



### Features

- Universal Input (Thermocouples, RTD Pt100, DC Linear mA/mV/V)
- Programmable Range / Resolution for DC Linear Inputs
- Programmable Input Signal Conditioning (Digital Filter & Zero Offset)
- Auto / Manual Control with Bumpless Transfer
- Forward - Reverse Relay Outputs for Motorized Valve Control
- Programmable Inertia and Backlash Time for Accurate Valve Control
- In-built 8 Segment Ramp/Soak Profile
- Optional Auxiliary Control Set Point with Remote Switching Input
- Optional Programmable Alarm / Retransmission Output
- Optional Serial Communication Port
- DIN Standard Dimensions : 48(H) X 48(W) X 110(D), mm

### Specifications

Display	
Digital Readout	Upper Readout : 4 digits, 0.39" Bright Red LED, 7 Segment Lower Readout : 4 digits, 0.3" Luminous Green LED, 7 Segment
Status Indicators	5 Red LEDs (3mm Round)
Keys	
Type	4 Tactile Switches
Functions	PAGE, DOWN, UP, ENTER
Sensor / Signal Input	
Type (User Programmable)	Thermocouple : J, K, T, R, S, B, N RTD Pt100, 3 wire DC Linear : 0-20 mA, 4-20 mA 0-50 mV, 0-200 mV 0-1.25 V, 0-5 V, 0-10 V, 1-5 V
Corrections	<ul style="list-style-type: none"> <li>• In-built Cold-Junction Compensation for Thermocouples</li> <li>• In-built Lead Resistance Compensation for RTD (Upto 22 Ohms in each lead)</li> </ul>
Accuracy	For Thermocouples & RTD : $\pm 0.25\%$ of reading $\pm 1^\circ\text{C}$ For DC Linear Volts / Current : $\pm 0.25\%$ of reading $\pm 1$ LSD
Display Range	Refer Table 1 for Thermocouples & RTD Inputs Adjustable from -1999 to 9999 Counts for DC Linear mA/mV/V
Display Resolution (User Programmable)	Thermocouples : $1^\circ\text{C}$ Fixed RTD Pt100 : $0.1 / 1^\circ\text{C}$ DC Linear Volts / Current : $0.001 / 0.01 / 0.1 / 1$ Counts
Zero Offset	User Adjustable over Full Range
ADC	16 Bit ( $\pm 32,768$ Counts), Sigma-Delta ( $\Sigma\Delta$ )

Sampling Time	200mS (5 Samples per Second)
Input Resistance	> 8 MOhm
Common Mode Rejection	> 100dB at 50/60 Hz
Signal Conditioning	L-C Analog Filter with Programmable Digital Low-Pass Filter
<b>Alarms</b>	
Numbers	One
Programmable Parameters	Type : Process Low, Process High, Deviation, Window Logic : Normal, Reverse Hysteresis : 1 to 999 Unit Counts Inhibit : No, Yes
Outputs (Optional)	Relay Change-over Contacts or SSR Drive (Jumper Selectable) Output-3 (OP-3) for Alarm
<b>Retransmission</b>	
Parameter Type	Process Value (PV) or Setpoint (SP)
Parameter Value	User Settable through 'Range Low' & 'Range High' Parameters
Output Signal	DC Volts (0-5/10 V) or DC Current (0/4-20 mA)
<b>Control</b>	
Type	Self Tune PID
Mode	Heat only, Cool only
Control Parameters	Proportional Band, Integral Time, Derivative Time, Motor Run Time Valve Inertia Time, Valve Backlash Time, Minimum On Time, Overshoot Inhibit
Manual Control	Bump-less Transfer between Auto PID and Manual Control through front panel Key
<b>Setpoint Profile</b>	
Segments	8 (4 Ramp + 4 Soak)
Hold Back Band	Separate Ramp Band and Soak Band
Power-fail Recovery	Servo Start
<b>Outputs</b> (Refer Table 2 : Output Option Selection & Function Assignments)	
Relay	Contact Type : Potential-free Change-over Contacts Contact Rating : 5A Resistive @ 120/240 Vac Contact Life : > 5,00,000 Operations at Rated Voltage / Current
SSR Drive	> 4.2 VDC into 1KOhm Minimum
DC Linear	Voltage : 0-5V, 0-10V (into 1KOhm Minimum) Current : 0-20mA, 4-20mA (into 500 Ohm Maximum)
<b>Serial Communication</b>	
Port	RS485, 2-wire, Half Duplex, Start-Stop Synchronized
Protocol	Modbus RTU
Baud Rate	Settable : 1200, 2400, 4800, 9600
Max. Units per Loop	31
Max. Distance	1200 Meters



**Table 1 : Temperature Ranges for Thermocouples & RTD**

Input Type	Range (Min. to Max.)
Type J Thermocouple (Fe-K)	0 to +960°C / +32 to +1760°F
Type K Thermocouple (Cr-Al)	-200 to +1376°C / -328 to +2508°F
Type T Thermocouple (Cu-Con)	-200 to +385°C / -328 to +725°F
Type R Thermocouple (Pt/Pt-Rh13%)	0 to +1770°C / +32 to +3218°F
Type S Thermocouple (Pt/Pt-Rh10%)	0 to +1765°C / +32 to +3209°F
Type B Thermocouple	0 to +1825°C / +32 to +3092°F
Type N Thermocouple	0 to +1300°C / +32 to +2372°F
3-wire, RTD Pt100	-199 to +600°C / -328 to +1112°F or -199.9 to 600.0°C / -199.9 to 999.9°F

**Table 2 : Output Option Selection & Function Assignments**

	Available Options	Function Assignments
Output-1 (OP-1)	<input type="checkbox"/> Relay	✓ Valve Forward (Open) Motion
Output-2 (OP-2)	<input type="checkbox"/> Relay	✓ Valve Reverse (Close) Motion
Output-3 (OP-3)	<p><b>(Specify while Ordering)</b></p> <input type="checkbox"/> Relay, SSR (Jumper Selectable) <input type="checkbox"/> 0-5/10 V <input type="checkbox"/> 0/4-20 mA	<p><b>(User Programmable)</b></p> <input checked="" type="checkbox"/> Alarm Output <input checked="" type="checkbox"/> End of Profile Output <input checked="" type="checkbox"/> Retransmission Output

**Ordering Code**

Input*		Output 1		Output 2		Output 3		Power Supply		Options	
TC	Thermocouple	1	Relay	1	Relay	0	None	0	85~264 VAC	N	None
PT	RTD Pt100					1	Relay**			S	Serial Port
LV	Linear Voltage					2	SSR**			A	Auxiliary SP
LC	Linear Current					3	0-5/10 V				
						4	0/4-20 mA				

**Example Code TC-1-1-4-0-S**

Thermocouple Input, Output-1 Relay, Output-2 Relay, Output-3 0/4-20 mA (Retransmission), 85~264 VAC Supply, Serial Port

\* Input type is universal and requires appropriate jumper settings. The ordering code only implies the factory settings at the time of dispatch.

\*\* Relay and SSR selection is jumper settable by user. The ordering code only implies the factory settings at the time of dispatch if Relay/SSR output option is ordered .



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