

# Zenex Pro

Advanced  
Universal Self-Tune PID Temperature Controller  
with Programmable Timer

# Operation Manual

This brief manual is primarily meant for quick reference to wiring connections and parameter searching. For more details on operation and application; please log on to [www.ppiindia.net](http://www.ppiindia.net)

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I/O CONFIGURATION PARAMETERS : PAGE-10	
Parameters	Settings (Default Value)
Input Type <b>INPT</b>	Refer Table 1 (Default : Type K)
Temperature Display Units <b>Unit</b>	<b>0C</b> °C <b>0F</b> °F (Default : °C)
Temperature Range <b>rRnG</b>	Min. to Max. specified for the selected Input Type (Refer Table 1) (Default : 1376)
Control Output Type <b>C_OP</b>	Refer Table 2 (Default : Relay)
Control Mode <b>Ctrl</b>	<b>OnOff</b> On-Off <b>PID</b> PID (Default : PID)
Control Logic <b>CLOG</b>	<b>dir</b> Direct <b>rEv</b> Reverse (Default : Reverse)
Hysteresis <b>HYSE</b>	1 to 999°C or 0.1 to 99.9°C (Default : 2 or 0.2)
Setpoint Low Limit <b>SPLo</b>	Min. Range to Setpoint High for the selected Input Type (Default : -200)
Setpoint High Limit <b>SPHi</b>	Setpoint Low to Max. Range for the selected Input Type (Default : 1376)

SUPERVISORY PARAMETERS : PAGE-11	
Parameters	Settings (Default Value)
Tune / Optimize Command <b>OPT</b>	<b>no</b> No <b>YES</b> Yes (Default : No)
Tune / Optimize Abort Command <b>Abt</b>	<b>no</b> No <b>YES</b> Yes (Default : No)
Overshoot Inhibit <b>OS.ih</b>	<b>dsbl</b> Disable <b>enbl</b> Enable (Default : Disable)
Overshoot Inhibit Factor <b>O.hf</b>	1.0 to 2.0 (Default : 1.2)
Self-tune on Setpoint Change <b>enSP</b>	<b>dsbl</b> Disable <b>enbl</b> Enable (Default : Disable)
Offset for PV <b>OFSE</b>	-1999 to 9999 or -199.9 to 999.9 (Default : 0)
Digital Filter for PV <b>FLtr</b>	0.5 to 25.0 Seconds in steps of 0.5 Seconds (Default : 1.0)
Permission for OP2/OP3 Setpoint Editing on Operator Page <b>SPOP</b>	<b>dsbl</b> Disable <b>enbl</b> Enable (Default : Enable)
Soak Abort Command on Operator Page <b>SOHA</b>	<b>dsbl</b> Disable <b>enbl</b> Enable (Default : Enable)
Soak Time Adjustment on Operator Page <b>SOHL</b>	<b>dsbl</b> Disable <b>enbl</b> Enable (Default : Enable)

Parameters	Settings (Default Value)
Utility Option <b>OPTn</b>	<b>nonE</b> None <b>StkE</b> Soak Start <b>LEuL</b> Water Level Low Detection (Default : None)
Water Level-Low Detection Logic <b>LLD</b>	<b>OPEn</b> Open <b>CLDS</b> Close (Default : Open)
Slave ID <b>id</b>	1 to 127 (Default : 1)
Baud Rate <b>BAUD</b>	4800, 9600, 19200 (Default : 9600)
Parity <b>PARi</b>	<b>nonE</b> None <b>EuEn</b> Even <b>Odd</b> Odd (Default : Even)
Communication Write Enable <b>ConE</b>	<b>no</b> No <b>YES</b> Yes (Default : Yes)

PID CONTROL PARAMETERS : PAGE-14	
Parameters	Settings (Default Value)
% Output Power <b>OUT.P</b>	Not Applicable (Default : Not Applicable)
Cycle Time <b>ct</b>	0.5 to 120.0 Seconds (in steps of 0.5 secs.) (Default : 0.5)
Proportional Band <b>Pb</b>	0.1 to 999.9 (Default : 10.0)
Integral Time <b>it</b>	0 to 1000 Seconds (Default : 100)
Derivative Time <b>dt</b>	0 to 250 Seconds (Default : 25)

OP2 FUNCTION PARAMETERS : PAGE-12	
Parameters	Settings (Default Value)
Output-2 Function Selection <b>OP2.F</b>	<b>nonE</b> None <b>ALrñ</b> Alarm <b>Ctrl</b> Control <b>BLOr</b> Blower (Default : None)
<b>OP2 Function : Alarm-1</b>	
Type <b>AL-1</b>	<b>P_Lo</b> Process Low <b>P_Hi</b> Process High <b>dE</b> Deviation Band <b>bRnD</b> Window Band <b>EOs</b> End of Soak (Default : Process Low)
Setpoint <b>ALSP</b>	Min. to Max. Range for the selected Input type (Default : 0)
Deviation Band <b>ALdE</b>	-199 to 999 or -199.9 to 999.9 (Default : 0)
Window Band <b>ALbA</b>	3 to 999 or 0.3 to 999.9 (Default : 3)

Parameters	Settings (Default Value)
Logic <b>ALG</b>	<b>norñ</b> Normal <b>rEv</b> Reverse (Default : Normal)
Inhibit <b>ALih</b>	<b>YES</b> Yes <b>no</b> No (Default : Yes)
Alarm Timer <b>ALtñ</b>	5 to 250 Seconds (Default : 10)

OP2 Function : Auxiliary Control	
Parameters	Settings (Default Value)
Offset Value <b>SP.2</b>	(Min. Range - SP) to (Max. Range - SP) specified for the selected Input Type (Default : 0)
Hysteresis <b>HY5.2</b>	1 to 999 or 0.1 to 999.9 (Default : 2 or 0.2)
Control Logic <b>LOG.2</b>	<b>norñ</b> Normal <b>rEv</b> Reverse (Default : Normal)
<b>OP2 Function : Blower / Compressor Control</b>	
Offset Value <b>BLSP</b>	0 to 250 or 0.0 to 25.0 (Default : 0)
Hysteresis <b>BLHY</b>	1 to 250 or 0.1 to 250.0 (Default : 2 or 0.2)
Time Delay <b>BLdL</b>	00.00 to 10.00 Min. Sec (in steps of 5 Seconds) (Default : 00.00)

OP3 FUNCTION PARAMETERS : PAGE-13	
Parameters	Settings (Default Value)
Output-3 Function Selection <b>OP3.F</b>	<b>nonE</b> None <b>ALrñ</b> Alarm <b>Ctrl</b> Control <b>LLOY</b> Water Level Low Alarm (Default : None)

OP3 Function : Alarm-2	
Parameters	Settings (Default Value)
Type <b>AL-2</b>	<b>P_Lo</b> Process Low <b>P_Hi</b> Process High <b>dE</b> Deviation Band <b>bRnD</b> Window Band <b>EOs</b> End of Soak (Default : Process Low)
Setpoint <b>AL2SP</b>	Min. to Max. Range for the selected Input type (Default : 0)
Deviation Band <b>AL2dE</b>	-199 to 999 or -199.9 to 999.9 (Default : 0)
Window Band <b>AL2bA</b>	3 to 999 or 0.3 to 999.9 (Default : 3)
Logic <b>AL2LG</b>	<b>norñ</b> Normal <b>rEv</b> Reverse (Default : Normal)
Inhibit <b>AL2ih</b>	<b>YES</b> Yes <b>no</b> No (Default : Yes)
Alarm Timer <b>AL2tñ</b>	5 to 250 Seconds (Default : 10)

OP3 Function : Auxiliary Control	
Parameters	Settings (Default Value)
Offset Value <b>SP.3</b>	(Min. Range - SP) to (Max. Range - SP) specified for the selected Input Type (Default : 0)
Hysteresis <b>HY5.3</b>	1 to 999 or 0.1 to 999.9 (Default : 2 or 0.2)
Control Logic <b>LOG.3</b>	<b>norñ</b> Normal <b>rEv</b> Reverse (Default : Normal)

SOAK TIMER PARAMETERS : PAGE-15	
Parameters	Settings (Default Value)
Timer Enable <b>SEnb</b>	<b>no</b> No <b>YES</b> Yes (Default : No)
Time Units <b>Unit</b>	<b>ññSS</b> Min:Sec <b>HHññ</b> Hours:Min <b>HoUr</b> Hours (Default : Min:Sec)
Time Duration <b>SoPt</b>	00.05 to 60.00 Min:Sec 00.05 to 99.55 Hrs:Min 1 to 999 Hours (Default : 00.10 Min:Sec)
Timer-Start Band <b>Sbnd</b>	0 to 9999 or 0.0 to 999.9 (Default : 5 or 0.5)
Holdback Strategy <b>HOLD</b>	<b>nonE</b> None <b>UP</b> Up <b>dn</b> Down <b>both</b> Both (Default : None)
Hold Band <b>Hbnd</b>	1 to 9999 or 0.1 to 999.9 (Default : 5 or 0.5)
Switch-Off Control Output at Timer End <b>OPDF</b>	<b>no</b> No <b>YES</b> Yes (Default : No)
Power-fail Recovery Method <b>PrFL</b>	<b>Abt</b> Abort <b>StkE</b> (Re)Start <b>Cont</b> Continue (Default : Continue)

OPERATOR PAGE AND PARAMETERS	
Parameters	Settings
Timer Start Command <b>StkE</b>	<b>no</b> No <b>YES</b> Yes
Timer Abort Command <b>AbtE</b>	<b>no</b> No <b>YES</b> Yes
Time Duration <b>SoPt</b>	00.05 to 60.00 M:Sec or 00.05 to 99.55 H:M or 1 to 999 Hours
<b>OP2 Function : Alarm-1</b>	
Alarm-1 Setpoint <b>AL1SP</b>	Min. to Max. Range for the Input Type
Alarm-1 Deviation Band <b>AL1dE</b>	-199 to 999 or -199.9 to 999.9
Alarm-1 Window Band <b>AL1bA</b>	3 to 999 or 0.3 to 999.9

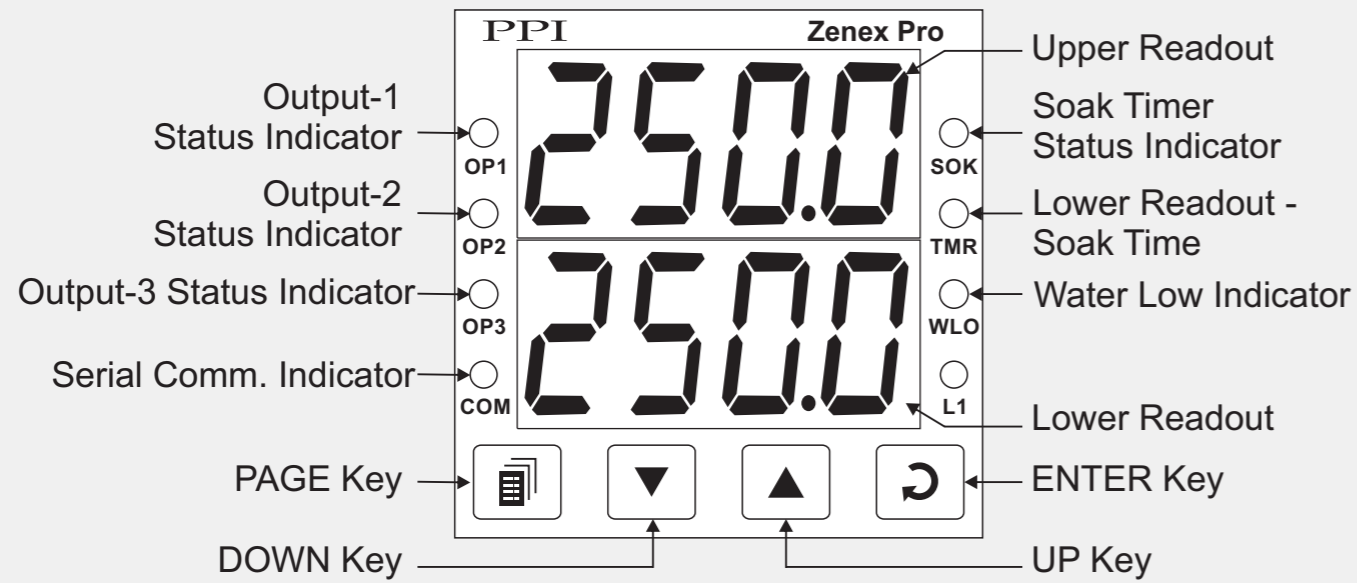
Parameters	Settings
<b>OP2 Function : Auxiliary Control</b>	
Auxiliary Control Setpoint <b>SP.2</b>	(Min. Range - SP) to (Max. Range - SP) for selected Input
<b>OP2 Function : Blower / Compressor Control</b>	
Blower / Compressor Setpoint <b>BLSP</b>	0 to 250 or 0.0 to 25.0
<b>OP3 Function : Alarm-2</b>	
Alarm-2 Setpoint <b>AL2SP</b>	Min. to Max. Range for the Input Type
Alarm-2 Deviation Band <b>AL2dE</b>	-1999 to 9999 or -199.9 to 999.9
Alarm-2 Window Band <b>AL2bA</b>	3 to 999 or 0.3 to 99.9
<b>OP3 Function : Auxiliary Control</b>	
Auxiliary Control Setpoint <b>SP.3</b>	(Min. Range - SP) to (Max. Range - SP) for selected Input
<b>Control Setpoint (SP) Locking</b>	
Setpoint Locking <b>SLOC</b>	<b>no</b> No <b>YES</b> Yes

TABLE - 1			
Option	Range (Min. to Max.)	Resolution	
<b>TC-U</b> J Type T/C	0 to +960°C / +32 to +1760°F	Fixed 1°C / 1°F	
<b>TC-P</b> K Type T/C	-200 to +1376°C / -328 to +2508°F		
<b>TC-E</b> T Type T/C	-200 to +385°C / -328 to +725°F		
<b>TC-R</b> R Type T/C	0 to +1770°C / +32 to +3218°F		
<b>TC-S</b> S Type T/C	0 to +1765°C / +32 to +3209°F		
<b>TC-B</b> B Type T/C	0 to +1825°C / +32 to +3092°F		
<b>TC-N</b> N Type T/C	0 to +1300°C / +32 to +2372°F		
<b>RTD</b> 3-wire, RTD Pt100	-199 to +600°C / -328 to +1112°F		
<b>RTD.I</b> 3-wire, RTD Pt100	-199.9 to 600.0°C / -199.9 to 999.9°F		0.1°C / 0.1°F

TABLE - 2		
Option	What it means	Remarks
<b>RLY</b> <b>SSR</b>	Relay SSR (Solid State Relay)	Applicable for OP1 as Relay / SSR

NOTE : Applicable Only For Zenex DC Linear Version		
Option	What it means	Remarks
<b>0-20</b> <b>4-20</b>	0 to 20mA current 4 to 20mA current	Applicable for OP1 as DC Linear Current
<b>0-5</b> <b>0-10</b>	0 to 5 Volts 0 to 10 Volts	Applicable for OP1 as DC Linear Voltage

## FRONT PANEL LAYOUT



### Keys Operation

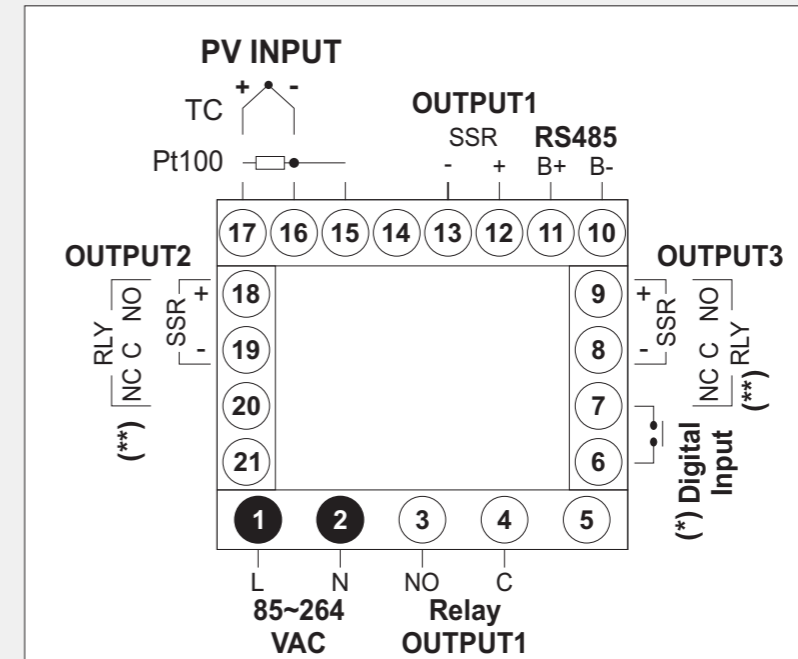
Symbol	Key	Function
	PAGE	Press to enter or exit set-up mode.
	DOWN	Press to decrease the parameter value. Pressing once decreases the value by one count; keeping pressed speeds up the change.
	UP	Press to increase the parameter value. Pressing once increases the value by one count; keeping pressed speeds up the change.
	ENTER	Press to store the set parameter value and to scroll to the next parameter on the PAGE.

### PV Error Indications

Message	PV Error Type
	Over-range (PV above Max. Range)
	Under-range (PV below Min. Range)
	Open (Sensor open / broken)

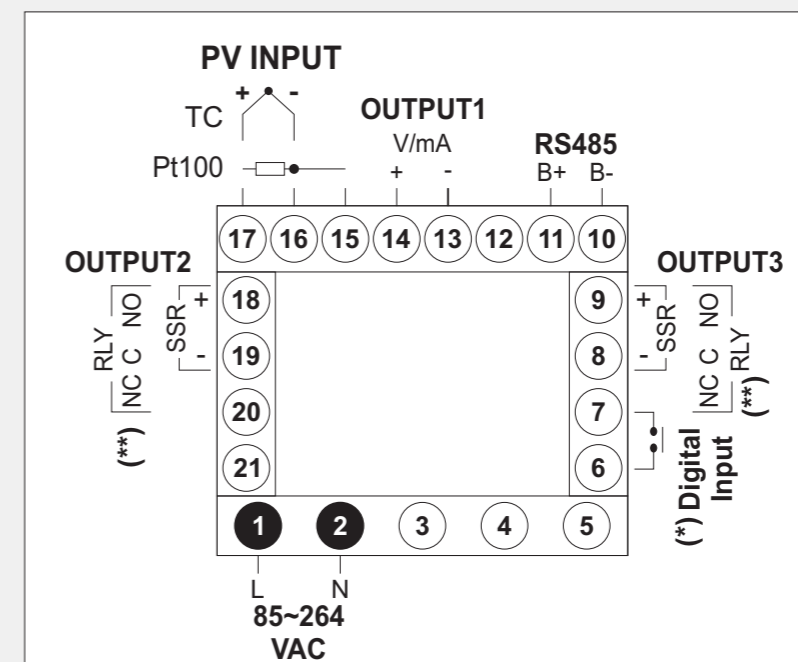
## ELECTRICAL CONNECTIONS

### 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



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