Ramp/Soak Controller

PZ400/PZ900/PZ401/PZ901 Parameter List

IMR03B03-E2

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 the parameter of the PZ400/900/401/901.

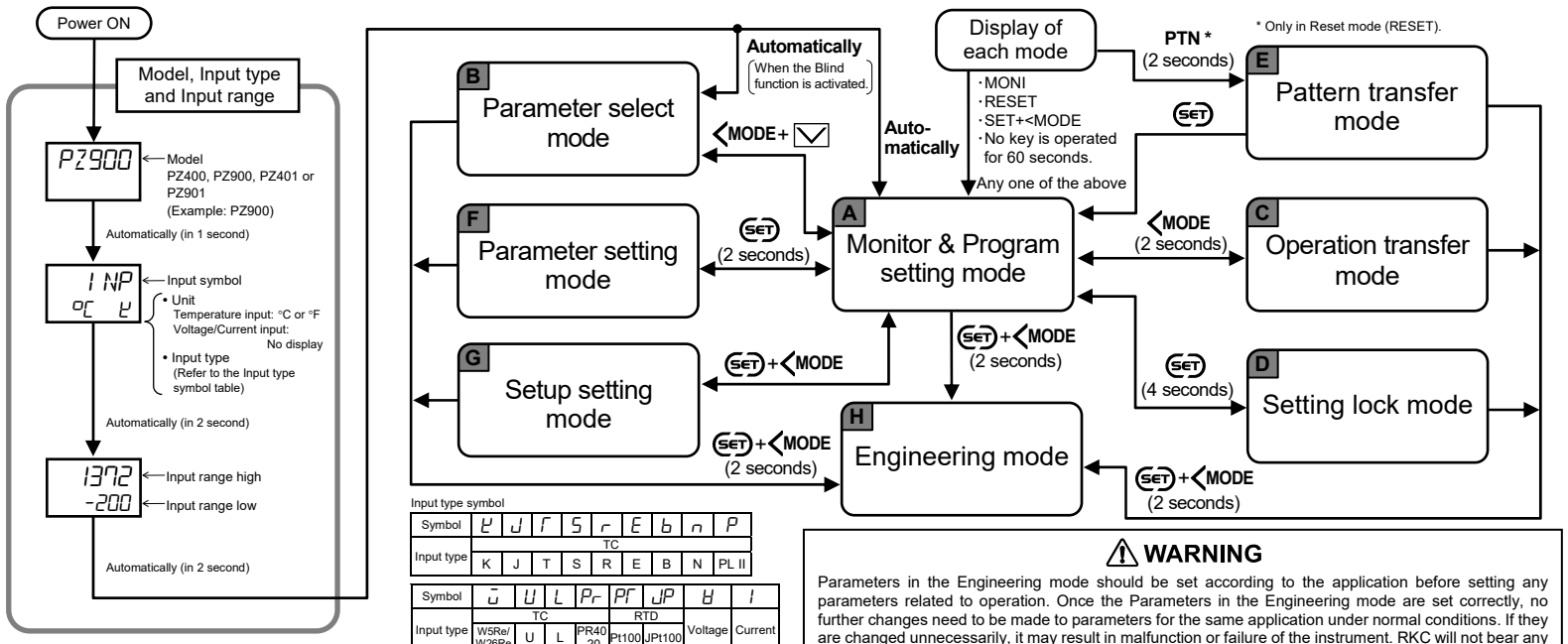
For detailed handling procedures and key operations, refer to separate **PZ400/PZ900/PZ401/PZ901 Instruction Manual**.
The manual can be downloaded from the official RKC website:
https://www.rkcinst.co.jp/english/download-center/

Notes for the display

- See the following legends for the key operations described in this manual.

  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 or more
- The PV/SV monitor screen in the Monitor and Program setting mode is the base screen of this instrument. The PV/SV monitor screen can be reached from any screens by any of the following operations.
  - ·MONI
  - ·RESET (When in control, the instrument will stop)
  - ·SET+<MODE
  - ·No key operated for 60 seconds.
- When a number is displayed in the second row in the Symbol field of the Parameter List, it means a segment number.
- Parameters with "♣" in the Name will be displayed only when all the display conditions are satisfied.
- The numbers in the No. field of PARAMETER LIST means "Screen number" and is used when the screen is registered with the Parameter select function.

1. SWITCHING BETWEEN MODES



Input type symbol

Symbol	U	J	T	S	R	E	b	n	P
Input type	TC								
	K	J	T	S	R	E	B	N	PL II

Symbol	U	L	Pr	Pt	JP	V	I
Input type	TC			RTD			
	W5Re/W26Re	U	L	PR40-20	Pt100	JPt100	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. PARAMETER LIST

A. Monitor & Program Setting Mode

■ Reset mode (RESET)

No.	Symbol	Name	Data range	Factory set value
1	—	PV/SV monitor	PV display unit: Input range low – (5 % of input span) to Input range high + (5 % of input span) [Varies with the setting of the Decimal point position.] PTN display unit: Pattern number SEG display unit: Segment number	—
16	LEVEL 1	Segment 1 level	Setting limiter low to Setting limiter high [Varies with the setting of the Decimal point position.]	0
17	TIME 1	Segment 1 time	0 hours 00 minutes to 199 hours 59 minutes or 0 minutes 00 seconds to 199 minutes 59 seconds 200:00: Continuous* (FLAT is displayed) * Settable only in Soak segments. However, segment 1 cannot be set to Continuous operation. [Time unit depends on the time unit of the setting]	0:00 (0 hour 00 minutes)
16 17	LEVEL 2 to 16 TIME 2 to 16 ♣	Segment 2 to 16 level ♣ Segment 2 to 16 time ♣	Level and Time of segments 2 to 16 are alternately displayed. The data range is the same as the Segment 1 Level and the Segment 1 Time.	
18	PEND	Pattern end	1 to 16 Displays the last segment of the pattern.	16
46	ENDTM	Pattern end output time ♣	0 hours 00 minutes to 199 hours 59 minutes or 0 minutes 00 seconds to 199 minutes 59 seconds 0:00: Output remains on [Time unit depends on the time unit of the setting]	0:00 (0 hour 00 minutes)
30	01.SSN	Time signal 1 start segment number ♣	1 to 16	1
31	01.STM	Time signal 1 start time ♣	0 hours 00 minutes to 199 hours 59 minutes or 0 minutes 00 seconds to 199 minutes 59 seconds [Time unit depends on the time unit of the setting]	0:00 (0 hour 00 minutes)
32	01.ESN	Time signal 1 end segment number ♣	1 to 16	1
33	01.ETM	Time signal 1 end time ♣	0 hours 00 minutes to 199 hours 59 minutes or 0 minutes 00 seconds to 199 minutes 59 seconds [Time unit depends on the time unit of the setting]	0:00 (0 hour 00 minutes)
34	02.SSN	Time signal 2 start segment number ♣	Same as Time signal 1 start segment number	
35	02.STM	Time signal 2 start time ♣	Same as Time signal 1 start time	
36	02.ESN	Time signal 2 end segment number ♣	Same as Time signal 1 end segment number	
37	02.ETM	Time signal 2 end time ♣	Same as Time signal 1 end time	
38	03.SSN	Time signal 3 start segment number ♣	Same as Time signal 1 start segment number	
39	03.STM	Time signal 3 start time ♣	Same as Time signal 1 start time	
40	03.ESN	Time signal 3 end segment number ♣	Same as Time signal 1 end segment number	
41	03.ETM	Time signal 3 end time ♣	Same as Time signal 1 end time	
42	04.SSN	Time signal 4 start segment number ♣	Same as Time signal 1 start segment number	
43	04.STM	Time signal 4 start time ♣	Same as Time signal 1 start time	
44	04.ESN	Time signal 4 end segment number ♣	Same as Time signal 1 end segment number	
45	04.ETM	Time signal 4 end time ♣	Same as Time signal 1 end time	
22	EV 1	Event 1 set value (EV1) Event 1 set value (EV1) [high] ♣	Deviation: –Input span to +Input span [Varies with the setting of the Decimal point position.] Input value or Set value: Input range low to Input range high [Varies with the setting of the Decimal point position.]	TC/RTD inputs: 10 V/I inputs: 5 % of input span
			Manipulated output value: –5.0 to +105.0 %	50.0
23	EV 1'	Event 1 set value (EV1') [low] ♣	Deviation: –Input span to +Input span Input value: Input range low to Input range high [Varies with the setting of the Decimal point position.]	TC/RTD inputs: –10 V/I inputs: –5 % of input span
24	EV2	Event 2 set value (EV2) Event 2 set value (EV2) [high] ♣	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
25	EV2'	Event 2 set value (EV2') [low] ♣	Same as Event 1 set value (EV1') [low]	
26	EV3	Event 3 set value (EV3) Event 3 set value (EV3) [high] ♣	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
27	EV3'	Event 3 set value (EV3') [low] ♣	Same as Event 1 set value (EV1') [low]	
28	EV4	Event 4 set value (EV4) Event 4 set value (EV4) [high] ♣	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
29	EV4'	Event 4 set value (EV4') [low] ♣	Same as Event 1 set value (EV1') [low]	

■ Program control mode (RUN)

No.	Symbol	Name	Data range	Factory set value
19	RPTPN	Number of repeating patterns	1 to 1000 times 1000: Continuous operation	1
20	LNKPN	Pattern link number	0 to 16 0: No link	0

No.	Symbol	Name	Data range	Factory set value
1	—	PV/SV monitor	PV display unit: Input range low – (5 % of input span) to Input range high + (5 % of input span) [Varies with the setting of the Decimal point position.] SV display unit: Segment level (SV monitor) TIME display unit: • Segment remaining time • Manipulated output value PTN display unit: Pattern number SEG display unit: Segment number	—
—	LEVEL	Segment level in progress	Setting limiter low to Setting limiter high [Varies with the setting of the Decimal point position.]	0
—	TIME	Segment time in progress	0 hours 00 minutes to 199 hours 59 minutes or 0 minutes 00 seconds to 199 minutes 59 seconds 200:00: Continuous * (FLAT is displayed) * Settable only in Soak segments However, segment 1 cannot be set to Continuous operation. [Time unit depends on the time unit of the setting]	0:00 (0 hour 00 minutes)

■ Fixed set point control mode (FIX)

No.	Symbol	Name	Data range	Factory set value
1	—	PV/SV monitor	PV display unit: Input range low – (5 % of input span) to Input range high + (5 % of input span) [Varies with the setting of the Decimal point position.] SV display unit: Set value (SV) in Fixed set point control mode TIME display unit: Manipulated output value	—
—	—	Set value (SV) in Fixed set point control mode	Setting limiter low to Setting limiter high [Varies with the setting of the Decimal point position.]	0

■ Manual control mode (MAN)

No.	Symbol	Name	Data range	Factory set value
1	—	PV/SV monitor	PV display unit: Input range low – (5 % of input span) to Input range high + (5 % of input span) [Varies with the setting of the Decimal point position.] SV display unit: Manual manipulated output value (Settable): –5.0 to +105.0 % TIME display unit: Manipulated output value	—

■ Monitor mode

No.	Symbol	Name	Data range	Factory set value
2	RPTPN	Number of repeating patterns monitor ♣	1 to 1000 times 1000: Continuous operation	—
3	RTNTM	Pattern remaining time monitor ♣	0 hours 00 minutes to 999 hours 59 minutes or 0 minutes 00 seconds to 999 minutes 59 seconds [Time unit depends on the time unit of the setting]	—
4	MV	Manipulated output value monitor [heat-side] ♣	–5.0 to +105.0 %	—
5	MVC	Manipulated output value monitor [cool-side] ♣	–5.0 to +105.0 %	—
6	CT1	Current transformer 1 (CT1) input value monitor ♣	0.0 to 100.0 A	—
7	CT2	Current transformer 2 (CT2) input value monitor ♣	0.0 to 100.0 A	—
8	EVENT	Comprehensive event state ♣	When an event occurs, the character of the occurring event is displayed on the Set value (SV) display unit. If two or more events occur at the same time, the relevant characters are displayed alternately every 0.5 seconds. EVT1: Event 1 EVT2: Event 2 EVT3: Event 3 EVT4: Event 4 HBA1: Heater break alarm 1 (HBA1) HBA2: Heater break alarm 2 (HBA2) LBA: Control loop break alarm (LBA) INPUP: Input error high INPDN: Input error low	—

B. Parameter Select Mode

Up to 16 user specified screens can be displayed.
Refer to the separate instruction manual for the **PZ400/PZ900/PZ401/PZ901** for details.

C. Operation Transfer Mode

No.	Symbol	Name	Data range	Factory set value
10	MODE	Operation mode transfer ♣	rESET: Reset mode (RESET) rUN: Program control mode (RUN) FIX: Fixed set point control mode (FIX) MAN: Manual control mode (MAN)	rESET
11	STEP	Step function ♣	oFF: Normol state on: Step	oFF
12	ATU	Autotuning (AT) ♣	oFF: PID control on: Start Autotuning When the Autotuning (AT) is finished, the control will automatically return to "oFF."	oFF
13	LV.ATU	Overall level autotuning (AT) ♣	oFF: Overall level autotuning (AT) OFF on: Overall level autotuning (AT) ON When the Overall level autotuning (AT) is finished, the control will automatically return to "oFF."	oFF
14	STU	Startup tuning (ST) ♣	oFF: ST unused on1: Execute once * on2: Execute always * When the ST is finished, the control will automatically return to "oFF."	oFF
15	ILR	Interlock release ♣	oFF: Interlock release on: Interlock state	oFF

D. Setting Lock Mode

No.	Symbol	Name	Data range	Factory set value
—	LOCK	Set data unlock/lock transfer	oFF: Unlock state on: Lock state	oFF
—	LCKLV	Set lock level	0: Unlock 1: Lock 00000 ← SV display unit Program setting mode + Parameter select mode Operation transfer mode Parameter setting mode Setup setting mode Engineering mode Set Lock/Unlock at each digit.	00000
—	BLIND	Select Blind function	oFF: Blind function: OFF on: Blind function: ON	oFF
—	PSLD	Parameter select direct registration	oFF: Direct registration: OFF on: Direct registration: ON	oFF
—	PSL01	Parameter select setting 1	0 to 254 (Screen No.) 0: No registration	0
—	⋮	⋮	⋮	⋮
—	PSL16	Parameter select setting 16	0 to 254 (Screen No.) 0: No registration	0

E. Pattern transfer mode

No.	Symbol	Name	Data range	Factory set value
9	PTN	Execution pattern selection ♣	1 to 16	1

F. Parameter Setting Mode

No.	Symbol	Name	Data range	Factory set value
—	Pn00	Parameter group No. 00	This is the first parameter symbol of Parameter group No. 00.	—
—	PTN	Pattern selection	1 to 16	1
—	SEL.SG	Segment selection	1 to 16	1
16	LEVEL	Segment level	Setting limiter low to Setting limiter high [Varies with the setting of the Decimal point position.]	0
17	TIME	Segment time	0 hours 00 minutes to 199 hours 59 minutes or 0 minutes 00 seconds to 199 minutes 59 seconds 200:00: Continuous * (FLAT is displayed) * Settable only in Soak segments. However, segment 1 cannot be set to Continuous operation. [Time unit depends on the time unit of the setting]	0:00 (0 hour 00 minutes)
18	P.END	Pattern end	1 to 16 Displays the last segment of the pattern.	16
19	RPTPN	Number of repeating patterns	1 to 1000 times 1000: Continuous operation	1
20	LNKPN	Pattern link number	0 to 16 0: No link	0
—	Pn01	Parameter group No. 01	This is the first parameter symbol of Parameter group No. 01.	—
21	SV	Set value (SV) in Fixed set point control mode	Setting limiter low to Setting limiter high [Varies with the setting of the Decimal point position.]	0
—	Pn40	Parameter group No. 40 ♣	This is the first parameter symbol of Parameter group No. 40.	—
—	PTN	Pattern selection ♣	1 to 16	1
22	EV 1	Event 1 set value (EV1) Event 1 set value (EV1) [high] ♣	Deviation: –Input span to +Input span [Varies with the setting of the Decimal point position.] Input value or Set value: Input range low to Input range high [Varies with the setting of the Decimal point position.]	TC/RTD inputs: 10 V/I inputs: 5 % of input span
			Manipulated output value: –5.0 to +105.0 %	50.0
23	EV 1'	Event 1 set value (EV1') [low] ♣	Deviation: –Input span to +Input span Input value: Input range low to Input range high [Varies with the setting of the Decimal point position.]	TC/RTD inputs: –10 V/I inputs: –5 % of input span
24	EV2	Event 2 set value (EV2) Event 2 set value (EV2) [high] ♣	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
25	EV2'	Event 2 set value (EV2') [low] ♣	Same as Event 1 set value (EV1') [low]	
26	EV3	Event 3 set value (EV3) Event 3 set value (EV3) [high] ♣	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
27	EV3'	Event 3 set value (EV3') [low] ♣	Same as Event 1 set value (EV1') [low]	
28	EV4	Event 4 set value (EV4) Event 4 set value (EV4) [high] ♣	Same as Event 1 set value (EV1)/Event 1 set value (EV1) [high]	
29	EV4'	Event 4 set value (EV4') [low] ♣	Same as Event 1 set value (EV1') [low]	
—	Pn47	Parameter group No. 47 ♣	This is the first parameter symbol of Parameter group No. 47.	—
—	PTN	Pattern selection ♣	1 to 16	1
30	01.SSN	Time signal 1 start segment number ♣	1 to 16	1
31	01.STM	Time signal 1 start time ♣	0 hours 00 minutes to 199 hours 59 minutes or 0 minutes 00 seconds to 199 minutes 59 seconds [Time unit depends on the time unit of the setting]	0:00 (0 hour 00 minutes)
32	01.ESN	Time signal 1 end segment number ♣	1 to 16	1
33	01.ETM	Time signal 1 end time ♣	0 hours 00 minutes to 199 hours 59 minutes or 0 minutes 00 seconds to 199 minutes 59 seconds [Time unit depends on the time unit of the setting]	0:00 (0 hour 00 minutes)
34	02.SSN	Time signal 2 start segment number ♣	Same as Time signal 1 start segment number	
35	02.STM	Time signal 2 start time ♣	Same as Time signal 1 start time	
36	02.ESN	Time signal 2 end segment number ♣	Same as Time signal 1 end segment number	
37	02.ETM	Time signal 2 end time ♣	Same as Time signal 1 end time	
38	03.SSN	Time signal 3 start segment number ♣	Same as Time signal 1 start segment number	
39	03.STM	Time signal 3 start time ♣	Same as Time signal 1 start time	
40	03.ESN	Time signal 3 end segment number ♣	Same as Time signal 1 end segment number	
41	03.ETM	Time signal 3 end time ♣	Same as Time signal 1 end time	
42	04.SSN	Time signal 4 start segment number ♣	Same as Time signal 1 start segment number	
43	04.STM	Time signal 4 start time ♣	Same as Time signal 1 start time	
44	04.ESN	Time signal 4 end segment number ♣	Same as Time signal 1 end segment number	
45	04.ETM	Time signal 4 end time ♣	Same as Time signal 1 end time	
—	Pn48	Parameter group No. 48 ♣	This is the first parameter symbol of Parameter group No. 48.	—
—	PTN	Pattern selection ♣	1 to 16	1
46	ENDTM	Pattern end output time ♣	0 hours 00 minutes to 199 hours 59 minutes or 0 minutes 00 seconds to 199 minutes 59 seconds 0:00: Output remains on [Time unit depends on the time unit of the setting]	0:00 (0 hour 00 minutes)
—	Pn51	Parameter group No. 51 ♣	This is the first parameter symbol of Parameter group No. 51.	—
47	P	Proportional band [heat-side] ♣	TC/RTD inputs: 0 (0.0, 0.00) to Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.0 to 1000.0 % of Input span 0 (0.0, 0.00): ON/OFF action	TC/RTD inputs: 30 V/I inputs: 3.0
48	I	Integral time [heat-side] ♣	PID control or Heat/Cool PID control: 0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PD action Position proportioning PID control: 1 to 3600 seconds, 0.1 to 3600.0 seconds or 0.01 to 360.00 seconds [Varies with the setting of the Integral/Derivative time decimal point position.]	240
49	D	Derivative time [heat-side] ♣	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60
50	oHH	ON/OFF action differential gap (upper) ♣	TC/RTD inputs: 0 (0.0, 0.00) to Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.0 to 100.0 % of Input span	TC/RTD inputs: 1 V/I inputs: 0.1
51	oHL	ON/OFF action differential gap (lower) ♣	Same as ON/OFF action differential gap (upper)	
52	rPT	Control response parameter ♣	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	2

No.	Symbol	Name	Data range	Factory set value
53	PRCr	Proactive intensity ♣	0 to 4 0: No function	2
54	MR	Manual reset ♣	−100.0 to +100.0 %	0.0
55	FF	FF amount ♣	−100.0 to +100.0 %	0.0
56	oLH	Output limiter high [heat-side] ♣	Output limiter low [heat-side] to 105.0 %	105.0
57	oLL	Output limiter low [heat-side] ♣	−5.0 % to Output limiter high [heat-side]	−5.0
58	LbA	Control loop break alarm (LBA) time ♣	0 to 7200 seconds 0: No function	0 or 480
59	Lbd	LBA deadband (LBD) ♣	0 to Input span [Varies with the setting of the Decimal point position.]	0
—	Pn53	Parameter group No. 53 ♣	This is the first parameter symbol of Parameter group No. 53.	—
—	PId.LY	PID group selection ♣	1 to 8	1
60	P	Proportional band [heat-side] ♣	TC/RTD inputs: 0 (0.0, 0.00) to Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.0 to 1000.0 % of Input span 0 (0.0, 0.00): ON/OFF action	TC/RTD inputs: 30 V/I inputs: 3.0
61	I	Integral time [heat-side] ♣	PID control or Heat/Cool PID control: 0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PD action Position proportioning PID control: 1 to 3600 seconds, 0.1 to 3600.0 seconds or 0.01 to 360.00 seconds [Varies with the setting of the Integral/Derivative time decimal point position.]	240
62	d	Derivative time [heat-side] ♣	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PI action [Varies with the setting of the Integral/Derivative time decimal point position.]	60
63	oHH	ON/OFF action differential gap (upper) ♣	TC/RTD inputs: 0 (0.0, 0.00) to Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.0 to 100.0 % of Input span	TC/RTD inputs: 1 V/I inputs: 0.1
64	oHL	ON/OFF action differential gap (lower) ♣	Same as ON/OFF action differential gap (upper)	
65	rPI	Control response parameter ♣	0: Slow 1: Medium 2: Fast [When the P or PD action is selected, this setting becomes invalid]	2
66	PRCr	Proactive intensity ♣	0 to 4 0: No function	2
67	MR	Manual reset ♣	−100.0 to +100.0 %	0.0
68	FF	FF amount ♣	−100.0 to +100.0 %	0.0
69	oLH	Output limiter high [heat-side] ♣	Output limiter low [heat-side] to 105.0 %	105.0
70	oLL	Output limiter low [heat-side] ♣	−5.0 % to Output limiter high [heat-side]	−5.0
71	LbA	Control loop break alarm (LBA) time ♣	0 to 7200 seconds 0: No function	0 or 480
72	Lbd	LBA deadband (LBD) ♣	0 to Input span [Varies with the setting of the Decimal point position.]	0
—	Pn56	Parameter group No. 56 ♣	This is the first parameter symbol of Parameter group No. 56.	—
74	Pc	Proportional band [cool-side] ♣	TC/RTD inputs: 1 (0.1, 0.01) to Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.1 to 1000.0 % of Input span	TC/RTD inputs: 30 V/I inputs: 3.0
75	Ic	Integral time [cool-side] ♣	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240
76	dc	Derivative time [cool-side] ♣	Same as Derivative time [heat-side]	
77	db	Overlap/Deadband ♣	TC/RTD inputs: −Input span to +Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: −100.0 to +100.0 % of Input span Minus (−) setting results in Overlap. However, the overlapping range is within the proportional range.	TC/RTD inputs: 0 V/I inputs: 0.0
78	oLHc	Output limiter high [cool-side] ♣	Output limiter low [cool-side] to 105.0 %	105.0
79	oLLc	Output limiter low [heat-side] ♣	−5.0 % to Output limiter high [cool-side]	−5.0
—	Pn58	Parameter group No. 58 ♣	This is the first parameter symbol of Parameter group No. 58.	—
—	PId.LY	PID group selection ♣	1 to 8	1
80	Pc	Proportional band [cool-side] ♣	TC/RTD inputs: 1 (0.1, 0.01) to Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: 0.1 to 1000.0 % of Input span	TC/RTD inputs: 30 V/I inputs: 3.0
81	Ic	Integral time [cool-side] ♣	0 to 3600 seconds, 0.0 to 3600.0 seconds or 0.00 to 360.00 seconds 0 (0.0, 0.00): PD action [Varies with the setting of the Integral/Derivative time decimal point position.]	240
82	dc	Derivative time [cool-side] ♣	Same as Derivative time [heat-side]	
83	db	Overlap/Deadband ♣	TC/RTD inputs: −Input span to +Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs: −100.0 to +100.0 % of Input span Minus (−) setting results in Overlap. However, the overlapping range is within the proportional range.	TC/RTD inputs: 0 V/I inputs: 0.0
84	oLHc	Output limiter high [cool-side] ♣	Output limiter low [cool-side] to 105.0 %	105.0
85	oLLc	Output limiter low [cool-side] ♣	−5.0 % to Output limiter high [cool-side]	−5.0
—	Pn59	Parameter group No. 59 ♣	This is the first parameter symbol of Parameter group No. 59.	—
86	LV.SEt	Automatic level PID setting ♣	oFF: Automatic setting OFF on: Automatic setting ON LoAd: Restore setting before change	oFF
87	LEV 1	Level PID setting 1 ♣	Input range low to Input range high [Varies with the setting of the Decimal point position.]	Input range high
88	LEV2	Level PID setting 2 ♣	Same as Level PID setting 1	
89	LEV3	Level PID setting 3 ♣	Same as Level PID setting 1	
90	LEV4	Level PID setting 4 ♣	Same as Level PID setting 1	
91	LEV5	Level PID setting 5 ♣	Same as Level PID setting 1	
92	LEV6	Level PID setting 6 ♣	Same as Level PID setting 1	
93	LEV7	Level PID setting 7 ♣	Same as Level PID setting 1	
—	Pn80	Parameter group No. 80	This is the first parameter symbol of Parameter group No. 80	—
94	ZoNE.H	Wait zone high	TC/RTD inputs 0 (0.0, 0.00) to Input span (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs 0.0 to 100.0 % of Input span 0 (0.0, 0.00): Wait zone high OFF	0
95	ZoNE.L	Wait zone low	TC/RTD inputs − Input span to 0 (0.0, 0.00) (Unit: °C [°F]) [Varies with the setting of the Decimal point position.] Voltage (V)/Current (I) inputs −100.0 to 0.0 % of Input span 0 (0.0, 0.00): Wait zone low OFF	0

G. Setup Setting Mode

No.	Symbol	Name	Data range	Factory set value
—	Sn00	Setting group No. 00	This is the first parameter symbol of Setting group No. 00.	—
96	SrSW	SV selection at program start	0: Zero start 1: PV start 2: PV start (time saving)	0
97	Pd	Hot/Cold start	0: Hot start 1 1: Hot start 2 2: Cold start 3: Reset start	0
98	End.P	Control action at pattern end	PID control, Heat/Cool PID control or Position proportioning PID control (With FBR input): 0: Control continued 1: Control stop Position proportioning PID control (When there is no FBR input or the FBR input is break): 0: Control continued 1: Open-side output OFF, Close-side output OFF 2: Open-side output OFF, Close-side output ON 3: Open-side output ON, Close-side output OFF	0
99	End.AE	Output action at pattern end	0 to 7 0: OFF +1: Logic calculation output: Action continues +2: Retransmission output: Action continues +4: Instrument status output: Action continues	7
—	Sn 10	Setting group No. 10	This is the first parameter symbol of Setting group No. 10.	—
100	PVCY	Display update cycle	1: 50 ms 6: 300 ms 2: 100 ms 7: 350 ms 3: 150 ms 8: 400 ms 4: 200 ms 9: 450 ms 5: 250 ms 10: 500 ms	1
—	Sn21	Setting group No. 21	This is the first parameter symbol of Setting group No. 21.	—
101	Pb	PV bias	−Input span to +Input span [Varies with the setting of the Decimal point position.]	0
102	dF	PV digital filter	0.0 to 100.0 seconds 0.0: Filter OFF	0.0
103	PR	PV ratio	0.500 to 1.500	1.000
104	PLC	PV low input cut-off ♣	0.00 to 25.00 % of Input span	0.00
—	Sn30	Setting group No. 30 ♣	This is the first parameter symbol of Setting group No. 30.	—
105	t 1	OUT1 proportional cycle time ♣	0.1 to 100.0 seconds	Relay contact output: 20.0 Voltage pulse output, Transistor output: 2.0 or 20.0
106	t2	OUT2 proportional cycle time ♣	Same as Proportional cycle time of OUT1	
107	t3	OUT3 proportional cycle time ♣	0.1 to 100.0 seconds	Voltage pulse output: 2.0 or 20.0
108	Mr 1	OUT1 minimum ON/OFF time of proportional cycle ♣	0 to 1000 ms	0
109	Mr2	OUT2 minimum ON/OFF time of proportional cycle ♣	0 to 1000 ms	0
110	Mr3	OUT3 minimum ON/OFF time of proportional cycle ♣	0 to 1000 ms	0
—	Sn45	Setting group No. 45 ♣	This is the first parameter symbol of Setting group No. 45.	—
111	HbA 1	Heater break alarm 1 (HBA1) set value ♣	0.0 to 100.0 A 0.0: HBA function OFF	0.0
112	HbC 1	Number of heater break alarm 1 (HBA1) delay times ♣	0 to 255 times	5
—	Sn46	Setting group No. 46 ♣	This is the first parameter symbol of Setting group No. 46.	—
113	HbA2	Heater break alarm 2 (HBA2) set value ♣	0.0 to 100.0 A 0.0: HBA function OFF	0.0
114	HbC2	Number of heater break alarm 2 (HBA2) delay times ♣	0 to 255 times	5
—	Sn49	Setting group No. 49	This is the first parameter symbol of Setting group No. 49.	—
—	PTN	Pattern selection	1 to 16	1
115	EvoN 1	Event selection of the Segment 1	0: Unused 1: Used 00000 ← SV display unit Event 1 Event 2 Event 3 Event 4 Unused Set Event at each digit.	1111
115	EvoN 2 to 16	Event selection of the Segment 2 to 16	Same as Event selection of the Segment 1 Screens for Event selection of the Segments 2 to 16 will be displayed up to the Segment No. where pattern end is set.	
—	Sn51	Setting group No. 51 ♣	This is the first parameter symbol of Setting group No. 51.	—
116	MMV	Manual manipulated output value ♣	PID control, Position proportioning PID control: Output limiter low [heat-side] to Output limiter high [heat-side] Heat/Cool PID control: −Output limiter high [cool-side] to +Output limiter high [heat-side]	PID control, Position proportioning PID control: −5.0 Heat/Cool PID control: 0.0
—	Sn53	Setting group No. 53	This is the first parameter symbol of Setting group No. 53.	—
117	Ar6	AT bias	−Input span to +Input span [Varies with the setting of the Decimal point position.]	0
118	ArTM	AT remaining time monitor	0 hours 00 minutes to 48 hours 00 minutes	—
119	rUNE	AT/ST status monitor	0: AT/ST complete 1: AT running now 2: ST running now −1: Aborted. Setting changed. −2: Aborted. Abnormal input. −3: Aborted. Timeout. −4: Aborted. Abnormal calculated values.	—
—	Sn55	Setting group No. 55 ♣	This is the first parameter symbol of Setting group No. 55.	—
120	Ydb	Open/Close output neutral zone ♣	0.1 to 10.0 % of output	2.0
121	YHS	Open/Close output differential gap ♣	0.1 to 5.0 % of output	1.0
—	Sn57	Setting group No. 57	This is the first parameter symbol of Setting group No. 57.	—
122	FFSr	FF amount learning ♣	0 to 1 0: No learning +1: Learn	0
123	ExdU	Determination point of external disturbance	−Input span to +Input span [Varies with the setting of the Decimal point position.]	−1
—	Sn91	Setting group No. 91	This is the first parameter symbol of Setting group No. 91.	—
124	PHLd	Peak hold monitor	Input range low − (5 % of input span) to Input range high + (5 % of input span) [Varies with the setting of the Decimal point position.]	—
125	bHLd	Bottom hold monitor	Same as Peak hold monitor	
126	HLdR	Peak/Bottom hold reset	HoLd: Hold rESEt: Reset Returns to Hold state automatically after reset.	HoLd

H. Engineering Mode

No.	Symbol	Name	Data range	Factory set value
—	Fn00	Function block No. 00	This is the first parameter symbol of Function block No. 00	—
127	TM.SL	Time unit of the setting	0: Hour : Minute 1: Minute : Second	0
128	SG.CNG	Segment setting change type	0: Change type 1 1: Change type 2	0
129	SG.SAV	Store segment setting change	0: Store setting 1: Do not store setting	0
—	Fn 10	Function block No. 10	This is the first parameter symbol of Function block No. 10.	—
130	ALC	ALM lamp lighting condition	0 to 511 0: OFF +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Heater break alarm 1 (HBA1) +32: Heater break alarm 2 (HBA2) +64: Control loop break alarm (LBA) +128: Input error high +256: Input error low To select two or more functions, sum each value.	127
131	dSoP	PV flashing display at input error	0: Flashing display 1: Non-flashing display	0
132	dS.MoN	Select hide items in Monitor mode	0 to 31 0: Show all +1: Number of repeating patterns monitor +2: Pattern remaining time monitor +4: Manipulated output value (MV) monitor +8: Current transformer (CT) input value monitor +16: Comprehensive event state To select two or more functions, sum each value.	0
133	dS.Mod	Select hide items in Operation transfer mode	0 to 31 0: Show all +1: Operation mode transfer +2: Step function +4: Autotuning (AT) +8: Overall level autotuning (AT) +16: Startup tuning (ST) To select two or more functions, sum each value.	0
134	dS.PRG	Select hide items in Program setting mode	0 to 31 0: Show all +1: Segment setting +2: Pattern end output time +4: Time signal setting +8: Event setting +16: Repeat and link setting To select two or more functions, sum each value.	0
—	Fn21	Function block No. 21	This is the first parameter symbol of Function block No. 21	—
135	INP	Input type	0: TC input K 1: TC input J 2: TC input R 3: TC input S 4: TC input B 5: TC input E 6: TC input N 7: TC input T 8: TC input W5Re/W26Re 9: TC input PLII 10: TC input U 11: TC input L 12: TC input PR40-20 13: RTD input Pt100 14: RTD input JPt100 15: Current input 0 to 20 mA DC 16: Current input 4 to 20 mA DC 17: Voltage input 0 to 10 V DC 18: Voltage input 0 to 5 V DC 19: Voltage input 1 to 5 V DC 20: Voltage input 0 to 1 V DC 21: Voltage input −10 to +10 V DC 22: Voltage input −5 to +5 V DC 23: Voltage input 0 to 100 mV DC 24: Voltage input 0 to 10 mV DC	Based on Model code
136	UNIT	Display unit ♣	0: °C 1: °F	Based on Model code
137	PGdP	Decimal point position	0: No decimal place 1: One decimal place 2: Two decimal place 3: Three decimal place 4: Four decimal place TC inputs: W5Re/W26Re, PR40-20: 0 (fixed) Thermocouples other than those shown above: 0 to 1 RTD inputs: 0 to 2 Voltage (V)/Current (I) inputs: In case of Input data type 0: 0 to 4 In case of Input data type 1: 0 to 3	Based on Model code
138	PGSH	Input range high	(Input range low + 1digit) to Maximum value of input range [Varies with the setting of the Decimal point position.]	Based on Model code
139	PGSL	Input range low	Minimum value of input range to (Input range high − 1digit) [Varies with the setting of the Decimal point position.]	Based on Model code
140	PoV	Input error determination point (high)	Input error determination point (low) to Input range high + (5 % of input span) [Varies with the setting of the Decimal point position.]	Input range high + (5 % of input span)
141	PUN	Input error determination point (low)	Input range low − (5 % of input span) * to Input error determination point (high) [Varies with the setting of the Decimal point position.] * When Input type is RTD, low limit value is about 2 Ohms. (Pt100: −245.5 °C [−409.8 °F], JPt100: −237.6 °C [−395.7 °F])	Input range low − (5 % of input span)
142	rCJC	Temperature compensation calculation ♣	0: No temperature compensation calculation 1: With temperature compensation calculation	1
143	boS	Burnout direction ♣	0: Upscale 1: Downscale	0
144	SQR	Square root extraction ♣	0: Unused 1: Used	0
145	INV	Inverting input ♣	0: Unused 1: Used	0
146	INdT	Input data type	0: Number of measured value digits: 5 Number of RKC communication digits: 7 Modbus: Double word PLC communication: Double word 1: Number of measured value digits:4 Number of RKC communication digits: 6 Modbus: Single word PLC communication: Single word	Based on Model code
—	Fn23	Function block No. 23 ♣	This is the first parameter symbol of Function block No. 23	—
147	dI SL 1	DI1 function selection ♣	0: No function 1: Reset mode (RESET) setting 2: Program control mode (RUN) setting 3: Step function 4: Hold function 5: Interlock release 6: Peak/Bottom hold reset 7: Autotuning (AT) 8: Set data unlock/lock transfer 9: Direct/Reverse action transfer 10: Program pattern No. switching (2 patterns without SET) 11: Program pattern No. switching (8 patterns without SET) 12: Program pattern No. switching (8 patterns with SET) 13: Program pattern No. switching (16 patterns without SET) 14: Program pattern No. switching (16 patterns with SET)	1
148	dI SL2	DI2 function selection ♣	0 to 9 Same as DI1 function selection (0 to 9)	2
149	dI SL3	DI3 function selection ♣	0 to 9 Same as DI1 function selection (0 to 9)	3
150	dI SL4	DI4 function selection ♣	0 to 9 Same as DI1 function selection (0 to 9)	4
151	dI SL5	DI5 function selection ♣	0 to 9 Same as DI1 function selection (0 to 9)	5
152	dI SL6	DI6 function selection ♣	0 to 9 Same as DI1 function selection (0 to 9)	8
153	dI INV	DI logic invert ♣	0 to 3 0: No logic invert +1: Set data unlock/lock transfer +2: Direct/Reverse action transfer To select two or more functions, sum each value.	0
—	Fn30	Function block No. 30	This is the first parameter symbol of Function block No. 30	—
154	oSL 1	OUT1 function selection ♣	0: No assignment 1: Control output [heat-side] or [open-side] 2: Control output [cool-side] or [close-side] 3: Retransmission output 4: Logic calculation output (Event, HBA, LBA, Input error) 5: Output of Program control mode (RUN) state 6: Output of Manual control mode (MAN) state 7: Autotuning (AT) state output 8: Output of the communication monitoring result 9: FAIL output (Permanently configured to be de-energized)	Based on Model code
155	oSL2	OUT2 function selection ♣	Same as OUT1 function selection	Based on Model code
156	oSL3	OUT3 function selection ♣	Same as OUT1 function selection	3
157	oLG 1	OUT1 logic calculation selection ♣	0 to 511 0: OFF +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Heater break alarm 1 (HBA1) +32: Heater break alarm 2 (HBA2) +64: Control loop break alarm (LBA) +128: Input error high +256: Input error low To select two or more functions, sum each value.	0
158	oLG2	OUT2 logic calculation selection ♣	Same as OUT1 logic calculation selection	0
159	oLG3	OUT3 logic calculation selection ♣	Same as OUT1 logic calculation selection	0
160	ExC	Energized/De-energized selection	0 to 127 0: All outputs are energized +1: OUT1 de-energized +2: OUT2 de-energized +4: OUT3 de-energized +8: DO1 de-energized +16: DO2 de-energized +32: DO3 de-energized +64: DO4 de-energized To select two or more functions, sum each value.	0
161	ILS	Interlock selection	0 to 511 0: OFF +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Heater break alarm 1 (HBA1) +32: Heater break alarm 2 (HBA2) +64: Control loop break alarm (LBA) +128: Input error high +256: Input error low To select two or more functions, sum each value.	0
162	SS	Output action in Reset mode	0 to 7 0: OFF +1: Logic calculation output: Action continues +2: Retransmission output: Action continues +4: Instrument status output: Action continues To select two or more functions, sum each value.	0
163	UNIo	Universal output type selection (OUT3) ♣	0: Voltage pulse output 1: Current output (4 to 20 mA DC) 2: Current output (0 to 20 mA DC)	1
—	Fn31	Function block No. 31 ♣	This is the first parameter symbol of Function block No. 31	—
164	Ao 1	Retransmission output 1 type ♣	0: No retransmission output 1: Measured value (PV) 2: Segment level or Set value (SV) in Fixed set point control mode 3: SV monitor value 4: Deviation 5: Manipulated output value [heat-side] 6: Manipulated output value [cool-side] 7: Current transformer 1 (CT1) input value 8: Current transformer 2 (CT2) input value	0
165	AHS 1	Retransmission output 1 scale high ♣	No retransmission output, Measured value (PV), Segment level, Set value (SV) in Fixed set point control mode, and SV monitor value: Input range low to Input range high [Varies with the setting of the Decimal point position.] Deviation: −Input span to +Input span [Varies with the setting of the Decimal point position.] Manipulated output value: −5.0 to +105.0 % Current transformer (CT) input value: 0.0 to 100.0 %	No retransmission output, Measured value (PV), Segment level, Set value (SV) in Fixed set point control mode, and SV monitor value: Input range high Deviation: +Input span Manipulated output value, and Current transformer (CT) input value: 100.0
166	ALS 1	Retransmission output 1 scale low ♣	Data range is the same as Retransmission output 1 scale high. [Factory set value] • No retransmission output, Measured value (PV), Segment level, Set value (SV) in Fixed set point control mode, and SV monitor value: Input range low • Deviation: −Input span • Manipulated output value, and Current transformer (CT) input value: 0.0	
—	Fn32	Function block No. 32 ♣	This is the first parameter symbol of Function block No. 32	—
167	Ao2	Retransmission output 2 type ♣	Same as Retransmission output 1 type	Based on Model code

No.	Symbol	Name	Data range	Factory set value
168	AHS2	Retransmission output 2 scale high ♣	Same as Retransmission output 1 scale high	
169	ALS2	Retransmission output 2 scale low ♣	Same as Retransmission output 1 scale low	
—	Fn33	Function block No. 33 ♣	This is the first parameter symbol of Function block No. 33	—
170	Ao3	Retransmission output 3 type ♣	Same as Retransmission output 1 type	Based on Model code
171	AHS3	Retransmission output 3 scale high ♣	Same as Retransmission output 1 scale high	
172	ALS3	Retransmission output 3 scale low ♣	Same as Retransmission output 1 scale low	
—	Fn34	Function block No. 34 ♣	This is the first parameter symbol of Function block No. 34	—
173	doSL1	DO1 function selection ♣	0: No assignment 1: Logic calculation output (Event, HBA, LBA, Input error) 2: Output of Program control mode (RUN) state 3: Output of Manual control mode (MAN) state 4: Autotuning (AT) state output 5: Output of the communication monitoring result 6: FAIL output (Permanently configured to be de-energized) 7: Time signal 8: Pattern end signal	Based on Model code
174	doSL2	DO2 function selection ♣	Same as DO1 function selection	
175	doSL3	DO3 function selection ♣	Same as DO1 function selection	
176	doSL4	DO4 function selection ♣	Same as DO1 function selection	
177	doLG1	DO1 logic calculation selection ♣	0 to 511 0: OFF +1: Event 1 +2: Event 2 +4: Event 3 +8: Event 4 +16: Heater break alarm 1 (HBA1) +32: Heater break alarm 2 (HBA2) +64: Control loop break alarm (LBA) +128: Input error high +256: Input error low To select two or more functions, sum each value.	Based on Model code
178	doLG2	DO2 logic calculation selection ♣	Same as DO1 logic calculation selection	
179	doLG3	DO3 logic calculation selection ♣	Same as DO1 logic calculation selection	
180	doLG4	DO4 logic calculation selection ♣	Same as DO1 logic calculation selection	
181	doTS1	DO1 time signal selection ♣	0: Unused 1: Used 00000 ← SV display unit Time signal 1 Time signal 2 Time signal 3 Time signal 4 Unused Set time signal at each digit.	Based on Model code
182	doTS2	DO2 time signal selection ♣	Same as DO1 time signal selection	
183	doTS3	DO3 time signal selection ♣	Same as DO1 time signal selection	
184	doTS4	DO4 time signal selection ♣	Same as DO1 time signal selection	
—	Fn41	Function block No. 41	This is the first parameter symbol of Function block No. 41	—
185	ES1	Event 1 type	0: None 1: Deviation high (Using SV monitor value) [a] 2: Deviation low (Using SV monitor value) [a] 3: Deviation high/low (Using SV monitor value) [a] 4: Band (Using SV monitor value) [a] 5: Deviation high/low (Using SV monitor value) [High/Low individual setting] [a] 6: Band (Using SV monitor value) [High/Low individual setting] [a] 7: SV high (Using SV monitor value) 8: SV low (Using SV monitor value) 9: Process high [b] 10: Process low [b] 11: Deviation high (Using segment level) [a] 12: Deviation low (Using segment level) [a] 13: Deviation high/low (Using segment level) [a] 14: Band (Using segment level) [a] 15: Deviation high/low (Using segment level) [High/Low individual setting] [a] 16: Band (Using segment level) [High/Low individual setting] [a] 17: SV high (Using segment level) 18: SV low (Using segment level) 19: MV high [heat-side] [b, c] 20: MV low [heat-side] [b, c] 21: MV high [cool-side] [b] 22: MV low [cool-side] [b] 23: Process high/low [High/Low individual setting] [b] 24: Process band [High/Low individual setting] [b] [a] Event hold and re-hold action is available. [b] Event hold action is available. [c] When the instrument is specified as position proportioning PID control with feedback resistance, this item becomes Feedback resistance (FBR) input.	If the Event type is specified by the DO function selection of initial setting code when ordering, that Event type will be the factory set value. If the Event type is not specified by the DO function selection of initial setting code: 1
186	EHo1	Event 1 hold action	0: Hold action OFF 1: Hold action ON 2: Re-hold action ON	If the Event type is specified by the DO function selection of initial setting code when ordering, the factory set value of Event hold action differs depending on the Event type. If the Event type is not specified by the DO function selection of initial setting code: 0

No.	Symbol	Name	Data range	Factory set value
187	EH1	Event 1 differential gap	Deviation, Process and SV: 0 to Input span [Varies with the setting of the Decimal point position.] Manipulated output value (MV): 0.0 to 110.0 %	Deviation, Process and SV: TC/RTD inputs: 2 V/I inputs: 0.2 % of input span MV: 0.2
188	EVT1	Event 1 timer	0.0 to 600.0 seconds	0.0
—	Fn42	Function block No. 42	This is the first parameter symbol of Function block No. 42	—
189	ES2	Event 2 type	Same as Event 1 type	Same as Event 1 type If the Event type is not specified by the DO function selection of initial setting code: 2
190	EHo2	Event 2 hold action	Same as Event 1 hold action	
191	EH2	Event 2 differential gap	Same as Event 1 differential gap	
192	EVT2	Event 2 timer	Same as Event 1 timer	
—	Fn43	Function block No. 43	This is the first parameter symbol of Function block No. 43	—
193	ES3	Event 3 type	ame as Event 1 type	Same as Event 1 type If the Event type is not specified by the DO function selection of initial setting code: 0
194	EHo3	Event 3 hold action	Same as Event 1 hold action	
195	EH3	Event 3 differential gap	Same as Event 1 differential gap	
196	EVT3	Event 3 timer	Same as Event 1 timer	
—	Fn44	Function block No. 44	This is the first parameter symbol of Function block No. 44	—
197	ES4	Event 4 type	Same as Event 1 type	Same as Event 1 type If the Event type is not specified by the DO function selection of initial setting code: 0
198	EHo4	Event 4 hold action	Same as Event 1 hold action	
199	EH4	Event 4 differential gap	Same as Event 1 differential gap	
200	EVT4	Event 4 timer	Same as Event 1 timer	
—	Fn45	Function block No. 45 ♣	This is the first parameter symbol of Function block No. 45	—
201	CTA1	CT1 assignment ♣	0: None 1: OUT1 2: OUT2 3: OUT3	1
202	CTt1	CT1 type ♣	0: CTL-6-P-N 1: CTL-12-S56-10L-N 2: CTL-6-P-Z	Based on Model code
203	CTR1	CT1 ratio ♣	0 to 9999 CT type: CTL-6-P-N: 800 CTL-12-S56-10L-N: 1000 CTL-6-P-Z: 800	If CTL-6-P-N or CTL-6-P-Z is specified for the Current transformer (CT) type: 800 If CTL-12-S56-10L-N is specified for the Current transformer (CT) type: 1000
204	CLC1	CT1 low input cut-off ♣	0.0 to 1.0 A	0.0
—	Fn46	Function block No. 46 ♣	This is the first parameter symbol of Function block No. 46	—
205	CTA2	CT2 assignment ♣	Same as CT1 assignment	
206	CTt2	CT2 type ♣	Same as CT1 type	
207	CTR2	CT2 ratio ♣	Same as CT1 ratio	
208	CLC2	CT2 low input cut-off ♣	Same as CT1 low input cut-off	
—	Fn47	Function block No. 47 ♣	This is the first parameter symbol of Function block No. 47	—
209	TSSL	Time signal selection	0: Unused 1: Used 00000 ← SV display unit Time signal 1 Time signal 2 Time signal 3 Time signal 4 Unused Set time signal at each digit.	Based on Model code
—	Fn48	Function block No. 48	This is the first parameter symbol of Function block No. 48	—
210	ENdSL	Pattern end signal selection	0: Unused 1: Used	Based on Model code
—	Fn51	Function block No. 51	This is the first parameter symbol of Function block No. 51	—
211	oS	Control action	0: Brilliant II PID control (direct action) 1: Brilliant II PID control (reverse action) 2: Brilliant II Heat/Cool PID control [water cooling] 3: Brilliant II Heat/Cool PID control [air cooling] 4: Brilliant II Heat/Cool PID control [Cooling linear type] 5: Brilliant II Position proportioning PID control (reverse action) 6: Brilliant II Position proportioning PID control (direct action)	Based on Model code
212	LPId	Level PID action selection	0: No Level PID 1: Switching by Set value (SV) (Level PID action) 2: Switching by Measured value (PV) (Level PID action)	0
213	LHS	Level PID differential gap	0 to Input span [Varies with the setting of the Decimal point position.]	TC/RTD inputs: 2 V/I inputs: 0.2
214	oRU	Output change rate limiter (up) [heat-side] ♣	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0

No.	Symbol	Name	Data range	Factory set value
215	oRd	Output change rate limiter (down) [heat-side] ♣	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0
216	AoVE	Action (high) input error	0: Control continues (with the latest output) 1: Manipulated output value at input error (Manual control mode) 2: Manipulated output value at input error (Program control mode, Fixed set point control mode)	2
217	AUNE	Action (low) input error	Same as Action (high) input error	2
218	PSM	Manipulated output value at input error	PID control, Position proportioning PID control: −5.0 to +105.0 % Heat/Cool PID control: −105.0 to +105.0 %	PID control, Position proportioning PID control: −5.0 Heat/Cool PID control: 0.0
219	RMV	Manipulated output value in Reset mode [heat-side]	−5.0 to +105.0 %	−5.0
220	PdA	Start determination point	0 to Input span 0: Operation starts from any start state selected by Hot/Cold start [Varies with the setting of the Decimal point position.]	3 % of input span
221	MVTS	Manual manipulated output value selection	0: Last manipulated output value (Balanceless-bumpless function) 1: Manual manipulated output value	0
222	Iddp	Integral/ Derivative time decimal point position	0: No decimal place 1: One decimal place 2: Two decimal place	0
223	STS	ST start condition	0: Activate the Startup tuning (ST) function when the power is turned on; when transferred from RESET to RUN/FIX; or when the Set value (SV) is changed. 1: Activate the Startup tuning (ST) function when the power is turned on; when transferred from RESET to RUN/FIX 2: Activate the Startup tuning (ST) function when the Set value (SV) is changed.	0
—	Fn55	Function block No. 55 ♣	This is the first parameter symbol of Function block No. 55	—
225	YbR	Action at feedback resistance (FBR) input error ♣	0: Action depending on the Valve action in Reset mode 1: Control action continued	0
226	PoS	Feedback adjustment ♣	When the <MODE key is pressed and held for 5 seconds, Feedback adjustment is automatically started. AdJ: Adjustment end oPEn: During adjustment on the open-side CLoSE: During adjustment on the close-side Err: Adjustment error	AdJ
227	MoT	Control motor time ♣	5 to 1000 seconds	10
228	oLA	Integrated output limiter ♣	0.0 to 200.0 % of control motor time 0.0: OFF	150.0
229	VAL	Valve action in Reset mode ♣	0: Close-side output OFF, Open-side output OFF 1: Close-side output ON, Open-side output OFF 2: Close-side output OFF, Open-side output ON	0
230	YASo	Action at saturated output ♣	0: Invalid 1: Valid	0
—	Fn56	Function block No. 56 ♣	This is the first parameter symbol of Function block No. 56	—
231	oRUc	Output change rate limiter (up) [cool-side] ♣	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0
232	oRdc	Output change rate limiter (down) [cool-side] ♣	0.0 to 1000.0 %/seconds of manipulated output 0.0: OFF	0.0
233	RMVc	Manipulated output value in Reset mode [cool-side] ♣	−5.0 to +105.0 %	−5.0
234	US	Undershoot suppression factor ♣	0.000 to 1.000	Water cooling: 0.100 Air cooling: 0.250 Cooling linear: 1.000
235	dbPA	Overlap/ Deadband reference point ♣	0.0 to 1.0	0.0
—	Fn57	Function block No. 57 ♣	This is the first parameter symbol of Function block No. 57	—
236	bTMSP	Bottom suppression function ♣	0: No function 1: FF amount is added by level 2: FF amount is forcibly added	0
—	Fn60	Function block No. 60 ♣	This is the first parameter symbol of Function block No. 60	—
237	CMPS	Communication protocol ♣	0: RKC communication 1: Modbus (Order of data transfer: upper word to lower word) 2: Modbus (Order of data transfer: lower word to upper word) 3: PLC communication (MITSUBISHI MELSEC series special protocol QnA-compatible 3C frame [format 4])	Based on Model code
238	Add	Device address ♣	RKC communication: 0 to 99 Modbus: 1 to 99 PLC communication: 0 to 30	RKC communication: 0 Modbus: 1 PLC communication: 0

No.	Symbol	Name	Data range	Factory set value
239	bPS	Communication speed ♣	0: 2400 bps 1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps 5: 57600 bps	3
240	bIT	Data bit configuration ♣	0 to 11 Refer to Data bit configuration table	0
241	INT	Interval time ♣	0 to 250 ms	10
242	CMRM	Communication response monitor ♣	0 to 110F Least significant digit: 0: Normal response 1: Overrun error 2: Parity error 4: Framing error 8: Receive buffer overflow If two or more errors occur, the error values are summed up. Errors are displayed in the hexadecimal format (0 to F). 2nd digit: 0 (fixed) 3rd digit: Reception status monitor * 4th digit: Transmission status monitor * * Each time signal is sent or received, 0 and 1 are displayed in turns. Most significant digit: Lights off	—
—	Fn62	Function block No. 62 ♣	This is the first parameter symbol of Function block No. 62	—
243	MP.REG	Register type ♣	0: D register (data register) 1: R register (file register) 2: W register (link register) 3: ZR register (Method of specifying consecutive numbers when 32767 of R register is exceeded.)	0
244	MP.SRH	Register start number (High-order 4-bit) ♣	0 to 15	0
245	MP.SRL	Register start number (Low-order 16-bit) ♣	0 to 65535	1000
246	MP.Mod	Monitor item register bias ♣	12 to 65535	12
247	MP.STb	Setting item register bias ♣	0 to 65535	0
248	MP.LFM	Instrument link recognition time ♣	0 to 255 seconds	5
249	MP.FMo	PLC response waiting time ♣	0 to 3000 ms	255
250	MP.STM	PLC communication start time ♣	1 to 255 seconds	5
251	MP.SLb	Slave register bias ♣	0 to 65535	140
252	MP.MAd	Number of recognizable devices ♣	0 to 30	8
—	Fn71	Function block No. 71	This is the first parameter symbol of Function block No. 71	—
253	SLH	Setting limiter high	Setting limiter low to Input range high [Varies with the setting of the Decimal point position.]	Input range high
254	SLL	Setting limiter low	Input range low to Setting limiter high [Varies with the setting of the Decimal point position.]	Input range low
—	Fn91	Function block No. 91	This is the first parameter symbol of Function block No. 91	—
—	dEF	Initialization	1225: Start initialization Other values: Set values are maintained After the initialization, the value automatically returns to zero.	0
—	WT	Integrated operating time	0 to 65535 hours	—
—	rCU	Peak hold monitor of ambient temperature	−120 to +120 °C	—
—	RoM	ROM version	The installed ROM version is displayed	—
—	PZ900	Model code monitor	Model code is displayed. Use the UP or DOWN key to scroll the display horizontally (left or right).	—
—	00000	Instrument number monitor	Instrument number is displayed.	—

Data bit configuration table

Set value	Data bit	Parity bit	Stop bit
0	8	None	1
1	8	None	2
2	8	Even	1
3	8	Even	2
4	8	Odd	1
5	8	Odd	2
6	7	None	1
7	7	None	2
8	7	Even	1
9	7	Even	2
10	7	Odd	1
11	7	Odd	2

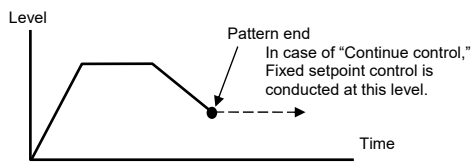
: Not settable for Modbus

3. CONTROL AT THE PATTERN END

You can select whether to continue or stop control and various output actions (such as event function, retransmission output, and instrument status output)

● Control action at pattern end (ENd.P)

You can select the control action (continue or stop control) at the Pattern end.
The factory set value is “continue control.”
In case of “Continue control,” fixed setpoint control is conducted at the level of the final segment.



● Output action at pattern end (ENd.A.E)

You can also select whether to continue or stop the following outputs at the Pattern end. (Factory set value: 7)

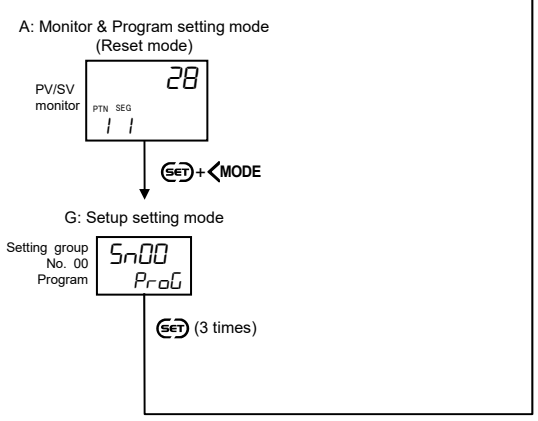
- Logic calculation output [Event 1 to 4, Heater break alarm (HBA) 1 to 2, Control loop break alarm (LBA), Input error]
- Retransmission output 1 to 3 [PV, SV, Deviation, MV, CT]
- Instrument status output [Output of Program control mode (RUN) state, Output of Manual control mode (MAN) state, Autotuning (AT) state output, Output of the communication monitoring result]

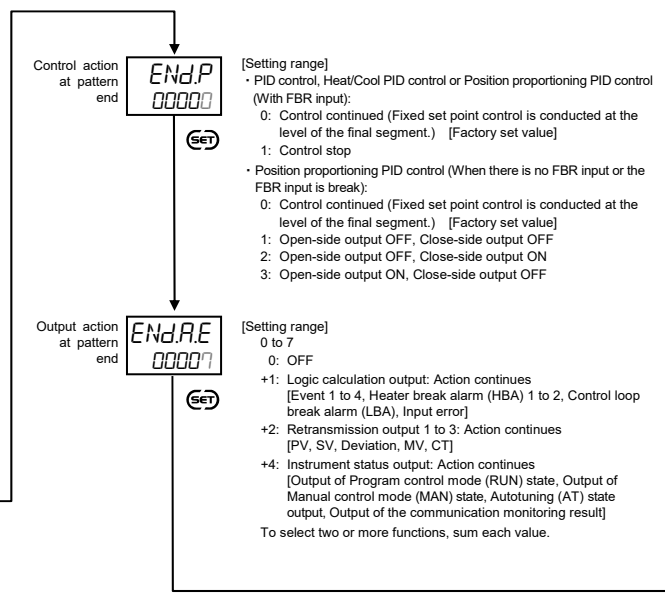
For setting the logical operation output and the instrument status output, go to Function block No. 30 (Fn30) or Function block No. 34 (Fn34) in the H: Engineering mode.

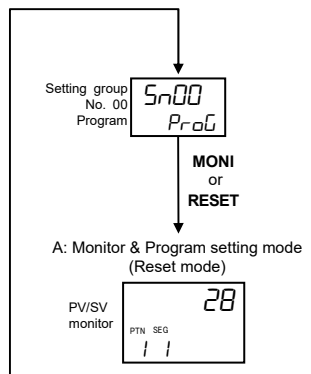
The retransmission output can be configured in Function block No. 31 (Fn31) in the H: Engineering mode.

Setting action at the Pattern end

There are two types of actions related to the action at the Pattern end: Control action at the Pattern end and Output action at the Pattern end.
These functions can be configured in G: Setup setting mode.





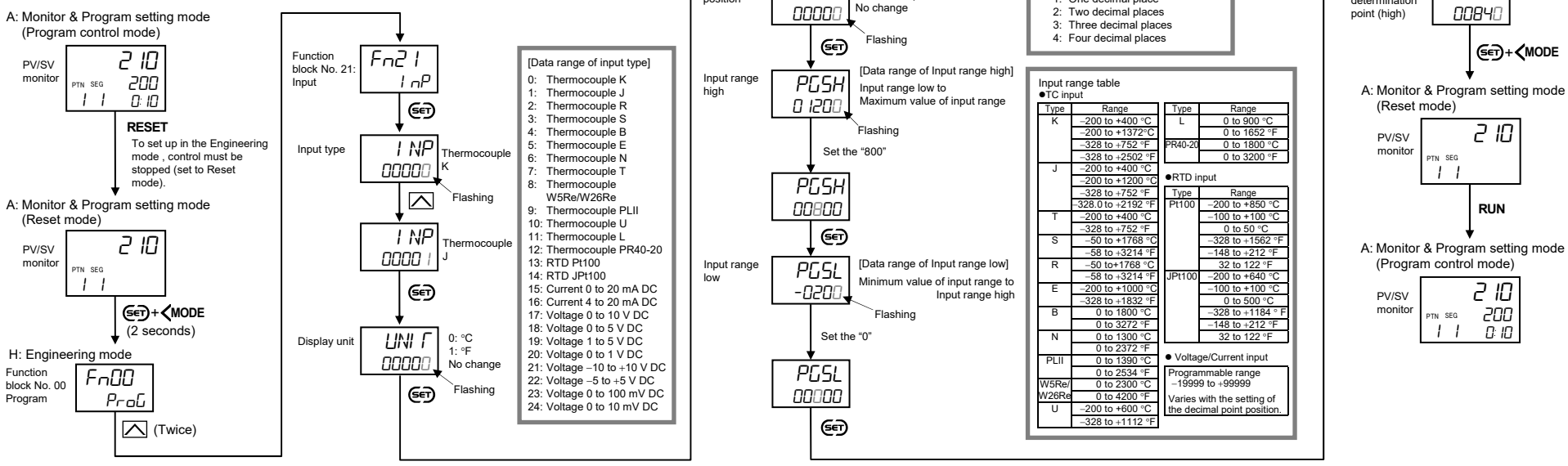


4. HOW TO CHANGE THE INPUT TYPE

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 to Thermocouple type J (0 to 800°C)

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

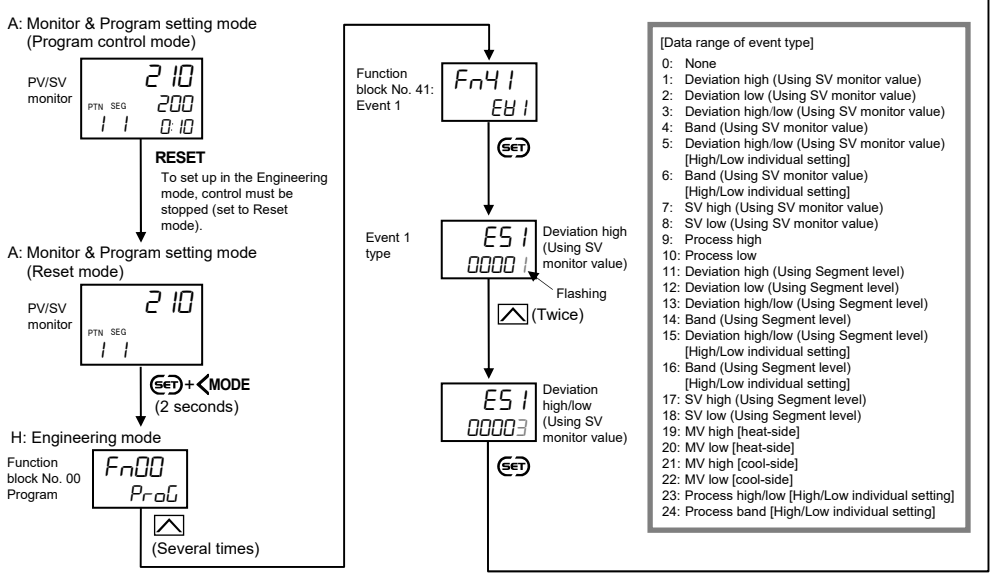


5. HOW TO CHANGE THE EVENT TYPE

The event related parameters may include: 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 hold action: Hold action ON, Event differential gap: 2, Event timer: 0.0



Description of event action

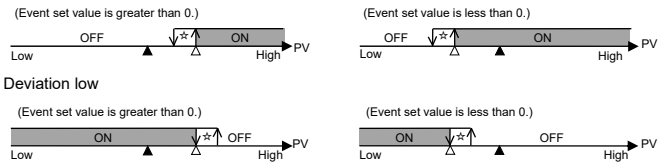
Some examples of event action are described in the following:
ON: Event action turned on
OFF: Event action turned off (▲: Set value (SV) * △: Event set value ☆: Event differential gap)
* Segment level and Set value (SV) in Fixed set point control mode

In the following explanation, the “Set value (SV)” means “Segment level SV” and “Set value (SV) in Fixed set point control mode.”

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

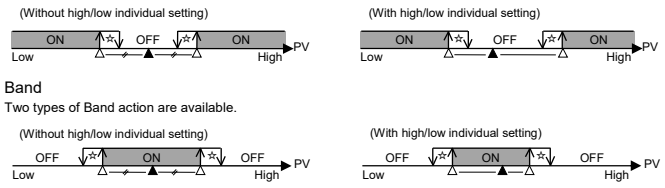
When the deviation (PV – SV) reaches the Event set value, event ON occurs.

Deviation high



Deviation low

Deviation high/low
Two types of Deviation high/low action are available.

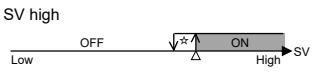


Band
Two types of Band action are available.

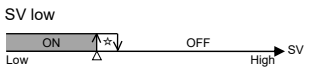
● Set value action (High, Low)

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

SV high



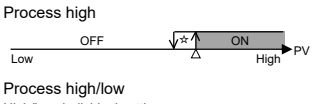
SV low



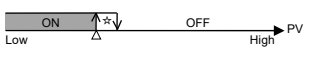
● Input value action (High, Low, High/Low, Band)

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

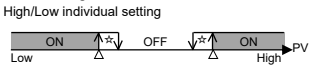
Process high



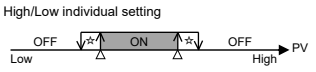
Process low



Process high/low
High/Low individual setting



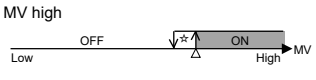
Process band
High/Low individual setting



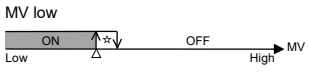
● Manipulated output value action (High, Low)

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

MV high



MV low



● SV monitor value type and Segment level type

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

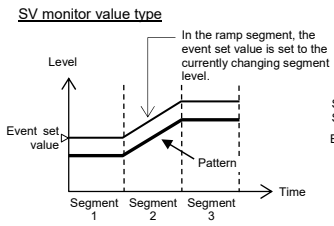
SV monitor value type
The Event set value is set for the SV monitor value.
In the ramp segment, the event set value is set to the changing set value (SV) [Segment level].

Segment level type
The Event set value is set for the Set value (SV) [Segment level or Set value (SV) in Fixed set point control mode]

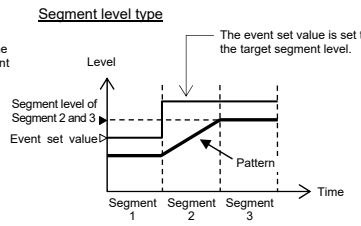
Example: When the event type is a deviation high:

[Program control mode (RUN)]

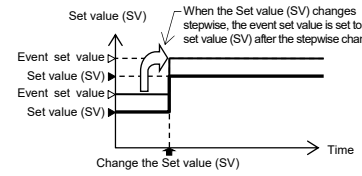
SV monitor value type



Segment level type



[Fixed set point control mode (FIX)]



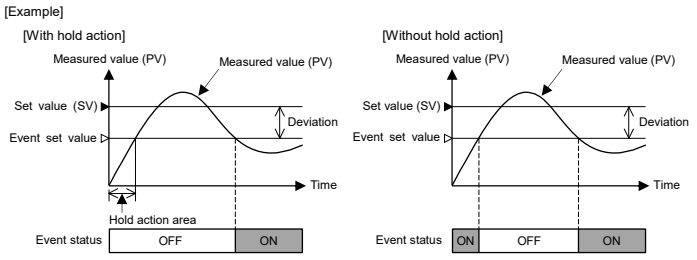
In the Fixed set point control mode (FIX), selecting either SV Monitor value type or Segment level type, whichever is selected, the event action will be the same.

Description of event hold action

● Hold action

When the following operation is conducted, the Hold action deactivates the event function until the measured value (PV) leaves the event state once.
When the measured value (PV) enters the Event off area, the HOLD action is released.
- When the instrument is powered on.
- When the mode is switched to the Program control mode (RUN) or to the Fixed set point control mode (FIX) from the Reset mode (RESET).

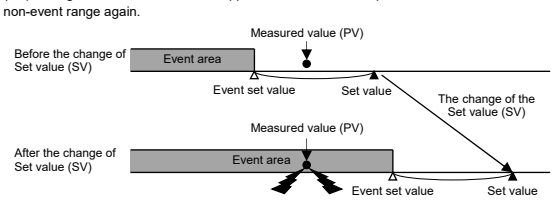
[Example]



● Re-hold action

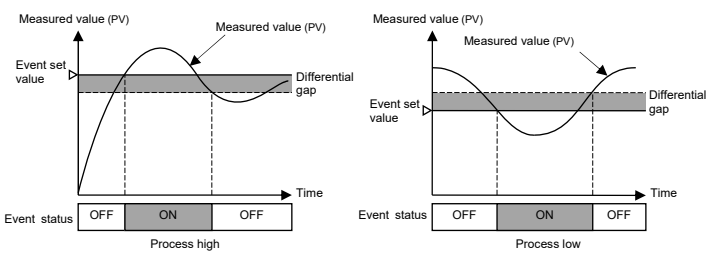
When re-hold action is ON, the event action is also suppressed at the control set value change until the measured value has entered the non-event range.

[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

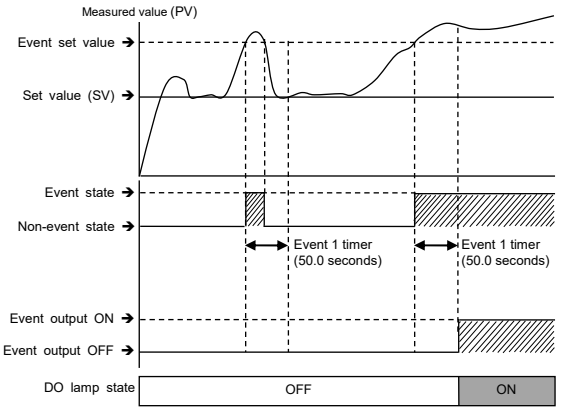
It prevents chattering of event output due to the measured value fluctuation around the Event set value.



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 the instrument enters the event state at the same time that the instrument is switched from the Reset mode (RESET) to the Program control mode (RUN), Fixed set point control mode (FIX) or Manual control mode (MAN).

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 RESET (Reset mode) from RUN (Program control mode) while the Event timer is being activated *
- Cancellation of Event state

* The instrument may not be reset in some cases.

The first edition: FEB. 2019 [IMQ00]
The second edition: FEB. 2021 [IMQ00]

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FEB. 2021