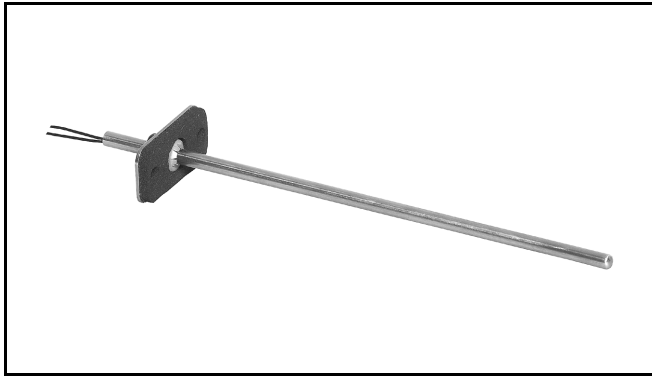


## C7046A,B,C,D Air Temperature Sensors

### PRODUCT DATA



### APPLICATION

The C7046 series of Air Temperature Sensors function as primary and/or secondary sensors in electronic control systems.

### FEATURES

- C7046A,C Sensors have probe lengths of 8 in. (203 mm) and nominal sensor resistance of 3000 ohms at 77°F (25°C).
- C7046B Sensor has probe length of 6 in. (152 mm) and nominal sensor resistance of 22,800 ohms at 77°F (25°C).
- C7046D Sensor has probe length of 8 in. (203 mm) and nominal sensor resistance of 1097 ohms at 77°F (25°C).
- Carbon type, negative temperature coefficient (NTC) thermistor sensing element in the C7046A,B,C and platinum thin film, positive temperature coefficient (PTC) element in C7046D precisely measures temperature changes.
- No settings or calibration required.
- Solid state components not affected by dust or dirt.
- Fast reacting.
- Rugged stainless steel insertion probe.
- Mounts on duct or plenum surface with mounting flange or in a 2 in. by 4 in. (51 by 102 mm) junction box.
- C7046B can be used as a replacement for C7100B Averaging Temperature Sensor where duct or plenum cross section is less than 13 in. (330 mm).

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## SPECIFICATIONS

### IMPORTANT

Specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit may not exactly match the listed specifications. Also, 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:

- C7046A Air Temperature Sensor: Intended for use as a discharge sensor with the W973 Single Zone Logic Panel.
- C7046B Air Temperature Sensor: Intended for use as a zone discharge, hot deck, cold deck, mixed air and/or return air sensor in the W7080 Multizone Control System.
- C7046C Air Temperature Sensor: Intended for use as a discharge sensor in rooftop applications.
- C7046D Air Temperature Sensor: Intended for use as a discharge air sensor in the Excel 500 Control System.

**Dimensions:** See Fig. 1.

**Mounting:** Integral mounting flange requiring two No. 8 screws.

### Sensing Element:

- C7046A,B,C: Carbon type, thermistor-resistor element.
- C7046D: Platinum thin film element.

**Maximum Ambient Temperature:** 250°F (121°C).

**Operating Temperature Range:** 40 to 150°F (4 to 66°C).

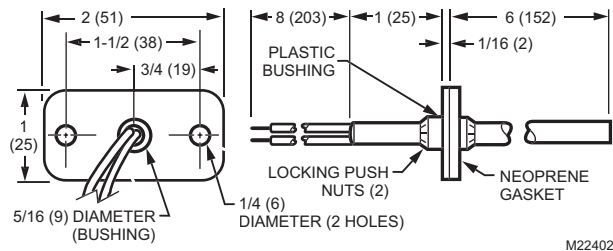
**Wiring Connections:** 6 in. (152 mm) leadwires.

### Performance Characteristics:

- Reaction Time Constant with Air Approach Velocity of 500 ft/min (2 m/sec):
  - C7046A: 100 seconds.
  - C7046B: 165 seconds.
  - C7046C: 60 seconds.
  - C7046D: 130 seconds.

### Resistance/Temperature (NTC):

- C7046A,C:
  - Nominal Resistance: 3000 ohms at 77°F (25°C)
  - Nominal Sensitivity: 70 ohms per degree F (124 ohms per degree C) at midrange.
- C7046B:
  - Nominal Resistance: 22,800 ohms at 77°F (25°C).
  - Nominal Sensitivity: 675 ohms per degree F (1290 ohms per degree C) at midrange.
- C7046D:
  - Nominal Resistance: 1097 ohms at 77°F (25°C).
  - Nominal Sensitivity: 2.1 ohms per degree F (3.9 ohms per degree C).



**Fig. 1. C7046A,B,C,D Air Temperature Sensor dimensions in in. (mm).**

NOTE: Sensor probe diameter is 1/4 in. (6 mm).

## ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Honeywell Automation and Control Products Sales Office (check white pages of your phone directory).
2. Honeywell Customer Care  
1885 Douglas Drive North  
Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9.

International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

## 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.

The sensor assembly (see Fig. 1) consists of an aluminum sensor probe (element housed internally) with attached flange that can be mounted on a flat duct or plenum surface, or in a 2 in. by 4 in. (51 by 102 mm) junction box using two No. 8 screws. Connections to the sensor are made through two 6 in. (152 mm) leadwires.

### Location

The sensor should be located in the air duct or plenum where it will sample an average air temperature. Avoid locations where air stratification can cause sensing errors.

### Mounting

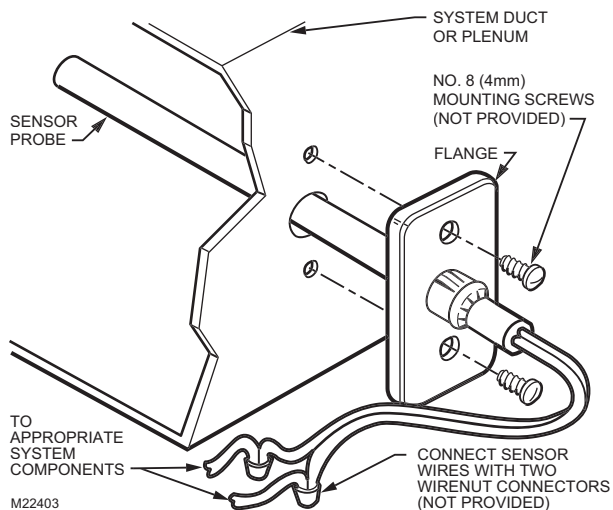
#### Mounting on a Flat Duct or Plenum Surface (Fig. 2)

1. Cut a 3/8 in. (9.5 mm) hole in the duct or plenum surface at the desired location.
2. Insert sensor probe into the duct or plenum until the flange rests against the duct or plenum wall.
3. If necessary, use the flange as a template to mark and drill two holes for No. 8 mounting screws.
4. Fasten the sensor to the duct or plenum surface with two No. 8 sheet metal screws (not provided).

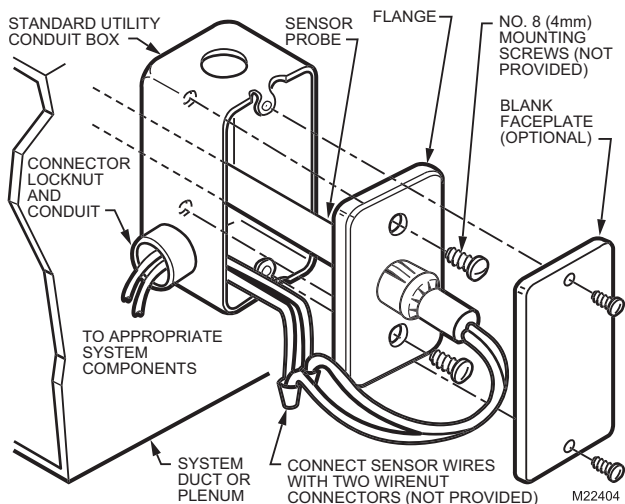
#### Mounting in a Junction Box (Fig. 3)

1. Cut a 3/8 in. (9.5 mm) hole in the duct or plenum surface at the desired location.
2. Remove the center rear knockout from the junction box and insert the sensing probe through the knockout with the flange flat against the outlet box.

3. Using the flange as a template, mark and drill two holes in the junction box and the duct or plenum surface for No. 8 mounting screws.
4. Insert sensor probe through both the junction box knockout and the 3/8 in. (9.5 mm) hole drilled in the duct or plenum and fasten the junction box and sensor to the duct or plenum surface.



**Fig. 2. Mounting C7046 Air Temperature Sensor on a flat duct or plenum surface.**



**Fig. 3. Mounting C7046 Air Temperature Sensor in a junction box.**

## Wiring

### CAUTION

**Electrical Shock or Equipment Damage Hazard.**  
**Can shock individuals or short equipment circuitry.**  
 Disconnect power supply before installation.

### CAUTION

**Erratic System Operation Hazard.**  
**Failure to follow proper wiring practices can introduce disruptive electrical interference (noise).**  
 Keep wiring at least one foot away from large inductive loads such as motors line starters, lighting ballasts, and large power distribution panels.  
 Shielded cable is required in installations where these guidelines cannot be met.  
 Ground shield only to grounded controller case.

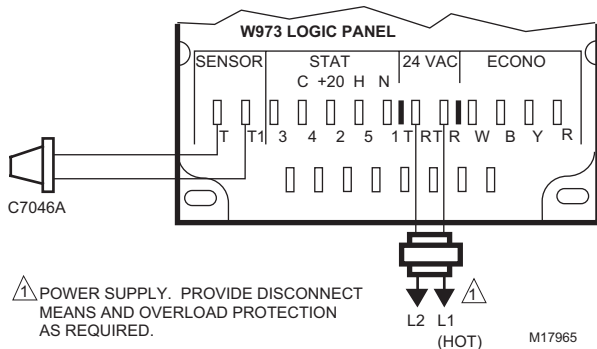
### IMPORTANT

1. All wiring must agree with applicable codes, ordinances and regulations.
2. Do not mount sensor in incorrect environment.
3. Wire according to the applicable controller instructions.
4. Erratic temperature readings from a sensor can be caused by improper wiring practices. These must be avoided to assure proper operation:
  - Avoid poor wiring connections.
  - Avoid intermittent or missing building earth ground.
  - Do not mount sensor in incorrect environment.

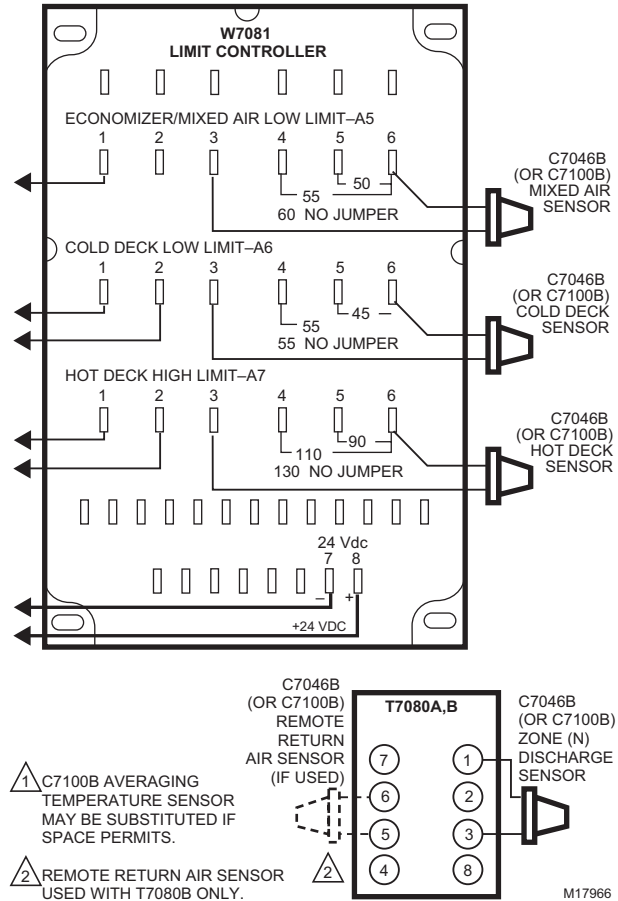
Connect low voltage wiring from the sensor to the appropriate system component terminals using solderless connectors. See Fig. 3.

### NOTES:

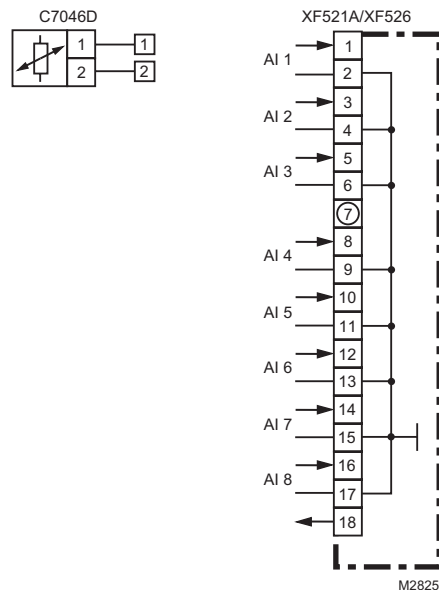
1. For connections to the W973 Single Zone Logic Panel, see Fig. 4.
2. For connections to the W7080 Multizone System, see Fig. 5.
3. For connections to the Excel 500 Control System, see Fig. 6.
4. For additional wiring information, refer to the appropriate specification.



**Fig. 4. Connecting C7046A Air Temperature Sensor to a W973 Single Zone Logic Panel.**



**Fig. 5. Connecting C7046B Air Temperature Sensor for mixed air, cold deck and hot deck sensing, zone discharge and optional remote return air sensing in W7080 Multizone System.**



**Fig. 6. Connecting C7046D Air Temperature Sensor to Excel 500 Control System.**

# OPERATION AND CHECKOUT

## Operation

The C7046A,B,C Air Temperature Sensors consist of a thermistor sensing element mounted in a tubular probe. They are applied at various locations throughout single zone and multizone duct systems. The negative temperature coefficient (NTC) characteristic of the thermistor element causes its resistance to decrease as the sampled air temperature increases. This resistance shift is balanced with other system sensor signals by appropriate system logic panels to stabilize system control.

The C7046D Air Temperature Sensor consists of a platinum thin film sensor element mounted in a tubular probe. It can be applied at various locations throughout single zone and multizone duct systems. The positive temperature coefficient (PTC) characteristics of the platinum thin film element causes its resistance to increase as the sampled air temperature increases. This resistance shift is balanced with other system sensor signals by the Excel 500 Control System.

## Checkout

Allow the C7046 Air Temperature Sensor to soak in the air moving through the duct or plenum for a minimum of five minutes before taking a resistance measurement.

1. Disconnect the sensor leadwires from the associated system components.
2. Connect an ohmmeter across the leadwires.
3. Assure nominal resistance measurements are in accordance with the resistance/temperature curves shown in Figs. 7, 8 and 9.
4. Reconnect sensor leadwires to associated system components.
5. Check operation of the complete control system.

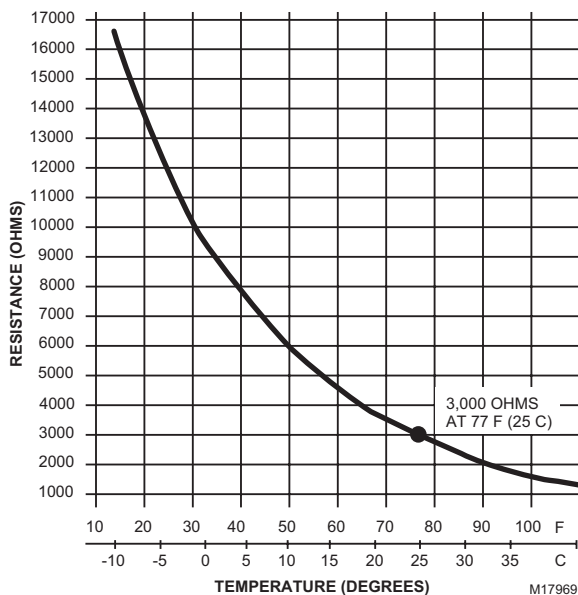


Fig. 7. C7046A,C Sensor resistance vs. temperature.

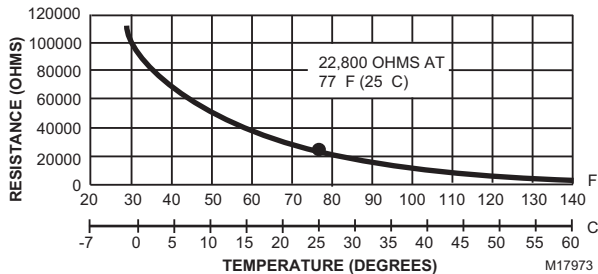


Fig. 8. C7046B Sensor resistance vs. temperature.

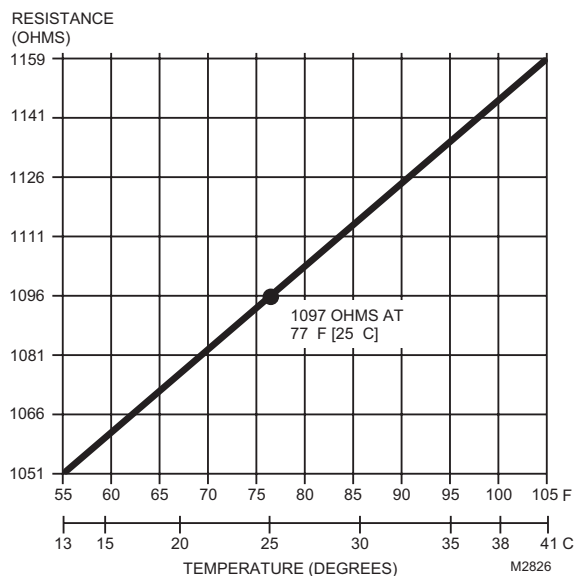


Fig. 9. C7046D Sensor resistance vs. temperature.





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