

## (F2) MICROPROCESSOR BASED SINGLE LOOP PID CONTROLLER



### MODEL WISE DESCRIPTIONS :

7.4	PID-300	Single input PID Controller (check details for special purpose models)
7.5	PID-309	Single input PID Temperature Controller with Forward / Reverse output for Motorized valve
7.6	PID-300/2	Two input PID Temperature Controller with selectable 'K' & 'S'/'R' T/C or any two types (to specified)
7.7	PID-2000	Single input PID Temperature Controller with 0.01°C resolution up to 150.00°C (For precise control of constant temperature baths).

### DESCRIPTION :

Libratherm Instruments offers the microprocessor based **Auto Tune** PID temperature controller (Model PID-300/309/2000) for complex processes which result in frequent system disturbance, and applications where precision temperature control is required. The user-friendly front panel keyboard allows programming the values of the PID parameters, set point and also facilitates to view the percentage control output. The dual display is provided for simultaneous display of the process temperature and the set point. Inputs can be either thermocouple or RTD temperature sensors, or voltage or current signals. The indicating accuracy of 0.1°C, or 1.0°C throughout the specified range can be provided. For applications requiring 0.01°C control, model PID-2000 is more suitable, since it incorporates 14 bit of input resolution.

These models can easily be used to control the heating or cooling system using Solid state relays, power contactors, solenoid valves, motorized valves or any other electrically operated actuators. The built in 5A triac output can easily control 1KW of load.

The analog control outputs of (4-20) mA or (0-1) or (0-5) Volt can be used to control a Thyristorized power pack (for electrical heating system) or to control the position of a modulating motor valve (for oil or gas fired heating system).

Model PID-309 has Dual outputs for both direct and reverse actions, suitable applications where dual output is required, for example, for heating and cooling control, acid and base level control or forward / reverse operation of the motorized valve for fuel fired heating system etc.

**FEATURES :**

- Standard size.
- Versatile application.
- Highly accurate and sturdy in operation.
- Accuracy better than  $\pm 0.1\%$  of the full scale.
- Resolution of 1 or 0.1 or 0.01 process unit.
- RS 485 / RS 232 Serial communication available

**APPLICATION :**

- ▶ Constant temperature bath.
- ▶ Furnace / Oven control
- ▶ Constant temp. baths,
- ▶ Plastic / Packaging / Rubber and metal industry
- ▶ Laboratory equipment. Etc.
- ▶ Motorized forward / reverse valve control
- ▶ Plastic Injection / Extruders
- ▶ Environmental chambers
- ▶ Cold Storage and Chilling plants
- ▶ pH/ORP control in chemical processes

**TECHNICAL SPECIFICATIONS:**

<b>Input</b>	Thermocouple type J, K, R, S, B, C, D or RTD - Pt-100 2 or 3-wire input, mV and (4-20)mA (any one to be specified)
<b>Range</b>	Subject to the full range of the specified input
<b>Resolution</b>	0.01, 0.1, 1.0 Subject to the specified range
<b>Accuracy</b>	Better than $\pm 0.1\%$ of the specified range
<b>Display</b>	4 digit 0.5" Red 7-segment LED display for process value 4 digit 0.3" Red 7-segment LED display for set value
<b>CJC</b>	Built-in automatic from 0 - 50 °C
<b>T/C open sensor detection</b>	Provided
<b>Tuning</b>	Auto or Manual
<b>Control Action</b>	PID or On/Off (for both direct and reverse action)
<b>Control output</b>	DC pulses to drive external SSR with built in Triac output or (4-20)mA or (0-5)VDC or (4-20)mA/(0-5)V analog signal for retransmission or direct action control
<b>Alarms</b>	High or Low Alarm Relay
<b>Output status indication</b>	Front panel LED indication
<b>Controls</b>	Soft touch front fascia membrane key pad control
<b>Supply</b>	230VAC / 110 VAC $\pm 10\%$ (10VA), 50/60Hz or 24VDC @ 500mA
<b>Size</b>	96 x 96 x 160 mm

**ORDERING INFORMATION :**

MODEL	INPUT A	RANGE B	OUTPUTS 1 DIRECT C	OUTPUT 2 REVERSE D
PID-300	J - (A1)	0 TO 760 °C (B1)	SSR (C1)	SSR (D1)
PID-309	K - (A2)	0 TO 1378 °C (B2)	SSR+Triac (C2)	Triac (D2)
PID-2000	E - (A3)	0 TO 1000 °C (B3)	(0-1)V (C3)	Relay (D3)
	T - (A4)	0 TO 400 °C (B4)	(0-5)V (C4)	(0-1)V (D4)
	S - (A5)	0 TO 1768 °C (B5)	(4-20)mA (C5)	(0-5)V (D5)
	R - (A6)	0 TO 1768 °C (B6)	(0-20)mA (C6)	(4-20)mA (D6)
	B - (A7)	200 TO 1820 °C (B7)	None (C7)	(0-20)mA (D7)
	PT 100 - (A8)	0 TO 350 °C (B8)		None (D8)
	PT 1000 - (A9)	-50.0-199.9 °C (B9)		
	For PID-2000 only	For PID-2000 only		
	Any other-(A10)	0.01 TO 150.0 °C(B10)		
		Any other (B11)		

ALARM RELAY E	ALARM RELAY F	RETRANS VOLTAGE G	SUPPLY H
High (E1)	High (F1)	(0-5)VDC (G1)	230VAC (H1)
Low (E2)	Low (F2)	(4-20)mA (G2)	110VAC (H2)
None (E3)	None (F3)	None (G3)	

**EXAMPLE :**

MODEL	A	B	C	D	E	F	G	H
<b>PID-300</b>	A 2	B 2	C 1	D 2	E 1	F 2	G 3	H 1

This is Model PID-300 with K type thermocouple input having range (0-1372)°C with SSR & TRIAC output and High & Low Alarm Relay output and Operating on 230VAC supply.

**Note :** Special customized models are available for two different type of switch selectable input, such as one input can be K type thermocouple and other input can be RTD(Pt-100) sensor. Corresponding to both the inputs, the required control output can be provided. For example, for K type the analog (4-20)mA and for RTD(Pt-100) the SSR driver (0-10)VDC pulse outputs can be provided.

## VARIOUS CONTROL PANELS USING PID-300

