

# C7770A/C7776A/C7778A Air Temperature Sensor

## INSTALLATION INSTRUCTIONS

### OVERVIEW

The C7770A, C7776A, C7778A Air Temperature Sensors are direct wired temperature sensors that are used to sense discharge or return air in a duct.

The C7770A Sensors contain a temperature sensitive 20K ohm NTC nonlinearized thermistor and are compatible with the Excel 10 controller. The C7776As are 10 ohm NTC Type II sensors that are compatible with TB7600, TB7300, and TB7200 communicating thermostats. The C7778As are 10 ohm NTC Type III sensors that are compatible with WEBS-AX I/O modules.

### BEFORE INSTALLATION

All wiring must comply with local electrical codes and ordinances or as specified on installation wiring diagrams.

Air temperature sensor wiring can be sized from 14 to 22 AWG (2.0 to 0.34 mm<sup>2</sup>) depending on the application. The maximum length of wire from a device to a wall module is 1000 ft (305m). Twisted pair wire is recommended for wire runs longer than 100 ft (30.5m). Run sensor wiring separately from 50 VAC or greater power wiring to avoid electromagnetic interference.

### INSTALLATION



#### 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 a stainless steel sensor probe with an attached flange that can be mounted on a flat duct or plenum surface using the type of screws appropriate for the duct or plenum material. It can also be mounted in a standard utility conduit box, 2 by 4 in. (51 by 102 mm) using No. 8 (4 mm) screws, see Fig. 2.

### 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.

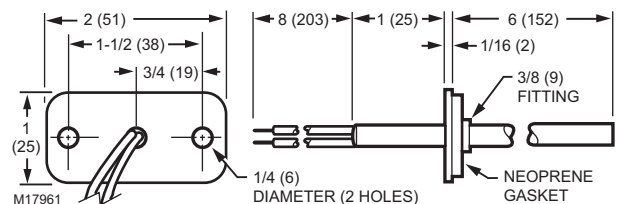
### Mounting

See Fig. 2 for mounting a sensor on a flat duct or plenum surface:

1. Cut a 3/8 in. (9.5 mm) hole in the duct or plenum surface at the desired location.
2. Insert the 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 the No. 8 (4 mm) mounting screws.
4. Fasten the sensor to the duct or plenum surface with two No. 8 (4 mm) sheet metal screws (not provided).

See Fig. 3 for mounting a sensor in a standard utility conduit box:

1. Cut a 3/8 in. (9.5 mm) hole in the duct or plenum surface at the desired location.
2. Remove the center knockout at the rear of the standard utility conduit box. Insert the sensing probe through the knockout with the flange flat against the box.
3. Using the flange as a template, mark and drill two holes in the standard utility conduit box and the duct or plenum surface for No. 8 (4 mm) mounting screws.
4. Insert the sensor probe through both the standard utility conduit box knockout and the hole drilled in the duct or plenum. Fasten the box and the sensor to the duct or plenum surface with two No. 8 (4 mm) mounting screws for sheet metal (not provided).



**Fig. 1. C7770A/C7776A/C7778A Air Temperature Sensor dimensions in in. (mm).**

#### NOTES:

1. Sensor probe diameter is 1/4 in. (6 mm) on all models.
2. 6 ft. plenum rated cable is standard on the C7770A1040, C7776A1040, C7778A1040.



## 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.

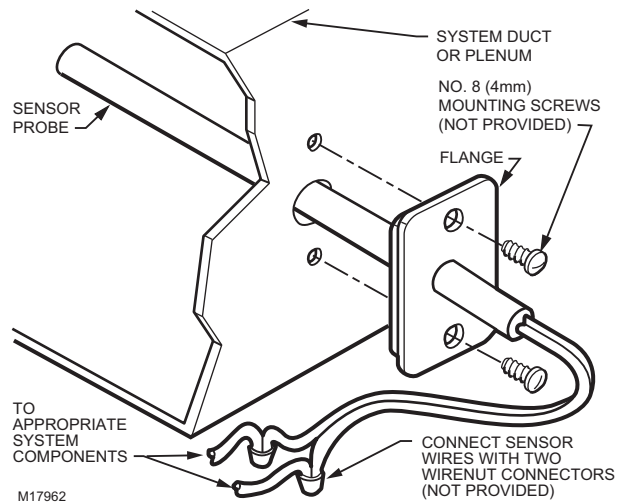
Shielded cable is required in installations where these guidelines cannot be met.

Ground shield only to grounded controller case.

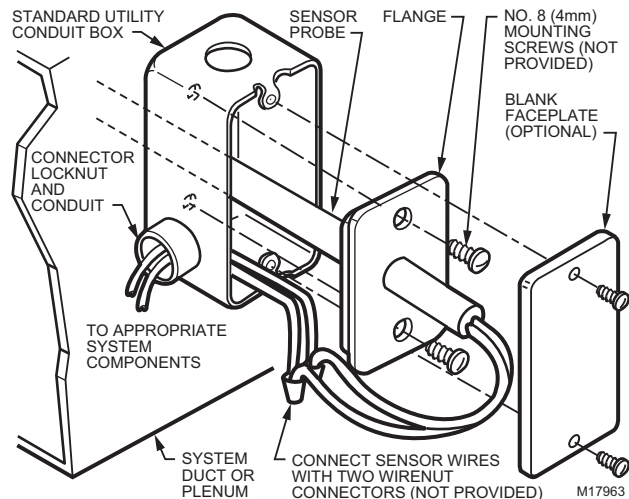
### IMPORTANT

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 the low voltage wiring from the sensor to the appropriate controller terminals using wirenut connectors (not provided) as shown in Fig. 2 and 3.



**Fig. 2. Mounting C7770A/C7776A/C7778A Air Temperature Sensor on duct or plenum.**



**Fig. 3. Mounting C7770A/C7776A/C7778A Air Temperature Sensor in a standard conduit box.**

## Automation and Control Solutions

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