

## (F3) MICROPROCESSOR BASED MULTI-LOOP PID TEMPERATURE CONTROLLER



7.8	PID-8000/X	Multiple input / Multi loop PID Controller (2,4,6,8 loop with logic and analog output per channel)
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### DESCRIPTION :

Libratherm offers Microprocessor based Eight loop PID Temperature Controller (Model PID-8000) for processes requiring multiple zones heating or heating plus cooling control. It is most suitable for difficult process, which results in frequent system disturbances, and applications where accurate temperature of number of heating/cooling zone is required. It also eliminates the need for number of individual PID or ON/OFF Temperature Controllers thereby saves on cost. It can accept 8 Thermocouples or RTD (Pt-100) inputs and can provide switching PID or ON/OFF Control output in the form of DC Pulses or SSR Drivers for heating and cooling. It can also simultaneously provide 8 analog PID control Outputs in the form of (4-20mA) or (0-5) volt, which can be used to drive external SCR Heater Power Controller or other actuators. Open or Faulty sensor indications for each zone is also displayed with the respective Zone No. Each zone loop parameters like PID, SET, Hysterisis, Power

Limit and Ramp Time values can be programmed from the user-friendly front panel membrane keyboard. The display scan rate is programmable from 1 to 99 seconds, whereas the internal control scanning is at the rate of 100mS. It also provides common High and Low alarm relay outputs, which can be used for external temperature dependent, inter locking or audiovisual alarm. In short, PID-8000 is as good as 8 independent PID controllers in a single enclosure, with facility of different input per channel, different set point per channel and different output per channel a unique feature.

Libratherm also supplies complete ready to user Temperature Control Panel using PID-8000, which finds its applications in large heating systems having number of sensors or number heaters needs to be controlled such Plastic Extruders manufacturing pipes, sheets etc..., Plastic Injection for runner less moulding, Tunnel Furnaces for annealing and large Ovens etc.

**FEATURES :**

- Microprocessor based design.
- Elegant looks and Very easy to operate.
- Accepts all types of maximum 8 inputs.
- PID or ON / Off heat and cool action per channel.
- All zones are individually configurable for Heat or Cool.
- Compact in size ½ DIN (192 x 96 x 200 mm).
- Versatile application and sturdy in operation.
- Accuracy better than  $\pm 0.1$  % of the full scale.
- RS 485 / RS 232 Serial communication available.

**APPLICATION :**

- ▶ Plastic extruders for pipes, sheets etc...
- ▶ Heat treatment using tunnel furnace
- ▶ Environmental chambers
- ▶ Laboratory equipments etc...
- ▶ Plastic injection, for runner less moulding
- ▶ Large furnace and oven for homogeneous control
- ▶ Multi zone furnace

**TECHNICAL SPECIFICATIONS:**

<b>No. Of Inputs</b>	2, 4, 6 or 8
<b>Input</b>	J, K, R, S, B, C, D, RTD(PT-100), RTD(PT-1000)/2 or 3 wire, (4-20)mA, (0-5)V etc. (each channel can be of different input type)
<b>Range</b>	Subject to the full range of the specified input
<b>Accuracy</b>	Better than $\pm 0.1\%$ of the specified range (Software Linearized)
<b>Resolution</b>	0.1/1.0 Subject to the specified range
<b>Display</b>	4 digit 0.5" Red 7-segment LED for actual temperature 4 digit 0.5" Red 7-segment LED for set temperature 2 digit 0.5" Red 7-segments LED for zone no.
<b>Open Sensor Indication</b>	Display shows Flt-1 or Flt-2 and relays will be turned OFF
<b>Tuning</b>	Auto/Manual tuning of PID values
<b>Settings</b>	Using front panel membrane key board to set the various values
<b>Scan Rate</b>	1 to 99 sec (programmable through front panel keyboard)
<b>Skip/Hold</b>	Available through key board in configuration mode
<b>Memory Backup</b>	Retention of PID and set values in the non volatile memory in the event of power failure
<b>Alarm Outputs</b>	2 Extra Relay outputs can be used as High/Low Alarms (Relay changeover contacts rated for 5A @ 230VAC)
<b>Control Action</b>	PID or ON/OFF selectable (for both direct and reverse action)
<b>Control Output</b>	DC Pulse, (4-20)mA, (0-5)VDC output per zone with soft start and power limit facility for analog output
<b>Interface</b>	Parallel Centronics printer output port for Printer interface and Serial (RS232/RS485) for PC interface with Window based software on Modbus ASCII Protocol
<b>Supply</b>	230VAC / 110 VAC $\pm 10\%$ (10VA), 50/60Hz or 24VDC @ 500mA
<b>Size</b>	192 x 96 x 200 mm
<b>Panel Cutout</b>	188 x 92 mm $\pm 0.5$ mm

**ORDERING INFORMATION :**

MODEL	INPUT		RANGE		OUTPUTS 1 PER CHANNEL HEAT		OUTPUT 2 PER CHANNEL COOL	
	A		B		C		D	
PID-8000/X	J	- (A1)	0 TO 760 °C	(B1)	DC PULSE	(C1)	DC PULSE	(D1)
	K	- (A2)	0 TO 1372 °C	(B2)	(0-5)V	(C2)	(0-5)V	(D2)
X=2,4,6,8	E	- (A3)	0 TO 1000 °C	(B3)	(4-20)mA	(C3)	(4-20)mA	(D3)
	T	- (A4)	0 TO 400 °C	(B4)	None	(C4)	None	(D4)
	S	- (A5)	0 TO 1768 °C	(B5)				
	R	- (A6)	0 TO 1768 °C	(B6)				
	B	- (A7)	200 TO 1820 °C	(B7)				
	PT 100	- (A8)	0.0 TO 400.0 °C	(B8)				
	PT 1000	- (A9)	-50.0 TO 199.9 °C	(B9)				
	Any other-	(A10)	0.01 TO 150.0 °C	(B10)				
			Any other	(B11)				

COMM.ALARM RELAY1		COMM. ALARM RELAY 2		COMM. PORT		SUPPLY	
E		F		G		H	
High	(E1)	High	(F1)	Printer O/P -	(G1)	230VAC	(H1)
Low	(E2)	Low	(F2)	RS 485	- (G2)	110VAC	(H2)
None	(E3)	None	(F3)	Both	- (G3)		
None	(G4)						

**EXAMPLE :**

MODEL	A	B	C	D	E	F	G	H
<b>PID-8000/8</b>	A 2	B 4	C 1	D 1	E 1	F 2	G 2	H 1

This is 8 Zone controller with 8-K type thermocouple input having range (0-400)°C with Heat SSR & Cool SSR output per channel and common High & Low Alarm Relay output with RS485 communication port operating on 230VAC supply.

**NOTE:** For different type of input please mention the type of input required as explained in the example given below.

**EXAMPLE :**

MODEL	A	B	C	D	E	F	G	H
<b>PID-8000/8</b>	(1,2,3,4) - A 2	B 3	C 1	D 1	E 1	F 2	G 4	H1
	(5,6,7,8) - A 8	B 4						

This is 8 Zone controller with 1<sup>st</sup> **4-K type thermocouple** input having range (0-1000)°C & next **4-RTD (Pt-100)** type input having range (0- 400)°C with Heat SSR & Cool SSR output per channel and High & Low Alarm Relay output and Operating on 230VAC supply.