

Symbol	Name	Setting range	Description	Factory set value
HBA	Heater break alarm (HBA) set value ¹	0.0 to 100.0 A	Alarm value is set by referring to input value from the current transformer (CT). Used only for single-phase.	0.0
LBA	Control loop break alarm (LBA) time ²	0.1 to 200.0 minutes	Set control loop break alarm set value.	8.0
Lbd	LBA deadband ³	Temperature input: 0 to 9999°C [°F] Voltage/current inputs: 0 to 100 % of span	Set the area of not outputting LBA. No LBA deadband functions with 0 set. Differential gap: Temperature input: 0.8°C [°F] Voltage/current inputs: 0.8 % of span	0
ATV	Autotuning (AT)	0: AT end or cancel 1: AT start or execution	Turns the autotuning ON/OFF.	0
P	Proportional band	Temperature input: 1/0.1 to span 0.1°C [°F] resolution: Within 99.9°C [°F] Voltage/current inputs: 01 to 100.0 % of span	Set when PI, PD or PID control is performed. Heat/cool PID action: Proportional band setting on the heat-side. ON/OFF action control when set to 0 (0.0). ON/OFF action differential gap: Temperature input: 2 (0.2)°C [°F] Voltage/current inputs: 0.2 % of span	Temperature input: 30 (3 0.0) Voltage/current inputs: 3.0
I	Integral time	1 to 3600 seconds (0 second: PD action)	Set the time of integral action to eliminate the offset occurring in proportional control.	240
d	Derivative time	1 to 3600 seconds (0 second: PI action)	Set the time of derivative action to improve control stability by preparing for output changes.	60
AR	Anti-reset windup (ARW)	1 to 100 % of heat-side proportional band (0 %: Integral action OFF)	Overshooting and undershooting are restricted by the integral effect.	100
r	Heat-side proportioning cycle	1 to 100 seconds (Not displayed if the control output is current output.)	Set control output cycle. Heat/cool PID action: Heat-side proportioning cycle	Relay contact output: 20 Voltage pulse output/ Trigger output for triac driving: 2
Pc	Cool-side proportional band	1 to 1000 % of heat-side proportional band	Set cool-side proportional band when heat/cool PID action.	100
SC	Deadband	Temperature input: -10 to +10 °C [°F] or -10.0 to +10.0 °C [°F] Voltage/current inputs: -10.0 to +10.0 % of span	Set control action deadband between heat-side and cool-side proportional bands. Minus (-) setting results in overlap.	0 or 0.0
t	Cool-side proportioning cycle	1 to 100 seconds (Not displayed if the control output is current output.)	Set control cool-side output cycle for heat/cool PID action.	Relay contact output: 20 Voltage pulse output: 2
LCK	Set data lock (LCK)	0100: No set data locked (All parameters changeable) 0101: Set data locked (All parameters locked) 0110: Only the set value (SV) is changeable with the set data locked	Performs set data change enable/disable.	0100

1 Heater Break Alarm (HBA) function
The HBA function monitors the current flowing through the load by a dedicated current transformer (CT), compares the measured value with the HBA set value, and detects a fault in the heating circuit.

Low or No current flow (Heater break, malfunction of the control device, etc.):

When the control output is ON and the current transformer input value is equal to or less than the heater break determination point for the preset number of consecutive sampling cycle, an alarm is activated.

Over current or short-circuit:
When the control output is OFF and the current transformer input value is equal to or greater than the heater break determination point for the preset number of consecutive sampling cycle, an alarm is activated.

Precaution for HBA setting:

- Displayed only for when HBA is selected as Alarm 2.
- HBA is not available on a current output.
- Set the set value to approximately 85 % of the maximum reading of the CT input.
- Set the set value to a slightly smaller value to prevent a false alarm if the power supply may become unstable.
- When more than one heater is connected in parallel, it may be necessary to increase the HBA set value to detect a single heater failure.
- When the current transformer is not connected or the HBA set value is set to 0.0, the HBA is turned on.

2 Control Loop Break Alarm (LBA) function

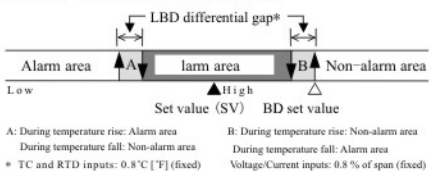
The LBA function is used to detect a load (heater) break or a failure in the external actuator (power controller, magnet relay, etc.), or a failure in the control loop caused by an input (sensor) break. The LBA function is activated when control output reaches 0 % or 100 %. LBA monitors variation of the measured value (PV) for the length of LBA time. When the LBA time has elapsed and the PV is still within the alarm determination range, the LBA will be ON.

Precaution for LBA setting:

- Displayed only for when LBA is selected as Alarm 1 or Alarm 2.
- No control loop break alarm can be used at heat/cool PID control action.
- The LBA function can not be activated when AT function is turned on.
- The LBA function is activated when control output reaches 0 % or 100 %. The time required for the LBA output to turn on includes both the time from the initial occurrence of loop failure and the LBA setting time. Recommended setting for LBA is for the set value of the LBA time to be twice the value of the integral time (I).
- If LBA setting time does not match the controlled object requirements, the LBA setting time should be lengthened.
- If setting time is not correct, the LBA will malfunction by turning on or off at inappropriate times or not turning on at all.

3 LBA Deadband function

The LBA may malfunction due to external disturbances. To prevent malfunctioning due to external disturbance, LBA deadband (LBD) sets a neutral zone in which LBA is not activated. When the measured value (PV) is within the LBD area, LBA will not be activated. If the LBD setting is not correct, the LBA will not work correctly.



5. INITIAL SETTING

WARNING

Parameters in the Initialization mode should be set according to the application before setting any parameter related to operation. Once the Parameters in the Initialization mode are set correctly, those parameters are not necessary to be changed for the same application under normal conditions. If they are changed unnecessarily, it may result in malfunction or failure of the instrument. xmt will not bear any responsibility for malfunction or failure as a result of improper changes in the Initialization mode.

- Press the SET key until LCK (Set Data Lock display) will be displayed.



- Press the DOWN key to change 0 to 1.



- Press the SHIFT key and SET key to "COD" model

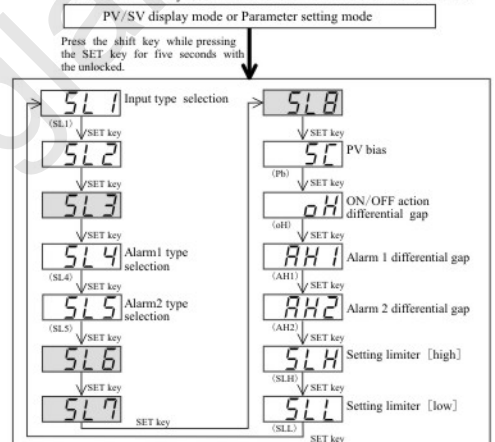


- Press the SET key to code 0 or code 1

5.1 Initial Setting Menu

Display flowcharts in Initialization mode are shown in the following.

Do not change to the section parameters and any parameter in the Initialization mode which is not described in the initial setting menu below. It may result in malfunction or failure of the instrument.



5.2 Input Type Selection (SL1)

When any parameter setting is changed in the Initialization Mode, check all parameter set values in SV Setting Mode and Parameter Setting Mode.

Factory set value varies depending on the input type.

Set value	Input type	Hardware	
0000	K	Thermocouple (TC)	
0001	J		
0010	R		
0011	S		
0100	B		
0101	E		
0110	N		
0111	T		
1000	Pt100		RTD
1001	Cu50		
1010	0 to 400Ω		
1011	0 to 50mV	Voltage	
1100	0 to 20 mA DC		Current
1101	0 to 5 V DC		

5.2 Alarm 1 [ALM1] Type Selection (SL4) Alarm 2 [ALM2] Type Selection (SL5)

If the alarm function is not provided with the instrument when shipped from the factory, no alarm output is available by changing SL4 and/or SL5.

- SL4 is set to 0000 in the following cases.
- When the instrument does not have ALM1 output
 - When Control Loop Break Alarm (LBA) is provided and assigned to ALM1

- SL5 is set to 0000 in the following cases.
- When the instrument does not have ALM2 output
 - When Control Loop Break Alarm (LBA) is provided and assigned to ALM2
 - When the SV alarm is provided and assigned to ALM2
 - When the Heater Break Alarm (HBA) is provided

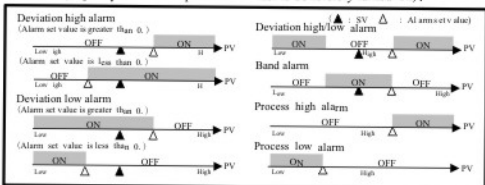
Factory set value varies depending on the instrument specification.

Set value	Details of setting
0000	No alarm
0001	Deviation high alarm
0101	Deviation low alarm
0010	Deviation high/low alarm
0110	Band alarm
0011	Process high alarm
0111	Process low alarm
1001	Deviation high alarm with hold action *
1101	Deviation low alarm with hold action *
1010	Deviation high/low alarm with hold action *
1011	Process high alarm with hold action *
1111	Process low alarm with hold action *

* Hold action:
When Hold action is ON, the alarm action is suppressed at start-up or the control set value change until the measured value enters the non-alarm range.

z Alarm action type

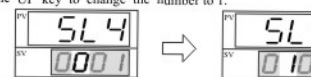
Both of the Alarm 1 and Alarm 2 outputs of this instrument are turned on when burnout occurs regardless of any of the following actions taken (High alarm, low alarm, etc.). In addition, when used for any purposes other than these alarms (event, etc.), specify the Z-124 specification (not to be forcibly turned on).



Change Settings

Example: Change the ALM1 type from "Deviation high alarm (0001)" to "Deviation low alarm (0101)"

- Press the SET key three times at SL1 until SL4 is displayed.
- Press the shift key to high-light the hundreds digit.
- Press the UP key to change the number to 1.



- Press the SET key to store the new set value. The display goes to the next parameter.

6. ERROR DISPLAYS

Error display

Err	RAM failure (Incorrect set data write, etc.)	Turn off the power once. If an error occurs after the power is turned on again, please contact xmt sales office or the agent.
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Overscale and Underscale

Measured value (PV) [Flashing]	PV is outside of input range.	<p style="text-align: center;">WARNING</p> <p>To prevent electric shock, always turn off the power before replacing the sensor.</p> <p>Check input type, input range, sensor and sensor connection.</p>
0000 [Flashing]	Overscale: PV is above the high input display range limit.	
UUUU [Flashing]	Underscale: PV is below the low input display range limit.	