



# TEMPERATURE

## ENCAPSULATED THERMISTOR AND RTD SENSORS

### ST-R\*, ST-R\*R SERIES

#### DESCRIPTION

Precon **Encapsulated Sensors** provide precision remote temperature sensing for building automation systems and mechanical equipment room instrumentation. The active sensing element is a highly stable precision thermistor material or platinum RTD.

The sensor is encapsulated with a low mass, high-conductivity compound for good heat transfer characteristics. It is enclosed in a tough, miniature cylinder, 0.17" (0.43 cm) in diameter, which is small enough to be installed in most HVAC thermostat enclosures.



ST-R\*



ST-R\*R

#### FEATURES

- *Lifetime warranty*
- *Wide selection of thermistor and RTD curves*
- *Adaptable miniature sensor*
- *High heat dissipation constant*
- *Easy to mount with clips*
- *Pre-aged, highly stable thermistor material*
- *Ultra high accuracy optional*

#### OPTIONS

- *25' (7.6m) of 24 AWG zipcord*
- *Matched sensor pairs*
- *Rugged sensor coating*

#### APPLICATION

##### ST-R\*

The **ST-R\* Series Encapsulated Sensor** (white) is intended for indoor use only, in areas not subject to moisture or condensation. The sensor may be installed under the cover of an existing pneumatic thermostat. Caution should be exercised when applying the sensor to existing electric thermostats. Heat is often generated by anticipators or other electronics that will affect the sensor reading. The sensor operating range is 35° to 140°F (2° to 60°C). Do not use in conditions below 35°F (2°C) or where condensation could occur.

##### ST-R\*R

The **ST-R\*R Series Rugged Encapsulated Sensor** (red) is suitable for temperature extremes and is immune to the effects of moisture and condensation. Precon uses a three-stage, rugged coating process to moistureproof any sensor which is to be used below ambient dewpoint. The sensor operating range is -30° to 230°F (-34° to 110°C). Vibration or wire stress below 32°F (0°C) can cause the rugged coating to crack.

#### SPECIFICATIONS

##### Accuracy

**Thermistor** ±0.36°F (0.2°C)  
**RTD**

**Type 63** ±0.72°F (0.40°C)  
**Type 71** ±0.054°F (0.03°C)  
**Type 81, 85** ±0.27°F (0.15°C)  
**Type 91** ±0.54°F (0.30°C)

##### Sensor types available

**Thermistor** 2.252 kΩ, 3 kΩ, 10 kΩ, 20 kΩ, 100 kΩ

**RTD**  
**Type 63** 1000Ω Nickel  
**Type 71, 81** 100Ω Pt 385 Curve  
**Type 85** 1000Ω Pt 385 Curve  
**Type 91** 1000Ω Pt 375 Curve

##### Temperature range

**Thermistor** 10° to 230°F (-12° to 110°C)  
**RTD**  
**Type 63** -76° to 392°F (-60°C to 200°C)  
**Type 71** -58° to 572°F (-50°C to 300°C)  
**Type 81, 85, 91** -67° to 240°F (-55°C to 115°C)

##### Temperature response

**Thermistor** Negative temperature coefficient  
**RTD** Positive temperature coefficient

##### Stability

**Thermistor** 0.24°F (0.13°C) over five years  
**RTD** <0.09°F (0.05°C) over five years

##### Heat dissipation

2.7 mW/°C (power needed to raise the temperature by 1°C)  
24 AWG, UL low voltage to 105°C  
8' (2.4m) of 24 AWG prestripped pigtails, type 71 & 81 sensors have 18" leads

##### Mounting

Directly to wall or customer-supplied enclosure using customer-supplied clips

**Weight** 0.3 lb (0.14 kg)  
**Warranty** Lifetime

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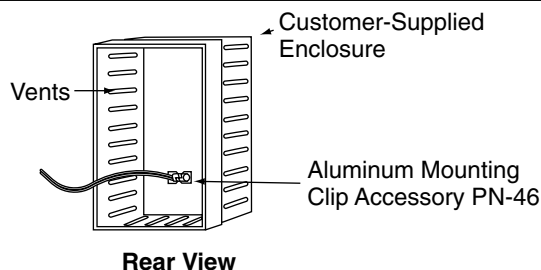
### ST-R\*, ST-R\*R SERIES



#### MOUNTING

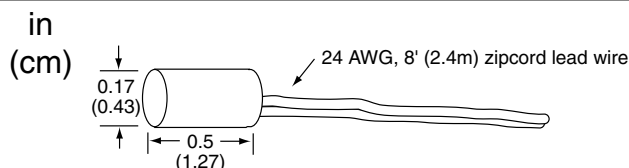
##### Mounting

Secure to enclosure or wall using cable ties, clips, or brackets. To obtain optimum performance, the sensor enclosure/assembly must be highly conductive. Any sensor element surrounded by insulating media will not perform properly at all temperatures or with the proper temperature response times. An accurate room sensor must have good ventilation and a high thermal-conducting metal which is in direct contact with the sensor. The enclosure must be insulated from the building mounting surface to limit wall temperature influence on the sensor.

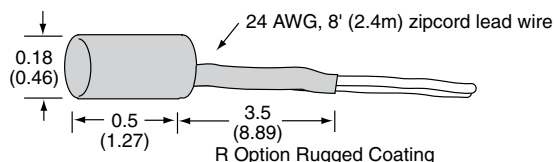


Rear View

#### DIMENSIONS



ST-R\*



ST-R\*R

#### ORDERING INFORMATION

MODEL	DESCRIPTION
ST-R3	10,000Ω encapsulated thermistor @ 77°F (25°C), Type III (gray leads)
ST-R21	2252Ω encapsulated thermistor @ 77°F (25°C), Type II (green leads)
ST-R22	3000Ω encapsulated thermistor @ 77°F (25°C), Type II (blue leads)
ST-R24	10,000Ω encapsulated thermistor @ 77°F (25°C), Type II (yellow leads)
ST-R27	100,000Ω encapsulated thermistor @ 77°F (25°C), Type II (gray leads)
ST-R42	20,000Ω encapsulated thermistor @ 77°F (25°C), Type IV (green leads)
ST-R63	1000Ω nickel encapsulated RTD @ 70°F (21°C), (yellow leads)
ST-R71	100Ω ultra high accurate encapsulated RTD @ 32°F (0°C), 385 platinum curve (blue leads)
ST-R81	100Ω encapsulated RTD @ 32°F (0°C), 385 platinum curve (yellow leads)
ST-R85	1000Ω encapsulated RTD @ 32°F (0°C), 385 platinum curve (blue leads)
ST-R91	1000Ω encapsulated RTD @ 32°F (0°C), 375 platinum curve (green leads)
<b>OPTIONS</b> (List options in alphabetical order with dashes)	
<b>R</b>	Rugged (3.5" moistureproof coating; adding a # following the R extends the coating in feet)
<b>QD</b> 1/4	25' (7.6m) lead length
<b>R</b>	Rugged moistureproof coating 3.5"
<b>R#</b>	Rugged moistureproof coating. # equals number of feet of the coating
<b>X25</b>	25' (7.6m) lead length 24 AWG
<b>XN</b>	NIST certificate of conformance
<b>XN1</b>	NIST certificate, one reference point 32°F(0°C)
<b>XN2</b>	NIST certificate, two reference points 32°F/158°F(0°C/70°C)
<b>XN3</b>	NIST certificate, three reference points 32°F/77°F/158°F(0°C/25°C/70°C)
<b>XP</b>	Matched sensor pair, matched to ±0.1°F, 0.05°C (must order two sensors)
<b>XPA</b>	Ultra high accuracy, thermistors only, ±0.135°F (0.075°C)
<b>XZ</b>	Three wire RTD connections (Optional only on Type 81, standard on Type 71)

ST-R3 — R — X25

**Example:** ST-R3R-X25 10,000Ω Type III thermistor with 3.5" rugged coating and 25' (7.6m) cable length