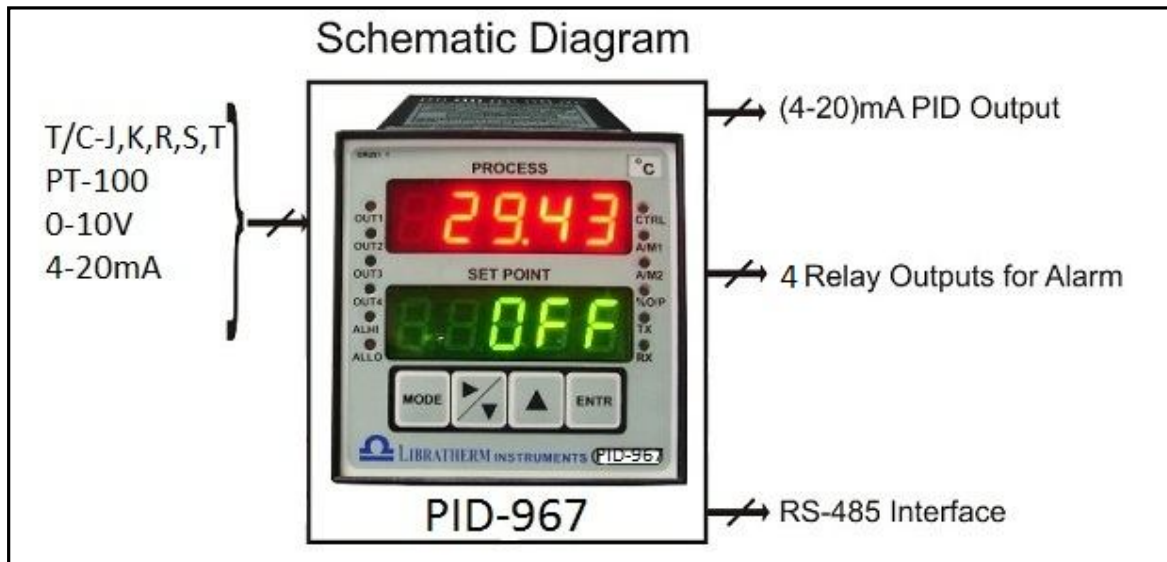


## 5 DIGIT PID Temperature Controller PID-967



### Description:

Libratherm offers 5 digit PID controller model PID-967, which is designed and developed using the latest high speed 8 bit microcontroller chip incorporating 16 bit ADC and 12 bit DAC 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 offers all the useful features which are required to control the complex system.

PID-967 accepts universal single input. The control action is user selectable as PID or On/Off for both direct and reverse or Heat and Cool action. Control outputs are given in the form of optically isolated DC pulse to drive external SSR, Triac or AC SSR to operate AC operated load, electro mechanical relay and/or linear analog output of 4-20mA, 0-5V or 0-10VDC to drive external thyristor based power regulators.

### Features:

- ❖ Microcontroller based design.
- ❖ 5 digit display with resolution of 0.1°C for high temperature measurement
- ❖ User selectable input type T/C,RTD, 4-20mA, 0-10VDC
- ❖ Single loop PID function.
- ❖ One Ramp/Soak feature (user programmable).
- ❖ Auto/Manual tuning of PID parameters.
- ❖ Field proven Algorithm tested successfully for various process control applications.
- ❖ RS485 digital interface for PC connectivity

## General Technical Specifications:

<b>Item / Make</b>	Microcontroller based PID controller / 100% Indigenous – Libratherm make and Made in India
<b>Input -U (Universal)</b>	Single Analog Input -- RTD(Pt-100)/ 2 or 3 wire and Thermocouple (type J,K,R,S,T), 0-10V and 4-20 mA (i.e. Maximum 8 user selectable inputs using keyboard and DIP switch on the back panel)
<b>Range</b>	Full +ve range of the selected input (please refer to the range selection table – given below)
<b>Decimal Point</b>	Programmable for voltage and current inputs.(1.0 0.1,0.01)
<b>Resolution</b>	1°C /0.1°C for thermocouples and 0.1°C for Pt-100. For V and mA inputs the display resolution is subject to the required range. For V and mA input the position of the decimal point can be selected.
<b>Sampling rate / Display rate</b>	The input is read @40mS / the display is updated @1 second. The control loop is also executed @ 40 mS.
<b>Indicating Accuracy</b>	+/- 1°C or +/-0.1°C for Thermocouple throughout the range and +/- 0.1°C for Pt-100 for (4-20)mA or (0-10)V – absolute to the linear input signal
<b>Burn Out Detection</b>	In the event of Input being open or short – the analog output can be programmed to go up scale or down scale and Digital Output like relay can be programmed to remain ON or OFF.
<b>One Ramp / Soak</b>	To Gradually increase the process value – Ramp rate : <b>rAmp</b> = 0.0 to 100.0°C/min or 0 to 100°C/min To Hold the controlled process value for required time, Soak time: <b>St</b> = 0 to 999 minutes.
<b>Display</b>	5 digit 0.5" Red 7-segment display for process variable. 5 digit 0.5" Green 7-segment display for set value and PID parameters
<b>Output Indications</b>	Front Panel LED indications for Control Output, Alarms, Control and A/M status and serial interface etc...
<b>Control Algorithm</b>	PID or ON/OFF selectable (when specified for switching output). Direct action (cool) or Reverse action (heat) (User programmable) Reverse Action is considered as Heat output – where control output decreases as the error (SV-PV) is less positive and vice versa. Direct Action is considered as Cool output – where control output increases as the error (PV-SV) is more positive and vice versa.
<b>Tuning</b>	Auto/Manual tuning of PID values.
<b>PID Values</b>	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, Hysteresis = 0 to 50 counts, Cycle Time = 2 to 100 seconds.
<b>Settings</b>	Using front panel feather touch (metal dome) key board to set various parameters.
<b>Memory Backup</b>	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.

<b>Control Outputs (Switching)</b>	Switching Outputs - DC pulse (0 to 10VDC@25mA) for external SSRs and Relay or Triac (AC SSR) (rated for 5A @230VAC) for external contactor. (PID or ON/OFF action – user selectable) <b>or</b>
<b>Control Outputs (Analog)</b>	Analog Outputs (4-20)mA (RL max = 300 Ohms) or 0-5VDC (RL min = 10KOhms)
<b>Alarm Outputs</b>	2 to 4 extra Relay Outputs with programmable hysteresis for High or Low Alarms. (relay contacts rated for 5A @230VAC) – Configurable for High, Low, Deviation and OFF state or as per desired event. (C and NO contacts are available to the user for each relay)
<b>Serial Communication</b>	Optically isolated 2 wire RS485 on Modbus RTU protocol. (in Slave mode with programmable modbus address).
<b>Supply</b>	230VAC +/- 20%, 50/60 Hz.
<b>Size</b>	96 x 96 x 120 mm.
<b>Panel Cutout</b>	92 x 92 mm +/- 0.5 mm.
<b>Enclosure</b>	ABS plastic with polycarbonate front graphic.

**Note : Technical specifications are subject to change due to continuous product upgradation at the discretion of the manufacturer. For any special requirement please contact us. (Specifications can be customized – against specific qty. requirement)**

### Input and Range Selection Table:

Code	Input	Range
<b>A1</b>	<b>Factory set to 8 universal inputs marked (*) below : A2,A3,A4,A5,A6,A7,A8,A9</b>	<b>Subject to input type</b>
A2	J type : Fe/Con thermocouple (*)	0 to 760 °C / 0.0 to 760.0 °C
A3	K type : Cr/Al thermocouple (*)	0 to 1372 °C / 0.0 to 1372.0 °C
A4	R type : Pt. Rh13%/Pt thermocouple (*)	0 to 1768 °C / 0.0 to 1768.0 °C
A5	S type : Pt Rh10%/Pt - thermocouple (*)	0 to 1768 °C / 0.0 to 1768.0 °C
A6	T type : Cu/Con thermocouple (*)	0 to 400 °C / 0.0 to 400.0 °C
A7	Pt-100 (Alpha = 0.00385) DIN 43760 (*)	-100.0 to 400.0 °C
A8	4-20mA (*) with selection of DP	-10000 to +10000 units
A9	0-10VDC (*) with selection of DP	-10000 to +10000 units
	For A8 and A9 – DP is programmable	