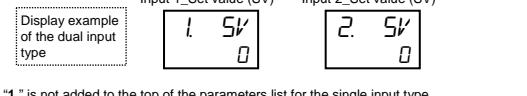


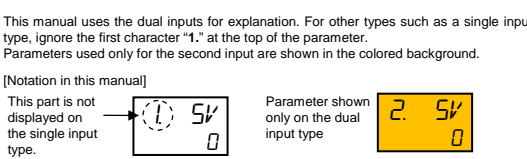
For detailed handling procedures and key operations, refer to separate **FZ110/FZ400/FZ900 Instruction Manual**. The manual can be downloaded from the official RKC website: http://www.rkcinst.com/english/manual_load.htm

Notes for the display

FZ110/400/900 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 (for FZ400/900) and PV + Remote setting type (for FZ110/400/900). 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.

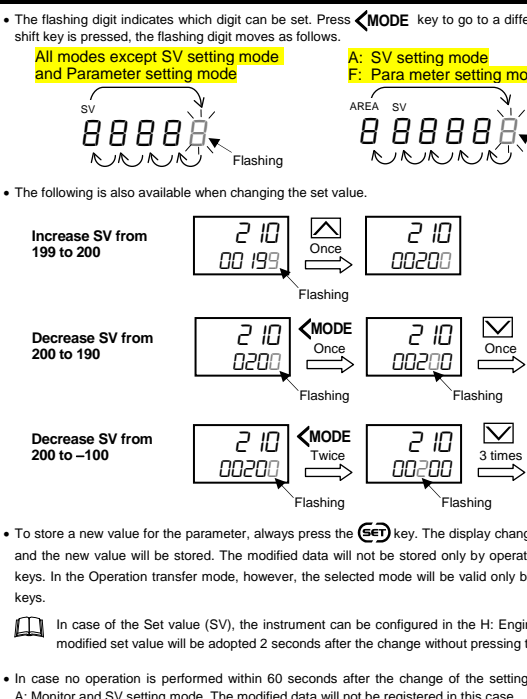


"1." is not added to the top of the parameters list for the single input type. This manual uses the dual inputs for explanation. For other types such as a single input type, ignore the first character "1." at the top of the parameter. Parameters used only for the second input are shown in the colored background.



[Notation in this manual] This part is not displayed on the single input type.

1. SWITCHING BETWEEN MODES



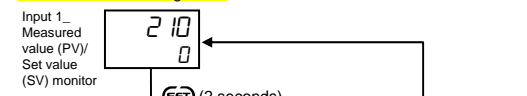
Legend: X: Press X key once; X (n times): Press X key n times; X (n seconds): Press and hold X key for n seconds or more; X+Y: Press X and Y keys simultaneously; X+Y (n seconds): Press and hold X and Y keys simultaneously for n seconds

Input type symbol table:
 Symbol: U, J, F, S, r, E, b, n, P, TC
 Input type: K, J, T, S, R, E, B, N, PL, II
 Symbol: U, L, P, r, P, J, P, H, I
 Input type: WSRa, W26Re, U, L, PR40, P1100, RTD, Voltage, Current

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.

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 <MODE> and <MONI> 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.

3. SET THE SET VALUE (SV)

Set value (SV) is the control target value.

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

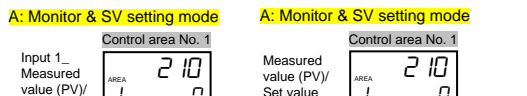


To return to the top of the list, press the MONI key or the <SET> key until the first parameter is displayed (for FZ400/900). Press the <SET> key until the first parameter is displayed (for FZ110).

4. SET AUTOTUNING (AT)

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

Set the Input 1_Autotuning (AT)



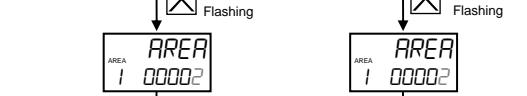
AT1 lamp flashing [AT start]

To return to the top of the list, press the MONI key or the <SET> key until the first parameter is displayed (for FZ400/900). Press the <SET> key until the first parameter is displayed (for FZ110).

5. SET THE EV1 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



Event 1 set value (EV1) flashing

Event 2 set value (EV2) flashing

Event 1 set value (EV1) flashing

To return to the top of the list, press the MONI key or the <SET> key until the first parameter is displayed (for FZ400/900). Press the <SET> key until the first parameter is displayed (for FZ110).

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



RUN/STOP transfer

STOP state

To return to the top of the list, press the MONI key or the <SET> key until the first parameter is displayed (for FZ400/900). Press the <SET> key until the first parameter is displayed (for FZ110).

Change form STOP to RUN

RUN/STOP transfer

RUN state

To return to the top of the list, press the MONI key or the <SET> key until the first parameter is displayed (for FZ400/900). Press the <SET> key until the first parameter is displayed (for FZ110).

7. AUTO/MANUAL TRANSFER

The control mode is switched between AUTO and MANUAL.

Switching Input 1 to Manual mode

Auto mode

Manual mode (MAN1 lamp ON)

While the Input 1_PV/SV monitor is displayed on FZ400/900, the Input 1_Manipulated output value (MV) can be displayed on the MV display unit (third display unit). Similarly, while the Input 2_PV/SV monitor is displayed on FZ400/900, the Input 2_Manipulated output value (MV) can be displayed on the MV display unit (third display unit). These parameters are set in H: Engineering mode.

Measured value (PV) display: 888888
 Set value (SV) display: 888888
 Manipulated output value (MV) display: 888888

To return to the top of the list, press the MONI key or the <SET> key until the first parameter is displayed (for FZ400/900). Press the <SET> key until the first parameter is displayed (for FZ110).

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

FZ400/900

FZ110

Memory area transfer

Control area No. 2

Measured value (PV)/Set value (SV) monitor

To return to the top of the list, press the MONI key or the <SET> key until the first parameter is displayed (for FZ400/900). Press the <SET> key until the first parameter is displayed (for FZ110).

9. SWITCHING TO THE ON/OFF ACTION

To switch to the ON/OFF action, set the Proportional band to zero (0).

Control the Input 1 with the ON/OFF action

Parameter group No. 00: Setting

Parameter group No. 51: Input 1_Control

Input 1_Proportional band (heat-side) flashing

Input 1_ON/OFF action differential gap lower flashing

Input 1_ON/OFF action differential gap upper flashing

Change to the ON/OFF action

"0" setting

To return to the top of the list, press the MONI key or the <SET> key until the first parameter is displayed (for FZ400/900). Press the <SET> key until the first parameter is displayed (for FZ110).

10. 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

Set data unlock/lock transfer

Unlock state

Area lock

Set lock

Engineering mode is locked

Set lock level

Flashing

0: Unlock

1: Lock

A: SV setting mode

C: Operation transfer mode

F: Parameter setting mode

G: Setup setting mode

H: Engineering mode

** Including "B: Parameter select mode"

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

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

* Parameter group Nos. 40, 52, and 56 may not be displayed depending on the specification.

One memory area consists of six 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)]

Memory area No. 1

Memory area No. 2

For the Memory area transfer, the values of the parameters will change when the Memory area No. is switched. No storing operation by the <SET> key is required.

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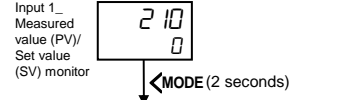
11. CHANGE OF THE INPUT TYPE

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.

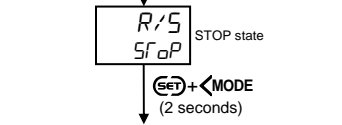
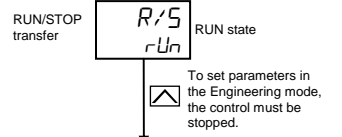
Changing the Input 1 to Thermocouple type J (0 to 800°C)

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

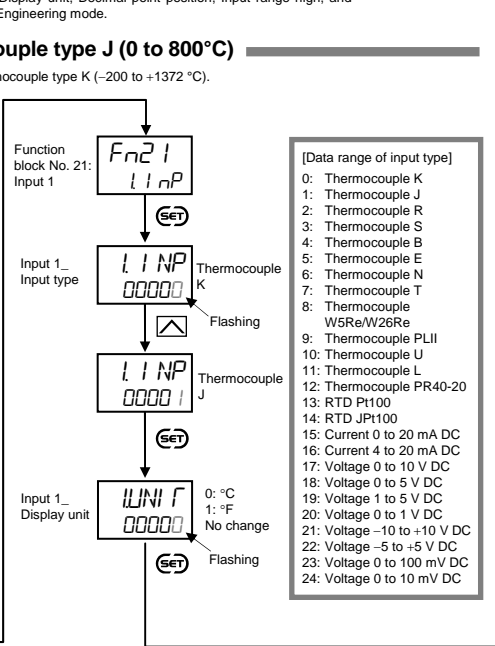
A: Monitor & SV setting mode



C: Operation transfer mode

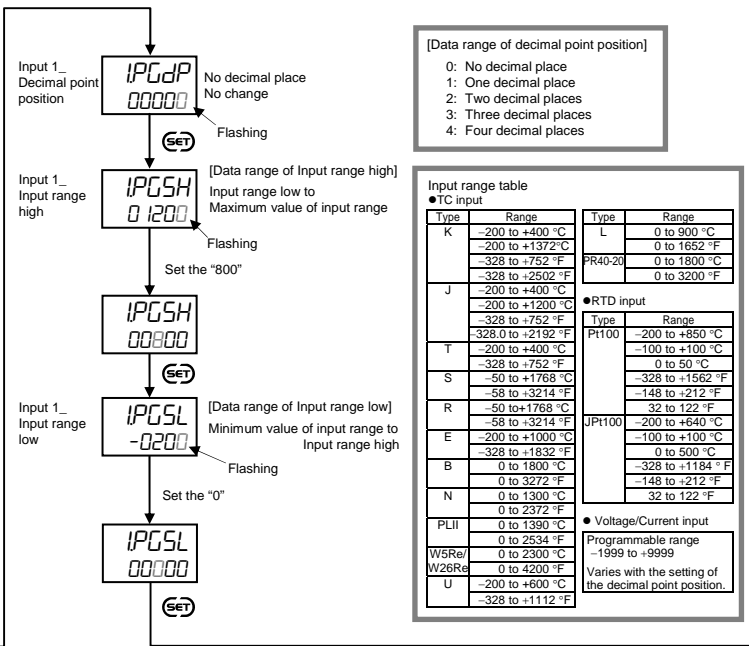


H: Engineering mode



[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 PL11
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

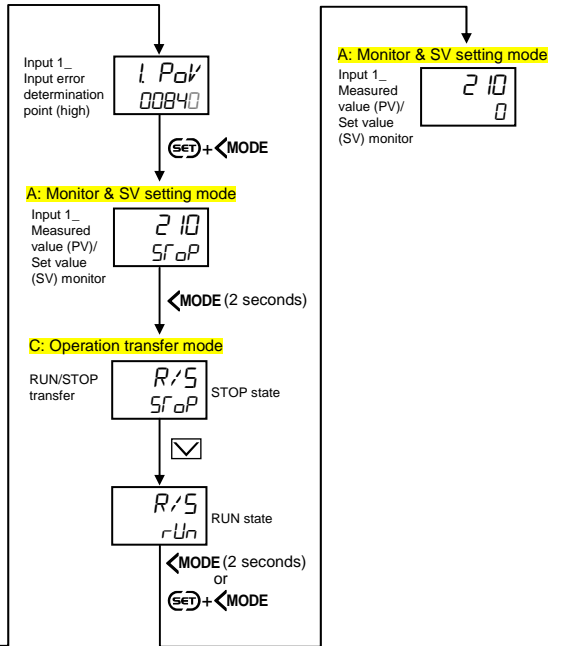


[Data range of decimal point position]

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

Input range table

Type	Range	Type	Range
K	-200 to +400 °C	L	0 to 900 °C
	-200 to +1372 °C		0 to 1652 °F
	-328 to +752 °F		0 to 1800 °C
	-328 to +2502 °F		0 to 3200 °F
J	-200 to +400 °C		
	-200 to +1200 °C		
	-328 to +752 °F		
	-328 to +2192 °F		
T	-200 to +400 °C		
	-50 to +1768 °C		
	-58 to +3214 °F		
S	-50 to +1768 °C		
	-328 to +1562 °F		
	-148 to +212 °F		
R	-50 to +1768 °C		
	-58 to +3214 °F		
E	-200 to +1000 °C		
	-328 to +1832 °F		
B	0 to 1300 °C		
	0 to 2372 °F		
N	0 to 1300 °C		
	0 to 2372 °F		
PL11	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		



12. CHANGE OF THE EVENT TYPE

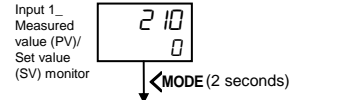
The event related parameters may include: Event assignment, Event type, Event hold action, Event differential gap, and Event timer. These parameters can be set in the H: Engineering mode.

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

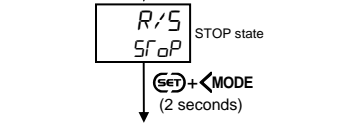
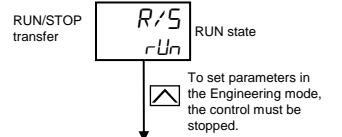
Assuming that the present Event 1 is configured to Deviation high (Using the SV monitor value).

Other setting: Event assignment: Input 1, Event hold action: Hold action ON, Event differential gap: 2, Event timer: 0.0

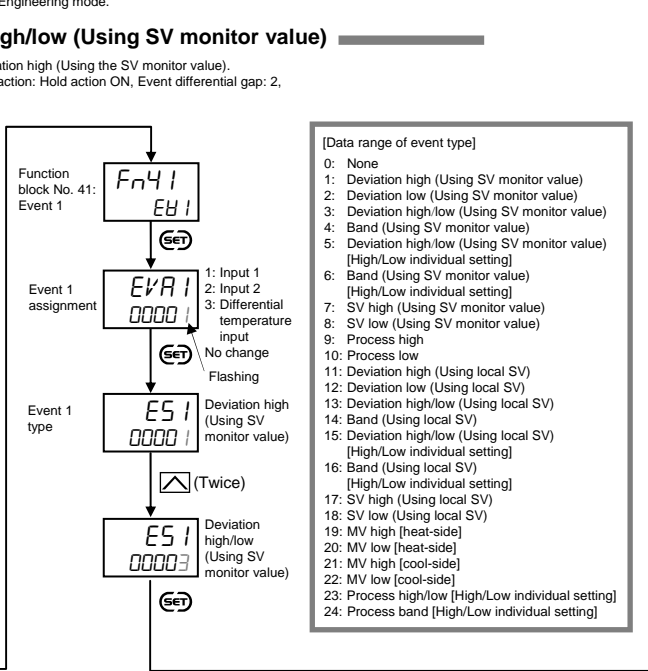
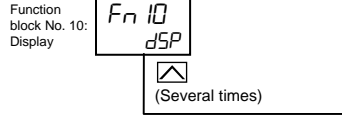
A: Monitor & SV setting mode



C: Operation transfer mode

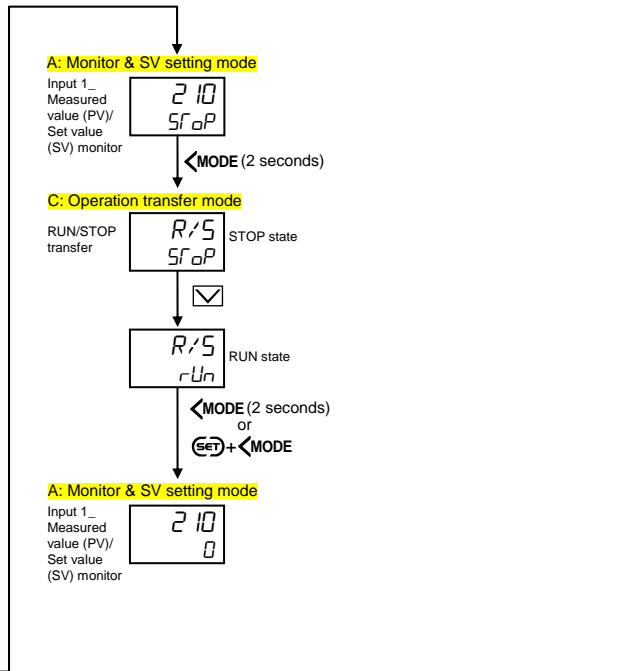
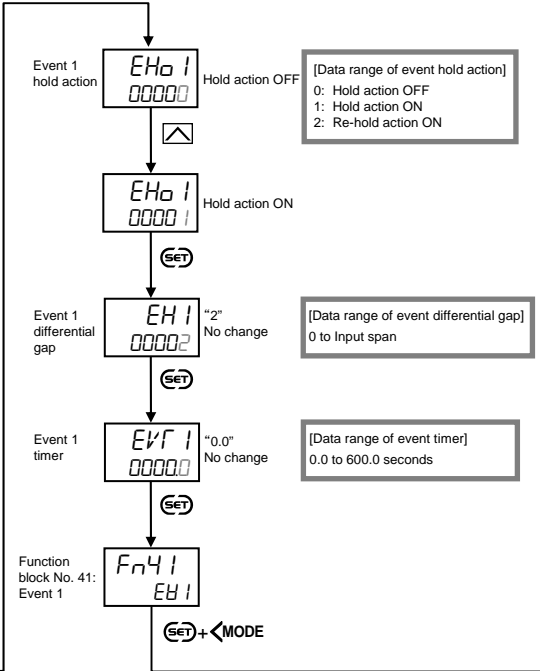


H: Engineering mode



[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) [High/Low individual setting]
6:	Band (Using SV monitor value) [High/Low individual setting]
7:	SV high (Using local SV)
8:	SV low (Using local SV)
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) [High/Low individual setting]
16:	Band (Using local SV) [High/Low individual setting]
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]



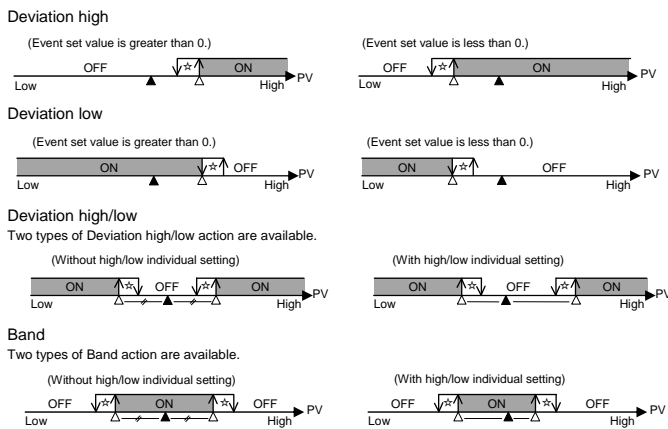
Description of event action

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)

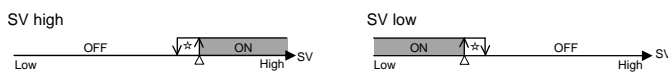
Deviation action (High, Low, High/low, Band)

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



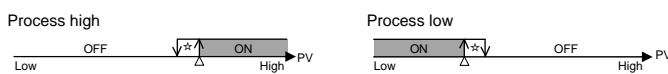
Set value action (High, Low)

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

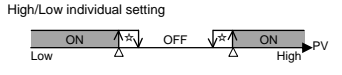


Input value action (High, Low)

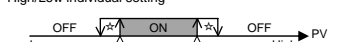
When the Measured value (PV) reaches the Event set value, event ON occurs.



High/Low individual setting



Process band



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.

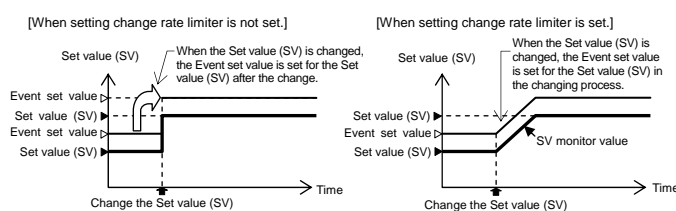
SV monitor value type

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.

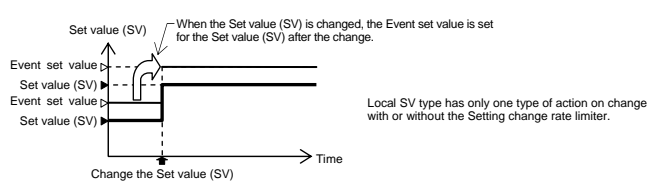
Local SV type

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

SV monitor value type



Local SV type

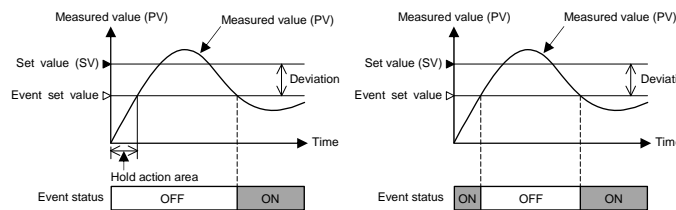


Description of event hold action

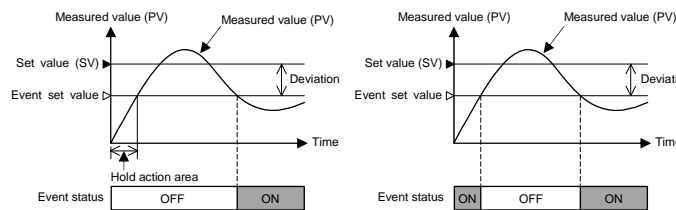
Hold action

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.

[With hold action]



[Without hold action]



Re-hold action

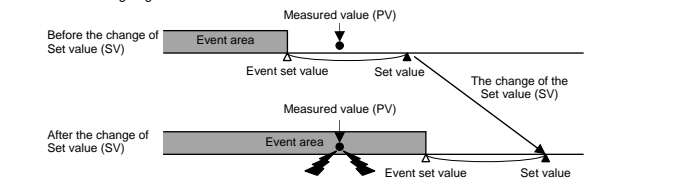
When re-hold action is ON, the event action is also suppressed at the control set value change until the measured value has entered the non-event range.

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

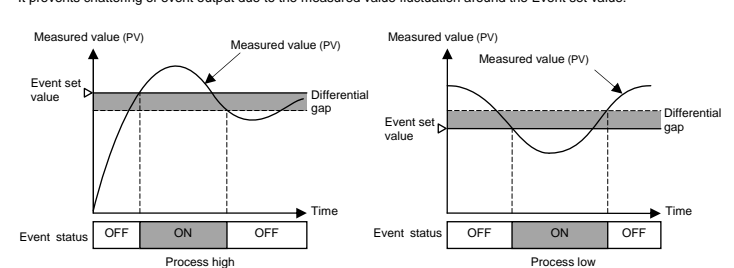
[Example] When Event 1 type is the deviation low:

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

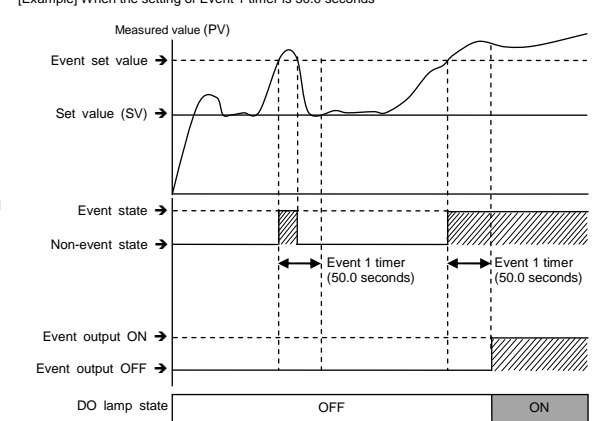
It prevents chattering of event output due to the measured value fluctuation around the Event set value.



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

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