

## T7047C,G,H Remote Space Sensors

### INSTALLATION INSTRUCTIONS

#### APPLICATION

The T7047 Remote Space Sensors are used in Series 70 Control Systems to provide modulating space temperature control.

#### SPECIFICATIONS

##### IMPORTANT

*The specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit may not exactly match the listed specifications. This product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.*

##### Models:

T7047C: 2-wire remote sensor with no internal adjustment means (requires remote setpoint device such as S963B, T7067B, and T7080B).

T7047C1009: 2-wire remote sensor for use with control systems such as M7044 and M7045 Motors.

T7047C1025: 2-wire remote sensor for use with control systems such as the W927, W960, and W973.

T7047C1082: 2-wire remote sensor for use with T7080B Transmitter in W7080 Multizone Control System.

T7047G: 2-wire remote sensor with no internal adjustment means (requires remote setpoint device such as S963B, T7067B or T7080B).

T7047H: Thin-film, platinum 1K (at 0°C) temperature sensor only. For use with the Excel 80/100/500/600 Controllers.

**Dimensions:** See Fig. 1.

**Mounting:** Mounts on wall or 2 x 4 in. vertical outlet box with screws provided.

**Temperature Sensor:** Thermistor-resistor element.

**Cover Thermometer (available on most models):**

Element: Bimetal.

Range: 55 to 95°F (13 to 35°C).



**Setpoint Adjustment (T7047C,G only):** Remote setpoint device such as S963B, T7067B, T7080B.

**Sensor Resistance:**

For the following negative temperature coefficient (NTC) devices, resistance decreases as temperature increases (see Fig. 3 through 6):

T7047C1009: 1695 ohms nominal at 75°F (24°C); resistance changes 21 ohms for each 1°F (0.6°C) temperature change.

T7047C1025: 1420 ohms nominal at 75°F (24°C); resistance changes 15 ohms for each 1°F (0.6°C) temperature change.

T7047C1082: 22,800 ohms nominal at 77°F (25°C); resistance changes nominally 800 ohms for each 1°F (0.6°C) temperature change at typical ambient room temperature.

T7047G: 710 ohms nominal at 75°F (24°C); resistance changes 7.5 ohms for each 1°F (0.6°C) temperature change.

For the following positive temperature coefficient (PTC) device, resistance increases as temperature increases (see Fig. 7):

T7047H: 1093 ohms nominal at 75°F (24°C); resistance changes 2 ohms for each 1°F (0.6°C) temperature change.

**Accessories:**

T7047C1009: 360 ohm S963B1003 Remote Setpoint Potentiometer.

T7047C1025: 480 ohm S963B1037 Remote Setpoint Potentiometer, T7067B Single Zone System Transmitter.

T7047C1082: T7080B Multizone System Transmitter.

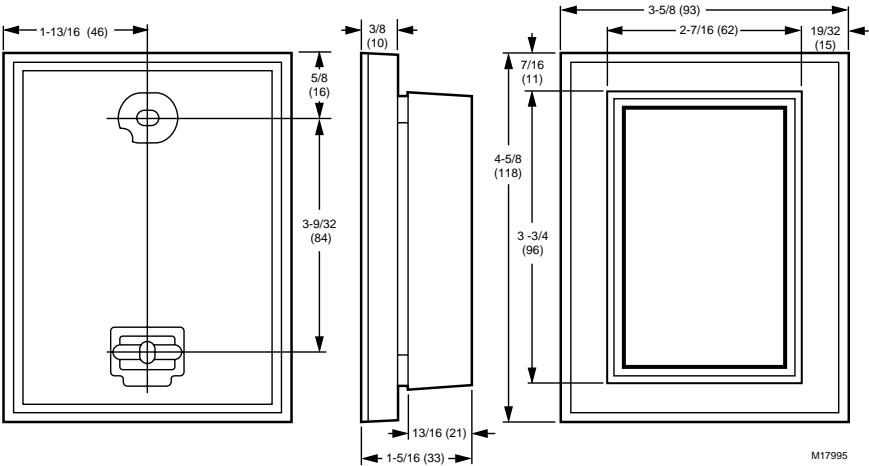


Fig. 1. T7047 dimensions in in. (mm).

# INSTALLATION

## When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.



## CAUTION

**Electrical Shock or Equipment Damage Hazard.**

**Can shock individuals or short equipment circuitry.**

Disconnect power supply before installation.

## Location

Locate the remote sensor about 5 ft (1.5m) above the floor on an inside wall where it will be affected by freely circulating air at average room temperatures.

## Mounting

1. Loosen the cover locking screw with the Allen wrench provided and remove the device cover.
2. Run wire to the selected location.
3. Thread wire through the semicircular hole in the device.
4. Make connections to the T7047 (see the Wiring section).
5. Select the proper screws for the application. Four mounting screws are provided:
  - a. Two self-tapping type for wall mounting.
  - b. Two for outlet box mounting.
6. If air drafts occur through the wall opening, *eliminate* with suitable material.
7. Fasten the T7047 on the wall or outlet box with screws through the mounting holes in the device. (See Fig. 2.)
8. Replace the cover and tighten the cover locking screw.

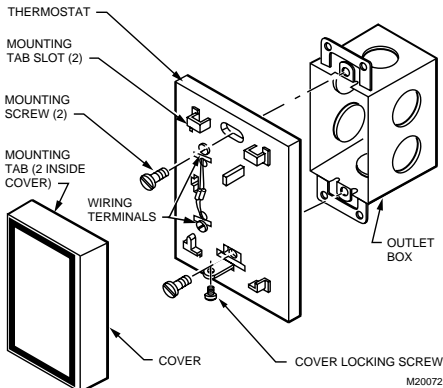


Fig. 2. Mounting the T7047.

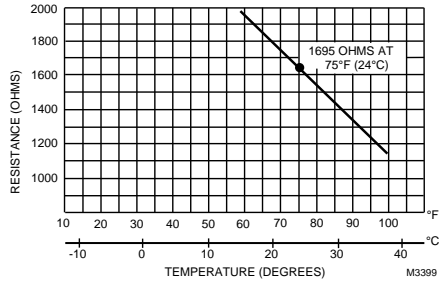


Fig. 3. T7047C1009 Remote Sensor resistance change with change in temperature.

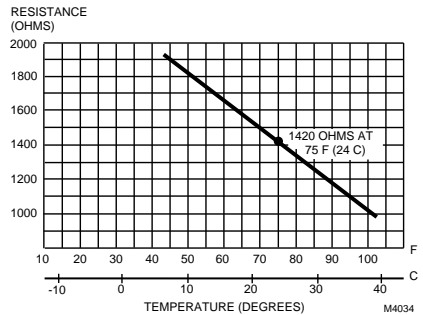


Fig. 4. T7047C1025 Remote Sensor resistance change with change in temperature.

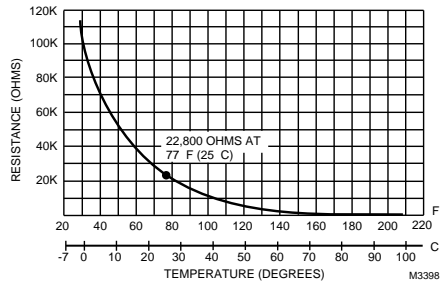


Fig. 5. T7047C1082 Remote Sensor resistance change with change in temperature.

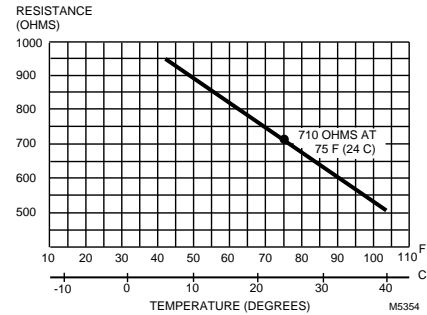


Fig. 6. T7047G1000 Remote Sensor resistance change with change in temperature.

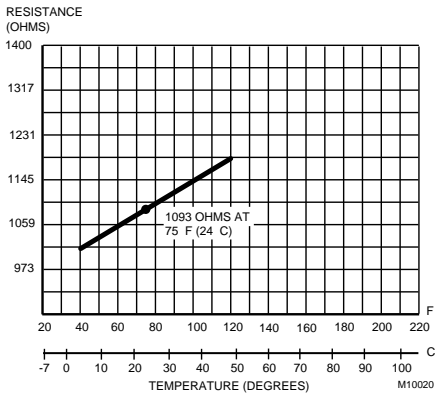


Fig. 7. T7047H1008 Remote Sensor resistance change with change in temperature.

## Wiring

### IMPORTANT

All wiring must agree with applicable codes, ordinances and regulations.

Fig. 8 through 16 show schematics and typical connections. Also refer to instructions supplied with other system components.

### IMPORTANT

To avoid electrical interference, which can cause erratic performance, keep wiring runs as short as possible and do not run wires adjacent to the line voltage electrical distribution systems. Use shielded cable (Belden type 8762 or equivalent for 2-wire and Belden type 8772 or equivalent for 3-wire). The cable shield must be grounded only at the controlled equipment case.

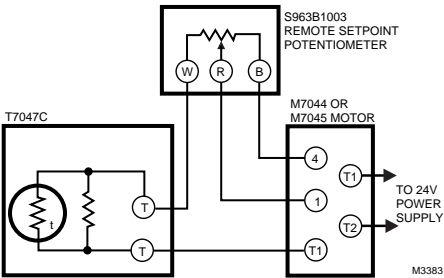


Fig. 8. Internal schematic and typical wiring for T7047C1009.

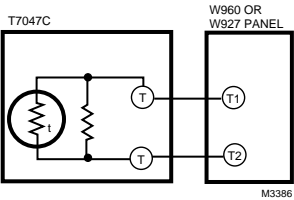


Fig. 9. T7047C1025 connected to W960 or W927 panel with internal setpoint adjustment.

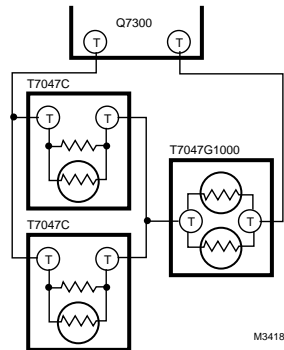


Fig. 10. Two T7047C1025 Sensors and one T7047G1000 Sensor providing a temperature-averaging network for a T7300/Q7300 Thermostat/Subbase.

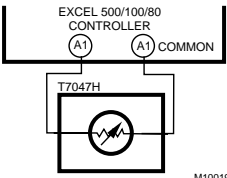
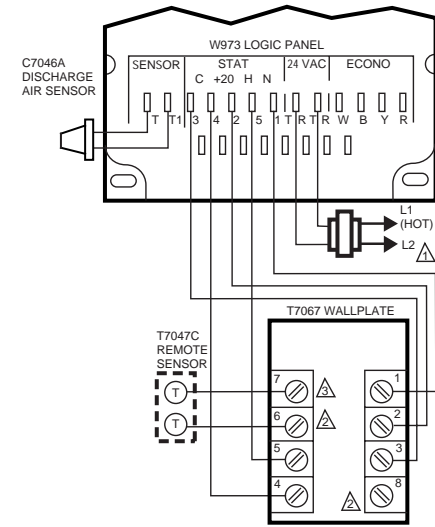
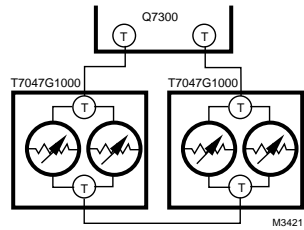


Fig. 11. Typical wiring for T7047H1008 to Excel 80/100/500/600 Controller.

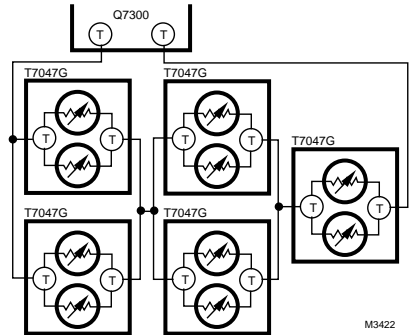


- ⚠ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- ⚠ TERMINAL 8 IS USED WITH THE W974A, B ONLY. TERMINAL 6 IS USED WITH THE W974A, B AND/OR REMOTE SENSING ELEMENT (T7067B ONLY).
- ⚠ TERMINALS 6 AND 7 ARE USED TO CONNECT THE REMOTE SENSING ELEMENT TO THE T7067B ONLY. NO SCREW IS PROVIDED WITH THE T7067A FOR TERMINAL 7. DOTTED LINES SHOW REMOTE SENSING ELEMENT CONNECTIONS.

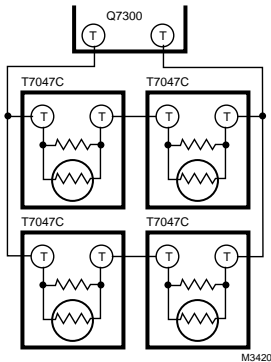
**Fig. 12. T7047C1025 used as a remote sensor with T7067B Thermostat.**



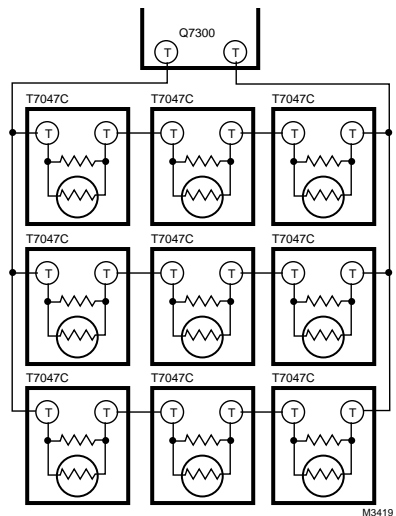
**Fig. 14. Two T7047G1000 Sensors providing a temperature-averaging network for a T7300/Q7300 Thermostat/Subbase.**



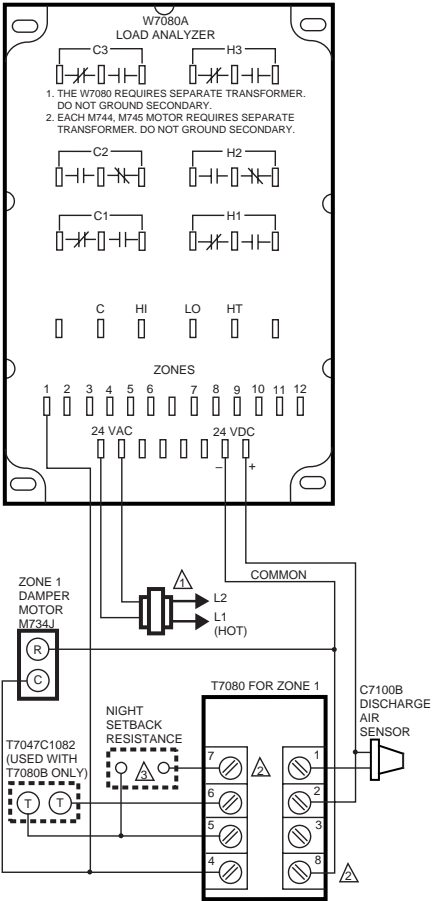
**Fig. 15. Five T7047G1000 Sensors providing a temperature-averaging network for a T7300/Q7300 Thermostat/Subbase.**



**Fig. 13. Four T7047C1025 Sensors providing a temperature-averaging network for a T7300/Q7300 Thermostat/Subbase.**



**Fig. 16. Nine T7047C1025 Sensors providing a temperature-averaging network for a T7300/Q7300 Thermostat/Subbase.**



⚠ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

⚠ TERMINALS 3, 7 AND 8 ARE ALL EQUIVALENT COMMON TERMINALS.

⚠ RESISTOR AND TIME SWITCH IN SERIES BETWEEN TERMINALS 5-7. SEE FIG. 6, PAGE 5.

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**Fig. 17. T7047C1082 used as a remote sensor with T7080B Thermostat.**

## OPERATION AND CHECKOUT

### Operation

The T7047C,G Remote Sensor control element is a negative temperature coefficient (NTC) thermistor. As the room temperature increases, the resistance of the thermistor decreases.

The T7047H Remote Sensor control element is a positive temperature coefficient (PTC) thermistor. As the room temperature increases, the resistance of the thermistor increases.

The change in the thermistor resistance causes the motor, system logic panel, or system transmitter bridge circuit to become unbalanced. As the electronic motor, system logic panel or system transmitter circuits react to rebalance the circuit, damper or valve movement, or sequential staging of heating and/or cooling equipment occurs.

### Low Range Thermostat

Use caution when setting temperatures below 40°F (5°C). A low temperature setpoint can result in temperatures below freezing in areas distant from the remote sensor.

### Calibration

The T7047 Remote Space Sensor is accurately calibrated at the factory. It cannot be field calibrated.

### Checkout

Allow the T7047 Remote Space Sensor to stabilize to ambient conditions before taking a resistance measurement. Measure nominal resistance according to the values described in the Specifications section. Measure the sensor resistance in accordance with the temperature curves. See Fig. 3 through 7.

Check operation of the complete control systems as directed in the associated technical publications.

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