Honeywell

C7041B,C,D,F,J,K Electronic Temperature Sensors

PRODUCT DATA



APPLICATION

The C7041 Electronic Temperature Sensors are designed to be used with electronic controllers in domestic or commercial heating and cooling systems.

FEATURES

- C7041B,C,J sense duct air temperature.
- C7041D,K sense water temperature.
- C7041F senses outdoor air temperature.
- C7041K with strap-on mounting senses water temperature.
- C7041J senses average duct air temperature.
- Solid state components not affected by dust or dirt.
- C7041F is weatherproof for outdoor use and connects directly to 1/2 in. externally-threaded conduit.

SPECIFICATIONS

Models: Use C7041 Temperature Sensors with Excel 10, 15, 80, 100, and 500 controllers. See Table 1 for specifications.

Dimensions: See Fig. 2 through 5.

Element Operating Range: -40° to 250°F (-40° to 121°C).

Element Maximum Ambient Temperature: 302°F (150°C).

Sensor Resistance (ohms) at 77°F (25°C): 20,000.

Sensor Response: NTC non-linear. See form 63-7074 for 20K ohm nominal resistance output in table form.

Sensor Accuracy:

From 32° to 158°F (0° to 70°C): ±0.36°F (±0.2K).

Accessories:

32005960-001 Well Assembly: Used with C7041D.

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Model	Control Application	Element Insertion Length in in. (mm)	Weight in oz (kg)	Dimensions (Fig.)
C7041B	Duct discharge air	6 (152) or 12 (305)	9 (0.26)	2
C7041C	Duct discharge air	18 (457)	-	
C7041D	Hot or chilled water (order immersion well separately)	4 (102)	14 (0.40)	1
C7041F	Outdoor air	—	9 (0.26)	3
C7041J	Duct discharge air (averaging sensor with 4 elements)	150 (3810)	12 (0.34)	4
C7041K	Hot water (strap-on mounting)	а	13 (0.37)	5

Table 1. Electronic Primary Sensor Application Guide.

^a Strap-on model not equipped with well; temperature sensed at surface of pipe.



Fig. 1. C7041D dimensions in in. (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.



Fig. 2. C7041B,C dimensions in in. (mm).



Fig. 3. C7041F dimensions in in. (mm).



Fig. 4. C7041J dimensions in in. (mm).



Fig. 5. C7041K 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.

Electrical Shock or Equipment Damage Hazard. Can shock individuals or short equipment circuitry.

Disconnect power supply before installation.

Mounting

The method of mounting depends on the particular application of the C7041 Temperature Sensor. The following procedures include outdoor, duct, immersion well and strap-on applications. Also refer to the instructions for the electronic control.

Outdoor Mounting

The C7041F senses outdoor air temperature. Mount this control where it can sense average outdoor air temperature. Normally, the north side of a building provides a suitable location.

- NOTE: The C7041F is weatherproof for outdoor use and connects directly to 1/2 in. externally-threaded conduit.
 - 1. Remove and set aside the two screws from the case.
 - 2. Set aside the sunshield and gasket.
 - 3. Thread the sensor onto standard 1/2 in. conduit.

NOTE: Mount sensor so that the element points down.

- 4. Make wiring connections to the screw terminal block.
- 5. Reattach the gasket and sunshield to the case.

Duct Mounting

The C7041B,C,J can be mounted in a duct to sense air temperature.

IMPORTANT

Select a spot for the C7041 where it will be exposed to average duct air temperature. Avoid locations where stratification can cause sensing errors.

C7041B,C MOUNTING

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

C7041J MOUNTING



Fig. 6. Duct cross section showing method of installing C7041J Averaging Electronic Sensor.

- 1. Install two supports inside the duct to hold the averaging element.
- **2.** Cut a 7/8 in. (22 mm) hole in the side of the duct to insert the averaging element.
- 3. Fasten the terminal box to the outside of the duct and thread the element through the hole and into the duct.
- **4.** Use plastic wire ties to fasten the element to supports. Seal the hole around the element with a rubber grommet.
- 5. Secure the end of the element to the duct on the support to prevent continuous flexing or abrasion.

IMPORTANT

To assure that the C7041J senses the average duct temperature, position the temperature sensitivity elements approximately as shown in Fig. 6. Do not allow the sensing elements to touch or be close to the sides of the duct.

NOTE: When the C7041J is used as a deck sensor in a multizone system, be sure to space the elements equally in the duct midstream as shown in Fig. 7.

Install one C7041J Sensor just upstream from the cold deck zone dampers and the other C7041J Sensor upstream from the hot deck zone dampers. Position the thermistors to sense the average deck temperature.



Fig. 7. Duct cross section showing method of installing C7041J Sensor in a multizone system.

Immersion Well Mounting

The C7041D Sensor is not supplied with an immersion well. For the C7041D Sensors, wells (part no.: 32005960-001) can be ordered as an accessory.

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. 8.

- 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.

Equipment Damage Hazard Attach the well adapter to the well independent of the sensor.

If the sensor is forced into the well with the adapter tightened to the sensor probe, the adapter will not thread smoothly. This can damage the well and/or adapter threads.

Mount the C7041D to the well:

- 1. Thread the well adapter into the well and hand tighten.
 - NOTE: The well adapter and set screw are included, but packaged in a plastic bag separate from the sensor.
- 2. Slide the sensor into the well.
- 3. Orient the sensor:
 - a. Push and turn the sensor onto the well adapter.
 - b. The sensor seats into one of four pre-cut adapter detents.
- 4. Tighten the set screw.



Fig. 8. Method of mounting C7041D Sensor.

Strap-On Mounting

Strap-on mounting is well-suited for retrofit applications where installation costs can be reduced by not draining the system. The C7041K Sensor mounts on metal pipes from one inch to four inches in diameter using the straps supplied. Clean the surface of the pipe where the sensor makes contact before mounting (remove insulation from the pipe at the point of installation if necessary). Thermal compound is recommended with the strap-on C7041K Sensor. The time constant with the compound is 30 seconds; without the compound, the time constant is two minutes. Locate the sensor on the discharge pipe within 3 feet (0.9m) of the boiler. See Fig. 9.



Fig. 9. Strap-on mounting of C7041K Sensor.

Wiring

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.



Electrical Shock or Equipment Damage Hazard. Can shock individuals or short equipment circuitry.

Disconnect power supply before installation.

IMPORTANT

- 1. All wiring must agree with applicable codes, ordinances and regulations.
- 2. Do not mount sensor in incorrect environment.
- Wire according to the applicable controller instructions.

OPERATION AND CHECKOUT

Operation

The C7041 Temperature Sensors are designed for use with XL500, XL100, XL50, XL15, XL10, and Honeywell LCBS Controllers or any controller requiring 20K ohm NTC non-linear input. As the temperature at the C7041 Sensor increases, the resistance of the sensor decreases, causing the controller to operate and offset the temperature change.

Checkout

Refer to the applicable controller instructions when checking out the complete heating and cooling systems.

To check out the sensors, move the thermostat or remote setpoint potentiometer below the temperature of the cooling or heating medium. Watch the motor, valve or damper for the correct movement.

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