



## TS3000 Series Remote Temperature Sensors



### Description

The TS3000 Series temperature sensors provide the remote temperature inputs for Superstat commercial programmable thermostats. Eight models are available for various applications, including:

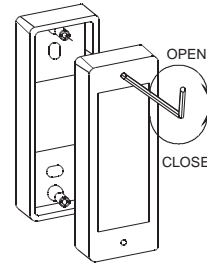
- Decorator or Security style space temperature
- Two-or three-sensor space temperature averaging
- Space temperature with manual occupancy button
- Discharge/Return air temperature
- Outside air temperature
- Mixed air temperature

Both wiring and operation are specifically configured to compliment the Superstat family of thermostats. The sensors are drift-free and linear over a wide temperature range.

### Mounting

#### DECORATOR STYLE

Mount the Decorator Style sensors directly to block or drywall. Open the sensor housing. Mount the back of the housing using mounting screws and bantam plugs included with the sensor. Attach the front of the housing to the back using the two allen screws and allen wrench included with the sensor. The mounting location should be on an interior wall which reflects the average room temperature, at a height of approximately five feet above the finished floor. Avoid unventilated locations and areas exposed to direct sunlight, unusual heat sources, windows and open doors.



#### SECURITY STYLE

Security Style sensors are mounted on standard 2" x 4" conduit boxes using the enclosed mounting screws. The mounting screws are installed using an allen wrench, which is included with the sensor. The mounting location should be on an interior wall which reflects the average room temperature, at a height of approximately five feet above the finished floor. Avoid unventilated locations and areas exposed to direct sunlight, unusual heat sources, open doors and windows.

#### DISCHARGE/RETURN STYLE

Discharge/Return Style sensors have a mounting plate as part of the sensor assembly. Drill a 1 1/4" hole in the duct at the desired location. Insert the probe end of the sensor into the ductwork and affix the sensor to the duct with two #10 sheet metal screws.

#### AVERAGING STYLE

Mount the Averaging Style element in a zigzag fashion across the air flow of the duct using the mounting clips provided with the sensor. Secure the end of the element with cable ties. Drill a 1 1/4" hole in the duct and mount the small conduit box enclosure. Insert the wiring end of the element through the protruding nylon fitting on the small conduit box.

## OUTSIDE STYLE

Outside Style sensors are designed to be installed on a threaded piece of 1/2" conduit. The sensing probe must point downward. The mounting location should be on northerly exposed walls, away from direct sunlight. This sensor should be properly sealed to prevent water and moisture from entering the enclosure.

## Wiring

These sensors come equipped with two or three wires. Only two wires are run from the sensor to the Superstat. For sensors with three wires, tie the red and white wires together. For the averaging style sensor, tie the two red wires together. Decorator style sensors come equipped with terminal blocks.

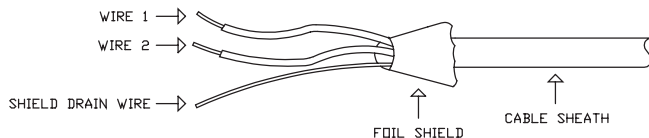
Use 18 AWG twisted shielded pair cable between the thermostat and the sensor. Route the cable at least 5' away from possible sources of interference (i.e. fluorescent light ballasts, magnetic contactors, neon lights, etc.).

Remove shield foil at terminations and splices. At splices, twist the shield drain wires together and tape off connection such that the shield drain wires are not exposed.

The shield drain wire at the thermostat should be cut off or twisted around the cable, and taped off.

The shield drain wire at the remote temperature sensor must be connected to a good earth ground. This may require a separate ground wire to be run. Ensure that the connection to the shield drain wire does not come in contact with anything except the earth ground.

Wire runs from thermostat to remote temperature sensor should not exceed 250'.



### TS3010 WIRING

The TS3010 is wired by connecting the two terminals labeled 'T' and 'T' to the two superstat terminals labeled 'T1' and 'T1'. The terminal labeled 'OVR' should be connected to the superstat terminal labeled 'OVR' and the terminal labeled 'GND' should be connected to the superstat terminal labeled '24-'. Shielded wire must be used for the sensor connection whether or not the other wires are shielded or not.

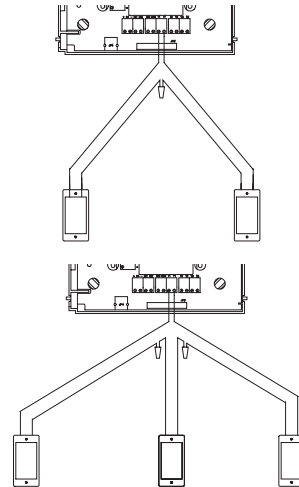
### TS3100 WIRING

The TS3100 is wired by connecting the two terminals labeled 'TB1' to the two superstat terminals labeled 'T1' and 'T1' in the subbase. The five terminals labeled 'TB2' should be connected to the five terminals in the superstat cover labeled 'TB20'. Terminal '1' is labeled on each

five position terminal block. Connect '1' to '1', '2' to '2', '3' to '3', '4' to '4' and '5' to '5'. Terminal '1' is the 'Warmer' button, terminal '2' is the 'Cooler' button, terminal '3' is the 'Override' button, terminal '4' is the 'Occupied LED' button and terminal '5' is the circuit 'Ground'. Shielded wire must be used for the sensor connection whether or not the other wires are shielded or not.

### TS3020 & TS3030 WIRING

The TS3020 and TS3030 are wired in a series. See the following two drawings.



## Checkout & Troubleshooting

Complete the following 5 steps before connecting remote sensor to thermostat or "taping off" drain wire:

1. At the thermostat, measure resistance at the two wires connected to the remote sensor. The resistance should correspond to the sensed temperature at the location of the remote sensor(s). See chart below.  
**Note:** For two or three sensor averaging, the sensors must be wired in series before this measurement is made. See wiring section.
2. Measure DC voltage across drain wire and both sensor lead wires. This should be 0 VDC.
3. Measure AC voltage across drain wire and both sensor lead wires. This should be 0 VAC.
4. If steps 1-3 check out OK, cut shield drain wire at the thermostat and tape off so that neither the shield nor shield drain wire are visible. Terminate the sensor wires at appropriate terminal block on the thermostat.
5. Make sure dip switches on the thermostat are set to accept (use) the remote sensor.

°F	Ω	°F	Ω	°F	Ω
-40	842.6	30	995.6	100	1146.8
-30	864.6	40	1017.4	110	1168.3
-20	886.5	50	1039.0	120	1189.7
-10	908.4	60	1060.7	130	1211.1
0	930.3	70	1082.3	140	1232.4
10	952.1	80	1103.8	150	1253.7
20	973.9	90	1125.4	160	1275.0