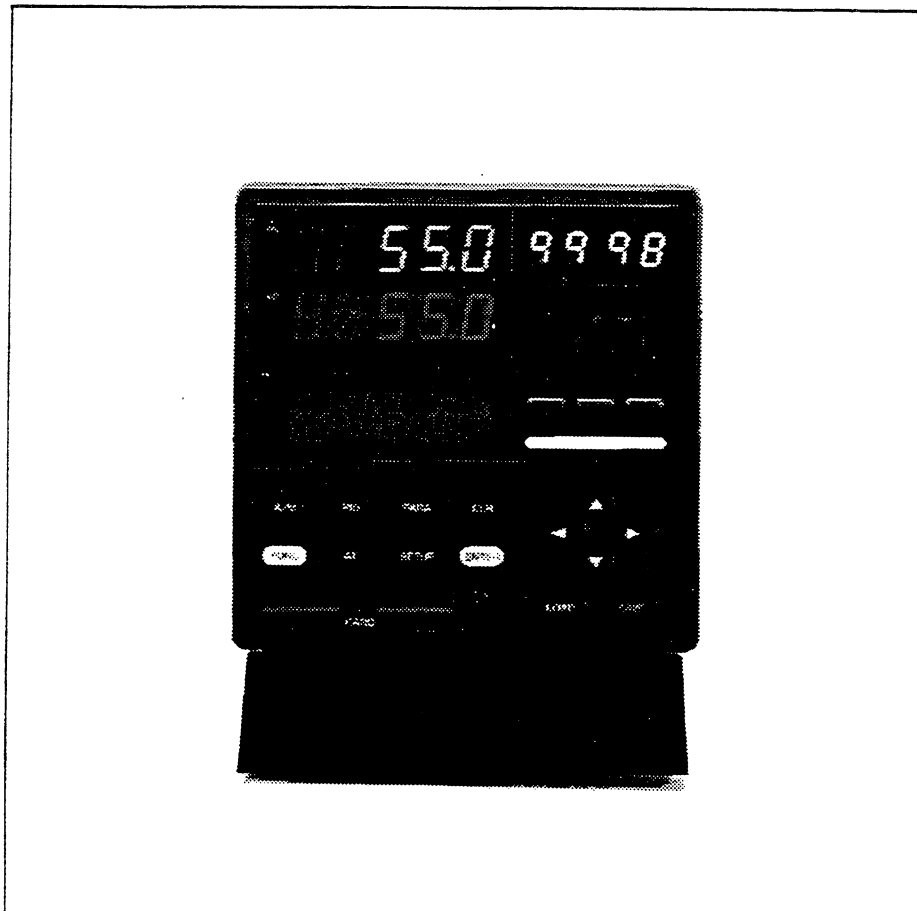


DCP 550

Digital Control Programmer



PRODUCT MANUAL

DUAL INPUT CHANNEL MODEL

WARRANTY

The Honeywell device described herein has been manufactured and tested for correct operation and is warranted for a period of one year.


TECHNICAL ASSISTANCE



If you encounter a problem with your unit, please review all the configuration data to verify that your selections are consistent with your application; (i.e. Inputs, Outputs, Alarms, Limits, etc.). If the problem persists after checking the above parameters, you can get technical assistance by calling the following:

In the U.S.A. 1-800-423-9883

In Europe Your local branch office

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1. DUAL INPUT MODEL SELECTION GUIDE

The dual input channel models are classified into two types; one uses the same kind of PV input channels CH1 and CH2, while the other uses different kinds of PV input channels CH1 and CH2.

- When the same type of sensor inputs are applied to CH1 and CH1, this instrument can be used for a redundant selection in which the input channel is changed from CH1 to CH2 to continue the normal running, if the CH1 sensor has caused an upscale or a downscale.
- When different types of sensors; a low temperature sensor and a high-temperature sensor are input to CH1 and CH2, this instrument can be used to permit high accuracy control over a wide range from low temperature to high temperature by using the low temperature sensor or high temperature sensor selectively at a change point.

Model Selection Guide

I II III IV V VI VII

Example: DCP5515GTR0111000

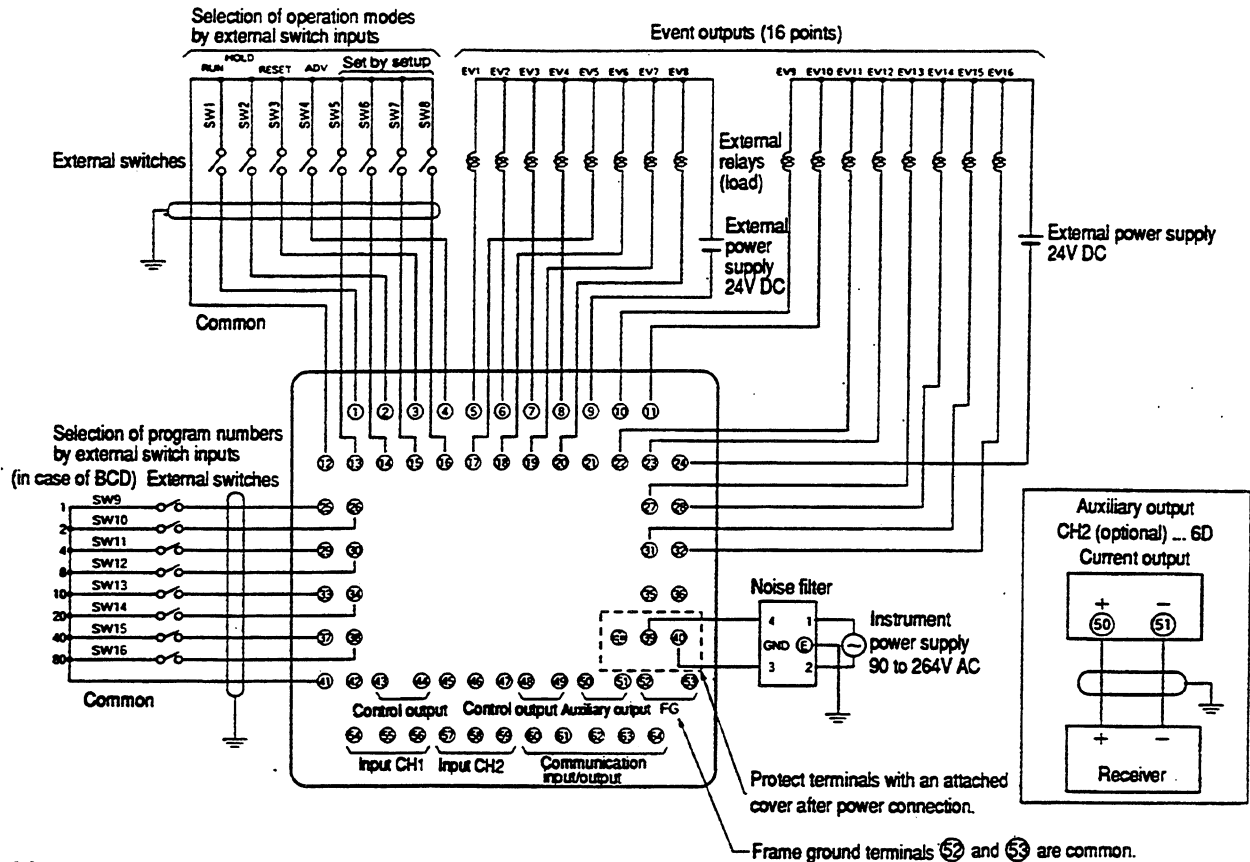
Example: DCP551 5G TR0 1 1 10 00

I	II	III	IV	V	VI	VII	Contents (o: Provided - : Not provided)			
Basic model No	Control output	Dual inputs	Auxiliary output	Communication	Memory card interface	Additional processing				
DCP551							Program controller, programmer			
	5G						Continuous PID: Current 4 to 20mA Changeable to 5S (programmer) by setup C21. Changeable to 8D (time proportional PID; transistor open collector output).			
	6D						Time proportional PID: Voltage output 24V ±15%			
		TT0					CH1 T ... Thermocouple · voltage (mV) · current (mA) CH2 T ... Thermocouple · voltage (mV) · current (mA)			
		LL0					CH1 L ... Voltage (V) · current (mA) CH2 L ... Voltage (V) · current (mA)			
		*1 RR0					CH1 R ... Resistance temperature detector CH2 R ... Resistance temperature detector			
		*1 TR0					CH1 T ... Thermocouple · voltage (mV) · current (mA) CH2 R ... Resistance temperature detector			
		*1 TL0					CH1 T ... Thermocouple · voltage (mV) · current (mA) CH2 L ... Voltage (V) · current (mA)			
		*1 RL0					CH1 R ... Resistance temperature detector CH2 L ... Voltage (V) · current (mA)			
							No. of auxiliary outputs	Applicable control action, output		No. of auxiliary outputs remains unchanged when 5G is changed to 5S by setup. However, No. of auxiliary outputs increases from 0 to 1 or from 1 to 2 when 5G is changed to 8D by setup.
								5G	6D	
		0					None	o	-	
		1					1 channel	o	o	
		2					2 channels	-	o	
							0			Not provided
							1			RS-485 CPL host communication/ST221 exclusive communication *2
							2			RS-232C CPL host communication
							10			A memory card interface is provided.
							00			Not provided.
							D0			Inspection specifications are provided.
							T0			Tropical zone treatment is attached.
							B0			Tropical zone treatment plus test data are attached.

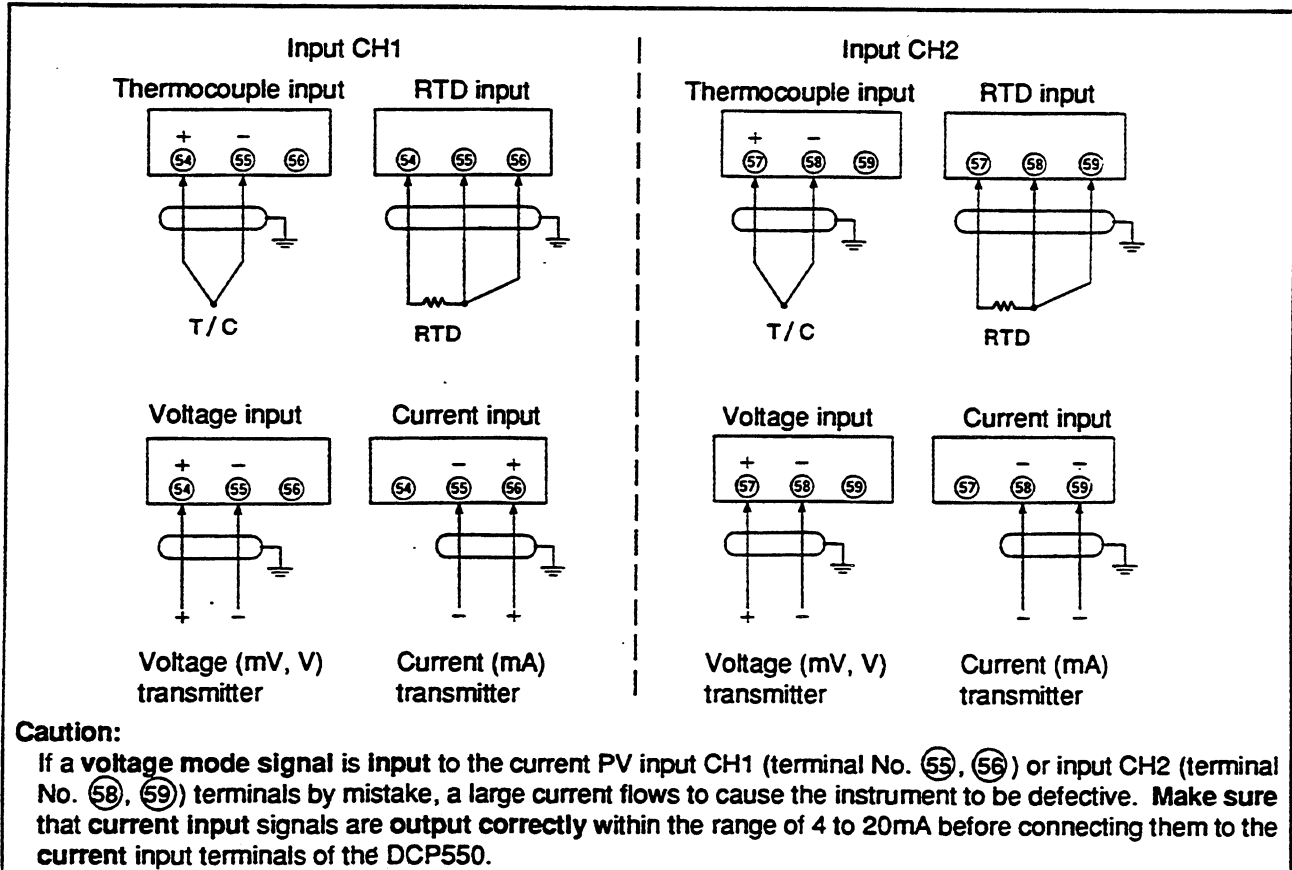
*1: Please contact us before ordering of these special models.

*2: CPL host communication/ST221 exclusive communication can be selected by setup.

2. WIRING

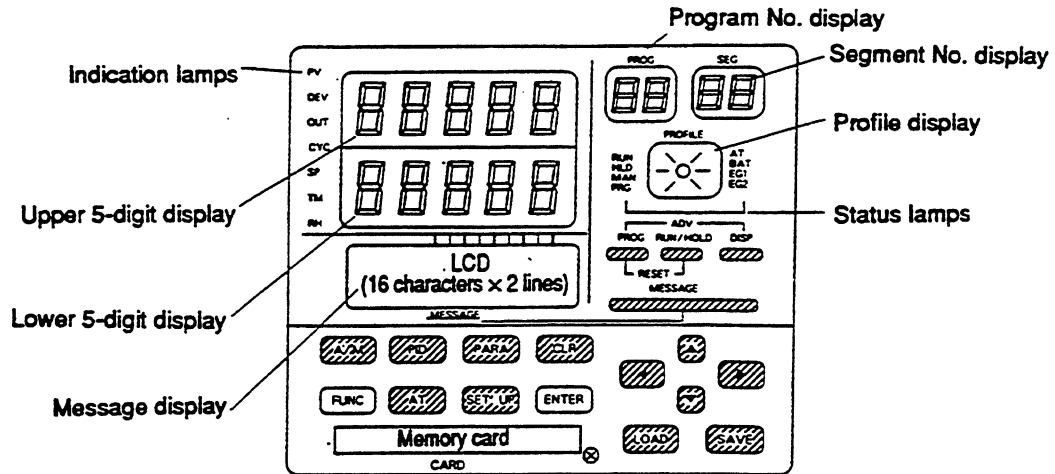


Dual Inputs

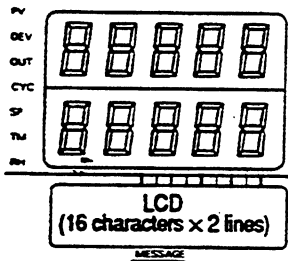


3. NAMES OF COMPONENT PARTS

3.1 Front Panel Configuration



3.2 Indications



Upper 5-digit display Indicates PV, SP and set items (*COI.PRODI ...*)

Lower 5-digit display Indicates SP, deviation, control output, time, cycle and set point.

Message display Indicates various messages, control output, and other data by graphs, and event operation status, setting events, IC card operation, and conditions.

Indication lamps Indicate the contents of upper 5-digit display and lower 5-digit display.

PV (Process Variable) : Lights during instrument temperature indication.

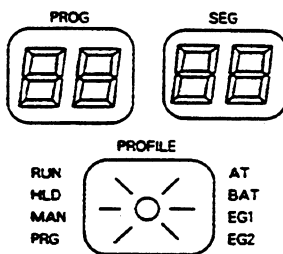
DEV (Deviation) : Lights during deviation indication.

OUT (Output) : Lights during output indication.

CYC (Cycle) : Lights during cycle indication.

SP (Set Point) : Lights during temperature setting indication.

TM (Time) : Lights during time indication.



PROG Program No. display Indicates a selected program No. Indicates AL when an alarm occurs.

SEG Segment No. display Indicates a selected segment No. Indicates alarm No. when an alarm occurs.

PROFILE Profile display Indicates the rising, soaking, and falling trends of a program pattern. Flashes during G.soak wait.

RUN (run) : Lights during a run.

HLD (hold) : Lights during hold, and flashes at end.

MAN (manual) : Lights in manual mode.

PRG (programming) : Lights during programming.

AT (Auto Tuning) : Flashes during auto tuning execution.

BAT (battery) : Flashes when the battery voltage has dropped.

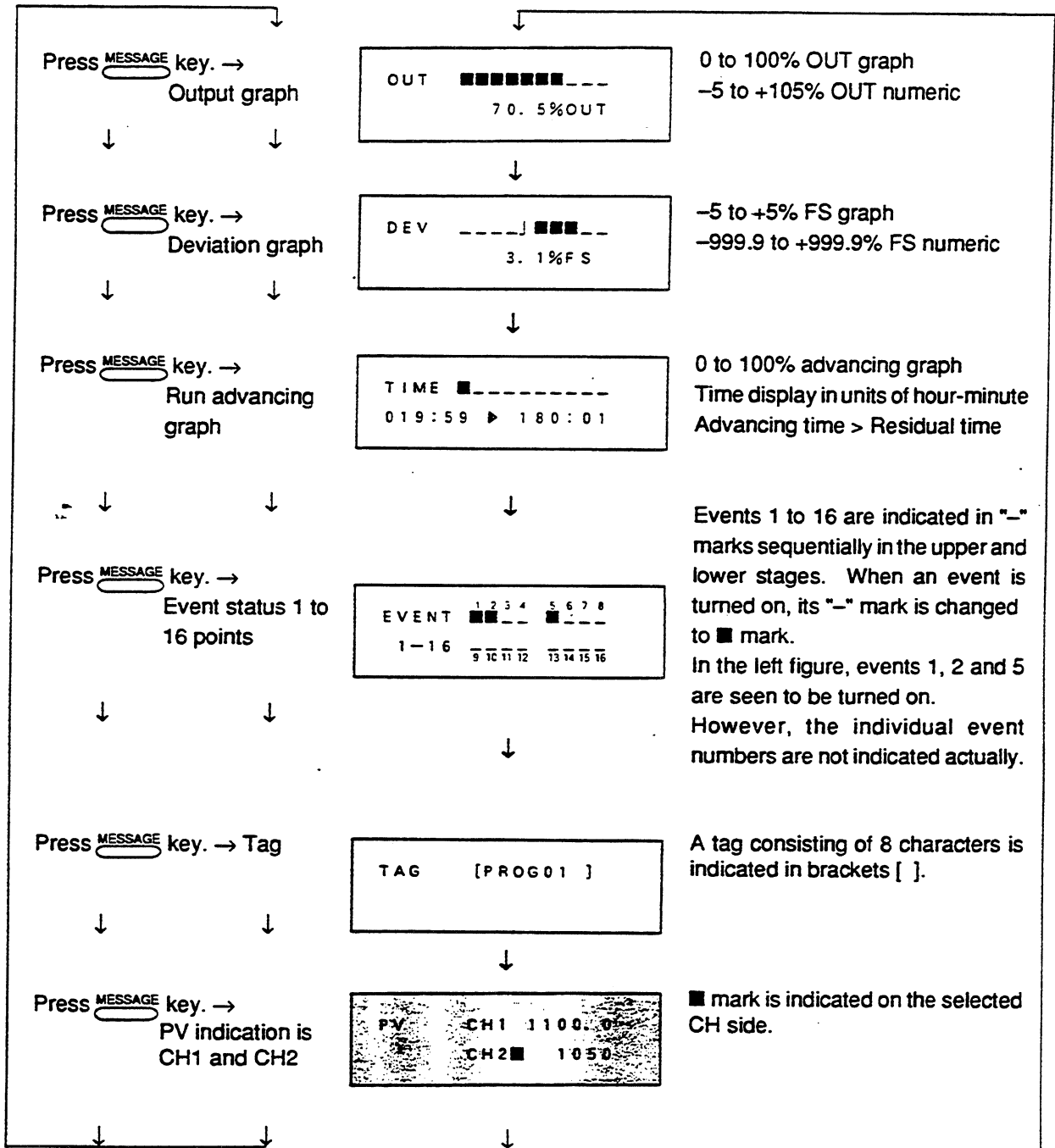
EG1 (Event Group 1) : Lights according to the event status designated to Event Group 1.

EG2 (Event Group 2) : Lights according to the event status designated to Event Group 2.

MESSAGE DISPLAY SCREEN OF PV2CH TYPE

The lowest screen is added to the message screen of a single input DCP550.
 The additional screen indicates which channel input is selected in the dual input model.

Liquid crystal display message screen during a run by **MESSAGE** key operation.



4. EXPLANATION ON FUNCTIONS

4.1 Types of Selection

The following types of selection are available to use the two PV input channels effectively.

1. Selection of low temperature sensor or high temperature sensor to CH1 and CH2

- Low temperature sensor to CH1 + high temperature sensor to CH2
- High temperature sensor to CH1 + low temperature sensor to CH2

2. Fixed control channel

PV for run or control is fixed.

- PV of channel CH1 is fixed.
- PV of channel CH2 is fixed.

PV of the remaining channel not fixed can also be indicated or used for an event.

3. Redundant selection

If one of two temperature sensors is defective, the other sensor can be selected instead by using the redundant selection function, thus maintaining the normal running. Normally, the main channel (CH1) is used for run plus control. If an over-range (upscale or downscale) occurs, the sub channel (CH2) is used for run or control to maintain the normal running continuously. If both main channel and sub channel cause over-range together, the former is used. In this case, it is effective to set the manipulated variable in an over-range. Normally, CH1 is selected to the main channel, and CH2 to the sub channel. However, the reverse selection can be done by external switch setting.

4.2 Low Temperature/High Temperature Selection

When a low temperature sensor is selected to CH1 and a high temperature sensor to CH2, or a high temperature sensor is selected to CH1 and a low temperature sensor to CH2, there are the following four types of selecting methods.

1. Selection by external switch
2. Automatic selection A
3. Automatic selection B
4. Automatic selection C

1. Selection by external switch

This method can be used for sensor selection by an external signal such as a sequence signal. Set 7 to one of setup C71 to 74 for selection by external switch.

When the set switch No. turns off, CH1 is selected; when it turns on, CH2 is selected.

CH2 is also selected by the command (WS or WB) of CPL communication with the switch off.

Types of selection

Selection by setup C25

- 0: Low temperature CH1, high temperature CH2 (initial values)
- 1: Low temperature CH2, high temperature CH1
- 2: CH1 side is fixed.
- 3: CH2 side is fixed.
- 4: Redundant selection

Selection system

Selection by setup C26

- 0: Selection by external switch
(OFF : low temperature,
ON : high temperature)
- 1: Automatic selection A
- 2: Automatic selection B
(automatic selection A + selection
by external switch)
- 3: Automatic selection C
(proportion between 2 points at
selection)

Selection by external switch

Select 7 to one of setup C71 to 74 (SW5 to SW8).

Selection	SW OFF	SW ON
7: PV CH1/2	CH1	CH2

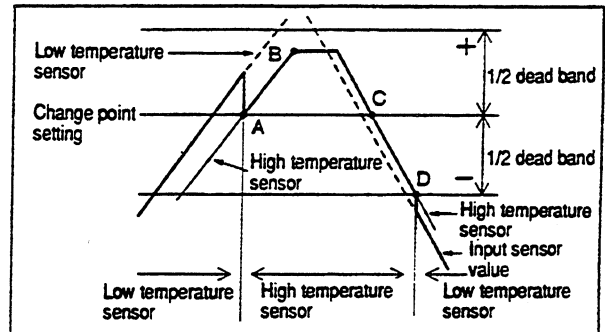
2. Automatic selection A

When a thermocouple is used on the low temperature sensor side, and a radiation thermometer on the high temperature side, the temperature measured by the thermocouple become a little higher during high temperature rising, and the temperature measured by the radiation thermometer becomes a little higher during temperature falling. Therefore, chattering is liable to be produced at a change time. To prevent this trouble from occurring, a dead band is set.

In examples 1 to 4, description is given on the selecting conditions as to the dead band and the input values.

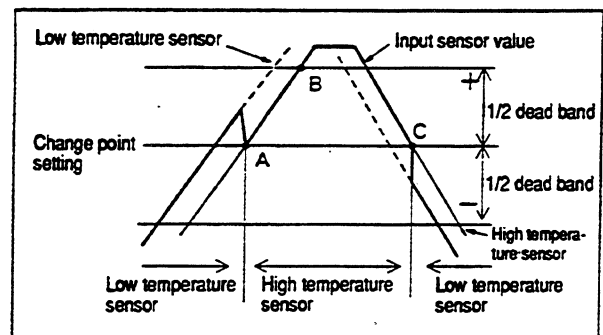
Example 1

- ① The low temperature sensor value and high temperature sensor value rise.
- ② When the high temperature sensor value reaches the change point A, the high temperature sensor is selected instead of the low temperature sensor.
- ③ When the high temperature sensor value rises, then falls from the point B below the dead band, it is not changed even at the change point C.
- ④ When the high temperature sensor value falls further and reaches the point D of the dead band, the low temperature sensor is selected instead of it.



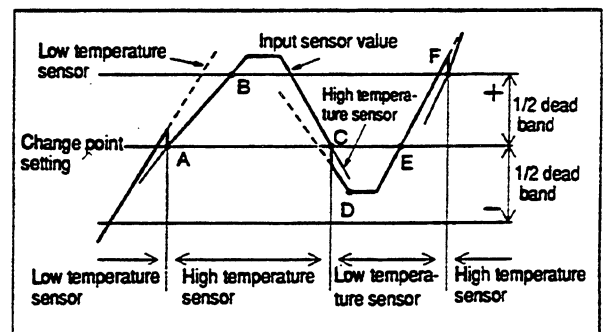
Example 2

- ① When the temperature rises up to the point A, the high temperature sensor is selected.
- ② When the high temperature sensor value rises beyond the dead band point B, then falls, the low temperature sensor is selected instead of the high temperature sensor.



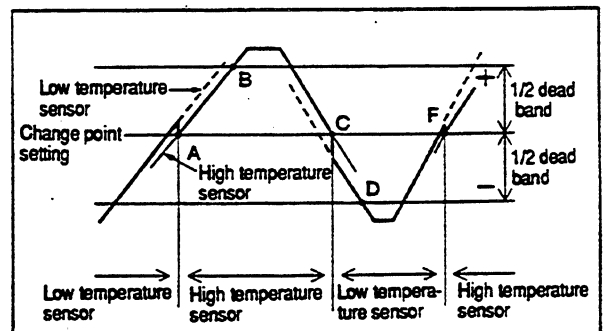
Example 3

- ① The process from the point A to the point C is the same as in Example 2.
- ② When the low temperature sensor value does not fall from the point C to the dead band, but rises from the point D, it is not changed at the change point E.
- ③ When the temperature rises further, and the high temperature sensor value reaches the dead band point F, the high temperature sensor is selected.



Example 4

- ① The process from the point A to the point C is the same as in Example 2.
- ② Assume that the low temperature sensor value falls from the point C below the dead band point D, then rises. When the high temperature sensor value then reaches the point F, the high temperature sensor is selected instead of the low temperature sensor.

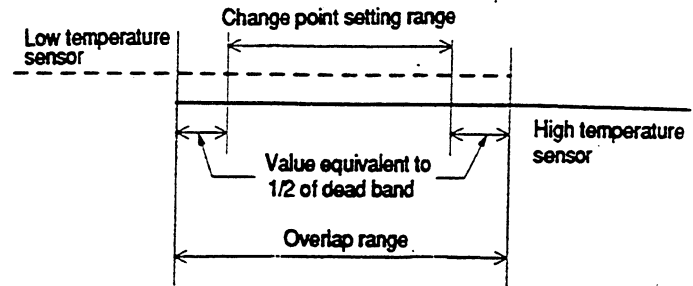


References

Caution for automatic change point setting

A change point between two inputs is located within the range of the overlap portion between the low temperature sensor and high temperature sensor.

Subtract the set value of the dead band from this overlap range (by one half each from both sides), and set a change point within the remaining range.



3. Automatic selection B

This is a combination of automatic selection A and external switch input condition.

Set 9: CH1 → 2 or 10: CH2 → 1 to one of setup C71 to 74 (SW5 to 8).

SW OFF ... The change condition is established.
SW ON Not changed.

(9 and 10: Status detection)

Change result of automatic selection (A)	CH2	CH2	CH1	CH1
External switch input	OFF ⊙	ON ⊙	OFF ⊕	ON ⊕
Change result of automatic selection (B) in combination of two above.	CH2	CH1	CH1	CH2

OFF ⊙ and ON ⊙ mean the case where 9 is set to one of SW5 to 8. OFF ⊕ and ON ⊕ mean the case where 10 is set to one of SW5 to 8.

4. Automatic selection C

In this system, one of the low temperature sensor and high temperature sensor values is not input, but the calculated intermediate value of these values is used as an input.

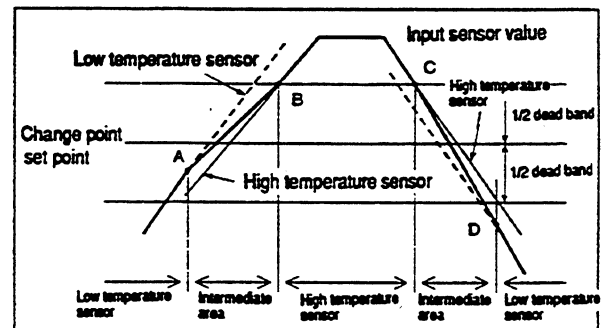
① The low temperature sensor value and high temperature sensor value rise.

② When the high temperature sensor value reaches the lower dead band value, the low temperature sensor temperature is checked. When the high temperature sensor value reaches the upper dead band value, the high temperature sensor is selected.

In the intermediate area, the inputs of the low temperature sensor and high temperature sensor are taken in at such a ratio that the low temperature sensor value of 100% and the high temperature sensor value of 0% are used at the point A, and the low temperature sensor value of 0% and the high temperature sensor value of 100% are used at the point B.

③ The falling process is reverse to the above-mentioned process.

Setup	Setting	Initial value
C71 SW5	0: Not set	0
C72 SW6		
C73 SW7		
C74 SW8	10: PV2 → 1	



References

If there is a temperature deviation between the two inputs of the low temperature sensor and high temperature sensor, PV indication value is changed as it is, but the output is subjected to PID operation to prevent the relevant deviation value from causing a large disturbance. However, if a large disturbance remains occurring at the control output, select the automatic selection C.

4.3 Channel Selection after Power Recovery

There are the following CH1, 2 selection methods when the power supply is to be turned on again after power interruption.

Selection continuation:

The channel being used at power interruption remains selected continuously.

CH1 or CH2:

CH1 or CH2 is selected without fail when the power supply is turned on.

High temperature or low temperature PV:

When the power supply is turned on, CH1 and CH2 are compared with each other, and PV channel of the high temperature side or low temperature side is selected.

4.4 CH1 – CH2 PV Difference Event at Change Time

Generally, the PV value difference between CH1 and CH2 is constant at a change point. If this difference becomes larger or smaller than a certain value, either channel sensor is assumed to be deteriorated.

This PV value difference can be preset to be used as an event output. Since the PV difference between CH1 and CH2 is checked at a change time only, the output turned on once is kept as it is until it is reset.

4.5 PV Channel Selection Event

There are two types of PV channel selection events; PV1 selection, and PV2 selection. This event is turned on when the designated PV channel is selected as PV for control and run.



When PV1 is being selected, the PV1 selection event is turned on and output. In the automatic selection C (CH1, 2 ratio selection), both PV1 selection and PV2 selection are turned on and output.

Channel selection after power recovery

Selection by setup C29

- 0: The channel being used at power off is selected continuously.
- 1: CH1 is selected when the power supply is turned on.
- 2: CH2 is selected when the power supply is turned on.
- 3: When the power supply is turned on, CH1 and CH2 are compared with each other, and the channel of the high temperature side is selected.
- 4: When the power supply is turned on, CH1 and CH2 are compared with each other, and the channel of the low temperature side is selected.

Event setting

Type set point	Event type [E xx- E]	Auxiliary setting 2 [E xx-2] ( means LCD indication.)
96	High-limit of PV1 – PV2 difference when PV channel is changed.	Action point (-19999 to +20000 SPU)
97	Low-limit of PV1 – PV2 difference when PV channel is changed.	 set point

PV channel selection event

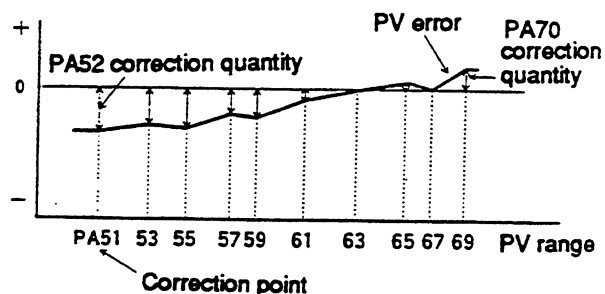
142 143	PV1 selection PV2 selection
Type set point	Event type [E xx- E]

4.6 PV Equalizer

When the PV input value causes an error from the true value according to the characteristic of the sensor, the correction quantity can be set within the range of -1000 to +1000 with arbitrary 10 points of the PV range used as correction points. Set the correction points and correction quantities separately for CH1 and CH2.

PV equalizer

1. When setting the PV equalizer, first set the correction of CH1 or CH2 only, or of both CH1 and CH2 by setup C30.
 - 0: No PV equalizer is provided.
 - 1: Correction of CH1 only
 - 2: Correction of CH2 only
 - 3: Correction of both CH1 and CH2
2. Set the correction points and correction quantities by parameters.



Since the section between correction points is corrected linearly, select a curve point or peak point as a correction point.

Parameter items

Set the correction points of CH1 to PA51, 53, 57, 59, 61, 63, 67, and 69 within the range of -19999 to +20000PVU.

Set the correction quantities of CH1 to PA52, 54, 56, 58, 60, 62, 64, 66, 68 and 70 within the range of -1000 to +1000PVU.

Set the correction points of CH2 to PA71, 73, 75, 77, 79, 81, 83, 85, 87, and 89 within the range of -19999 to +20000PVU.

Set the correction quantities of CH2 to PA72, 74, 76, 78, 80, 82, 84, 86, 88, and 90 within the range of -1000 to +1000PVU.

PA51, 69, 71 and 89 are automatically set according to the PV range, and the set values cannot be changed.

5. SETUP SETTING

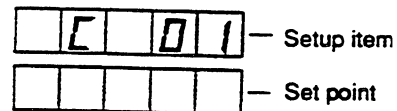
5.1 General

The following items are set by setup for the PV input of CH2 in the dual input model. (Refer to the No. CP-UM-1456-1E DCP550 User Manual for the setup of CH1.)

1. CH2 PV input type (initial value; 0, 64 or 128)	C11
2. CH2 temperature unit	C12
3. CH2 PV decimal point position	C13
4. CH2 linear decimal point position	C14
5. CH2 linear low-limit	C15
6. CH2 linear high-limit	C16
7. CH2 CJ compensation	C17
8. CH2 root extraction	C18
9. CH2 root extraction dropout	C19
10. CH2 CJ bias	C20
11. PV CH1/CH2 selection type	C25
12. PV CH1/CH2 selection system	C26
13. Change point	C27
14. Dead band value	C28
15. Selection after power recovery	C29
16. PV equalizer	C30
17. CH2 auxiliary output type	C48
18. Setting of CH2 current output 4mA	C49
19. Setting of CH2 current output 20mA	C50
20. Setting of external switch operation	C71 to C71 to 74 setting items are added.

5.2 Operation

The upper display indicates a setup item, while the lower display indicates a set point. The setup setting cannot be done during a run. Perform the setup setting in the ready condition.



1. Setup setting procedure

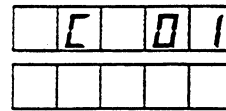
Procedure

① For setting the ready condition Press **RUNHOLD** key, while pressing **PROG** key. RUN, HLD, MAN and PRG LEDs go out.

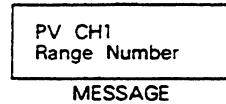


② For setting the setup condition.

Press **SETUP** key.

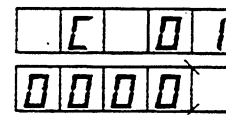


Upper display indicates the setup item.



③ For setting the instrument to be ready for setting or changing a numeric

Press **ENTER** key.



The 1st digit flashes in lower display.



④ For setting a numeric

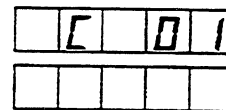
Press **▲** **▼** key.

Set the numeric at the flashing part by **▲** **▼** keys. Shift the digit by **◀** **▶** keys.



⑤ For loading the numeric

Press **ENTER** key.



Lower display stops flashing.



For correction



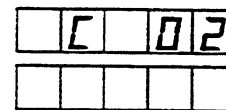
Check if the set or changed contents are correct.

Proceed to the next step.



⑥ For the next setup item

Press **SETUP** key.



The next setup item is indicated.





Observe the same procedure hereafter.

References


- The setup item is transferred by **SETUP** key and **▲** **▼** keys.
- The **SETUP** key indicates items sequentially, but it does not transfer them reversely.
- **▲** **▼** keys execute matrix functions.
- If the setup item is not indicated by pressing **SETUP** key, press **PROG** key and **RUNHOLD** key together after pressing **DISP** key, and then press **SETUP** key again. The setup item is now indicated.

2. Functions of **SETUP** key and keys



Functions of **SETUP** key and   keys after pressing the reset key (**PROG** + **RUN/HOLD**)



  lateral shift keys : Shift setup items C01, C11 ... C81 laterally.

  vertical shift keys : Shift setup items C01, C02 ... C10 vertically.

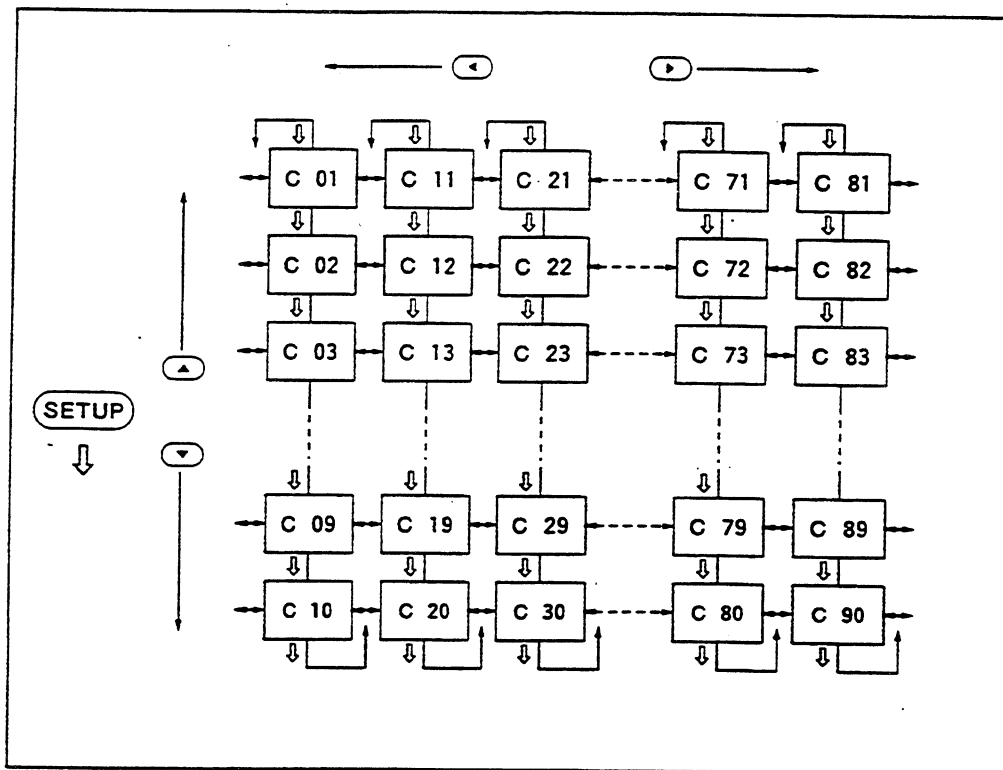
SETUP key : This key functions in the same way as in  key; provided that non-displayable items are skipped.

< Notes >


Out of setup 1 to 90 items, certain items may be left as initial conditions (preset conditions at the delivery time from the factory). In such a case,  and  keys take time.

DCP550 can shift the tenth digit by using   keys. Set them efficiently by using this function.

This item shift is illustrated below.

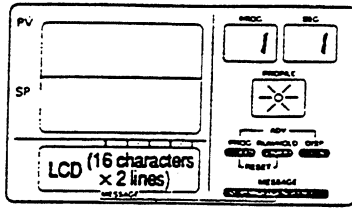
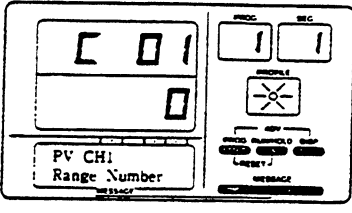
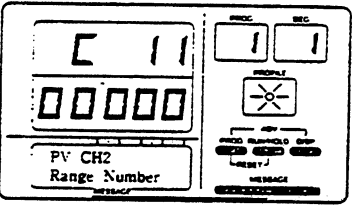
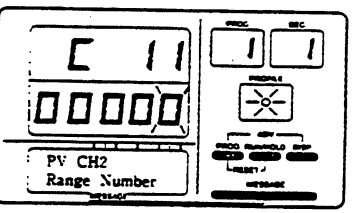

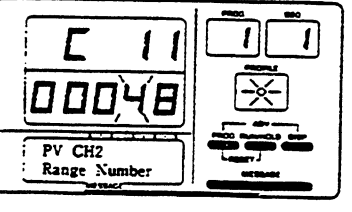

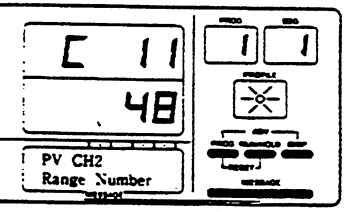


References

Certain setup items are not indicated by pressing **SETUP** key and  keys when the model does not provide this function. Accordingly, such a display-free condition does not indicate any trouble.

3. Setting change of CH2 PV input range

Example: Input model No. TTO K type 0 to 1200°C → Linear 4 to 20mA
 Change the setting of setup C11=0.

Purpose	Operation	Display	Remarks
① For indicating the ready condition	Press RUN/HOLD key, while pressing PROG key.		Ambient temperature indication when PV is an ambient temperature.
② For obtaining a setup setting screen	Press SETUP key.		C01 is indicated in upper display.
③ For indicating C11 of CH2 PV range	Press 0 key once.		C11 is indicated in upper display.
④ For setting CH2 PV range	Press ENTER key.		Lower display  flashes.
⑤ Select PV input range No. from the reference shown on the next page. (Example: C11 = 0 → 48. Change CH2 input range type to model No.T 4 to 20mA.)	Press 0 key once and 0 key twice.		 flashes.
⑥ For loading the above-mentioned contents of setting	Press ENTER key.		Flashing goes out.

References

- Set points of the following setup items are automatically reset when PV1 input range is changed.
 - C66: The SP limit low-limit is reset to a low-limit value of PV range.
 - C67: The SP limit high-limit is reset to a high-limit value of PV range.
- Since the above items are not reset automatically when PV2 input range is changed, change their setting.

Set setup items 1 to 90 by the above procedure.

Although this setting may be troublesome, it is essential to set the instrument to the specified functions.

References

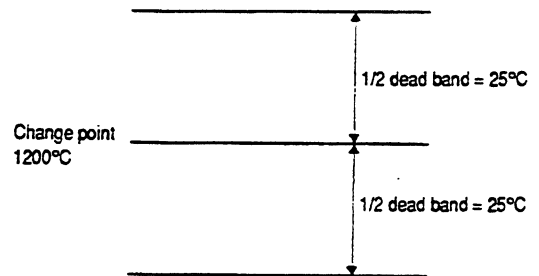
Input types and input range No.

Input range No.	Symbol	Input range FS°C	Input range No.	Symbol	Input range FS°C	Input range No.	Symbol	Input range FS°C
Model No. T Thermocouple & linear (current, voltage)	16	K	K46	-200.0 to +200.0	Model No. R RTD	64	F50	-200.0 to +500.0
	0	K	K09	0.0 to 1200.0		65	F46	-200.0 to +200.0
	1	K	K08	0.0 to 800.0		66	F32	-100.0 to +150.0
	2	K	K04	0.0 to 400.0		67	F36	-50.0 to +200.0
	3	E	E08	0.0 to 800.0		68	F33	-40.0 to +60.0
	4	J	J08	0.0 to 800.0		69	F01	0.0 to 100.0
	5	T	T44	-200.0 to +300.0		70	F03	0.0 to 300.0
	6	B	B18	0.0 to 1800.0		71	F05	0.0 to 500.0
	7	R	R16	0.0 to 1600.0		96	P50	-200.0 to +500.0
	8	S	S16	0.0 to 1600.0		97	P46	-200.0 to +200.0
	9	W	W23	0.0 to 2300.0		98	P32	-100.0 to +150.0
	10	W	W14	0.0 to 1400.0		99	P36	-50.0 to +200.0
	11	PR40-20	D19	0.0 to 1900.0		100	P33	-40.0 to +60.0
	12	N	U13	0.0 to 1300.0		101	P01	0.0 to 100.0
13	PLI	Y13	0.0 to 1300.0	102	P03	0.0 to 300.0		
14	Ni-Ni-Mo	Z13	0.0 to 1300.0	103	P05	0.0 to 500.0		
15	Golden iron-chromel	Z06	0.0 to 300.0K	*K: Kelvin absolute temperature				
48	mA	C01	4 to 20mA					
52	(linear)	Z51	2.4 to 20mA					
49		M01	0 to 10mV					
50	mA (linear)	L02	-10 to +10mV					
51			0 to 100mV					
Model No. L Linear (current, voltage)	128	mV	C01	4 to 20mA				
	134	(linear)	Z51	2.4 to 20mA				
	129	V (linear)		0 to 1V				
	130		-1 to +1V					
	131		V01	1 to 5V				
	132		0 to 5V					
133	0 to 10V							

4. An example of setting of change point

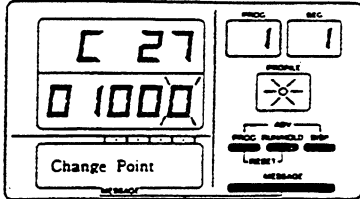
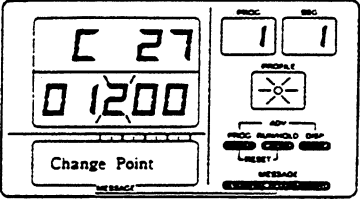
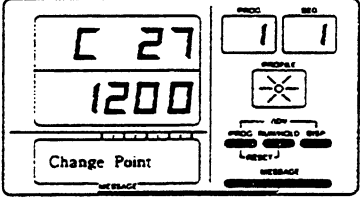
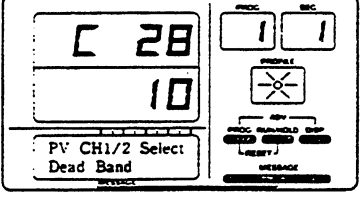
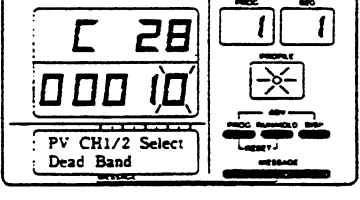
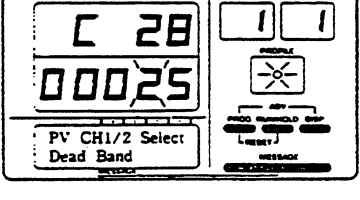
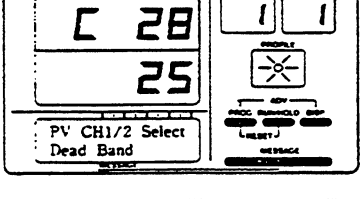
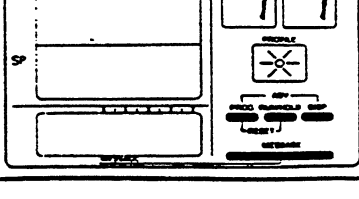
When a thermocouple is used as CH1 low temperature sensor, a radiation thermometer is used as CH2 high temperature sensor, a change point between the low temperature and high temperature is set to 1200°C, the automatic selection C is employed to minimize disturbance at a change time, and the dead band of selection width is set to 50°C, set setup as follows;

- Selection type (CH1; low temperature, CH2; high temperature)
C25 : 0
(initial value: 0, resetting is not required)
- Selection system (automatic selection C)
C26 : 3
(initial value: 0, resetting is required)
- Change point
C27 : 1200
(initial value: 1000, resetting is required)
- Dead band (selection width)
C28 : 50 (25 + 25)
(initial value: 10, resetting is required)
- Selection at power recovery
(continuation)
C29 : 0
(initial value: 0, resetting is not required)



Procedure

Purpose	Operation	Display	Remarks
① For indicating the ready condition	Press RUN/HOLD key, while pressing PROG key.		Ambient temperature indication in upper display when PV is an ambient temperature.
② For obtaining a setup setting screen	Press SETUP key.		C01 is indicated in upper display.
Setting of selection system			
③ For indicating selection system C26	Press ▶ key twice, and ▼ key five times.		C26 is indicated in upper display.
④ For setting the selection system to be ready for setting	Press ENTER key.		0 flashes in lower display.
⑤ For setting the automatic selection C	Press ▲ key three times.		3 flashes.
⑥ For loading the above setting	Press ENTER key.		Flashing goes out.
Change of change point			
⑦ For indicating change point C27	Press ▼ key once.		C27 is indicated in upper display, and 1000 in lower display.

Purpose	Operation	Display	Remarks
⑧ For permitting the change point to be readily changeable	Press ENTER key.		0 flashes in lower display.
⑨ For changing 1000 to 1200	Press ← key twice, and → key twice.		1200 is indicated.
⑩ For loading the above change	Press ENTER key.		Flashing goes out.
Change of selection width			
⑪ For indicating dead band C28 of selection width	Press ▽ key.		C28 is indicated in upper display, and 10 in lower display.
⑫ For permitting the dead band to be readily changeable	Press ENTER key.		0 flashes in lower display.
⑬ For changing 10 to 25	Press → key five times, ← key once, and → key twice.		25 is indicated.
⑭ For loading the above change	Press ENTER key.		Flashing goes out.
⑮ For resetting to the initial indication	Press DISP key.		PV value is indicated in upper display.

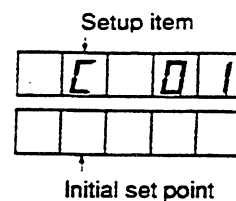
5.3 Additional Setup Items

There are the following additional setup items.

Setup setting is not required when a set value is an initial value and it satisfies the demanded specifications.

Certain setup items are not indicated when the model does not provide this function.

Setup items can be called by pressing **SETUP** key and  keys.



Display	Items	Setting	Initial value	Remarks
C11	CH2 PV range type	0 to (CH2 PV input model No. T) 64 to (CH2 PV input model No. R) 128 to (CH2 PV input model No. L)	0 64 128	Indicated when PV CH2 is provided. See the range table for setting range.
C12	CH2 temperature unit	0: Centigrade (°C) 1: Fahrenheit (°F)	0	See T/C, RTD input table on page 14.
C13	CH2 PV decimal point position	0: x.x.x.x x 1: x.x.x.x,x 2: x.x.x.x x	1	
C14	CH2 linear decimal point position	0: x.x.x.x x 1: x.x.x.x,x 2: x.x.x.x x 3: x.x.x.x x 4: x.x.x.x x	1	Displayed by a linear input. For the decimal point position in C15 and C16, see C14.
C15	CH2 linear lower-limit	-19999 to +20000U	0	
C16	CH2 linear upper-limit	-19999 to +20000U	1000.0	
C17	CH2 CJ compensation	0: Provided (compensated inside the instrument) 1: Not provided (External compensation outside the instrument is necessary)	0	Indicated by T/C input.
C18	CH2 root extraction	0: Not provided 1: Provided	0	Indicated by linear input.
C19	CH2 root extraction dropout	0.2 to 10.0% FS (Ratio to PV range)	0.2	
C20	CH2 CJ bias	-1.0 to +1.0	0.0	Indicated by T/C input. Used as 0.0 normally.
PV channel selection				Indicated when PV CH2 is provided.
C25	Selection type- (low temperature, high temperature)	0: Low temperature CH1, high temperature CH2 1: Low temperature CH2, high temperature CH1 2: CH1 side fixed 3: CH2 side fixed 4: Redundant selection	0	
C26	Selection system	0: Remote selection (OFF: low temperature, ON: high temperature) 1: Automatic selection A (dead band) 2: Automatic selection B (dead band) + remote 3: Automatic selection C (proportion between 2 points)	0	Indicated when C25 = 0, 1
C27	Change point	-19999 to +20000U	1000.0	When C25 = 0, 1 and C26 ≠ 0.
C28	Dead band, selection width	1 to 10000U	10.0	
C29	Selection at power recovery	0: Continuation 1: CH1 side 2: CH2 side 3: High-temperature PV 4: Low-temperature PV	0	The decimal point position is the same as in PV CH1 (effective by C3, 4)
C30	PV equalizer	0: Not provided 1: In CH1 only 2: In CH2 only 3: In both CH1 and CH2 (limited only to 0 and 1 in PV 1CH model)	0	

Display	Items	Setting	Initial value	Remarks	
C48	CH2 current output type (auxiliary output)	0 : SP 1 : PV 2 : DEV 3 : MV 4 : PV1 5 : PV2	0	Not indicated when current output is sent in CH1 only.	
C49	Setting of CH2 current output 4mA		0.0	Not indicated when C48 = control output, heat output, cool output, control output 1, or control output 2. Decimal point position is set by C65.	
C50	Setting of CH2 current output 20mA		1000.0		
External switch input					
C71	SW5	0 : NOP 1 : RAMP - E 2 : FAST 3 : GS is reset by OR. 4 : GS is reset by AND. 5 : AUTO/MANUAL 6 : AT 7 : PV CH1/2 8 : Auto load	9 : PV 1 → 2 10 : PV 2 → 1	0	SW1: RUN SW2: HOLD SW3: RESET SW4: ADV] SW1 to 4 are fixed.
C72	SW6		See page 5 and 7 for changeover between PV1 and PV2 of codes 9 and 10.	0	
C73	SW7		11: NOP	0	
C74	SW8		12: Control action direct/reverse	0	

PV : PV1 or PV2, whichever is selected.

PV1: PV input to CH1.

PV2: PV input to CH2

6. SETTING OF PARAMETERS

6.1 General

The following parameter items are added for the dual PV input model.

1. PV filters in CH2 PA22
2. PV bias in CH2 PA23
3. PV equalizers in CH1 and CH2 PA51 to 90.

To correct the PV values, setting of setup C30 is required at first.

When setting CH1 PV equalizer, C30: 1

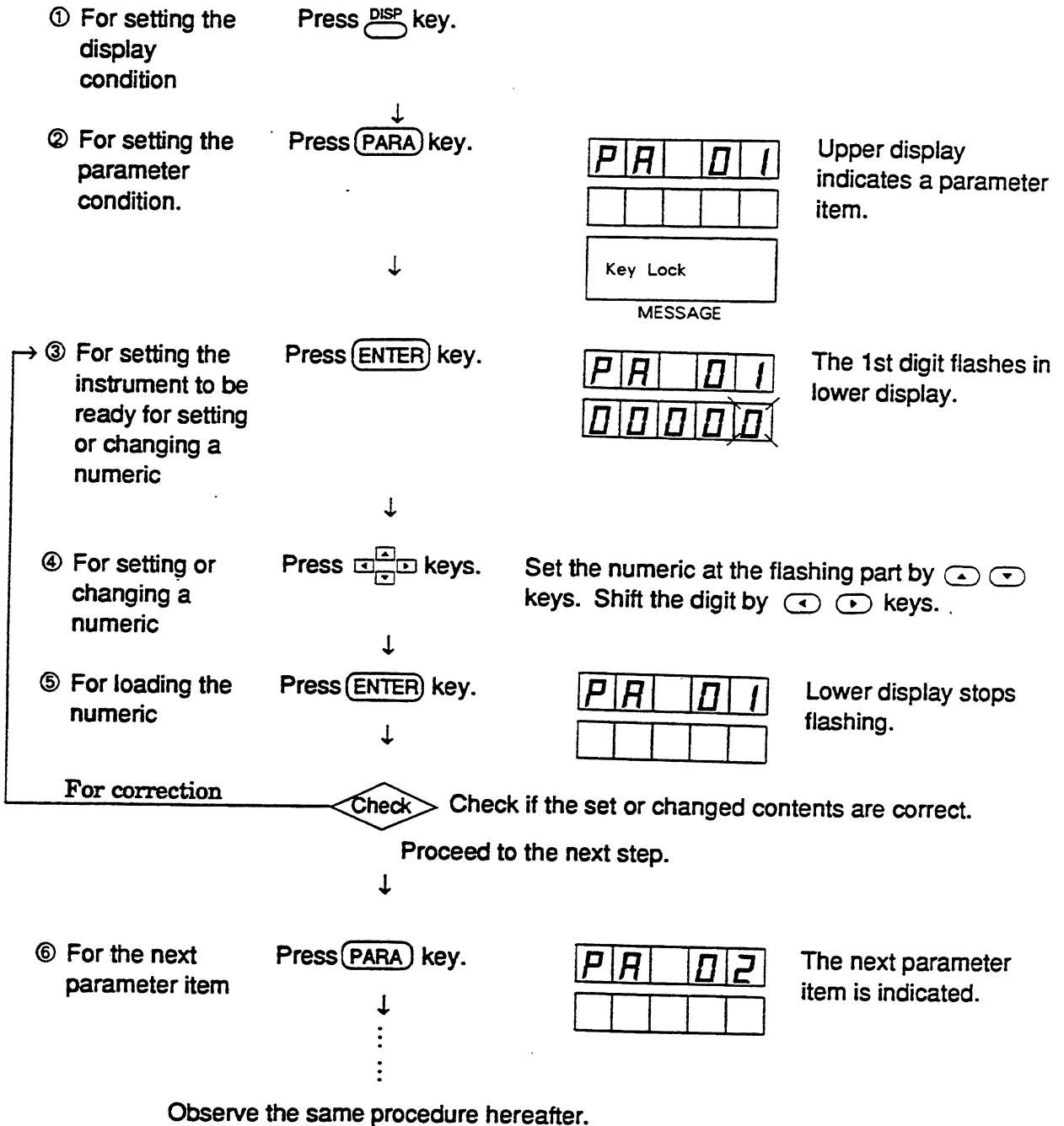
When setting CH2 PV equalizer, C30: 2

When setting CH1 and CH2 PV equalizers, C30: 3

In the dual PV input model, a PV equalizer can be set in CH1 or CH2 only, or in each of CH1 and 2.

6.2 Operation






1. Parameter setting procedure





References



- The parameter item is transferred by **PARA** key and **←** **↑** **↓** **→** keys.
- The **PARA** key indicates items sequentially, but it does not transfer them reversely.
- **←** **↑** **↓** **→** keys execute matrix functions.
- If the setup item is not indicated by pressing **PARA** key, press **DISP** key and then **PARA** key again. The setup item is now indicated.

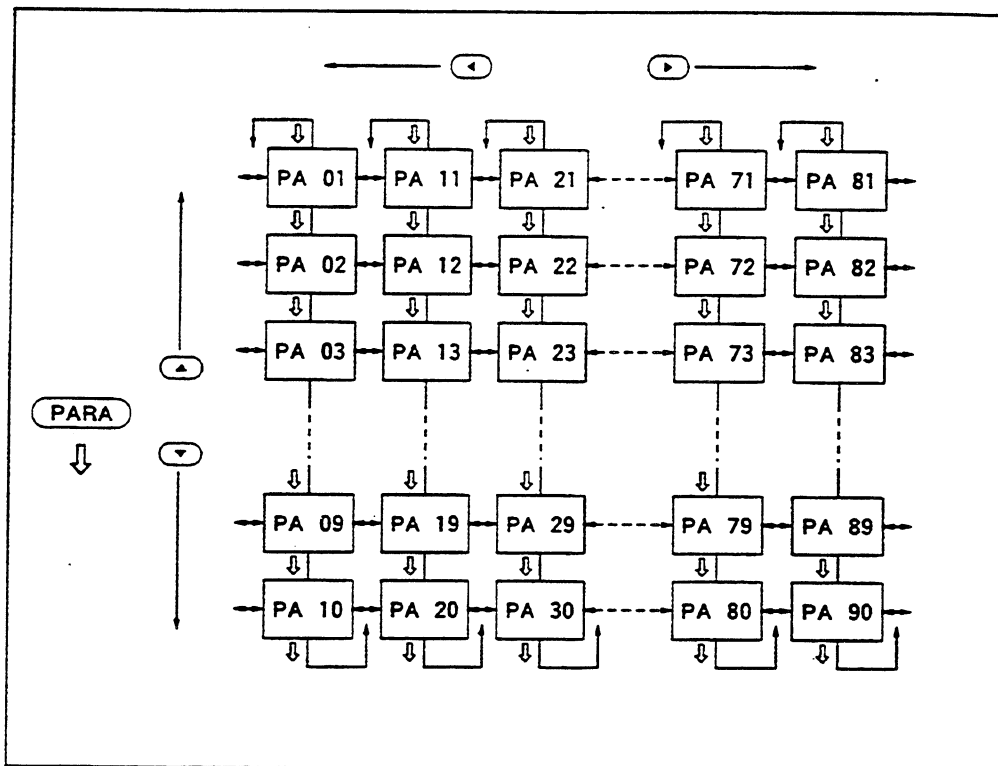
2. Functions of **PARA** key and keys

-   lateral shift keys : Rightward or leftward shift as in PA01 to PA81.
-   vertical shift keys : Upward or downward shift as in PA01 to PA10.
- PARA** key : This key functions in the same way as in  key; provided that non-displayable items are skipped.

< Notes >

Out of parameter 1 to 90, certain parameters may be left as the initial conditions (preset conditions at the delivery time from the factory). In such a case,  and  keys take time.

DCP550 can shift the tenth digit by using   keys. Set them efficiently by using this function.



3. An example of setting of PV equalizer

Consider such an example that the range of 600°C to 3000°C of the radiation thermometer input to CH2 is corrected as shown below.

Correction point	600°C	900°C	1400°C	3000°C
Correction quantity	-100°C	-50°C	0°C	0°C

Perform setting of parameters as shown below.

PA71 600°C (unchangeable preset value)
PA72 -100°C
PA73 900°C
PA74 -50°C
PA75 1400°C
PA76 0°C

When zero correction is executed at 1400°C and at 3000°C as in the above example, set zero correction at 1400°C only. The latter zero correction need not be set at 3000°C.

When a PV equalizer is provided to CH2 PV input only as mentioned above, it is necessary to set 2 to setup C30.

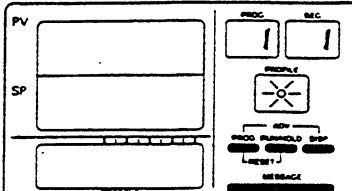
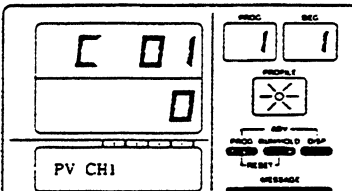
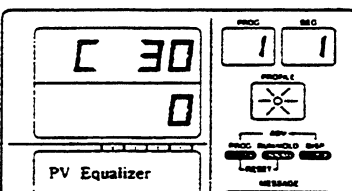
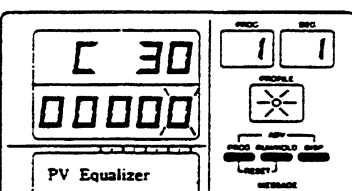

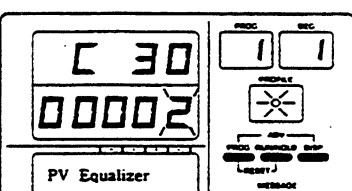

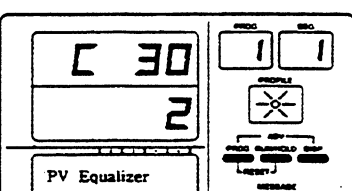
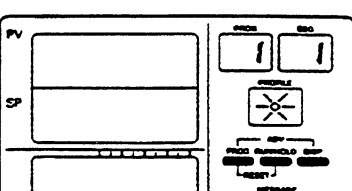
When the setup setting has been already done, start with procedure ⑦.

When the input of the radiation thermometer is 4 to 20mA, set the low-limit temperature by C15 (4mA), and the high-limit temperature by C16 (20mA), and then set the temperature unit to °C.

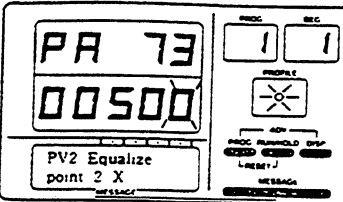
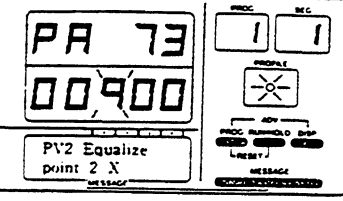
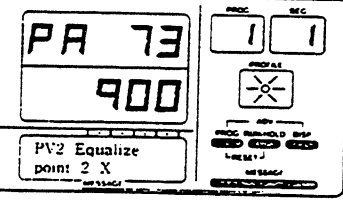
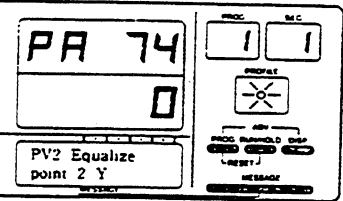
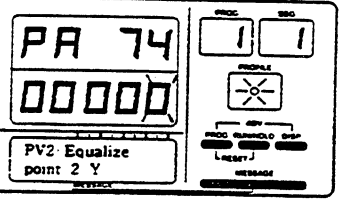
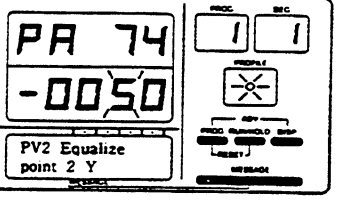
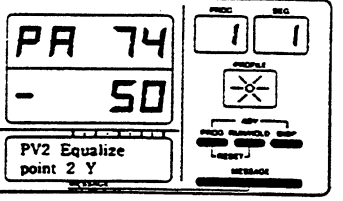
When the input range is 600 to 3000°C as in this example, set setup C14, C15 and C16 as shown below.

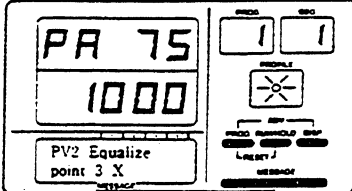
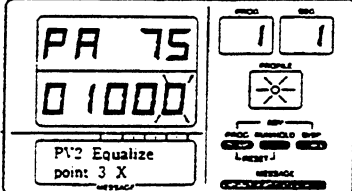
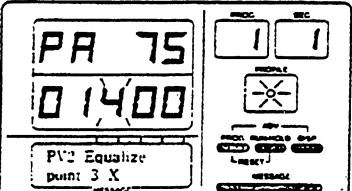
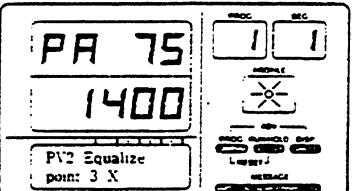
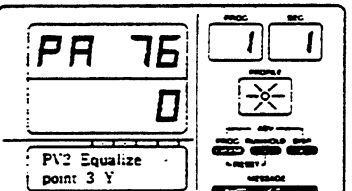
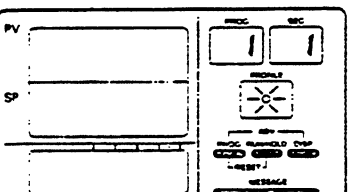
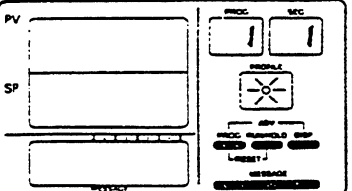
C14 0 (shift a decimal point position)
C15 600°C (low-limit temperature)
C16 3000°C (high-limit temperature)

Procedure

Purpose	Operation	Display	Remarks
Setting of setup C30, ① to ⑦			
① For indicating the ready condition	Press RUN/HOLD key, while pressing PROG key.		PV value is indicated in upper display.
② For obtaining a setup setting screen	Press SETUP key.		C01 is indicated in upper display.
③ For indicating PV equalizer C30	Press ▶ key three times, and ▲ key once.		C30 is indicated in upper display.
④ For permitting PV equalizer to be readily set	Press ENTER key.		Lower display  flashes.
⑤ For setting CH2 PV equalizer	Press ▲ key twice		 flashes.
⑥ For loading the above setting	Press ENTER key.		Flashing goes out.
⑦ For setting the initial display condition	Press DISP key.		PV is indicated in upper display.

Purpose	Operation	Display	Remarks
Setting of parameters PA71 to 76			
⑧ For obtaining a parameter setting screen	Press <u>PARA</u> key.		PA01 is indicated in upper display.
⑨ For indicating PA71	Press <u>0</u> key seven times.		PA71 is indicated in upper display, and 600 in lower display (in case of this example).
⑩ For indicating PA72 of correction quantity 600°C	Press <u>0</u> key once.		PA72 is indicated in upper display.
⑪ For permitting the correction quantity 600°C to be readily set.	Press <u>ENTER</u> key.		0 flashes in lower display.
⑫ For indicating -100°C	Press <u>0</u> key twice and <u>1</u> key once.		-0100 is indicated.
⑬ For loading -100°C	Press <u>ENTER</u> key.		Flashing goes out.
⑭ For indicating the next correction point PA73	Press <u>0</u> key once.		PA73 is indicated in upper display.

Purpose	Operation	Display	Remarks
⑮ For permitting the correction point to be readily changed	Press ENTER key.		0 flashes in lower display.
⑯ For changing 500°C to 900°C	Press ← key twice and → key four times.		00900 is indicated.
⑰ For loading 900°C	Press ENTER key.		Flashing goes out.
⑱ For indicating PA74 of correction quantity 900°C	Press ↓ key once.		PA74 is indicated in upper display.
⑲ For permitting correction quantity 900°C to be readily set	Press ENTER key.		0 flashes in lower display.
⑳ For indicating -50	Press ← key once and ↓ key five times.		-0050 is indicated.
㉑ For loading -50.0	Press ENTER key.		Flashing goes out.


Purpose	Operation	Display	Remarks
㉓ For indicating the next correction point PA75	Press <input type="button" value="0"/> key.		PA75 is indicated in upper display.
㉔ For permitting the correction point to be readily changed	Press <input type="button" value="ENTER"/> key.		0 flashes in lower display.
㉕ For changing 1000°C to 1400°C	Press <input type="button" value="0"/> key twice and <input type="button" value="0"/> key four times.		0 1400 is indicated.
㉖ For loading 1400°C	Press <input type="button" value="ENTER"/> key.		Flashing goes out.
㉗ For indicating PA76 of correction quantity 1400°C	Press <input type="button" value="0"/> key once.		PA76 is indicated in upper display and 0 in lower display.
㉘ For resetting to the initial display condition since the correction quantity at 1400°C is 0.	Press <input type="button" value="DISP"/> key.	 	PV is indicated in upper display.

6.3 Additional Parameter Item Table

The upper display indicates parameter items, while the lower display indicates set points.

When the initial value of a parameter satisfies the demanded specifications, no parameter setting is required.

Parameter items can be called by pressing

PARA key and  keys.

To use the PV equalizer function, set the setup C30 item, and then set parameter items.

- C30: 1 Equalizer for CH1 PV only
- : 2 Equalizer for CH2 PV only
- : 3 Equalizers for both CH1 and 2 PVs

Parameter item in upper display

PA 01

0

Initial value in lower display

Additional parameter items

Display	Item	Setting	Initial value	Remarks
PA 22	CH2 PV filter	0.0 to 120.0sec (0.0: filter OFF)	0.0	Indicated when CH2 PV is provided.
PA 23	CH2 PV bias	-1000 to +1000 PVU (CH2)	0	

Display	Item	Setting	Initial value	Remarks
PA 51	PV1 equalizer No.1 correction point	Low-limit value of PV1 range (setting is automatically changed)	As mentioned at the left.	Indicated when setup C30 = 1, 3.
PA 52	PV1 equalizer No.1 correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA 53	PV1 equalizer No.2 correction point	-19999 to +20000 PVU (CH1)	50.0	
PA 54	PV1 equalizer No.2 correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA 55	PV1 equalizer No.3 correction point	-19999 to +20000 PVU (CH1)	100.0	
PA 56	PV1 equalizer No.3 correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA 57	PV1 equalizer No.4 correction point	-19999 to +20000 PVU (CH1)	150.0	
PA 58	PV1 equalizer No.4 correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA 59	PV1 equalizer No.5 correction point	-19999 to +20000 PVU (CH1)	200.0	
PA 60	PV1 equalizer No.5 correction quantity	-1000 to +1000 PVU (CH1)	0.0	

PARA items

Display	Item	Setting	Initial value	Remarks
PA 61	PV1 equalizer No.6 correction point	-19999 to +20000 PVU (CH1)	250.0	Indicated when setup C30 = 1, 3.
PA 62	PV1 equalizer No.6 correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA 63	PV1 equalizer No.7 correction point	-19999 to +20000 PVU (CH1)	300.0	
PA 64	PV1 equalizer No.7 correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA 65	PV1 equalizer No.8 correction point	-19999 to +20000 PVU (CH1)	350.0	
PA 66	PV1 equalizer No.8 correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA 67	PV1 equalizer No.9 correction point	-19999 to +20000 PVU (CH1)	400.0	
PA 68	PV1 equalizer No.9 correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA 69	PV1 equalizer No.10 correction point	High-limit value of PV1 range (Setting is automatically changed)	As mentioned at the left.	
PA 70	PV1 equalizer No.10 correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA 71	PV2 equalizer No.1 correction point	Low-limit value of PV2 range (Setting is automatically changed)	As mentioned at the left.	Indicated when setup C30 = 2, 3
PA 72	PV2 equalizer No.1 correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA 73	PV2 equalizer No.2 correction point	-19999 to +20000 PVU (CH2)	50.0	
PA 74	PV2 equalizer No.2 correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA 75	PV2 equalizer No.3 correction point	-19999 to +20000 PVU (CH2)	100.0	
PA 76	PV2 equalizer No.3 correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA 77	PV2 equalizer No.4 correction point	-19999 to +20000 PVU (CH2)	150.0	
PA 78	PV2 equalizer No.4 correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA 79	PV2 equalizer No.5 correction point	-19999 to +20000 PVU (CH2)	200.0	
PA 80	PV2 equalizer No.5 correction quantity	-1000 to +1000 PVU (CH2)	0.0	

Additional parameter items

Display	Item	Setting	Initial value	Remarks
PA 81	PV2 equalizer No.6 correction point	-19999 to +20000 PVU (CH2)	250.0	Indicated when setup C30 = 2, 3.
PA 82	PV2 equalizer No.6 correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA 83	PV2 equalizer No.7. correction point	-19999 to +20000 PVU (CH2)	300.0	
PA 84	PV2 equalizer No.7 correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA 85	PV2 equalizer No.8 correction point	-19999 to +20000 PVU (CH2)	350.0	
PA 86	PV2 equalizer No.8 correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA 87	PV2 equalizer No.9 correction point	-19999 to +20000 PVU (CH2)	400.0	
PA 88	PV2 equalizer No.9 correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA 89	PV2 equalizer No.10 correction point	High-limit value of PV2 range (Setting is automatically changed)	As mentioned at the left.	
PA 90	PV2 equalizer No.10 correction quantity	-1000 to +1000 PVU (CH2)	0.0	

References

If a decimal point is changed by setting setup C3, C4 or C13, C14, the decimal point of the correction point is shifted as it is.

< Example > When C14: 0 is set, the initial value of PA73 is 500.

7. SETTING OF EVENTS

7.1 General

The following event types are added for the dual PV input model.

1. PV2 high-limit normal action Event type 66
2. PV2 low-limit normal action Event type 67
3. PV high-limit (PV1 or PV2 is selected as PV) Event type 68
4. PV low-limit (PV1 or PV2 is selected as PV) Event type 69
5. High-limit of PV1 – PV2 difference at channel selection Event type 96
6. Low-limit of PV1 – PV2 difference at channel selection Event type 97
7. High-limit of PV1 – PV2 difference Event type 98
8. Low-limit of PV1 – PV2 difference Event type 99
9. PV1 selection Event type 142
10. PV2 selection Event type 143

The event at PV channel selection of event 5 or 6 corresponds to the high limit/low limit of PV1 – PV2 at PV automatic selection, and its ON-OFF identification is executed only when the PV channel is changed from low range to high range or from low range to intermediate range. Therefore, the output condition turned ON once is maintained until the next selection or reset is done.

There are two types of channel selection events; PV1 selection (event 9) and PV2 selection (event 10). Each event is turned ON when the designated PV channel is selected as PV for control or run.

In the one PV-input model, the PV1 selection is always turned ON, and the PV2 selection is turned OFF.

In the dual PV-input model, the event of the channel side being selected is turned ON. However, PV1 selection and PV2 selection are turned ON during ratio selection of channels 1 and 2.

7.2 Operation

1. Event type setting procedure

An event type can be set by selecting the event type No. to be set to event No.1 E 01-t.


In the auxiliary setting 1, 2, set the set point or hysteresis of the event related with that event type.

In certain event types, the lower display of the auxiliary setting 1, 2 may indicate

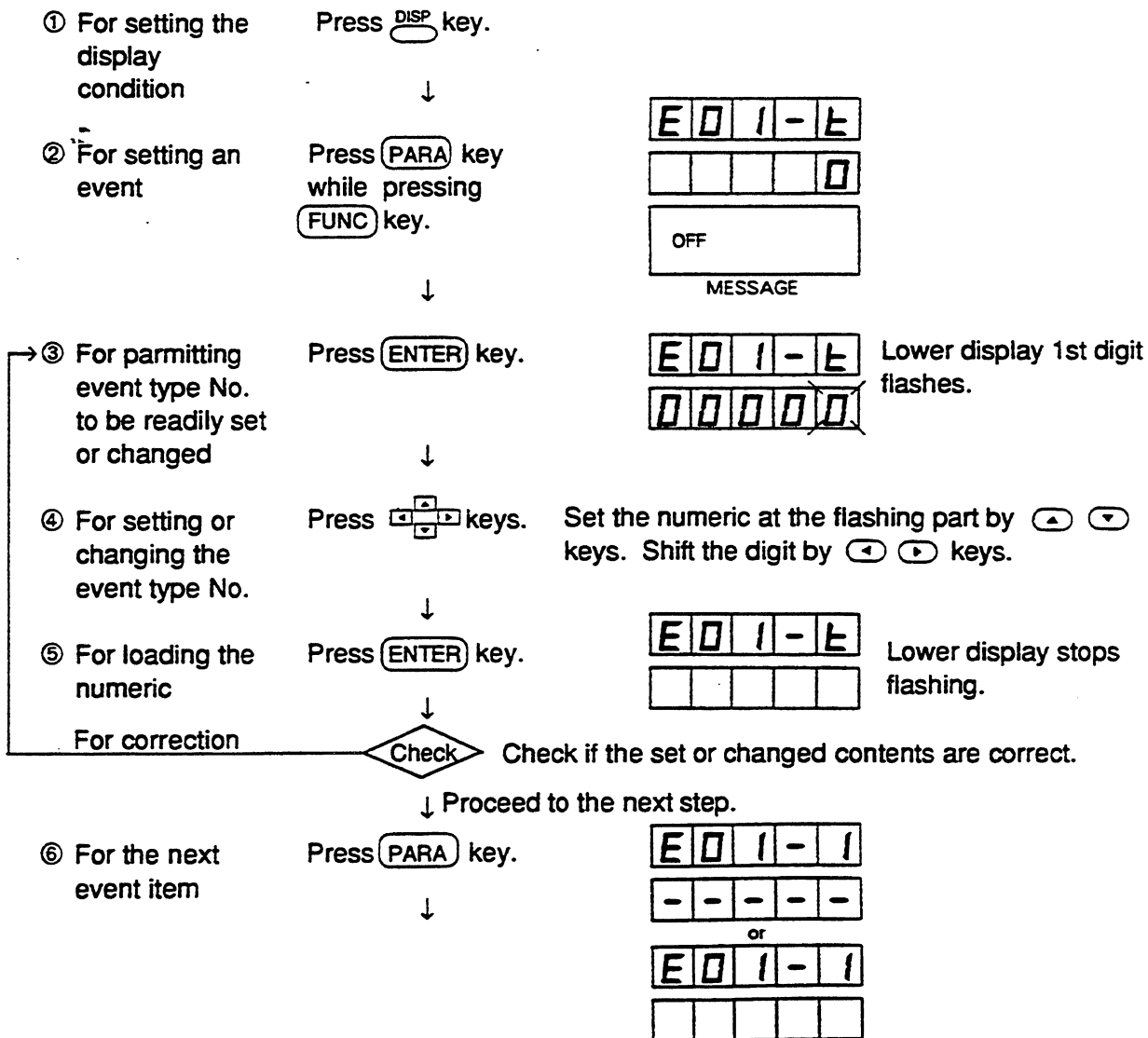


This means a time event or RUN, READY or other mode event which does not require auxiliary setting. ON/OFF time setting of time event is done at a segment on the programming map.

Select event type No. from the event type table, and set it as event No. herein.





The event setting mode can be set by pressing **FUNC** key and then **PARA** key after pressing **DISP** key. After E 01 - t is indicated, the display is transferred sequentially. Matrix indication transfer is executed by  keys. See page 33.


Procedure



2. Functions of **PARA** key and keys

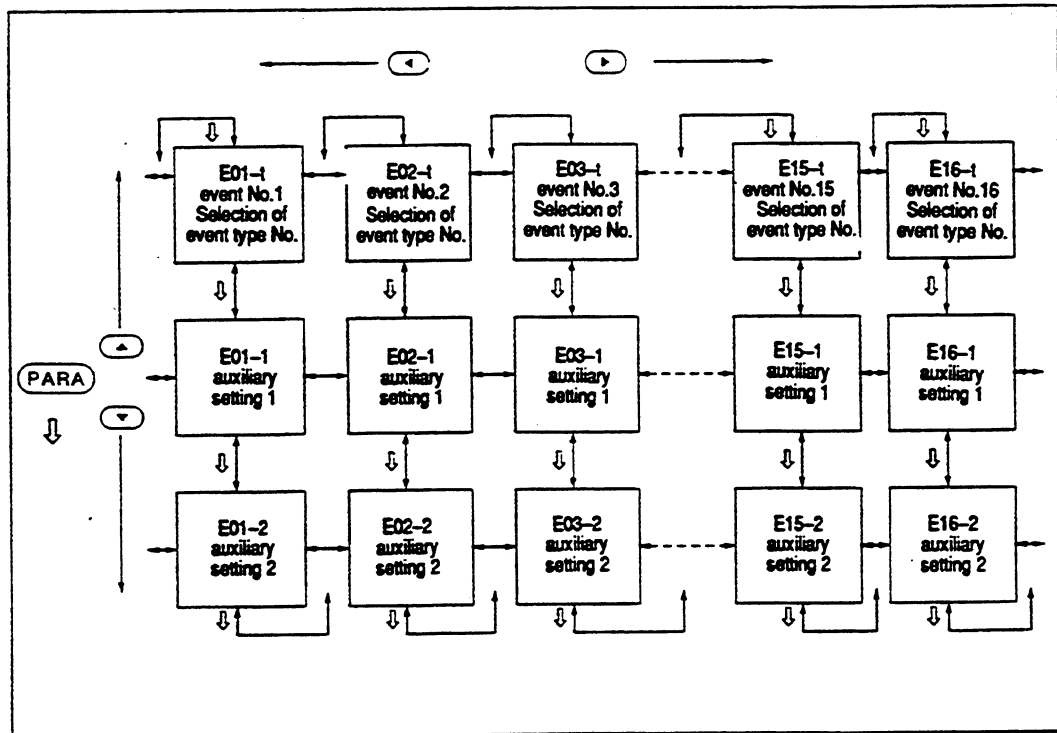
The keys function as shown below after calling an event item by pressing **FUNC** key then pressing **PARA** key.

-   lateral shift keys : Rightward or leftward shift such as E01-t, E02-t, E16-t, E01-t
or E01-1, E02-1, ... E16-1, E01-1
or E01-2, E02-2, ... E16-2, E01-2
-   vertical shift keys: Upward or downward shift such as E01-t, E01-1, E01-2, E01-t ...
or E02-t, E02-1, E02-2, E02-t ...
⋮
or E16-t, E16-1, E16-2, E16-t ...

PARA key : Functions in the same way as in  key.

< Notes >

For checking the event numbers and types of events, they are easily indicated by pressing  or  key after calling E01-t.

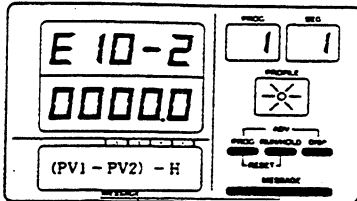
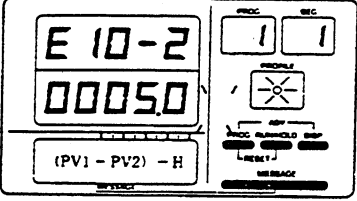
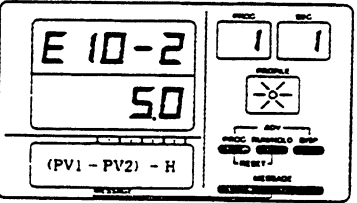
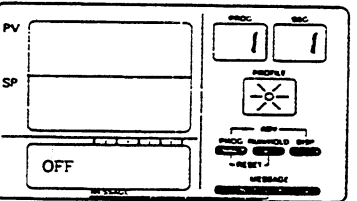


3. An example of high-limit of PV1 – PV2 difference

Consider an example that event No.10 is output when the PV1 – PV2 difference is 5°C or more.

Procedure

Purpose	Operation	Display	Remarks
① For setting the ready condition	Press DISP key.		PV input is indicated.
② For setting the event configuration	Press PARA key, while pressing FUNC key .		E10-t event No.1 is indicated.
③ For indicating event 10	Press ← key seven times.		E10-t event No.10 is indicated.
④ For setting the event type	Press ENTER key.		The first digit flashes in the lower display.
⑤ For indicating the high-limit 96 of PV1 – PV2 difference	Press ▲ key six times, ← key once, and ▲ key nine times.		96 is indicated.
⑥ For loading the high-limit 96 of PV1 – PV2 difference	Press ENTER key.		Flashing goes out.
⑦ For indicating the auxiliary setting of difference 5°C	Press ▼ key twice.		E10-2 auxiliary setting is indicated.

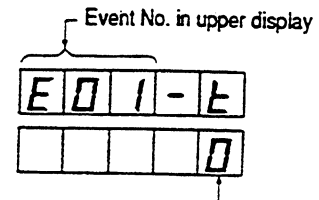
Purpose	Operation	Display	Remarks
⑧ For permitting 5°C to be readily set	Press ENTER key.		The first digit flashes in lower display.
⑨ For indicating 5°C	Press ← key once, and → key five times.		5.0 is indicated.
⑩ For loading 5°C	Press ENTER key		Flashing goes out.
⑪ For resetting to the initial display condition	Press DISP key.		The initial PV display condition is indicated.

7.3 Additional Event Type Items

Event No. is indicated in upper display, while type set point and numeric are indicated in lower display.

An event item can be indicated by locking in (FUNC) key, then pressing (PARA) key.

After it has been indicated once, event items are indicated sequentially by (PARA) key or $\left[\begin{array}{c} \uparrow \\ \left[\begin{array}{c} \leftarrow \\ \rightarrow \end{array} \right] \\ \downarrow \end{array} \right]$ keys.



Type set point and numeric in lower display

Event type table

Type set point	Event type [E _{xx} - t]	Auxiliary setting 1 [E _{xx} - 1] ([] is indicated by LCD)	Auxiliary setting 2 [E _{xx} - 2] ([] is indicated by LCD)	Remarks ([] is an event type indicated by LCD)
66	PV2 high-limit normal action	Hysteresis (0 to 1000 SPU) [hysteresis]	Action point (-19999 to +20000 SPU) [set point]	[PV2-H] Operated in READY mode, too.
67	PV2 low-limit normal action			[PV2-L] Operated in READY mode, too.
68	PV high-limit			[PV-H] Same as specified in type 2.
69	PV low-limit			[PV-L] Same as specified in type 3.

Type set point	Event type [E _{xx} - t]	Auxiliary setting 1 [E _{xx} - 1] (is indicated by LCD)	Auxiliary setting 2 [E _{xx} - 2] (is indicated by LCD)	Remarks (is an event type indicated by LCD)
96	High-limit of PV1 – PV2 difference at PV channel selection	-----	Action point (–19999 to +20000 SPU) set point	CHG P – CH – DEV – H
97	Low-limit of PV1 – PV2 difference at PV channel selection			CHG P – CH – DEV – L (Note)
98	High-limit of PV1 – PV2 difference	Hysteresis (0 to 1000 SPU) hysteresis	Action point (–19999 to +20000 SPU) set point	CH – DEV – H
99	Low-limit of PV1 – PV2 difference			CH – DEV – L
142	PV1 selection execution	-----	-----	SELECT PV1
143	PV2 selection execution			SELECT PV2

(Note): This functions during a run only. Once turned ON, this status is kept on until it is reset.

PV : PV1 or PV2, whichever is selected.

PV1 : PV input to CH1

PV2 : PV input to CH2

APPENDIX

- Setup Setting Table 38 to 41
- Parameter Setting Table 42 to 44
- PID Setting Table 45
- Event Type Table 46 to 57

Setup Setting Table

Setup Items

Display	Items	Setting	Initial value	Remarks
C01	CH1 PV range type	0 to 63 (CH1 PV input model No. T) 64 to 127 (CH1 PV input model No. R) 128 to 191 (CH1 PV input model No. L)	0 64 128	See input type and input range on page 14.
C02	CH1 temperature unit	0 : Centigrade (°C) 1: Fahrenheit (°F)	0	See PV range type and decimal point position on page 41.
C03	CH1 PV decimal point position	0: ××××× 1: ××××.× 2: ×××.×××	1	
C04	CH1 linear decimal point position	0: ××××× 1: ××××.× 2: ×××.××× 3: ××.×××× 4: ×.×××××	1	Indicated by a linear input. For the decimal point position in C5 and C6, see C4.
C05	CH1 linear low-limit	-19999 to +20000U	0	
C06	CH1 linear high-limit	-19999 to +20000U	1000.0	
C07	CH1 cold junction compensation	0 : Provided (Compensated inside the instrument) 1 : Not provided (External compensation outside the instrument is necessary)	0	Indicated by T/C input.
C08	CH1 root extraction	0 : Not provided 1 : Provided	0	Indicated by linear input.
C09	CH1 root extraction dropout	0.2 to 10.0% FS (ratio to PV range)	0.2	
C10	CH1 cold junction bias	-1.0 to +1.0	0.0	Indicated by T/C input. Used as 0.0 normally.
C11	CH2 PV range type	0 to (CH2 PV input model No. T) 64 to (CH2 PV input model No. R) 128 to (CH2 PV input model No. L)	0 64 128	Indicated when PV CH2 is provided. See input type and input range No. on page 14.
C12	CH2 temperature unit	0 : Centigrade (°C) 1 : Fahrenheit (°F)	0	See PV range type and decimal point position on page 41.
C13	CH2 PV decimal point position	0: ××××× 1: ××××.× 2: ×××.×××	1	
C14	CH2 linear decimal point position	0: ××××× 1: ××××.× 2: ×××.××× 3: ××.×××× 4: ×.×××××	1	Indicated by linear input. For the decimal point position in C15 and C16, see C14.
C15	CH2 linear low-limit	-19999 to +20000U	0	
C16	CH2 linear high-limit	-19999 to +20000U	1000.0	
C17	CH2 cold junction compensation	0 : Provided (Compensated inside the instrument) 1 : Not provided (External compensation outside the instrument is necessary)	0	Indicated by T/C input.
C18	CH2 root extraction	0 : Not provided 1 : Provided	0	Indicated by linear input.
C19	CH2 root extraction dropout	0.2 to 10.0% FS (ratio to PV range)	0.2	
C20	CH2 cold junction bias	-1.0 to +1.0	0.0	Indicated by T/C input. Used as 0.0 normally.
C21	Control output model No.	0 : Model No. 5S (no control) 1 : Model No. 5G (CP) 2 : Model No. 6D, 8D (TP)	Model No. at delivery time is used.	Settable range changes, depending upon hardware configuration.
C23	Control action	0 : PID - A reverse action 1 : PID - A direct action 2 : PID - B reverse action 3 : PID - B direct action	0	Indicated by other than heat and cool.

Setup Items

Display	Items	Setting	Initial value	Remarks
	PV channel selection			Indicated when PV CH2 is provided.
C25	Selection type (low temperature, high temperature)	0 : Low temperature CH1, high temperature CH2 1 : Low temperature CH2, high temperature CH1 2 : CH1 side fixed 3 : CH2 side fixed 4 : Redundant selection	0	
C26	Selection system	0 : Remote selection (OFF; low temperature, ON; high temperature) 1 : Automatic selection A (dead band) 2 : Automatic selection B (dead band) + remote 3 : Automatic selection C (proportion between two points)	0	Indicated when C25 = 0, 1.
C27	Change point	-19999 to +20000U	1000.0	When C25 = 0, 1 and C26 ≠ 0.
C28	Dead band, selection width	1 to 10000U	10.0	The decimal point position is the same as in PV CH1 (effective in C3 and C4)
C29	Selection at power recovery	0 : Continuation 1 : CH1 side 2 : CH2 side 3 : High-temperature PV 4 : Low-temperature PV	0	
C30	PV equalizer	0 : Not provided 1 : In CH1 only 2 : In CH2 only 3 : In both CH1 and CH2 (0, 1 setting only in PV 1CH model)	0	
C31	Run end condition	0 : READY 1 : END	0	When set to END, PV and SP are indicated at the end of program. HOLD LED flashes on control condition.
C32	Control output in READY mode, or heat side control output in READY mode	-5.0 to +105.0%	0.0	
C33	Control output setting in PV over-range	0: Not provided 1: Provided	0	
C34	Control output in PV over-range	-5.0 to +105.0%	0.0	
C35	Manual selecting action	0: Bumpless 1: Preset	0	
C36	Preset manual value	-5 to +105.0%	0.0	
C43	Power interruption time, permitting run continuation	0 to 3600sec (there is setting error) When set to 0, run is continued after power recovery regardless of power interruption time. Run is continued when power interruption time is within the set time.	0	Used when run is not desired to be continued after long power interruption time. The instrument stops in HOLD condition when power interruption is longer than the set time.
C45	CH1 current output type (auxiliary output)	In case of 1 channel controller 0: SP 1: PV 2: DEV 3: MV 4: PV1 5: PV2	0	C45 to 47 are not indicated in case of output 5G. C45 is not indicated, but C46 and C47 are indicated in case of output 5S. Output is determined by C21.
C46	Setting of CH1 current output 4mA	-19999 to +20000 SPU	0.0	Decimal point position is determined by C65.
C47	Setting of CH1 current output 20mA	-19999 to +20000 SPU	100.0	
C48	CH2 current output type (auxiliary output)	0: SP 1: PV 2: DEV 3: MV 4: PV1 5: PV2	0	Not indicated when the current output is sent in 1 channel only.
C49	Setting of CH2 current output 4mA		0.0	Not indicated when C48 = control output, heat side output, cool side output, control output 1, or control output 2. Decimal point position is determined by C65.
C50	Setting of CH2 current output 20mA		1000.0	

Setup Items

Display	Items	Setting	Initial value	Remarks
	Programming indication			
C57	Event	0: Indicated 1: Not indicated	0	
C58	PID, output limiter	0: Indicated 1: Not indicated	0	
C59	G. soak, PV shift, and repeat	0: Indicated 1: Not indicated	0	
C60	PV start, cycle, and pattern link	0: Indicated 1: Not indicated	0	
C61	Programming pattern setting system	0: RAMP-X and RAMP-T (Θ) are used together. 1: RAMP-X and RAMP-E (ΔSP) are used together.	0	When set to 1, it is necessary to select RAMP-E by one of C71 to 74 of external switch input.
C62	Program time unit	0 : Hr, min 1: Min, sec 2: 0.1sec	0	
C63	Advancing time indication (indicated by 5-digit LED)	0 : Residual time of segment 1 : Total run time (after starting a RUN)	0	
C65	SP decimal point position	0 : ××××× 1 : ××××.× 2 : ×××.×× 3 : ××.××× 4 : ×.××××	1	Decimal point position of SPU
C66	SP limit low-limit	-19999 to +20000 SPU	Low limit of range	Decimal point position is determined by C65.
C67	SP limit high-limit	-19999 to +20000 SPU	High-limit of range	
	External switch input			
C71	SW5	0 : NOP 1 : RAMP-E 2 : FAST 3 : GS is reset by OR. 4 : GS is reset by AND. 5 : AUTO/MANUAL 6 : AT 7 : PV CH1/2 8 : Auto load	0	SW1: RUN SW2: HOLD SW3: RESET SW4: ADV SW1 to 4 are fixed.
C72	SW6	9 : PV1 → 2 10 : PV2 → 1 See pages 5 and 7 for the changeover between PV1 and PV2 of codes 9 and 10.	0	
C73	SW7	11 : NOP 12 : Control action direct/reverse	0	
C74	SW8		0	
C75	SW9 to 16 (program selection)	0 : 4 BCD bits, 2 digits 1 : 7 binary bits	0	
C76	Communication address	0 to 127	0	
C77	Transmission speed (BPS)	0 : 9600, 1 : 4800, 2 : 2400, 3 : 1200	0	
C78	Communication code	0 : 8 bits, even parity, 1 stop bit 1 : 8 bits, no parity, 2 stop bits	0	
C79	Communication protocol	0 : CP system 1 : ST221 (PV trend is not provided) 2 : ST221 (PV trend is provided)	0	
C81	Instrument code		144	Indication only is possible. Unchangeable.
C82	ROM ID		836	
C83	ROM version		XX.XX	
C84	Data version		XX.X	
C85	SPU, PV, Power supply board ID		XX.X.X.	Indicated in hexadecimal notation
C86	D/O board ID		X.X.X.X.	
C87	Option board ID		X.X.X.X.	
C88			
C89			
C90			

PV: PV1 or PV2, whichever is selected.

PV1: PV input to CH1

PV2: PV input to CH2

- C85 0. 1. 0. 0. → CH1 T input, no CH2
0. 2. 0. 0. → CH1 R input, no CH2
0. 4. 0. 0. → CH1 L input, no CH2
0. 9. 0. 0. → CH1 T input, CH2 T input
1. 1. 0. 0. → CH1 T input, CH2 R input
2. 1. 0. 0. → CH1 T input, CH2 L input
1. 2. 0. 0. → CH1 R input, CH2 R input
2. 2. 0. 0. → CH1 R input, CH2 L input
2. 4. 0. 0. → CH1 L input, CH2 L input

- C86 X X 0. 0.
- 4: CH1 current
 - 5: CH1 current + RS-485
 - 6: CH1 current + RS-232C
 - C: CH1 current + CH2 current
 - D: CH1 current + CH2 current + RS-485
 - E: CH1 current + CH2 current + RS-232C
 - 1: CH1 voltage
 - 3: CH1 voltage + CH2 voltage
 - 4: CH1 open collector
 - 6: CH1 open collector + CH2 voltage
 - C: CH1 open collector + CH2 open collector

- C87. 0. 0. 0. 0. Standard
0. 1. 0. 0. → Memory card I/F
0. 2. 0. 0. → 2G output
0. 3. 0. 0. → 2G output + memory card I/F

PV range type and decimal point position setting range

Setting range of Centigrade decimal point position	Setting of PV range type
0 to 1	0 to 4, 6 to 14, 64, 70, 71, 96, 102, 103
0 to 2	5, 15 (The unit of 15 is K), 65 to 69, 97 to 101

Setting range of Fahrenheit decimal point position	Setting of PV range type
0 only is possible.	6, 9, 10
0 to 1	0 to 5, 7, 8, 10, 12 to 14, 64, 65, 67, 70, 71, 96, 97, 99, 102, 103
0 to 2	66, 68, 69, 98, 100, 101

Parameter Setting Table

Parameter Items

Display	Items	Setting	Initial value	Remarks	
PA01	Key lock	0: No key is locked. 1: SETUP key is locked. 2: All keys are locked (manually possible). 3: All keys other than DISP and MSSG are locked.	0	PA01 is changeable, irrespective of its value.	
PA02	Memory protect	0: None 1: Program 2: SETUP, PARA, EVENT 3: SETUP, PARA, EVENT, program 4: SETUP, PARA, EVENT, PID 5: Program and all parameters	0	PA02 is changeable, irrespective of its value. Each constant can be initialized by this protect function. Auto tuning is impossible in 4 and 5.	
PA05	Program auto load	0 : OFF 1 : ON	0	Program setting by memory card.	
PA08	Auto tuning	0: AT cannot be started. 1: AT can be started by system A1. 2: AT can be started by system A2. 3: AT can be started by system B1. 4: AT can be started by system B2.	0	These systems are combinations of the following items. A: Working PID B: SP zone division 1: Normal system 2: System subjected to vibrations	
PA09	Auto tuning control output low-limit	-5.0 to high-limit % OUT	0.0		
PA10	Auto tuning control output high-limit	Low-limit to 105.0% OUT	100.0		
PA11	SP bias	-10000 to +10000 SPU	0	SP indication can be changed.	
PA12	PV filter	0.0 to 120.0sec (Filter turns off at 0.0)	0.0		
PA13	PV bias	-1000 to +1000 PVU	0	PV indication can be changed.	
PA14	Control output change quantity limit	0.1 to 110.0% OUT/100sec	110.0		
PA15	Time proportional cycle	1 to 600sec	10		
PA16	ON-OFF control differential	0 to 1000 (CH1)	50		
PA17	PID operation initialize control output substitute value	-5.0 to +105.0% OUT	0.0		
PA22	CH2 PV filter	0.0 to 120.0sec (Filter turns OFF at 0.0)	0.0	Indicated when CH2 PV is provided.	
PA23	CH2 PV bias	-1000 to +1000 PVU (CH2)	0		
Event ON delay					
PA31	Group 1	Event No.	0 to 16 (No delay is instructed in case of 0)	0	Delay is effective, irrespective of event types. Delay setting is impossible in event 17 to 32. Delay time is not displayed, if event No. is 0 in each group.
PA32		Delay time	0.0 to 3000.0sec	0.0	
PA33	Group 2	Event No.	0 to 16 (No delay is instructed in case of 0)	0	
PA34		Delay time	0.0 to 3000.0sec	0.0	
PA35	Group 3	Event No.	0 to 16 (No delay is instructed in case of 0)	0	
PA36		Delay time	0.0 to 3000.0sec	0.0	
PA37	Group 4	Event No.	0 to 16 (No delay is instructed in case of 0)	0	
PA38		Delay time	0.0 to 3000.0sec	0.0	
PA39	Program time fast feed (FAST scale factor)	0: 2X, 1: 10X, 2: 60X, 3: 120X	0	Setting is impossible to 60X and 120X when setup C62 is 1.	

Display	Items	Setting	Initial value	Remarks
PA40 (Blank)		
PA41	EG1 lamp indication event	0 to 16 (No lamp lights at 0)	0	
PA42	EG2 lamp indication event	0 to 16 (No lamp lights at 0)	0	
PA43	PID operation initialize	0: RUN start, AUTO start 1: ADV is added. 2: PID group selection is added. 3: ADV and PID group selections are added.	0	Specifies the initialize of PID operations.
PA46	G. soak wait time	0.1 to 60.0sec	2.0	
PA51	PV1 equalizer No.1 Correction point	Low-limit of PV1 range (Setting is automatically changed)	As mentioned at the left.	Indicated when setup C30 = 1, 3.
PA52	PV1 equalizer No.1 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA53	PV1 equalizer No.2 Correction point	-19999 to +20000 PVU (CH1)	50.0	
PA54	PV1 equalizer No.2 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA55	PV1 equalizer No.3 Correction point	-19999 to +20000 PVU (CH1)	100.0	
PA56	PV1 equalizer No.3 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA57	PV1 equalizer No.4 Correction point	-19999 to +20000 PVU (CH1)	150.0	
PA58	PV1 equalizer No.4 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA59	PV1 equalizer No.5 Correction point	-19999 to +20000 PVU (CH1)	200.0	
PA60	PV1 equalizer No.5 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA61	PV1 equalizer No.6 Correction point	-19999 to +20000 PVU (CH1)	250.0	Indicated when setup C30 = 1, 3.
PA62	PV1 equalizer No.6 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA63	PV1 equalizer No.7 Correction point	-19999 to +20000 PVU (CH1)	300.0	
PA64	PV1 equalizer No.7 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA65	PV1 equalizer No.8 Correction point	-19999 to +20000 PVU (CH1)	350.0	
PA66	PV1 equalizer No.8 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA67	PV1 equalizer No.9 Correction point	-19999 to +20000 PVU (CH1)	400.0	
PA68	PV1 equalizer No.9 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA69	PV1 equalizer No.10 Correction point	High-limit of PV1 range (Setting is automatically changed)	As mentioned at the left.	
PA70	PV1 equalizer No.10 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	

Display	Items	Setting	Initial value	Remarks
PA71	PV2 equalizer No.1 Correction point	Low-limit value of PV2 range (Setting is automatically changed)	As mentioned at the left.	Indicated when setup C30 = 2, 3
PA72	PV2 equalizer No.1 Correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA73	PV2 equalizer No.2 Correction point	-19999 to +20000 PVU (CH2)	50.0	
PA74	PV2 equalizer No.2 Correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA75	PV2 equalizer No.3 Correction point	-19999 to +20000 PVU (CH2)	100.0	
PA76	PV2 equalizer No.3 Correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA77	PV2 equalizer No.4 Correction point	-19999 to +20000 PVU (CH2)	150.0	
PA78	PV2 equalizer No.4 Correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA79	PV2 equalizer No.5 Correction point	-19999 to +20000 PVU (CH2)	200.0	
PA80	PV2 equalizer No.5 Correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA81	PV2 equalizer No.6 Correction point	-19999 to +20000 PVU (CH2)	250.0	Indicated when setup C30 = 2, 3.
PA82	PV2 equalizer No.6 Correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA83	PV2 equalizer No.7 Correction point	-19999 to +20000 PVU (CH2)	300.0	
PA84	PV2 equalizer No.7 Correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA85	PV2 equalizer No.8 Correction point	-19999 to +20000 PVU (CH2)	350.0	
PA86	PV2 equalizer No.8 Correction quantity	-1000 to +1000 PVU (CH2)	0.0	
PA87	PV2 equalizer No.9 Correction point	-19999 to +20000 PVU (CH2)	400.0	
PA88	PV2 equalizer No.9 Correction quantity	-1000 to +1000 PVU (CH1)	0.0	
PA89	PV2 equalizer No.10 Correction point	High-limit value of PV2 range (Setting is automatically changed)	As mentioned at the left.	
PA90	PV2 equalizer No.10 Correction quantity	-1000 to +1000 PVU (CH2)	0.0	

References

When the decimal point position is changed by setup C3, C4 or C13, C14, the decimal point of the correction point is shifted as it is.

<Example> When C14: 0 is set, the initial value of PA73 becomes 500.

PID Setting Table

PID Items (1) For setting PID every segment

Display	Items	Items	Setting	Initial value	Remarks
P-1	PID parameter Group 1	Proportional band	0.0 to 1000.0%	100.0	On-off controlled when P-1 = 0.0
I-1		Integral time	0 to 3600sec	0	Indicated when P-1 ≠ 0.0.
d-1		Derivative time	0 to 1200sec	0	
rE-1		Manual reset	0.0 to 100.0%	50.0	Indicated when P-1 ≠ 0.0 and [I-1] = 0.
OL-1	Control output limiter Group 1	Control output low-limit	-0.5 to high-limit %	0.0	
OH-1		Control output high-limit	Low-limit to 105.0%	100.0	
P-2	PID parameter Group 2	Proportional band	Same as PID parameter Group 1.		On-off controlled when P-2 = 0.0.
I-2		Integral time			Indicated when P-2 ≠ 0.0
d-2		Derivative time			Indicated when P-2 ≠ 0.0 and [I-2] = 0.
rE-2		Manual reset			
OL-2	Control output limiter Group 2	Control output low-limit	Same as in the control output limiter Group 1.		
OH-2		Control output high-limit			
PID parameters Groups 3 to 9 : Same as in Groups 1 and 2. Control output limiter Groups 3 to 9: Same as in Groups 1 to 2.					

PID Items (2) For automatically setting PID by auto tuning every zone

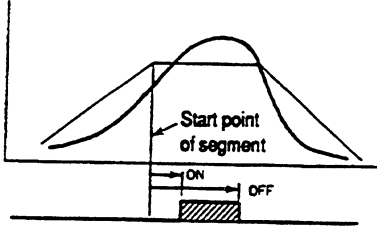
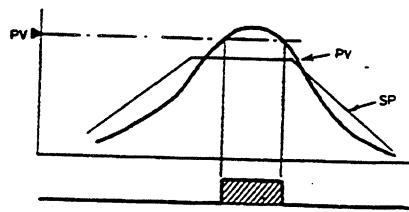
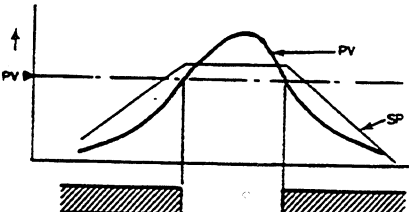
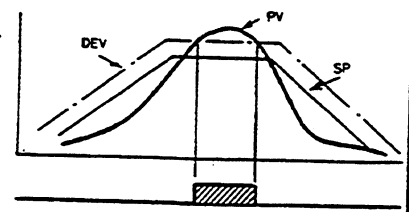
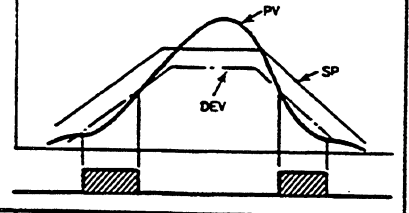
Display	Items	Items	Setting	Initial value	Remarks
P-A1	PID parameter Group A1	Proportional band	0.0 to 1000.0%	100.0	On-off controlled when P-A1 = 0.0
I-A1		Integral time	0 to 3600sec	0	Indicated when P-A1 ≠ 0.0.
d-A1		Derivative time	0 to 1200sec	0	
rE-A1		Manual reset	0.0 to 100.0%	50.0	Indicated when P-A1 ≠ 0.0 and [I-A1] = 0.
CP-A1		Change point	-19999 to +20000 SPU	See the table below.	
tP-A1		Tuning point	-19999 to +20000 SPU		
P-A2	PID parameter Group A2	Proportional band	0.0 to 1000.0%	100.0	On-off controlled when P-A2 = 0.0.
I-A2		Integral time	0 to 3600sec	0	Indicated when P-A2 ≠ 0.0
d-A2		Derivative time	0 to 1200sec	0	
rE-A2		Manual reset	0.0 to 100.0%	50.0	Indicated when P-A2 ≠ 0.0 and [I-A2] = 0.
CP-A2		Change point	-19999 to +20000 SPU	See the table below.	
tP-A2		Tuning point	-19999 to +20000 SPU		
PID parameters Groups A3 to A7: Same as Groups A1 and A2; providing that CP-A7 always indicates [20000SPU], and it cannot be set.					

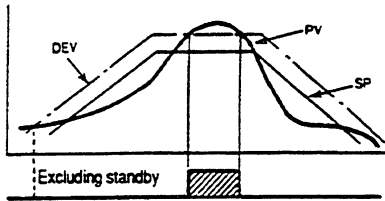
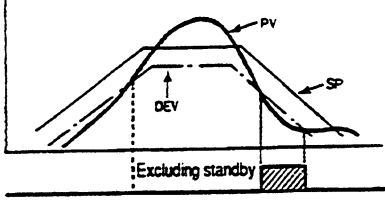
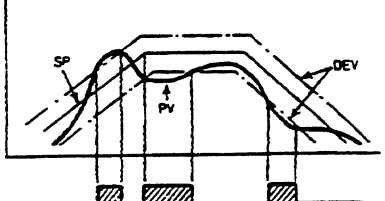
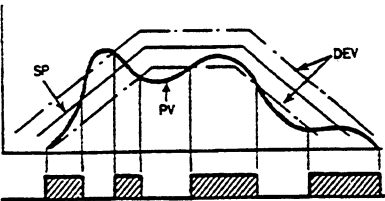
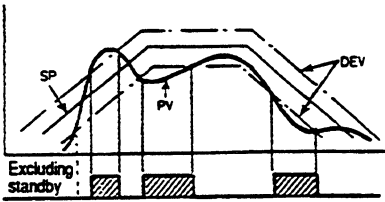
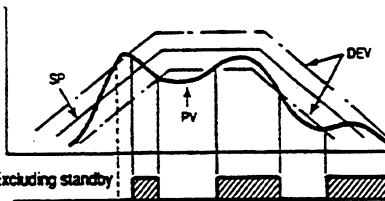
Initial values at CP-Ax (changing point) and tP-Ax (tuning point)

	A1	A2	A3	A4	A5	A6	A7
CP-Ax	100.0	200.0	300.0	400.0	500.0	600.0	2000.0 (fixed value)
tP-Ax	50.0	150.0	250.0	350.0	450.0	550.0	650.0






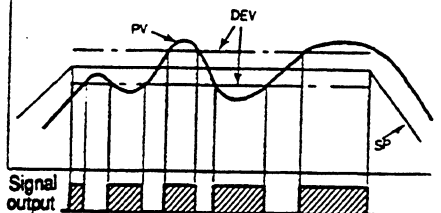

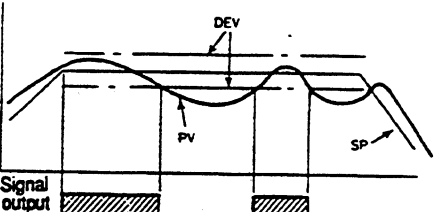

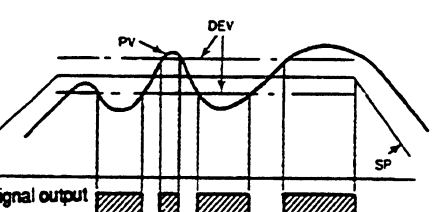

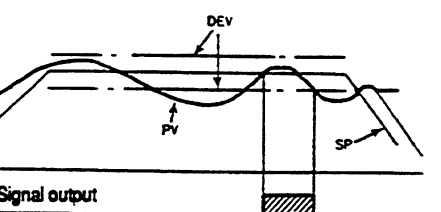


Event Type Table

Segment event Numerics 1 to 22 are set for segment events every segment in the programming map.







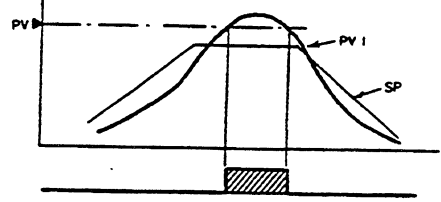

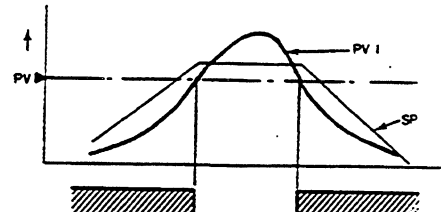

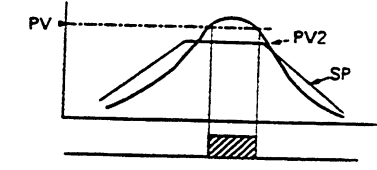

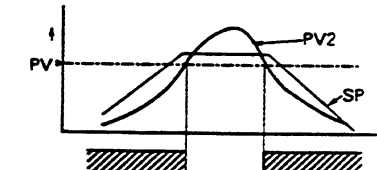

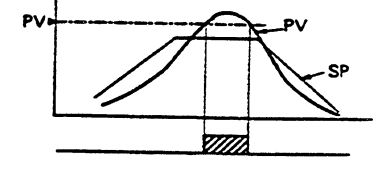

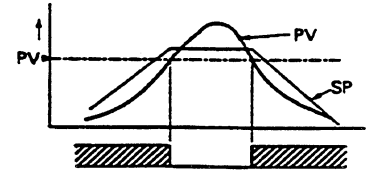
Type set point	Event type [E _{xx} - t]	Auxiliary setting 1 [E _{xx} - 1] (▨ is indicated by LCD)	Auxiliary setting 2 [E _{xx} - 2] (▨ is indicated by LCD)	Remarks (▨ is an event type indicated by LCD)
0	Event stop	-----	-----	OFF
1-23	Segment event (Set the action condition at every segment.)			
1	Time event	-----	-----	TIME 
2	PV high-limit	Hysteresis (0 to 1000 SPU) Hysteresis	-----	PV-H 
3	PV low-limit			PV-L 
4	Deviation high-limit			DEV-H 
5	Deviation low-limit			DEV-L 






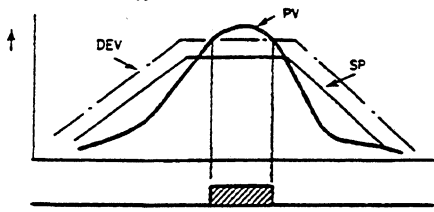

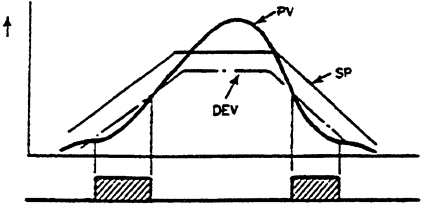

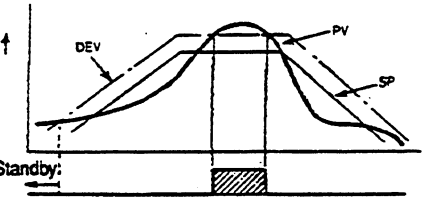

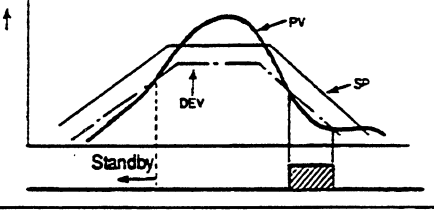


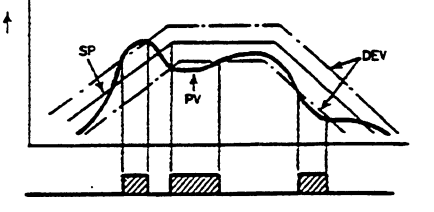

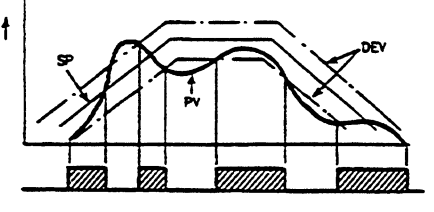
Type set point	Event type [Exx - t]	Auxiliary setting 1 [Exx - 1] ([] is indicated by LCD)	Auxiliary setting 2 [Exx - 2] ([] is indicated by LCD)	Remarks [] is an event type indicated by LCD
6	Deviation high-limit with a standby function	Hysteresis (0 to 1000 SPU) hysteresis	-----	DEV-H-W 
7	Deviation low-limit with a standby function			DEV-L-W 
8	Absolute deviation high-limit			A-DEV-H 
9	Absolute deviation low-limit			A-DEV-L 
10	Absolute deviation high-limit with a standby function			A-DEV-H-W 
11	Absolute deviation low-limit with a standby function			A-DEV-L-W 






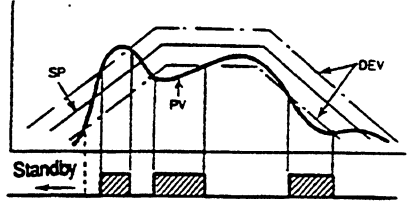

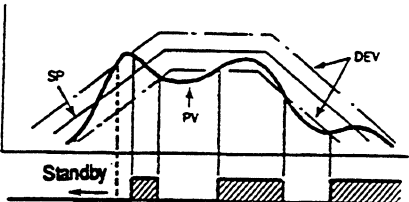







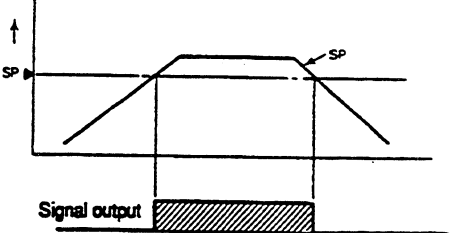

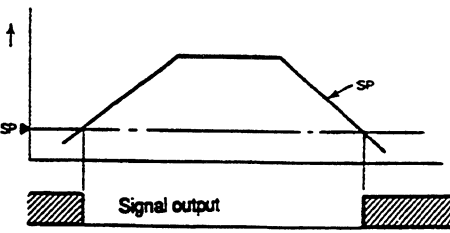



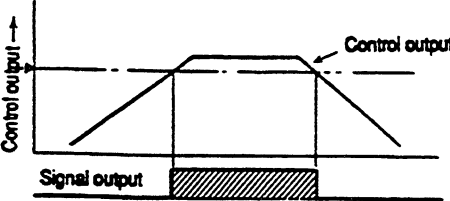
Type set point	Event type [Exx - t]	Auxiliary setting 1 [Exx - 1] ([] is indicated by LCD)	Auxiliary setting 2 [Exx - 2] ([] is indicated by LCD)	Remarks ([] is an event type indicated by LCD)
12 13	PV change ratio high-limit PV change-ratio low-limit	Sampling cycle (0.1 to 600.0sec) [Sampling rate]	-----	<p>PV-H PV-L</p> <p>When change ratio $\Delta PV > 0$ is set</p> <p>When change ratio $\Delta PV < 0$ is set</p> <p>ΔPV value is set every segment.</p>
14	SP high-limit	Hysteresis (0 to 1000 SPU) [hysteresis]	-----	<p>SP-H</p> <p>Signal output</p>
15	SP low-limit			<p>SP-L</p> <p>Signal output</p>
16	MV high-limit (control output high-limit)	Hysteresis (0.0 to 100.0%) [hysteresis]	-----	<p>MV-H</p> <p>Control output</p> <p>Signal output</p>
17	MV low-limit (control output low-limit)			<p>MV-L</p> <p>Control output</p> <p>Signal output</p>
18	Code event	No. of outputs (1 to 8) [Channels]	-----	<p>CODE</p>





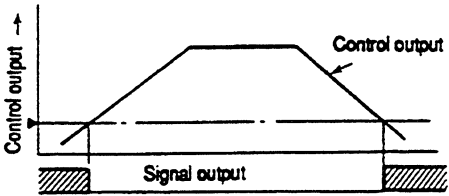



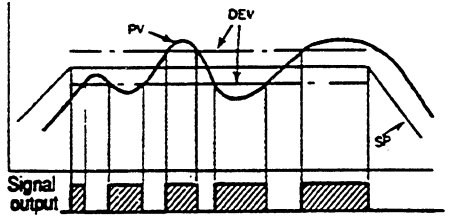

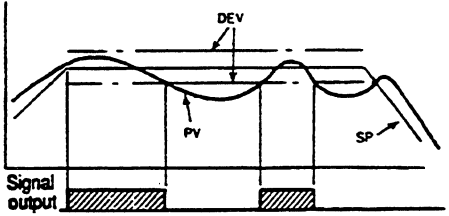

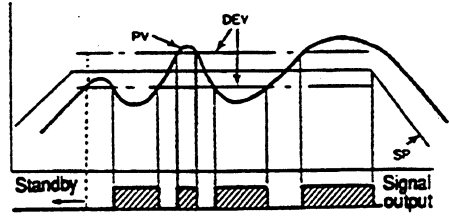

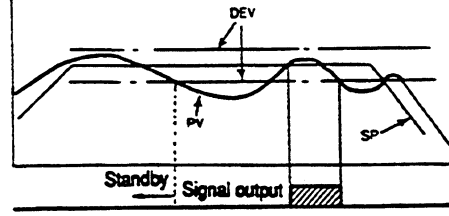
Type set point	Event type [E _{xx} - t]	Auxiliary setting 1 [E _{xx} - 1] ( is indicated by LCD)	Auxiliary setting 2 [E _{xx} - 2] ( is indicated by LCD)	Remarks ( is an event type indicated by LCD)
19	Soak absolute deviation high-limit	Hysteresis (0 to 1000 SPU)  hysteresis	-----	 S-A-DEV-H 
20	Soak absolute deviation low-limit			 S-A-DEV-L 
21	Soak absolute deviation high-limit with a standby function			 S-A-DEV-H-W 
22	Soak absolute deviation low-limit with a standby function			 S-A-DEV-L-W 
23	Code event with a timer function	No. of outputs (1 to 8)  channels		
24~63	Event stop	-----	-----	 OFF

















Instrument event Types 64 to 87 are instrument events common to all programs, irrespective of segments. After setting them once, it is not necessary to set them in individual programs.

Type set point	Event type [E _{xx} - t]	Auxiliary setting 1 [E _{xx} - 1] ( is indicated by LCD)	Auxiliary setting 2 [E _{xx} - 2] ( is indicated by LCD)	Remarks ( is an event type indicated by LCD)
64~99	Instrument events (These events are provided to set the operating conditions every instrument.)			When an instrument event is selected, no event is indicated in the program map.
64	PV1 high-limit normal action	Hysteresis (0 to 1000 SPU)  hysteresis	Action point (-19999 to +20000 SPU)  set point	 PV1-H Operated in ready mode, too. 
65	PV1 low-limit normal action			 PV1-L Operated in ready mode, too. 
66	PV2 high-limit normal action			 PV2-H Operated in ready mode, too. 
67	PV2 low-limit normal action			 PV2-L Operated in ready mode, too. 
68	PV high-limit			 PV-H Same as specified in type 2. 
69	PV low-limit			 PV-L Same as specified in type 3. 

Type set point	Event type [Exx - t]	Auxiliary setting 1 [Exx - 1] ( is indicated by LCD)	Auxiliary setting 2 [Exx - 2] ( is indicated by LCD)	Remarks ( is an event type indicated by LCD)
70	Deviation high-limit	Hysteresis (0 to 1000 SPU)  hysteresis	Action point (-19999 to +20000 SPU)	 DEV-H Same as specified in type 4. 
71	Deviation low-limit			 DEV-L Same as specified in type 5. 
72	Deviation high-limit with a standby function			 DEV-H-W Same as specified in type 6. 
73	Deviation low-limit with a standby function			 DEV-L-W Same as specified in type 7. 
74	Absolute deviation high-limit	Hysteresis (0 to 1000 SPU)  hysteresis	Action point (0 to 20000 SPU)	 A-DEV-H Same as specified in type 8. 
75	Absolute deviation low-limit			 A-DEV-L Same as specified in type 9. 

Type set point	Event type [E _{xx} - k]	Auxiliary setting 1 [E _{xx} - 1] ( is indicated by LCD)	Auxiliary setting 2 [E _{xx} - 2] ( is indicated by LCD)	Remarks ( is an event type indicated by LCD)
76	Absolute deviation high-limit with a standby function	Hysteresis (0 to 1000 SPU)  hysteresis	Action point (0 to 20000 SPU)	 A-DEV-H-W Same as specified in type 10. 
77	Absolute deviation low-limit with a standby function			 A-DEV-L-W Same as specified in type 11. 
78	PV change ratio high-limit PV change ratio low-limit	Sampling cycle (0.1 to 600.0sec)  sampling rate	Change quantity (-19999 to +20000 SPU)  set point	 D-PV-H Same as specified in type 12.  D-PV-L Same as specified in type 13. Sampling 0 is equal to 0.1.
79	SP high-limit	Hysteresis (0 to 1000 SPU)  hysteresis	Action point (-19999 to +20000 SPU)  set point	 SP-H Same as specified in type 14. 
80	SP low-limit			 SP-L Same as specified in type 15. 
81	MV high-limit (control output low-limit)	Hysteresis (0.0 to 100.0%)  hysteresis	Action point (-5.0 to +105.0%)  set point	 MV-H Same as specified in type 16. 

Type set point	Event type [E _{xx} - E]	Auxiliary setting 1 [E _{xx} - 1] ( is indicated by LCD)	Auxiliary setting 2 [E _{xx} - 2] ( is indicated by LCD)	Remarks ( is an event type indicated by LCD)
83	MV low-limit (control output low-limit)			 Same as specified in type 17. 
84	Soak absolute deviation high-limit	Hysteresis (0 to 1000 SPU)  hysteresis	Deviation quantity (0 to 20000 SPU)  set point	 Same as specified in type 19. 
85	Soak absolute deviation low-limit			 Same as specified in type 20. 
86	Soak absolute deviation high-limit with a standby function			 Same as specified in type 21. 
87	Soak absolute deviation low-limit with a standby function			 Same as specified in type 22. 

Type set point	Event type [E _{xx} - E]	Auxiliary setting 1 [E _{xx} - 1] ( is indicated by LCD)	Auxiliary setting 2 [E _{xx} - 2] ( is indicated by LCD)	Remarks ( is an event type indicated by LCD)
88 89 90 91	Program No. binary code Segment No. binary code Program No. BCD code Segment No. BCD code	No. of outputs (1 to 7) ↑ No. of outputs (1 to 8) ↑  channels	-----	 PROG BIN  SEG BIN  PROG BCD  SEG BCD <ul style="list-style-type: none"> When one of numerics 88 to 91 is selected as an event, either program number or segment number is selected, and the number is automatically output as a code when the instrument has started running. However, if the total number of the program number or the maximum number of the segment employed in the instrument does not meet the number of digits of the output code, the code is not output correctly. <p>Assume that the number of outputs is set to 3 in a pattern up to 8 segments, for example. A code of 3 digits is output correctly in 1 to 7 segments. However, particularly be careful since a code of 000 is output in case of 8 segments, because of lower significant 3 digits only.</p>
92	Specified segment	Segment specification (-2 to 2)  0: Final segment 1: No.1 segment 2: No.2 segment -1: First segment just before the last one -2: Second segment before the last one	-----	 SEG SEQUENCE <p>If a segment is specified by selecting a specified segment, it is set common to all program patterns once, and an output signal is obtained at the specified segment. No setting is necessary for these segments on the programming map since segment number is selected here.</p>
93	RAMP - E time monitoring	0.0 to 3000.0sec (0: No time monitoring)  time out	-----	 RAMP E TIME OUT <p>RAMP-E time is provided to check the time of the pulse-input interval.</p>
94 95	Segment time Program time	ON-time 0:00 to 500:00 Hr. min, Min. sec or 0.0 to 3000.0sec)  on-time	OFF-time 0:00 to 500:00 Hr. min, Min. sec or 0.0 to 3000.0sec)  off-time	 SEG TIME  PROG TIME <p>When ON-OFF time is set by the segment time (program time), an ON-OFF signal is obtainable to all segments (to all programs) at the same time. The time event being set here is not necessary to be set on the programming map again. The selection of hour, minute or minute, second is determined by the program time unit of setup C62.</p>

Type set point	Event type [Exx - t]	Auxiliary setting 1 [Exx - 1] (<input type="checkbox"/> is indicated by LCD)	Auxiliary setting 2 [Exx - 2] (<input type="checkbox"/> is indicated by LCD)	Remarks (<input type="checkbox"/> is an event type indicated by LCD)
96	High-limit of PV1 - PV2 difference at PV channel selection	-----	Action point (-19999 to +20000 SPU) <input type="checkbox"/> set point	<input type="checkbox"/> CHG.P - CH - DEV - H
97	Low-limit of PV1 - PV2 difference at PV channel selection			<input type="checkbox"/> CHG.P - CH - DEV - L (Note)
98	High-limit of PV1 - PV2 difference	Hysteresis (0 to 1000 SPU) <input type="checkbox"/> hysteresis	Action point (-19999 to +20000 SPU) <input type="checkbox"/> set point	<input type="checkbox"/> CH - DEV - H
99	Low-limit of PV1 - PV2 difference			<input type="checkbox"/> CH - DEV - L
100	Event stop	-----	-----	<input type="checkbox"/> OFF

Notes: This functions during a run only. Once turned on, it is kept on until it is reset.

PV : PV1 or PV2, whichever is selected.

PV1: PV input to CH1

PV2: PV input to CH2

Status event No setting of numerics is necessary to status events 128 to 144.

Type set point	Event type [Exx - t]	Auxiliary setting 1 [Exx - 1] (is indicated by LCD)	Auxiliary setting 2 [Exx - 2] (is indicated by LCD)	Remarks (is an event type indicated by LCD)
128~144	Status event (Instrument status serves as operating conditions.)			If this status event is selected to a certain event number, no setting is necessary in the programming map, so that the event number is not indicated in the programming map.
128	RUN, HOLD, END	-----	-----	RUN, HOLD, END An event signal output is obtainable during the execution of RUN, HOLD or END.
129	HOLD			HOLD An event signal output is obtainable during hold.
130	READY			READY An event signal output is obtainable during ready.
131	END			END An event signal output is obtainable when the instrument running ends.
132	G.SOAK wait			G.SOAK An event signal output is obtained under G.SOAK wait condition. A G. soak width must be set to a segment during programming.
133	MANUAL			MANUAL An event signal output is obtainable during a manual run.
134	AT execution			AT An event signal output is obtainable during the execution of auto tuning.
135	Fast feed			FAST An event signal output is obtainable during a fast feed (FAST) run.
136	Console setting operation			CONSOLE An event output signal is obtainable during various setting operations by the front keys of the instrument.
137	RUN (excluding HOLD and END)			RUN An event output signal is obtainable during a run.

Type set point	Event type [Exx - t]	Auxiliary setting 1 [Exx - 1] (is indicated by LCD)	Auxiliary setting 2 [Exx - 2] (is indicated by LCD)	Remarks (is an event type indicated by LCD)
138	ADV	-----	-----	ADV Turns on for one second during an advance run. An event signal output is obtainable when processing has proceeded to the next segment by skipping the execution of a segment.
139	All alarms (logical sum)	-----	-----	ALL ALARMS An event signal output is obtainable during the occurrence of one of all alarms.
140	PV range alarm			PV ALARMS An event signal output is obtainable during the occurrence of one of PV alarms.
141	Instrument alarms			DCP ALARMS An event signal output is obtainable during the occurrence of one of instrument alarms.
142 143	PV1 selection execution PV2 selection execution	-----	-----	SELECT PV1 SELECT PV2
144	Battery voltage drop	-----	-----	BATTERY LOW
145~ 253	Event stop	-----	-----	OFF

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