key function selection	Action		
		0: No function	No function		
		1: Automatic/Manual control	Switch between automatic and manual		
		function	control.		
		2: Control output OFF function	Turn control output ON/OFF.		
		3: Remote/Local selection	Switch between remote and local operation.		
		4: RUN/STOP function	Switch program control execution ON/OFF.		
		In setting mode, it is possible to select the number of digits for numerical input.			
	OUT/OFF key	Depending on the OUT/OFF key function selection, it operates as follows.			
		OUT/OFF key function	A ction		
		selection	Action		
		0: No function	No function		
		1: Automatic/Manual control function	Switch between automatic and manual control.		
		2: Control output OFF function	Turn control output ON/OFF.		
		3: Remote/Local selection	Switch between remote and local operation.		
		4: RUN/STOP function	Switch program control execution ON/OFF.		
	MODE key	Enter setup mode and register the settings.			

Control Performance

- OTTAL OTT OTTO THIS COLUMN	
Control action selection	In the control operation selection menu, you can choose any control
	method from 2 DOF PID control, Fast-PID control, Slow-PID control, or
	Gap-PID control.
	Selecting the control method according to the application and process
	enables optimal control.
	However, when changing the control operation, reset and display the
	warm-up.

It performs control operations with disturbance response characteristics similar to Fast-PID control while reducing overshoot. Fast-PID control (PI-D control) Derivative-leading PID control method, a common control method where the differential action operates according to the change in the measured value. The control action can be changed by making the following settings. When the integral time and derivative time are set to 0. P control: PI control: When the derivative time is set to 0. PD control: When the integration time is set to 0. **Deviation PID control:** When the target value changes over time, select Fast-PID control in the control action selection. Set the proportional gain 2 DOF coefficient (α) to 1.00 and the derivative 2 DOF coefficient (y) to 1.00 to enable the derivative action to operate according to the deviation. ON/OFF control: When the proportional band setting is set to 0 (or 0.0). Slow-PID control (I-PD control) Proportional-derivative leading PID control method, where the proportional action operates based on the measured value and the derivative action operates based on the rate of change of the measured value. This control method is used when overshoot is to be avoided. Gap-PID control (Gapped PID control) When measurement values contain excessive noise or control components exhibit hysteresis, slight fluctuations may persist near zero deviation. In such cases, a deadband is typically employed. However, since control does not occur within the deadband, measurement values change during disturbances. Therefore, deviation characteristics are introduced within the deadband to enable response to disturbances. Proportional · 2 DOF PID control, Slow-PID control, Gap-PID control band (P) Thermocouple, RTD inputs without decimal point: 1 to input span ℃(F) Thermocouple, RTD inputs with decimal point: 0.1 to input span ℃(F) Direct current, voltage inputs: 0.1 to 1000.0 % Fast-PID control (PI-D control) Thermocouple, RTD inputs without decimal point: 0 to input span ℃(F) Thermocouple, RTD inputs with decimal point: 0.0 to input span ℃(℉) Direct current, voltage inputs: 0.0 to 1000.0 % Except when Slow-PID control is selected Integral time 0 to 10000 sec or 0.0 to 1999.9 sec (I) When Slow-PID control is selected 1 to 10000 sec or 0.1 to 1999.9 sec Change the setting by selecting the integral/derivative decimal point position. Derivative 0 to 10000 sec time (D) 0.0 to 1999.9 sec

· 2 DOF PID control

Control action

Change the setting by selecting the integral/derivative decimal point position.

Proportional gain 2 DOF coefficient (g) Integral 2 DOF coefficient (g) 0.00 to 10.00 coefficient (g) Derivative 2 DOF coefficient (g) 0.00 to 1.00 DOF coefficient (y) 0.1 to 120.0 sec proportional cycle OUT1 DIFFER COMMENT (great current, voltage inputs: 1 to 10000 F hysteresis (Fast-PID control) 0.0 to 100.0 % Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) 0.0 to 100.0 % Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.)				
Coefficient (g) Integral 2 DOF Coefficient (g)		•	0.00 to 1.00	
Integral 2 DOF coefficient (β) Derivative 2 DOF coefficient (γ) OUT1		_		
Coefficient (β) Derivative 2 DOF Coefficient (γ) OUT1 proportional cycle OUT1 D.1 to 120.0 sec DoF Coefficient (γ) ON/OFF Direct current, voltage inputs: 1 to 10000 Direct current, voltage inputs: 1 to 10000 Direct current, voltage inputs: 5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) OUT1 low limit O.0 to 100.0 % Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) Out 100.0 % Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) Out 100.0 % Out 100.0 % Out 100.0 % Output (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) Output 0.0 to 10.0 % Output 0.0 %				
Derivative 2 DOF coefficient (y) OUT1		_	0.00 to 10.00	
DOF Coefficient (y) OUT1 DUT1 DUT1 DUT1 DUT1 DUT1 DUT2 DUT2 DUT2 DUT3 DUT		coefficient (β)		
DOF Coefficient (y) OUT1 DUT1 DUT1 DUT1 DUT1 DUT1 DUT2 DUT2 DUT2 DUT3 DUT		Danis satis sa O	0.00 to 4.00	
coefficient (y) OUT1 proportional cycle OUT1 ON/OFF hysteresis (Fast-PID control) OUT1 high limit Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) OUT1 low limit OUT1 low limit OUT0 1 low limit OUT1			0.00 to 1.00	
OUT1 proportional cycle OUT1 ON/OFF hysteresis (Fast-PID control) OUT1 high limit Direct current, voltage inputs: 1 to 10000 OUT1 low limit Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) OUT1 low limit Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) Gap width Setting (Gap-PID control) Gap coefficient setting (Gap-PID control) Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 ∞(90 ₹) to Input range low limit value - 50 ∞(90 ₹) to Input range low limit value - 50 ∞(90 ₹) to Input range low limit value - 50 ∞(90 ₹) to Input range low limit value - (Input span × 1%) ∞(₹) to Input range low limit value - (Scaling width × 10%) to Scaling limit value + 50.0 ∞(90.0 ₹) Direct current, voltage inputs Scaling limit value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit settin				
proportional cycle OUT1 ON/OFF hysteresis (Fast-PID control) OUT1 high limit OUT1 low limit low low limit low low limit OUT1 low limit low low limit l			0.44, 400.0	
Countrol O.1 to 1000.0 to (0.1 to 1800.0 to 10000			0.1 to 120.0 sec	
OUT1 ON/OFF hysteresis (Fast-PID control) OUT1 high limit OUT1 low limit low li				
ON/OFF hysteresis (Fast-PID control) OUT1 high limit Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) OUT1 low limit 0.0 to 100.0 % Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) Gap width setting (Gap-PID control) Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °C(90 °F) to Input range low limit value - 50 °C(90 °F) to Input range low limit value - (Input span × 11%) °C(F) to Input range low limit value - (100.0 °F) Direct current, voltage inputs (without decimal point), RTD input Input range low limit value - (100.0 °F) to Input range low limit value - (100.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling low limit setting value + (Scaling width × 10%) to Scaling low limit setting value + (Scaling width × 10%) to Scaling low limit setting value + (Scaling width × 10%)				
hysteresis (Fast-PID control) OUT1 high limit Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) OUT1 low limit OUT1 low limit low low limit low low limit low low low limit low low low limit low low low limit limput range low limit value - 50 °C(90 °C) OUT1 low limit limit limput low limit limput l			,	
(Fast-PID control) OUT1 high limit			Direct current, voltage inputs:1 to 10000	
Control		•		
OUT1 high limit Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) OUT1 low limit 0.0 to 100.0 % Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) Gap width setting (Gap-PID control) 0.0 to 10.0% Proportional band width × Gap width (%), 0.0% means gap width is disabled Gap coefficient setting (Gap-PID control) Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °c(90 °r) to Input range high limit value - 50 °c(90 °r) to Input range low limit value - (Input span × 1%) °c(r) to Input range high limit value + 50 °c (90 °r) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value - (Scaling width × 10%) to Scaling high limit setting value - (Scaling width × 10%) to Scaling high limit setting value - (Scaling width × 10%) to Scaling high limit setting value - (Scaling width × 10%)				
limit Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) OUT1 low limit Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) Gap width setting (Gap-PID control) O.0 to 10.0% Proportional band width × Gap width (%), 0.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O.0 to 1.0 O.0% means gap width is disabled O.0 to 1.0 O				
(However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) OUT1 low limit OUT1 low limit low limit low low low low low limit limput range limit limit low limit limput range limit limit low limit limput range limit limit limit low limit limput range limit limit limit limit limit limit low limit limput range limit lim				
OUT1 low limit O.0 to 100.0 % Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) Gap width setting (Gap-PID control) Gap coefficient setting (Gap-PID control) Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 ~ (90 ~ F) to Input range high limit value + 50 ~ (90 ~ F) Thermocouple input (without decimal point), RTD input Input range high limit value - (Input span × 1%) ~ (F) to Input range high limit value + 50.0 ~ (90.0 ~ F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) (Scaling span × 10%) (Sc		limit		
OUT1 low limit O.0 to 100.0 %			· · · · · · · · · · · · · · · · · · ·	
Direct current, voltage inputs: -5.0 to 105.0 % (However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) Gap width setting (Gap-PID control) Gap coefficient setting (Gap-PID control) Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °c(90 °F) to Input range low limit value + 50.0 °c(90.0 °F) Direct current, voltage inputs Scaling low limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Scaling low limit to Control range Control range Direct current, voltage inputs Scaling low limit setting value + (Scaling width × 10%) to Scaling low limit setting value + (Scaling width × 10%) to Scaling low limit setting value + (Scaling width × 10%) to Scaling low limit setting value + (Scaling width × 10%) Scaling low limit setting value + (Scaling width × 10%) Control range Control range Add selection when rad even scar limit (Direct current, DC voltage input) Control range Add selection when rad even scar limit (Direct current, DC voltage input) Control range Add selection when rad even scar limit (Direct current, DC voltage input) Control range Add selection when rad even scar limit (Direct current, DC voltage input) Control range Add selection when rad even scar limit (Direct current, DC voltage input) Control range Add selection when rad even scar limit (Direct current, DC voltage input) Control range Add selection when rad even scar limit (Direct current, DC voltage input) Control range Control range Add selection when rad even scar limit (Direct current, DC voltage input) Add selection when rad even scar limit (Direct current, DC voltage input) Add selection when rad even scar limit (Direct current, DC voltage input)			. ,	
(However, for outputs other than 4-20 mA DC or 1-5 V DC, values below 0.0% will not be output.) Gap width setting (Gap-PID control) Gap coefficient setting (Gap-PID control) Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °C(90 °F) Thermocouple input (without decimal point), RTD input Input range low limit value - 50 °C(90 °F) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °C(°F) to Input range high limit value + 50.0 °C(90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Control range Control rang		OUT1 low limit	0.0 to 100.0 %	
O.0% will not be output.)			Direct current, voltage inputs: -5.0 to 105.0 %	
Gap width setting (Gap-PID control) Gap coefficient setting (Gap-PID control) Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value + 50 °c(90 °r) to Input range ligh limit value + 50 °c(90 °r) Thermocouple input (without decimal point), RTD input Input range low limit value - 100 °c(90 °r) Thermocouple input (without decimal point), RTD input Input range low limit value + 50.0 °c(90.0 °r) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Addin selection when input range low limit or Scaling low limit setting value + (Scaling width × 10%) Control range Control range Addin selection when input range low limit (Direct current, DC voltage input) Scaling low limit (Direct current, DC voltage input) Control range Addin selection when input range low limit (Direct current, DC voltage input) Control range (Scaling selection when input range low limit (Direct current, DC voltage input) (Scaling span × 10 %) (Scaling span × 10 %) (Scaling span × 10 %) (Co voltage, Scaling span × 10 %)			(However, for outputs other than 4-20 mA DC or 1-5 V DC, values below	
setting (Gap-PID control) Gap coefficient setting (Gap-PID control) Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °c (90 °r) Thermocouple input (without decimal point), RTD input Input range low limit value - 50 °c (90 °r) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °c (°r) to Input range high limit value + 50.0 °c (90.0 °r) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Control range Addon selection when input errors occur Input range low limit Oileed current, Oil			0.0% will not be output.)	
PID control) Question (Gap- PID control) Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °c(90 °F) to Input range high limit value + 50 °c(90 °F) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °c(°F) to Input range high limit value + 50.0 °c(90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Scaling high limit setting value + (Scaling width × 10%) Thermocouple input (without decimal point) Input range low limit value + 50.0 °c(90.0 °F) Control range Control range Input range high limit Collect current, Collec		Gap width	0.0 to 10.0%	
Gap coefficient setting (Gap-PID control) If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °c (90 °F) to Input range high limit value + 50 °c (90 °F) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °c (F) to Input range ligh limit value + 50.0 °c (90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Control range Input range low limit or Scaling low limit Or		setting (Gap-	Proportional band width × Gap width (%),	
Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °c(90 °F) to Input range high limit value + 50 °c(90 °F) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °c(°F) to Input range high limit value + 50.0 °c(90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Scaling low limit setting value + (Scaling width × 10%) Control range Input range high limit Or Scaling high limit Or Voltage input) -50 °C(90 °F) - (Input span × 1 %) °C(°F) - (Scaling span × 10 %) Or (Oc voltage, (DC voltage, (D		PID control)	0.0% means gap width is disabled	
Setting (Gap-PID control) Control range If the value exceeds the specified control range, the action set in the action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °c (90 °r) to Input range low limit value + 50 °c (90 °r) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °c (r) to Input range high limit value + 50.0 °c (90.0 °r) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Redon selection when Input range low limit Input range high limit Or Scaling high limit Or Scali		Gap	0.0 to 1.0	
PID control		coefficient		
PID control		setting (Gap-		
action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °C (90 °F) to Input range high limit value + 50 °C (90 °F) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °C (F) to Input range high limit value + 50.0 °C (90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Control range Control range Addin selection when input errors occur PV Input range high limit (Direct current, DC voltage input) -50 °C (90 °F) or -(Input span × 1 %) °C (F) -(Scaling span × 10 %) (DC voltage, (DC voltage, span × 10 %) (DC voltage, (DC voltage, span × 10 %)				
action selection when input error occurs will be executed. Thermocouple input (without decimal point) Input range low limit value - 50 °C (90 °F) to Input range high limit value + 50 °C (90 °F) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °C (F) to Input range high limit value + 50.0 °C (90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Control range Control range Addin selection when input errors occur PV Input range high limit (Direct current, DC voltage input) -50 °C (90 °F) or -(Input span × 1 %) °C (F) -(Scaling span × 10 %) (DC voltage, (DC voltage, span × 10 %) (DC voltage, (DC voltage, span × 10 %)	Control rai	nae	If the value exceeds the specified control range, the action set in the	
Thermocouple input (without decimal point) Input range low limit value - 50 °C (90 °F) to Input range high limit value + 50 °C (90 °F) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °C (°F) to Input range high limit value + 50.0 °C (90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Action selection when input errors occur Control range Input range high limit or Scaling low limit (Direct current, OC voltage input) -50 °C (90 °F) or - (Input span × 1 %) °C (°F) or - (Scaling span × 10 %) (DC voltage, (DC voltage,		90	·	
Input range low limit value + 50 °C(90 °F) to Input range high limit value + 50 °C(90 °F) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °C(F) to Input range high limit value + 50.0 °C(90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Control range Input range low limit Or Scaling high limit Or Scaling high limit Or Scaling high limit Or O			·	
Input range high limit value + 50 °C(90 °F) Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °C(F) to Input range high limit value + 50.0 °C(90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Control range Input range low limit or Scaling low limit (Direct current, DC voltage input) -50 °C(90 °F) or - (Input span × 1 %) °C(F) or - (Scaling span × 10 %) (DC voltage, (DC voltage,				
Thermocouple input (without decimal point), RTD input Input range low limit value - (Input span × 1%) °C(F) to Input range high limit value + 50.0 °C(90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Addon selection when input errors occur Control range Action selection when input errors occur Control range Action selection when input errors occur Action selection when input errors occur Control range Action selection when input errors occur Action selection when input errors occur Control range Action selection when input errors occur Action selection when input errors occur Control range Action selection when input errors occur Action selection when input errors occur Control range Action selection when input errors occur Action selection when input errors occur Control range Action selection when input errors occur Action selection when input errors occur Control range Action selection when input errors occur Action selection when input errors occur Control range Action selection when input errors occur Action selection when input errors oc			. , ,	
Input range low limit value - (Input span × 1%) °C(F) to Input range high limit value + 50.0 °C(90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Action selection when input errors occur Control range Action selection when input errors occur Action selection when input errors occur Control range Action selection when input errors occur Action selection when input errors occu				
Input range high limit value + 50.0 °C (90.0 °F) Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Action selection when input errors occur Control range Input range low limit or Scaling low limit (Direct current, DC voltage input) -50 °C (90 °F) or - (Input span × 1 %) °C (F) or - (Scaling span × 10 %) (DC voltage, (DC voltage,				
Direct current, voltage inputs Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Action selection when input errors occur Input range low limit or Scaling low limit (Direct current, DC voltage input) -50 °C(90 °F) or - (Input span × 1 %) °C(°F) or - (Scaling span × 10 %) (DC voltage, (Scaling span × 10 %)				
Scaling low limit setting value - (Scaling width × 10%) to Scaling high limit setting value + (Scaling width × 10%) Action selection when input errors occur Control range Input range low limit or Scaling high limit (Direct current, DC voltage input) -50 °C (90 °F) or - (Input span × 1 %) °C (°F) or - (Scaling span × 10 %) (DC voltage, (DC voltage,			, , ,	
Scaling high limit setting value + (Scaling width × 10%) Action selection when input errors occur Input range low limit or or or Scaling low limit (Direct current, DC voltage input) -50 °C(90 °F) or - (Input span × 1 %) °C(°F) or - (Scaling span × 10 %) (DC voltage, (DC voltage, (DC voltage, (DC voltage, Action selection when input range high limit or scaling high limit (Direct current, DC voltage input) Action selection when input errors occur Action				
Action selection when input errors occur Input range low limit or Scaling low limit (Direct current, DC voltage input) -50 °C (90 °F) or - (Input span × 1 %) °C (F) or - (Scaling span × 10 %) (DC voltage, (DC voltage,			Scaling low limit setting value - (Scaling width × 10%) to	
Input errors occur Input range low limit or or or Scaling low limit (Direct current, DC voltage input) - 50 °C (90 °F) or - (Input span × 1 %) °C (°F) or - (Scaling span × 10 %) (DC voltage, (DC vol			Scaling high limit setting value + (Scaling width × 10%)	
Input errors occur Input range low limit or or or Scaling low limit (Direct current, DC voltage input) - 50 °C (90 °F) or - (Input span × 1 %) °C (°F) or - (Scaling span × 10 %) (DC voltage, (DC vol				
Input errors occur Input range low limit or or or Scaling low limit (Direct current, DC voltage input) - 50 °C (90 °F) or - (Input span × 1 %) °C (°F) or - (Scaling span × 10 %) (DC voltage, (DC vol			// Action selection when //	
Input range low limit or or or Scaling low limit (Direct current, DC voltage input) - 50 °C (90 °F)			L V/A I/A CONTROL PANCE	
Input range low limit or or or Scaling low limit (Direct current, DC voltage input) - 50 °C (90 °F)			PV	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				
DC voltage input) DC voltage input) - 50 °C(90 °F)			Scaling low limit Scaling high limit	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			DC voltage input) DC voltage input)	
- (Input span × 1 %) °C(°F)				
or or -(Scaling span×10 %) +(Scaling span×10 %) (DC voltage, (DC voltage,				
(DC voltage, (DC voltage,			or	
Direct current input) Direct current input)			(DC voltage,	
			Direct current input) Direct current input)	

Standard Function

	nction		
EV1 output		The output is turned ON or OFF based on the event conditions allocated in the event output setting mode.	
		When "Enable" is selected for the output latch, the output remains ON	
		even if the event condition changes from ON to OFF.	
Alarm action		When the alarm action is selected as energized in the event output setting mode, if the PV exceeds the deviation setting range for the SV (excluding absolute value alarms), the output turns ON or OFF (high/low limit range alarm). When de-energized is selected, the output behavior is reversed.	
	Туре	High limit alarm, Low limit alarm, High/Low limits alarm, High/Low limits independent alarm, High/Low limit range alarm, High/Low limit range independent alarm, Process high alarm, Process low alarm, High limit with standby alarm, Low limit with standby alarm, High/Low limits with standby alarm, High/Low limits with standby independent alarm Energized/De-energized action are applied to the above alarms, totaling	
	•	24 alarm types. No alarm action can also be selected.	
	Action	ON/OFF action	
	_	Thermocouple, RTD inputs: 0.1 to 1000.0 ℃(0.1 to 1800.0 ℉)	
	setting	Direct current, voltage inputs: 1 to 10000	
	Alarm action delay timer setting	0 to 10000 sec	
	Output	Event output allocated to alarm output in event output setting mode	
	Alarm value 0	If 'Enabled' is selected in [Alarm value 0 Enabled/Disabled], the	
	Enabled/	following alarm type activates even if alarm value is set to 0 (zero):	
	Disabled	High limit alarm, Low limit alarm, High/Low limits alarm, High/Low limits independent alarm, High/Low limit range alarm, High/Low limit range independent alarm, High limit with standby alarm, Low limit with standby alarm, High/Low limits with standby independent alarm.	
Loop break	alarm (LA)	Detects heater burnout, sensor burnout and actuator trouble.	
Loop break	Setting range	Loop break alarm time setting:	
		0 to 200 min	
		Loop break alarm band setting:	
		0 to 150 ಿc(0 to 270 ್) or 0.0 to 150.0 ಿc(0.0 to 270.0 ೯) Direct current, voltage inputs: 0 to 1500	
		Loop break alarm dead band setting:	
		0 to 150 ಿರ(0 to 270 ್) or 0.0 to 150.0 ಿರ(0.0 to 270.0 ್)	
		Direct current, voltage inputs: 0 to 1500	
	Output	Event output allocated to alarm output in event output setting mode	
Setting value ramp function		When the SV changes, control from the previous SV to the new SV at	
		the set change rate.	
		Set the SV rise rate and SV fall rate separately.	
	SV rise rate	Thermocouple, RTD inputs:	
setting		0 to 10000 °c/min (0 to 18000 °г/min)	
		or 0.0 to 1000.0 ℃/min (0.0 to 1800.0 ℉/min)	
		Direct current, voltage inputs:	
		0 to 10000 /min	
		[However, if set to 0 (0.0), this function will not operate.]	

1)	
]	
ing and fall rate	
J	
n OFF to ON, or	
·	
nanual control to	
peration can be	
perate from the	
an be switched	
Shift and correct the input value. Enabled when program control is selected in the control/program control	
selection.	
program setting	
control action is	
becomes	
coefficient (α),	
efficient (γ)	
en the program	
ion selected in	
tional gain 2	
derivative 2	
derivative 2	
a ala at E t DID	
select Fast-PID	
the proportional	
C range).	
in step SV.)	

Attached Functions

Power failure countermeasure	The setting data is backed up in the non-volatile IC memory.		
Self-diagnosis	The watchdog timer monitors program runaway and stoppage. Upon		
	detecting an abnormality, it resets the MCU and restores the		
	instrument to its initial state.		
Automatic cold junction	This detects the temperature at the connecting terminal between the		
temperature compensation	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).		
PV filter time constant	Digital first-order low-pass filter reduces fluctuations in input values		
setting	caused by noise.		
3	PV filter time constant: 0.0 to 10.0 seconds		
Number of moving average			
rtamber of moving average	noise.		
	Moving average count: 1 to 10 times		
Scaling function	For DC voltage and direct current inputs, the input analog value can		
Scaling function			
	be scaled to any display range set between the scaling low limit setting		
	value and the scaling high limit setting value.		
	For thermocouple and RTD inputs, the target value setting range is		
	limited to the range set between the scaling low limit setting value and		
	the scaling high limit setting value.		
Overscale	The input range below is overscale, and the overscale status flag is		
	set.		
	However, control operations continue during overscale.		
	Thermocouple input (without decimal point)		
	Scaling high limit to Input range high limit + 50 ್ರ(90 ್)		
	Thermocouple input (without decimal point), RTD input		
	Scaling high limit to Input range high limit + 50.0 ೀ(90.0 ೯)		
	Direct current, voltage inputs		
	Scaling high limit setting value to Scaling high limit setting value +		
	(Scaling width × 10 %)		
	※ If the scaling high limit setting value is 19999 or higher, it will		
	display as [¯ ¯ ¯ ¯]. The control range extends up to the scaling		
	high limit setting value + (Scaling width $ imes$ 10%).		
	Within input range Overscale		
	Within input range Overscale		
	PV		
	Control range		
	→ PV		
	Input range high limit or scaling high limit + 50°C (90°F) setting (DC voltage, current input) or		
	+ 50.0°C (90.0°F)		
	or +(Scaling range × 10%)		
	(DC voltage, current input)		

Underscale

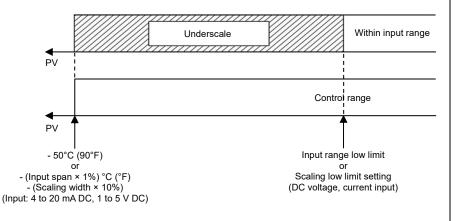
The input range below is underscale, and the underscale condition flag is set. However, control operations continue during underscale.

Thermocouple input (without decimal point)

Input range low limit - 50 °c (90 °F) to Input range low limit

Thermocouple input (without decimal point), RTD input Input range low limit - (Input span × 1 %) ℃(℉) to Input range low limit

Direct current (4 to 20 mA), voltage(1 to 5 V) inputs
Scaling low limit setting value - (Scaling width × 10 %) to Scaling low limit setting value

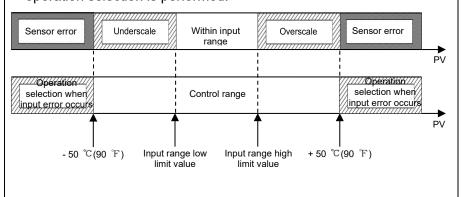


Sensor error

Thermocouple Input (without decimal points) disconnection condition When below the input range low limit value -50°C (90°F)

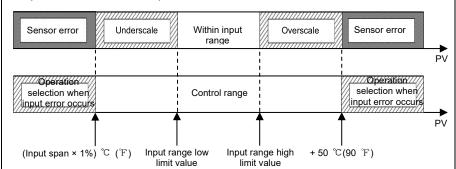
The PV Display flashes [---], and the action set in the input error operation selection is performed.

When exceeding the input range high limit value +50°C (90°F)
The PV Display flashes [----], and the action set in the input error operation selection is performed.

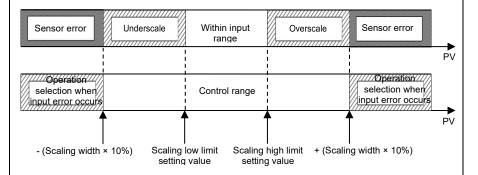


Thermocouple Input (with decimal points) disconnection condition When below the input range low limit value - (Input span × 1 %) ${}^{\circ}{}^{\circ}({}^{\circ}{}^{\circ})$ The PV Display flashes [_ _ _ _], and the action set in the input error operation selection is performed.

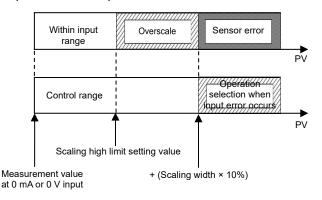
When exceeding the input range high limit value + 50.0 $^{\circ}$ C(90.0 $^{\circ}$ F) The PV Display flashes [$^{-}$ - $^{-}$], and the action set in the input error operation selection is performed.



DC voltage, direct current input disconnection condition
When less than the scaling low limit setting value - (Scaling width × 10%)
The PV Display flashes [____], and the control output turns OFF.
When exceeding the scaling high limit setting value + (Scaling width × 10%)
The PV Display flashes [____] and the control output turns OFF.



However, for 0 to 20 mA, 0 to 1 V, 0 to 5 V, and 0 to 10 V, the measured value corresponds to the input at 0 mA or 0 V.



Cold junction error

If the internal cold junction temperature falls below -10°C (14°F) or exceeds 55°C (131°F), the cold junction becomes errored.

(When thermocouple input is selected)

Internal bus error

If the internal circuitry experiences a fault or other abnormality, the control output will turn OFF.

Warm-up indication	After power-up, for approximately 3 seconds, the PV Display shows [L] REE] and the SV Display shows [L] Subsequently, the PV Display shows the input type and temperature unit selection, while the SV Display shows the input range high limit (for thermocouple or RTD inputs) or the scaling high limit (for DC voltage or direct current inputs). During this period, all outputs and indicator lights are OFF. For direct current output and transmission output (option: TA (4-20 mA)), the output is 4 mA DC.
Console communication	Operated via the tool cable connector from the external computer.
Contact open/close count measurement function	Outputs (O1, O2, EV1, EV2, EV3) can accumulate and measure the number of ON/OFF cycles. Each ON/OFF cycle is counted as one instance for accumulation. This allows for an approximate estimation of the contact life based on the number of operations of the external switchgear. However, since the storage cycle is 10 minutes, counts within a 10-minute period may not be saved in cases such as power outages. The measurement count can be confirmed using the dedicated console software.
Cumulative energizing time	This function allows you to check the duration of energization.
measurement function	Cumulative time is saved every 10 minutes, enabling you to grasp the
	approximate usage period. However, since the save interval is 10
	minutes, time periods shorter than 10 minutes may not be saved due
	to power outages or other reasons. The cumulative time can be
	checked using the dedicated console software.
He atom assessed time	Cumulative energizing time: 10 minutes per count
Heater cumulative	For relay output and SSR output, the cumulative time the heater has
energization time measurement function	been energized can be confirmed. The count increments when the output time to the heater reaches a cumulative total of 1 minute. The
measurement function	accumulated time is saved every 10 minutes, allowing you to estimate
	the approximate heater usage period and use it as a guideline for
	when to replace the heater. However, since the save cycle is 10
	minutes, time within a 10-minute period may not be saved in cases
	such as power outages.
	It is possible to check the energization time using the dedicated
	console software.
	Heater Cumulative Energization Time: 1 minute per count

Error Log	When an abnormality occurs, the abnormality type and cumulative energization time for the past 10 occurrences are stored. Error logs can be checked using dedicated console software.		
	The types of abnormalities stored in the error log are listed in the table		
	below.		
	Cumulative energization time: 1 hour per count		
	Alarm type		
	Alarm 1		sor error
	Alarm 2		t error (overscale)
	Alarm 3	· ·	t error (underscale)
	Heater burnout alarm		junction error (-10°C or below,
			cor above)
	Actuator short circuit alarm		-volatile IC memory error
	Loop break alarm Internal bus error		
	When selecting the event output allocation selection 19: Output when error occurs, output is generated when error occurs. Exception display when alarm occurs Alarm type Exception display		
			rs
			Exception display
	Non-volatile IC memory error		PV Display shows [Err !] lit
	Internal bus error Instrument periodic reset		Instrument periodic reset
			(malfunction)
	Sensor error (out of high limit range) PV Display shows [PV Display shows []
			flashing
	Sensor error (out of low limit range)		PV Display shows []
			flashing
Firmware Update Function	Function updates can be performed via the console software.		
Non-volatile IC memory	All settings can be temporarily changed.		
data saving selection	Upon power-on, the values revert to those before selecting the non-		
	volatile IC memory save proh	ibition	
Set value lock	Locks the set values to preve	nt sett	ing errors.

Others

Accessories included	Mounting frame: 1 piece	
	Instruction manual (excerpt): 1 copy	
Accessories sold	Terminal cover (TC-ACS)	
separately	CT (Current transformer):	
	CTL-6-S-H (For Heater burnout alarm 20 A)	
	CTL-12-S36-10L1U (For Heater burnout alarm 100 A)	
	Tool cable CMD-001	

11.2 Optional Specifications

2 Optional Specifications			
Event input	4 points (EI1 to EI4) are added as event inputs.		
(Option: EI)	For options except C5W and EI, 2 points (EI1 and EI2) are added		
	simultaneously.		
	Events allocated via the event input allocation selection are executed		
	based on whether they are in the ON (closed) or OFF (open) state.		
	Input points: 4 points (optional)		
	Input method: Contact input		
	Closed-circuit current: Approx. 2.3 mA		
	Import judgment time: 40 ms to 40 ms + within input sampling range		
Event output	The output is turned ON or OFF based on the event conditions allocated		
(Options: EV2, EV3)	in the event output settings.		
	If "Enabled" is selected in the output latch selection, the output remains		
	ON even when the event condition changes from ON to OFF. For the EV3 option, the COM pin is shared.		
	Relay contact, 1a		
	Control capacity: 3 A 250 V AC (resistive load)		
	1 A 250 V AC (lesistive load) 1 A 250 V AC (inductive load, $\cos \phi = 0.4$)		
	,		
	Electrical life: 100,000 cycles		
	Minimum applicable load: 10 mA 5 V DC		
Heater burnout alarm	When allocated to multiple EVT outputs, the set value is common.		
[Options: C5W (20 A),	When the control output is ON, if the CT input (detected current) value		
C5W (100 A), W (20 A),	falls below the heater burnout alarm set value, a heater burnout error		
W (100A)]	occurs and the EVT output turns ON. Additionally, the heater burnout		
	alarm flag is set in status flag 1.		
	Rated current: 20 A, 100 A (Must be specified when ordering.		
	Setting range: 0.0 to 20.0 A (If set to 0.0, it does not function.)		
	0.0 to 100.0A (If set to 0.0, it does not function.)		
	Setting accuracy: 5% of the rated value		
	Operation point Setting value		
	Operation: ON/OFF operation		
	Output: Event outputs allocated in the event output allocation		
	setting will be turned ON or OFF.		
	Actuator short circuit alarm		
	When the control output is OFF, if the CT input (detected current)		
	value exceeds the heater burnout alarm setpoint, an actuator		
	short circuit alarm occurs and the EVT output turns ON.		
	Additionally, the actuator short circuit alarm flag is set in status		
	flag 1.		
Heating/Cooling control	Performs Heating/Cooling control.		
[Options: EV2 (Select 21 in	Cooling proportional band (Pc)		
the output allocation	Thermocouple input (with decimal point), RTD input:		
selection), O2 (SSR/A)]	0 to Input span ℃(ஈ)		
	DC voltage, current inputs:		
	0.0 to 1000.0 %		
	When 0 or 0.0 is set:		
	ON-OFF control		
	Cooling integral time (Ic)		
	2-DOF PID control, Fast-PID control		
	0 to 10000 sec		
	0.0 to 1999.9 sec		
	Slow-PID control		
	1 to 10000 sec		
	0.1 to 1999.9 sec		
	Change settings via the decimal point position selection.		

Cooling derivative time (Dc) 0 to 10000 sec 0.0 to 1999.9 sec Change settings via the decimal point position selection. Cooling proportional cycle 0.1 to 120.0 sec Cooling output high limit, output low limit 0.0 to 100.0 % DC voltage, current inputs: -5.0 to 105.0 % (However, for outputs other than 4-20mA, values below 0% are not output.) Cooling ON/OFF hysteresis 0.1 to 100.0 v (Cl.1 to 180.0 r) DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method can be selected from Air cooling (linear characteristics), Oil cooling (15th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 v (-180.0 to 180.0 v) DC voltage, current inputs: -1000 to 1000 When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 v DC (Allowable load resistance: Minimum 1 kΩ) 0 to 1 v DC (Allowable load resistance: Minimum 1 kΩ) 0 to 1 v DC (Allowable load resistance: Minimum 1 kΩ) 0 to 1 v DC (Allowable load resistance: Minimum 1 kΩ) 0 to 1 v DC (Allowable load resistance: Minimum 1 kΩ) 0 to 1 v DC (Allowable load resistance: Minimum 1 kΩ) 0 to 1 v DC (Allowable load resistance: Minimum 1 kΩ) 0 to 1 v DC (Allowable load resistance: Minimum 1 kΩ) 1 to 1 v DC (Allowable load resistance: Minimum 1 kΩ) 0 to 1 v DC (Allowable load resistance: Mi		,	
0.0 to 1999.9 sec Change settings via the decimal point position selection. Cooling proportional cycle 0.1 to 120.0 sec Cooling output high limit, output low limit 0.0 to 100.0 % DC voltage, current inputs: -5.0 to 105.0 % (However, for outputs other than 4-20mA, values below 0% are not output.) Cooling ON/OFF hysteresis 0.1 to 100.00 % OC.1 to 1800.0 m) DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method can be selected from Air cooling (linear characteristics), Oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) where characteristics, Oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 % (-180.0 to 180.0 m) DC voltage, current inputs: -1000 to 1000 When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input. 50 mA DC Input simpedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 O to 1 V DC (Allowable load resistance: Minimum 1 kΩ) O to 1 V DC (Allowable load resistance: Minimum 1 kΩ) O to 1 V DC (Allowable load resistance: Minimum 1 kΩ) O to 1 V DC (Allowable load resistance: Minimum 1 kΩ) O to 1 V DC (Allowable load resistance: Minimum 1 kΩ) O to 1 V DC (Allowable load resistance: Minimum 1 kΩ) Other to 1 value Ot		\ , ,	
Change settings via the decimal point position selection. Cooling proportional cycle 0.1 to 120.0 sec Cooling output high limit, output low limit 0.0 to 100.0 % DC voltage, current inputs: -5.0 to 105.0 % (However, for outputs other than 4-20mA, values below 0% are not output.) Cooling ON/OFF hysteresis 0.1 to 100.0 ° (0.1 to 1800.0 °) DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method selection One cooling method selection One cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 ° (-180.0 to 180.0 °) DC voltage, current inputs: -1000 to 1000 External setting input (Option: EA) When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) Ot 1 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output roll was hall be output. Insulated power output (Option: P24) The following operations can be carried out from an external computer. (Option: P24) The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function cha			
Cooling proportional cycle			
0. 1 to 120.0 sec Cooling output high limit, output low limit 0.0 to 100.0 % DC voltage, current inputs: -5.0 to 105.0 % (However, for outputs other than 4-20mA, values below 0% are not output.) Cooling ON/OFF hysteresis 0.1 to 1000.0 ∞(0.1 to 1800.0 ∞) DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method can be selected from Air cooling (linear characteristics), old cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 ∞(-180.0 to 180.0 ∞) DC voltage, current inputs: -1000 to 1000 External setting input (Option: EA) When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ)			
Cooling output high limit, output low limit 0.0 to 100.0 % DC voltage, current inputs: -5.0 to 105.0 % (However, for outputs other than 4-20mA, values below 0% are not output.) Cooling ON/OFF hysteresis 0.1 to 1000.0 %(0.1 to 1800.0 *) DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method can be selected from Air cooling (linear characteristics), Oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 %(-180.0 to 180.0 %) DC voltage, current inputs: -1000 to 1000 When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 1 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 1 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 1 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 1 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 1 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 1 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 1 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 1 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 2 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) 2 to 10 V DC (Allowable load resistanc			
O. 0 to 100.0 % DC voltage, current inputs: -5.0 to 105.0 % (However, for outputs other than 4-20mA, values below 0% are not output.) Cooling ON/OFF hysteresis 0.1 to 1000.0 ∞ (0.1 to 1800.0 ⊤) DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method selection One cooling method selection (Portion of the linear characteristics) on the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 ∞(-180.0 to 180.0 ⋾) DC voltage, current inputs: -1000 to 1000 External setting input (Option: EA) When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication method: Half-duplex communication			
DC voltage, current inputs: -5.0 to 105.0 % (However, for outputs other than 4-20mÅ, values below 0% are not output.) Cooling ON/OFF hysteresis 0.1 to 1000.0 ~c(0.1 to 1800.0 ~r) DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method can be selected from Air cooling (linear characteristics), Oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 ~c(180.0 to 180.0 ~r) DC voltage, current inputs: -1000 to 10000 When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span if the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output of Max. load current: 10 mA DC) Replaced to the control of the SV, PID values and various set values (2) Reading and setting of the SV, PID values and various set values (2) Reading and setting of the SV, PID values and various set values (2) Reading and setting of the SV, PID values and various set values (2) Reading and setting of the SV, PID values and various set values (2) Reading and setting of the SV, PID values and various set values (2) Reading and settin			
(However, for outputs other than 4-20mA, values below 0% are not output.) Cooling ON/OFF hysteresis 0.1 to 1000.0 °C(0.1 to 180.00 °F) DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method can be selected from Air cooling (linear characteristics), Oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 °C(-180.0 to 180.0 °F) DC voltage, current inputs: -1000 to 1000 External setting input (Option: EA) When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Insulated power output (Option: P24) Cerial communication (Options: C5, C5W (20 A), C5W (100 A)] Ot 10 V DC (Allowable load resistance: Minimum 1 kΩ) Aux. load current: 10 mA DC Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC Max. load current: 10 mA DC Heading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary,			
Cooling ON/OFF hysteresis 0.1 to 1000.0 ℃(0.1 to 180.0 ☉) DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method can be selected from Air cooling (linear characteristics) oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 ℂ(-180.0 to 180.0 ℂ) DC voltage, current inputs: -1000 to 1000 External setting input (Option: EA) When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span if the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output low limit value shall be output. Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC The following operations can be carried out from an external computer: (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication method: Half-duplex communication		·	
0.1 to 1000.0 ℃(0.1 to 1800.0 ♀) DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method can be selected from Air cooling (linear characteristics), Oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 ℃(-180.0 to 180.0 ♀) DC voltage, current inputs: -1000 to 1000 External setting input (Option: EA) When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ± 0.3% of Transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output low limit value shall be output. Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Amx. load current: 10 mA DC Serial communication [Options: C5, C5W (20 A), C5W (100 A)] C5W (100 A)] Fig. 20 Allowable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication method: Half-duplex communication		. ,	
DC voltage, current inputs: 1 to 10000 Cooling method selection One cooling method can be selected from Air cooling (linear characteristics), Oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 ∞(-180.0 to 180.0 ₹) DC voltage, current inputs: -1000 to 1000 External setting input (Option: EA) When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting and the transmission output low limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication method: Half-duplex			
Cooling method selection One cooling method can be selected from Air cooling (linear characteristics), Oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting: -100.0 to 100.0 √c(-180.0 to 180.0 √p) DC voltage, current inputs: -1000 to 1000 When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span if the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Serial communication [Options: C5, C5W (20 A), C5W (100 A)] Serial communication [Options: C5, C5W (20 A), C5W (100 A)] Communication land setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		· · · · · · · · · · · · · · · · · · ·	
One cooling method can be selected from Air cooling (linear characteristics), Oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting:		,	
characteristics), Oil cooling (1.5th power of the linear characteristics) and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting:			
and Water cooling (2nd power of the linear characteristics) by key operation. Overlap/Dead band setting:			
operation. Overlap/Dead band setting: -100.0 to 100.0 ℃(-180.0 to 180.0 ₮) DC voltage, current inputs: -1000 to 1000 External setting input (Option: EA) When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: ⁴ to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: ⁴ to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Insulated power output (Option: P24) The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		, , , , , , , , , , , , , , , , , , , ,	
Overlap/Dead band setting:		, , ,	
Content Con		· ·	
External setting input (Option: EA) When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Insulated power output (Option: P24) Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		,	
External setting input (Option: EA) When Remote is selected via Remote/Local selection operation (key operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Insulated power output (Option: P24) Serial communication [Options: C5, C5W (20 A), C5W (100 A)] Serial communication [Options: C5, C5W (20 A), C5W (20 A), C5W (100 A)] Communication (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		,	
operation, event input), the external analog signal is used as the setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication	External setting input	·	
setpoint. The control target value is the value with the remote bias value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Cotplion: P24) Cotplion: P24) Cotplion: C5, C5W (20 A), C5W (100 A)] Cerial communication (Options: C5, C5W (20 A), C5W (20 A), C5W (100 A)] Cerial communication (Options: C5, C5W (20 A), C5W (20 A), C5W (100 A)] Communication increases are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication			
value added. However, this is disabled during program control and operates within the range from the low limit to the high limit of the external setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Coption: P24) Serial communication [Options: C5, C5W (20 A), C5W (100 A)] Serial communication [Options: C5, C5W (20 A), C5W (100 A)] Communication the resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication method: Half-duplex communication	(0)	, ,	
external setting input. Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Coption: P24) Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		1 - 1	
Setting signal: 4 to 20 mA DC Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		<u> </u>	
Allowable input: 50 mA DC Input impedance: 50 Ω Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Compute voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		external setting input.	
Input impedance: 50 Ω Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Cotton P24) Serial communication [Options: C5, C5W (20 A), C5W (100 A)] C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		Setting signal: 4 to 20 mA DC	
Input sampling period: 100 ms Transmission output (Option: TA, TV) Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		Allowable input: 50 mA DC	
Converting the value (PV, SV or MV transmission) to analog signal every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC Max. load current: 10 mA DC The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		Input impedance: 50 Ω	
(Option: TA, TV)every 125 ms, outputs the value in current or voltage. Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output.Insulated power output (Option: P24)Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC)Serial communication [Options: C5, C5W (20 A), C5W (100 A)]The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication			
Resolution: 12000 Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550 Ω) 0 to 1 V DC (Allowable load resistance: Minimum 1 kΩ) 0 to 10 V DC (Allowable load resistance: Minimum 1 kΩ) Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication	Transmission output		
Output: 4 to 20 mA DC (Allowable load resistance: Maximum 550Ω)	(Option: TA, TV)		
$\begin{array}{c} 0 \text{ to 1 V DC (Allowable load resistance: Minimum 1 k}\Omega) \\ 0 \text{ to 10 V DC (Allowable load resistance: Minimum 1 k}\Omega) \\ 0 \text{ ot 10 V DC (Allowable load resistance: Minimum 1 k}\Omega) \\ 0 \text{ Output accuracy: Within } \pm 0.3\% \text{ of Transmission output span} \\ \text{If the transmission output high limit setting and the transmission output low limit value shall be output.} \\ \text{Insulated power output} \\ \text{(Option: P24)} & \text{Output voltage: } 24\pm3 \text{ V DC (when load current is 10 mA DC)} \\ \text{Ripple voltage: Within 200 mV DC (when load current is 10 mA DC)} \\ \text{Max. load current: } 10 \text{ mA DC} \\ \text{Serial communication} \\ \text{[Options: C5, C5W (20 A), C5W (100 A)]} & \text{The following operations can be carried out from an external computer.} \\ \text{(1) Reading and setting of the SV, PID values and various set values} \\ \text{(2) Reading of the PV and action status} \\ \text{(3) Function change} \\ \text{Cable length: Max 1.2 km, Cable resistance: Within 50 } \Omega \text{ (Terminators are not necessary, but if used, use } 120 \Omega \text{ or more on both sides.)} \\ \text{Communication line: EIA RS-485} \\ \text{Communication method: Half-duplex communication} \\ \end{array}$			
O to 10 V DC (Allowable load resistance: Minimum 1 k Ω) Output accuracy: Within $\pm 0.3\%$ of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Output voltage: 24 ± 3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		, ,	
Output accuracy: Within ±0.3% of Transmission output span If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		, ,	
If the transmission output high limit setting and the transmission output low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24) Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		,	
low limit setting are the same, the transmission output low limit value shall be output. Insulated power output (Option: P24)			
shall be output. Insulated power output (Option: P24) Serial communication [Options: C5, C5W (20 A), C5W (100 A)] C5W (100 A)] Shall be output. Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication			
Insulated power output (Option: P24)Output voltage: 24±3 V DC (when load current is 10 mA DC) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DCSerial communication [Options: C5, C5W (20 A), C5W (100 A)]The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication			
(Option: P24) Ripple voltage: Within 200 mV DC (when load current is 10 mA DC) Max. load current: 10 mA DC Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication	Inculated nower output	·	
Max. load current: 10 mA DC Serial communication [Options: C5, C5W (20 A), C5W (100 A)] (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication	1	, ,	
Serial communication [Options: C5, C5W (20 A), C5W (100 A)] The following operations can be carried out from an external computer. (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication	(Ορασιί. 1 27)	, , ,	
[Options: C5, C5W (20 A), C5W (100 A)] (1) Reading and setting of the SV, PID values and various set values (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication	Serial communication		
C5W (100 A)] (2) Reading of the PV and action status (3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication			
(3) Function change Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication	1		
Cable length: Max 1.2 km, Cable resistance: Within 50 Ω (Terminators are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication	O300 (100 A)]	, ,	
are not necessary, but if used, use 120 Ω or more on both sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		, ,	
sides.) Communication line: EIA RS-485 Communication method: Half-duplex communication		· · · · · · · · · · · · · · · · · · ·	
Communication line: EIA RS-485 Communication method: Half-duplex communication			
Communication method: Half-duplex communication		,	
· ·			
Communication speed: 9600, 19200, 38400, 57600, 115200 bps		Communication speed: 9600, 19200, 38400, 57600, 115200 bps	
(Selectable by key operation)		·	

Synchronization method: Start-stop synchronization

Data bit/Parity: Data bit: 7 bits, 8 bits, (Selectable by key operation)

Parity: Even/Odd/No parity (Selectable by key operation)

Stop bit: 1 bit, 2 bits (Selectable by key operation)

Communication protocol: Shinko protocol/MODBUS RTU/MC protocol/

SVTC (Selectable by key operation)

Instrument number: 0 to 95

When selecting the MC protocol, set the master to 1 and the slave to 2 to 8.

· SV digital transmission

Selecting SV digital transmission in the serial communication protocol selection allows digital transmission of the setpoint (SV) when combined with a digital indicating controller (with serial communication (options: C5, C5W)).

If the transmission range of the SV digital transmission sender exceeds the scaling range of the digital indicating controller, the transmission is limited to the scale range of the digital indicating controller.

Update cycle: 250 ms

· SVTC bias setting

ACS2 Digital external setting (active when Shinko protocol is selected)

Receives digital setpoint values from the SVTC program controller option.

The control target value is the value received via the SVTC command plus the SVTC bias value.

The control target value is the value received via the SVTC command plus the SVTC bias value, constrained within the range defined by the scaling low limit setting to scaling high limit setting.

Setting Range: Equivalent to ±20% of the input span

Response delay time setting

After receiving a command from the host, the response time can be delayed.

Setting range: 0 to 1000 ms

PLC link function

When MC Protocol is selected in the communication protocol selection, the PLC Link function (program-free communication function) becomes available.

This function enables serial communication connection with Mitsubishi Electric's "Q Series" PLC, allowing various data to be written to and read from PLC registers using the PLC's communication protocol.

The communication protocol uses "QW" and "QR" commands, targeting PLCs that support A-compatible 1C frame AnA/AnU common commands (QR/QW).

In the console software, specify the PLC register address, the monitor items linked to the register address, and the configuration items to perform initial setup. ACS2 periodically writes to the PLC registers using the QW command for the specified monitor items, constantly updating the register values.

Additionally, it reads data from the PLC registers using the QR command in response to configuration requests for specified items. If the read data changes, ACS2 updates its configuration values. Set the master device number to 1 and slave device numbers from 2

to 8.
Set the PLC station number to 0 and the PC number to 255 (fixed).
Remote output
When selecting remote output in EVT output allocation, it becomes
possible to forcibly turn the output ON/OFF from the host.

12. Troubleshooting

If any malfunctions occur, refer to the following items after checking that power is being supplied to the controller.

12.1 Indication

Problem	Possible Cause	Solution
The PV Display indicates	Internal non-volatile IC memory is	Contact our agency or us.
[<i>E</i> [].	defective.	
The PV Display indicates	PV has exceeded the Indication	Check the input signal source.
[].	range and Control range.	
	Burnout of thermocouple, RTD or	Replace each sensor.
	disconnection of DC voltage (0 to 1	How to check whether the
	V DC)	sensor is burnt out
		[Thermocouple]
		If the input terminals of the
		instrument are shorted, and if a
		value around room temperature is
		indicated, the instrument is likely to
		be operating normally, however, the
		sensor may be burnt out.
		[RTD]
		If approx. 100 Ω of resistance is connected to the input terminals
		between A-B of the instrument and
		between B-B is shorted, and if a
		value around 0℃ (32°) is indicated,
		the instrument is likely to be
		operating normally, however, the
		sensor may be burnt out.
		[DC voltage (0 to 1 V DC)]
		If the input terminals of the
		instrument are shorted, and if a
		scaling low limit value is indicated,
		the instrument is likely to be
		operating normally, however, the
		signal wire may be disconnected.
	Check whether the input terminals	Connect the sensor terminals to the
	of thermocouple, RTD or DC	instrument input terminals securely.
	voltage (0 to 1 V DC) are securely	
	mounted to the instrument input	
	terminals.	

Problem	Possible Cause	Solution
The PV Display indicates	PV has dropped below the	Check the input signal source and
[].	Indication range and Control range.	wiring of input terminals.
	Check whether input signal wire for	How to check whether the input
	DC voltage (1 to 5 V DC) or direct	signal wire is disconnected
	current (4 to 20 mA DC) is	[DC voltage (1 to 5 V DC)]
	disconnected.	If the input to the input terminals of
		the instrument is 1 V DC and if a
		scaling low limit value is indicated,
		the instrument is likely to be
		operating normally, however, the
		signal wire may be disconnected.
		[Direct current (4 to 20 mA DC)]
		If the input to the input terminals of
		the instrument is 4 mA DC and if a
		scaling low limit value is indicated,
		the instrument is likely to be
		operating normally, however, the
		signal wire may be disconnected.
	Check whether input signal wire for	Connect the input signal wire to the
	DC voltage (1 to 5 V DC) or current	terminals of this instrument securely.
	(4 to 20 mA DC) is securely	
	connected to the instrument input	
	terminals.	\\\(\(\text{\text{\$\alpha} \\ \text{\$\alpha} \
	Check if polarity of thermo- couple	Wire them correctly.
	or compensating lead wire is	
	Chack whather codes (A. R. R.) of	
	Check whether codes (A, B, B) of RTD agree with the instrument	
	terminals.	
The PV Display indicates	Control output OFF function	Press the © key or 🗲 key for
[□FF□],nothing or PV.	is enabled.	approx. 1 second to cancel the
[[], i], i ou ii i g or i v.		function.
The indication of PV	Check whether sensor input or	Select the sensor input and
Display is irregular or	temperature unit (℃ or ஈ) is	temperature unit (° or ℉) correctly.
unstable.	correct.	
	Sensor correction coefficient or	Set them to suitable values.
	Sensor correction value is	
	unsuitable.	
	Check whether the sensor	Use a sensor with appropriate
	specification is correct.	specifications.
	AC leaks into the sensor circuit.	Use an ungrounded type sensor.
	There may be equipment that	Keep the instrument clear of any
	interferes with or makes noise near	potentially disruptive equipment.
	the instrument.	

Problem	Possible Cause	Solution
The PV Display keeps	Check whether the input signal wire	Check the input signal wires of DC
indicating the value set	for DC voltage (0 to 5 V DC, 0 to 10	voltage (0 to 5 V DC, 0 to 10 V DC)
in [Scaling low limit].	V DC) and direct current (0 to 20	and direct current (0 to 20 mA DC).
	mA DC) is disconnected.	How to check whether the input
		signal wire is disconnected
		[DC voltage (0 to 5 V DC, 0 to 10
		V DC)]
		If the input to the input terminal of this controller is 1 V DC, and if a value (converted value from scaling high, low limit setting) corresponding to 1 V DC is indicated, the controller is likely to be operating normally, however, the input signal wire may be disconnected.
		[Direct current (0 to 20 mA DC)] If the input to the input terminal of this controller is 4 mA DC, and if a value (converted value from scaling high, low limit setting) corresponding to 4 mA DC is indicated, the controller is likely to be operating normally, however, the input signal wire may be disconnected.
	Check whether the input terminals	Connect the input terminals of DC
	for DC voltage (0 to 5 V DC, 0 to 10	voltage and current to the input
	V DC) or direct current (0 to 20 mA DC) are securely connected to the	terminals of this instrument securely.
	instrument input terminals.	Scourciy.

12.2 Key Operation

Problem	Possible Cause	Solution
None of the set values	Set value Lock 1 is selected.	Release the lock in [Set value lock].
can be set.	AT, 'AT on startup' or Fast AT is	If AT, 'AT on startup' or Fast AT is
	performing.	performing, cancel AT, 'AT on
		startup' or Fast AT.
SV cannot be set.	Set value Lock 2 is selected.	Release the lock in [Set value lock].
The setting indication	Scaling high or low limit value may	Set it to a suitable value.
does not change in the	be set at the point where the value	
input range, and new	does not change.	
values are unable to be		
set.		

12.3 Control

Problem	Possible Cause	Solution
Temperature does not	Sensor is out of order.	Replace the sensor.
rise.	Check whether the sensor or	Ensure that the sensor or control
	control output terminals are	output terminals are mounted to the
	securely mounted to the instrument	instrument input terminals securely.
	input terminals.	
	Check whether the wiring of sensor or control output	Wire them correctly.
	terminals is correct.	
The control output	OUT1 (or OUT2) low limit value is	Set it to a suitable value.
remains in an ON status.	set to 100% or higher.	
	Have you selected "MV setting	Set it to a suitable value.
	when input errors occur" under	
	"action selection when input errors	
	occur" and set "MV setting when	
	input errors occur" to 100.0%?	
	If the input cable breaks, the control	
	output will remain ON.	
The control output	OUT1 (or OUT2) high limit value is	Set it to a suitable value.
remains in an OFF	set to 0% or less.	
status.		

13. Character Table

The character list is shown below.

13.1 Display Mode

13.1.1 PV/SV Display Mode

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the PV, and the SV Display shows the value of the displayed item.

The right column indicates the status of this instrument.

Character	Status
25	During fixed value control
[Memory number]	The memory number is displayed when the fixed value control is selected and
[Setting value]	the setting value memory function is enabled (the MEMO indicator light also
	illuminates).
25	During program control
	(Standby mode)
25	During program control
[Step number]	(Run)
[Setting value]	

13.1.2 MV Display Mode

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the PV, and the SV Display shows the value of the displayed item.

The right column indicates the status of this instrument.

Character	Status
25	During fixed value control
[Memory number]	The memory number is displayed when the fixed value control is selected and
[MV]	the setting value memory function is enabled (the MEMO indicator light also
	illuminates).
25	During program control
	(Standby mode)
25	During program control
[Step number] [MV]	(Run)

SV Display, the decimal point in the first digit flashes.

13.1.3 Remaining Time Display Mode

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the PV, and the SV Display shows the value of the displayed item.

The right column indicates the status of this instrument.

Character	Status	
25	During program control	
	(Standby mode)	
25	During program control	
[Step number]	(Run)	
[Remaining time]		

Displays the remaining time during program control run (turns off when program control is stopped).

13.2 Settings

13.2.1 Manual Control Mode

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the PV value, while the SV Display shows the factory default value.

The right column shows the setting item name and the setting range.

Characters,	Setting Item, Setting Range		
Factory Default			
25	Manual control MV		
[(*1)]	OUT1 low limit setting to OUT1 high limit setting		
	Option1: O2 (SSR/A) when added,		
	-OUT2 high limit setting to OUT1 high limit setting		

^(*1) This is the MV when switching from automatic control to manual control.

13.2.2 SV Setting (Direct Setting for Fix Value Control)

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the PV value, and the SV Display shows the factory default value.

The MEMO/STEP Display shows the setpoint memory number.

The right column shows the setting item name and setting range.

Characters, Factory Default	Setting Item, Setting Range	
Factory Default	CV/1 patting	
	SV1 setting	
	Scaling low limit to Scaling high limit	
<u> </u>	SV2 setting	
	Scaling low limit to Scaling high limit	
25	SV3 setting	
	Scaling low limit to Scaling high limit	
25	SV4 setting	
	Scaling low limit to Scaling high limit	
25	SV5 setting	
	Scaling low limit to Scaling high limit	
25	SV6 setting	
	Scaling low limit to Scaling high limit	
25	SV7 setting	
	Scaling low limit to Scaling high limit	
25	SV8 setting	
	Scaling low limit to Scaling high limit	

13.2.3 Setting Group

The upper row of the left column is the PV Display.

The PV Display shows the group name characters.

The lower left is the MEMO/STEP Display, and the lower right is the SV Display.

The PV Display shows the group name characters.

The MEMO/STEP Display and SV Display are off.

The right column shows the group name.

		hows the group name.
Characters,		Group Name
Fact	ory Default	
	ʹ4 . □	Main setting group
	P.r.o.[;	Program setting group
	Rr. 🗆	AT setting group
	P.I.J.	PID setting group
	RL.A.	Alarm setting group
	1.n. 🗌	Input setting group
		Output setting group
	E.I .n.	EVT Input setting group
	E.a.L.IT	EVT Output setting group
	c.a.ā.ā	Communication setting group
,,	ΓR	Transmission output setting group
	E.48())	External setting input setting group
	⊆.⊓Г.F	Control function setting group
	P.c.o.F	Program function setting group
	SRLF	Wait setting group
	aΓ.ΚΕ	Other setting group
	ART∐	Maintenance group

(1) Program Setting Group

The upper section of the left column is the PV Display.

The PV Display shows the setting item character.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display indicates the program step number.

The right column shows the setting item name and setting range.

Characters, Factory Default		Setting Item, Setting Range
	5	Step1 SV setting
		Scaling low limit to Scaling high limit
	ri ae	Step1 Time setting
	0000	====, 00:00 to 99:59
	JRI C	Step1 Wait block number setting
		1 to 8
	Pl d□	Step1 PID block number setting
		1 to 8
		The same applies to program step numbers 16 and beyond.
	5	Step16 SV setting
ls		Scaling low limit to Scaling high limit
	ri ae	Step16 Time setting
ls	0000	, 00:00 to 99:59
	JRI F	Step16 Wait block number setting
ls		1 to 8
	Pl d□	Step16 PID block number setting
ls		1 to 8

(2) AT Setting Group

The upper section of the left column is the PV Display.

The PV Display shows the setting item character.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP indicator is off.

The right column displays the setting (selection) item name and the setting range (selection items).

Characters Factory Defa	•	Setting Item, Setting Range	
₽Ĺ		AT perform	selection
		EEE	AT cancel
		RI 📗	AT perform
RCR_		AT action m	odel selection
		Rr 🔛	Normal AT
		<i>\Rſ</i> □	Startup AT
		FRC	FastAT
ЯГ_Ь		AT bias sett	ing
	!	0 to 50 ℃(0 to 90 ஈ) or 0.0 to 50.0 ℃(0.0 to 90.0 ஈ)	
RΓ_E		AT gain setting	
		0.1 to 10.0 times	
RCHY		AT hysteresys setting	
	1	0.0 to 5.0 ℃(0.0 to 9.0 ஈ)	
		DC voltage, current inputs: 0 to 50	

(3) PID Setting Group

The upper section of the left column is the PV Display.

The PV Display shows the setting item character.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The MEMO/STEP Display shows the block number.

The right column shows the setting item name and setting range.

Characters, Factory Default	Setting Item, Setting Range
P	Block1 OUT1 Proportional band setting
	Except when Fast-PID control is selected
	If input is without decimal points, 1 to input span
	If input with decimal points, 0.1 to input span
	DC voltage, current inputs: 0.1 to 1000.0 %
	When Fast-PID control is selected
	If input is without decimal points, 0 to input span
	If input with decimal points, 0.0 to input span
	DC voltage, current inputs: 0.0 to 1000.0 %
	Block1 OUT1 Integral time setting
□ I □200	Except when Slow-PID control is selected
	0 to 10000 sec or 0.0 to 1999.9 sec
	When Slow -PID control is selected
,	1 to 10000 sec or 0.1 to 1999.9 sec
d	Block1 OUT1 Derivative time setting
□ / □□5 <i>□</i>	0 to 10000 sec or 0.0 to 1999.9 sec
P_6	Block1 OUT2 Proportional band setting
	0 to input span ீ(ஈ) or 0.0 to input span ீ(ஈ)
	DC voltage, current inputs: 0.0 to 1000.0 %
/_b□	Block1 OUT2 Integral time setting
□ I □200	Except when Slow-PID control is selected
	0 to 10000 sec or 0.0 to 1999.9 sec
	When Slow -PID control is selected
	1 to 10000 sec or 0.1 to 1999.9 sec
d_b	Block1 OUT2 Derivative time setting
□ / □□5 <i>□</i>	0 to 10000 sec or 0.0 to 1999.9 sec
FSEC	Block1 MV bias setting
□ / □□ <i>0.0</i>	0.0 to 100.0 %
db 	Block1 Overlap, dead band setting
	-100.0 to 100.0 ℃(-180.0 to 180.0 ℉)
	DC voltage, current inputs: -1000 to 1000 The same applies to block numbers up to 8.
	The same applies to block hullibels up to 0.

Characters, Factory Default	Setting Item, Setting Range
P	Block8 OUT1 Proportional band setting
□a □□ IO	Except when Fast-PID control is selected
	If input is without decimal points, 1 to input span
	If input with decimal points, 0.1 to input span
	DC voltage, current inputs: 0.1 to 1000.0 %
	When Fast-PID control is selected
	If input is without decimal points, 0 to input span
	If input with decimal points, 0.0 to input span
	DC voltage, current inputs: 0.0 to 1000.0 %
<u> </u>	Block8 OUT1 Integral time setting
□ <i>e</i> □200	Except when Slow-PID control is selected
	0 to 10000 sec or 0.0 to 1999.9 sec
	When Slow -PID control is selected
	1 to 10000 sec or 0.1 to 1999.9 sec
d	Block8 OUT1 Derivative time setting
□ <i>8</i> □□50	0 to 10000 sec or 0.0 to 1999.9 sec
P_6□ □8 □□ 10	Block8 OUT2 Proportional band setting
	0 to input span $\mathfrak{C}(\mathfrak{F})$ or 0.0 to input span $\mathfrak{C}(\mathfrak{F})$
, , , , , , ,	DC voltage, current inputs: 0.0 to 1000.0 %
	Block8 OUT2 Integral time setting
□ <i>8</i> □200	Except when Slow-PID control is selected
	0 to 10000 sec or 0.0 to 1999.9 sec
	When Slow -PID control is selected
1 1 [1 to 10000 sec or 0.1 to 1999.9 sec Block8 OUT2 Derivative time setting
d_b□ □# □□50	0 to 10000 sec or 0.0 to 1999.9 sec
	Block8 MV bias setting
-567 8 00	0.0 to 100.0 %
db	Block8 Overlap, dead band setting
□s	-100.0 to 100.0 ℃(-180.0 to 180.0 ℉)
	DC voltage, current inputs: -1000 to 1000

(4) Alarm Setting Group

The upper section of the left column is the PV Display.

The PV Display shows the setting item character.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The MEMO/STEP Display is off.

The right column shows the setting item name and setting range.

Characters,	shows the setting item name and setting range.		
Factory Default	Setting Item, Setting Range		
R (EV1 alarm setting		
	No action		
	High limit alarm	-(Input span) to Input span (*1)	
	Low limit alarm	-(Input span) to Input span (*1)	
	High/Low limits alarm	0 to Input span (*1)	
	High/Low limits independent	0 to Input span (*1)	
	High/Low limit range alarm	0 to Input span (*1)	
	High/Low limit range	0 to Input span (*1)	
	independent alarm	, ,	
	Process high alarm	Input range low limit to Input range high limit (*2)	
	Process low alarm	Input range low limit to Input range high limit (*2)	
	High limit with standby alarm	-(Input span) to Input span (*1)	
	Low limit with standby alarm	-(Input span) to Input span (*1)	
	High/Low limits with standby	0 to Input span (*1)	
	High/Low limits with standby	0 to Input span (*1)	
	independent alarm		
	, ,	current inputs, this is the scaling range.	
	(Maximum setting: -19999	,	
	, ,	current inputs, this is the scaling low limit (high limit).	
R IH	(Maximum setting: -19999 to 19999)		
	EV1 high limit alarm setting		
R2[[]	Same as the EV1 alarm setting.		
	EV2 alarm setting		
R2H	Same as the EV1 alarm setting.		
	EVT2 high limit alarm setting		
R3[[]	Same as the EV1 alarm setting.		
	EVT3 alarm setting		
	Same as the EV1 alarm setting.		
	EVT3 high limit alarm setting		
H (CD	Same as the EV1 alarm setting.		
	Heater burnout alarm 1 setting		
Alternating display of	0.0 to 20.0 A(Option, W20)		
mode character and measured CT current	0.0 to 100.0 A(Option, W100)		
value (0.5-second			
cycle)	Heater burnout alarm 2 setting		
	0.0 to 20.0 A(Option, W20)		
Alternating display of mode character and	0.0 to 100.0 A(Option, W100	0)	
measured CT current			
value (0.5-second cycle)			

Characters, Factory Default		Setting Item, Setting Range
LP F		Loop break alarm time setting
		0 to 200 min
	LP_H	Loop break alarm band setting
		0 to 150 ℃(0 to 270 ஈ) or 0.0 to 150.0 ℃(0.0 to 270.0 ஈ)
	·—	DC voltage, current inputs: 0 to 1500
	LP_d	Loop break alarm dead band setting
		0 to 150 ℃(0 to 270 ஈ) or 0.0 to 150.0 ℃(0.0 to 270.0 ஈ)
		DC voltage, current inputs: 0 to 1500

(5) Input Setting Group

The upper section of the left column is the PV Display.

The PV Display shows the setting item character.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The MEMO/STEP Display is off.

Characters,		Setting Item, Setting Range
Factory Default		Setting item, Setting Range
hEnh	Input type	selection
	ELLE	K -200 to 1370 ℃
	£8 .C	K -200.0 to 800.0 ℃
	E4 <u>E</u>	K -200.0 to 400.0 °c
	JII	J -200 to 1000 ℃
	J I	J -200.0 to 400.0 ℃
	r III E	R 0 to 1760 °c
	5 E	S 0 to 1760 ℃
	ьшс	B 0 to 1820 ℃
	ELLE	E -200 to 800 ℃
	$\Gamma\Box$. Γ	T -200.0 to 400.0 °c
	$\neg \square \mathcal{L}$	N -200 to 1300 °c
	PL 20	PL-II 0 to 1390 ℃
	<u> </u>	C(W/Re5-26) 0 to 2315 ℃
	PF .E	Pt100 -200.0 to 850.0 ℃
	PIDE	Pt100 -200 to 850 ℃
	PT LE	Pt100 -100.0 to 100.0 ℃
	4201	4 to 20 mA DC (*1)
		-19999 to 19999
	0201	0 to 20 mA DC (*1)
		-19999 to 19999
	420E	4 to 20 mA DC (*2)
		-19999 to 19999
	0208	0 to 20 mA DC (*2)
		-19999 to 19999
	D IA	0 to 1 V DC -19999 to 19999
	0058	0 to 5 V DC -19999 to 19999
	1058	1 to 5 V DC -19999 to 19999
	0 108	0 to 10 V DC -19999 to 19999
		is a built-in receiving resistor (50 Ω).
	(∠): The s	separately sold receiving resistor (50 Ω) is attached externally.
EorF	Temperati	ure unit selection
		Celsius
	FIII	Fahrenheit

Characters, Factory Default		Setting Item, Setting Range		
45L		Scaling high limit setting		
□□ lanl		Scaling high limit to Input range high limit		
与厂 L		Scaling low limit setting		
-20i		Scaling low limit to Input range high limit		
d₽		Decimal point position selection		
		□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□		
		1st decimal place		
		2nd decimal place		
		□Д□□□ 3rd decimal place		
		t⊕⊕⊕⊕ 4th decimal place		
525		Input sampling selection		
	15	☐ 125 ms		
		<u> </u>		
		□□□ / 🖸 10 ms		
88-0	J.	Number of moving average		
	1	1 to 10		
50E	I	Sensor correction coefficient setting		
	10	0.000 to 10.000		
70		Sensor correction setting		
		-100.0 to 100.0 ℃(-180.0 to 180.0 ₮)		
	_	DC voltage, current inputs: -1000 to 1000		
FILE		PV filter time constant setting		
	0	0.0 to 10.0 sec		

(6) Output Setting Group

The upper section of the left column is the PV Display.

The PV Display shows the setting item character.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display is off.

Characters,			
Factory Default	Setting Item, Setting Range		
LAP I	OUT1 output type selection		
<u> </u>	55-	SSR output	
	420R	Direct current output (4 to 20 mA DC)	
	020R	Direct current output (0 to 20 mA DC)	
c	OUT1 pro	portional cycle setting	
300	0.1 to 1	20.0 sec	
Factory default settings			
 For relay contact 	(When the	e direct current/DC voltage output type is set/selected, the proportional	
output type: 30.0 seconds	cycle item	will not be displayed.)	
 For non-contact 			
voltage output type, open collector type:			
3.0 seconds			
HY5		/OFF hysteresis setting	
	0.1 to 1000.0 ೀ(0.1 to 1800.0 ೯) DC voltage, current outputs: 1 to 10000		
oLH[]	OUT1 high limit setting		
	OUT1 Output low limit setting value to 100.0 %		
		age, current outputs: Output low limit setting value to 105.0 %	
oll.	OUT1 low limit setting		
	0.0 to O	UT1 Output high limit setting value	
		age, current outputs: -5.0 % to Output high limit setting value	
or Ar		e of change limit setting	
		100.00 %/sec	
LR5		out type selection	
	\\\- \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	SSR output Direct current output (4 to 20 mA DC)	
	020R	Direct current output (4 to 20 mA DC)	
cRcr		ling method selection	
BI -	Al r	Air cooling	
	o! L	Oil cooling	
	JRF□	Water cooling	

Characters,	Setting Item, Setting Range			
Factory Default				
c _ b□ □□□□□∃ΩΩ Factory default	OUT2 proportional cycle setting 0.1 to 120.0 sec			
settings • For relay contact output type: 30.0 seconds • For non-contact	(When the direct current/DC voltage output type is set/selected, the proportional cycle item will not be displayed.)			
voltage output type, open collector type: 3.0 seconds				
HY56	OUT2 ON/OFF hysteresis setting			
	0.1 to 1000.0 ℃(0.1 to 1800.0 ℉) DC voltage, current outputs: 1 to 10000			
oL Hb	OUT2 high limit setting			
	OUT2 Output low limit setting value to 100.0 % DC voltage, current outputs: OUT2 Output low limit setting value to 105.0 %			
oLLb	OUT2 low limit setting			
	0.0 to OUT2 Output high limit setting value DC voltage, current outputs: -5.0 % to OUT2 Output high limit setting value			
conf	Direct/Reverse action selection			
□□ HERC	HERI Reverse action			
	Direct action			
P5F (Pre-set output setting 1 -5.0 to 105.0 %			
P5C2	Pre-set output setting 2			
	-5.0 to 105.0 %			
ER∈Γ	Action selection when input errors occur			
□□ Е₀ШГ	Eo出に MV setting when input errors occur			
	Control operation continues			
Eoñ I	OUT1 MV setting when input errors occur -5.0 to 105.0 %			
E052	OUT2 MV setting when input errors occur			
	-5.0 to 105.0 %			

(7) EVT Input Setting Group

The upper column on the left side is the PV Display.

The lower left side is the MEMO/STEP Display, and the lower right side is the SV Display.

The PV Display indicates the setting item character.

The SV Display indicates the factory default value.

The MEMO/STEP Display is off.

The right column indicates the selection item name and the selected item.

Characters, Factory Default	Setting Item, Setting Range			
EBI I	Event input EI1 allocation setting			
	Event input EI1 allocation table			
	Selection value	Event input function	Input ON (Closed)	Input OFF (Open)
		No event		
	IIII ;	Set value memory (*1)	2 ⁿ	1
		Control ON/OFF	Control OFF	Control ON
		Direct/Reverse action	Direct action	Reverse action
	ШЧ	Preset output 1 ON/OFF	Preset output	Usual control
	1115	Preset output 2 ON/OFF	Preset output	Usual control
	1115	Auto/Manual control	Manual control	Automatic control
	1117	Remote/Local	Remote	Local
		Program control	RUN	STOP
		RUN/STOP		
		Program control Holding/Not holding	HOLD	Not holding
	□□ <i>!</i> D	Program control	ADVANCE	Usual control
	No.	Advance function		
		Integral action holding	Integral action	Usual
			holding	integral action
	III 12	EV(x) output latch selection	Latch cancel	Usual control
	increr Event	nenting by 1. If EI1=OFF a	nd El2=ON, the o	d by adding 2n and then display shows 3. starting from the smallest
EBI 2	Event input	El2 allocation setting		
		Event input EI1 allocation	setting.	
E81 3		EI3 allocation setting		
		Event input EI1 allocation	setting.	
EBI 4		El4 allocation setting		
	Same as	Event input EI1 allocation	setting.	

(8) EVT Output Setting Group

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display is off.

Characters,		Sotting Itom Sotting Page	
Factory Default	Setting Item, Setting Range		
EBo I	Event output EV1 allocation setting		
		ut EV1 allocation table	
	Selection value	Event output function	
		No event	
		Alarm output, High limit alarm	
		Alarm output, Low limit alarm	
	[][][] 3	Alarm output, High/Low limits alarm	
	1114	Alarm output, High/Low limits	
		independent alarm	
	<u> </u>	Alarm output, High/Low limit range alarm	
	1115	Alarm output, High/Low limit range independent alarm	
	<u> </u>	Alarm output, Process high alarm	
		Alarm output, Process low alarm	
		Alarm output, High limit with standby alarm	
		Alarm output, Low limit with standby alarm	
		Alarm output, High/Low limits with standby alarm	
	III 12	Alarm output, High/Low limits with standby independent alarm	
	III 13	Heater burnout alarm output	
	14	Loop break alarm output	
	III 15	Time signal output	
	□ 15	Output during AT	
	[] 17	Pattern end output	
	□□ /8	Remote output	
	<u> </u>	Additional output when error occurs	
	20	Main output	
	<u> </u>	Cooling output	
A IEA	EV1 enable	ed/disabled selection when alarm sets 0	
	00 <u> </u>	Disabled	
	YE'Y□	Enabled	
A IHA	EV1 hysteresis setting		
	0.1 to 1000.0 ℃(0.1 to 1800.0 ℉)		
		ge, current inputs: 1 to 10000	
8 183	EV1 action delay timer setting		
		0 to 10000 sec	
A ILĀ		Energized/De-energized setting	
□□ noñL	noñL	Energized	
	r E 8 5	De-energized	

Characters,			Setting Item, Setting Range	
Factory Default		E) /4 1		
r1r1	A ILc no	EV1 output latch selection		
	00	00 II	Disabled	
	-	4E40	Enabled	
r(r)	F5 15		t step number	
		1 to 16		
p===1p===1	Γ'S IF		ime setting	
	0000	00:00 to	99:59	
	Γ5 lp		ime setting	
	0000	00:00 to	99:59	
	E802	Event outp	out EV2 allocation setting	
		Same a	s Event output EV1 allocation setting.	
	A2EA	EV2 enabl	ed/disabled selection when alarm sets 0	
	no	0	Disabled	
		4E7	Enabled	
	R2H4	EV2 hyste	resis setting	
	□□ <i>t</i> O	0.1 to 10	000.0 ℃(0.1 to 1800.0 ೯)	
		DC volta	age, current inputs: 1 to 10000	
	8597	EV2 action	n delay timer setting	
	$\square\square\square G$	0 to 100	00 sec	
	R2LA	EV2 action	n Energized/De-energized setting	
	noñL	noñL	Energized	
		-E85	De-energized	
	A2Lc	EV2 output latch selection		
	op III		Disabled	
		4E5	Enabled	
	F-125	TS2 outpu	t step number	
	[1 to 16	'	
	[42F	TS2 OFF	ime setting	
	0000	00:00 to	-	
	T 520	TS2 ON ti		
	00.00	00:00 to		
	E803		out EV3 allocation setting	
		-	s Event output EV1 allocation setting.	
	R3:R		ed/disabled selection when alarm sets 0	
	no	no	Disabled	
		8E4[]	Enabled	
	A3HY		resis setting	
	,,,,,, []] (0	-	000.0 ℃(0.1 to 1800.0 ℉)	
1			age, current inputs: 1 to 10000	
	R389	EV3 action delay timer setting		
		0 to 100	•	
	A3LA		n Energized/De-energized setting	
	noñL	nonL	Energized Setting	
1		-E85	De-energized	
		, , , , , ,	De-elleryizeu	

Characters, Factory Default	Setting Item, Setting Range		
A3Lc	EV3 output latch selection		
	□ □ □ Disabled		
	当Eっ□ Enabled		
F535	TS3 output step number		
	1 to 16		
Γ '-3F	TS3 OFF time setting		
	00:00 to 99:59		
Γ53o	TS3 ON time setting		
	00:00 to 99:59		

(9) Communication Setting Group

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display is off.

Characters, Factory Default			Setting Item, Setting Range	
	cāhL	Communication protocol		
	noñL	noñL	Shinko protocol	
		ñodr	MODBUS RTU	
		āc 🗆	MC protocol	
		78Fc	SVTC	
	cāno	Instrumen	t number	
		0 to 95		
	cāhP	Communic	cation speed	
	L 195	<u> 1</u> 95	9600 bps	
		□ <i>1</i> 92	19200 bps	
		<u>∃</u> 384	38400 bps	
		□576	57600 bps	
		1 152	115200 bps	
	EĀFF	Data bit/P	· •	
	7 <i>E</i>	8000	8 bits/No parity	
		Topo	7 bits/No parity	
		8880	8 bits/Even	
		7887	7 bits/Even	
		8000	8 bits/Odd	
	-, ,-	Todd	7 bits/Odd	
,1,1	c 5 5 5	Stop bit		
	[] I		1 bit	
			2 bits	
r	cādy -		delay time	
		0 to 100		
r	58_b	SVTC bias		
		±20% c	of input span	

(10) Transmission Output Setting Group

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display is off.

Characters, Factory Default			Setting Item, Setting Range	
1	7-05	Transmiss	ion output type selection	
	5 A 🗔	PB	PV transmission	
		<u>ነ</u>	SV transmission	
		H H	MV transmission	
,	-LH	Transmission output high limit setting (For PV, SV transmission)		
	1370	Transmission output high limit setting (For PV, SV transmission)		
1	rll	Transmission output low limit setting (For PV, SV transmission)		
[<u>[</u>][_] -	-200	Input range low limit to Transmission output high limit setting		
,	-LH	Transmission output high limit setting (For MV transmission)		
	1000	Transmission output low limit setting to 105.0 %		
,	-LL	Transmission output low limit setting (For MV transmission)		
	II	-5.0 % to Transmission output high limit value		

(11) External Setting Input Setting Group

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display is off.

Characters, Factory Default		Setting Item, Setting Range	
rEāl	Remote/L	ocal selection	
CC Lock	Lock	Local	
	rEAL	Remote	
- T L H	External s	External setting input high limit setting	
□□ lan0	External setting input low limit to Input range high limit		
- TLL	External s	etting input low limit setting	
-200	Input range low limit to External setting input high limit		
ァ		G	
	± 20% of input span		

(12) Control Function Setting Group

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display is off.

Characters, Factory Default		Setting Item, Setting Range	
cFnc	Control action selection		
□□ 2doF	2doF	2 DOF PID control	
	FPI d	Fast-PID control	
	hPl d	Slow-PID control	
	GRP.	Gap-PID control	
F_R	•	I gain 2 DOF coefficient setting	
	0.00 to 1.	00	
F_b	Integral 2 D	OF coefficient setting	
	0.00 to 10.00		
F_G[Derivative 2	2 DOF coefficient setting	
	0.00 to 1.00		
F_cP	Desired val	Desired value proportional coefficient	
	0.00 to 1.00		
GRPb	Gap width s	Gap width setting item	
	0.0 to 10.	0 %	
GRPE	Gap coeffic	ient setting item	
	0.0 to 1.0	0.0 to 1.0	
F_dP	Integral/Derivative decimal point position selection		
		No decimal point	
		With decimal point	

(13) Program Function Setting Group

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display is off.

Characters, Factory Default	Setting Item, Setting Range	
Pr-05	Fix control/program control selection	
□□ FI ¥□	FI 🖳 Fix control	
	Program control	
	Step time unit selection	
□□ ñin□	ni n Hours:Minutes	
	ካይር Minutes:Seconds	
PrEF	Power restore action selection	
S STOP	ዓ. Stops after power is restored.	
	Continues (resumes) after power is restored.	
	H교는 설 Suspends (on hold) after power is restored.	
5_58	Program start temperature setting	
	Scaling low limit value to Scaling high limit value	
7-76	Program control start type selection	
PB PB	PH PV start	
	PBr PVR start	
	SV start	
-EPT	Number of repetitions setting	
	0 to 10000	

(14) Wait Setting Group

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display shows the block number.

The right column shows the setting item name and setting range.

Characters, Factory Default	Setting Item, Setting Range
ūRI ſ	Block 1 wait setting
	0 to 20% of input span
JRI F	Block 2 wait setting
	0 to 20% of input span
JRI F	Block 3 wait setting
	0 to 20% of input span
JRI F	Block 4 wait setting
□4	0 to 20% of input span
JRI F	Block 5 wait setting
□5 □□□ □□	0 to 20% of input span
JRI F	Block 6 wait setting
□5 □□□	0 to 20% of input span
JRI F	Block 7 wait setting
□7 <i>□□□</i>	0 to 20% of input span
JRI F	Block 8 wait setting
	0 to 20% of input span

(15) Other Setting Group

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display is off.

Characters, Sotting Itom, Sotting Bango		
Factory Default Setting Item, Setting Range		
Lock selection		
Unlock		
<u>Loc Lock 1</u>		
Lock 2		
テドゥゥ SV Rise/Fall rate action selection		
ロロ アB 与 「		
무성도 PV start		
テロス SV Rise/Fall rate time unit selection		
らい Seconds Seconds		
テロスト SV rise rate setting		
0 to 10000 ℃/min (0 to 18000 ₮/min) or 0.0 to 1000.0 ℃/min (0.0 to	1800.0 ℉	
/min)		
DC voltage, current inputs: 0 to 10000/min		
	1900 0 🐃	
/min)	1000.0 F	
DC voltage, current inputs: 0 to 10000/min		
라 나무 LCD display part selection		
All LCD sections		
Lower section (including the operation indicator)		
- 유니급 SV display method selection		
나님 Set target value		
구 '구남 Target value fluctuating during ramp function (*1)		
P片분 Indication when control output OFF selection		
□□ □FF□ OFF indication		
Roff No indication		
PH PV indication		
PHRL PV indication + Any Alarm active		
교무니스 OUT/OFF key function selection		
□□ nenE No function		
지원 Auto/Manual control		
Control output OFF function		
Remote/Local selection		
RUN/STOP function (enabled during program control)		

Characters, Factory Default	Setting Item, Setting Range	
PFSL	PF key function selection	
- nonE	<u>nanE</u> No function	
	Auto/Manual control	
	Control output OFF function	
	ァミニア Remote/Local selection	
	RUN/STOP function (enabled during program control)	
AR-5	Auto/Manual control after power ON selection	
□□ RUΓ₀	RUFロ Automatic control	
	⊼R⊐U Manual control	
d_F⊼	Indication time setting	
0000	0:00 to 60:00 Minutes:Seconds	
	0:00 Consecutively 0:01 to 60:00 Indication time	
488E	Non-volatile IC memory saving selection	
SS SABE	与RHE Saving	
	Not saving	

^{(*1):} Rise rate, fall rate, target values during program operation.

(16) Maintenance Group

The upper section of the left column is the PV Display.

The lower left section is the MEMO/STEP Display, and the lower right section is the SV Display.

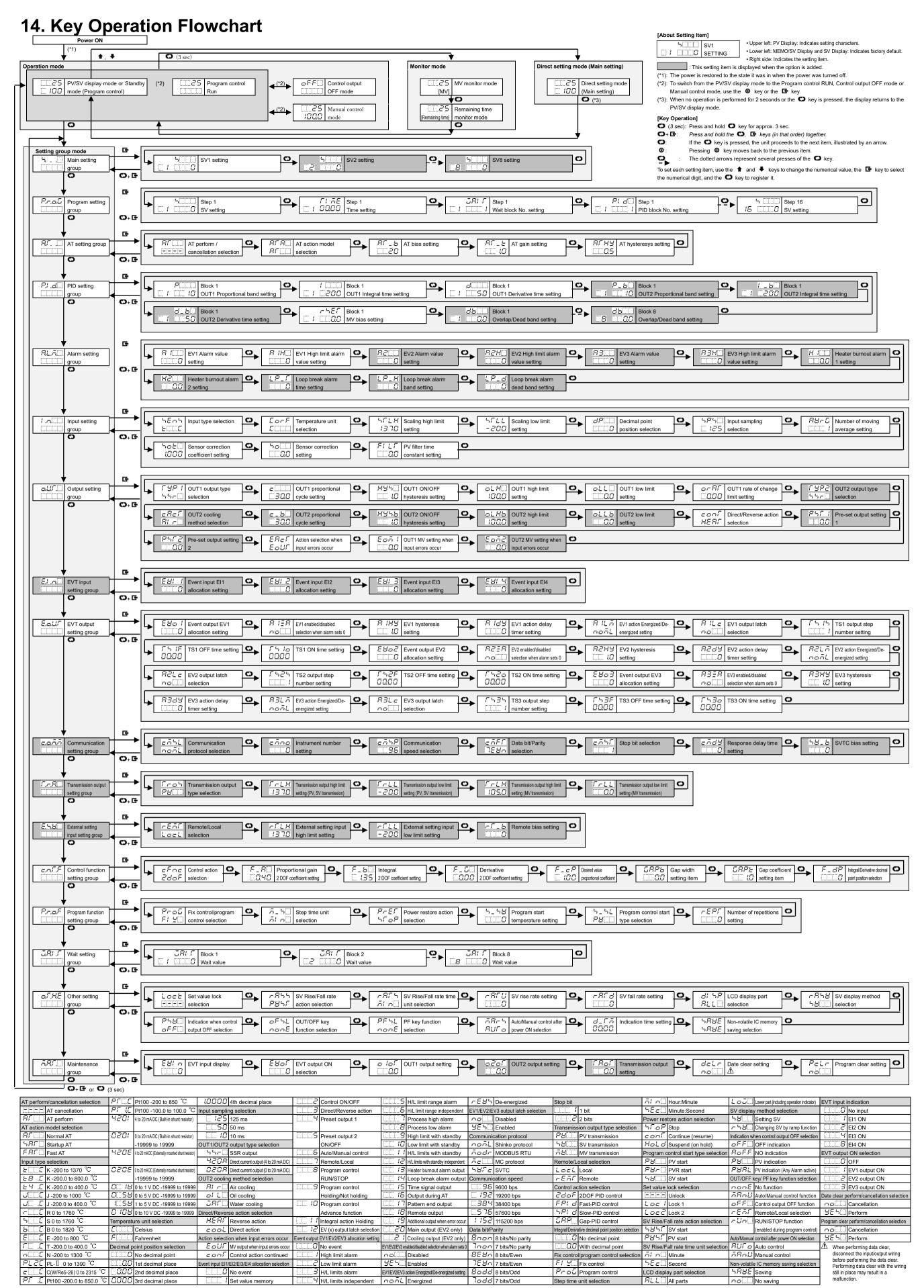
The PV Display shows the setting item character.

The SV Display shows the factory default value.

The MEMO/STEP Display is off.

Characters,	Setting Item Setting Dange		
Factory Default	Setting Item, Setting Range		
EBI n	EVT input display (*1)		
	No input		
	EI1 ON		
	El2 ON		
	EI3 ON		
	EI4 ON		
EBol	EVT output ON setting		
	OFF		
	EV1 output ON		
	EV2 output ON		
	EV3 output ON		
o lo[OUT1 output setting (*2)		
$\Box\Box\Box\Box\Box\Box\Box$	0.0 to 100.0 %		
	DC voltage, current outputs: -5.0 to 105.0 % (*3)		
o2oF	OUT2 output setting (*2) 0.0 to 100.0 %		
	DC voltage, current outputs: -5.0 to 105.0 % (*3)		
ГРОГ	Transmission output		
	0.0 to 100.0 %(*4)		
dcLr	Date clear setting		
no	Cancel		
	무는 Execute		
PcLr	Program clear setting		
no.	Cancel		
	Cancel SEA Execute		
L			

- (*1): If duplicated, it will be the total value.
- (*2): Can be set to 0.0 to 100.0 % or -5.0 to 105.0 %, but the output depends on the OUT□ high/low limit settings.
- (*3): For outputs other than 4 to 20 mA DC or 1 to 5 V DC, values below 0% MV are not output.
- (*4): For 0 to 1 V DC or 0 to 10 V DC outputs, values below 0% are not output.



SHINKO TECHNOS CO., LTD.

OVERSEAS DIVISION

Head Office: 2-5-1, Senbahigashi, Minoo, Osaka, 562-0035, Japan