

Programmable Ramp / Soak PID Temperature Controller (Microcontroller Based ECO Model)



Model Wise Description:

Sr. No	Model	Description	Size (mm.)
12.12	PRC-480	Single input, Single profile of 20 steps Ramp / Soak Programmable PID Temperature Controller	48 x 48 x 110

Description:

Libratherm offers Microcontroller based multiple Ramp / Soak programmable PID temperature controller Model **PRC-480** which is designed to improve reliability, accuracy and control for all temperature control applications. It features Ramp and Soak functions (the capability to control the temperature and its rate of change over a predetermined time span). Single patterns of total twenty (ramp/soak) steps can be programmed into the memory using the front panel keyboard. It can also be used as single set point control when the profile control is not desired. Inputs can be Thermocouple, IR Thermocouple, RTD Temperature Sensors, Voltage, Current Signals and etc.

PRC-480 offers both switching outputs in the form of SSR driver for external SSR or external load contactor and continuous control outputs in the form of (4-20)mA or (0-5)volt control signal, 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. Additional one relay is also provided for time or temperature dependent event outputs as per the system requirement. The programmed profile and other parameters are retained in the nonvolatile memory in the event of power failure.

To monitor the on line temperature profile of the heating system, serial communication port on either RS232 or RS 485 interface can be optionally provided, the same can be connected to the computer. Libratherm provides the window based software to program the controller and to view the on line behavior of the heating system in both graphical and tabular format.

Features:

- ❖ Accepts standard type of thermocouple, RTD, Voltage or Current signal.
- ❖ Control output of Relay / TRAIAC / DC pulse / (4-20)mA / (0-5)Volt.
- ❖ Servo start from the current process temperature.
- ❖ 1 to 20 programmable ramp/soak steps.
- ❖ Retention of program in case of power failure.
- ❖ Automatic program resumption.
- ❖ Software password security lock for unauthorized tampering of the set and tune values.

Applications:

- ◆ Heat Treatment
- ◆ Wax Burn out furnace used in jewelry making
- ◆ Environmental Chambers
- ◆ Furnace / oven control
- ◆ PWHT and SR heat treatment cycle

Technical Specifications:

Input -U (Universal)	J,K, R,S,B type thermocouple, RTD(Pt-100)/3 wire, 4-20mA (User can select any of these inputs through front panel keyboard).
Input -F (Fixed)	Any one factory set input as per user's requirement – as per the input selection table given below.
Range	Full +ve range of the selected input (please refer to the range selection table)
Resolution	1 °C for thermocouples and 0.1°C for Pt-100 For mA input the display resolution is subject to the required range.
Indicating Accuracy	+/- 1 °C for Thermocouple throughout the range and +/- 0.1°C for Pt-100 for (4-20)mA absolute to the linear input signal
Display	4 digit 0.25" Red 7-segment display for process variable. 4 digit 0.25" Green 7-segment display for set value and PID parameters
Output Indication	Front Panel LED indications for SSR output. % Control Output and for Alarm status.
Control Algorithm	PID or ON/OFF selectable (when specified for switching output).
Tuning	Auto/Manual tuning of PID values.
PID Values	Proportional Band (P)= 0.0 to 100.0% of Span, Integral (I)= 0.00 to 5.00 resets/minute, Derivative (D) = 0.00 to 5.00 minutes, Cycle Time = 2 to 100 seconds. Hysteresis = 0 to 50 counts, Soft start or Ramp time (rt) = 2 to 99 seconds Power Limit (PL) = 0 to 100%.
Settings	Using front panel feather touch (tactile) key board to set various parameters.
Ramp/Soak Steps	1 to 20 Steps. (no restrictions in programming – a ramp can be followed by a ramp and a soak can be followed by a soak).
Set Temperature	Programmable for each steps in the full range of the specified input
Time per Step	1 to 540 mins. (9 Hr. per step) or 1 to 99:59 hour min. (To be specified in ordering info.)
Program Hold Facility	Manual Hold or Auto Hold (Hold back feature for guaranteed Ramp/Soak facility)

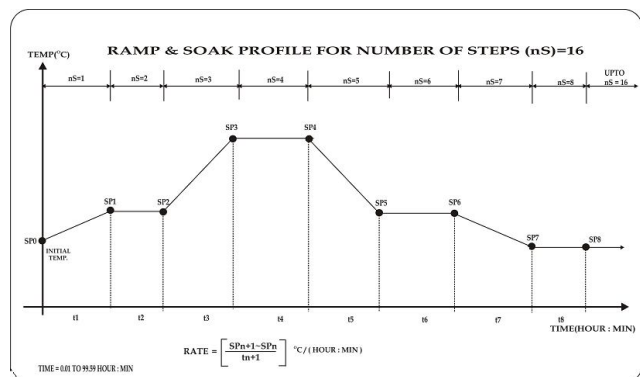
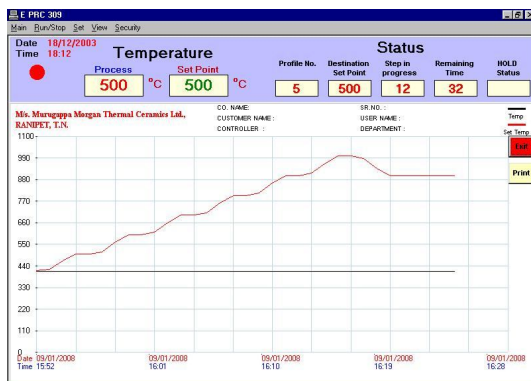
Alarm Output	Relay Output with programmable hysteresis- can be used as High or Low Alarms.
Serial Communication (Optional)	Optically isolated 2 wire RS485 on Modbus RTU protocol. (in Slave mode with programmable slave ID)
Supply	(90VAC-250VAC), 50/60 Hz
Size	48 x 48 x 110 mm.
Panel Cutout / Terminals	45 x 45 mm. +/- 0.5 mm. - 16 back panel terminals
Enclosure	ABS plastic with polycarbonate front graphic.

Note : Technical specifications are subject to change due to continuous product upgradation and the discretion of manufactures. For any special requirement contact manufacturers.

Input and Range Selection Table:

Code	Input	Range
A1	Factory set to 4 universal inputs marked (*) below : A3,A4,A5,A13,A15	Subject to input type
A2	J type : Fe/Con thermocouple	0 to 760 °C
A3	K type : Cr/Al thermocouple (*)	0 to 1372 °C
A4	R type : Pt/PtRh13% thermocouple(*)	0 to 1768 °C
A5	S type : Pt/PtRh10% - thermocouple(*)	0 to 1768 °C
A6	B type : Pt30%Rh/Pt6%Rh thermocouple	200 to 1820 °C
A7	T type : Cu/Con thermocouple	0 to 350 °C
A8	E type : NiCr/CuNi thermocouple	0 to 900 °C
A9	C type : W5%Re/W26%Re thermocouple	0 to 2300 °C
A10	D type : W3%Re/W25%Re thermocouple	0 to 2300 °C
A11	G type : W/W26%Re thermocouple	0 to 2000 °C
A12	N type : Ni-Cr-Si/Ni-Si-Mg	0 to 1300 °C
A13	Pt-100 (Alpha = 0.00385) DIN 43760 (*)	0.0 to 400.0 °C
A14	Pt-100 (Alpha = 0.00385) DIN 43760	-199.0 to 200.0 °C
A15	4-20mA (*)	0 to 3500 unit
A16	4-20mA	-1500 to +2000 unit
A17	0-10VDC	0 to 3500 unit
A18	0-10VDC	-1500 to +2000 unit

Ramp/Soak Profile:



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Ordering Information:

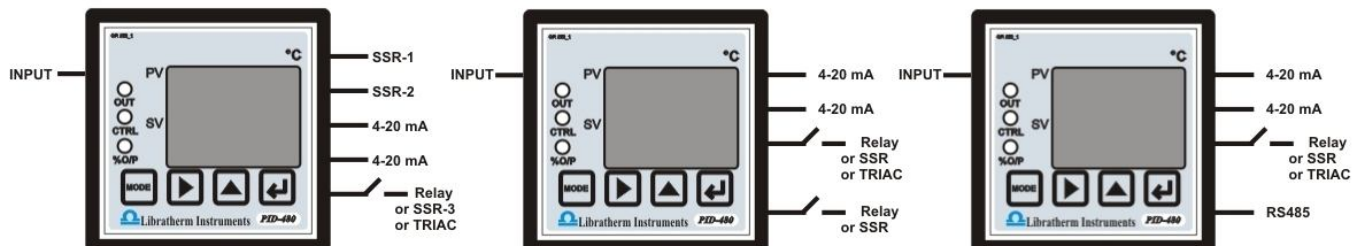
Model	A- Input	B- Output 1	C – Retransmission	D – Alarm Relay	E- Serial Interface
PRC-480-F	A1- (Factory set to 5 inputs)	B1- (DC Pulse)	C1- (4-20mA)	D1- (High Alarm Relay)	E1- (RS485)
PRC-480-F		B2- (4-20 mA)	00- (None)	D2- (Low Alarm Relay)	00- (None)
	A2 to A18- (Any one Single Fixed input)	B3- (0-5)V		D3- (Com. High / Low Alarm Relay)	
		B4- (DC Pulse + 4-20 mA)		00- (None)	
		B5- (DC Pulse + 0-5V)			

Example:

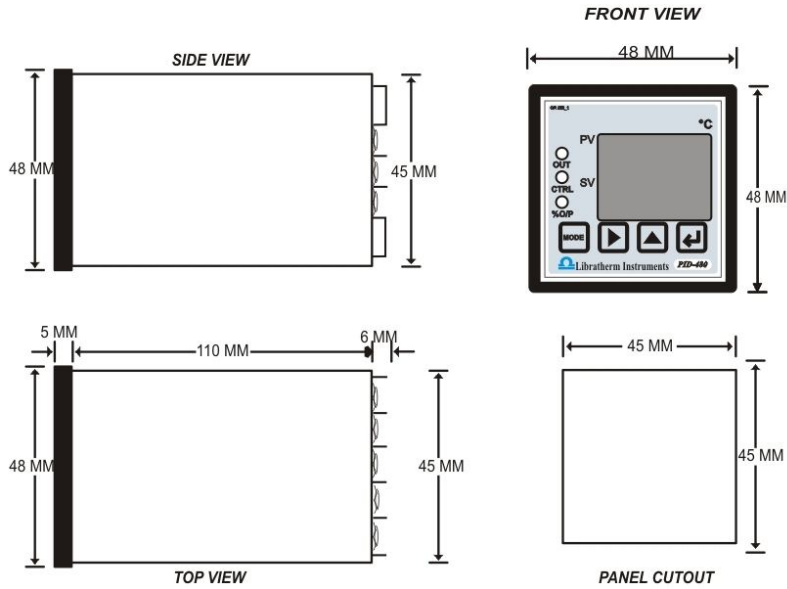
Model	A- Input	B- Output 1	C – Retrans.	D - Alarm	E- Serial Interface
PRC-480-U	A1	B1	C1	D1	E1
PRC-480-F	A3	B4	00	D2	00

Model	A- Input	B- Output 1	C- Retrans.	D- Alarm	E- Serial
PRC-480-U	A1	B1	C1	D1	00
PRC-480-F	A3	B4	00	D2	E1

Example	Ordering Code	Description
1	PRC-480-U-A1-B1-C1-D1-00	Model PRC-480-U with Universal Input(A1), DC PULSE output for SSR control, (4-20) mA output proportional to input, with High Alarm relay output
2	PRC-480-F-A3-B4-00-D2-E1	Model PRC-480-F with Fixed K type Input, DC pulse and 4-20mA output for heating control, with low alarm relay and RS485 serial interface.



Dimensions :



Any special feature or requirement of optional feature can be mentioned by the user in the Remark column.

REMARK :