

Instruction Manual (PID Dual Line)  
PT244A-T / PT244A-K  
PT344A-T / PT344A-K  
PT444A-T / PT444A-K



Introduction

A proportional–integral–derivative controller (PID controller or three term controller) is a control loop feedback mechanism widely used in industrial control systems and a variety of other applications requiring continuously modulated control. A PID controller continuously calculates an error value as the difference between a desired setpoint (SV) and a measured process variable (PV) and applies a correction based on proportional, integral, and derivative terms (denoted P, I, and D respectively) which give the controller its name.

PT244A/ PT344A/ PT444A is a two-set point PID controller. It is available in touch & keypad version. Customized iconic display interprets status easily.

Caution for your safety

**WIRING:** The probe and its corresponding wires should never be installed in a conduit next to control or power supply lines. The electrical wiring should be done as shown in the diagram. The power supply circuit should be connected to a protection switch. The terminals admit wires of upto 2.5sq mm.

**WARNING:** Improper wiring may cause irreparable damage and personal injury. Kindly ensure that wiring is done by qualified personnel only.

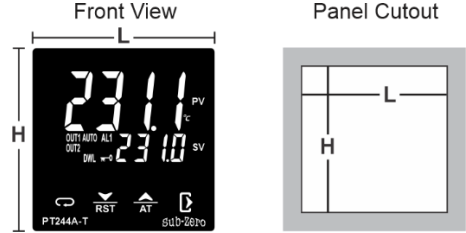
**Maintenance:** Cleaning: Clean the surface of the controller with a soft moist cloth. Do not use abrasive detergents, petrol, alcohol or solvents.

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**Controller:** Controller should be installed in a place protected by vibration, water and corrosive gasses and where ambient temperature does not exceed the values specified in the technical data.

**Probe:** To give a correct reading, the probe must be installed in a place protected from thermal influences, which may affect the temperature to be controlled.

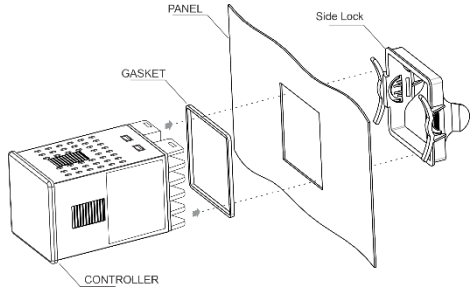
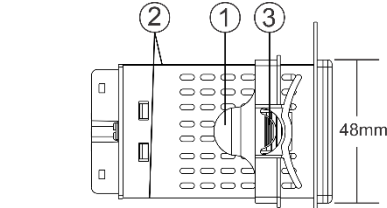
Dimensions & Panel Cutout



Sr.	Model	Dimensions (L x H) mm	Panel Cut-out (L x H) mm
1	PT244A-T/K	45.5 X 45.5	48 X 48
2	PT344A-T/K	68 X 68	72 X 72
3	PT444A-T/K	92 X 92	96 X 96

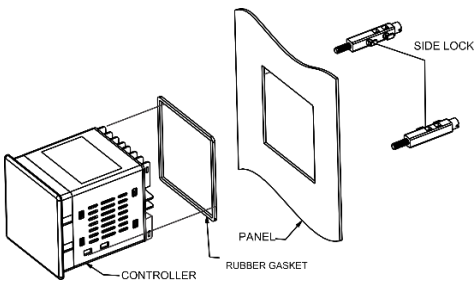
Product Mounting (PT244A-T/K)

**Installation:** Fixing and dimensions of panel models:  
To fix the unit, slide the fastener ① through the guides ② as per the position shown in the figure. Move the fastener in the direction of the arrow, pressing tab ③ it permits to move the fastener in the opposite direction of the arrow.



Product Mounting (PT344A-T/K)

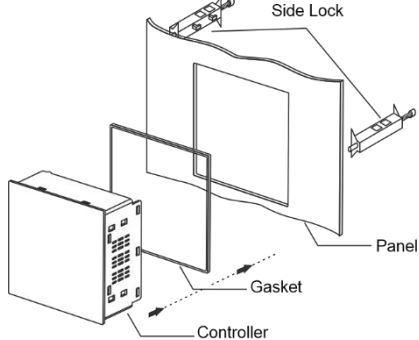
**Installation:**  
1. Prepare the panel cutout with proper dimension.  
2. Fix the controller with side locks to place it in proper position.



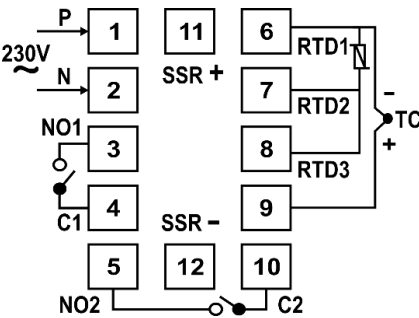
Product Mounting (PT444A-T/K)

Installation:

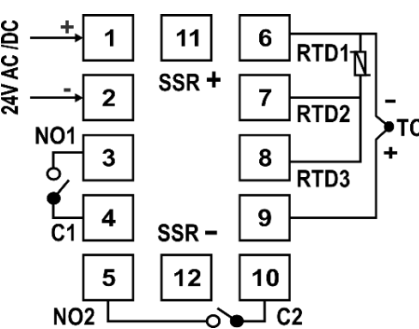
1. Prepare the panel cutout with proper dimension.
2. Fix the side locks to place controller in proper position.



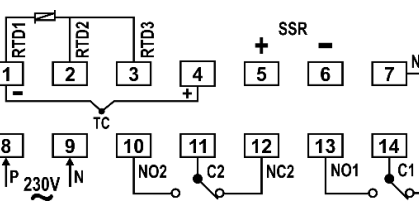
Connection Diagram (for PT244A-T/K)



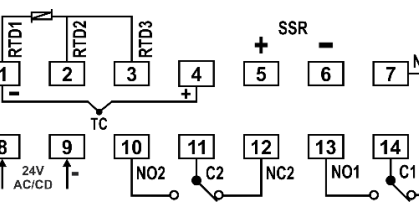
Connection Diagram (for PT244A-T/K – 24V)



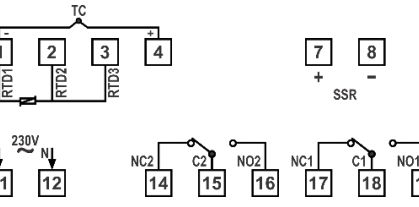
Connection Diagram (for PT344A-T/K)



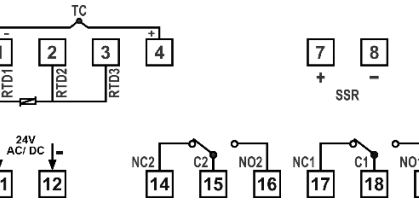
Connection Diagram (for PT344A-T/K – 24V)



Connection Diagram (for PT444A-T/K)



Connection Diagram (for PT444A-T/K – 24V)



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		Working
		Initial display when Power is ON
		Parameter setting mode
		Set mode
1	Set 1	To set control1 set point.
2	Set 2	To set control2 set point.
3	dwell	Sets the dwell time.
		LEVEL 1
4	Input	Sets type of input sensor.
5	inb	Sets input correction.
6	Hsu	Sets the upper limit of PV input.
7	LSu	Sets the lower limit of PV input.
8	Ht-R	To set maximum allowable high temperature range.
9	Lt-R	To set minimum allowable low temperature range.
10	ent2	Sets control action for relay2
11	band	To set ON/OFF for relay2 in band control action
12	Hys2	Set the hysteresis for ON-OFF action in Control2.
13	dly2	Time delay between control output 2 restart
14	mod2	Sets the alarm type.
15	ALr-n	Sets AL1 icon as alarm relay ON/OFF indicator for alarm1.

16	dF	Sets digital filter time.
17	rSt	To restore default setting of the controller.
		LEVEL 2
18	ent 1	Sets control action for relay1.
19	At	Runs auto tuning.
20	Cycle	Sets cycle time for PID action.
21	P	Sets proportional band.
22	I	Sets Integration band.
23	d	Sets differential band.
24	Hys 1	Set hysteresis for ON/OFF action in Control1.
25	dly1	Time delay between control output1 restart
26	out	To select Relay/SSR/Both
27	LoF	To lock Parameter.
28	LoI	To lock set point.
		Pro-key (On-request)
		LED Indications
		Error Messages
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User Interface



Sr. No	Description
1	<b>Process Value (PV)</b> RUN mode: Displays current measured value. SETTING mode: Displays parameter.
2	<b>Set value (SV)</b> RUN mode: Displays set value. Displays countdown time when Dwell timer is running. SETTING mode: Displays set value of parameter.
3	<b>°C</b> Displays the Temperature unit.
4	<b>OUT1</b> Turns ON while control output1 is ON.
5	<b>OUT2</b> Turns ON while control output2 is ON.
6	<b>AL1</b> Turns ON when the corresponding alarm out turns ON.
7	<b>AUTO</b> Flashes when auto tuning is in progress.
8	<b>DWL</b> Flashes during Dwell timer is in progress. Continuous ON: Dwell time elapsed.
9	<b>0</b> Turns ON when keypad is locked.
10	<b>Next key:</b> Used to enters parameters level, moves to next parameters. Press & hold this key at least 500m seconds to enter in set mode. Press & hold this key at least 2 seconds to enter in Level1 Parameters. Press & hold this key at least 4 seconds to enter in Level2 Parameters.
11	<b>RST</b> <b>Down / Reset key:</b> Used in Program mode to decrement parameter value. Used to reset the Dwell timer.
12	<b>AT</b> <b>Up / AT key:</b> Used in Program mode to increment parameter value. Press this key for 2 seconds to start or stop auto-tuning.
13	<b>Exit key:</b> Press this key to save the setting value and to exit the programing mode. Also used to access the Pro-key function.

Technical Specification

<b>Housing</b>	: Polycarbonate Plastic
<b>Dimensions (PT244A)</b>	: <b>Frontal:</b> 48 X 48mm, <b>Depth:</b> 78mm
<b>Panel Cutout (PT244A)</b>	: 45.5 X 45.5mm
<b>Dimensions (PT344A)</b>	: <b>Frontal:</b> 72 X 72mm, <b>Depth:</b> 84mm
<b>Panel Cutout (PT344A)</b>	: 68 X 68mm
<b>Dimensions (PT444A)</b>	: <b>Frontal:</b> 96 X 96mm, <b>Depth:</b> 61mm
<b>Panel Cutout (PT444A)</b>	: 92 X 92mm
<b>Mounting</b>	: Flush panel mounting with fasteners.
<b>Protection</b>	: IP65 Front
<b>Connections</b>	: Terminal connectors. < 2.5sq mm terminal only.

<b>Display (PT244A)</b>	: 4 X 17mm 7 segment Red/White display, 4 X 8mm 7 segments Green display 7 Iconic LEDs for Indication
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<b>Display (PT344A) (PT444A)</b>	: 4 X 20mm 7 segment Red/White display, 4 X 9.5mm 7 segment Green display 7 Iconic LEDs for Indication
<b>Data storage</b>	: Non-volatile flash memory
<b>Operating temp.</b>	: 0°C to 60°C (non-condensing)
<b>Operating humidity</b>	: 20% to 85% (non-condensing)
<b>Storage temp.</b>	: -25°C to 60°C (non-condensing)
<b>Power input</b>	: 230Vac ± 15%, 50/60Hz Standard. 85 to 265Vac, 12/24Vdc on request.

<b>Control output</b>	: <b>(For all PT244A-T / PT244A-K)</b> Relay: 7A, 230V AC (Res.) or SSR (field selectable): 10V DC, 30mA
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<b>Auxiliary output</b>	: <b>(For all PT244A-T / PT244A-K)</b> Relay: 7A, 230V AC (Res.)
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<b>Control output</b>	: <b>(For all PT344A-T/K - PT444A-T/K)</b> Relay: 10A, 230V AC (Resistive) or SSR (field selectable): 10V DC, 30mA
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<b>Auxiliary output</b>	: <b>(For all PT344A-T/K - PT444A-T/K)</b> Relay: 10A, 230V AC (Resistive)
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<b>Input Type</b>	: RTD: Pt100 <b>Thermocouple:</b> J, K
<b>Resolution</b>	: 0.1°C / 1°C for RTD (Pt100) input 1°C for Thermocouple (J, K) input
<b>Display Accuracy</b>	: 0.3% of F.S (20 min of settling time for TC)
<b>Sampling Period</b>	: 1 second

Model Description

1. PT244A-T-W2C34	1. PT344A-T-W2C34	1. PT444A-T-W2C34
2. PT244A-K-R2C34	2. PT344A-K-R2C34	2. PT444A-K-R2C34
3. PT244A-T-W5C34	3. PT344A-T-W5C34	3. PT444A-T-W5C34
4. PT244A-K-R5C34	4. PT344A-K-R5C34	4. PT444A-K-R5C34

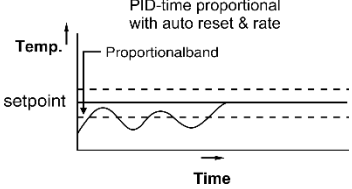
Input types & Input range

Input Type	Decimal Point	Display	Input Range (°C)
Thermocouple	J	J	-50 to 750°C
	K	K	-50 to 1200°C
RTD	Pt	rt d 1	-99 to 400°C
	100	rt d . 1	-99.9 to 400.0°C

Working

1. Auto tuning

The Auto-tuning function automatically computes and sets the proportional band (P), Integral time (I), Derivative time (D) as per process characteristics.  
While Auto-tune is in progress "AUTO" led will flashing.  
After Auto-tuning is complete the "AUTO" led will turn OFF.



If auto -tuning is not complete after 3-4 cycles, it is suspected to fail. In this case, check the wiring & parameters such as the control action, input type etc.  
Carry out the auto-tuning again, if there is a change in set point or process parameters.

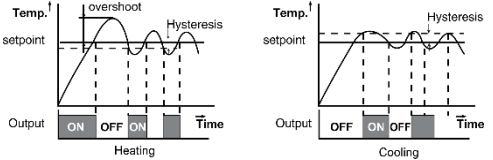
**Note:** When Auto tuning in progress, user cannot change the parameter value.

2. ON/OFF control action (For Heating mode)

The relay is 'ON' up to the set temperature and cuts "OFF" above the set temperature. As the temperature of the system drops, the relay is switched 'ON' at a temperature lower than the set point.

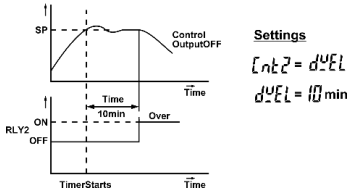
HYSTERESIS:

The difference between the temperature at which relay switches 'OFF' is the hysteresis or dead band.



3. Dwell Timer

A dwell timer is used to control a process at a fixed temperature for a defined period. Once the process reaches the setpoint, dwell timer starts to count until time out. After the time completes, control output goes OFF and auxiliary output energies as an alarm.



Note:

- 1) Countdown timer is displayed on the lower display. Once total time elapsed lower display will show "done".
- 2) DWL icon LED blinking indicates that dwell timer is in progress. It switches to continuous 'ON' when dwell timer is over.
- 3) If Dwell time programmed as OFF, it will disable the dwell timer.
- 4) When soak in progress & dwell time is modified, new dwell time is applicable.
- 5) The dwell period can be reduced or increased when the timer is running. If it is reduced to meet the time elapsed. The timer will change to the end state.
- 6) Once the timer output was energized it can be reset with the Reset key.

Initial Display when Power is ON

When power is On, entire display part will flash for 3 sec, Software revision will flash for 2 sec, Hardware revision will flash for 2 sec and then enter in to RUN mode.



1. Entire display Part

2. Run Mode

Parameter Setting Mode

SET MODE	
1. Set 1	<b>Function:</b> To set control1 set point.

Press & hold key for 500mSec to enter set mode  
Display will show Set 1. User can change Set 1 value using UP/ DOWN keys. Holding the key, will change the value at a faster rate. Press key to store the desired value & move on to the next parameter. Set value also can be stored by pressing key.

Min	Max	Fac.
LSu	HSu	0°C

2. Set 2	<b>Function:</b> To set control2 set point.
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This parameter is prompted only if Relay 2 is configured in ent2, 1.As absolute auxiliary control or as an alarm (High/Low) mode. 2.As deviation auxiliary control or as a deviation alarm mode.

**Note:** If ent2 set to OFF, Set2 will not be shown in the SP setting.

Min	Max	Fac.
LSu	HSu	0°C

3. dwell	<b>Function:</b> Sets the dwell time.
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This parameter is prompted only if Relay 2 is configured in ent2 as dwell

For dwell timer operation please refer Working section.

Min	Max	Fac.
off	9999min	off

LEVEL1 Parameter

Press & hold key for 2 seconds to enter into Level1 parameter setting (Level1 will flash).

When release the key, will flash.

Press UP/DOWN keys to modify the set value and to go to the next parameter by pressing key.

Press the key to save the set value and to come out of parameter setting after changing the set value.




4. Input	<b>Function:</b> Sets the type of input sensor.
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While changing the sensor type Set 1, Set2, inb, Hsu, LSu, Ht-R, Lt-R parameters of level1 will reset accordingly.

For type of input sensor & range please refer "Input types & Input range" table.

For J type sensor		
Min	Max	Fac.
J	rt d . 1	J

5. <i>lnb</i>	<b>Function:</b> Sets input correction.								
In time it may be possible that the display may be offset by a degree or so. To compensate for this error, user may need to add or minus the degrees required to achieve the correct temperature. <b>Example:</b> The temperature on the display is 28°C, whereas the actual temperature is 30°C. User will have to set the " <i>lnb</i> " parameter to 2°C, which means that once out of the programming mode, the temperature on display will be 30°C (28°C+ 2°C).									
<table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td>-10°C</td><td>10°C</td><td>0°C</td></tr></table>		<b>Min</b>	<b>Max</b>	<b>Fac.</b>	-10°C	10°C	0°C		
<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
-10°C	10°C	0°C							
6. <i>HSV</i>	<b>Function:</b> Sets the upper limit of PV input.								
Sets the maximum limit for set point adjustment. It can be set from <i>LSu+1</i> value to maximum specified range of selected sensor. Once set at a particular value, this will not allow the set point to go above this value. When changing the setting value and SV > HSV, SV will reset as HSV.									
<b>For J type sensor</b> <table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td><i>LSu+1</i></td><td>750°C</td><td>750°C</td></tr></table>		<b>Min</b>	<b>Max</b>	<b>Fac.</b>	<i>LSu+1</i>	750°C	750°C		
<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
<i>LSu+1</i>	750°C	750°C							
7. <i>LSu</i>	<b>Function:</b> Sets the lower limit of PV input.								
Sets the minimum limit for set point adjustment. It can be set from minimum specified range of selected sensor to <i>HSu-l</i> value. Once set at a particular value, this will not allow the set point to go below this value. When changing the setting value and SV < LSV, SV will reset as LSV.									
<b>For J type sensor</b> <table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td>-50°C</td><td><i>HSu-l</i></td><td>-50°C</td></tr></table>		<b>Min</b>	<b>Max</b>	<b>Fac.</b>	-50°C	<i>HSu-l</i>	-50°C		
<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
-50°C	<i>HSu-l</i>	-50°C							
8. <i>Ht-R</i>	<b>Function:</b> To set maximum allowable high temperature limit.								
Example: If this parameter is set to 700°C and the temperature reaches or goes above 700°C, display will show <i>Ht</i> (High Temp.) alarm indicating that the temperature has reached or gone above the value set in this parameter. <b>Note: Ht fault will be ignored at every power ON.</b>									
<table><tr><td><i>Ht</i> (Message on display)</td><td><table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td><i>LtR+l</i></td><td><i>HSu-l</i></td><td><i>HSu-l</i></td></tr></table></td></tr></table>		<i>Ht</i> (Message on display)	<table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td><i>LtR+l</i></td><td><i>HSu-l</i></td><td><i>HSu-l</i></td></tr></table>	<b>Min</b>	<b>Max</b>	<b>Fac.</b>	<i>LtR+l</i>	<i>HSu-l</i>	<i>HSu-l</i>
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<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
<i>LtR+l</i>	<i>HSu-l</i>	<i>HSu-l</i>							
9. <i>Lt-R</i>	<b>Function:</b> To set minimum allowable low temperature limit.								
Example: If this parameter is set to -40°C and the temperature reaches or goes below -40°C, display will show <i>Lt</i> (Low temp) alarm indicating that the temperature has reached or gone below the value set in this parameter. <b>Note: Lt fault will be ignored at every power ON.</b>									
<table><tr><td><i>Lt</i> (Message on display)</td><td><table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td><i>LSu+l</i></td><td><i>HtR-l</i></td><td><i>LSu+l</i></td></tr></table></td></tr></table>		<i>Lt</i> (Message on display)	<table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td><i>LSu+l</i></td><td><i>HtR-l</i></td><td><i>LSu+l</i></td></tr></table>	<b>Min</b>	<b>Max</b>	<b>Fac.</b>	<i>LSu+l</i>	<i>HtR-l</i>	<i>LSu+l</i>
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<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
<i>LSu+l</i>	<i>HtR-l</i>	<i>LSu+l</i>							
10. <i>Lnk2</i>	<b>Function:</b> Sets control action for relay2.								
This parameter used to set required control action for output 2 as,  <i>oFF</i> = No action <i>HEAt</i> = Heating <i>CoOL</i> = Cooling <i>dWEL</i> = Dwell time <i>bAnd</i> = Band alarm									
<table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td><i>oFF</i></td><td><i>bAnd</i></td><td><i>HEAt</i></td></tr></table>		<b>Min</b>	<b>Max</b>	<b>Fac.</b>	<i>oFF</i>	<i>bAnd</i>	<i>HEAt</i>		
<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
<i>oFF</i>	<i>bAnd</i>	<i>HEAt</i>							
11. <i>bAnd</i>	<b>Function:</b> To set ON/OFF for relay2 in band control action.								
<b>Example:</b> When <i>Ht-R</i> sets as 300 & <i>Lt-R</i> set as 200 in between this values relay 2 will be OFF or ON according to band parameter selection above and below of selected range.									
<table><tr><td><i>rLon</i> = ON <i>rLoF</i> = OFF</td><td><table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td><i>rLoF</i></td><td><i>rLon</i></td><td><i>rLoF</i></td></tr></table></td></tr></table>		<i>rLon</i> = ON <i>rLoF</i> = OFF	<table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td><i>rLoF</i></td><td><i>rLon</i></td><td><i>rLoF</i></td></tr></table>	<b>Min</b>	<b>Max</b>	<b>Fac.</b>	<i>rLoF</i>	<i>rLon</i>	<i>rLoF</i>
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<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
<i>rLoF</i>	<i>rLon</i>	<i>rLoF</i>							
12. <i>HYSc</i>	<b>Function:</b> Set the hysteresis for ON-OFF action in Control2.								
This parameter will be prompted only if selected control action is <i>HEAt</i> (Heating) or <i>CoOL</i> (Cooling) in <i>Lnk2</i> setting. It sets the dead band between ON & OFF switching of the output. <b>Example (For Cooling control):</b> If the set point is set at 100°C and hysteresis is set at 2°C, then when the system reaches 100°C, the heater relay will go OFF. Since the hysteresis is 2°C, the heater relay will get ON (restart) at 102°C (100°C +2°C).									
<table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td>1°C</td><td>100°C</td><td>2°C</td></tr></table>		<b>Min</b>	<b>Max</b>	<b>Fac.</b>	1°C	100°C	2°C		
<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
1°C	100°C	2°C							
13. <i>dLY2</i>	<b>Function:</b> To set time delay between output2 restart.								
Use UP/DOWN keys to set desired value. This parameter is used to protect the output device from restarting in a short period of time. <b>Example:</b> If this parameter is set to 60 Sec, Output 2 goes OFF at the set point, it will not restart until time delay completes, even if differential is achieved earlier. <b>Note:</b> If set to 0, dly parameter will be ignored.									
<table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td>0sec</td><td>1200sec</td><td>10sec</td></tr></table>		<b>Min</b>	<b>Max</b>	<b>Fac.</b>	0sec	1200sec	10sec		
<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
0sec	1200sec	10sec							
14. <i>nod2</i>	<b>Function:</b> To set ON/OFF for relay2 in band control action.								
It's applicable when <i>Lnk2</i> is <i>HEAt</i> (Heating) or <i>CoOL</i> (Cooling).  <i>AbS</i> : Absolute <i>dEu</i> : Deviation  <b>For Alarm Types setting, please refer Alarm Type description.: Deviation</b>									
<table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td><i>AbS</i></td><td><i>dEu</i></td><td><i>AbS</i></td></tr></table>		<b>Min</b>	<b>Max</b>	<b>Fac.</b>	<i>AbS</i>	<i>dEu</i>	<i>AbS</i>		
<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
<i>AbS</i>	<i>dEu</i>	<i>AbS</i>							
15. <i>ALrn</i>	<b>Function:</b> Sets AL1 icon as alarm relay ON/OFF indicator for alarm indication.								
Set " <i>YES</i> " to enable AL1 icon. AL1 icon turns ON when the corresponding alarm output turns ON. Type of alarm can selected by using Mod2 parameter.									
<table><tr><td><b>Min</b></td><td><b>Max</b></td><td><b>Fac.</b></td></tr><tr><td><i>no</i></td><td><i>YES</i></td><td><i>no</i></td></tr></table>		<b>Min</b>	<b>Max</b>	<b>Fac.</b>	<i>no</i>	<i>YES</i>	<i>no</i>		
<b>Min</b>	<b>Max</b>	<b>Fac.</b>							
<i>no</i>	<i>YES</i>	<i>no</i>							

16. <i>dF</i>	<b>Function:</b> Sets control action for relay2.						
It differentiate between measured noise and actual changes. For accurate control, increase <i>dF</i> value as desired. For faster response, set <i>dF</i> value minimum.							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td><i>oFF</i></td><td>2</td><td>1</td></tr></table>		Min	Max	Fac.	<i>oFF</i>	2	1
Min	Max	Fac.					
<i>oFF</i>	2	1					
17. <i>rSt</i>	<b>Function:</b> To restore default settings of the controller.						
When set to <i>YES</i> all parameter are programmed to factory values. Useful to debug setting related problems.							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td><i>no</i></td><td><i>YES</i></td><td><i>no</i></td></tr></table>		Min	Max	Fac.	<i>no</i>	<i>YES</i>	<i>no</i>
Min	Max	Fac.					
<i>no</i>	<i>YES</i>	<i>no</i>					
<b>LEVEL2 Parameter</b>							
Press & hold  key for 4 seconds to enter into Level2 parameter setting ( <i>LevL2</i> will flash). When release the key, <i>Lnk1</i> will flash. Press <b>UP/DOWN</b> keys to modify the set value and to go to the next parameter by pressing  key. Press the  key to save the set value and to come out of parameter setting after changing the set value.							
18. <i>Lnk1</i>	<b>Function:</b> Sets control action for Relay 1/ SSR.						
This parameter used to set required control action for relay 1/ SSR as,  <i>oFF</i> = No action <i>HEAt</i> = Heating <i>CoOL</i> = Cooling <i>PId</i> = PID							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td><i>oFF</i></td><td><i>PId</i></td><td><i>PId</i></td></tr></table>		Min	Max	Fac.	<i>oFF</i>	<i>PId</i>	<i>PId</i>
Min	Max	Fac.					
<i>oFF</i>	<i>PId</i>	<i>PId</i>					
19. <i>At</i>	<b>Function:</b> Runs auto tuning.						
This parameter is used to set <b>YES/NO</b> to start and stop Auto-tuning. When set as <i>YES</i> , the unit starts auto-tuning. After Completing <i>no</i> is automatically Set. During auto-tuning, the AUTO icon is continuously ON. This parameter will be prompted only if selected control action is PID in <i>Lnk1</i> .							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td><i>no</i></td><td><i>YES</i></td><td><i>no</i></td></tr></table>		Min	Max	Fac.	<i>no</i>	<i>YES</i>	<i>no</i>
Min	Max	Fac.					
<i>no</i>	<i>YES</i>	<i>no</i>					
20. <i>CYCL</i>	<b>Function:</b> Sets cycle time for PID action.						
Cycle time also known as duty cycle, the total length of time for the controller to complete one ON/OFF cycle user can set cycle time. When auto tuning is competed, it will calculated automatically.  <b>Example:</b> With a 20 second cycle time, an on time of 10 seconds and an OFF time of 10 seconds represents a 50 percent power output. The controller will cycle ON and OFF while within the proportional band.							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td>1sec</td><td>60sec</td><td>15sec</td></tr></table>		Min	Max	Fac.	1sec	60sec	15sec
Min	Max	Fac.					
1sec	60sec	15sec					
21. <i>P</i>	<b>Function:</b> Sets proportional band.						
Term P is proportional to the current value of the SV-PV error.  <b>Example:</b> If the (SV-PV) error is large and positive, the control output will be proportionately large and positive and vice versa if error is negative.							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td>0.1°C</td><td>100.0°C</td><td>10.0°C</td></tr></table>		Min	Max	Fac.	0.1°C	100.0°C	10.0°C
Min	Max	Fac.					
0.1°C	100.0°C	10.0°C					
22. <i>I</i>	<b>Function:</b> Sets integration time.						
Term I accounts for past values of the SV-PV error and integrates them over time to produce the I term.  <b>Example:</b> If there is a residual SV-PV error after the application of proportional control, the integral term seeks to eliminate the residual error by adding a control effect due to the historic cumulative value of the error. Setting "0" will turn OFF integration.							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td>0sec</td><td>2000sec</td><td>120sec</td></tr></table>		Min	Max	Fac.	0sec	2000sec	120sec
Min	Max	Fac.					
0sec	2000sec	120sec					
23. <i>d</i>	<b>Function:</b> Sets differential time.						
Term D is a best estimate of the future trend of the SV-PV error, based on its current rate of change. It is sometimes called "anticipatory control", as it is effectively seeking to reduce the effect of the SV-PV error by exerting a control influence generated by the rate of error change. The more rapid the change, the greater the controlling or dampening effect. Setting "0" will turn OFF differential.							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td>0sec</td><td>1000sec</td><td>30sec</td></tr></table>		Min	Max	Fac.	0sec	1000sec	30sec
Min	Max	Fac.					
0sec	1000sec	30sec					
24. <i>HYSc1</i>	<b>Function:</b> Set the hysteresis width for ON-OFF action in Control1.						
This parameter will be prompted only if selected control action is <i>HEAt</i> (Heating) or <i>CoOL</i> (Cooling) in <i>Lnk1</i> setting. It sets the dead band between ON & OFF switching of the output.  <b>Example (For COOL control):</b> If the set point is set at 100°C and hysteresis is set at 2°C, then when the system reaches 100°C, the heater relay will go OFF. Since the hysteresis is 2°C, the heater relay will get ON (restart) at 102°C (100°C +2°C).							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td>1°C</td><td>100°C</td><td>2°C</td></tr></table>		Min	Max	Fac.	1°C	100°C	2°C
Min	Max	Fac.					
1°C	100°C	2°C					
25. <i>dLY1</i>	<b>Function:</b> To set time delay between output1 restart.						
Use UP/DOWN keys to set desired value. This parameter is used to protect the output device from restarting in a short period of time. <b>Example:</b> If this parameter is set to 10 Sec, Output 1 goes OFF at the set point, it will not restart until time delay completes, even if differential is achieved earlier. <b>Note:</b> If set to 0, dly parameter will be ignored.							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td>0sec</td><td>1200sec</td><td>10sec</td></tr></table>		Min	Max	Fac.	0sec	1200sec	10sec
Min	Max	Fac.					
0sec	1200sec	10sec					
26. <i>out</i>	<b>Function:</b> Sets Control output1.						
This parameter used to set required control action for output1 as,  <i>SSr</i> = SSR <i>rLy</i> = Relay <i>batH</i> = Both  User has to set this parameter in accordance with the output used.							
<table><tr><th>Min</th><th>Max</th><th>Fac.</th></tr><tr><td><i>SSr</i></td><td><i>batH</i></td><td><i>batH</i></td></tr></table>		Min	Max	Fac.	<i>SSr</i>	<i>batH</i>	<i>batH</i>
Min	Max	Fac.					
<i>SSr</i>	<i>batH</i>	<i>batH</i>					


27. *LoL*

Function: To lock keypad.

This parameter is used to lock the parameter so that tampering is not possible by by-standers.

*no* = Unlocked parameter  
*YES* = Locked parameter

When locked all parameters can only be viewed, but cannot be modified.



(Parameter Locked)

Min	Max	Fac.
<i>no</i>	<i>YES</i>	<i>no</i>


28. *LoL1*

Function: To lock set point.

This parameter is used to lock the parameter so that tampering is not possible by by-standers.

*no* = Unlocked set point  
*YES* = Locked set point


When locked all parameters can only be viewed, but cannot be modified.








(Set point Locked)

Min	Max	Fac.
<i>no</i>	<i>YES</i>	<i>no</i>

Pro-Key (On Request)


To use Pro-key user must insert it prior to power ON. Insert the pro-key and power ON controller. When the display flashes for 5 seconds, touch the  key for 1 second. Controller will enter into Pro-key mode and will display “ *Pr oL* “. Then touch either of the below given keys to use the Pro-Key.


Function	Keys to be Used
To upload the parameters to the controller	touch “  ” key
To download the parameters to the controller	touch “  ” key
To set and exit	touch “  ” key

If user tries to enter Pro-key mode without inserting the pro key or with wrong connection, no further function will be activated after displaying “  or  “. Controller will display “ *Pr oL* “. Then switch off controller and insert the pro key properly and try to enter Pro key mode.

User has to first Upload the parameters in the Subzero Validated Blank Pro-Key and then subsequently use it for downloading.


• **Uploading mode**

Press  key to upload the parameters to Pro Key.


Lower display will show “ *u-l* ” once uploading is done. Press  to exit display will show “----” and return to normal display.


• **Downloading mode**

Similarly connect Pro key to the controller.


Press  key to download all parameters from Pro key to the controller.

Lower display will show “ *d-l* ” once download is done.

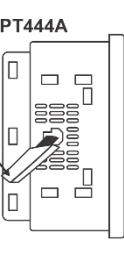
Once done press  key to exit and display will flash and return to normal mode.



PT244A





PT344A



PT444A

LED Indication


LED	Status	Description
OUT1	ON	Output1 ON.
	OFF	Output1 OFF.
OUT1	ON	Output2 ON.
	OFF	Output2 OFF.
AUTO	FLASHING	Tuning is in progress.
	OFF	Tuning Stop.
DWL	FLASHING	Dwell timer is in progress.
	ON	Dwell time elapsed.
	OFF	Dwell timer disabled.
	ON	Alarm relay ON.
AL1	OFF	Alarm relay OFF.
	ON	Alarm indication ON.
	OFF	Alarm indication OFF.
	ON	Parameters are Locked.
	OFF	Parameters are Unlocked.
	ON	Set point are Locked.
	OFF	Set point are Unlocked.

Error Messages

Message	Description
<i>oPEr</i>	Displays when input sensor is disconnected or sensor is not connected.
<i>HHHH</i>	Flashes when measured value is higher than input range.
<i>LLLL</i>	Flashes when measured value is lower than input range.
<i>Ht</i>	Temperature above the maximum high temperature limit.
<i>Lt</i>	Temperature below the minimum low temperature limit.

Alarm Types

Setting	Alarm Type
<i>Lnk2</i> = <i>HEAt</i> <i>ALrn</i> = <i>YES</i> <i>nod2</i> = <i>AbS</i>	Absolute value high limit alarm
<i>Lnk2</i> = <i>CoOL</i> <i>ALrn</i> = <i>YES</i> <i>nod2</i> = <i>AbS</i>	Absolute value low limit alarm
<i>Lnk2</i> = <i>HEAt</i> <i>ALrn</i> = <i>YES</i> <i>nod2</i> = <i>dEu</i>	Deviation high limit alarm
<i>Lnk2</i> = <i>CoOL</i> <i>ALrn</i> = <i>YES</i> <i>nod2</i> = <i>dEu</i>	Deviation low limit alarm
<i>Ht</i>	High temperature alarm
<i>Lt</i>	Low temperature alarm
<i>*HYSc2</i> : Alarm output hysteresis	

Calibration Certificate		
DATE		
MODEL NO.		
CONTROLLER SR. NO.		
Claimed Accuracy: 0.3% of FS (20 min of settling time for TC inputs)		
Calibration Instrument & Sr. No:		
Calibrated ON : _____		
Valid Upto : _____		
The calibration of this unit has been verified at the following values:		
SENSOR TYPE	VALUE TESTED (°C)	VALUE Observed (°C)
RTD	0°C	All values within specified limit of accuracy
	100°C	
	350°C	
J, K	50°C	
	400°C	
	650°C	
Instrument is confirmed accepted as accuracy is within the specified limit. This certificate is valid up to 18 months from the date of manufacturing or 12 months from date of sale from authorized dealer, whichever is earlier.		
Checked By:		
_____		
(Specification are subject to change, since development is a continuous process.)		
PVR Controls, India		
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<b>Warranty:</b> This product is warranted against defects in materials and workmanship for a period of one year from the date of purchase. During the warranty period, product determined by us to be defective in form or function will be repaired or, at our option, replaced at no charge. Such rectification shall be provided / carried out only upon submitting a valid purchase receipt. Any claim raised after warranty period shall not be entertained. This warranty does not apply if the product has been damaged by accident, abuse, willful default on part of the user, negligent use and misuse or as a result of service or modification other than by the firm. (De)mounting and/or (de)installation, and labor costs are excluded from warranty. In no event shall the firm be held liable for incidental or consequential damages, including loss of revenue or loss of business opportunity arising from the purchase of this product nor compensate you for any reason whatsoever.		
OUR OTHER PRODUCTS		
 Precision Control, <i>always</i>		
Digital Panel Meter, Power Analyzer Timer, PLC, HMI, Data Logger		
REV0 - 28.12.2021		