PID500 FULL FEATURED PID TEMPERATURE CONTROLLER

48 x 48

CE

FEATURES

- Compact Size: 1/16 Din
- Dual LED Displays for Simultaneous Indication of Process Temperature and Set Point (lower display selectable for Set1, Set 2, Set 3, % output, Ramp set point °C / °F etc)
- Zone PID.
- PID Control With Reduced Overshoot
- On demand Auto-tuning of PID Control Settings
- Relay 2 can be programmed as heat / cool / Alarm
- Heat - Cool PID Algorithm
- Single point ramp-soak Algorithm
- Auto / manual mode
- Soft Start (Set point Ramping for Process Startup)
- 85 to 270 VAC Supply Voltage (also available 24 VAC/DC models)
- Universal input; Accepts Sensor Inputs (thermocouple or RTD), Current: 0/4 - 20 mA, Voltage: 0-10 VDC
- Digital Filtering: 0 to 99 sec
- High Indication Accuracy: ±0.25%
- Sensor Error Compensation (offset)
- Sensor Break Detection
- Status Indicators For Outputs
- Parameter Security Via Programmable Lockouts
- IP66 Bezel
- Compliance: CE

OPTIONAL FEATURES

- Extra Alarm Output (Relay 3)
- Heater Current Monitor And Heater Break Alarm
- Linear DC Outputs (0 to 10 V, 0 to 20mA, 4 to 20 mA)
- Remote Set point Input (4 to 20 mA)
- Motorised input.
- RS-485 Serial Communication (PC Software Available for Controller Configuration)
- 12 VDC Output To Drive SSR
- 24 VAC /DC supply voltage models

Description:

The PID500 controller accepts signals from a variety of temperature sensors (thermocouple or RTD elements) and 4 to 20 mA or 0 to 10 VDC signals. It precisely displays the process temperature, and provides the appropriate output control signal to maintain the process accurately at the desired temperature.

The controller operates in the PID control mode for both heating and cooling, with on-demand auto-tune, which will establish the tuning constants. The PID tuning constants may be fine-tuned by the operator at any time and then locked from further modification. The controller employs a unique overshoot suppression feature, which allows the quickest response without excessive overshoot. The controller may also be programmed to operate in the ON/OFF control mode with adjustable hysteresis.

The **Zone PID** feature enables efficient control through four programmable control zones.

Dual 4-digit displays allow viewing of the process temperature and set point simultaneously.

Optional **alarm(s)** can be configured to activate according to a variety of actions (Absolute HI or LO, Deviation HI or LO, Band IN or OUT, and Heater Current Break) with adjustable hysteresis.

A **standby** feature suppresses the alarm during power-up until the temperature stabilizes outside the alarm region.

The second alarm can be configured as a secondary PID output (heat / cool PID applications).

Optional **Linear DC output** can be used for control or retransmission purposes.

Optional **Heater Current Monitor** provides a direct readout of process heater current. An alarm can be programmed to signal when the heater has failed. This provides early warning of system failure before product quality is affected.

Optional **Remote Set point input** allows for multiple ganged controller operation for large oven and extruder applications; allows for cascade control loops, where tighter control is required; and allows for remotely driven set point signal from computers or other similar equipment.

The optional **RS-485 serial communication** interface provides two-way Communication between a PID500 and other compatible equipment such as a Printer, PLC, or a computer. In multipoint applications (up to thirty-two), the address number of each PID 500 on the line can be programmed from 1 to 99. Data from the PID500 can be interrogated or changed, and alarm output(s) may be reset by sending the proper command code via serial communications. PC software is available for configuration of controller parameters. These settings can be saved to disk for later use or used for multi-controller down loading.

SPECIFICATIONS

1. DISPLAY: Dual 4-digit (7 segment LED)

Upper Display: 10 mm high red LED (process value)

Lower Display: 7mm high green LED (selectable)

Display alternating between

- PV and '-AL1' during AL1 alarm
- PV and '-AL2' during AL2 alarm
- PV and 'AL12' during AL1 and AL2 alarm

Tuning indicated by blinking decimal point.

LED Status Annunciators:

- Relay on
- Alarm
- Manual mode

SENSOR BREAK Indicated on display, relay off

SENSOR REVERSE Indicated on display, relay off

2. POWER:

AC Versions: 85 VAC min. to 270 VAC max. @ 50 or 60 Hz, 5 VA max.

DC Versions (Optional): 24VAC /DC (AC: 50/60Hz)

3. SETTINGS: Via four keys on front panel.

4. MEMORY: Nonvolatile EEPROM retains all programmable parameters and values.

5. MAIN SENSOR INPUT: (Universal)

Sample period	:	250msec
Digital Filtering	:	0 to 99 sec
Failed Sensor Response	:	Auto/Manual
Main Control Output(s)	:	Programmable:- option to switch to manual output at the last output value.
Temperature units	:	°C / °F
Resolution	:	1 / 0.1°C for TC/RTD 1/0.1/0.01/0.001 for AIN.

Thermocouple

J	:	-200 to 750°C
K	:	-200 to 1350°C
T	:	-200 to 400°C
R	:	0 to 1750°C
S	:	0 to 1750°C
C	:	0 to 2300°C
E	:	- 200 to 750°C
B	:	+ 149 to 1820°C
N	:	-200 to 1300°C
L	:	- 200 to 900°C
U	:	- 200 to 400°C
W	:	0 to 2300°C
Platinel II	:	0 to 1390°C
PT100	:	-100 to 850°C

NOTE: Other TCs / RTDs available on request.

Signal inputs

Linear mV	:	-5.00mV to 56 mV
Voltage	:	0 to 10 V DC
Current	:	0 to 20mA DC

6. INDICATION ACCURACY: +/-0.25% of span or 1°C whichever is greater (After 20min. warm-up)

7. CONTROL AND ALARM OUTPUTS: (Heating, Cooling or Alarm)

Relay output (Main):	5A @ 250VAC or 30VDC
Aux / Alarm outputs:	5A @ 250VAC or 30VDC
Relay 3 (Alarm):	5A @ 250VAC or 30VDC
Life expectancy:	100000 cycles at max. load rating
Logic / SSR drive:	main control output only

8. MAIN CONTROL:

Control:	PID or ON/OFF
Output:	Time proportioning or Linear DC
Cycle time:	Programmable
Auto-tune:	When selected, sets Proportional band, Integral time, Derivative time, Cycle time, and other parameters.

Probe Break Action: Programmable % output

9. ANALOG DC OUTPUT (optional on Main control output / Retransmission)

Range :	4 - 20 mA/ 0 - 10V / 0 - 5V
Action:	Control or retransmission
Update rate:	100msec

10. AUXILIARY OUTPUTS (ALARMS):

1 (set 2) or 2 alarms (set 2 + Output 3, optional)

Modes:	Direct, Reverse, Heat-Cool, Alarm.
Operates:	either Absolute or Deviation value
Hysteresis:	Programmable
Annunciator:	Programmable
Reset Action:	Programmable: automatic or latched
Standby Mode:	Programmable: enable or disable

Probe Break Action: Upscale

11. HEAT - COOL PID MODE: (Setting for set 2)

Control:	PID or ON/OFF
Output:	Time Proportioning
Cycle time:	Programmable

Proportional gain: Programmable

Heat/Cool Dead band Overlap: Programmable

12. REMOTE SET POINT INPUT: (optional)

Input type:	0/4 to 20mA
Input Resistance:	100
Over range:	-5% to 105%
Scale Range:	-1999 to 9999 fixed 1°C for TC/RTD (as per dp selected for AIN)

13. HEATER CURRENT MONITOR INPUT: (optional)

Type:	Single phase, full wave monitoring of load currents controlled by main output.
Input:	100 mA AC output from current transformer
Display Scale Range:	0.0 to 999.9 A
Input Resistance:	47
Accuracy:	±0.5 % of full scale ±1 Digit.
Frequency:	50 to 400 Hz.
Alarm Mode:	LA / HA / BAND.
Over range:	105% Capacity
Overload:	150 mA (continuous).

14. SERIAL COMMUNICATIONS: (optional)

Interface standard:	RS485
Communication Address:	1 to 99, max of 32 units per line
Protocol:	Modbus

15. ENVIRONMENTAL CONDITIONS:

Operating Range:	0 to 50°C
Storage Range:	-20 to 75°C
Humidity:	85% max. RH

(non-condensing) from 0 to 50°C

16. ISOLATION BREAKDOWN RATINGS:

AC line with respect to all inputs and outputs: 2000 Volts

All other inputs and outputs with respect to relay contacts: 2000VAC

17. COMPLIANCE: CE

18. ELECTROMAGNETIC COMPATIBILITY:

Emissions in compliance with BSEN 50081-2

RF interference: BSEN 55011
- Power mains class A
- Enclosure class A

Immunity in compliance with BSEN 50082-2

Electrostatic discharge: BSEN 61000-4-2
- Level 2; 6 kV contact
- Level 3; 8 kV air

Electromagnetic RF fields: BSEN 61000-4-3
- Level 3; 10 V/m
- 80 MHz - 1 GHz

Fast transients (burst): BSEN 61000-4-4
- Level 3; 2 kV power

RF conducted interference: BSEN 61000-4-6
- Level 3; 3 V rms
- 150 KHz - 100 MHz

Power frequency magnetic fields: BSEN 61000-4-8
- Level 4; 30 A/m

Voltage dips / interference: BSEN 61000-4-11
- Reduction 100%
- Duration: 0.5 cycle / each polarity

19. CONNECTION: Wire clamping screw terminals.

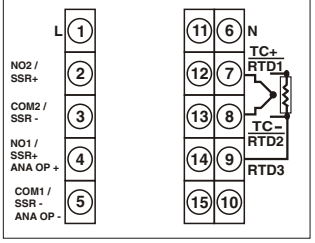
20. WEIGHT: 195 grams.

21. CONSTRUCTION:

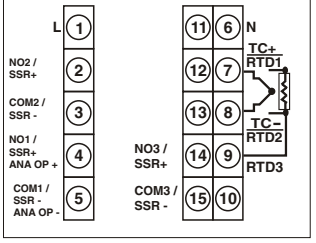
Black plastic alloy case and collar style panel latch. Bezel assembly with circuit boards can be removed from the case to change the output board without removing the case from the panel or disconnecting wiring. Unit meets IP66 requirements for indoor use.

TERMINAL CONNECTIONS

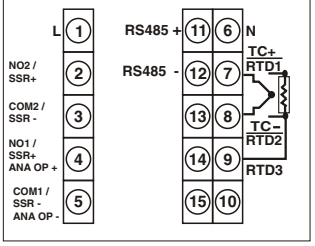
PID500-A-B-00



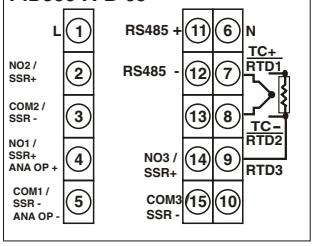
PID500-A-B-01
PID500-A-B-02



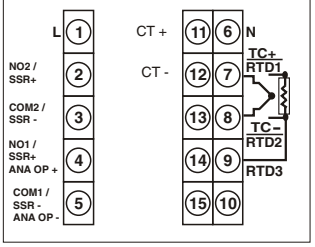
PID500-A-B-03



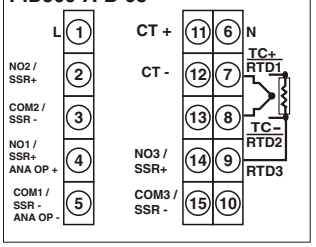
PID500-A-B-04
PID500-A-B-05



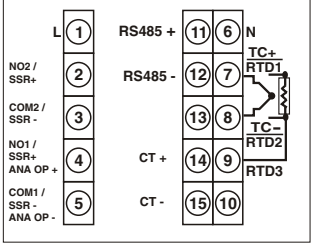
PID500-A-B-06



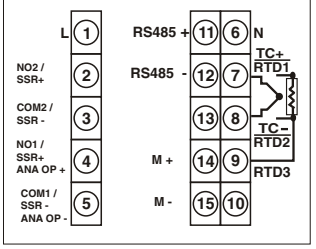
PID500-A-B-07
PID500-A-B-08



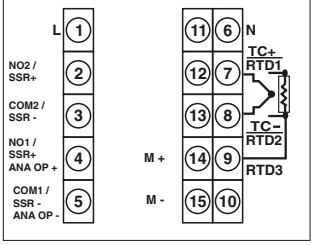
PID500-A-B-09



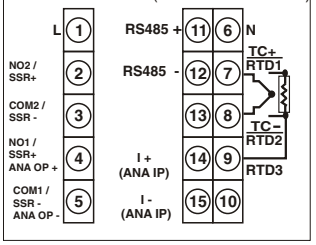
PID500-A-B-11



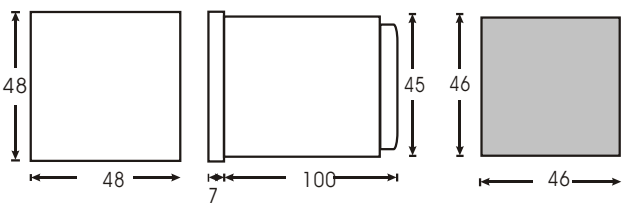
PID500-A-B-10



PID500-A-B-12
PID500-A-B-13 (without Comm. term.)



DIMENSIONS (in mm)



ORDERING CODE -

PID 500 - A - B - XX

A : Output 1	
0	Relay
1	12VDC SSR drive
2	Current
3	Voltage

B : Output 2	
0	Relay
1	12VDC SSR drive

00	Only Output 1 & Output 2
01	Output 3 (Relay)
02	Output 3 (12VDC SSR drive)
03	Communication RS485
04	Output 3 (Relay) + Communication RS485
05	Output 3 (12VDC SSR drive) + Communication RS485
06	CT Input
07	Output 3 (Relay) + CT Input
08	Output 3 (12VDC SSR drive) + CT Input
09	CT Input + Communication RS485
10	Second Analog Input (valve positioner type)
11	Second Analog Input (valve positioner type) + Communication RS485
12	Second Analog Input (Remote set point type)
13	Second Analog Input (Remote set point type) + Communication RS485

ORDERING EXAMPLE

Note: Input is user selectable.
Only output needs to be specified in the ordering code.

1. PID500 - 3 - 0 - 01
   - 01 → Output 3 (Relay)
   - 0 → Output 2 (Relay)
   - 3 → Output 1 (Voltage)