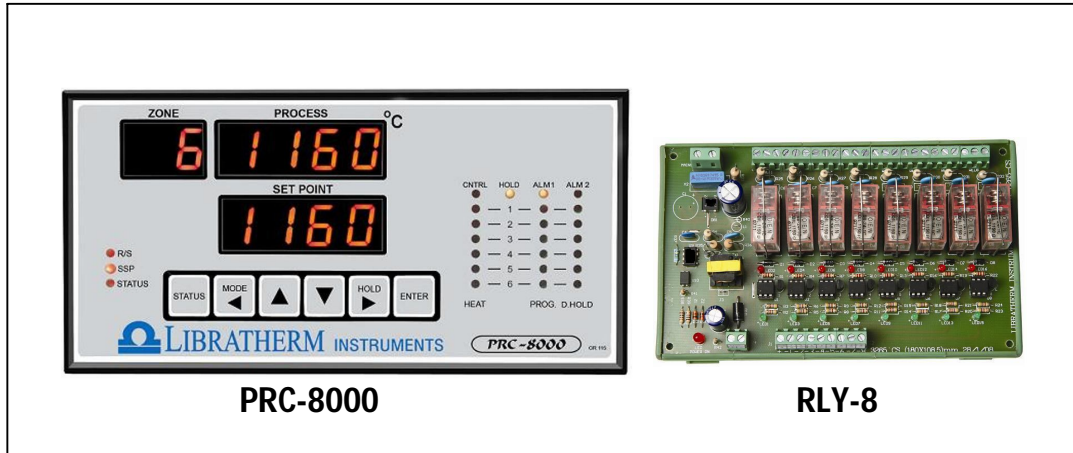


Microprocessor Based Multizone (8 Zone) Ramp/Soak Programmable PID Temperature Controller (Product Code 13.1 to 13.3)



Model Wise Description:

Sr. No	Model	Description
13.1	PRC-8000-4	4 input and 4 zone Ramp / Soak Programmable Profile PID Temperature Controller
13.2	PRC-8000-6	6 input and 6 zone Ramp / Soak Programmable Profile PID Temperature Controller
13.3	PRC-8000-8	8 input and 8 zone Ramp / Soak Programmable Profile PID Temperature Controller

Description:

Libratherm offers Microprocessor based Eight Zone PID Temperature indicator / Controller (Model PRC-8000) for accurate temperature control of multiple zone Gradual Heating and Cooling is required. PRC 8000 is ideally suitable and is most economical as it eliminates the need for number of individual PID or ON/OFF Temperature Controllers required per zone. Each zone can be independently programmed for 16 steps of Ramp/Soak profile. Each loop parameters like PID, Hysteresis, Deviation Hold, Facility to skip unused channel etc... can be programmed from the user-friendly front panel membrane keyboard. The programmed profile and other parameters are retained in the non-volatile memory in the event of power failure.

PRC 8000 can accept 8 Thermocouples or RTD(Pt-100)3 wire inputs and can provide switching PID or ON/OFF Control output in the form of DC Pulses or SSR or relay to drive external load contactor drivers for heating and cooling. It can simultaneously provide 8 analog PID control outputs in the form of (4-20)mA or (0-5)volt, which can be used to control heater power through Thyristor power pack (for electrical heating system) or to control the position of a modulating motor valve (for oil or gas fired heating systems). The analog outputs can be directly connected to Libratherm make single phase / three phase SCR phase angle fired power controller which is ideally suitable for both resistive and inductive heating load

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Open or Faulty sensor indications for each zone is also displayed with the respective Zone No. It also provides common High and Low alarm relay outputs, which can be used for external temperature dependent, inter locking or audiovisual alarm. The display scan rate is programmable from 1 to 99 seconds, whereas the internal control scanning is at the rate of 100ms. Separate displays are provided to indicate simultaneously the Process temperature, Set temperature and the channel / zone number. There is a provision to view on demand the on line status of the running program viz., Percentage control output, balance time of the current process, set point of current step, step no. in progress, etc. In case of power failure, the internal non volatile memory back up ensures automatic resumption of control from the last point on power resumption.

PRC-8000 is ideally suited for on line pre and post welding heat treatment cycle. Where the large size jobs are heated by local heating pads. Temperatures are sensed using 6 to 8 K type thermocouples welded at different points. The common ramp/soak profile is run for all zones. To ensure the uniform heating cycle of all the zones, the PRC-8000 offers special feature of common or individual deviation hold facility, thereby the guaranteed ramp/soak controlled is achieved. All the 8 zones heating cycles can be synchronized with this feature. Since, for PWHT applications, thermocouples are welded on the job, all the thermocouples becomes grounded and may cause ground loop problems and may cause jump the temperature reading. To eliminate this effect, Libratherm offers and recommends thermocouple to thermocouple signal isolators.

PRC-8000 can also be configured for controlling the average or uniform temperature of the large heating system, with maximum 8 sensors and 8 independent control outputs, following the common ramp/soak profile.

For graphical representation of the actual process in progress, duplex thermocouple can be used which can be connected to a multi point recorder. PRC-8000 is available in standard 1/2 DIN (192 x 96 x 200mm) for 8 zones, 6 zones or 4 zones. It operates on 230 VAC with built in high and low supply voltage trip circuits. It is also protected against industrial RFI/EMI Interference.

The serial interface of RS-485 in Modbus protocol is also optionally available for computer interface. The supporting window based software allows user to monitor behavior all the heating zones in both graphical and tabular form. The model PRC-8000 is a field proven model in the industry and performing satisfactorily since 1994.

Libratherm also offers modified version of this controller for average control applications and special purpose heating applications requiring multi input.

Features:

- ❖ Microprocessor based design.
- ❖ Eight zone - independent, uniform or average control
- ❖ Highly accurate and sturdy in operation.
- ❖ Accuracy better than ± 0.1 % of the full scale.
- ❖ Accepts standard type of thermocouple or RTD(Pt-100)/2 or 3-wire input.
- ❖ Control output of Relay or TRAIC or DC pulse or (4-20)mA or (0-5)Volt or any other.
- ❖ Servo start from the process temperature
- ❖ Deviation hold back facility (common or individual)
- ❖ Copying facility
- ❖ Facility to use as PID and / or ON / Off controller
- ❖ Hardware security locks for unauthorized tempering of the set values.
- ❖ 3 separate displays to display channel no, process temp. & Set temp.
(Extra 6 digit display for real time clock – for PC/Printer interface)
- ❖ Models with 2, 4, 6 & 8 inputs are available.
- ❖ 1 to 16 Ramp / Soak steps individually programmable per zone.

Application:

- ◆ Heat Treatment
- ◆ Large ovens and furnace with multiple sensors
- ◆ Environmental Chambers
- ◆ Multi zone Stress relieving furnace
- ◆ Pre and Post welding heat treatment
- ◆ Tunnel furnace
- ◆ Normalizing furnace

Technical Specifications:

No. of Inputs	4, 6 or 8
Input types	J, K, R, S, B, C, D, RTD(PT-100) All channels of the similar input type (Refer range selection table below)
Range	Subject to the full range of the specified input (Refer range selection table below)
Resolution	0.1 °C or 1 °C for RTD inputs and 1°C for thermocouple inputs.
Accuracy	Better than $\pm 0.1\%$ of the specified range.
Display	2 digit 0.5" Red 7-segment LED display for Zone no. 4 digit 0.5" Red 7-segment LED display for process value 4 digit 0.5" Red 7-segment LED display for set value 6 digit 0.3" Red 7-segment LED display for real time clock and calendar – optionally provided only when computer interface is provided.
Tuning	Manual tuning of PID values.
Control Action	PID or On/Off.
Cold Junction Compensation (CJC)	Built-in automatic from 0 - 50 °C for thermocouple input.
Faulty Sensor Indication	Display shows FLt-1 for reverse input and FLt-2 for open input. Under fault conditions all the control outputs and relays will be turned OFF.
Parameter Settings	Using front panel membrane keyboard to set the PID , set points and time values.
No. Of Profiles	Single Program for each zone.
Ramp Soak Steps	1 to 16 Steps per program. (Common OR Independent for all the zones).
Time per Step	1 to 540 mins. (9 Hr. per step). Two or more steps can be combined for longer time duration.
Program Hold Facility	Manual Hold or Auto Hold (Hold back feature for guaranteed Ramp/Soak facility).
Control mode	User can select the single set point control mode and Ramp/Soak control mode through front panel keyboard.
Copying Facility	This facility allows Copying of Ramp/Soak profiles parameters of the 1 st zone to all remaining zones.
Memory Backup	Retention of PID and set values in the non-volatile memory in the event of power failure. On power resumption the program will resume automatically from the last set point.
Alarm Output	2 Extra Relay outputs configured as High and Low Alarms – common for all zones (Relay changeover contacts rated for 5A @ 230VAC).
Control Outputs	0 to 10VDC pulses to drive external SSRs or linear signal of (4-20)mA or (0-5)VDC with soft start and power limit facility. (Independent for each zone).
Digital Interface (Optional)	Parallel Centronics printer output port for Printer interface and / or Serial (RS232 or RS485 on Modbus ASCII protocol) for PC interface with supporting Window based software.
Supply	230VAC / 110 VAC $\pm 10\%$ (10VA), 50/60Hz
Size	192 x 96 x 200 mm
Panel cut out	188 x 92 mm +/- 0.5 mm.
Enclosure	Metal Powder coated with polycarbonate front.

Input and Range Selection Table:

Code	Input	Range
A1	J type : Fe/Con thermocouple (*)	0 to 760 °C
A2	K type : Cr/Al thermocouple (*)	0 to 1372 °C
A3	R type : Pt/PtRh13% thermocouple (*)	0 to 1768 °C
A4	S type : Pt/PtRh10% - thermocouple (*)	0 to 1768 °C
A5	B type : Pt30%Rh/Pt6%Rh thermocouple (*)	200 to 1820 °C
A6	C type : W5%Re/W26%Re thermocouple	0 to 2300 °C
A7	D type : W3%Re/W25%Re thermocouple	0 to 2300 °C
A8	Pt-100 (Alpha = 0.00385) DIN 43760	0.0 to 400.0 °C

Ordering Information for Model PRC– 8000:

Model	A- Input type	B- Output 1 type	C-Alarm Relay 1	D-Alarm Relay 2	E- COM Port	F- Supply
PRC-8000-H-4 PRC-8000-H-6 PRC-8000-H-8	Any one of A1 to A8	B1- (DC Pulse) B2- (0-5 VDC) B3- (4-20mA)	C1- (High) C2- (Low) 00- (None)	D1- (High) D2- (Low) 00- (None)	E1- (RS 232) E2- (RS 485) E3- (Printer) E4- (Both E1 and E3) E5- (Both E2 and E3) 00- (None) Optional	F1- (230 VAC) F2- (110 VAC)

Example:

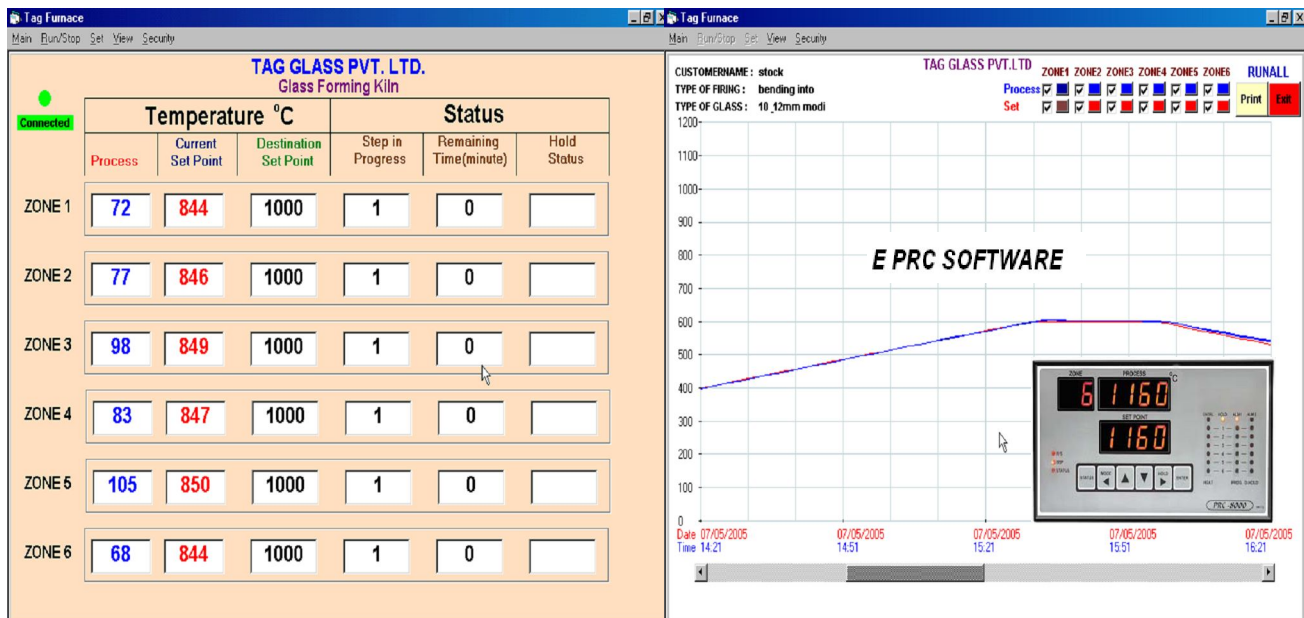
Model	A- Input type	B- Output 1 type	C-Alarm Relay 1	D-Alarm Relay 2	E- COM Port	F- Supply
PRC-8000-6	A2	B1	C1	D2	E2	F1
PRC-8000-8	A2	B3	C1	D2	E1	F2

Example	Model	Description
1	PRC-8000-6-A2-B1-C1-D2-E2-F1	This is 6 Channel / Zone controller with 6-K type thermocouple input having range of (0-1372)°C with DC pulse output per channel and High & Low Alarm Relay output with RS485 Communication and Operating on 230VAC supply.
2	PRC-8000-8-A2-B3-C1-D2-E1-F2	This is 8 Channel / Zone controller with 8-K type thermocouple input having range of (0-1372)°C with DC pulse output per channel and High & Low Alarm Relay output with RS232 Communication and Operating on 110VAC supply.

Various Control Panel using PRC-8000 controller:



EPRC software - designed to interface with our controller **PRC-8000** to control the temperature of eight heating zones. The software allows user to monitor the on line temp. of all eight zones on the screen, user can program the ramp and soak profile for each zone, feed the PID, Set Point and Program values or start and stop the profile through the computer keyboard, one can also view the real time values in graphical format which can be zoomed or scaled as per the requirement. Database can be searched with date and time or other user defined fields. Software can be customized to monitor more than one PRC-8000 on a single screen, selection options are provided to the user.



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