Ramp/Soak Controller

PF900/PF901 Parameter List

IMR02L14-E1

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 PF900/901.

For detailed handling procedures and key operations, refer to separate **PF900/PF901 Instruction Manual**.
The manual can be downloaded from the official RKC website:
https://www.rkcinst.co.jp/english/download-center/

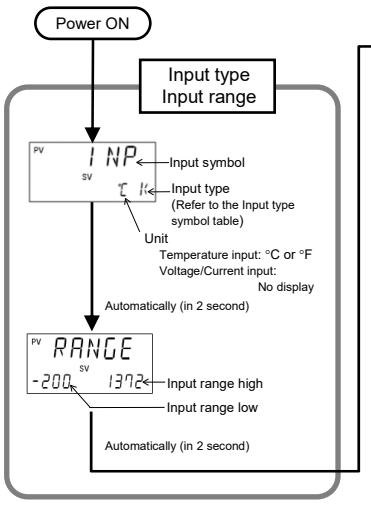
Notes for the display

- 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 SV setting & monitor 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.
- Parameters with "♣" in the Name will be displayed only when all the display conditions are satisfied.
- Each mode title describes the key operations to switch from SV setting & monitor mode to other modes. (The SV setting & monitor mode describes the key operation to return from other modes)

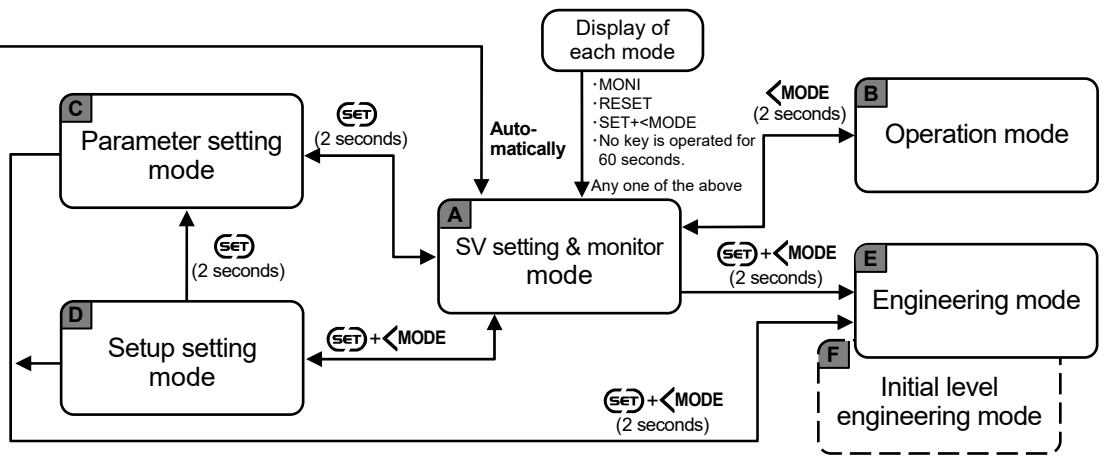
1. SWITCHING BETWEEN MODES



Input type symbol

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

Symbol	W	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.

To enter the "Extended engineering mode", press (SET)+<MODE+ ☑ for 2 seconds or longer in one of the following modes: Monitor and SV setting mode, Parameter setting mode, or Setup setting mode.

2. PARAMETER LIST

A. SV setting & monitor mode — MONI

(1) SV setting mode

Symbol	Name	Data range	Factory set value
—	PV 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	Set value (SV) in Reset mode	Setting limiter low to Setting limiter high	0
PTN	Execution pattern selection	1 to 99 (Within the maximum pattern number)	1

■ **Program control mode (RUN)**

Symbol	Name	Data range	Factory set value
—	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	—
LEVEL	Segment level	Setting limiter low to Setting limiter high	0
TIME	Segment time	From 0:00 to 500:00 (Hour: Minute), or from 0:00 to 500:00 (Minute: Second)	0:00 (0 hour 00 minutes)

■ **Fixed set point control mode (FIX)**

Symbol	Name	Data range	Factory set value
—	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	—
SV	Set value (SV) in Fixed set point control mode	Setting limiter low to Setting limiter high	0

■ **Manual control mode (MAN)**

Symbol	Name	Data range	Factory set value
MV	PV monitor/ Manual manipulated output value	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 • PID control or Position proportioning PID control (With FBR input): Output limiter low to Output limiter high • Heat/Cool PID control: –(Cool-side output limiter (high)) to + (Heat-side output limiter (high)) For overlap: –105.0 to +105.0 % * * Actual output value is limited by the output limiter function.	–5.0
SV	Set value (SV) in Manual control mode	Setting limiter low to Setting limiter high	0

(2) Monitor mode

Symbol	Name	Data range	Factory set value
PTNTM	Pattern remaining time monitor	From 0:00 to 999:59 (Hour: Minute), or from 0:00 to 999:59 (Minute: Second)	—
RPT.SG	Segment repeat remaining time/ execution time monitor	0 to 9999 times	—
RPT.PN	Pattern repeat remaining time/ execution time monitor	0 to 10000 times 10000: No limit	—
RPT.PR	Total pattern remaining time/ execution time monitor	0 to 10000 times 10000: No limit	—
WAIT	Wait condition monitor	_ Display: Not in wait state □ Display: In wait state □□□ ← Value at SV display Zone wait of the controller Zone wait of the slave Zone wait of the DI	—
EV	Event state monitor	_ Display: OFF □ Display: ON □□□□□□□□ ← Value at SV display Event 1 Event 2 Event 3 Event 4 HBA1 HBA2 LBA	—
TS	Time signal state monitor	_ Display: OFF □ Display: ON □□□□□□□□ ← Value at SV display Time signal 1 Time signal 2 Time signal 3 Time signal 4 Time signal 5 Time signal 6 Time signal 7 Time signal 8	—
CT1	Current transformer 1 (CT1) input value monitor ♣	0.0 to 100.0 A	—
CT2	Current transformer 2 (CT2) input value monitor ♣	0.0 to 100.0 A	—

Symbol	Name	Data range	Factory set value
MV1	Manipulated output value 1 (MV1) [heat-side] monitor	PID control, Heat/Cool PID control: –5.0 to +105.0 % Position proportioning PID control: 0.0 to 100.0 % (Displays the FBR input value)	—
MV2	Manipulated output value 2 (MV2) [cool-side] monitor ♣	–5.0 to +105.0 %	—

B. Operation mode — <MODE (2 seconds)

Symbol	Name	Data range	Factory set value
MODE	Operation mode transfer	RESET (Reset mode) PROG (Program control mode) FIX (Fixed set point control mode) MAN (Manual control mode)	RESET
STEP	Step function	ON: Forward to the next segment in progress. Turns OFF automatically when the Step function is completed.	OFF
SRCH	Search function	ON: Search start OFF: Search stop Turns OFF automatically when the Search function is completed.	OFF
ATU	PID/AT transfer	PID: PID control AT: Autotuning (AT) start When the AT is finished, the control will automatically returns to "PID control."	PID
ATT	Autotuning (AT) with learning function	ON: Autotuning (AT) with learning start OFF: Autotuning (AT) with learning stop Turns OFF automatically when the AT with learning function is completed.	OFF
ILR	Interlock release	ON: Interlock OFF: Interlock release	OFF
LOCK	Set data lock	ON: Set data lock OFF: Set data unlock	OFF

C. Parameter setting mode — (SET) (2 seconds)

Symbol	Name	Data range	Factory set value
PROG	Program setting block		—
PTNNO	Setting pattern number	1 to 99 (Within the maximum pattern number)	1
LEVEL	Segment level	Setting limiter low to Setting limiter high	0
TIME	Segment time	From 0:00 to 500:00 (Hour: Minute), or from 0:00 to 500:00 (Minute: Second)	0:00 (0 hour 00 minutes)
STED	Segment repeat start/end number	Start number: 1 to 99 End number: 1 to 99 Within the maximum segment number	1
RPT.SG	Segment repeat execution time	1 to 9999 times 1: No segment repeat	1
RPT.PN	Pattern repeat execution time	1 to 10000 times 1: No pattern repeat 10000: No limit	0
LNK.PN	Link pattern number	0 to 99 (Within the maximum pattern number) 0: No pattern link	0
END.TM	Pattern end output duration	From 0:00 to 500:00 (Hour: Minute), or from 0:00 to 500:00 (Minute: Second) Output remains ON at 0:00 (Hour: Minute or Minute: Second)	0:00 (0 hour 00 minutes)
TS.GR	Time signal memory group number	0 to 16 0: No assignment	1
PMV.GR	Output program memory group number	0 to (128/Maximum number of segments) Up to 99 0: No assignment	0

PRMEM	Program memory group setting block		—
PTN.NO	Setting pattern number	1 to 99 (Within the maximum pattern number)	1
PID.GR	PID memory group number	0 to 8 0: Level PID	0
EV.GR	Event memory group number	0 to 8 0: Event OFF	1
WT.GR	Wait memory group number	0 to 8 0: Wait OFF	1
SIGNL	Segment signal ♣	0: OFF 1: ON □□□□□□□□ ← Value at SV display Segment signal 1 Segment signal 2 Segment signal 3 Segment signal 4 Segment signal 5 Segment signal 6 Segment signal 7 Segment signal 8	00000000

PID	PID memory group setting block		—
PID.GR	PID memory group number	1 to 8	1
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: 30 V/I: 3.0
I	Integral time [heat-side]	PID control or Heat/Cool PID control: 0 to 3600 seconds or 0.0 to 3600.0 seconds 0 (0.0): PD action Position proportioning PID control: 1 to 3600 seconds or 0.1 to 3600.0 seconds Varies with the setting of the Integral/ Derivative time decimal point position.	240
D	Derivative time [heat-side]	0 to 3600 seconds or 0.0 to 3600.0 seconds 0 (0.0): PI action Varies with the setting of the Integral/ Derivative time decimal point position.	60

Symbol	Name	Data range	Factory set value
EVENT	Event memory group setting block		—
EV.GR	Event memory group number	1 to 8	1
EV1	Event 1 set value (EV1)	Deviation: –Input span to +Input span Process and set value: Input range low to Input range high Manipulated output value (MV1 or MV2): –5.0 to +105.0 %	50
	Event 1 set value (EV1) [high] ♣	–Input span to +Input span	50
EV1'	Event 1 set value (EV1') [low] ♣		–50
EV2	Event 2 set value (EV2)	Same as Event 1 set value (EV1).	50
	Event 2 set value (EV2) [high] ♣	Same as Event 1 set value (EV1) [high].	50
EV2'	Event 2 set value (EV2') [low] ♣	Same as Event 1 set value (EV1') [low].	–50
EV3	Event 3 set value (EV3)	Same as Event 1 set value (EV1).	50
	Event 3 set value (EV3) [high] ♣	Same as Event 1 set value (EV1) [high].	50
EV3'	Event 3 set value (EV3') [low] ♣	Same as Event 1 set value (EV1') [low].	–50
EV4	Event 4 set value (EV4)	Same as Event 1 set value (EV1).	50
	Event 4 set value (EV4) [high] ♣	Same as Event 1 set value (EV1) [high].	50
EV4'	Event 4 set value (EV4') [low] ♣	Same as Event 1 set value (EV1') [low].	–50

Symbol	Name	Data range	Factory set value
PB	PV bias	–Input span to +Input span	0
DF	PV digital filter	0.0 to 100.0 seconds 0.0: Unused	0.0
PR	PV ratio	0.001 to 9.999	1.000
L-CUT	PV low input cut-off ♣	0.00 to 25.00 % of Input span	0.00
O1	OUT1 proportional cycle time ♣	0.1 to 100.0 seconds M: Relay contact output T: Triac output V: Voltage pulse output D: Open collector output Relay contact output and Triac output cannot be selected for OUT3.	M: 20.0 V/T/D: 2.0
O2	OUT2 proportional cycle time ♣		M: 20.0 V/T/D: 2.0 Factory set value No output: 2.0
O3	OUT3 proportional cycle time ♣		V/D: 2.0 Factory set value No output: 2.0

Symbol	Name	Data range	Factory set value
WAIT	Wait memory group setting block		—
WT.GR	Wait memory group number	1 to 8	1
ZONE.H	Wait zone high	TC/RTD inputs: 0 (0.0, 0.00) to 200 (200.0, 200.00) (Unit: °C [°F]) Voltage (V)/Current (I) inputs: 0.0 to 20.0 % of Input span 0 (0.0, 0.00): Wait zone high becomes OFF	0
ZONE.L	Wait zone low	TC/RTD inputs: –200 (–200.0, –199.99) to 0 (0.0, 0.00) (Unit: °C [°F]) Voltage (V)/Current (I) inputs: –20.0 to 0.0 % of Input span 0 (0.0, 0.00): Wait zone low becomes OFF	0
RESTRG	Wait release trigger selection	0: Invalidate 1: Validate □□□□□ ← Value at SV display Zone wait 1 (the controller) Zone wait 2 (all slave controllers) Wait release by digital input (DI) Unused	00001
TM.OUT	Wait time-out set value	From 0:00 to 500:00 (Hour: Minute), or from 0:00 to 500:00 (Minute: Second) 0:00 (Hour: Minute or Minute: Second): Unused	0:00 (0 hour 00 minutes)

Symbol	Name	Data range	Factory set value
TM.SU.G	Time signal memory group setting block		—
TS.GR	Time signal memory group number	1 to 16	1
O1.OUT	Time signal output assignment	1 to 8: Time signal 1 to 8 0: No assignment	0
TS.SN	Start segment of time signal	1 to 99 Within the maximum segment number.	1
TS.TM	Time signal start time	From 0:00 to 500:00 (Hour: Minute), or from 0:00 to 500:00 (Minute: Second)	0:00 (0 hour 00 minutes)
TE.SN	End segment of time signal	1 to 99 Within the maximum segment number.	1
TE.TM	Time signal end time	From 0:00 to 500:00 (Hour: Minute), or from 0:00 to 500:00 (Minute: Second)	0:00 (0 hour 00 minutes)
PRG.MV	Output program memory group setting block ♣		—
PMV.GR	Output program memory group number ♣	1 to (128/Maximum number of segments) Up to 99	1
PMV1	Output program value 1 ♣	–5.0 to +105.0 %	–5.0
PMV2	Output program value 2 ♣	–5.0 to +105.0 %	–5.0
PMV3	Output program value 3 ♣	–5.0 to +105.0 %	–5.0

LV.PID	Level PID setting block		—
LEVL.1	Level PID setting 1	Input range low to Level PID setting 2	Input range high
LEVL.2	Level PID setting 2	Level PID setting 1 to Level PID setting 3	Input range high
LEVL.3	Level PID setting 3	Level PID setting 2 to Level PID setting 4	Input range high
LEVL.4	Level PID setting 4	Level PID setting 3 to Level PID setting 5	Input range high
LEVL.5	Level PID setting 5	Level PID setting 4 to Level PID setting 6	Input range high
LEVL.6	Level PID setting 6	Level PID setting 5 to Level PID setting 7	Input range high
LEVL.7	Level PID setting 7	Level PID setting 6 to Input range high	Input range high

RESET	Reset mode setting block		—
SV	Set value (SV) in Reset mode	Setting limiter low to Setting limiter high	0
MV1	Manipulated output value 1 (MV1) in Reset mode	–5.0 to +105.0 %	–5.0
MV2	Manipulated output value 2 (MV2) in Reset mode ♣	–5.0 to +105.0 %	–5.0
EV.GR	Event memory group number in Reset mode	0 to 8 0: Event OFF	1

FIX	Fixed set point control mode setting block		—
SV	Set value (SV) in Fixed set point control mode	Setting limiter low to Setting limiter high	0
PID.GR	PID memory group number in Fixed set point control mode	0 to 8 0: Level PID	0
EV.GR	Event memory group number in Fixed set point control mode	0 to 8 0: Event OFF	1

MAN	Manual control mode setting block		—
PID.GR	PID memory group number in Manual control mode	0 to 8 0: Level PID	0
EV.GR	Event memory group number in Manual control mode	0 to 8 0: Event OFF	1

EDIT	Editing block		
COPY	Pattern copy	Copy source number: 0 to 99 Copy destination number: 0 to 99 Within the maximum pattern number.	0
CLR	Data clear	All set values in the Parameter setting mode will be initialized after setting 9999 and switching from NO to YES.	0

D. Setup setting mode — (SET)+<MODE

Symbol	Name	Data range	Factory set value
PB	PV bias	–Input span to +Input span	0
DF	PV digital filter	0.0 to 100.0 seconds 0.0: Unused	0.0
PR	PV ratio	0.001 to 9.999	1.000
L-CUT	PV low input cut-off ♣	0.00 to 25.00 % of Input span	0.00
O1	OUT1 proportional cycle time ♣	0.1 to 100.0 seconds M: Relay contact output T: Triac output V: Voltage pulse output D: Open collector output Relay contact output and Triac output cannot be selected for OUT3.	M: 20.0 V/T/D: 2.0
O2	OUT2 proportional cycle time ♣		M: 20.0 V/T/D: 2.0 Factory set value No output: 2.0
O3	OUT3 proportional cycle time ♣		V/D: 2.0 Factory set value No output: 2.0

Symbol	Name	Data range	Factory set value
HbA 1	Heater break alarm 1 (HBA1) set value ♣	CTL-6-P-N: 0.0 to 30.0 A CTL-12-S56-10L-N: 0.0 to 100.0 A 0.0: Unused (Current value monitoring still available)	0.0
HbA2	Heater break alarm 2 (HBA2) set value ♣		0.0
SF.SV	SV selection at Program start	0: Start with the Set value (SV) in the Reset mode. 1: PV start 1 [Time fixed type] 2: PV start 2 [Time saving & ramp holding type] 3: PV start 3 [Time saving & level searching type/with HOLD function at start] 4: PV start 4 [Time saving & level searching type/without HOLD function at start]	2
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 Setting is still effective when using Output program function. 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
Add 1	Device address 1 ♣	0 to 99	RKC communication: 0 Modbus: 1
bPS 1	Communication speed 1 ♣	2400: 2400 bps 4800: 4800 bps 9600: 9600 bps 19200: 19200 bps 38400: 38400 bps 57600: 57600 bps	19200
bIT 1	Data bit configuration 1 ♣	Refer to Data bit configuration table	8N1
INT 1	Interval time 1 ♣	0 to 250 ms	10
Add2	Device address 2 ♣	0 to 99	0
bPS2	Communication speed 2 ♣	9600: 9600 bps 19200: 19200 bps 38400: 38400 bps	19200

Data bit configuration table

Symbol	Data bit	Parity bit	Stop bit
8N1 *	8	None	1
8N2 *	8	None	2
8E1 *	8	Even	1
8E2 *	8	Even	2
8o1	8	Odd	1
8o2	8	Odd	2
7N1	7	None	1
7N2	7	None	2
7E1	7	Even	1
7E2	7	Even	2
7o1	7	Odd	1
7o2	7	Odd	2

* Available for only Modbus

E. Engineering Mode (SET)+<MODE (2 seconds)

Symbol	Name	Data range	Factory set value
F 10.	Function block 10		—
dSoP	PV flashing display at input error	0: Flashing at input error 1: No flashing at input error	0
ddrP	Dot monitor type	0: Program pattern type 1: Output bar graph type	0
dSCH	Dot monitor scale high	Dot monitor low to Maximum value of the selected input range Validate the Dot monitor type for the Program pattern type.	Input range high
dSCL	Dot monitor scale low	Minimum value of the selected input range to Dot monitor high Validate the Dot monitor type for the Program pattern type.	Input range low
ALC 1	ALM lamp light condition 1	0: No lighting 1: Lighting 00000 ← Value at SV display Event 1 Event 2 Event 3 Event 4 Unused	1111
ALC2	ALM lamp light condition 2	0: No lighting 1: Lighting 00000 ← Value at SV display HBA1 HBA2 LBA Self-diagnostic error Unused	0011
ALC3	ALM lamp light condition 3	0: No lighting 1: Lighting 00000 ← Value at SV display FAIL Host communication error Intercontroller communication error Unused	000
ddEY	Dot monitor at ALM lamp light	0: Normal display 1: Red flashing display	0
rSC 1	TS lamp light condition 1	0: No lighting 1: Lighting 00000 ← Value at SV display TS1 TS2 TS3 TS4 Unused	1111
rSC2	TS lamp light condition 2	0: No lighting 1: Lighting 00000 ← Value at SV display TS5 TS6 TS7 TS8 Unused	1111
oFFTM	Power saving mode duration	0 to 60 minutes (0: Lights at all times)	0

F 11.	Function block 11		—
KTYP 1	RESET key type	0: Invalid 1: Press once 2: Press twice 3: Press and hold Key type is not available for the PTN END key.	1
KTYP2	RUN key type		1
KTYP3	FIX key type		1
KTYP4	MAN key type		1
KTYP5	HOLD key type		1
KTYP6	STEP key type		3

Symbol	Name	Data range	Factory set value
F21.	Function block 21		—
INP	Input type	Voltage (low) input group 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 22: Voltage (low) 0 to 10 mV DC 23: Voltage (low) 0 to 100 mV DC 24: Voltage (low) 0 to 1 V DC 25: Voltage (low) −10 to +10 mV DC 26: Voltage (low) −100 to +100 mV DC 27: Voltage (low) −1 to +1 V DC Voltage (high) input group 17: Voltage (high) 0 to 10 V DC 18: Voltage (high) 0 to 5 V DC 19: Voltage (high) 1 to 5 V DC 20: Voltage (high) −5 to +5 V DC 21: Voltage (high) −10 to +10 V DC Current input group 15: Current 0 to 20 mA DC 16: Current 4 to 20 mA DC For the selecting procedure, refer to the **PF900/PF901 Installation Manual** or the **PF900/PF901 Instruction Manual (P. 6-4)**.	Based on model code. When not specifying: 0
UNIT	Display unit	0: °C 1: °F	0
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: Only 0 or 1 can be set. RTD inputs: From 0 to 2 can be set. Voltage (V)/Current (I) inputs: From 0 to 4 can be set.	Based on model code. When not specifying: 1
PGSH	Input range high	TC/RTD inputs: Input range low to Maximum value of the selected input range Voltage (V)/Current (I) inputs: −19999 to +32000 Varies with the setting of the Decimal point position.	TC/RTD: Maximum value of the selected input range V/I: 100.0
PGSL	Input range low	TC/RTD inputs: Minimum value of the selected input range to Input range high Voltage (V)/Current (I) inputs: −19999 to +32000 Varies with the setting of the Decimal point position.	TC/RTD: Minimum value of the selected input range V/I: 0.0
PoV	Input error determination point (high)	Input range low − (5 % of Input span) to Input range high + (5 % of Input span) Maximum setting value of Input error determination point (high): 32767 (excluding decimal point)	Input range high + (5 % of Input span)
PUN	Input error determination point (low)	Minimum setting value of Input error determination point (low): −19999 (excluding decimal point)	Input range low − (5 % of Input span)
boS	Burnout direction	0: Upscale 1: Downscale Valid only when the Voltage (low) input group selected.	0
SQR	Square root extraction	0: Used 1: Unused	0
PFRQ	Power supply frequency	0: 50 Hz 1: 60 Hz	0
SMP	Sampling cycle	0: 50 ms 1: 100 ms 2: 250 ms	1
Pb	PV bias	−Input span to +Input span	0
dF	PV digital filter	0.0 to 100.0 seconds 0.0: Unused	0.0
PR	PV ratio	0.001 to 9.999	1.000
L-CUT	PV low input cut-off	0.00 to 25.00 % of Input span	0.00

F23.	Function block 23		—
dI SL	Digital input (DI) assignment	0 to 5 Refer to the table of DI1 to DI6 (Optional) and DI7 to DI11 (Standard).	Based on model code. When not specifying: 0
dI PTN	Pattern input method of Digital input (DI)	0: Set Pattern number by using the Pattern set input. Pattern number = Binary number of DI +1 1: Set Pattern number by switching the contact input. Pattern number = Binary number of DI +1 2: Set Pattern number by using the Pattern set input. Pattern number = Binary number of DI 3: Set Pattern number by switching the contact input. Pattern number = Binary number of DI For the switching method of Pattern number, refer to the **PF900/PF901 Instruction Manual (P. 6-14** and **P. 6-23)**.	0

DI1 to DI6 (Optional)

	DI1	DI2	DI3	DI4	DI5	DI6
0	PTN1	PTN2	PTN4	PTN8	PTN16	P.SET
1	PTN1	PTN2	PTN4	PTN8	PTN16	P.SET
2	WAIT	WAIT	WAIT	WAIT	WAIT	WAIT
3	WAIT	WAIT	WAIT	WAIT	WAIT	WAIT
4	WAIT	WAIT	WAIT	WAIT	WAIT	WAIT
5	WAIT	WAIT	WAIT	WAIT	WAIT	WAIT

DI7 to DI11 (Standard)

	DI7	DI8	DI9	DI10	DI11
0	RESET	RUN	STEP	HOLD	PTN32
1	RESET	RUN	STEP	PTN32	PTN64
2	PTN1	PTN2	PTN4	PTN8	P.SET
3	PTN1	PTN2	PTN4	PTN8	PTN16
4	RESET	RUN	STEP	HOLD	D/R
5	RESET	RUN	STEP	HOLD	PTN_INC

PTN1 to PTN64: Pattern number switch
P.SET: Pattern set
WAIT: Wait state release
RESET: Reset mode setting
RUN: Program control mode setting
STEP: Step function
HOLD: Hold function
D/R: Direct/Reverse action switching
PTN_INC: Pattern increment

F30.	Function block 30		—
ExoUT	OUT2, OUT3 Energized/ De-energized	0: Energized 1: De-energized 00000 ← Value at SV display OUT2 OUT3 Unused	00
Exdo 1	DO1 to DO4 Energized/ De-energized	0: Energized 1: De-energized 00000 ← Value at SV display DO1 DO2 DO3 DO4 Unused	0000
Exdo2	DO5 to DO8 Energized/ De-energized	0: Energized 1: De-energized 00000 ← Value at SV display DO5 DO6 DO7 DO8 Unused	0000

Symbol	Name	Data range	Factory set value
Exdo3	DO9 to DO12 Energized/ De-energized	0: Energized 1: De-energized 00000 ← Value at SV display DO9 DO10 DO11 DO12 Unused	0000
RAo	Transmission output action in Reset mode	0: Action stop 1: Action continued 00000 ← Value at SV display OUT2 OUT3 Unused	00
REV	Event action in Reset mode	0: Action stop 1: Action continued 00000 ← Value at SV display Event 1 Event 2 Event 3 Event 4 HBA1 or HBA2	00000
PEdAo	Transmission output action at Pattern end	0: Action stop 1: Action continued 00000 ← Value at SV display OUT2 OUT3 Unused Action of OUT1 stops or continues based on the setting of Control action selection at Pattern end.	00
PEdEV	Event action at Pattern end	0: Action stop 1: Action continued 00000 ← Value at SV display Event 1 Event 2 Event 3 Event 4 HBA1 or HBA2	00000

F31.	Function block 31		—
LoCC 1	OUT1 assignment	0: Manipulated output value 1 (MV1) [For Control output] [PID control or Heat/Cool PID control: Heat-side output Position proportioning PID control: Open-side output] 1: Output program value 1 [For Control output or Transmission output (Voltage/Current output)]	0

F32.	Function block 32		—
LoCC2	OUT2 assignment	Voltage output or Current output (Control output: 1, 2, 7 Transmission output: 3 to 7): 0: None 1: Manipulated output value 1 (MV1) [Feedback resistance (FBR) input value when FBR input is specified with the Position proportioning PID control.] 2: Manipulated output value 2 (MV2) [Cool-side output at Heat/Cool PID control] 3: Measured value (PV) 4: Deviation value (DEV) 5: Set value (SV) monitor 6: Segment time (percentage basis) 7: Output program value 2 Manipulated output value (MV1 or MV2) may be used as a transmission output. Relay contact output, Voltage pulse output, Triac output or Open collector output (Control output: 21, 22, 23 Event output: 24 to 53): 20: None 21: Manipulated output value 1 (MV1) PID control or Heat/Cool PID control: Heat-side output [Feedback resistance (FBR) input value when FBR input is specified with the Position proportioning PID control.] 22: Manipulated output value 2 (MV2) Heat/Cool PID control: Cool-side output Position proportioning PID control: Close-side output 23: Output program value 2 24 to 31: Time signal 1 to Time signal 8 32 to 35: Event 1 to Event 4 36: HBA1 37: HBA2 38: Logical *OR* of HBA1 and HBA2 39: LBA 40: Input error state 41: Program control mode (RUN) state 42: Fixed set point control mode (FIX) state 43: Manual control mode (MAN) state 44: Ramp state 45: Soak state 46: Hold state 47: Wait state 48: Pattern end signal 49: Autotuning (AT) state 50: FAIL state 51: Host communication error 52: Intercontroller communication error 53: Feedback resistance (FBR) input error	Heat/Cool PID control: 22 or 2 (varies with output type) Position proportioning PID control: 22 Other control method: 0 or 20 (varies with output type) When the OUT2 is not provided: 0
AHS2	OUT2 transmission output scale high	Varies with OUT2 assignment. Measured value (PV), Set value (SV) monitor: Input range low to Input range high Deviation value (DEV): −Input span to +Input span (Within −19999 to +32000 [excluding decimal point]) Output program value 2: Fixed at 100.0 % (scaling is not available) Segment time (percentage basis): Fixed at 100.0 % (scaling is not available) When using Manipulated output value (MV1 or MV2) as a transmission output: Fixed at 100.0 % (scaling is not available)	Measured value (PV), Set value (SV) monitor: Input range high Deviation value (DEV): +Input span Other: 100.0
ALS2	OUT2 transmission output scale low	Varies with OUT2 assignment. Measured value (PV), Set value (SV) monitor: Input range low to Input range high Deviation value (DEV): −Input span to +Input span (Within −19999 to +32000 [excluding decimal point]) Output program value 2: Fixed at 0.0 % (scaling is not available) Segment time (percentage basis): Fixed at 0.0 % (scaling is not available) When using Manipulated output value (MV1 or MV2) as a transmission output: Fixed at 0.0 % (scaling is not available)	Measured value (PV), Set value (SV) monitor: Input range low Deviation value (DEV): − Input span Other: 0.0

F33.	Function block 33		—
LoCC3	OUT3 assignment	The data range is same as OUT2 assignment. However, No. 7 or 23 becomes output program value 3. There are no relay contact output and triac output in OUT3. No control output when No. 21 or 22 is selected at Position proportioning PID control.	0 or 20 (varies with output type) When the OUT3 is not provided: 0
AHS3	OUT3 transmission output scale high	Varies with OUT3 assignment. The data range is the same as the OUT2 transmission output scale high.	
ALS3	OUT3 transmission output scale low	Varies with OUT3 assignment. The data range is the same as the OUT2 transmission output scale low.	

F34.	Function block 34		—
Ldo 1	DO1 assignment	0: None 1 to 8: Time signal 1 to Time signal 8 9 to 12: Event 1 to Event 4 13: HBA1 14: HBA2 15: Logical *OR* of HBA1 and HBA2 16: LBA 17: Input error state 18: Program control mode (RUN) state 19: Fixed set point control mode (FIX) state 20: Manual control mode (MAN) state 21: Ramp state 22: Soak state 23: Hold state 24: Wait state 25: Pattern end signal 26: Autotuning (AT) state 27: FAIL state 28: Host communication error 29: Intercontroller communication error 30: Feedback resistance (FBR) input error	Based on model code. When not specifying: DO1: 9 DO2: 10 DO3: 1 DO4: 25 When specifying 12 points of DO at ordering: DO5 to DO12: 1 to 8 When specifying 4 points of DO at ordering: DO5 to DO12: 0
Ldo2	DO2 assignment		
Ldo3	DO3 assignment		
Ldo4	DO4 assignment		
Ldo5	DO5 assignment		
Ldo6	DO6 assignment		
Ldo7	DO7 assignment		
Ldo8	DO8 assignment		
Ldo9	DO9 assignment		
Ldo 10	DO10 assignment		
Ldo 11	DO11 assignment		
Ldo 12	DO12 assignment		

F41.	Function block 41		—
ES 1	Event 1 type	0: None 1: Deviation high [1] 2: Deviation low [1] 3: Deviation high/low [1] 4: Deviation high/low (Individual high and low setting) [1] 5: Band [1] 6: Band (Individual high and low setting) [1] 7: Process high [1] 8: Process low [1] 9: SV high 10: SV low 11: MV1 high [heat-side] [1, 2] 12: MV1 low [heat-side] [1, 2] 13: MV2 high [cool-side] [1] 14: MV2 low [cool-side] [1] [1] Event hold action is available. [2] If there is Feedback resistance (FBR) input in Position proportioning PID control, set to the FBR input value.	Based on model code. When not specifying: 1
EHo 1	Event 1 hold action	0: OFF 1: Hold action ON [when power turned on; when Event start (SV changed)]	Based on model code. When not specifying: 0
EH 1	Event 1 differential gap	Deviation, process or set value: 0 to Input span (Unit: °C [°F]) MV: 0.0 to 110.0 %	TC/RTD: 2 V/I: 0.2 MV: 0.2
Eb o 1	Event 1 output action at input error	0 to 4 Refer to the selection table of Event output action at input error.	0
EMT 1	Event 1 timer	0.0 to 600.0 seconds	0.0
EIL 1	Event 1 interlock	0: Unused 1: Used 2: Activate Interlock and switch to the Manual control mode to produce Manipulated output at Input error.	0
E 1oN	Event 1 minimum ON time	0.0 to 600.0 seconds	0.0
E 1oFF	Event 1 minimum OFF time	0.0 to 600.0 seconds	0.0

Selection table of Event output action at input error

	When PV reaches Input error determination point (high) or higher temperature:	When PV reaches Input error determination point (low) or lower temperature:
0	Conforms to Event action	Conforms to Event action
1	ON	Conforms to Event action
2	Conforms to Event action	ON
3	ON	ON
4	OFF	OFF

F42.	Function block 42		—
ES2	Event 2 type	Same as Event 1.	Based on model code. When not specifying: 2
EHo2	Event 2 hold action	Same as Event 1.	Based on model code. When not specifying: 1
EH2	Event 2 differential gap	Same as Event 1.	
Eb o2	Event 2 output action at input error		
EMT2	Event 2 timer		
EIL2	Event 2 interlock		
E2oN	Event 2 minimum ON time		
E2oFF	Event 2 minimum OFF time		

F43.	Function block 43		—
ES3	Event 3 type	Same as Event 1.	Based on model code. When not specifying: 0
EHo3	Event 3 hold action	Same as Event 1.	Based on model code. When not specifying: 0
EH3	Event 3 differential gap	Same as Event 1.	
Eb o3	Event 3 output action at input error		
EMT3	Event 3 timer		
EIL3	Event 3 interlock		
E3oN	Event 3 minimum ON time		
E3oFF	Event 3 minimum OFF time		

F44.	Function block 44		—
ES4	Event 4 type	Same as Event 1.	Based on model code. When not specifying: 0
EHo4	Event 4 hold action	Same as Event 1.	Based on model code. When not specifying: 0
EH4	Event 4 differential gap	Same as Event 1.	
Eb o4	Event 4 output action at input error		
EMT4	Event 4 timer		
EIL4	Event 4 interlock		
E4oN	Event 4 minimum ON time		
E4oFF	Event 4 minimum OFF time		

F45.	Function block 45		—
CTR 1	CT1 ratio	0 to 9999	CTL-6-P-N: 800 CTL-12-S56: 1000 When not specifying: 800
CTA 1	CT1 assignment	0: None 1: OUT1 2: OUT2 3: OUT3	When specifying CT at ordering: 1 When not specifying: 0

Symbol	Name	Data range	Factory set value
Hbc 1	Number of heater break alarm 1 (HBA1) delay times	0 to 255 times	5
HbA 1	Heater break alarm 1 (HBA1) set value	CTL-6-P-N: 0.0 to 30.0 A CTL-12-S56-10L-N: 0.0 to 100.0 A 0.0: Unused (Current value monitoring still available)	0.0
Hbi L 1	Heater break alarm 1 (HBA1) interlock	0: Unused 1: Used 2: Activate Interlock and switch to the Manual control mode to produce Manipulated output at Input error.	0
F46.	Function block 46		—
CrA2	CT2 ratio	Same as Function block 45 (F45.).	CTL-6-P-N: 800 CTL-12-S56: 1000 When not specifying: 800
CrA2	CT2 assignment		When specifying CT at ordering: 2 When not specifying: 0
Hbc2	Number of heater break alarm 2 (HBA2) delay times		5
HbA2	Heater break alarm 2 (HBA2) set value		0.0
Hbi L2	Heater break alarm 2 (HBA2) interlock		0
F47.	Function block 47		—
LbASL	Control loop break alarm (LBA) selection	0: Without LBA 1: With LBA	0
Lbi L	Control loop break alarm (LBA) interlock	0: Unused 1: Used 2: Activate Interlock and switch to the Manual control mode to produce Manipulated output at Input error.	0
F50.	Function block 50		—
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 gain linear type) 5: Brilliant II Position proportioning PID control (reverse action) 6: Brilliant II Position proportioning PID control (direct action)	Based on model code. When specifying FBR input at ordering: 5 When initial setting is not specifying: 1
Pd	Hot/Cold start	0: Hot start 1 1: Hot start 2 2: Cold start 3: Reset start	0
PdR	Start determination point	0 to Input span (The unit is the same as input value.)	3 % of Input span
AoVE	Action (high) at input error	0: Normal control (with the latest output) 1: Manipulated output value at input error	0
AUNE	Action (low) at input error		0
PSM	Manipulated output value at input error	PID control: −5.0 to +105.0 % Heat/Cool PID control: −105.0 to +105.0 % Actual output values become those restricted by the Output limiter.	0.0
EndP	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 Setting is still effective when using Output program function. 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
RSS.AU	Intensity factor of Ramp/Soak stabilizer	0.0 to 1.0 0.0: Unused	0.5
r 1	OUT1 proportional cycle time	0.1 to 100.0 seconds M: Relay contact output T: Triac output V: Voltage pulse output D: Open collector output	M: 20.0 V/T/D: 2.0
o 1.rM	OUT1 minimum ON/OFF time of proportioning cycle	0 to 1000 ms	0
r2	OUT2 proportional cycle time	0.1 to 100.0 seconds M: Relay contact output T: Triac output V: Voltage pulse output D: Open collector output	M: 20.0 V/T/D: 2.0 When the OUT2 is not provided: 2.0
o2.rM	OUT2 minimum ON/OFF time of proportioning cycle	0 to 1000 ms	0
r3	OUT3 proportional cycle time	0.1 to 100.0 seconds V: Voltage pulse output D: Open collector output	V/D: 2.0 When the OUT3 is not provided: 2.0
o3.rM	OUT3 minimum ON/OFF time of proportioning cycle	0 to 1000 ms	0

Symbol	Name	Data range	Factory set value
F52.	Function block 52		—
Arb	AT bias	−Input span to +Input span (The unit is the same as input value.)	0
ArHS	AT differential gap time	0.0 to 100.0 seconds	10.0
ArrS	AT time signal action	0: Time signal OFF 1: Time signal ON	0
ArC	AT cycles	0: 1.5 cycles 1: 2.0 cycles 2: 2.5 cycles 3: 3.0 cycles	0
ArON	Output value with AT turned on	Output value with AT turned off to +105.0 % Actual output values become those restricted by the Output limiter. Position proportioning PID control: Becomes valid only when there is Feedback resistance (FBR) input and it does not break (high limit of Feedback resistance input at AT).	105.0
ArOF	Output value with AT turned off	−105.0 % to Output value with AT turned on Actual output values become those restricted by the Output limiter. Position proportioning PID control: Becomes valid only when there is Feedback resistance (FBR) input and it does not break (high limit of Feedback resistance input at AT).	−105.0
ArrR	ATwith learning function at ramp segment	0: No AT with learning function at ramp segment 1: Conduct AT with learning function at ramp segment	0
F53.	Function block 53		—
YbR	Action at feedback resistance (FBR) input error	0: Action depending on the Valve action at Reset mode 1: Control action continued	0
PoS	Feedback adjustment	AdJ: Adjustment end oPEN: During adjustment on the open-side CLoSE: During adjustment on the close-side To start Feedback adjustment, press and hold the ◁ key for 5 seconds or more at AdJ display. Err display: Adjustment error When FBR input is not specified, only AdJ displays.	AdJ
MoT	Control motor time	5 to 1000 seconds	10
oLA	Integrated output limiter	0.0 to 200.0 % of Control motor time 0.0: OFF Invalidate when Feedback resistance (FBR) input is selected.	150.0
VAL	Valve action in Reset mode	0: Open-side output OFF, Close-side output OFF 1: Open-side output OFF, Close-side output ON 2: Open-side output ON, Close-side output OFF Invalidate when Feedback resistance (FBR) input is selected.	0
F60.	Function block 60		—
CMP 1	Communication 1 protocol	0: RKC communication 1: Modbus	Based on model code.
Add 1	Device address 1	RKC communication: 0 to 99 Modbus: 1 to 99	RKC communication: 0 Modbus: 1
bPS 1	Communication speed 1	2400: 2400 bps 4800: 4800 bps 9600: 9600 bps 19200: 19200 bps 38400: 38400 bps 57600: 57600 bps	19200
bit 1	Data bit configuration 1	Refer to Data bit configuration table	8N1
INT 1	Interval time 1	0 to 250 ms	10

Data bit configuration table

Symbol	Data bit	Parity bit	Stop bit
8N1 *	8	None	1
8N2 *	8	None	2
8E1 *	8	Even	1
8E2 *	8	Even	2
8o1	8	Odd	1
8o2	8	Odd	2
7N1	7	None	1
7N2	7	None	2
7E1	7	Even	1
7E2	7	Even	2
7o1	7	Odd	1
7o2	7	Odd	2

* Available for only Modbus

Symbol	Name	Data range	Factory set value
F61.	Function block 61		—
SLV.SL	Slave controller	0: FB series: FB100/400/900 1: RB series: RB100/400/500/700/900 2: PF900/901	0
SLV.No	Number of slave unit	0 to 4	0
Add2	Device address 2	0 to 99	0
bPS2	Communication speed 2	9600: 9600 bps 19200: 19200 bps 38400: 38400 bps	19200
H.ERrM	Host communication error judgment time	0 to 600 seconds 0: Unused	10
C.ERrM	Intercontroller communication error judgment time	0 to 600 seconds 0: Real-time error	10

Symbol	Name	Data range	Factory set value
F71.	Function block 71		—
SLH	Setting limiter high	Setting limiter low to Input range high (The unit is the same as input value.)	Input range high
SLL	Setting limiter low	Input range low to Setting limiter high (The unit is the same as input value.)	Input range low
F80.	Function block 80		—
SrSV	SV selection at Program start	0: Start with the Set value (SV) in the Reset mode 1: PV start 1 [Time fixed type] 2: PV start 2 [Time saving & ramp holding type] 3: PV start 3 [Time saving & level searching type/ With HOLD function at start] 4: PV start 4 [Time saving & level searching type/ Without HOLD function at start]	2
SrWr	Wait memory group number at Program start	0: Wait OFF 1 to 8: Wait memory 1 to Wait memory 8	0
PRTYP	Program setting type	0: Batch setting type 1: Partial setting type	1
rSTYP	Signal type	0: Time signal type 1: Segment signal type	0
TM.SL	Set time unit	0: Hour : Minute 1: Minute : Second	0
PNxSN	Maximum pattern/ segment number	Maximum pattern number: 1 to 99 Maximum segment number: 1 to 99 Maximum pattern number × Maximum segment number = 1024 at maximum	Maximum pattern number: 32 Maximum segment number: 32

F. Initial level engineering mode

(SET) + ◁MODE + ▽ (2 seconds)

Parameters of the Initial level engineering mode are in the function blocks: F10, F50, F52, F53, F60, F61 and F80. Parameters of the Initial level engineering mode display in the Engineering mode.

Symbol	Name	Data range	Factory set value
F 10.	Function block 10		—
RPT.SL	Repeat remaining process/program progression display selection	0: Segment repeat remaining time 1: Segment repeat execution time	0
UNT.SL	Unit display	0: Conform to the input type TC/RTD iputs: °C or °F Voltage (V)/Current (I) inputs: No unit display 1: No unit display 2: % 3: °C 4: °F	0
F50.	Function block 50		—
1 d.dP	Integral/Derivative time decimal point position	0: 1 second setting (No decimal place) 1: 0.1 seconds setting (One decimal place)	0
d.GA	Derivative gain	0.1 to 10.0	6.0
d.rP	Derivative action	0: Measured value derivative 1: Deviation derivative	0
US	Undershoot suppression factor	0.000 to 1.000	Water cooling: 0.100 Air cooling: 0.250 Cooling gain linear type: 1.000
dbAA	Overlap/Deadband reference point	0.0 to 1.0 0.0: Reference in the heat-side 1.0: Reference in the cool-side	0.0
F52.	Function block 52		—
PLH	Proportional band limiter (high) [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	TC/RTD: Input span V/I: 1000.0
PLL	Proportional band limiter (low) [heat-side]		TC/RTD: 0 V/I: 0.0
1 LH	Integral time limiter (high) [heat-side]	PID control or Heat/Cool PID control: 0 to 3600 seconds or 0.0 to 3600.0 seconds Position proportioning PID control: 1 to 3600 seconds or 0.1 to 3600.0 seconds Varies with the setting of the Integral/ Derivative time decimal point position.	3600 PID control, Heat/Cool PID control: 0 Position proportioning PID control: 1
1 LL	Integral time limiter (low) [heat-side]		
dLH	Derivative time limiter (high) [heat-side]	0 to 3600 seconds or 0.0 to 3600.0 seconds Varies with the setting of the Integral/ Derivative time decimal point position.	3600
dLL	Derivative time limiter (low) [heat-side]		0
PcLH	Proportional band limiter (high) [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: Input span V/I: 1000.0
PcLL	Proportional band limiter (low) [cool-side]		TC/RTD: 1 V/I: 0.1
1 cLH	Integral time limiter (high) [cool-side]	0 to 3600 seconds or 0.0 to 3600.0 seconds Varies with the setting of the Integral/ Derivative time decimal point position.	3600
1 cLL	Integral time limiter (low) [cool-side]		0
dcLH	Derivative time limiter (high) [cool-side]	0 to 3600 seconds or 0.0 to 3600.0 seconds Varies with the setting of the Integral/ Derivative time decimal point position.	3600
dcLL	Derivative time limiter (low) [cool-side]		0
PAu	Proportional band adjusting factor [heat-side]	0.01 to 10.00	1.00
1 Au	Integral time adjusting factor [heat-side]		1.00
dAu	Derivative time adjusting factor [heat-side]		1.00
PcAu	Proportional band adjusting factor [cool-side]		1.00
1 cAu	Integral time adjusting factor [cool-side]		1.00
dcAu	Derivative time adjusting factor [cool-side]		1.00
F53.	Function block 53		—
YASo	Action at saturated output	0: Invalid 1: Valid	0
F60.	Function block 60		—
CMRM 1	Communication 1 error (Monitor item)	0: Normal 1: Overrun error 2: Parity error 4: Framing error 8: Receive buffer overflow 16: Data not received When multiple errors occur, displays sum total of each error value.	0
CMro 1	Interval time-out1	0 to 100 ms	0
F61.	Function block 61		—
CMRM2	Communication 2 error (Monitor item)	0: Normal 1: Overrun error 2: Parity error 4: Framing error 8: Receive buffer overflow 16: Data not received When multiple errors occur, displays sum total of each error value.	0
L.ERR	Action at Link error	0: Reset 1: Continue	0
S.SC1	Communication start time	2 to 100 seconds	3
SLV.R 1	Slave 1 ratio	0.001 to 9.999	1.000
SLV.R2	Slave 2 ratio		1.000
SLV.R3	Slave 3 ratio		1.000
SLV.R4	Slave 4 ratio		1.000
SLV.b 1	Slave 1 bias	−1000.0 to +1000.0 Varies with the setting of the Decimal point position.	0.0
SLV.b2	Slave 2 bias		0.0
SLV.b3	Slave 3 bias		0.0
SLV.b4	Slave 4 bias		0.0
Add.SE	Set memory area switching address	0000H to FFFFH	0500
Add.RN	Control memory area switching address		0024
Add.SS	SV address of set memory area		0507
Add.EP	EEPROM mode setting address		FFFF
Add.RS	RUN/STOP setting address		0023
F80.	Function block 80		—
PE.SL	Pattern end output action at Pattern repeat/ Pattern link	0: OFF 1: ON (0.5 seconds) 000 ◀ Value at SV display └Pattern end output is ON at Pattern repeat. └Pattern end output is ON at Total pattern repeat. └Pattern end output is ON at Pattern link.	000

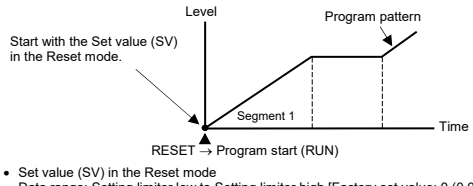
3. PROGRAM CONTROL START SELECTION

Segment level and action at Program control start are selectable from the following 5 types of SV at Program start in the Setup setting mode.

- Start with the Set value (SV) in the Reset mode.
- PV start 1 [Time fixed type]
- PV start 2 [Time saving & ramp holding type] (Factory set value)
- PV start 3 [Time saving & level searching type/with HOLD function at start]
- PV start 4 [Time saving & level searching type/without HOLD function at start]

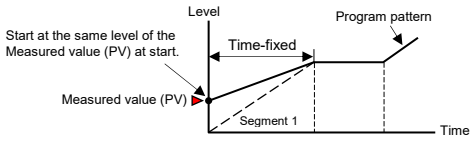
For details, refer to the **PF900/PF901 Instruction Manual (P. 6-148)**.

■ Start with the Set value (SV) in the Reset mode



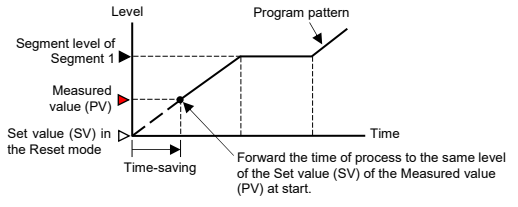
- Set value (SV) in the Reset mode
  Data range: Setting limiter low to Setting limiter high [Factory set value: 0 (0.0)]

■ PV start 1 [Time fixed type]

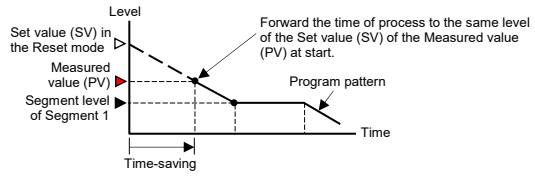


■ PV start 2 [Time saving & ramp holding type] (Factory set value)

- **When Set value (SV) in the Reset mode is smaller than the Segment level of the Segment 1**



- **When Set value (SV) in the Reset mode is larger than the Segment level of the Segment 1**

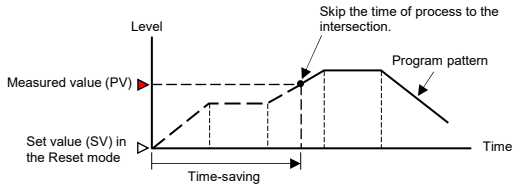


■ PV start 3/PV start 4 [Time saving & level searching type]

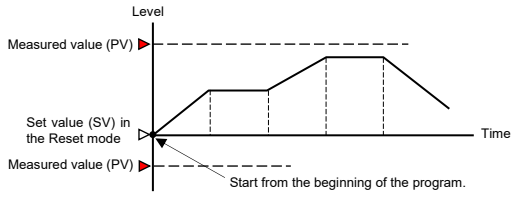
Search locates the intersection of the Measured value (PV) at start and Set value (SV) in the program pattern to skip time of process until the PV and the SV intersect.

Differences between PV start 3 and PV start 4:
- PV start 3: Starts in Hold state
- PV start 4: Starts in RUN state (without Hold)

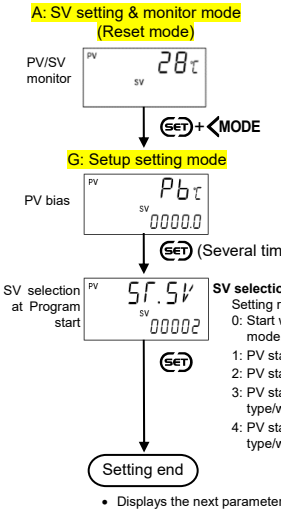
- **When the intersection is found:**



- **When no intersection was found:**



■ SV selection at Program start



SV selection at Program start
Setting range
0: Start with the Set value (SV) in the Reset mode.
1: PV start 1 [Time fixed type]
2: PV start 2 [Time saving & ramp holding type]
3: PV start 3 [Time saving & level searching type/with HOLD function at start]
4: PV start 4 [Time saving & level searching type/without HOLD function at start]

- Displays the next parameter.
- Press the **MONI** key to return to the PV/SV monitor.

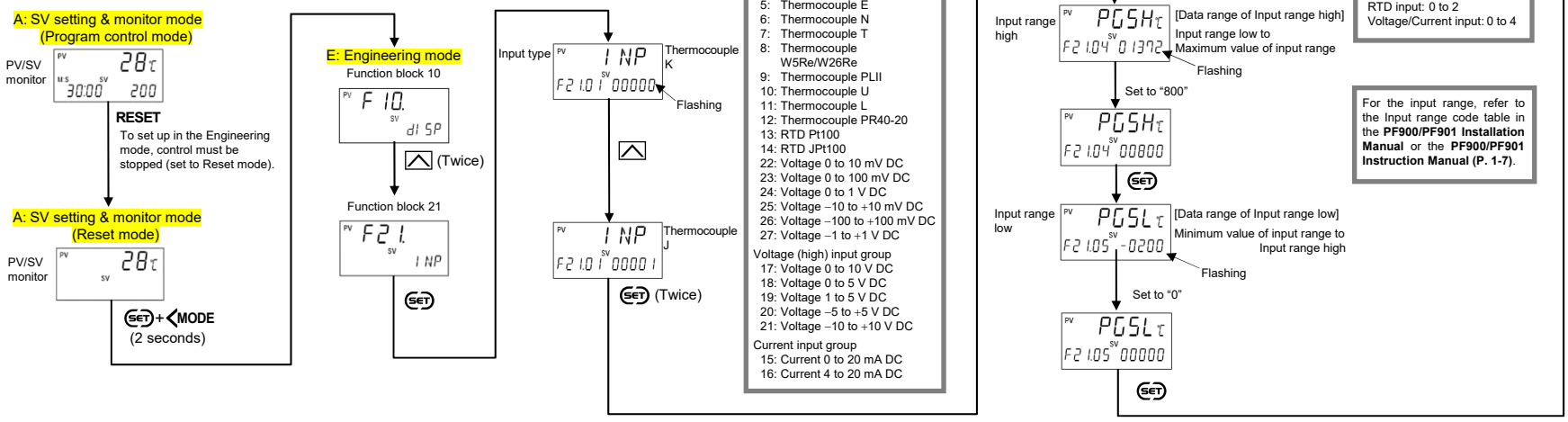
4. HOW TO CHANGE THE INPUT TYPE

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

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

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

To change the input type from a thermocouple type K to type J, setting the input select switch is not required because both of these input types belong to the same input group. If they belong to different input groups, you have to change the input select switch.
For the details of the Input select switch, refer to the **PF900/PF901 Installation Manual** or the **PF900/PF901 Instruction Manual (P. 6-4)**.

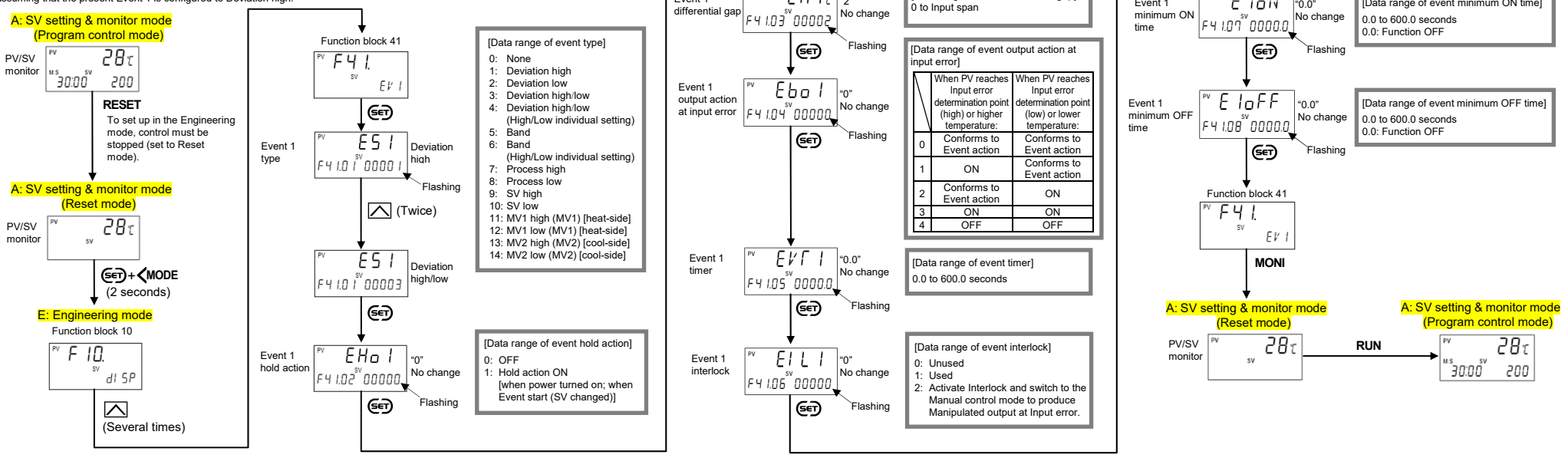


5. HOW TO CHANGE THE EVENT TYPE

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

Changing Event 1 to Deviation high/low

Assuming that the present Event 1 is configured to Deviation high.



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 value ☆: Event differential gap)
* Segment level and Set value (SV) in Fixed set point control mode

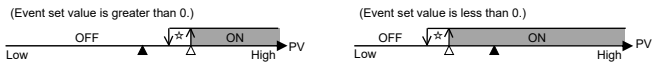
In the following explanation, the "Set value (SV)" means "Segment level SV" and "Set value (SV) in Fixed set point control mode."

For details, refer to the **PF900/PF901 Instruction Manual (P. 6-61)**.

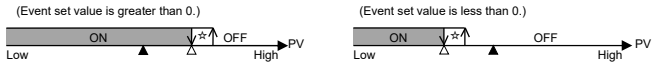
● Deviation action (High, Low, High/Low, Band)

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

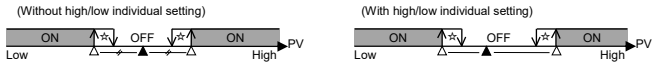
Deviation high



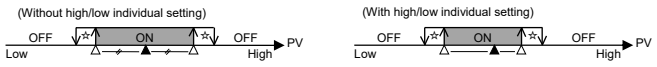
Deviation low



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



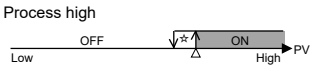
Band
Two types of Band action are available.



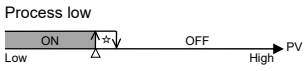
● Input value action (High, Low)

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

Process high



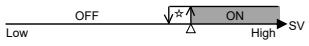
Process low



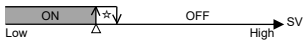
● Set value action (High, Low)

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

SV high



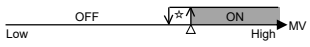
SV low



● Manipulated output value action (High, Low)

When the Manipulated output value 1 (MV1) or Manipulated output value 2 (MV2) reaches the Event set value, Event ON occurs.

MV1 high [heat-side]
MV2 high [cool-side]



MV1 low [heat-side]
MV2 low [cool-side]

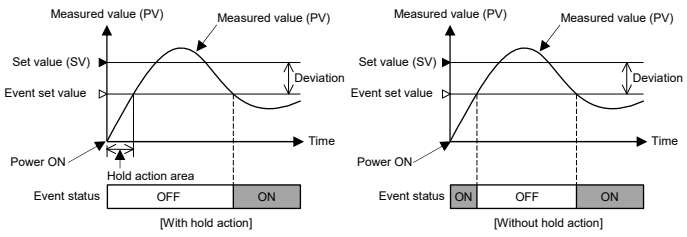
Event hold action

● 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.
- At power ON
- At Event ON

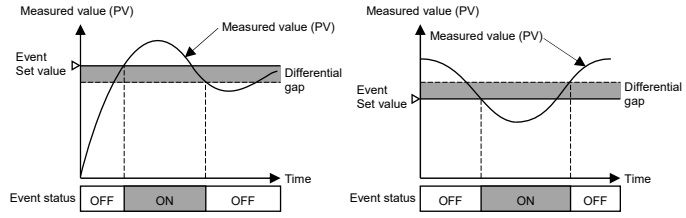
"At Event ON" refers to the following circumstances
– Event occurrence condition is satisfied after changing the Event memory number from "0" to other number when Event is OFF.
– Event occurrence condition is satisfied after changing the Operation mode when Event is OFF.
– Event action in Reset mode is changed from "0: Action stop" to "1: Action continued" when Event occurrence condition in Reset mode is satisfied.
– Event action at Pattern end is changed from "0: Action stop" to "1: Action continued" when Event occurrence condition at Pattern end is satisfied.

[Example]
● When the power turned on



Event differential gap

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

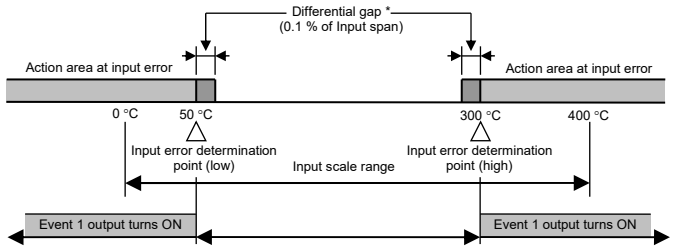


Event output action at Input error

Event output action at Input error is selectable.

Action	Description
Conform to Event action	When Measured value (PV) exceeds the Input error determination point, Event output turns ON to conform to the Event action being selected at Event type.
ON	Event output turns ON when Measured value (PV) exceeds the Input error determination point.
OFF	Event output remains OFF when Measured value (PV) exceeds the Input error determination point.

[Example] Turn ON Event 1 when Measured value (PV) exceeds the Input error determination point.

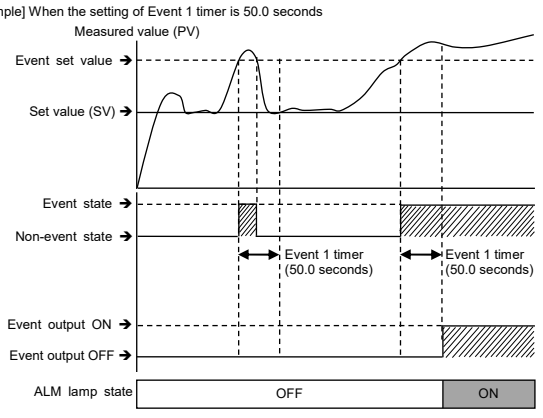


* Differential gap of PF900/901 (Value of Differential gap cannot be changed.)

Event timer

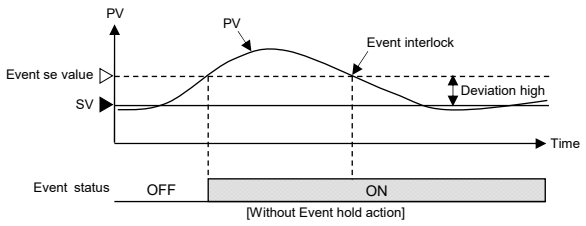
When an event condition becomes ON, the output is suppressed until the Event timer set time elapses. If the event output is still ON after time is up, the output will resume.

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



Event interlock

The Event interlock function is used to hold the event state.

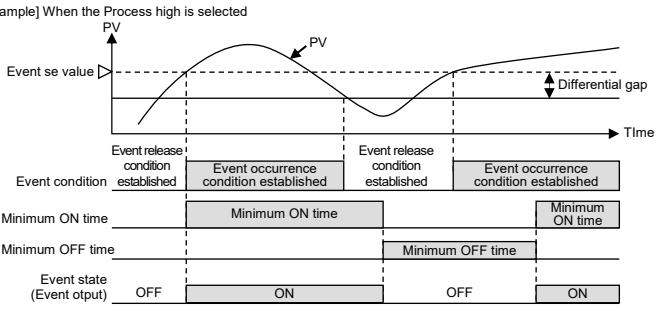


Event minimum ON time/Event minimum OFF time

Event minimum ON time or Event minimum OFF time can be set only in the Reset mode (RESET).

- Event minimum ON time
  Event remains ON during the Event minimum ON time being set while the Measured value (PV) satisfies Event release condition.
- Event minimum OFF time
  Event remains OFF during the Event minimum OFF time being set while the Measured value (PV) satisfies Event occurrence condition.

[Example] When the Process high is selected



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