

## Series 2000 Electronic Temperature Sensors

DUCT, OUTDOOR, STRAP-ON & IMMERSION





### INSTALLATION INSTRUCTIONS

### APPLICATIONS & SELECTION

The Series 2000 electronic temperature sensors offer a full range of temperature sensors for outdoor, immersion, duct, pipe, and wall temperature sensing.

For more information on Honeywell's complete sensor offering download the Sensors Product Overview brochure (63-9285) from [customer.honeywell.com](http://customer.honeywell.com).

**Table 1. Electronic Sensor Application Guide.**

	Model	Application	Output	Element Insertion Length
	C7021F	Outdoor	10K ohms NTC @ 77 F Type II	—
	C7023F	Outdoor	10K ohms NTC @ 77 F Type III	—
	C7031G	Outdoor	3484 ohms @ 77 F	—
	C7041F	Outdoor	20 K ohms NTC @ 77 F	—
	T775-SENS-OAT	Outdoor	1097 ohms @ 77 F	—
	C7021D	Immersion	10K ohms NTC @ 77 F Type II	5 in. (127 mm)
	C7023D	Immersion	10K ohms NTC @ 77 F Type III	5 in. (127 mm)
	C7031D	Immersion	1097 ohms @ 77 F	5 in. (127 mm)
	C7041D	Immersion	20 K ohms NTC @ 77 F	5 in. (127 mm)
	C7021B	Duct	10K ohms NTC @ 77 F Type II	6 in. (152) or 12 in. (305 mm)
	C7023B	Duct	10K ohms NTC @ 77 F Type III	6 in. (152) or 12 in. (305 mm)
	C7041B	Duct	20 K ohms NTC @ 77 F	6 in. (152) or 12 in. (305 mm)
	C7021C	Duct	10K ohms NTC @ 77 F Type II	18 in. (457 mm)
	C7023C	Duct	10K ohms NTC @ 77 F Type III	18 in. (457 mm)
	C7041C	Duct	20 K ohms NTC @ 77 F	18 in. (457 mm)
	T775-SENS-STRAP	Strap-On	1097 ohms @ 77 F	—
	C7021K	Strap-On	10K ohms NTC @ 77 F Type II	—
	C7023K	Strap-On	10K ohms NTC @ 77 F Type III	—
	C7041K	Strap-On	20 K ohms NTC @ 77 F	—
	T775-SENS-STRAP	Strap-On	1097 ohms @ 77 F	—



# 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.

## Mounting

The mounting method depends on the particular sensor application. The following procedures include:

- duct applications
- immersion well applications
- strap-on applications

NOTE: Also refer to the instructions for the electronic control.

## Duct Mounting (C7021B/C, C7023B/C, C7041B/C)

### IMPORTANT

Select a spot for the sensor that will expose it to average duct air temperature. Avoid locations where stratification can cause sensing errors.

1. Cut a hole in the duct just large enough to accept the sensing element.
2. Use the sensor's case to mark locations of pilot holes for the mounting screws.
3. Drill pilot holes and fasten the sensor to the duct.

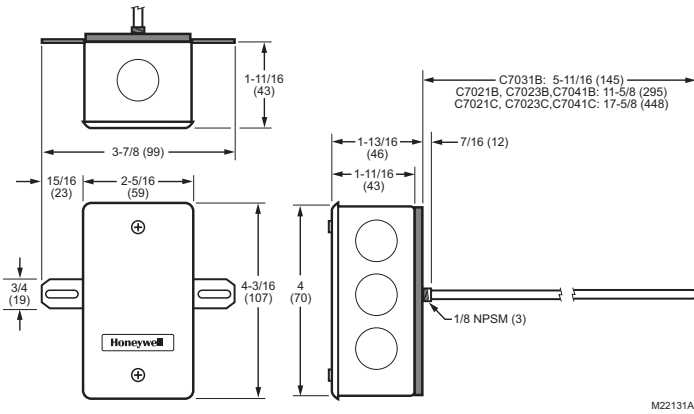


Fig. 1. C7021B/C, C7023B/C, C7041B/C Dimensions in in. (mm).

## Outdoor Mounting (C7021F, C7023F, C7031G, C7041F; T775-SENS-OAT)

The C7021F, C7023F, C7031G, C7041F, and T775-SENS-OAT outdoor air temperature sensors have a weather-proof enclosure. Mount the sensor where it can sense average outdoor air temperature. All mounting hardware is provided with the sensor. Be sure to mount the sensor out of direct sunlight with the sensor probe point down. Normally, the north side of a building provides a suitable location.

NOTE: C7021F, C7023F, C7031G, C7041F, and T775-SENS-OAT are weatherproof for outdoor use. Knockouts allow for 1/2 in. conduit connection.

1. Remove and set aside the wiring box cover.
2. Mount the sensor to a standard 1/2 in. conduit.

NOTE: Mount sensor so that the element points down.

3. Make wiring connections using two wire nuts.
4. Reattach the wiring box cover.

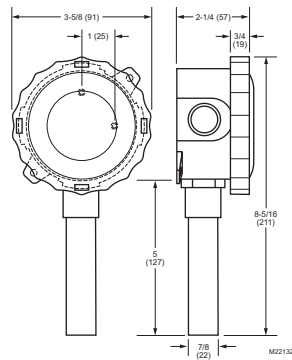


Fig. 2. C7021F, C7023F, C7031G, C7041F, T775-SENS-OAT Dimensions in in. (mm).

### Immersion Well Mounting (C7021D, C7031D, C7031D, C7041D)

NOTE: The C7021D, C7023D, C7041D uses the 50001774-001 Well Assembly. See Fig. 5 for dimensions.

The C7031D Sensor includes an immersion well. The C7021D, C7023D, C7041D Sensors do not include a well; order the well as an accessory (part no.: 50001774-001).

When used on a boiler, follow the manufacturer instructions for location. If a tapped hole is not provided for the immersion well, provide one as follows:

1. Drain boiler and drill a 23/32 in. (18 mm) hole at the selected location.
2. Cut threads in the hole with a 1/2 in. (13 mm) by 14 NPT tap.

In other installations, mount the immersion well in an elbow with a heel outlet as shown in Fig. 3.

1. Drain the system, if you have not already done it, and open the tapped hole.
2. Put pipe joint compound on the threads of the immersion well and screw it into the tapped hole or elbow, tightening it securely.
3. Refill the system and check for leaks.

Mount the C7021D, C7023D, C7031D/C7041D into the well:

NOTE: Mounting using previously installed Honeywell wells (part no.: 32005960-001) requires an adapter (part no.: 50001775-001).

1. When an adapter is required, first thread it into the well no more than one or two turns.
2. Slide the sensor into the well.
3. Rotate the sensor to thread it tightly into the adapter and the adapter tightly into the well.

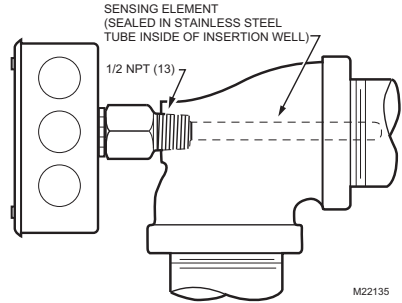


Fig. 3. Mounting the C7021D, C7023D, C7031D, C7041D Sensor.

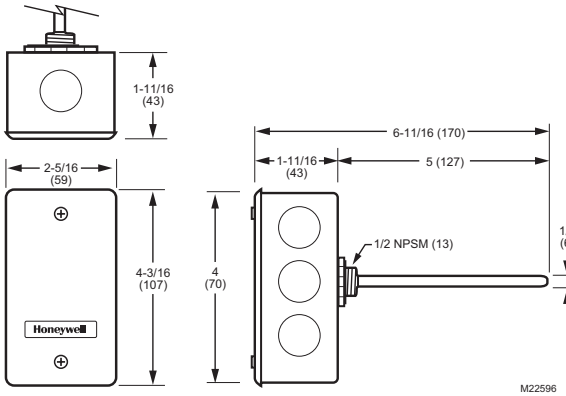


Fig. 4. C7021D, C7023D, C7031D, C7041D Dimensions in in. (mm).

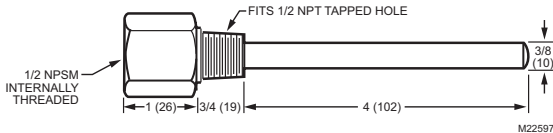
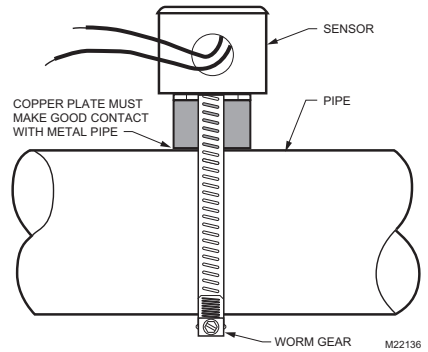


Fig. 5. 50001774-001 Immersion Well Dimensions in in. (mm).

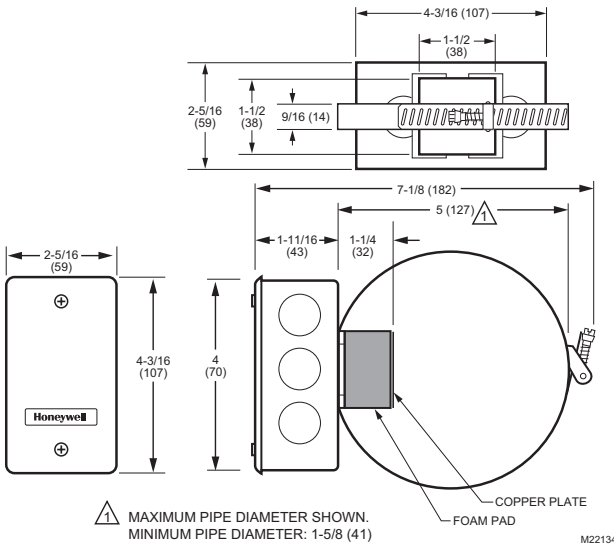
**Strap-on Mounting (C7021K, C7023K, C7041K, T775-SENS-STRAP)**

The C7021K, C7023K, C7041K and T775-SENS-STRAP Sensor mounts on metal pipes from 1-5/8 inch to 5 inches in diameter using the straps supplied. Clean the pipe surface where the sensor makes contact before mounting. If necessary, remove pipe insulation at the installation point. Thermal compound is recommended. Locate the sensor on the discharge pipe within 3 ft. (0.9 m) of the boiler. See Fig. 6.

NOTE: Insulation around the contact area increases sensor accuracy.



**Fig. 6. Strap-on Mounting of Sensor.**



**Fig. 7. C7021K, C7023K, C7041K, T775-SENS-STRAP Strap-on Dimensions in in. (mm).**