



Temperature Controller

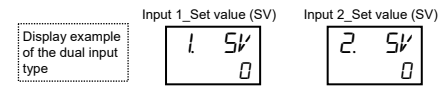
GZ400/GZ900

IMR03D02-E2 All Rights Reserved. Copyright © 2019, RKC INSTRUMENT INC.
Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of the instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference. This manual describes basic key operations of the GZ400/900.

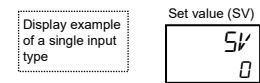
For detailed handling procedures and key operations, refer to separate **GZ400/GZ900 Instruction Manual**.
The manual can be downloaded from the official RKC website:
<https://www.rkcinst.co.jp/english/download-center/>

Notes for the display

GZ400/900 are available in two types: single input type and dual input type.
The dual input type is further categorized into two types: Dual PV type and PV + Remote setting type.
For a dual input model, the same parameter may exist in both Input 1 and Input 2.
"1." or "2." is added to the top of the parameters for identification.

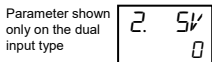
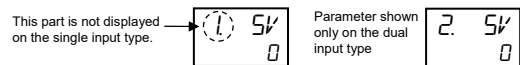


"1." is not added to the top of the parameters list for the single input type.



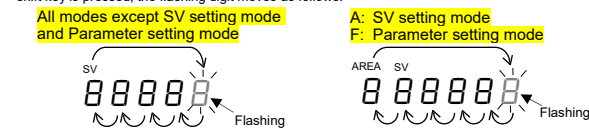
This manual uses the dual inputs for explanation. For other types such as a single input type, ignore the first character "1." at the top of the parameter.

[Notation in this manual]

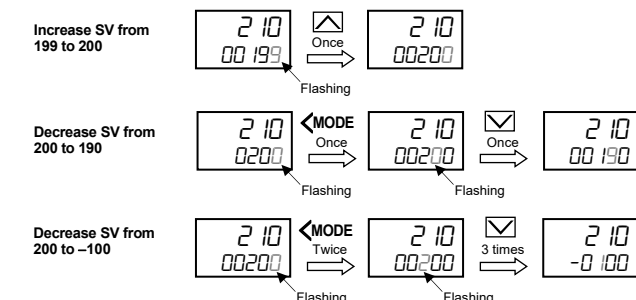


2. CHANGING SET VALUE

The flashing digit indicates which digit can be set. Press **<MODE>** key to go to a different digit. Every time the shift key is pressed, the flashing digit moves as follows.



The following is also available when changing the set value.



To store a new value for the parameter, always press the **(SET)** key. The display changes to the next parameter and the new value will be stored. The modified data will not be stored only by operating the **(Δ)** and **(□)** keys. In the Operation transfer mode, however, the selected mode will be valid only by the operations of these keys.

In case of the Set value (SV), the instrument can be configured in the H: Engineering mode so that the modified set value will be adopted 2 seconds after the change without pressing the **(SET)** key.

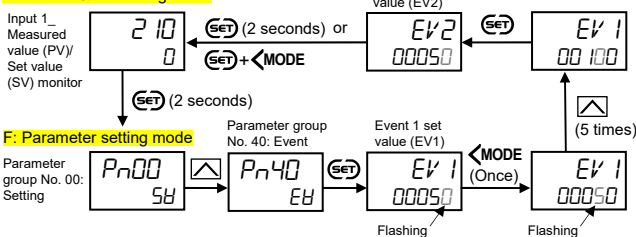
In case no operation is performed within 60 seconds after the change of the setting, the mode will return to A: Monitor and SV setting mode. The modified data will not be registered in this case.

5. SET THE EVET SET VALUE

As shown below, the Event trigger values are set according to the preset event types.

Set the Event 1 set value (EV1) to 100 °C

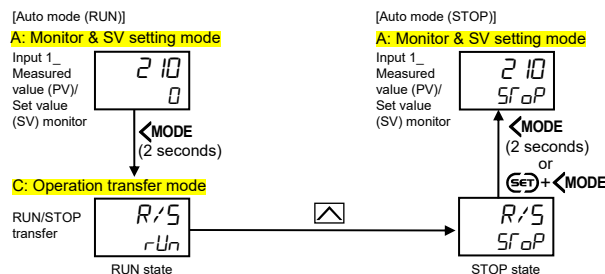
A: Monitor & SV setting mode



6. RUN/STOP TRANSFER

The control is switched between RUN and STOP. The instrument must be stopped before attempting the setting in the Engineering mode.

Change form RUN to STOP



Outline of memory area

The Memory area function is to store up to 16 areas (patterns) of parameters such as a Set value (SV). This parameter can be found in the F: Parameter setting mode. Any one area out of 16 areas can be called up for the control.

Parameter groups in F: Parameter setting mode

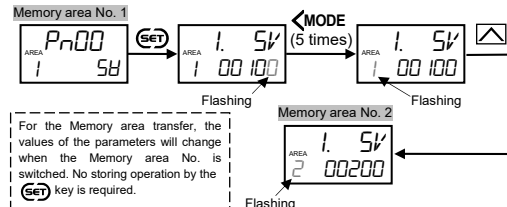
No. 00 Setting	No. 56 Input 1_Cool control *
No. 40 Event *	No. 70 Memory area function
No. 51 Input 1_Control	No. 71 Input 1_Input knee point correction *
No. 52 Input 2_Control *	No. 72 Input 2_Input knee point correction *

* May not be shown depending on the specification.

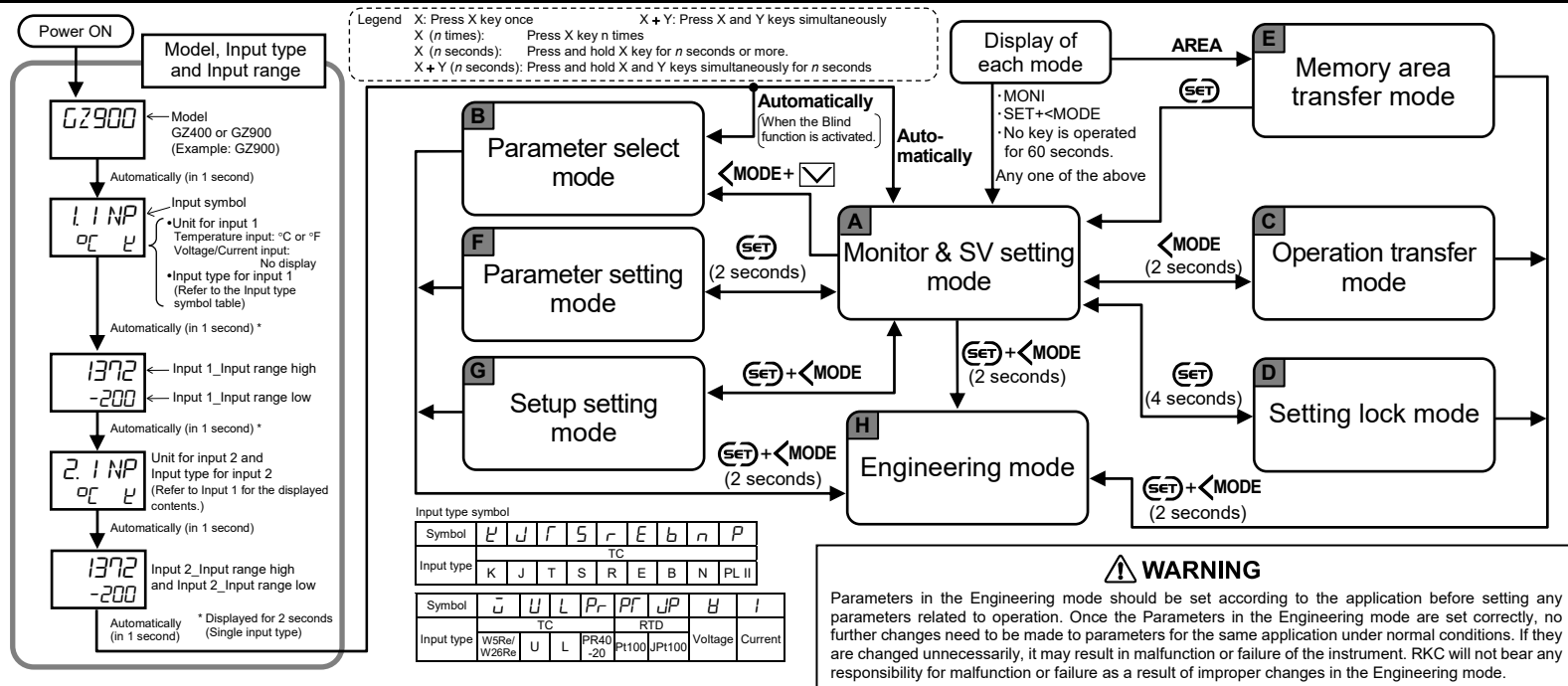
One memory area consists of eight parameter groups.

To change a memory area number to another, when a certain parameter is displayed, press the **<MODE>** key to shift the flashing digit to the left until the flashing digit reaches the AREA digit.

[Example: Memory area transfer of set value (SV)]



1. SWITCHING BETWEEN MODES



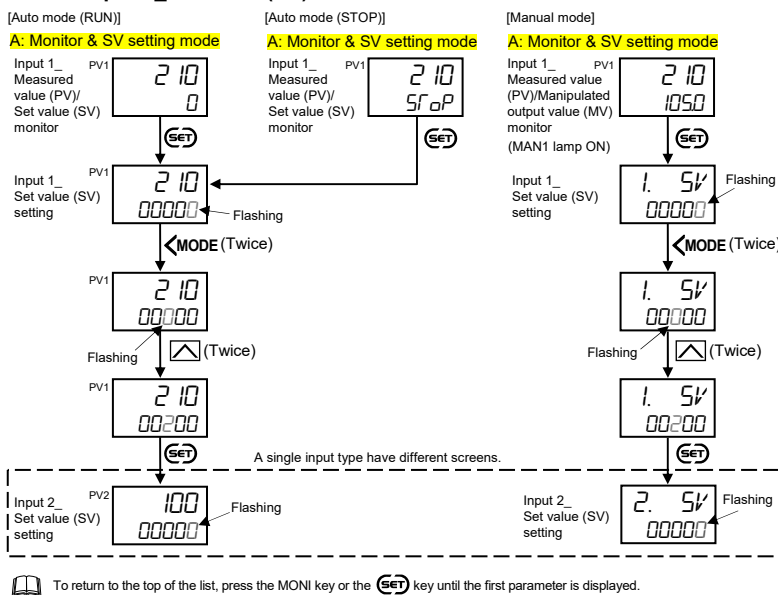
WARNING

Parameters in the Engineering mode should be set according to the application before setting any parameters related to operation. Once the Parameters in the Engineering mode are set correctly, no further changes need to be made to parameters for the same application under normal conditions. If they are changed unnecessarily, it may result in malfunction or failure of the instrument. RKC will not bear any responsibility for malfunction or failure as a result of improper changes in the Engineering mode.

3. SET THE SET VALUE (SV)

Set value (SV) is the control target value.

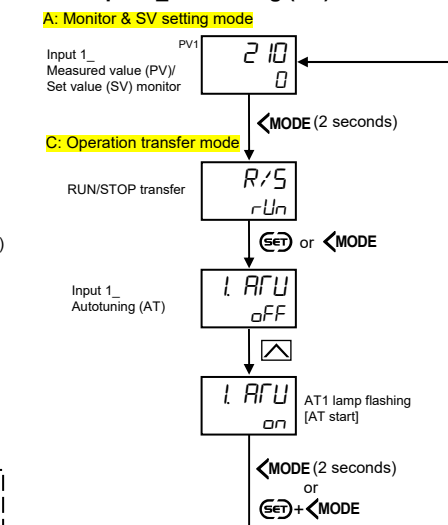
Set the Input 1_Set value (SV) to 200 °C



4. SET AUTOTUNING (AT)

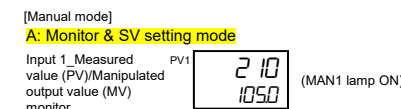
The Autotuning (AT) function automatically measures, computes and sets the optimum PID values.

Set the Input 1_Autotuning (AT)



Manipulated output value setting in manual mode

After the Manual mode is selected using the Auto/Manual transfer, set the Manipulated output value (MV) on the PV/MV monitor in the A: Monitor & SV setting mode using the **(Δ)** and **(□)** keys.



- Press the **(Δ)** key to increase the Manipulated output value (MV).
- Press the **(□)** key to decrease the Manipulated output value (MV).
- If the **(Δ)** or **(□)** key is kept pressing, the changing rate of the Manipulated output value (MV) will be accelerated.
- The output value adjusted with the **(Δ)** and **(□)** keys will be valid immediately.

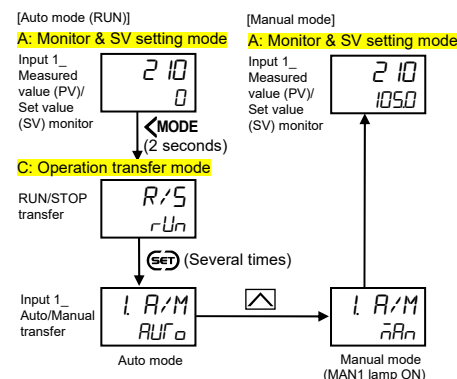
To change the mode from dSP to RUN, you have to close the digital input (DI) terminals** to which RUN/STOP is assigned or disable the RUN/STOP transfer function by digital input (DI). You can disable the RUN/STOP transfer function at DI function selection in the Engineering mode.

** Terminal Nos. 27-31 (Factory set value)

7. AUTO/MANUAL TRANSFER

The control mode is switched between AUTO and MANUAL.

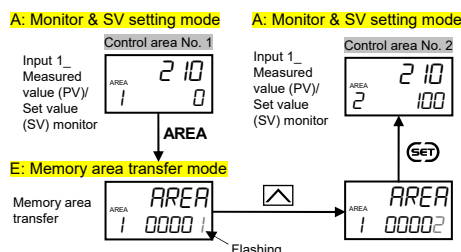
Switching Input 1 to Manual mode



8. MEMORY AREA TRANSFER

The memory area to be used for control (control area) can be switched to the desired area.

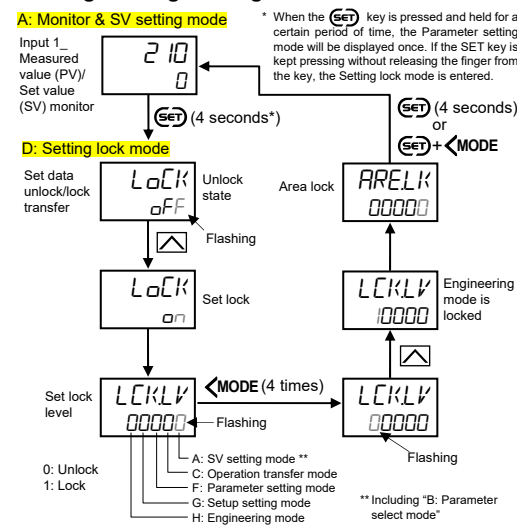
Change control area from No. 1 to No. 2



9. SET DATA UNLOCK/LOCK TRANSFER

This is a function to lock the set data to restrict the change of the set data.

Locking the Engineering mode



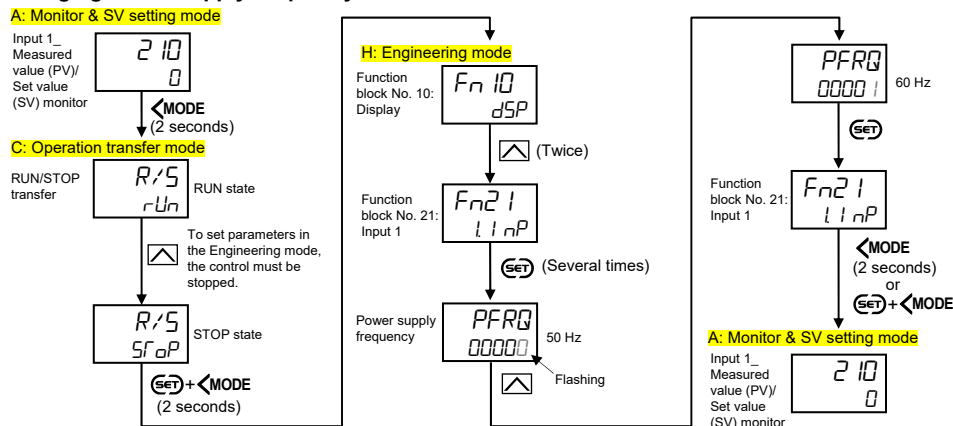
The Set lock level can be changed even after the set data lock has been set.

10. SETTING POWER SUPPLY FREQUENCY (REQUIRED)

WARNING

To prevent malfunction and instrument failure, setting Power supply frequency (50/60Hz) is required. Set the power supply frequency at Power supply frequency parameter in the H: Engineering mode.

Changing Power supply frequency to 60 Hz



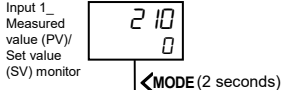
11. CHANGE OF THE INPUT TYPE

The Input related parameters may include: Input type, Display unit, Decimal point position, Input range high, and Input range low. These parameters can be set in the H: Engineering mode.

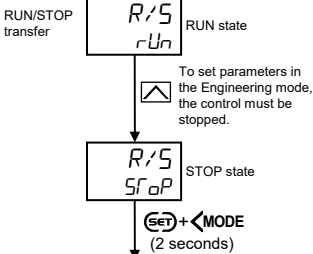
Changing the Input 1 to Thermocouple type J (0 to 800°C)

Assuming that the present Input 1 is configured to Thermocouple type K (-200 to +1372 °C).

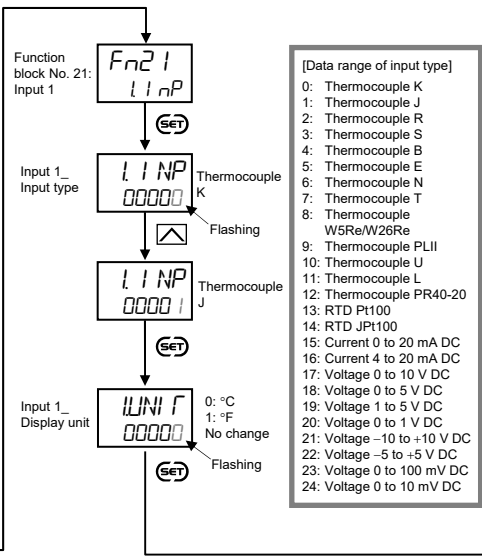
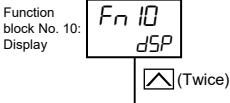
A: Monitor & SV setting mode



C: Operation transfer mode

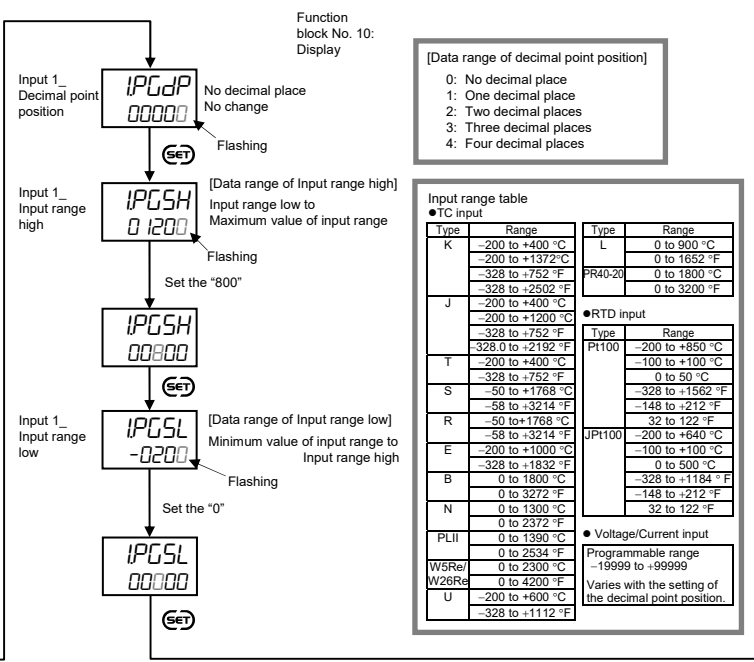


H: Engineering mode



[Data range of input type]

0:	Thermocouple K
1:	Thermocouple J
2:	Thermocouple R
3:	Thermocouple S
4:	Thermocouple B
5:	Thermocouple E
6:	Thermocouple N
7:	Thermocouple T
8:	Thermocouple W5Re/W26Re
9:	Thermocouple PLII
10:	Thermocouple U
11:	Thermocouple L
12:	Thermocouple PR40-20
13:	RTD Pt100
14:	RTD JPt100
15:	Current 0 to 20 mA DC
16:	Current 4 to 20 mA DC
17:	Voltage 0 to 10 V DC
18:	Voltage 0 to 5 V DC
19:	Voltage 1 to 5 V DC
20:	Voltage 0 to 1 V DC
21:	Voltage -10 to +10 V DC
22:	Voltage -5 to +5 V DC
23:	Voltage 0 to 100 mV DC
24:	Voltage 0 to 10 mV DC



[Data range of decimal point position]

0:	No decimal place
1:	One decimal place
2:	Two decimal places
3:	Three decimal places
4:	Four decimal places

[Data range of input range high]

Type	Range
K	-200 to +400 °C
	-200 to +1372 °C
	-328 to +752 °F
	-328 to +2502 °F
J	-200 to +1200 °C
	-328 to +752 °F
	-328.0 to +2192 °F
T	-200 to +400 °C
	-328 to +752 °F
S	-50 to +1768 °C
	-58 to +3214 °F
R	-58 to +3214 °F
E	-200 to +1000 °C
	-328 to +1832 °F
B	0 to 1800 °C
	0 to 3272 °F
N	0 to 1300 °C
	0 to 2372 °F
PLII	0 to 1350 °C
	0 to 2534 °F
W5Re/W26Re	0 to 2300 °C
	0 to 4200 °F
U	-200 to +600 °C
	-328 to +1112 °F

[Data range of input range low]

Type	Range
L	0 to 900 °C
	0 to 1652 °F
PR40-20	0 to 1800 °C
	0 to 3200 °F
JPt100	-200 to +850 °C
	-100 to +100 °C
	0 to 50 °C
	-328 to +1562 °F
	-148 to +212 °F
	32 to 122 °F
	-100 to +640 °C
	-100 to +100 °C
	0 to 500 °C
	-328 to +1184 °F
	-148 to +212 °F
	32 to 122 °F

[Data range of event hold action]

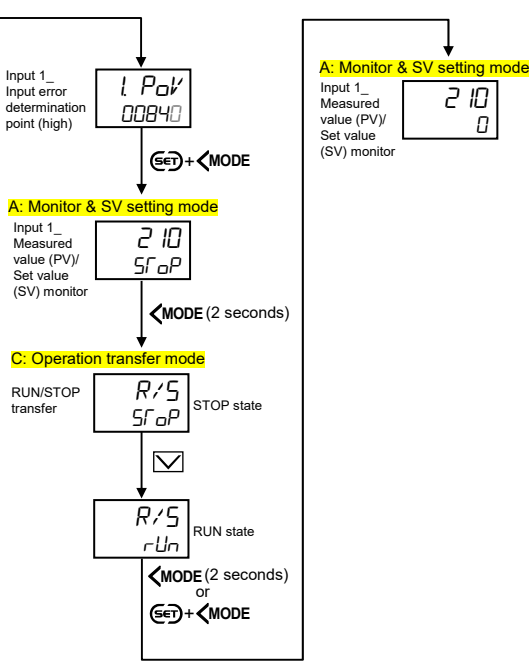
0:	Hold action OFF
1:	Hold action ON
2:	Re-hold action ON

[Data range of event differential gap]

0:	0 to Input span
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[Data range of event timer]

0.0:	0.0 to 600.0 seconds
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12. CHANGE OF THE EVENT TYPE

The event related parameters may include: Event assignment, Event type, Event hold action, Event differential gap, and Event timer. These parameters can be set in the H: Engineering mode.

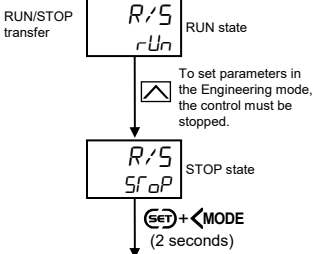
Changing Event 1 to Deviation high/low (Using SV monitor value)

Assuming that the present Event 1 is configured to Deviation high (Using the SV monitor value). Other setting: Event assignment: Input 1, Event hold action: Hold action ON, Event differential gap: 2, Event timer: 0.0

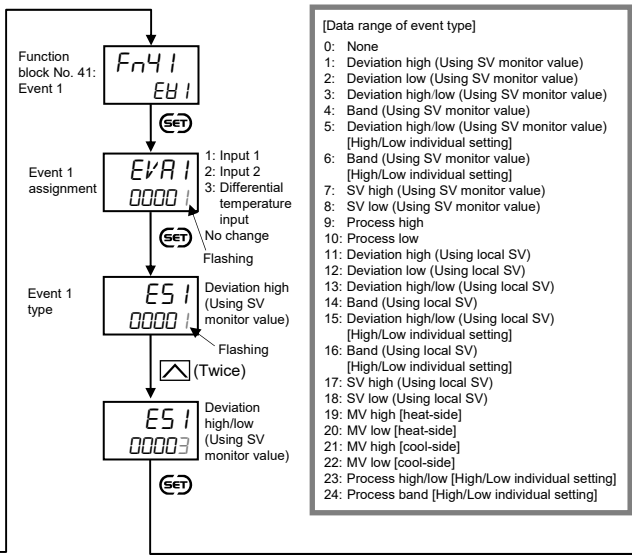
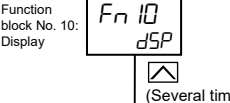
A: Monitor & SV setting mode



C: Operation transfer mode

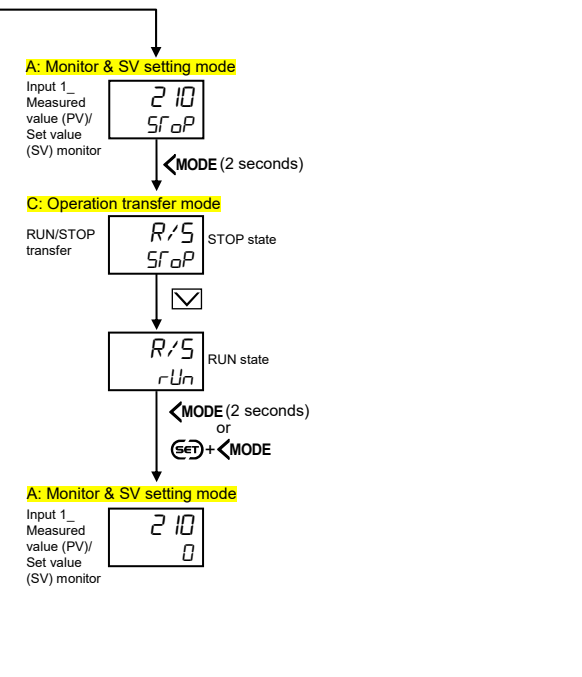
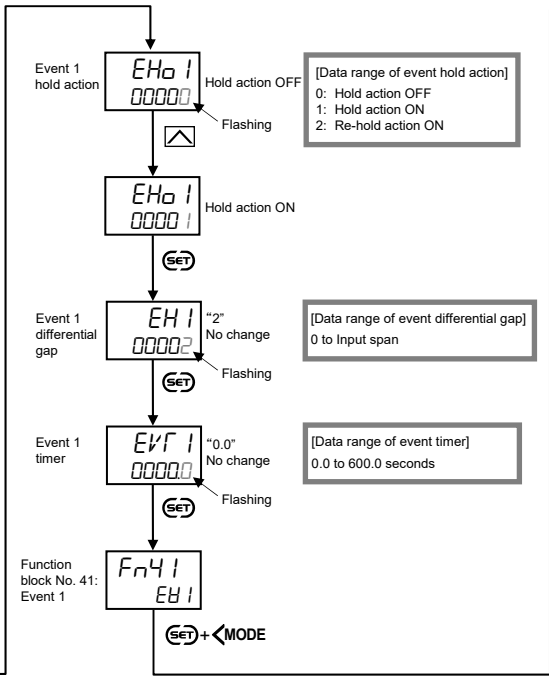


H: Engineering mode



[Data range of event type]

0:	None
1:	Deviation high (Using SV monitor value)
2:	Deviation low (Using SV monitor value)
3:	Deviation high/low (Using SV monitor value)
4:	Band (Using SV monitor value)
5:	Deviation high/low (Using SV monitor value)
6:	Band (Using SV monitor value)
7:	SV high (Using SV monitor value)
8:	SV low (Using SV monitor value)
9:	Process high
10:	Process low
11:	Deviation high (Using local SV)
12:	Deviation low (Using local SV)
13:	Deviation high/low (Using local SV)
14:	Band (Using local SV)
15:	Deviation high/low (Using local SV)
16:	Band (Using local SV)
17:	SV high (Using local SV)
18:	SV low (Using local SV)
19:	MV high [heat-side]
20:	MV low [heat-side]
21:	MV high [cool-side]
22:	MV low [cool-side]
23:	Process high/low [High/Low individual setting]
24:	Process band [High/Low individual setting]



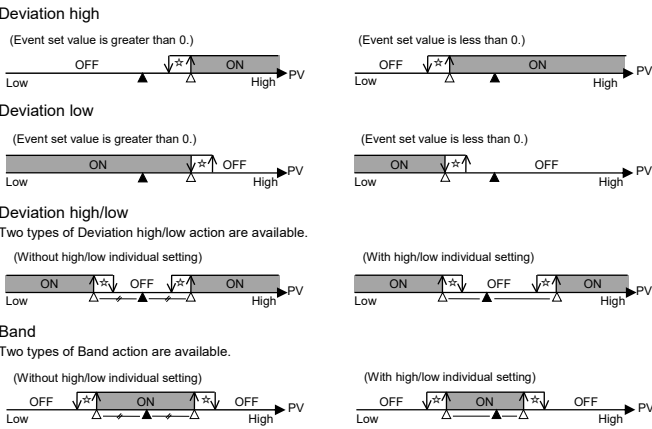
Description of event action

Some examples of event action are described in the following:

ON: Event action turned on
OFF: Event action turned off (▲: Set value (SV) △: Event set value ☆: Event differential gap)

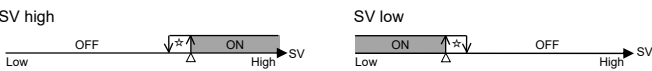
Deviation action (High, Low, High/low, Band)

When the deviation (PV - SV) reaches the Event set value, event ON occurs.



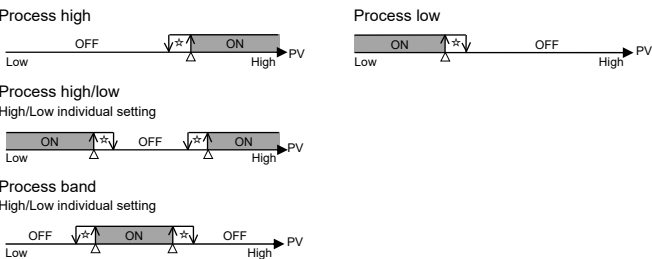
Set value action (High, Low)

When the Set value (SV) reaches the Event set value, event ON occurs.



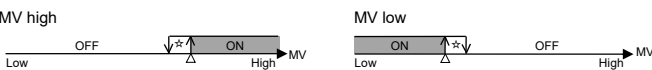
Input value action (High, Low, High/low, Band)

When the Measured value (PV) reaches the Event set value, event ON occurs.



Manipulated output value action (High, Low)

When the Manipulated output value (MV) reaches the Event set value, event ON occurs.



SV monitor value type and Local SV type

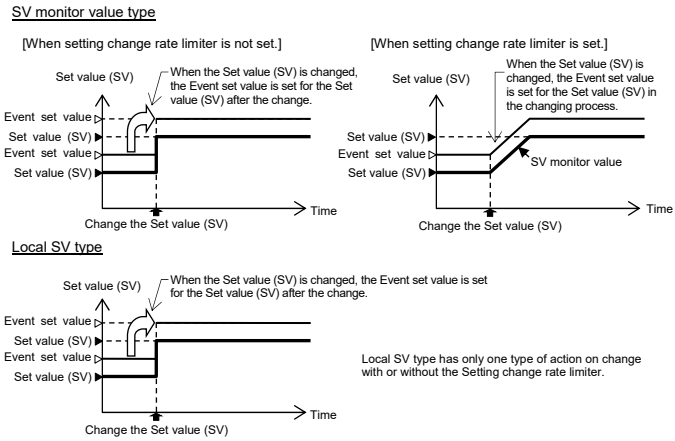
SV monitor value type and local SV type are available for Deviation action and Set value action.

SV monitor value type

The Event set value is set for the SV monitor value.
Setting change rate limiter adjusts the Event set value to follow the same change rate of SV monitor value.

Local SV type

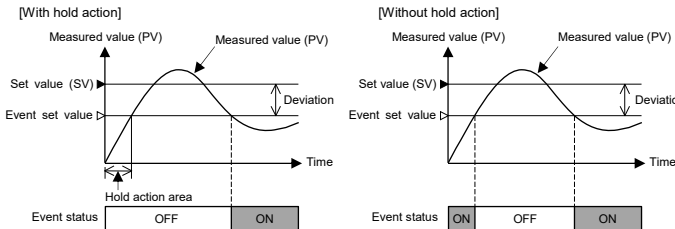
The Event set value is set for the Set value (SV) [Local SV].



Description of event hold action

Hold action

When hold action is ON, the event action is suppressed at start-up or STOP to RUN until the measured value has entered the non-event range.



Re-hold action

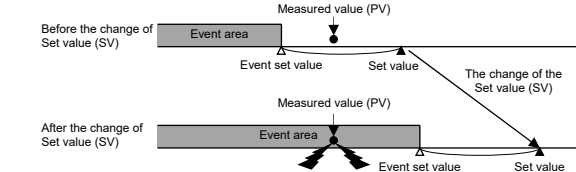
When re-hold action is ON, the event action is also suppressed at the control set value change until the measured value has entered the non-event range.

The re-hold action is invalid for any of the following. However, the hold action is valid.

- When Setting change rate limiter other than "0" are set
- When operation mode is remote mode

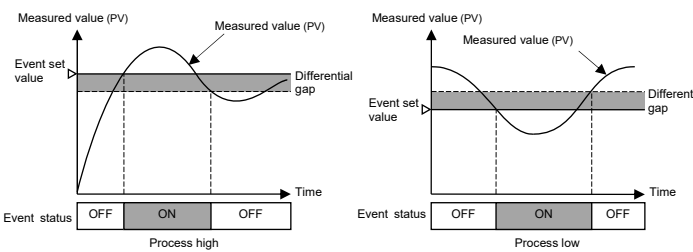
[Example] When Event 1 type is the deviation low:

When re-hold action is OFF and event output type is deviation, the event output is produced due to the Set value (SV) change. The re-hold action suppresses the alarm output until the measured value has entered the non-event range again.



Description of event differential gap

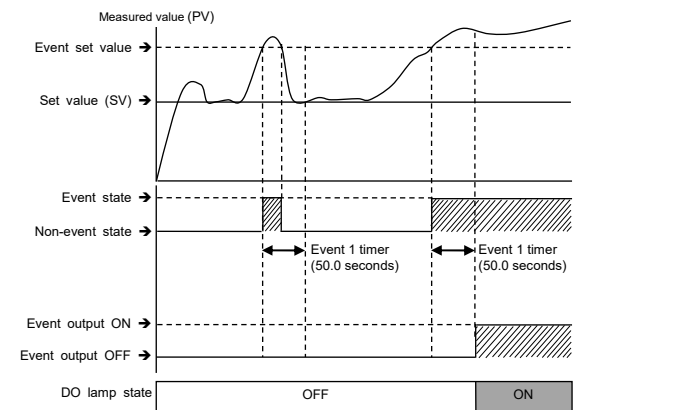
It prevents chattering of event output due to the measured value fluctuation around the Event set value.



Description of event timer

When an event condition becomes ON, the output is suppressed until the Event timer set time elapses. If the event output is still ON after time is up, the output will resume.

[Example] When the setting of Event 1 timer is 50.0 seconds



- The Event timer is also activated for the following reasons:
 - When set to the event state simultaneously with power turned on.
 - When set to the event state simultaneously with control changed to RUN (control start) from STOP (control stop).
- In the event wait state, no event output is turned on even after the Event timer preset time has elapsed.
- The Event timer is reset for the following reasons:
 - When power failure occurs while the Event timer is being activated
 - When control is changed to STOP (control stop) from RUN (control start) while the Event timer is being activated