

PID Controller-Single Loop (1/16 DIN - Microcontroller Based)
(Product Code 10.10)



Model Wise Description:

Sr. No	Model	Description	Size (mm.)
10.10	PID-480-U	PID Controller (Universal Input)	48 x 48 x 110
10.11	PID-480-F	PID Controller (Fixed Input)	48 x 48 x 110

Description:

Libratherm offers new PID controller, Model PID-480. This is designed and developed using the latest microcontroller chip and programmed with the time tested and field proven PID algorithm. PID controllers are mainly used for the precise process control. Unlike On/Off type of oscillatory control, PID control action gives smooth and steady state control. This model offer, all the useful features which are required to control the complex system.

This model accepts factory set single fixed input or the user selectable 4 universal inputs. The control action is user selectable as PID or On/Off for direct (Cool) or reverse(Heat) action. Control outputs are given in the form of optically isolated DC pulse to drive external SSR. The analog PID control output level can also be configured for (0-20) mA or (4-20)mA or (0-5) volt using the front panel key board. Analog output can be used to control heating through thyristor or proportional valve. Additional analog output can also be provided as retransmission output proportional to the process input. Two electromechanical relays are available, which can be used as High and Low alarms.

In brief, PID-480 provides 2 switching SSR output and 2 analog outputs with 2 alarm output. Various combinations of outputs are possible to meet end application. Both Auto and manual tuning of PID values makes the controller versatile and user friendly. The model PID-480 being small in size, can easily be accommodated in small size equipments. One Ramp/Soak function can be provided to gradually increase the set value and hold the process value for desired soak time.

Libratherm also offers customized algorithm for special purpose applications, where user or OEM wants to have control and logic action to suit their application.

Features:

- ❖ Microcontroller based design.
- ❖ Single loop PID function.
- ❖ One Ramp/Soak feature (Optional -user programmable).
- ❖ Available Control - logic (DC pulse) and one analog (12 bit resolution).
- ❖ Auto/Manual tuning of PID parameters.
- ❖ Field proven Algorithm tested successfully for various process control applications.
- ❖ Auto/Manual bump less transfer.
- ❖ One programmable alarms and / or event relay outputs.
- ❖ RS 485 serial interface - Optional

Applications:

- ◆ Furnace / Oven Temperature control
- ◆ Pressure control
- ◆ Constant Temperature Bath
- ◆ Laboratory equipment.
- ◆ Plastic Injection, Extruder machines
- ◆ Material Testing equipments
- ◆ Auto Clave, BOD incubators etc...

Technical Specifications:

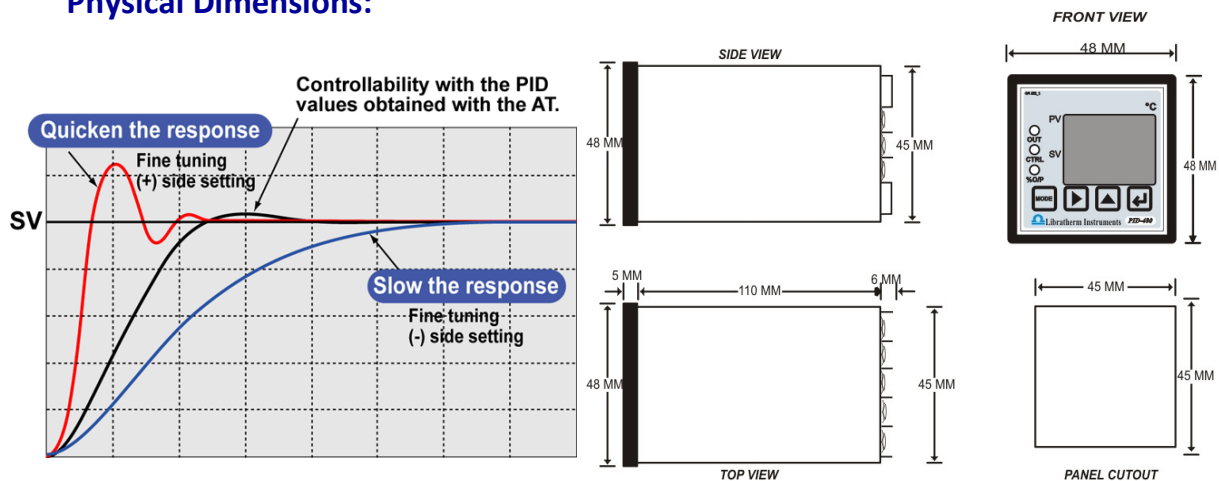
Input -U (Universal)	J,K, type thermocouple, RTD(Pt-100)/3 wire, 4-20mA (User can select any of these 4 inputs)
Input -F (Fixed)	Any one factory set input as per user's requirement – as per the input selection table given below. (It is not possible to change the type of input on the field.)
Range	Full +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 0.3" Red 7-segment display for process variable. 4 digit 0.3" 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.
Memory Backup	Retention of PID and Set values in the built in non-volatile memory - in case of power failure and automatic re-execution of control on power resumption.
Control Outputs (Switching)	2 SSR 0 to 10VDC pulse (OUT1 + OUT2)
Control Outputs (Analog)	Analog Outputs (4-20)mA (RL max = 300 Ohms) or 0-5VDC (RL min = 10KOhms) (dual output is also available)
Retransmission Output (Analog)	4-20mA, linearized and proportional to the selected input type and range. RL max = 250 Ohms.
Alarm Outputs	2 Relay Outputs 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 mod bus address) in lieu of OUT2.
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 : A2,A3,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

Physical Dimensions:



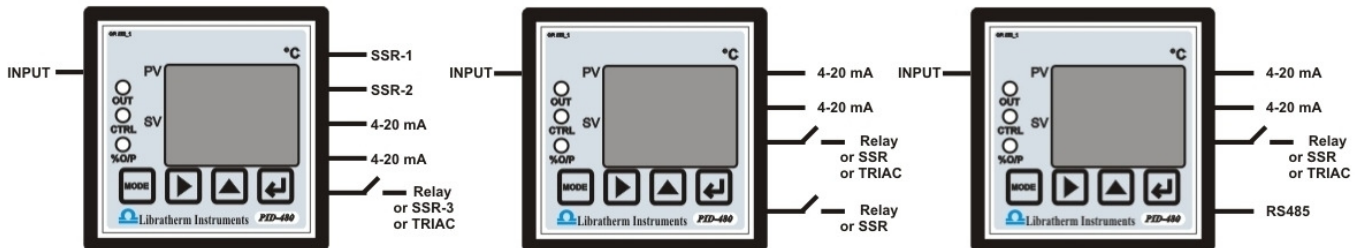
Ordering Information:

Model	A- Input	B- Output 1 (Heat – OUT1)	C- Output 2 (Cool – OUT2)	D- Retransmission	E- Alarm 1 – OUT1	F- Alarm 2 – OUT2	G- Serial Interface
PID-480-U	A1- (Factory set to 4 inputs)	B1- (DC Pulse)	C1- (DC Pulse)	D1- (4-20mA x 1) For PV1	E1- (High Alarm Relay)	F1- (High Alarm Relay)	G1- (RS485)
PID-480-F	A2 to A18- (Single Fixed input)	B2- (4-20 mA)	C2- (4-20 mA)	00- (None)	E2- (Low Alarm Relay)	F2- (Low Alarm Relay)	00- (None)
		B3- (0-5)V	C3- (0-5)V	IF D1 IS CHOSEN, C2 to C7 ARE NOT AVAILABLE.	00- (None)	00- (None)	IF G1 IS CHOSEN THEN IN C ONLY C2 OR C3 AVAILABLE AND F IS NOT AVAILABLE.
		B4- (DC Pulse + 4-20 mA)	C4- (DC Pulse + 4-20 mA)		IF E1 OR E2 IS CHOSEN THEN ONLY B2 OR B3 IS AVAILABLE.	IF F1 OR F2 IS CHOSEN THEN ONLY C2 OR C3 IS AVAILABLE.	
		B5- (DC Pulse + 0-5V)	C5- (DC Pulse + 0-5V)				
		00- (None)	C6- (DC pulse + Triac +4-20mA)				
			C7- (DC pulse + Triac + 0-5V)				
			00- (None)				

Example:

Model	A- Input	B- Output 1 (Heat –OUT1)	C- Output 2 (Cool – OUT2)	D- Retransmission	E- Alarm 1 – OUT1	F- Alarm 2 – OUT2	G-Serial Interface
PID-480-U	A1	B2	00	D1	E1	F2	00
PID-480-F	A3	B4	00	D1	00	00	G1

Example	Ordering Code	Description
1	PID-480-U-A1-B2-00-D1-E1-F2-00	Model PID-480-U with Universal Input(A1), 4-20mA output for heating control, (4-20) mA output proportional to input, with High and Low Alarm relay outputs
2	PID-480-F-A3-B4-00-D1-00-00-G1	Model PID-480-F with Fixed K type Input, DC pulse and 4-20mA output for heating control, (4-20) mA output proportional to input, with serial interface RS 485.



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

REMARK :
