

ETR-9000 / 3000 SPECIFICATIONS

90-264 VAC, 47-63 Hz, 10 VA, 5W maximum
11-26 VAC / VDC, 10VA, 5W maximum

Signal Input

Resolution: 18 bits

Sampling Rate: 5 times / second

Maximum Rating: -2 Vdc minimum, 12 Vdc maximum
(1 minute for mA input)

Temperature Effect: $\pm 1.5 \mu\text{V}/^\circ\text{C}$ for all inputs except
mA input, $\pm 3.0 \mu\text{V}/^\circ\text{C}$ for mA input

Sensor Lead Resistance Effect : T/C: $0.2 \mu\text{V}/\text{ohm}$

3-wire RTD: $2.6^\circ\text{C}/\text{ohm}$ of resistance difference of
two leads

2-wire RTD: $2.6^\circ\text{C}/\text{ohm}$ of resistance sum of two leads

Burn-out Current: 200 nA

Common Mode Rejection Ratio (CMRR): 120dB

Normal Mode Rejection Ratio (NMRR): 55dB

Sensor Break Detection: Sensor open for TC, RTD and
mV inputs, Sensor short for RTD input, below 1 mA for
4-20 mA input, below 0.25V for 1 - 5 V input, unavailable
for other inputs.

Sensor Break Responding Time: Within 4 seconds for
TC, RTD and mV inputs, 0.1 second for 4-20 mA and
1 - 5 V inputs.

Relay Rating: 2A / 240 VAC, life cycles 200,000 for
resistive load

Pulsed Voltage: Source Voltage 5V, current limiting
resistance 66.

Linear Output Characteristics

Type	Zero Tolerance	Span Tolerance	Load Capacity
4-20 mA	3.8-4 mA	20-21 mA	500 ? max.
0-20 mA	0 mA	20-21 mA	500 ? max.
0-5 V	0 V	5-5.25 V	10 K ? min.
1-5 V	0.95-1 V	5-5.25 V	10 K ? min.
0-10 V	0 V	10-10.5 V	10 K ? min.

Linear Output

Resolution: 15 bits

Output Regulation: 0.02 % for full load change

Output Settling Time: 0.1 sec. (stable to 99.9 %)

Isolation Breakdown Voltage: 1000 VAC

Temperature Effect: ± 0.01 % of SPAN / $^\circ\text{C}$

Triac (SSR) Output

Rating: 1A / 240 VAC

Inrush Current: 20A for 1 cycle

Min. Load Current: 50 mA rms

Max. Off-state Leakage: 3 mA rms

Max. On-state Voltage: 1.5 V rms

Insulation Resistance: 1000 Mohms min. at 500 Vdc

Dielectric Strength: 2500 VAC for 1 minute

Alarm (Output 2)

Alarm Relay: Form A, Max. rating 2A/240VAC, life cycles
200,000 for resistive load.

Alarm Functions: Dwell timer, Deviation High / Low Alarm,
Deviation Band High / Low Alarm, Process High / Low
Alarm,

Alarm Mode: Normal, Latching, Hold, Latching / Hold.

Dwell Timer: 0.1-4553.6 minutes

Data Communication

Interface: RS-232 (1 unit), RS-485 (up to 247 units)

Protocol: Modbus Protocol RTU mode

Address: 1 - 247

Baud Rate: 2.4 ~ 38.4 Kbits/sec

Data Bits: 7 or 8 bits

Parity Bit: None, Even or Odd

Stop Bit: 1 or 2 bits

Communication Buffer: 160 bytes

User Interface

Single 4-digit LED Displays: 10 mm (ETR-3000, 9000)

Keypad: 3 keys (ETR-3000), 4 keys (ETR-9000)

Programming Port: For automatic setup, calibration and
testing

Communication Port: Connection to PC for supervisory
control

Control Mode

Output 1: Reverse (heating) or direct (cooling) action

Output 2: PID cooling control, cooling P band 50 ~ 300%
of PB, dead band -36.0 ~ 36.0% of PB

ON-OFF: 0.1 - 90.0 ($^\circ\text{F}$) hysteresis control (P band = 0)

P or PD: 0 - 100.0 % offset adjustment

PID: Fuzzy logic modified Proportional band 0.1 ~ 900.0 $^\circ\text{F}$.

Integral time 0 - 1000 seconds

Derivative time 0 - 360.0 seconds

Cycle Time: 0.1 - 90.0 seconds

Manual Control: Heat (MV1) and Cool (MV2)

Auto-tuning: Cold start and warm start

Failure Mode: Auto-transfer to manual mode while sensor
break or A-D converter damage

Ramping Control: 0 - 900.0 $^\circ\text{F}$ / minute or 0 - 900.0 $^\circ\text{F}$ /
hour ramp rate

Digital Filter

Function: First order

Time Constant: 0, 0.2, 0.5, 1, 2, 5, 10, 20, 30, 60 seconds
programmable

Environmental & Physical

Operating Temperature: -10 $^\circ\text{C}$ to 50 $^\circ\text{C}$

Storage Temperature: -40 $^\circ\text{C}$ to 60 $^\circ\text{C}$

Humidity: 0 to 90 % RH (non-condensing)

Insulation Resistance: 20 Mohms min. (at 500 VDC)

Dielectric Strength: 2000 VAC, 50/60 Hz for 1 minute

Vibration Resistance: 2 10 - 55 Hz, 10 m/s for 2 hours

Shock Resistance: 2 200 m/s (20 g)

Moldings: Flame retardant polycarbonate

Mounting: ETR-3000 - panel mount, cutout 7/8 x 1-25/32"

(22 X 45 mm)

ETR-9000 - panel mount, cutout 1-25/32 x 1-25/32"

(45 X 45 mm)

Weight: ETR-3000 --- 120 grams

ETR-9000 --- 140 grams

Approval Standards

Safety: UL61010C-1

CSA C22.2 No. 24-93

EN61010-1 (IEC1010-1)

Protective Class:

NEMA 4X (IP65) front panel for C21,

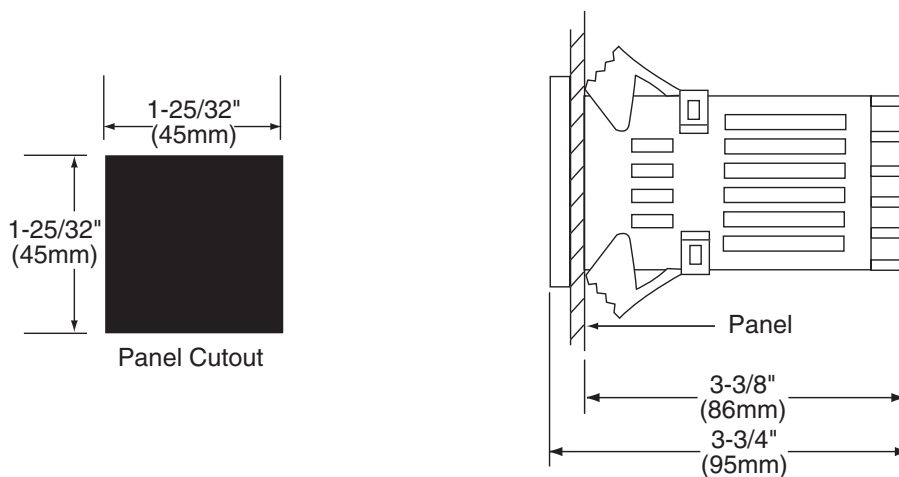
IP30 front panel for C91, all indoor use,

IP 20 housing and terminals

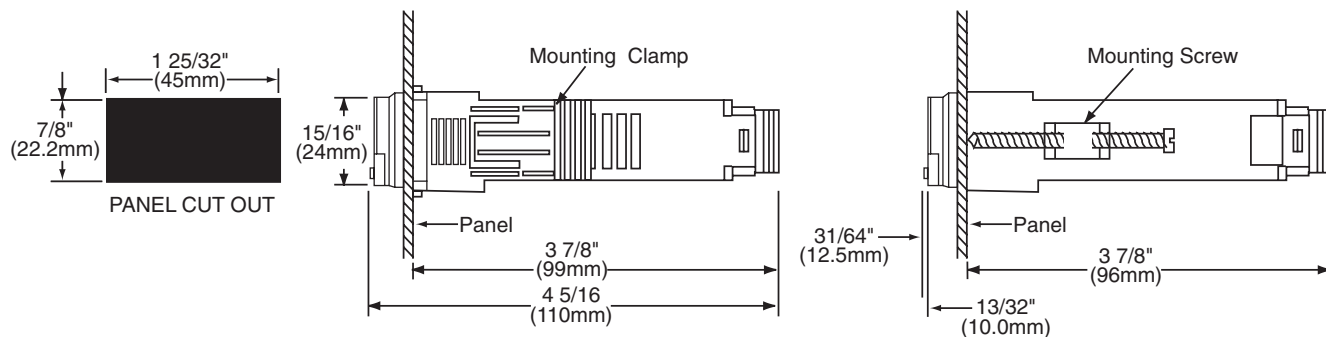
EMC: EN61326

ETR-9000/3000 DIMENSION SPECIFICATIONS

ETR-9000



ETR-3000



Controls are supplied with mounting clamp and mounting screws.
Release the mounting clamp by depressing the ends of the clamp together.
The mounting screws are to be used in applications that require
NEMA 4X rating.

NOTE: All Dimensions in Inches (mm)