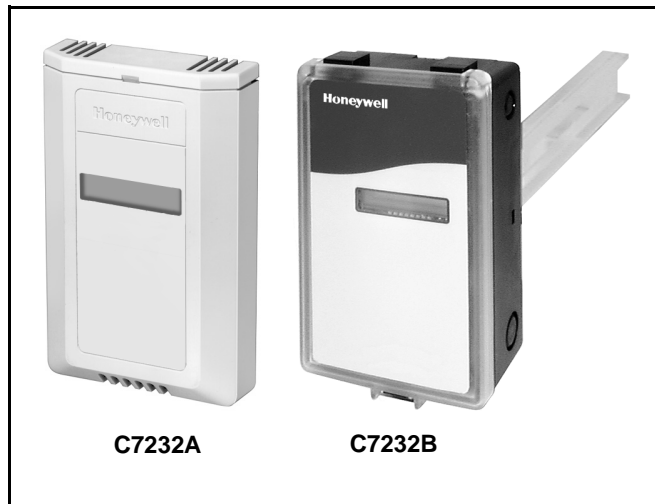


C7232A,B Sensor and Controller CARBON DIOXIDE SENSOR

PRODUCT DATA



C7232A

C7232B

FEATURES

- Models available with LCD that provides sensor readings and status information.
- Non-Dispersion-Infrared (NDIR) technology used to measure carbon dioxide gas.
- Gold-plated sensor provides long-term calibration stability.
- Device provides voltage output based on CO₂ levels.
- Models available with SPST relay output.
- Used for CO₂ based ventilation control.
- Automatic Background Calibration (ABC) algorithm based on long-term evaluation reduces required typical zero-drift check maintenance.

APPLICATION

The C7232 Sensor and Controller is a stand-alone carbon dioxide (CO₂) sensor for use in determining ventilation necessity with HVAC controllers. The C7232 measures the CO₂ concentration in the ventilated space or duct. The C7232 is used in ventilation and air conditioning systems to control the amount of fresh outdoor air supplied to maintain acceptable levels of CO₂ in the space.

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SPECIFICATIONS

Models: C7232 Sensor and Controller. A stand-alone carbon dioxide (CO₂) sensor with two jumper-adjustable outputs (one analog and one spst relay).

C7232A: Wall mount model.

C7232B: Duct mount model.

NOTE: Models are available with or without a 4-digit LCD that indicates the current CO₂ concentration.

Dimensions:

C7232A: See Fig. 1.

C7232B: See Fig. 2.

Sensor Performance Ratings:

Response Time: 2 min.

Carbon Dioxide Sensor:

Operation: Non-dispersive infrared (NDIR).

Sampling: Diffusion.

Range: 0 to 3000 ppm $\pm 5\%$ and ± 50 ppm.

Annual Drift: 20 ppm (nominal).

Calibration Interval: Five years.

Electrical Ratings:

Power Supply: 24 Vac $\pm 20\%$, 50/60 Hz (Class 2).

Maximum Power Consumption: 3W.

Peak Current (at 20 ms): 600 mA.

Relay:

Configuration: Shipped N.O. (configureable with software.)

Contact Rating: 1A at 50 Vac/24 Vdc.

Minimum Permissible Load: 1 mA at 5 Vdc.

Linear Analog Output:

Voltage: 0/2-10 Vdc (resistive load greater than 5000 ohms).

Current: 0/4-20 mA (resistive load less than 500 ohms).

Outputs (Jumper Adjustable, see Table 1):

Analog: 0-10 Vdc (Default: 2-10 Vdc, 500 to 1500 ppm).

Relay: Normally Open Spst (Default: Close at 1000 ppm).

Ambient Ratings:

Temperature:

Operating: +32°F to +122°F (0°C to +50°C).

Storage: -4°F to +158°F (-20°C to +70°C).

Relative Humidity (non-condensing): 0 to 95 percent.

CO₂ Pressure Dependence: 1.4% change in reading per 1 kPa deviation from 100 kPa.

Connections:

Wiring:

C7232A: 20-gauge cable with six 8 in. leadwires.

C7232B: 20-gauge cable with six 6 in. leadwires.

Mounting:

C7232A: Vertical surface with standard single-gang junction box.

C7232B: Sheet metal duct with a sampling tube.

Automatic Background Calibration (ABC) default: On.

Approvals:

Underwriters Laboratories Inc. Component Recognition:

UL94-5V, File No. E191465.

CE.

C7232A: NEMA1.

C7232B: NEMA3.

Accessories:

32002181-001: Zero Calibration and Service Kit.

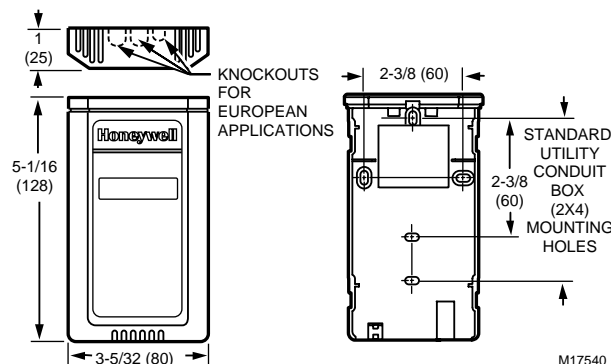


Fig. 1. C7232A dimensions in in. (mm).

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 Home and Building Control Sales Office (check white pages of your phone directory).
2. Home and Building Control Customer Logistics
Honeywell Inc., 1885 Douglas Drive North
Minneapolis, Minnesota 55422-4386 (612) 951-1000

In Canada—Honeywell Limited/Honeywell Limitée, 155 Gordon Baker Road, North York, Ontario M2H 3N7.

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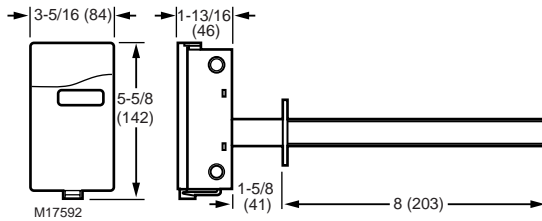


Fig. 2. C7232B dimensions in in. (mm).

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.

IMPORTANT

All wiring must agree with applicable codes, ordinances and regulations.



CAUTION

Health Hazard.

Improper use can create dangerous situations.

Use in application for sensing carbon dioxide only. For life-safety applications, this device can function only as a secondary or lesser device.



CAUTION

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

Disconnect power supply before installation.



CAUTION

Equipment Damage Hazard.

Electrostatic discharge can short equipment circuitry.

Ensure that you are properly grounded before handling the unit.

C7232A Cover Removal/Replacement

C7232A Cover Removal (see Fig. 3)

1. Remove button head socket cap screw and set it aside.
2. Insert the head of a small screwdriver into the slot at the center and near the top of the cover.
3. Gently pull the handle down toward the bottom of the device until a small gap between the subbase and the cover appears.
4. Remove the screwdriver and pull the cover straight down until it meets a stop.
5. Pull the cover straight off the subbase.

C7232A Cover Replacement

1. Feed the wires through the opening in the subbase.
2. Place the cover, with a small gap at the top, flat on top of the subbase.
3. When the cover rests flat on the subbase, slide it straight up until it latches in place.

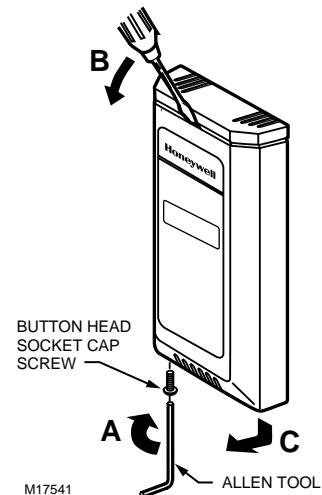


Fig. 3. C7232A cover removal.

Location and Mounting

C7232 Sensors mount directly on the wall, sheet metal duct, or a panel. When planning the installation, allow enough clearance for maintenance and service. Mount the sensor in a well-ventilated area.

NOTES: Do not install the sensor where it can be affected by:

- drafts or dead spots behind doors and in corners.
- air from ducts.

Wall Mounting

The C7232 Wall Mount models can be mounted using two or four screws:

1. Remove C7232 cover.
2. Mount the subbase to the wall using washers and two or four screws (not supplied) appropriate for the wall material.

NOTE: When mounting on a junction box, see Fig. 4.

3. Replace the cover.

Duct Mounting (see Fig. 5)

1. Place gasket on aspiration tube.

IMPORTANT

Ensure largest tab at tube control end is at the top.

2. Insert tube into duct; attach using screws and washers.

IMPORTANT

Leakage into the duct or the C7232 box cover from the room will skew the sensor readings. Ensure the box cover and duct seal completely.

3. Place o-ring on tube end; mount the control to the tube.

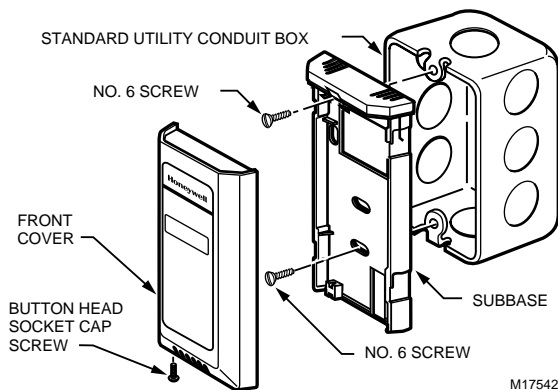


Fig. 4. Junction box mounting (C7232A).

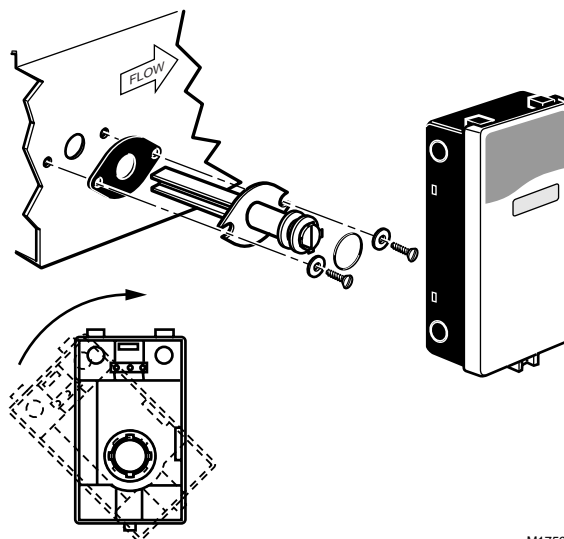


Fig. 5. Duct mounting (C7232B).

WIRING

The factory ships the device with the output default settings shown in Tables 1 and 2. Set the jumpers and wire the device (see Table 3 and Fig. 6).



CAUTION

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



CAUTION

Equipment Damage Hazard.
Electrostatic Discharge Can Short Equipment Circuitry.
Ensure that you are properly grounded before handling the unit.

IMPORTANT

1. All low voltage connections to this device must be 24 Vac Class 2.
2. All wiring must comply with applicable local codes, ordinances and regulations.

Table 1. CO₂ Range Jumper Settings

Jumper	Setting	Jumper SW1		Jumper SW2	
		On ^a	Off	On ^a	Off
OUT1 ^b	AN1	X	— ^c	0 to 1000	0 to 2000
	AN2 ^a	X	— ^c	500 to 1500	500 to 2000
Relay Switching ^b		X		800 ^d	1200 ^d
			X	1000 ^d	

^a Setting when shipped from the factory.

^b OUT1 jumper setting does not affect the Relay Switching.

^c The analog output will not work properly when SW1 is Off.

^d When the level reaches this value, the contacts close; when the level drops 100 ppm below this value, the contacts open.

Table 2. Output Signal Jumper Settings.

AN1 and AN2 ^a	OUT	
	0-100%	20-100% ^b
Voltage ^b	0-10 Vdc	2-10 Vdc
Current	0-20 mA	4-20 mA

^a Set jumpers AN1 and AN2 with the same setting.

^b Setting when shipped from the factory.

NOTE: The high and low values of the CO₂ range are not affected by the output signal range.

Table 3. C7232 Wiring Connections (see Fig. 6).

Wire Color	Designation	Function
Red	G+	24 Vac Hot
Black	G0	24 Vac Common
Yellow	OUT1	Analog Output Signal
Brown	M	Analog Output Common
Orange	NO	Relay Output Normally Open
Green	COM	Relay Output Common

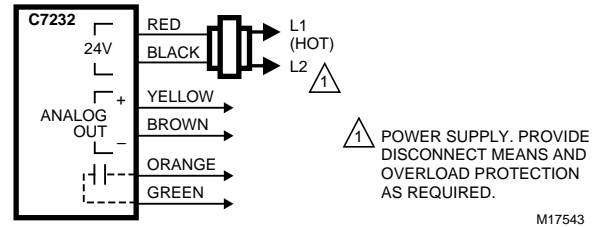


Fig. 6. Wiring the C7232.

CALIBRATION

To calibrate the sensor:

1. Using the 32002181-001 Calibration Kit, eliminate the CO₂ gas.

IMPORTANT

Any CO₂ present during calibration skews the sensor zero level resulting in incorrect CO₂ level reports.

2. Once the sensor stabilizes, use a screwdriver to connect the two MENU soldering pads.
3. The display should indicate CAL.
4. Execute the zero calibration by connecting the two ENTER soldering pads.
5. The display should return to providing the measured CO₂ level.

CHECKOUT

Perform a quick test of the unit with the unit powered:

1. Stand close to the unit and breathe air into the sensor.
2. Check the CO₂ level registered by the controller to ensure a strong rise.
3. When connected to a damper in a ventilation system, the controller typically signals an increase in air flow.

Home and Building Control

Honeywell Inc.
Honeywell Plaza
P.O. Box 524
Minneapolis, MN 55408-0524

Honeywell Latin American Region

480 Sawgrass Corporate Parkway
Suite 200
Sunrise FL 33325

Home and Building Control

Honeywell Limited-Honeywell Limitée
155 Gordon Baker Road
North York, Ontario
M2H 3N7

Honeywell Europe S.A.

3 Avenue du Bourget
1140 Brussels
Belgium

Honeywell Asia Pacific Inc.

Room 3213-3225
Sun Hung Kai Centre
No. 30 Harbour Road
Wanchai
Hong Kong

Honeywell