

## ETR-9300 1/16 DIN Temperature Controller with Smarter Logic®



- NEMA 4X IP65 Front Panel
- Universal Sensor Input
- Analog Input for Remote Set-point adjustment
- Event Input
- Loop Break Alarm
- Heater Break Alarm
- Auxiliary Input for Remote Set Point Adjustment
- 5 Per Second Sample Rate
- Digital Communications
- Bumpless Transfer
- 3 Year Warranty

### Description

The ETR-9300 with **Smarter Logic** offers extensive features that are rarely available on a 1/16 DIN controller. In addition to universal field selectable inputs, **auto tuning of PID** parameters and a selection of various control outputs, this controller has an additional analog input and an event input; an analog output or digital communications; and other software features which make this controller stand out among 1/16 DINs.

### Flexible Second Input:

The control sensor input is the primary input. The second input can be set up as a CT (current transformer) input to monitor the actual heater current and alarm if a heater is lost. The second input can also be used as a remote set point, or this input can make the controller a differential controller via a temperature transmitter (the difference in temperature between input 1 and 2).

### Event Input:

The Event input can be used for various functions: selecting between Set point 1 and set point 2, between PID1 and PID2 parameters, resetting the alarms, disabling outputs or locking out the operator parameters.

### Analog Retransmit:

This analog output can retransmit to a PLC or recorder the Process value, input 2 value, the difference between input 1 and 2, the set point, the output 1 or 2 value, or the deviation between the set point and Process variable.

### Other Features:

- Bumpless transfer on a sensor break continues to switch the output at the same percentage to prevent a possibly damaging change in output
- Sensor sample rates of 5 times a second, controlling processes such as pressure and flow are possible
- NEMA 4X front panel rating can be used in applications requiring washing with a direct spray
- Up to 4 outputs – provides flexibility
- Dwell Timer – excellent for cooking or other batch applications
- Digital Communications permit networking with other controllers and computers

### Automatic Tuning

- Eliminates complicated and time consuming manual tuning procedures
- Smarter Logic practically eliminates overshoot and temperature variations
- Universal Input
- Analog input for remote set point adjustments
- Heater Break alarm
- Serial Communications or analog retransmission of process value

### Set Value Display (SV)

- All control parameters and set point displayed
- Output Percentage

### External Lockout Code

- Prevents accidental or unauthorized changes

### Process Value Display(PV)

- Process display updated 5 times per second
- Menu and error codes
- Display shift feature allows agreement of process value and set value

### Status Indicators

- Output and alarm conditions

### 3 Pushbuttons

- For ease of control set-up
- Parameters can be displayed in forward or backward sequence

### Non-Volatile Memory

Retains process parameters when power is off



Scroll Key Up Key Down Key

### NEMA 4X Front Panel

- Water and corrosion proof

## ETR-9300

### 1/16 DIN Temperature Controller with Smarter Logic® (cont'd.)

#### Control Specifications

##### UNIVERSAL INPUT SELECTIONS

Display in temperature or engineering units  
Input Set 1

- Input 1:** Thermocouple - J,K,T,E,B,R,S,N,L  
RTD-PT 100 DIN, PT100 JIS  
Current or Voltage - 4-20mA,  
0-20mA, 0-1V, 0-5V, 1-5V  
and 0-10V
- Input 2:** Analog input for remote set point  
adjustment 4-20mA, 0-20mA,  
0-1V, 0-5V, 1-5V and 0-10V, or  
CT for heater break
- Input 3:** Event input

##### CONTROL FEATURES

- Temperature Range:** Selectable
- Set Point:** Full range adjustable
- Control Modes:**

Can be configured as:

- On/off, Proportional (P)
- Proportional with manual reset
- Proportional/Integral (PI)
- Proportional Derivative (PD)
- Proportional/Integral/Derivative (PID)

##### Heating and Cooling

**Proportional Band:** 0-900°F (0-482°C)

**Integral (Reset):** 0-1000 Seconds

**Derivative (Rate):** 0-360 Seconds

**Ramp Rate:** 0-99.9°F  
(0-55.5°C)/Minute

**Dwell Timer:** 0-6553.5 minutes

##### Cooling

**Overlap/Deadzone** Adjustable dead band  
from -36% to +36%  
of PB1

**Manual Mode:** Configurable or auto-  
matic transfer to open  
loop control if sensor  
should no longer  
function

##### Heating or Cooling

**Cycle Time:** 0.1-100.0 seconds

- Sensor Break Protection:** Configurable status of  
control and secondary  
outputs
- Control Action:** Selectable - Direct action  
for cooling; reverse action  
for heating

##### POWER

- Supply Voltage:** 90-264Vac, 50/60Hz;  
11-26 VAC/VDC optional
- Consumption:** Less than 5VA
- Data Retention:** EEPROM

##### OUTPUTS

Main output with 3 optional independent  
outputs

**Outputs 1 and 2:**  
**Relay:** SPST relay rated 2A, 240V  
maximum resistive load

**Pulsed Voltage:** 5V/30mA SSR Drives  
(Code 2)  
14V/40mA SSR Drives  
(Code C)

**Current:** Isolated 4-20mA/0-20mA

**Voltage:** Isolated 1-5V/0-5V/0-10V

**Triac:** 1A/240VAC

##### Output 2 Only

**DC Power supply:** 20V/25mA,  
12V/40mA/5V/80mA

- Alarm:**
- Alarm 1 Output: Form C relay  
for deviation, process or band  
alarm, 2A/240VAC
  - Alarm 2 Output: Form A Relay,  
2A/240VAC

**Communications:** RS485, RS232 Serial

**Analog Output:** 4-20mA/0-20mA, 1-5V/0-  
5V and 0-10V; Analog  
retransmission of process  
value, set point, output %,  
deviation

##### INDICATION

Dual 4-Digit red .4" LED Process Value Display

##### Selectable Decimal

**Placement:** For normal or high resolu-  
tion display. Example:  
0000; 000.0; 00.00; or  
0.000

**°F/°C:** Selectable with 2 LED  
indicators

**Sample Rate:** 5 Samples/second

##### SPECIFICATIONS

**Accuracy:** ±0.1% of span, ± least  
significant digit

**Control Stability:** ±0.15% (typical) of full  
scale

##### Cold Junction

**Compensation:** 0.1°C/°C Ambient

##### External

**Resistance:** 100 ohms, maximum

##### Common Mode

**Rejection:** 120dB

##### Normal Mode

**Rejection:** 60dB

**Input Impedance:** 10M ohms

##### Operating Temperature for

**Rated Accuracy:** 14-122°F (-10 - 50°C)

**Humidity:** 0-90% RH

##### Shock:

200m/s<sup>2</sup> (20 grams)

##### Dimensions:

1-7/8"W x 1-7/8"H x 3-3/8"D  
(48mmW x 48mmH x 86mmD)  
Depth behind panel: 3" (76mm)  
Panel Cutout: 1-25/32" x  
1-25/32" (42mm x 45mm)  
Weight: 5oz. (142 grams)  
(non-condensing)

## ETR-9300 1/16 DIN Temperature Controller with Smarter Logic® (cont'd.)

### Ordering Information

Complete the model number using the matrix provided.

#### Accessories

CC94-1	RS-232 Interface Cable (2M)
CT94-1	Current Transformer for CT Input/ Heater Break Option
SNA10A	Smart Network Adaptor for Third Party Software. Converts one channel of RS-485 or RS-422 to RS-232 Network.
SNA10B	Smart Network Adapter for ETR-Net Software. Converts 255 channels of RS-485 or RS-422 to RS-232 Network.

Model	Microprocessor based temperature controller with Smarter Logic®						
ETR-9300	1/16 DIN; universal field selectable inputs; PID autotuning; selection of various control outputs; additional analog and event inputs; analog or digital communications						
	<b>Code</b>	<b>Power Input</b>					
	4	90-264 Vac, 50/60 Hz					
	5	11-26Vac or Vdc					
			<b>Code</b>	<b>Signal Input</b>			
			1	Standard Input			
				Input 1 - Universal input Thermocouple J,K,T,E,B,R,S,N,L RTD: PT100 DIN, PT100 JIS Current: 4-20mA, 0-20mA Voltage: 0-1V, 0-5V, 1-5V, 0-10V			
				Input 2 - CT and Analog Input*** CT: 0-50 Amp, AC Current Transformer Analog Input: 4-20mA, 0-20mA, 0-1V, 0-5V, 1-5V, 0-10V			
				Input 3 - Event Input (EI)**			
			<b>Code</b>	<b>Output 1</b>			
			1	Relay rated 3A/240Vac			
			2	Pulsed voltage to drive SSR, 5V/30mA			
			3	Isolated 4 - 20mA/0 - 30mA			
			4	Isolated 1 - 5/0 - 5V*			
			5	Isolated 0 - 10Vdc			
			6	Triac Output 1A/240Vac, SSR			
			C	SSR Drive 14V/40mA			
			<b>Code</b>	<b>Output 2/Alarm 2</b>			
			0	None			
			1	Form A Relay 2A/240Vac			
			2	Pulsed voltage to drive SSR, 5V / 30mA			
			3	Isolated 4 - 20mA/0 - 20mA*			
			4	Isolated 1 - 5/0 - 5V*			
			5	Isolated 0 - 10V			
			6	Triac Output 1A/240Vac, SSR			
			7	Isolated 20/25mA DC Output Power Supply			
			8	Isolated 12/40mA CD Output Power Supply			
			9	Isolated 5V/80mA DC Output Power Supply			
			C	SSR Drive 14V/40mA			
			<b>Code</b>	<b>Alarm 1</b>			
			0	None			
			1	Form A Relay 2A/240Vac			
			2	Form B Relay 2A/240Vac			
			<b>Code</b>	<b>Communications</b>			
			0	None			
			1	RS-485 Interface			
			2	RS-232 Interface**			
			3	Retransmit 4 - 20mA 0 - 20mA*			
			4	Retransmit 1 - 5V/0 - 5V*			
			5	Retransmit 0 - 10Vdc			
ETR-9300	4	1	1	1	1	1	Typical Model Number

\* Range set by front keyboard

\*\* Alternative between RS-232 and Event Input

\*\*\* Order CT94-1 if Heater Break Function is required