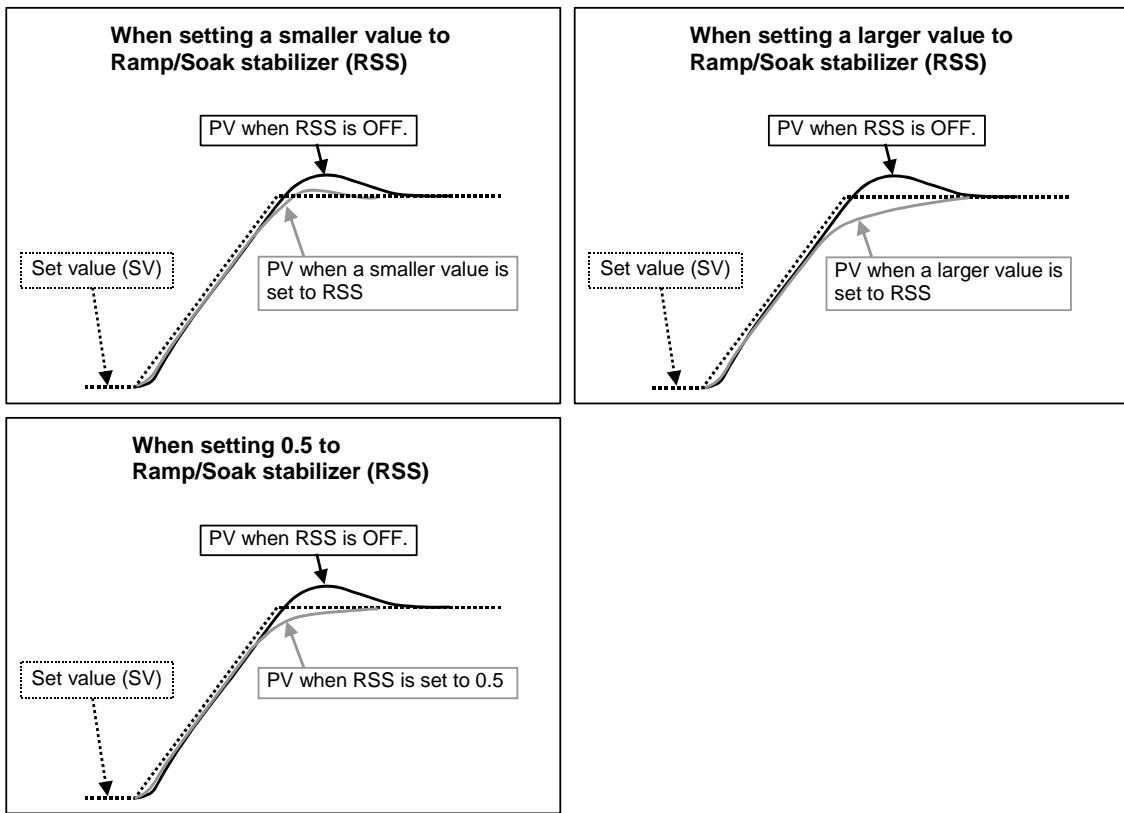

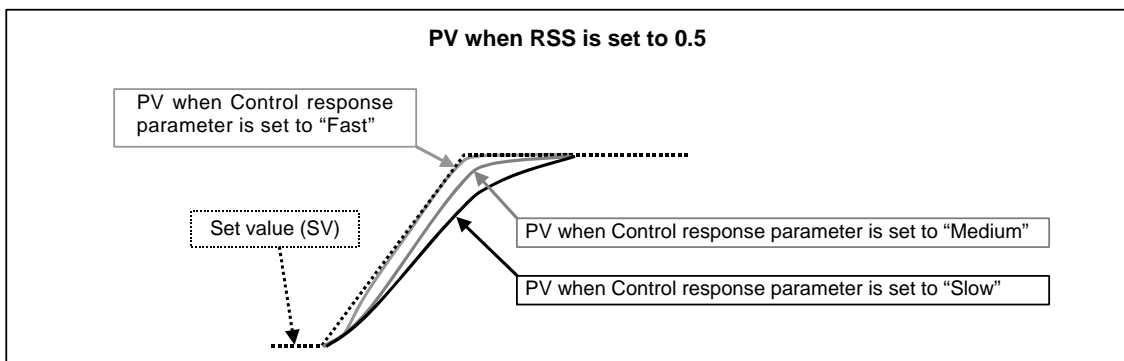


3. DESCRIPTION OF THE RAMP/SOAK STABILIZER (RSS) FUNCTION

Overshoot occurring during the transition from ramp segment to soak segment can be suppressed by Ramp/Soak stabilizer (RSS) function.




 To achieve better follow-up, activate Ramp/Soak stabilizer (RSS) and set the Control response parameter to "Fast."



Condition of action:

- Intensity factor of Ramp/Soak stabilizer is set to larger value of "0.1."
- Ramp state and Soak state is set by Setting change rate limiter function (or Link function).
- PI or PID control is used. (Excluding the Position proportioning PID control)
- Auto mode is selected and the operation is in RUN state.

 When the following setting is set to Input 2_use selection (\overline{EPR}), RSS function may not be operative:

- Remote input: RSS function is not operative for Input 1 side.
- Cascade control: RSS function is not operative for Input 2 (slave) side.

4. DESCRIPTION OF THE PARAMETER

4.1 Additional Parameters

The following parameters are added for Z-1151 specification:

- Input 1_intensity factor of Ramp/Soak stabilizer (1. r55)
- Input 1_AT differential gap (1. rPH)
- Input 1_proportional band adjusting factor (1. PPU)
- Input 1_integral time adjusting factor (1. IPU)
- Input 1_derivative time adjusting factor (1. dPU)
- Input 2_intensity factor of Ramp/Soak stabilizer (2. r55)
- Input 2_AT differential gap (2. rPH)
- Input 2_proportional band adjusting factor (2. PPU)
- Input 2_integral time adjusting factor (2. IPU)
- Input 2_derivative time adjusting factor (2. dPU)

4.2 Description of Each Parameters

■ Intensity factor of Ramp/Soak stabilizer (1. r55, 2. r55) [Engineering mode F51, F52]

Set Intensity factor of Ramp/Soak stabilizer. Input 1 and Input 2 can be set individually.

Data range: 0.0 to 1.0 (0.0: Unused)

Factory set value: Input 1_intensity factor of Ramp/Soak stabilizer (1. r55): 0.5
Input 2_intensity factor of Ramp/Soak stabilizer (2. r55): 0.5

■ AT differential gap (1. rPH, 2. rPH) [Engineering mode F53, F54]

Use to set an ON/OFF action differential gap for Autotuning (AT). This function prevents the AT function from malfunctioning caused by noise.

Data range: Temperature input: 0 (0.0) to 100 (100.0) °C [°F]
Voltage/Current input: 0.0 to 10.0 % of Input span

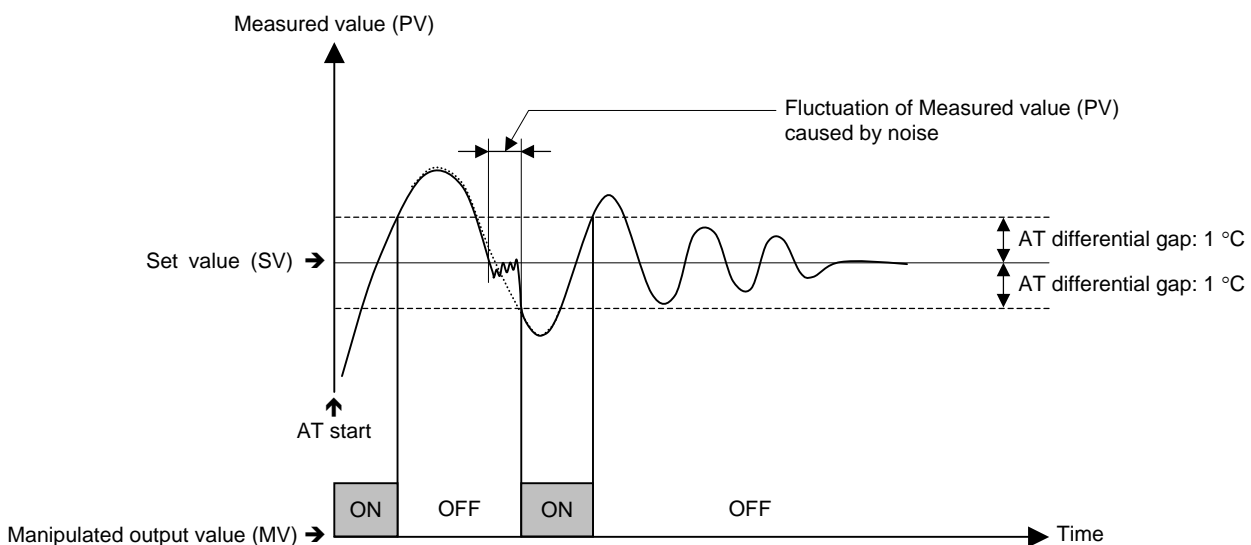
Factory set value: Input 1_AT differential gap (1. rPH): Temperature input: 1.0
Voltage/Current input: 0.1 of Input span
Input 2_AT differential gap (2. rPH): Temperature input: 1.0
Voltage/Current input: 0.1 of Input span



Do not use “AT differential gap” and “AT differential gap time” at the same time.

Functional description:

Output may chatter due to the fluctuation of the Measured value (PV) caused by noise during Autotuning (AT). The differential gap of AT differential gap prevents the output from chattering during Autotuning (AT).



Example of action when setting AT differential gap to 1 °C (factory set value)

■ Proportional band adjusting factor (1. *PRJ*, 2. *PRJ*) [Engineering mode F53, F54]

This is a factor which is multiplied by the Proportional band computed by executing the Autotuning (AT) function. Input 1 and Input 2 can be set individually.

Data range: 0.01 to 10.00 times

Factory set value: Input 1_proportional band adjusting factor (1. *PRJ*): 1.00
Input 2_proportional band adjusting factor (2. *PRJ*): 1.00

■ Integral time adjusting factor (1. *I RJ*, 2. *I RJ*) [Engineering mode F53, F54]

This is a factor which is multiplied by the Integral time computed by executing the Autotuning (AT) function. Input 1 and Input 2 can be set individually.

Data range: 0.01 to 10.00 times

Factory set value: Input 1_integral time adjusting factor (1. *I RJ*): 1.00
Input 2_integral time adjusting factor (2. *I RJ*): 1.00

■ Derivative time adjusting factor (1. *dRJ*, 2. *dRJ*) [Engineering mode F53, F54]

This is a factor which is multiplied by the Derivative time computed by executing the Autotuning (AT) function. Input 1 and Input 2 can be set individually.

Data range: 0.01 to 10.00 times

Factory set value: Input 1_derivative time adjusting factor (1. *dRJ*): 1.00
Input 1_derivative time adjusting factor (2. *dRJ*): 1.00

4.3 Parameter with Specific Data Range

Data range and Factory set value of the parameter below is changed.

■ AT differential gap time (1. *AFH*, 2. *AFH*) [Engineering mode F53, F54]

Use to set an ON/OFF action differential gap time for Autotuning (AT). This function prevents the AT function from malfunctioning caused by noise.

Data range: 0.00 to 100.00 seconds

Factory set value: Input 1_AT differential gap time (1. *AFH*): 0.00
Input 2_AT differential gap time (2. *AFH*): 0.00



Do not use “AT differential gap time” and “AT differential gap” at the same time.

5. KEY OPERATION FOR Z-1151 SPECIFICATION

Set parameters related to Z-1151 in the Engineering mode.

WARNING

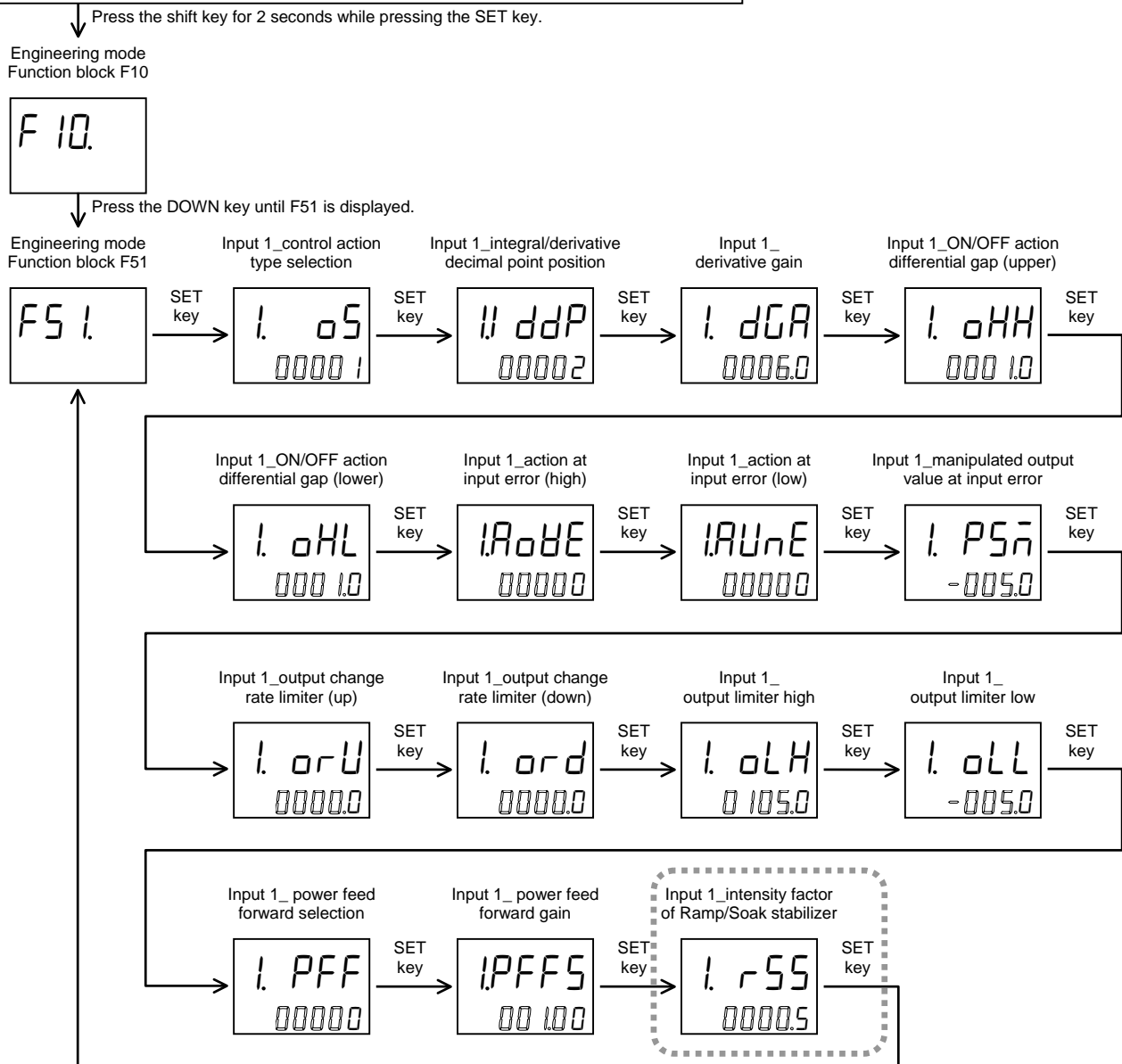
Parameters in the Engineering mode should be set according to the application before setting any parameter related to operation. Once the Parameters in the Engineering mode are set correctly, no further changes need to be made to parameters for the same application under normal conditions. If they are 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.

- Parameters in Engineering mode are settable only when the controller is in STOP mode.**
- All parameters of the engineering mode are displayed regardless of the instrument specification.
- This instrument returns to the PV1/SV1 monitor screen if no key operation is performed within 1 minute.

■ Input 1_intensity factor of Ramp/Soak stabilizer (I_r55)

Input 1_intensity factor of Ramp/Soak stabilizer (I_r55) is added after Input 1_power feed forward gain (I_PFF5) at the Function block F51.

SV setting & Monitor mode, Parameter setting mode, or Setup setting mode



■ Input 2_intensity factor of Ramp/Soak stabilizer (2. r55)

Input 2_intensity factor of Ramp/Soak stabilizer (2. r55) is added after Input 2_power feed forward gain (2. PFF5) at the Function block F52.

SV setting & Monitor mode, Parameter setting mode, or Setup setting mode

Press the shift key for 2 seconds while pressing the SET key.

Engineering mode
Function block F10

F 10.

Press the DOWN key until F52 is displayed.

Engineering mode
Function block F52

F 52.

Input 2_control action
type selection

2. 05
0000 1

Input 2_integral/derivative
decimal point position

2. d d P
0000 2

Input 2_
derivative gain

2. d G A
0000 6.0

Input 2_ON/OFF action
differential gap (upper)

2. 0 H H
000 1.0

Input 2_ON/OFF action
differential gap (lower)

2. 0 H L
000 1.0

Input 2_action at
input error (high)

2. A 0 B E
0000 0

Input 2_action at
input error (low)

2. A U n E
0000 0

Input 2_manipulated output
value at input error

2. P S n
-005.0

Input 2_output change
rate limiter (up)

2. 0 r U
0000 0

Input 2_output change
rate limiter (down)

2. 0 r d
0000 0

Input 2_
output limiter high

2. 0 L H
0 105.0

Input 2_
output limiter low

2. 0 L L
-005.0

Input 2_power feed
forward selection

2. P F F
0000 0

Input 2_power feed
forward gain

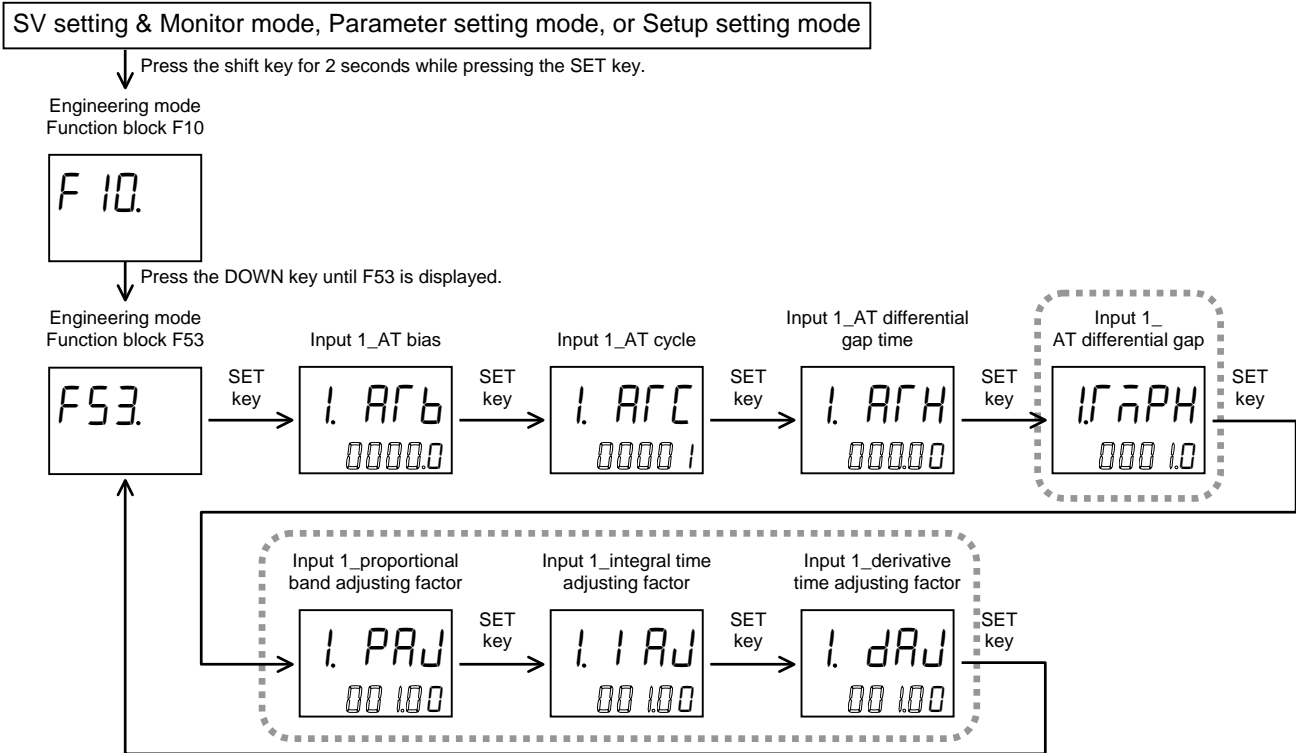
2. P F F 5
00 100

Input 2_intensity factor
of Ramp/Soak stabilizer

2. r 5 5
0000 5

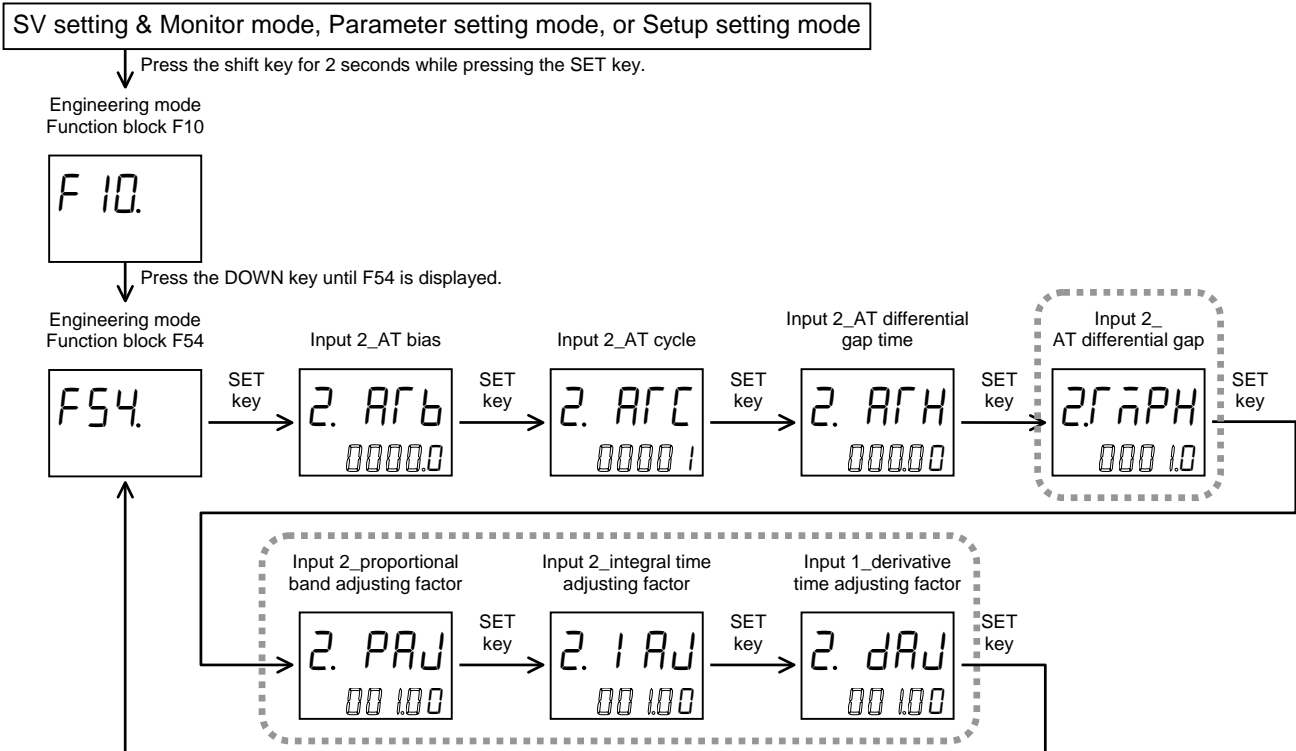
■ **Input 1_AT differential gap (1.Γ̄PH), Input 1_proportional band adjusting factor (1.PAJ), Input 1_integral time adjusting factor (1.IAJ) and Input 1_derivative time adjusting factor (1.dAJ)**

Setting display of each parameter above is added after Input 1_AT differential gap time (1.AFH) at Function block F53.



■ **Input 2_AT differential gap (2.Γ̄PH), Input 2_proportional band adjusting factor (2.PAJ), Input 2_integral time adjusting factor (2.IAJ) and Input 1_derivative time adjusting factor (2.dAJ)**

Setting display of each parameter above is added after Input 2_AT differential gap time (2.AFH) at Function block F54.



6. AUTOTUNING (AT) AT CASCADE CONTROL

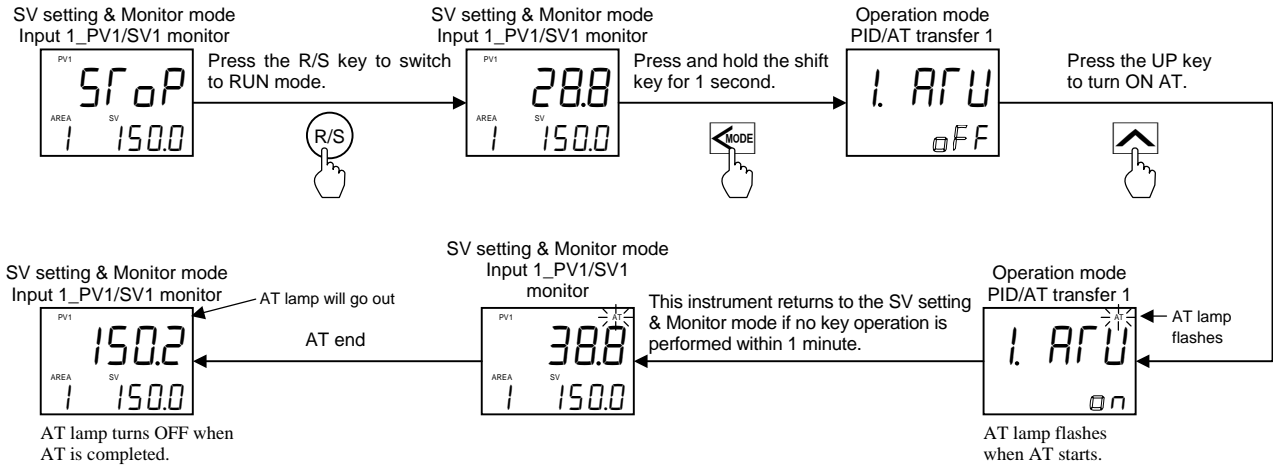
For HA400/900 standard version, PID values cannot be computed by Autotuning (AT) for either Input 1 or Input 2 when selecting “2: Cascade control (Slave)” at Input 2_use selection (LR \bar{n}).

When specifying Z-1151 specification, Autotuning (AT) can be conducted for Cascade control and Autotuning (AT) is operative for both Input 1 and Input 2.

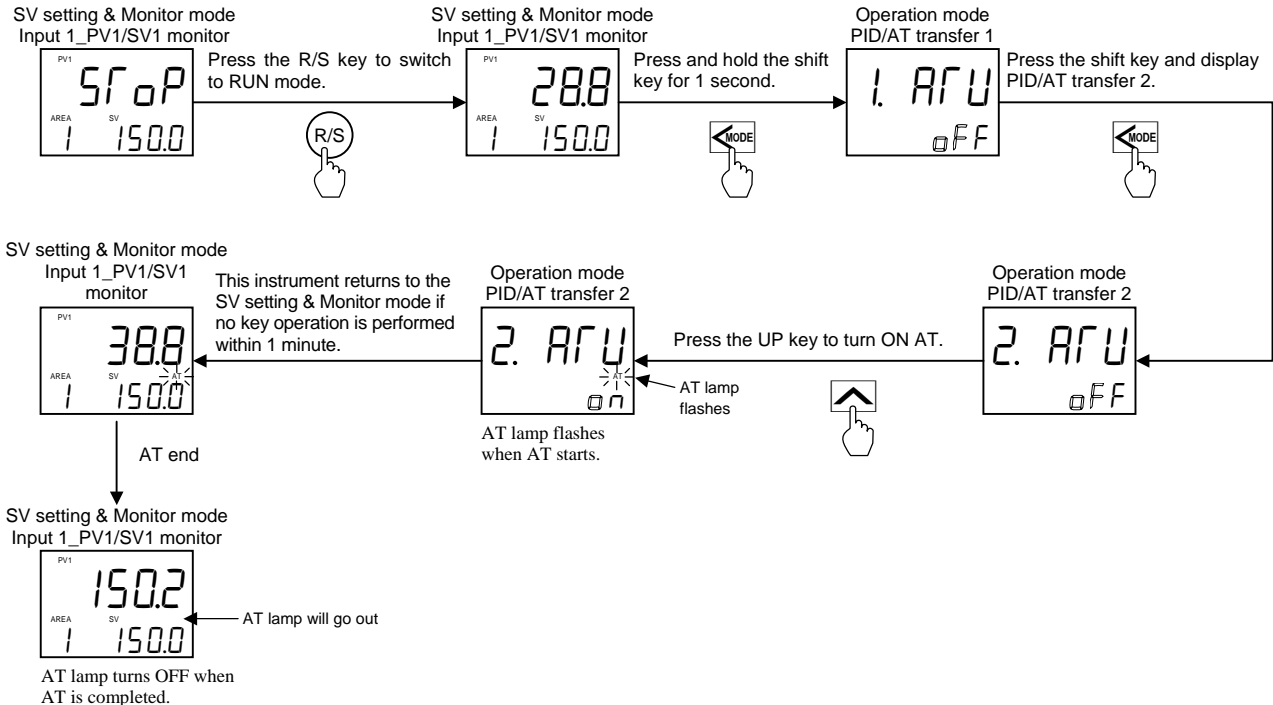
 For Autotuning (AT), refer to **HA400/HA900/HA401/HA901 Operation Manual (IMR01N02-E□)**.

■ Operation for Autotuning (AT)

● To conduct Autotuning (AT) for Input 1



● To conduct Autotuning (AT) for Input 2



For 2-input specification, both Input 1 and 2 are in Run state or Stop state when pressing the R/S key. RUN/STOP cannot be switched for each input.

7. COMMUNICATION DATA

7.1 RKC Communication

The communication data related to Autotuning (AT) is added. As the data is added after the **NZ** identifier, polling/selecting by ACK (Acknowledgment) is available. Additionally, confirm the communication data with changed setting ranges. Data is in 7 digits.

- ☞ For details of communication protocol, refer to the **HA400/HA900/HA401/HA901 Communication Instruction Manual (IMR01N03-E□)**.

■ Communication Item List

● Additional communication data

RO: Read only R/W: Read and Write

No.	Name	Identifier	Attribute	Data range	Factory set value
233	Input 1_proportional band adjusting factor	JC	R/W*	0.01 to 10.00 times	1.00
234	Input 1_integral time adjusting factor	JD	R/W*	0.01 to 10.00 times	1.00
235	Input 1_derivative time adjusting factor	JE	R/W*	0.01 to 10.00 times	1.00
236	Input 2_proportional band adjusting factor	JF	R/W*	0.01 to 10.00 times	1.00
237	Input 2_integral time adjusting factor	JG	R/W*	0.01 to 10.00 times	1.00
238	Input 2_derivative time adjusting factor	JH	R/W*	0.01 to 10.00 times	1.00
239	Input 1_intensity factor of Ramp/Soak stabilizer	CC	R/W*	0.0 to 1.0 (0.0: Unused)	0.5
240	Input 2_intensity factor of Ramp/Soak stabilizer	CD	R/W*	0.0 to 1.0 (0.0: Unused)	0.5
241	Input 1_AT differential gap	GU	R/W*	Temperature input: 0 (0.0) to 100 (100.0) °C [°F] Voltage/Current input: 0.0 to 10.0 % of Input span	Temperature input: 1.0 Voltage/Current input: 0.1 of Input span
242	Input 2_AT differential gap	GV	R/W*	Temperature input: 0 (0.0) to 100 (100.0) °C [°F] Voltage/Current input: 0.0 to 10.0 % of Input span	Temperature input: 1.0 Voltage/Current input: 0.1 of Input span

* The attribute for the communication data is RO (Read only) when the instrument is in RUN state.

● Parameter with specific data range

RO: Read only R/W: Read and Write

No.	Name	Identifier	Attribute	Data range	Factory set value
185	Input 1_AT differential gap time	GH	R/W*	0.00 to 100.0 seconds	0.00
188	Input 2_AT differential gap time	GG	R/W*	0.00 to 100.0 seconds	0.00

* The attribute for the communication data is RO (Read only) when the instrument is in RUN state.

7.2 Modbus Communication

The communication data related to Autotuning (AT) is added. Additionally, confirm the communication data with changed setting ranges.

- ☞ For details of communication protocol, refer to the **HA400/HA900/HA401/HA901 Communication Instruction Manual (IMR01N03-E□)**.

■ Data Map List

● Additional communication data

RO: Read only R/W: Read and Write

Name	Register address				Attribute	Data range	Factory set value
	Hexadecimal		Decimal				
	Low-order	High-order	Low-order	High-order			
Input 1_proportional band adjusting factor	0326	0327	806	807	R/W*	0.01 to 10.00 times	1.00
Input 1_integral time adjusting factor	0328	0329	808	809	R/W*	0.01 to 10.00 times	1.00
Input 1_derivative time adjusting factor	032A	032B	810	811	R/W*	0.01 to 10.00 times	1.00
Input 2_proportional band adjusting factor	032C	032D	812	813	R/W*	0.01 to 10.00 times	1.00
Input 2_integral time adjusting factor	032E	032F	814	815	R/W*	0.01 to 10.00 times	1.00
Input 2_derivative time adjusting factor	0330	0331	816	817	R/W*	0.01 to 10.00 times	1.00
Input 1_intensity factor of Ramp/Soak stabilizer	0332	0333	818	819	R/W*	0.0 to 1.0 (0.0: Unused)	0.5
Input 2_intensity factor of Ramp/Soak stabilizer	0334	0335	820	821	R/W*	0.0 to 1.0 (0.0: Unused)	0.5
Input 1_AT differential gap	0336	0337	822	823	R/W*	Temperature input: 0 (0.0) to 100 (100.0) °C [°F] Voltage/Current input: 0.0 to 10.0 % of Input span	Temperature input: 1.0 Voltage/Current input: 0.1 of Input span
Input 2_AT differential gap	0338	0339	824	825	R/W*	Temperature input: 0 (0.0) to 100 (100.0) °C [°F] Voltage/Current input: 0.0 to 10.0 % of Input span	Temperature input: 1.0 Voltage/Current input: 0.1 of Input span

* The attribute for the communication data is RO (Read only) when the instrument is in RUN state.

● Parameter with specific data range

RO: Read only R/W: Read and Write

Name	Register address				Attribute	Data range	Factory set value
	Hexadecimal		Decimal				
	Low-order	High-order	Low-order	High-order			
Input 1_AT differential gap time	02C6	02C7	710	711	R/W*	0.00 to 100.0 seconds	0.00
Input 2_AT differential gap time	02CC	02CD	716	717	R/W*	0.00 to 100.0 seconds	0.00

* The attribute for the communication data is RO (Read only) when the instrument is in RUN state.