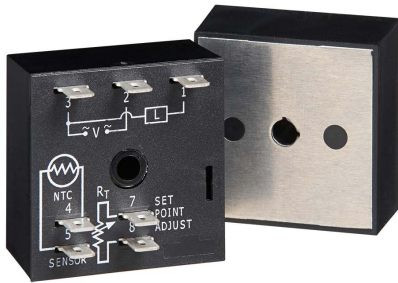


# Single Function Relays

## TCR9C

Temperature Controller



## Description

The solid-state TCR9C series relays are designed for dedicated temperature control of resistive loads. These relays feature a single setpoint controller with high-current, solid-state output. The TCR9C relay is a low-cost, modular approach to accurate temperature control and supports loads up to 20 A. The efficient mounting surface allows for utilization of equipment as the heat sink.

## Operation

**Setpoint Control:** TCR9C is a single setpoint temperature controller. When the thermistor resistance is high (above the setpoint), the solid-state output is ON. When the thermistor resistance decreases (temperature increases) to the setpoint or below, the output turns OFF. It should be noted that temperature differential (under and overshoot) is largely due to the system as a whole. The mass of the system, size of the heaters, and sensor all play an important part. Single setpoint control is best when there is little or no lag time between the heater and sensor, and when the heater is not oversized.

## Features & Benefits

FEATURES	BENEFITS
<b>Low-cost setpoint control</b>	NTC thermistor sensing
<b>Control resistive heaters</b>	Solid-state output
<b>Accuracy</b>	External setpoint adjustment
<b>Facilitates heat transfer</b>	Metalized mounting surface
<b>Protects against shock, vibration, and humidity</b>	Encapsulated

## Applications

- Temperature control of resistive loads

# Single Function Relays

## TCR9C

### Specifications

#### Control

##### Type

Single setpoint, negative temperature coefficient resistance sensing

##### Sensor Type

Thermistor, negative temperature coefficient (customer supplied)  
Electrically insulated for 1500 V RMS min.

##### Adjustment

Temperature setpoint selected by means of an external resistance

##### Accuracy

$\leq \pm 5\%$  of the setpoint resistance Add the tolerance of the NTC thermistor and the drift of the adj. pot over temp. range

##### Setpoint vs. Ambient Temperature and Operating Voltage

$\pm 5\%$  of setpoint resistance

##### Reset Time

$\leq 150$  ms

#### Input

##### Voltage

120–240 V ac

##### Tolerance

$\pm 15\%$

##### AC Line Frequency

50/60 Hz

#### Output

##### Type

Solid state

##### Form

Non-isolated, single pole, zero voltage switching

##### Rating

Model	Steady State	Inrush**
C	20 A	200 A**

##### Minimum Load Current

100 mA

##### Voltage Drop

$\approx 2$  V at rated current

##### Off State Leakage Current

$\approx 5$  mA @ 230 V ac

#### Protection

##### Dielectric Breakdown

$\geq 2000$  volts terminals to mounting surface

##### Isolation Voltage

$\geq 100$  m $\Omega$

##### Circuitry

Encapsulated

#### Mechanical

##### Mounting

Surface mount with one #10 (M5 x 0.8) screw

##### Dimensions

**H** 50.8 mm (2.0"); **W** 50.8 mm (2.0"); **D** 38.4 mm (1.51")

##### Termination

0.25 in. (6.35mm) male quick connect terminals

#### Environmental

##### Operating/Storage Temperature

-40 °C to 60 °C / -40 °C to 85 °C

##### Humidity

95% relative, non-condensing

##### Weight

$\approx 2.7$  oz (77 g)

\*\* Must be bolted to a metal surface using the included heat sink compound. The maximum mounting surface temperature is 90 °C. Inrush: non-repetitive for 16 ms.

### Certification & Compliance

UL Recognized

File E111456 UL873

### Accessories

#### P1015-13 (AWG 10/12), P1015-64 (AWG 14/16), P1015-14 (AWG 18/22) Female Quick Connect

These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief.

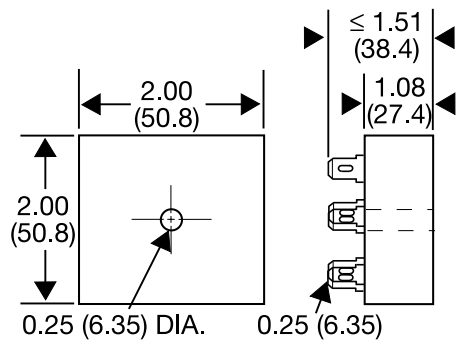
# Single Function Relays

## TCR9C

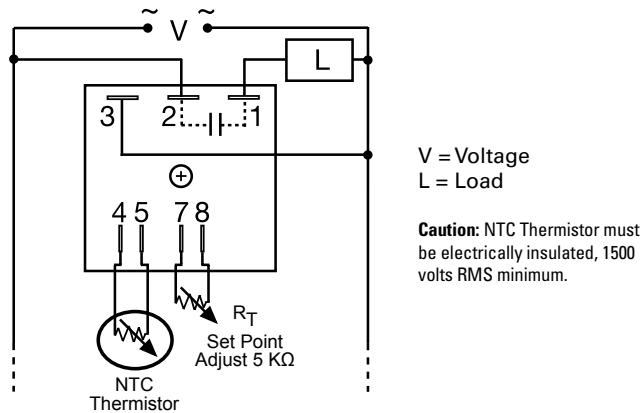
### Ordering Information

MODEL	LINE VOLTAGE	OUTPUT AMPERAGE	DESCRIPTION
TCR9C	120 – 240 V ac	20 A	Low cost solid state temperature controller for use with negative coefficient thermistors

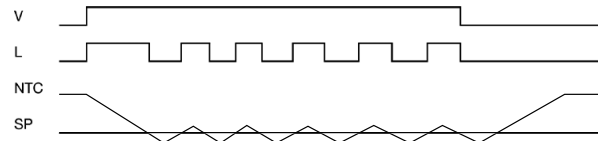
### Dimensions Inches (mm)



### Wiring Diagram



### Function Diagram



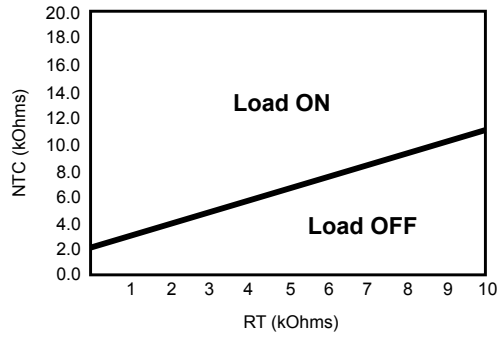
V = Voltage  
L = Load  
SP = Setpoint

NTC = Negative Temperature  
Coefficient Thermistor

# Single Function Relays

## TCR9C

### Adjustment vs. Thermistor Resistance



Note: If  $R_T$  value exceeds 13kOhms, the output will not energize.

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