

Digital Thermostat PXR3 (Replacement for PAS3)

Type: PXR3

Operation Manual

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Table 1: Model Codes

Sensor	Range	Alarms	Model
Thermocouple	See Table 2	1	PXR3TAY2-0Y061
		2	PXR3TAY2-1Y061
Thermistor	0–100°C	1	PXR3HAY2-0Y061
			PXR3HAY2-1Y061

Notes

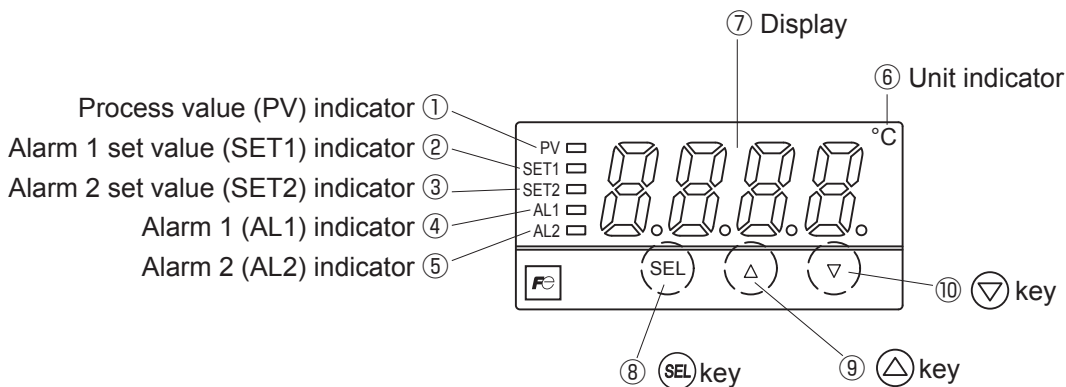
- You cannot switch between thermocouple input and thermistor input.
- Default settings are as follows:
 - Thermocouple version: type K thermocouple, 0–1200°C range
 - Thermistor version: thermistor input, 0–100°C range

*If you ordered a thermocouple version, you can change the input setting to the one for other thermocouples as shown in Table 1. If you change the input setting, do not forget to change the range setting as well.
- For thermistor input version, use the dedicated thermistor that comes with the product.

Table 2: Input Range Codes

Sensor		Pn2 code	Range (°C)	
			PSL	PSU
Thermocouple	J	2	0	800
	K	3	0	1200
	R	4	0	1600
	T	6	0	400
	E	7	0	600
Thermistor	PB-36	8	0	100

1 Display and Keys



Display/Indication

No.	Name	Function
①	Process value (PV) indicator	Lights in green when PV is displayed.
②	Alarm 1 set value (SET1) indicator	Lights in green when the alarm 1 set value is displayed.
③	Alarm 2 set value (SET2) indicator	Lights in green when the alarm 2 set value is displayed.
④	Alarm 1 (AL1) indicator	<ul style="list-style-type: none"> Lights in green when the alarm 1 occurs. Blinks during on-delay.
⑤	Alarm 2 (AL2) indicator	<ul style="list-style-type: none"> Lights in green when the alarm 2 occurs. Blinks during on-delay.
⑥	Unit indicator	Shows the temperature unit.
⑦	7-seg 4 digit LED <ul style="list-style-type: none"> PV SET1 SET2 Parameter name Parameter set value 	<ul style="list-style-type: none"> In operation mode (level 1): displays PV, SET1, or SET2 In parameter setting modes (level 2, 3, or 4): displays a parameter name or a parameter value Upon error: shows an error code. *PV and alarm set values can be set in increments of 1°C.

Setting keys

No.	Name	Function
⑧	Select key	Used for switching of display between process value and alarm set value, level move, switching to parameter setting mode and for data registration.
⑨	Up key	<ul style="list-style-type: none"> Used for parameter shifting (returning) or data changing (increasing). The numerical value is increased by pressing the key once. The numerical value keeps on increasing by pressing the key continuously.
⑩	Down key	<ul style="list-style-type: none"> Used for parameter shifting (to next) or data changing (decreasing). The numerical value is decreased by pressing the key once. The numerical value keeps on decreasing by pressing the key continuously.

2 Operation

2-1 Parameter List

Parameters are classified into the following four levels.

Level	Description	Notes
Level 1	Process value and alarm setpoint (indication only)	You cannot change the alarm setpoint in Level 1.
Level 2	Alarm setpoint change	
Level 3	Set up	
Level 4	Input compensation	

Level 1 Parameters

	Name	Function	Range	Default setting	Your setting	Page
	PV	Process value	Shows the process value	—		9
	SET1	Alarm 1 setpoint display	Shows the alarm 1 setpoint	— *1		9
	SET2	Alarm 2 setpoint display	Shows the alarm 2 setpoint	— *1, *3		9

Level 2 Parameters

	Name	Function	Range	Default setting	Your setting	Page
<i>ST1</i>	ST1	Alarm 1 setpoint setup	Allows you to change the alarm 1 trigger value within the input range.	0%-100% FS	100% *1, *2	10
<i>ST2</i>	ST2	Alarm 2 setpoint setup	Allows you to change the alarm 2 trigger value within the input range.	0%-100% FS	0% *1, *2, *3	10

Level 3 Parameters

	Name	Function	Range	Default setting	Your setting	Page
<i>Pn2</i>	Pn2	Input type	Allows you to change the type of input.	2-8 (excluding 5)	*7, *8	11
<i>PSL</i>	PSL	Range lower limit setup	Allows you to set the lower limit of the input range.	-1999 to 9999	0°C *7	12
<i>PSU</i>	PSU	Range upper limit setup	Allows you to set the upper limit of the input range.	-1999 to 9999	*7, *9	12
<i>PA1</i>	PA1	Alarm type 1	Allows you to select the type of alarm.	0-8	1	13
<i>PA2</i>	PA2	Alarm type 2		0-8	2 *3	13
<i>HY1</i>	HY1	Alarm 1 hysteresis	Allows you to set the on/off hysteresis width of alarm output.	0%-110% FS	1 *1, *2	14
<i>HY2</i>	HY2	Alarm 2 hysteresis		0%-110% FS	1 *1, *2, *3	14
<i>Pd1</i>	Pd1	Alarm 1 ON delay time	Allows you to set the delay time until the alarm starts.	0-120 s	0 *4	15
<i>Pd2</i>	Pd2	Alarm 2 ON delay time		0-120 s	0 *3, *4	15
<i>brn</i>	brn	Burn-out direction	Allows you to set the input value when an input error is detected, to either high limit or low limit.	H/L	H	16
<i>oPd</i>	oPd	Power ON delay time	Allows you to set the delay time during which no output is emitted after power ON.	0-120 s	0	17
<i>LoC</i>	LoC	Setup lock	Allows you to select if parameter change is allowed or not. LoC = 0: All parameters can be changed. LoC = 1: No change is permitted. LoC = 2: ST1 and ST2 can be changed.	0-2	0	18

Level 4 Parameters

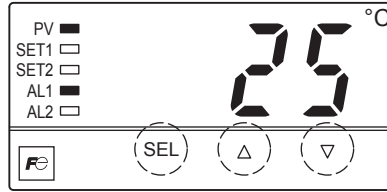
	Name	Function	Range	Default setting	Your setting	Page
<i>PdF</i>	PdF	Input filter time constant	Allows you to set the time constant. *Setting is available in 0.5 seconds increments. Setting to "0.0" turns off the filter.	0.0-90.0 s	5.0	19
<i>POF</i>	POF	PV offset	Allows you to shift the process value (PV) on display.	-10% to 10% FS	0°C *1, *2	20
<i>AJO</i>	AJO	User ZERO adjustment	Allows you to adjust the zero point.	-50% to 50% FS	0°C *1, *2	21
<i>AJS</i>	AJS	User SPAN adjustment	Allows you to adjust the span point.	-50% to 50% FS	0°C *1, *2	21

Notes:

- Parameters marked with change when PSL and/or PSU is changed.
*PSU = range upper limit, PSL = range lower limit
- FS (full scale) means the value of PSU - PSL.
For example, when PSL = 0, and PSU = 1200,
$$50\% \text{ FS} = (1200-0) \times \frac{50}{100} = 600$$
- Parameters indicated with do not appear on the versions that have only one alarm.
- The accuracy of the alarm delay time and the power ON delay time is less than 1 second.
- A difference of 1°C may arise between the indication and the alarm output depending on the range setup.
(Example: If the alarm set value is 200°C, an alarm occurs when the indication is 200°C in some cases, but in other cases, an alarm occurs when the indication is 201°C.)
- There may be the cases where over-range (UUUU) or under-range (LLLL) code does not appear, if a large value is set for PV offset, user zero adjustment or user span adjustment.
- Parameters indicated with are not displayed on the thermistor input version.
- Default setting of input type: thermocouple: 3, thermistor: 8
- Default setting of the range upper limit: thermocouple: 1200, thermistor: 100

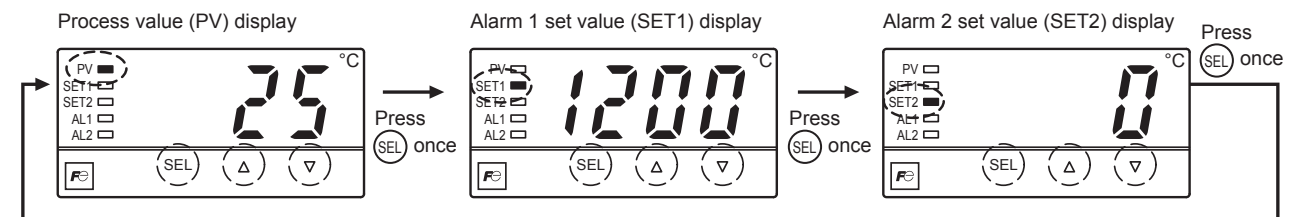
2-2 Basic Operation

When you turn on the digital thermostat, the screen shows “---” and then the process value. The below figure shows an example when the process value is 25°C and the alarm 1 is active.



Display mode switching

Operation mode (level 1)



- Notes
- To move among the displays, use SEL key. The duration to press the SEL key defines the destination display.
 - To change the alarm setpoint, access the parameters ST1 or ST2 in the level 2 parameter block.
 - The display changes back to process value display of the operation mode when 30 seconds have passed after the last key operation.

Press (SEL) for about 3 seconds to go back to the process value (PV) indication.

Press (SEL) for about 3 seconds.

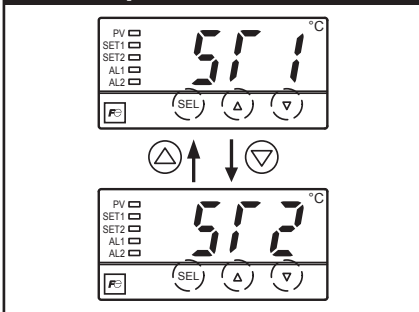
Press (SEL) for about 3 seconds to go back to the process value (PV) indication.

Press (SEL) for about 7 seconds.

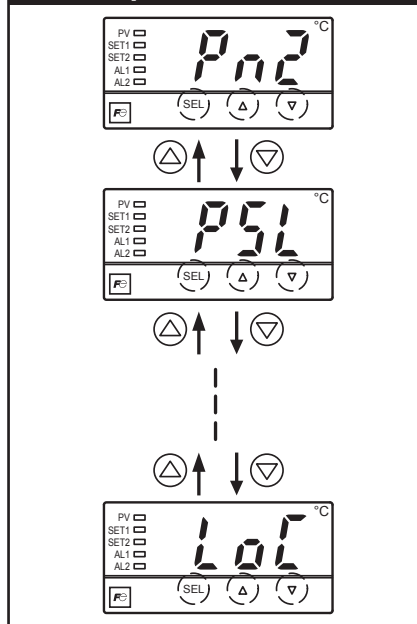
Press (SEL) for about 3 seconds to go back to the process value (PV) indication.

Press (SEL) for about 9 seconds.

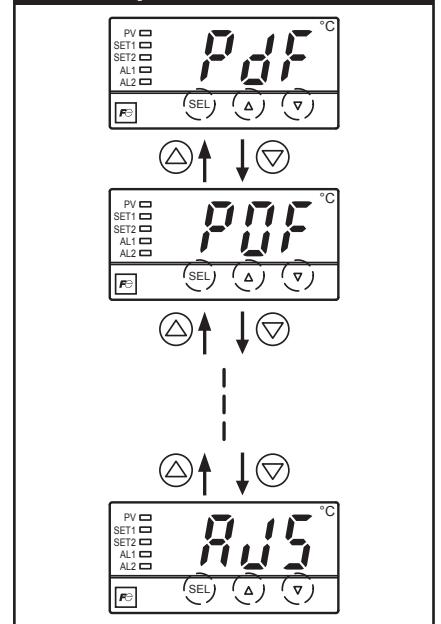
Level 2 parameter block



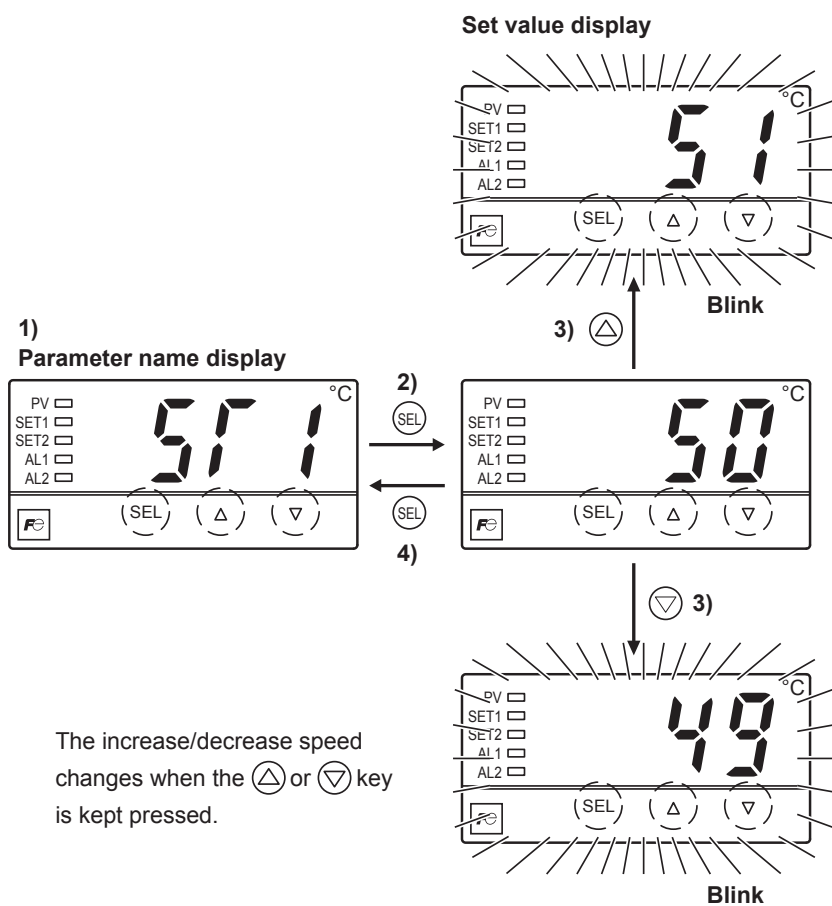
Level 3 parameter block



Level 4 parameter block



Parameter setting



<Parameter setting procedure>

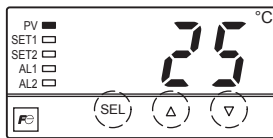
- 1) Select a parameter you want to set by pressing the Δ or ∇ key.
- 2) Press the (SEL) key to display the parameter set value.
- 3) Press the Δ or ∇ key, to change the parameter set value.
- 4) To save the change, press the (SEL) key or just wait for 3 seconds. The value will stop blinking, and the display changes back to the parameter name display.

<Method for move of level 1>

- 1) To move to the operation mode display, press the (SEL) key for 3 seconds in the parameter name display.

2-3 Parameter Functions and Method of Settings

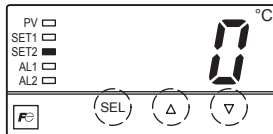
Level 1 parameters (operation mode)



PV display



Alarm 1 setpoint (SET1) display



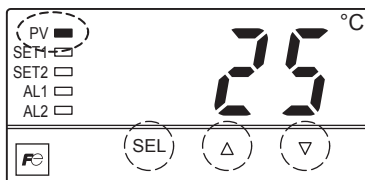
Alarm 2 setpoint (SET2) display

-
- Level 1 parameters associate with the display during initial startup and display during operation.
 - You cannot change parameters in the level 1 parameters.
 - Level 1 parameters include: PV display, alarm 1 setpoint (SET1), and alarm 2 setpoint (SET2).
 - Indicator lamps (PV, SET1, and SET2) tell you which value is being displayed.

Related parameters: *SF 1* (page 10), *SF 2* (page 10)

[Examples]

PV display



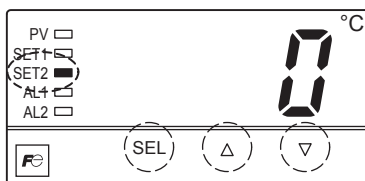
When the process value is 25°C

Alarm 1 setpoint (SET1) display




When the alarm 1 setpoint is 1200°C


Alarm 2 setpoint (SET2) display



When the alarm 2 setpoint is 0°C

Level 2 parameters

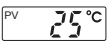
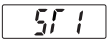

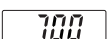
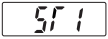
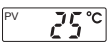






 Alarm 1 setpoint (SET1) setup

 Alarm 2 setpoint (SET2) setup

- Allows you to change the setpoint for the alarm 1 and the alarm 2.
- You can set the alarm setpoint in the range between *PSL* (range lower limit) and *PSU* (range upper limit).

Related parameters: *PSL* (page 12), *PSU* (page 12), *PR1* (page 13), *PR2* (page 13)

[Setting example] Changing the alarm 1 setpoint from 1200°C to 700°C

Display	Operating procedure
 PV display      PV display	<ol style="list-style-type: none"> 1. Press the  key for 3 seconds. 571 appears. 2. Press the  key once. The setpoint (1200) is displayed. 3. Use the  and  keys to change 1200 to 700. 4. Press the  key once to save the change. The display changes back to 571 when the change is complete. If you want to check the setpoint, repeat the steps 2 to 4. 5. To go back to the operation mode (PV display), press the  key for 3 seconds.

Level 3 parameters

Pn2 Input type

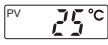
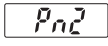
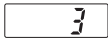
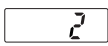
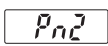
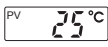
- Allows you to set the input type.
- If you ordered a thermocouple version (5th digit of the code symbols is "T") , the default setting of this parameter is "3", which is for the type K thermocouple. If you use the thermocouple other than the type K thermocouple, change the setting of this parameter according to the type of thermocouple you use, in reference to Table 3. If you change the input setting, do not forget to change the range setting (*PSL* and *PSU*) as well.
- You cannot change between thermocouple input to thermistor input.
- This parameter (*Pn2*) does not appear on the thermistor input version (5th code "H").

Related parameters: *PSL* (page 12), *PSU* (page 12)

Table 3: TC Input Range Codes

Thermocouple type	Pn2 code	Range lower limit (PSL)	Range upper limit (PSU)
J	2	0	800
K	3	0	1200
R	4	0	1600
T	6	0	400
E	7	0	600

[Setting example] Changing the input type from type K thermocouple to type J thermocouple

Display	Operating procedure
 PV display    	<ol style="list-style-type: none"> 1. Press the (SEL) key for 7 seconds. <i>Pn2</i> appears. 2. Press the (SEL) key once. The setpoint (<i>3</i>) is displayed. 3. Use the (▲) and (▼) keys to change <i>3</i> to <i>2</i>. 4. Press the (SEL) key once to save the change. The display changes back to <i>Pn2</i> when the change is complete. 5. To go back to the operation mode (PV display), press the (SEL) key for 3 seconds.
 PV display	<p>*Be sure to change the <i>PSU</i> from <i>1200</i> to <i>800</i> because you changed <i>Pn2</i> to "<i>2</i>".</p>

PSL

Range lower limit setup (setting range: -1999 to 1999)

PSU

Range upper limit setup (setting range: -1999 to 1999)

- Allows you to configure the upper limit and the lower limit of the measurement range. Enter the appropriate value for the sensor you use in reference to the "TC input range codes" on the previous page.
- When the process value goes below -5% FS from PSL, the error code "LLLL" that means the under-range appears on the display. When the process value goes beyond 5% FS from PSU, the error code "UUUU" that means over-range appears. With the parameter "brn", you can set how PXR3 should react when an under-range or an over-range occurs.

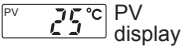

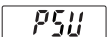


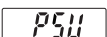
Notes:

- Be sure to set the relevant values for the input type (*Pn2*). For example, if you use the type K thermocouple and set the parameter "Pn2" to "3", the PSL should be "0" and the PSU should be "1200".
- The parameters "PSL" and "PSU" do not appear on the PXR3 thermistor input version (5th code "H"). PSL is fixed to "0" and PSU to "100".
- If you change *PSL* and/or *PSU*, check out the values of the following parameters because they automatically change themselves according to the values of *PSL* and *PSU*.

SF 1, SF 2, HY 1, HY 2, POF, RUD, RUS

Related parameters: *SF 1, SF 2* (page 10), *HY 1, HY 2* (page 14), *POF* (page 20), *RUD, RUS* (page 21), *brn* (page 16)

[Setting example] Changing the upper limit from 1200°C to 800°C

Display	Operating procedure
 PV display     	<ol style="list-style-type: none"> 1. Press the (SEL) key for 7 seconds. <i>Pn2</i> appears. 2. Use the (▲) and (▼) keys to access <i>PSU</i>. 3. Press the (SEL) key once. The setpoint (<i>1200</i>) is displayed. 4. Use the (▲) and (▼) keys to change <i>1200</i> to <i>800</i>. 5. Press the (SEL) key once. The display changes back to <i>PSU</i> when the change is complete. (If you want to check the result, repeat the steps 3–5.) 6. To go back to the operation mode (PV display), press the (SEL) key for 3 seconds.

PA1 Alarm type 1 (setting range: 0 to 8)

PA2 Alarm type 2 (setting range: 0 to 8)

Allows you to set the type of alarms from the selection below.

Table 4: Alarm Types

Code of PA1 and 2	Alarm type	Set value	Hold function	Relay operation at alarm	Action diagram
0	No alarm	If your PXR3 has two alarms but you want to use only one alarm, set the other alarm to "0".			
1	Upper limit	Absolute value	Without	Relay energization	
2	Lower limit	Absolute value	Without	Relay energization	
3	Upper limit	Absolute value	With	Relay energization	
4	Lower limit	Absolute value	With	Relay energization	
5	Upper limit	Absolute value	Without	Relay de-energization	
6	Lower limit	Absolute value	Without	Relay de-energization	
7	Upper limit	Absolute value	With	Relay de-energization	
8	Lower limit	Absolute value	With	Relay de-energization	

Note: Be sure to power-cycle PXR3 after you change the alarm type.

How to read activation diagram

area: Range in which the AL1 or the AL2 indicator lights.

area: Range in which the alarm relay is energized

point: Alarm set value

The horizontal represents PV.

Notes:

- Be sure to power-cycle PXR3 after you change the alarm type.
- If you set the alarm type code to "0", PXR3 runs with no alarm.
- If you ordered the version with two alarms but want to stop one of the alarms, set it to "0".

[Setting example] Changing the alarm 2 from "lower limit absolute alarm without hold, relay energization" to "upper limit absolute alarm without hold, de-energization"

Display	Operating procedure
 	<ol style="list-style-type: none"> 1. Press the key for 7 seconds. <i>PA2</i> appears. 2. Use the and keys to access <i>PA2</i>. 3. Press the key once. The setpoint (<i>2</i>) is displayed. 4. Use the and keys to change <i>2</i> to <i>5</i>. 5. Press the key once. The display changes back to <i>PA2</i> when the change is complete. (If you want to check the result, repeat the steps 3–5.) 6. To go back to the operation mode (PV display), press the key for 3 seconds.

HY1

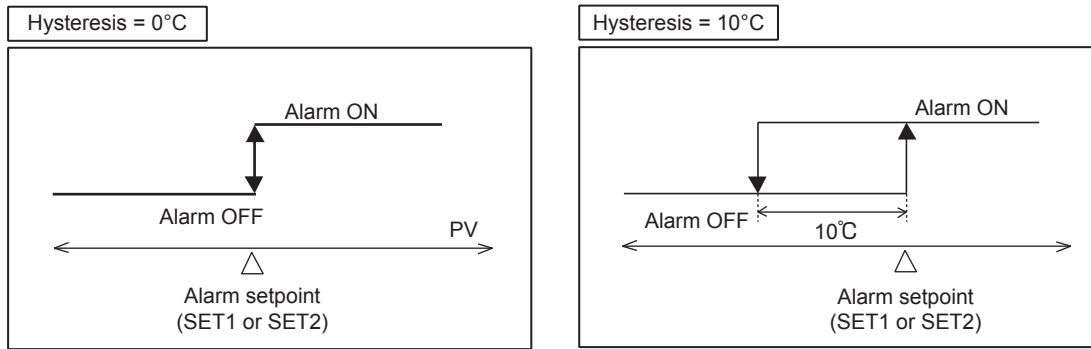
Alarm 1 hysteresis (setting range: 0 to 110% FS)

HY2

Alarm 2 hysteresis (setting range: 0 to 110% FS)

Once the alarm is triggered, PXR3 stays in the alarm state until PV returns to the point defined by the hysteresis.

Fig 1: Alarm Hysteresis



Note:

- Setting the hysteresis to 110% allows the alarm to latch. Note that in some cases this is not available. For the details, see Page 24.

[Setting example] Changing the alarm 1 hysteresis from 0°C to 10°C

Display	Operating procedure
PV 25 °C PV display Pn2 HY1 0	<ol style="list-style-type: none"> 1. Press the (SEL) key for 7 seconds. Pn2 appears. 2. Use the (△) and (▽) keys to access HY1. 3. Press the (SEL) key once. The setpoint (0) is displayed. 4. Use the (△) and (▽) keys to change 0 to 10. 5. Press the (SEL) key once. The display changes back to HY1 when the change is complete. (If you want to check the result, repeat the steps 3–5.)
PV 25 °C PV display 10 HY1	<ol style="list-style-type: none"> 6. To go back to the operation mode (PV display), press the (SEL) key for 3 seconds.

Pd1

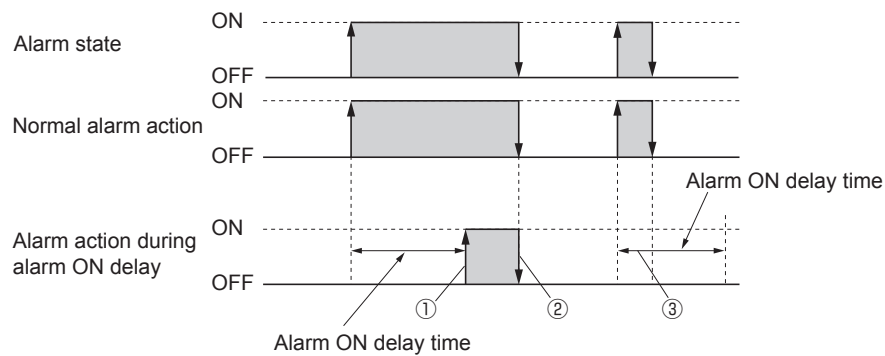
Alarm 1 ON delay time (setting range: 0 to 120 seconds)

Pd2

Alarm 2 ON delay time (setting range: 0 to 120 seconds)

- Allows you to set a lag between the time that the alarm conditions are satisfied and the time that the alarm starts. (① in the below figure)
- If the alarm conditions are satisfied and then failed before the set delay time has passed, the alarm does not start. (③ in the below figure)
- The alarm goes OFF when the alarm conditions are failed, regardless of the alarm ON delay setting. (② in the below figure)

Fig 2: Alarm ON Delay



Note:

- The alarm ON delay is also effective during the relay de-energization and during the input error alarm.

[Setting example] Changing the alarm 1 ON delay time to 30 seconds

Display	Operating procedure
PV display 	1. Press the (SEL) key for 7 seconds. <i>Pd2</i> appears.
	2. Use the (▲) and (▼) keys to access <i>Pd1</i> .
	3. Press the (SEL) key once. The setpoint (<i>0</i>) is displayed.
	4. Use the (▲) and (▼) keys to change <i>0</i> to <i>30</i> .
	5. Press the (SEL) key once. The display changes back to <i>Pd1</i> when the change is complete. (If you want to check the result, repeat the steps 3–5.)
PV display	6. To go back to the operation mode (PV display), press the (SEL) key for 3 seconds.



Burn-out direction (setting range: L or H)

Allows you to set how the input reacts if an input error such as open loop, under-range, or over-range is detected.

brn setpoint	Input value at input error	Alarm setting
H	Upper limit	Upper limit alarm
L	Lower limit	Lower limit alarm

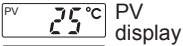

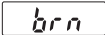
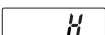

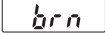








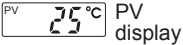
Notes:

You cannot set brn for the alarm 1 and the alarm 2 independently.

Change of brn setting does not affect the error codes appear on the display.

Error code	Description
UUUU	<ul style="list-style-type: none"> Thermocouple burnout (open-loop of input line) Over-range (PV beyond 5% of FS)
LLLL	<ul style="list-style-type: none"> Thermistor burnout (open-loop of input line) Under-range (PV below -5% of FS)

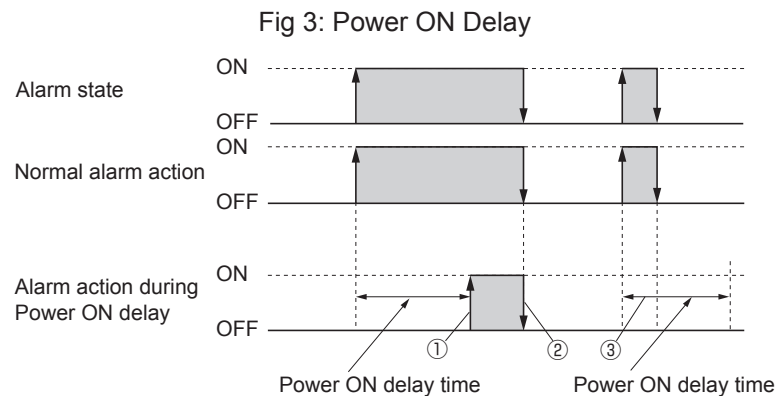
[Setting example] Setting the burn-out direction to the lower limit

Display	Operating procedure
     	<ol style="list-style-type: none"> Press the  key for 7 seconds. Pn2 appears. Use the  and  keys to access brn. Press the  key once. The setpoint (H) is displayed. Use the  and  keys to change H to L. Press the  key once. The display changes back to brn when the change is complete. (If you want to check the result, repeat the steps 3–5.) To go back to the operation mode (PV display), press the  key for 3 seconds.
	



Power ON delay time (setting range: 0 to 120 seconds)

- Allows you to set the delay time during which alarm is disabled after power ON. (① in the below figure)
- If the alarm conditions are satisfied and then failed before the set delay time has passed, the alarm does not start. (③ in the below figure)
- The alarm goes OFF when the alarm conditions are failed, regardless of the setting of this parameter. (② in the below figure)



Notes:

- The power ON delay time is also effective during the relay de-energization.
- The power ON delay time is effective only on power-up.

[Setting example] Setting the power ON delay time to 60 seconds

Display	Operating procedure
 	<ol style="list-style-type: none"> 1. Press the (SEL) key for 7 seconds. Pn2 appears.
 	<ol style="list-style-type: none"> 2. Use the (▲) and (▼) keys to access OPd.
	<ol style="list-style-type: none"> 3. Press the (SEL) key once. The setpoint (0) is displayed.
	<ol style="list-style-type: none"> 4. Use the (▲) and (▼) keys to change 0 to 60.
	<ol style="list-style-type: none"> 5. Press the (SEL) key once. The display changes back to OPd when the change is complete. (If you want to check the result, repeat the steps 3–5.)
 	<ol style="list-style-type: none"> 6. To go back to the operation mode (PV display), press the (SEL) key for 3 seconds.



Setup lock (setting range: 0 to 2)

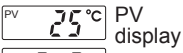


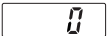


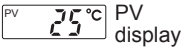
- Allows you to protect the setting from being changed. One can check the parameter names and setpoints but cannot edit.
- To cancel the setup lock, set the parameter to “0”.
- There are the following three levels in the setup lock.

LoL setting	Description
0	No lock. All the parameters can be edited.
1	All the parameters are locked.
2	Only the alarm setpoint 1 (SET1) and the alarm setpoint 2 (SET2) can be changed.

Note:

- Alarm actions are not affected by the setup lock.

[Setting example] Setting the setup lock to “2”

Display	Operating procedure
     	<ol style="list-style-type: none"> 1. Press the (SEL) key for 7 seconds. Pn2 appears. 2. Use the (▲) and (▼) keys to access LoL. 3. Press the (SEL) key once. The setpoint (0) is displayed. 4. Use the (▲) and (▼) keys to change 0 to 2. 5. Press the (SEL) key once. The display changes back to LoL when the change is complete. Now all the parameters but SET1 and SET2 are locked. (If you want to check the result, repeat the steps 3–5.) 6. To go back to the operation mode (PV display), press the (SEL) key for 3 seconds.
	

Level 4 parameters

PdF

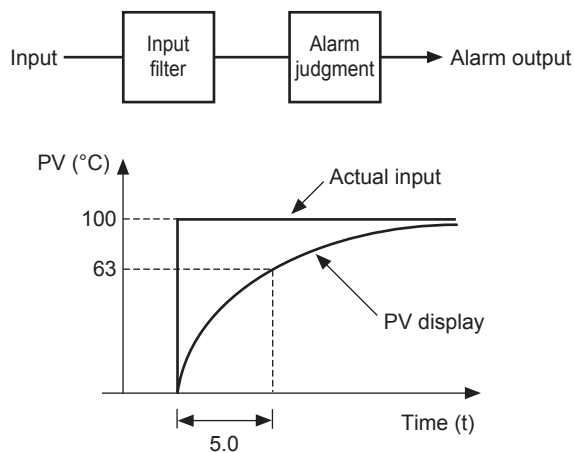
Input filter time constant (setting range: 0.0 to 90.0 seconds)

- You can set the time until the input reaches to 63% of the total change. This allows you to reduce the fluctuation of input signals.
- You can set the time constant in 0.5 seconds increments.
- To turn off the input filter, set the parameter to "0.0".

For example,

If you set the input filter time constant to 5.0 seconds and the input suddenly changes from 0°C to 100°C, displayed PV gradually changes, taking 5.0 seconds to change from 0°C to 63°C.

Fig 4: Input Filter



Note:

- Default setting is 5.0 seconds. Change the setting only if needed.

[Setting example] Changing the input filter time constant from 5.0 seconds to 10.0 seconds —

Display	Operating procedure
	1. Press the (SEL) key for 9 seconds. <i>PdF</i> appears.
	2. Press the (SEL) key once. The setpoint (<i>5.0</i>) is displayed.
	3. Use the (Δ) and (▽) keys to change <i>5.0</i> to <i>10.0</i> .
	4. Press the (SEL) key once. The display changes back to <i>PdF</i> when the change is complete. (If you want to check the result, repeat the steps 3–5.)
	5. To go back to the operation mode (PV display), press the (SEL) key for 3 seconds.



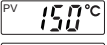





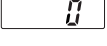


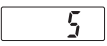






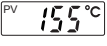

PV offset (setting range: -10% to 10% FS)

Allows you to add the user-specified value to the reading. This is useful when you want to make the displayed PV agree with the reading of a recorder.

Note:

- Judgment for alarm is made based on the PV to which the PV offset value is added.

[Setting example] Add a 5°C offset to the PV (example when the reading is 150°C)

Display	Operating procedure
 PV display 	<p>1. Press the  key for 9 seconds. <i>PdF</i> appears.</p>
	<p>2. Use the  and  keys to access <i>PdF</i>.</p>
	<p>3. Press the  key once. The setpoint () is displayed.</p>
	<p>4. Use the  and  keys to change  to .</p>
	<p>5. Press the  key once. The display changes back to <i>PdF</i> when the change is complete. (If you want to check the result, repeat the steps 3–5.)</p>
 PV display	<p>6. To go back to the operation mode (PV display), press the  key for 3 seconds.</p>

User ZERO adjustment (setting range: -50% to 50% FS)

User SPAN adjustment (setting range: -50% to 50% FS)

- Allows you to calibrate the zero point and the span point.
- These parameters are independent from the default settings. You can restore the default settings by setting these parameters to "0".

Zero point adjustment:

Apply a 0% input to PXR3 and check the error. If there is unacceptable level of error, edit the parameter *R00* according to the below example.

Span point adjustment:

Apply a 100% input to PXR3 and check the error. If there is unacceptable level of error, edit the parameter *R15* according to the below example.

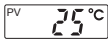
















Example when using the type K thermocouple whose input range is 0–1200°C

If the reading for 0°C input is -8°C, and the reading for 1200°C input is 1206°C, you should set *R00* to "8" and *R15* to "-6".

Then, the reading for 0°C input will be 0°C and the reading for 1200°C input will be 1200°C.

*Setting *R00* and *R15* to "0" restores the default settings.

[Setting example] Setting the user ZERO adjustment to +1°C

Display	Operating procedure
 PV display     	<ol style="list-style-type: none"> 1. Press the  key for 9 seconds. <i>P d F</i> appears. 2. Use the  and  keys to access <i>R00</i>. 3. Press the  key once. The setpoint () is displayed. 4. Use the  and  keys to change  to . 5. Press the  key once. The display changes back to <i>R00</i> when the change is complete. (If you want to check the result, repeat the steps 3–5.) 6. To go back to the operation mode (PV display), press the  key for 3 seconds.

3 Alarm

This section describes how to set the alarm type and the alarm setpoint properly, and some points you have to know when combining different kinds of alarms.

Alarm type

PXR3 has eight types of alarms. Select the right type for your application from the table below, and set the right code for your selection to the parameters $PR1$ (alarm type 1) and $PR2$ (alarm type 2).

Be sure to power-cycle PXR3 after changing the alarm type.

Table 4: Alarm Types

Code of PA1 and 2	Alarm type	Set value	Hold function	Relay operation at alarm	Action diagram
0	No alarm	If your PXR3 has two alarms but you want to use only one alarm, set the other alarm to "0".			
1	Upper limit	Absolute value	Without	Relay energization	
2	Lower limit	Absolute value	Without	Relay energization	
3	Upper limit	Absolute value	With	Relay energization	
4	Lower limit	Absolute value	With	Relay energization	
5	Upper limit	Absolute value	Without	Relay de-energization	
6	Lower limit	Absolute value	Without	Relay de-energization	
7	Upper limit	Absolute value	With	Relay de-energization	
8	Lower limit	Absolute value	With	Relay de-energization	

Note: Be sure to power-cycle PXR3 after you change the alarm type.

How to read activation diagram

area: Range in which the AL1 or the AL2 indicator lights.

area: Range in which the alarm relay is energized

point: Alarm set value

The horizontal represents PV.

Alarm setpoint

The alarm 1 and the alarm 2 start to function at the trigger values you set.

Alarm setting

Set the alarm 1 setpoint with $SF1$, and the alarm 2 setpoint with $SF2$, both of which belong to the level 2 parameters. Setting is available within the input range, which is between PSL and PSU .

Note that in the level 1 parameter, you can only check the setpoints, i.e. you cannot edit the setpoints.

Energization and de-energization

You can select whether to energize or to de-energize the relay when an alarm occurs.

Relay energization: Alarm relay contact is closed when an alarm occurs.

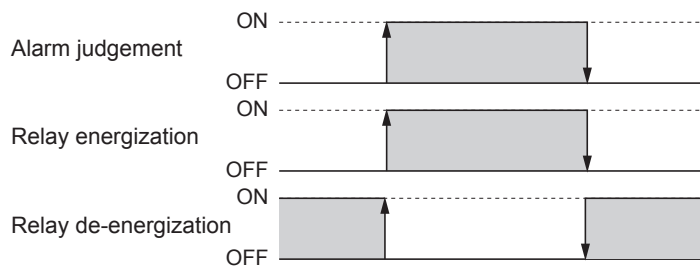
Relay de-energization: Alarm relay contact is opened when an alarm occurs. The contact is closed during normal operation. Note that the contact is also opened during no power is supplied to PXR3 and during the initial action ("----" is displayed) after power-up.

Alarm setting

To energize the relay output, set *PR1* and/or *PR2* to 1, 2, 3, or 4.

To de-energize the relay output, set *PR1* and/or *PR2* to 5, 6, 7, or 8.

Fig 5: Energization and De-Energization



Alarm with hold

By using this function, you can let PXR3 go without activating the alarm if the input on power-up falls in the alarm range. If the input once goes out of the alarm range and then falls into the alarm range again, PXR3 will emit the alarm. This allows you to start PXR3 without worrying about the effect of input fluctuation on power-up.

Alarm setting

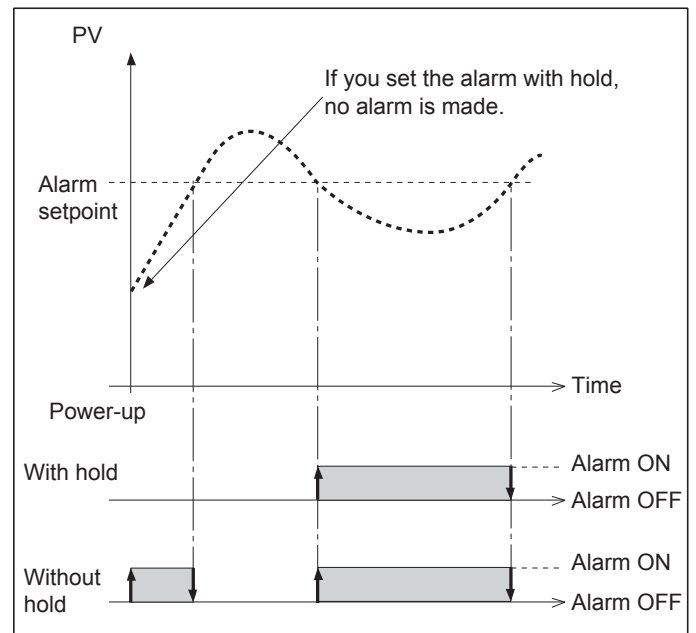
To use the hold function, set *PR1* and/or *PR2* to 1, 2, 5, or 6;

not to use the hold function, set *PR1* and/or *PR2* to 3, 4, 7, or 8.

Note:

Alarm with hold is cancelled and the alarm is activated when an input error (open loop, over-range, or under-range) occurs.

Fig 6: Lower Limit Alarm with Hold



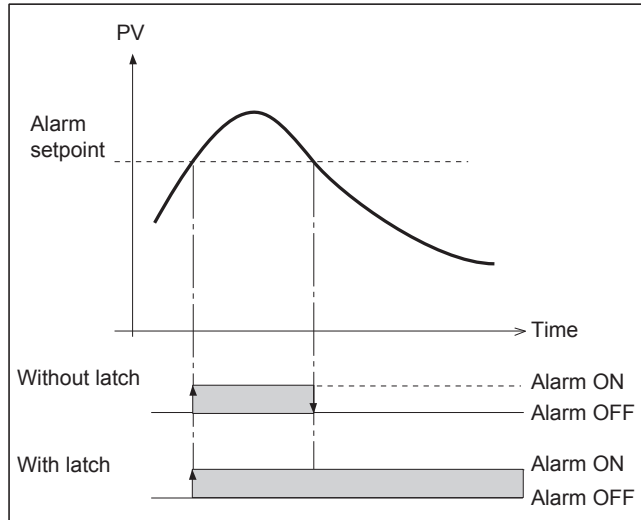
Alarm latch by hysteresis

Setting the hysteresis to 110% allows the alarm to latch, i.e. once the alarm starts to work, it will not go off even if the input goes out of the alarm range. To turn off the alarm, power-cycle PXR3 or change the alarm type of *PR1* and/or *PR2* to "0".

Alarm setting

Set the hysteresis parameter (*HY1* and/or *HY2*) of the alarm you want to latch to 110% FS.

Fig 7: Upper Limit Alarm Latch



Notes:

- Do not use the alarm latch by 110% FS hysteresis and the alarm with hold together, or no alarm except for input error alarm is emitted.
- The alarm latch may not work when input error alarm occurs. In input error alarms, the alarm turns off when the input goes into the normal range (i.e. out of the alarm range).

Alarm	<i>brn</i> parameter setting	Alarm conditions
Upper range alarm	<i>H</i>	Over-range
Lower range alarm	<i>L</i>	Under-range

- If you use both the upper range alarm and the lower range alarm, you can only latch either one, according to your setting of the *brn* parameter.

<i>brn</i> parameter setting	Alarm action
<i>H</i>	Only the upper-range alarm can be latched.
<i>L</i>	Only the under-range alarm can be latched.

Combining the alarm latch by hysteresis and the alarm with hold

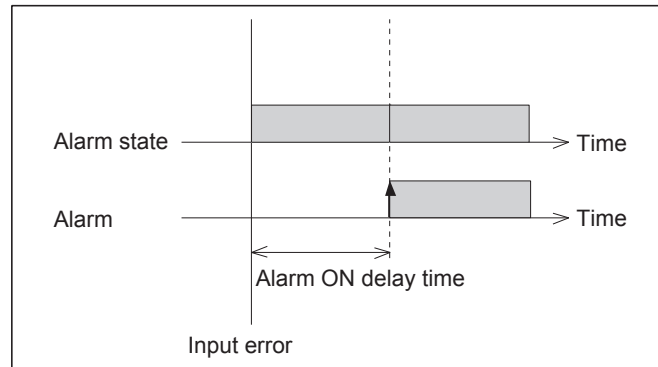
Do not use this combination. If you combine these two alarms, no alarm will be emitted except for input error alarm, i.e. open loop (burnout), over-range, or under-range.

Reason: the alarm with hold function skips the first alarm and lets the alarm start at the second time that the input falls into the alarm range. The alarm latch by hysteresis uses the hysteresis of 110% FS. If you combine these two alarms, the input never goes into the alarm range, and the hold is never cancelled unless an input error occurs.

Alarm ON delay time

Alarm ON delay functions for all the alarms including the input error alarms (open loop, over-range, and under-range). The alarm starts only after the delay time you set has passed.

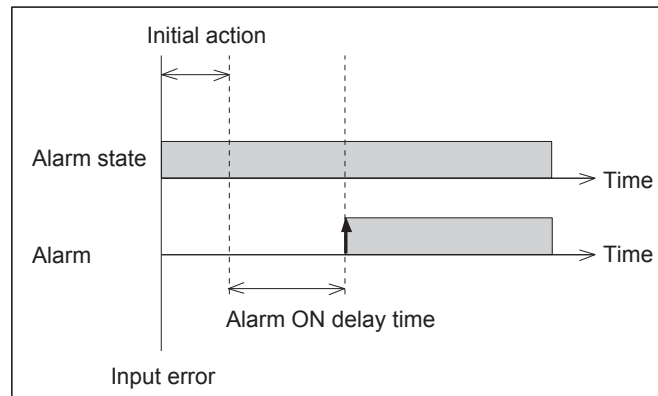
Fig 8: Alarm ON Delay



Power ON delay time

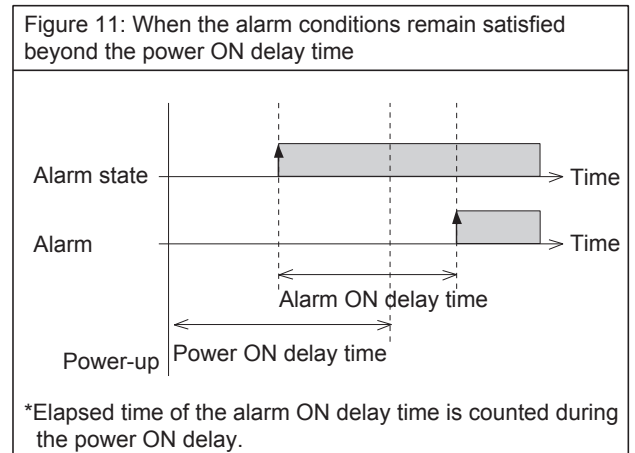
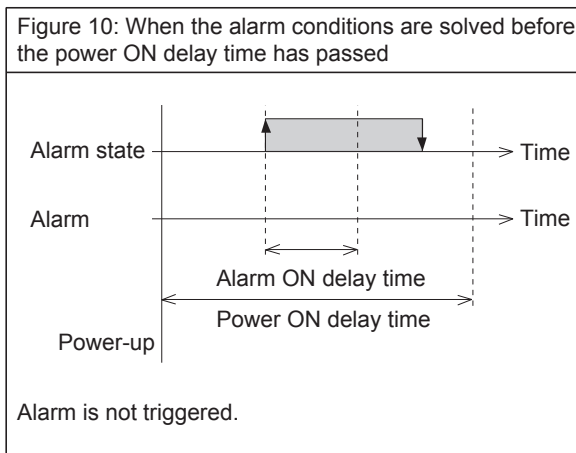
- Power ON delay functions for all the alarms including the input error alarms (open loop, over-range, and under-range). The alarm starts only after the delay time you set has passed.
- The alarm does not work during the initial action (during which “----“is displayed). The power ON delay time starts when the initial action ends and PV is displayed. Consequently, the alarm is ineffective all through these periods.

Fig 9: Power ON Delay



Combining the power ON delay time and the alarm ON delay time

If the power ON delay and the alarm ON delay are active on power-up, the power ON delay is prioritized.



4 Troubleshooting

Problem	Probable cause	Remedy	Page
UUUUU or LLLLL appears on the screen.	Parameter P_{n2} setting is not appropriate for the input sensor in use.	Check the settings of P_{n2} , PSL , and PSU .	11, 12
	Input sensor is not properly connected.	Connect the input sensor with the correct polarity.	–
	Input is short-circuited during the use of the type R thermocouple.	Change the parameter setting of P_{n2} to 3, and check the the reading. If the reading is around the room temperature, there is no short-circuiting. The error code appeared because the type R thermocouple tends to show large error around the room temperature.	11
	The input sensor in use is not appropriate for the version of PXR3 you ordered.	Use the right sensor for your PXR3 or the right PXR3 for the sensor you use.	2, 11
	The connection of the input is loose.	Fasten the terminal connection.	–
	Input circuit is opened or shorted.	Replace the sensor, or solve the short circuit.	–
	Sensor is failed.	Replace the sensor.	–
	Process temperature is too high or too low.	Replace the sensor appropriate for the measurement range. *LLLLL appears when the $PSL-5\% FS > PV$, and UUUUU appears when $PSU+5\% FS < PV$.	12
Errr appears on the screen.	The parameter PSL is larger than the parameter PSU .	Set the parameters PSL and PSU according to the “input range code” table.	12
Alarm setpoint and some other parameters automatically change.	You changed the parameters PSL and PSU .	Set all the parameters again. *when you change PSL and PSU , parameters marked with <input type="checkbox"/> in Parameter List change accordingly.	5
Response is slow	The value of the input filter time constant is too large.	Make the setpoint of the parameter P_{dF} smaller.	19
Keys won't work. Parameters cannot be changed.	The parameter L_{oC} is set to 1 or 2.	Set the parameter L_{oC} to 0.	18
Alarm setpoint cannot be changed.	The parameter L_{oC} is set to 1.	Set the parameter L_{oC} to 0.	18
	The value you try to set is out of the range between PSL and PSU .	Set the alarm within the range between PSL and PSU , or Replace the sensor that meets the measurement range you want to use.	11, 12

No alarm is made.	The alarm with hold is set.	Set the alarm type to any of “without hold” alarm types, and check if the alarm occurs.	13
	The setting of the alarm ON delay is too large.	Set the alarm ON delay to 0, and check if the alarm occurs.	15
	The alarm type setting is inappropriate.	Set the parameters <i>PR1</i> and <i>PR2</i> appropriately in reference to the explanation on page 13.	13
FALT appears on the screen.	PXR3 is failed.	Stop the operation and consult us.	–

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⚠ Caution on Safety

*Before using this product, be sure to read its instruction manual.

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