Advanced Self-tune PID Temperature Controller with Timer

PPI
The Perfection Experts

zenex Pro / zenex Pro 96

Self-tune PID & On-Off Control
Heat (Reverse) & Cool (Direct) Control Mode
Auxiliary Control : Blower/Alarm/Compressor with Time Delay
1/16 DIN (48x48) & 1/4 DIN (96x96) Size Options

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48 x 48

96 x 96

Salient Features

- 1/16 DIN (48x48) & 1/4 DIN (96x96) Size Options
- 2 Rows of Bright Green 0.36" (48 x 48) & 0.8" (96 x 96) 7-Segment LED Display, Designed for Sunlight Readability
- Universal Temperature Inputs : J, K, T, R, S, B, N Thermocouples, RTD Pt100
- Built-in Lead Resistance Compensation for RTD Input & CJC for Thermocouple Input
- Programmable Input Signal Conditioning (Digital Filter & Zero Offset)
- Self Tune PID or On-Off Control
- Heat (Reverse) or Cool (Direct) Control Mode
- Relay / SSR & DC mA/V Control Output Versions
- In-built Programmable Timer
- Auxiliary Control : Blower/Alarm/Compressor with Time Delay
- RS485 MODBUS RTU Serial Communication Port
- Universal Supply Voltage : 85~264 VAC, 50/60 Hz
- DIN Standard Dimensions (mm) :
  zenex Pro : 48(H) X 48(W) X 94(D)
  zenex Pro 96 : 96(H) X 96(W) X 84(D)
- Flame-proof Enclosure (Gas Group IIA & IIB) Available

General Information

Product Type	Advanced Universal Self-tune PID Temperature Controller with Programmable Timer

Ordering Code

ZPro- □-□-□-□-□-□

Size **48** : 48 x 48 **96** : 96 x 96
Output 1 **1** : Relay / SSR **2** : mA **3** : V
Output 2 **0** : None **1** : Relay **2** : SSR
Output 3 **0** : None **1** : Relay **2** : SSR
Option **0** : None **1** : Water Level Digital Input

Example Code : ZPro-48-1-1-0-0
Size : 48 x 48
Ouput 1 : Relay/SSR
Output 2 : Relay
Output 3 : None
Option : None

Quantity	1 Unit
Accessories	(Optional) USB to RS485 Convertor

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Operator Interface

Display	**zenex Pro** : 2 Rows of 4 Digits, 0.36" Luminous Green, 7 Segment LED **zenex Pro 96** : 2 Rows of 4 Digits, 0.8" Luminous Green, 7 Segment LED
Status Indicators	8 Red LEDs
Keys	4 Tactile Switches PAGE, DOWN, UP, ENTER

PV Input

Temperature Sensors (User Configurable)	**Thermocouple** : J, K, T, R, S, B, N **RTD** : Pt100, 3 wire
Accuracy	**Thermocouples** : ± 0.2% of reading for J, K, T (Excluding CJC) ± 0.4% of reading for R, S, B, N (Excluding CJC) CJC : ± 1.5 °C (Specified over 18 to 37 °C) **RTD Pt100** : ± 0.2% of reading. Lead Resistance Compensation : Max. 5Ω per Lead for 3-wire RTD
Display Resolution	Thermocouples : 1°C Fixed RTD Pt100 : 0.1 / 1°C (Settable)
Range	Refer Table 1 for Thermocouples & RTD Inputs
Zero Offset	User Adjustable over Full Range
ADC	16 Bit (± 32,768 Counts), Sigma-Delta (ΣΔ)
Sampling Time	200mS (5 Samples per Second)
Input Resistance	> 8 MΩ
Common Mode Rejection	> 100dB at 50/60 Hz
Input Protection	ESD : 8KV EFT : 2KV Surge : 1KV
Input Conditioning	First Order Analog R-C Low-Pass Filter & Settable Digital Low-Pass Filter

Water Level Monitoring

Input	Digital Input (Potential-free Contacts / NPN) with programmable OPEN or CLOSE Logic.
Function	Alarm Alert & Control Output (Heater) Cut-off on Low Water Level Detection
Input Protection	ESD : 8KV EFT : 2KV Surge : 1KV

Alarms

Numbers	2, Independent
Programmable Parameters	**Type** : Process Low, Process High, Deviation, Window **Logic** : Normal, Reverse **Hysteresis** : 1 to 3000 Unit Counts **Inhibit** : No, Yes

Auxiliary Control

Control Type	Setpoint-2 **or** Blower / Compressor Setpoint
Control Parameters	• Setpoint-2 : Hysteresis, Control Logic • Blower / Compressor : Hysteresis, Time Delay

Control

Type	Self Tune PID or ON-OFF
Mode	Heat-only or Cool-only
Control Parameters	• ON-OFF : Hysteresis • Self Tune PID : Proportional Band, Integral Time, Derivative Time, Cycle Time, Power Low, Power High, Overshoot Inhibit

Programmable Timer

Operation Mode	Free Running **or** Soak at Setpoint with Hold Band
Range	5 Seconds to 999 Hours
Power-fail Recovery	Resume, Reset, Abort

Electrical Specifications for Outputs (Refer Table 2)

Relay	Contact Type : Potential-free Change-over Contacts Contact Rating : 5A Resistive @ 250 VAC Contact Life : > 5,00,000 Operations at Rated Voltage / Current
SSR Drive	12 VDC @ 30 mA
DC Linear	Current : 0-20mA, 4-20mA (into 500 Ohm Maximum) Voltage : 0-5V, 0-10V (into 1KOhm Minimum)
Isolation	For **zenex Pro 96** : All Outputs are Isolated from Power, Analog Inputs & RS485 Port Rating : 1500VAC for 1 second or 250VAC continuous Isolation.

Serial Communication

Port	RS485, 2-wire, Half Duplex, Start-Stop Synchronized
Protocol	MODBUS RTU
Baud Rate	Settable : 4800, 9600, 19200
ID	1 to 127
Parity	Settable : None, Even, Odd
Max. Units per Loop	31
Max. Distance	1200 Meters

Power Supply

Type	Switch Mode (SMPS)
Line Voltage	85~264 VAC, 50/60Hz
Consumption	5 VA Max

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Physical

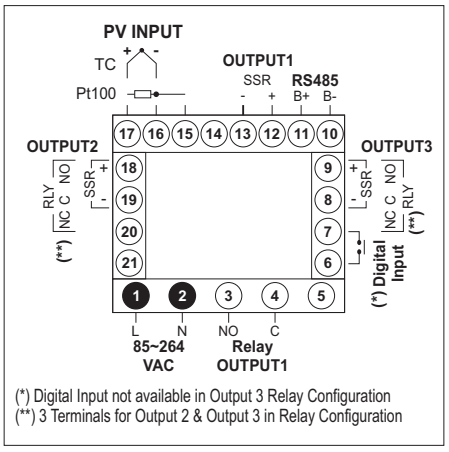
Mounting	Plug-in with Panel Mounting Clamps	
Overall Dimensions	**zenex Pro** : 48(H) X 48(W) X 94(D), mm	**zenex Pro 96** : 96(H) X 96(W) X 84(D), mm
Panel Cutout	**zenex Pro** : 45(H) X 45(W), mm	**zenex Pro 96** : 92(H) X 92(W), mm
Terminals	Screw Type, Pluggable	
Weight	**zenex Pro** : 200 gm, Approx.	**zenex Pro 96** : 400 gm, Approx

Environmental

Operating Ambient	0 to 55°C & 5 to 90%RH Non-condensing
Storage Temperature	-10 to +70°C
Atmospheres	Not Suitable for use in Corrosive or Explosive Atmospheres. The Panel in which the Instrument is Mounted must be free of Electrically Conductive Pollution.

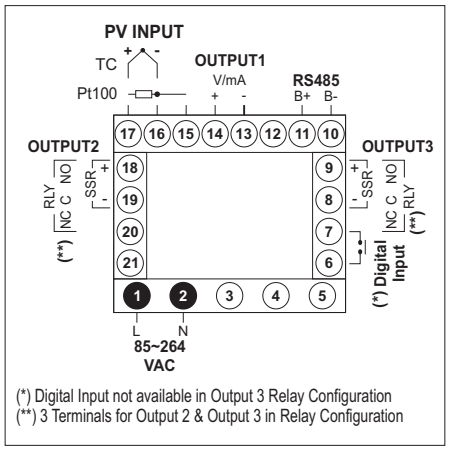
Terminations

Relay / SSR Control Output Version



(*) Digital Input not available in Output 3 Relay Configuration
(**) 3 Terminals for Output 2 & Output 3 in Relay Configuration

DC mA/V Control Output Version



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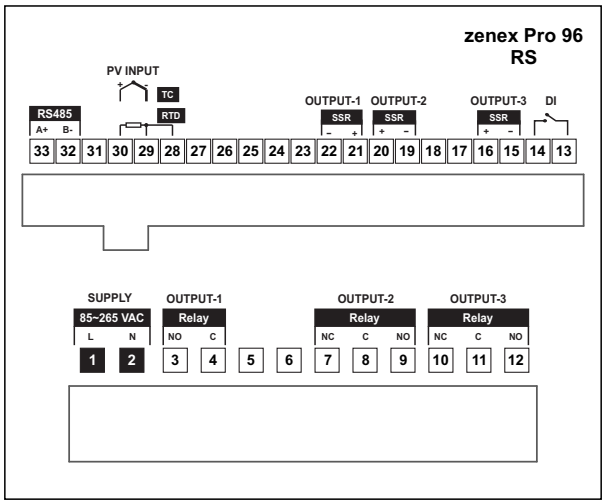
Relay / SSR Control Output Version



DC mA/V Control Output Version

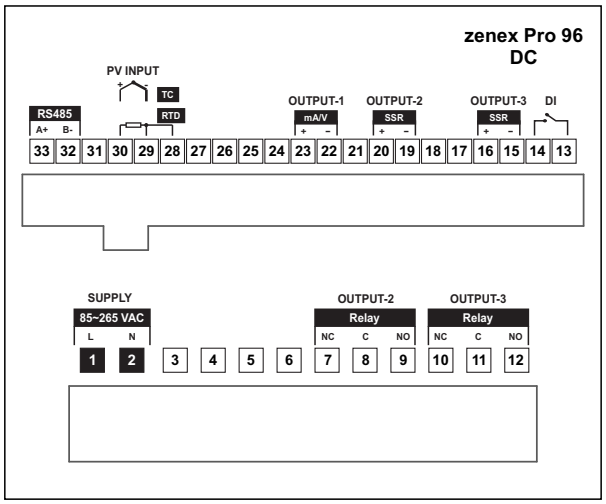


Table 1 : Thermocouple & RTD Input Ranges	
Input Type	**Range (Min. to Max.)**
2 / 3-wire, RTD Pt100	-199.9 to +850.0 °C / -328.0 to +1562.0 °F
Type J Thermocouple (Fe-K)	0.0 to +960.0°C / +32.0 to +1760.0°F
Type K Thermocouple (Cr-Al)	-200.0 to +1376.0°C / -328.0 to +2508.0°F
Type T Thermocouple (Cu-Con)	-200.0 to +387.0°C / -328.0 to +728.0°F
Type R Thermocouple (Pt / Pt-Rh13%)	0.0 to +1771.0°C / +32.0 to +3219.0°F
Type S Thermocouple (Pt / Pt-Rh10%)	0.0 to +1768.0°C / +32.0 to +3214.0°F
Type B Thermocouple (Pt-Rh6% / Pt-Rh30%)	0.0 to +1826.0°C / +32.0 to +3318.0°F
Type N Thermocouple (NiCrSi / NiSi)	0.0 to +1314.0°C / +32.0 to +2397.0°F

Table 2 : Output Option Selection & Function Assignments		
Output	**Available Options (Specify while Ordering)**	**Function Assignments (User Programable)**
Output-1 **zenex Pro** : Non-isolated **zenex Pro 96** : Isolated	☐ Relay, SSR (Relay / SSR Version) ☐ 0/4-20 mA (DC Linear Version) ☐ 0-5/10 V (DC Linear Version)	✓ Main Control Output
Output-2 **zenex Pro** : Non-isolated **zenex Pro 96** : Isolated	☐ Relay ☐ SSR	✓ Alarm-1 Output ✓ Auxiliary Control Output ✓ Blower Control Output
Output-3 **zenex Pro** : Non-isolated **zenex Pro 96** : Isolated	☐ Relay ☐ SSR	✓ Alarm-2 Output ✓ Auxiliary Control Output ✓ Low Water Level

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