Honeywell

C7632A,B
Sensor and Controller
CARBON DIOXIDE SENSOR

C7632B

C7632A

FEATURES

• **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 CO$_2$ levels.**

• **Used for CO$_2$ based ventilation control.**

• **Automatic Background Calibration (ABC) algorithm based on long-term evaluation reduces required typical zero-drift check maintenance.**

• **Fixed 0 to 10 Vdc from 0 to 2000 ppm. No adjustments are necessary.**

• **Compatible with Honeywell Excel 10, 15, 5000, and any controller requiring 0-10 Vdc input.**

APPLICATION

The C7632 Sensor and Controller is a stand-alone carbon dioxide (CO$_2$) sensor for use in determining ventilation necessity with heating ventilation and air conditioning (HVAC) controllers. The C7632 measures the CO$_2$ concentration in the ventilated space or duct. The C7632 is used in HVAC systems to control the amount of fresh outdoor air supplied to maintain acceptable levels of CO$_2$ in the space.

SPECIFICATIONS

Models: C7632 Sensor and Controller. A stand-alone carbon dioxide (CO$_2$) sensor with one 0-10 Vdc analog output.
C7632A: Wall mount model.
C7632B: Duct mount model.

Dimensions:
C7632A: See Fig. 1.
C7632B: See Fig. 2.

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.

Automatic Background Calibration (ABC) default: On.

Electrical Ratings:
Power Supply: 24 Vac ±20%, 50/60 Hz (Class 2).
Maximum Power Consumption:
    Average: 1W.
    Peak: 2W.
Peak Current (at 20 ms): 300 mA.
Linear Analog Output: 0-10 Vdc.

Mounting:
C7632A: Vertical surface with standard single-gang junction box.
C7632B: Sheet metal duct with a sampling tube.

CO$_2$ Pressure Dependence: 1.6% change in reading per 1 kPa deviation from 100 kPa.

CE

Output: Analog: 0-10 Vdc, 0-2000 ppm (fixed).

Sensor Performance Ratings:
Response Time: 2 min.
Carbon Dioxide Sensor:
    Operation: Non-dispersive infrared (NDIR).
    Sampling: Diffusion.
    Range: 0 to 2000 ppm (fixed).
    Annual Drift: ±10 ppm (nominal).
    Accuracy: ±(30 ppm+2%) at normal temperature/pressure.

Wiring Connections:
C7632A: Terminal block.
C7632B: 20-gauge cable with three 6 in. leadwires.

Approvals:
CE.
Underwriters Laboratories Inc. Listed, File No. E4436.
cUL.
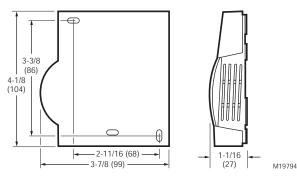C7632B: Flammability Rating, UL94-5V.
C7632A: NEMA1.
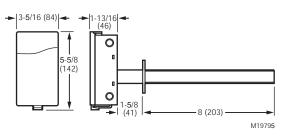C7632B: NEMA3.

Fig. 1. C7632A dimensions in in. (mm).

Fig. 2. C7632B 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.

C7632A Cover Removal/Replacement
The cover of the C7632A is fixed by a latch on the underside of the unit.

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.

C7632A Cover Removal (see Fig. 3)

1. Unless the device is mounted, hold the base using the wiring hole and/or the perforated vent.
2. Depress the tab on the underside of the device.
3. Swing the cover away from the base.
4. Lift cover from base.

C7632A Cover Replacement

1. Place top cover tab over the ridge along the base top.
2. Swing the cover down.
3. Press the lower edge of the case to latch.

Location and Mounting

C7632 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.

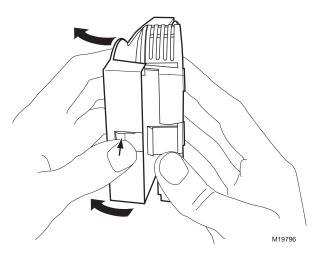**Fig. 3. C7632A cover removal.**

Wall Mounting (C7232A)

Mount the C7232A to the wall as follows:

1. Remove the C7632 cover.
2. Mount the device in a vertical position.
3. Mount the subbase directly on a wall using the type of screws (not supplied) appropriate for the wall material.
4. Replace the cover.

Junction Box Mounting (Fig. 4)

Mount the C7232A to a junction box as follows:

1. Attach the wallplate using only the top screw.
2. Remove the C7632 cover.
3. Place the subbase on the wallplate hook.
4. Mount the subbase and wallplate to the junction box using the lower screw.
5. 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 C7632 box cover from the room will skew the sensor readings. Ensure the box cover and duct seal completely.*

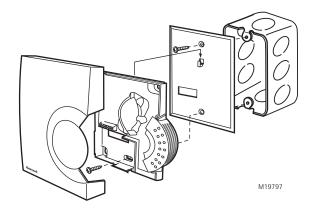3. Place o-ring on tube end; mount the control to the tube.
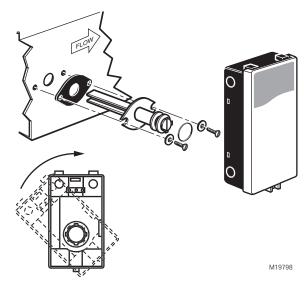

Fig. 4. Junction box mounting (C7632A).

Fig. 5. Duct mounting (C7632B).

WIRING (FIG. 6)

⚠ CAUTION

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

⚠ CAUTION

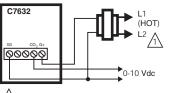**Equipment Damage Hazard. Electrostatic Discharge Can Short Equipment Circuitry.**
Ensure that you are properly grounded before handling the unit.
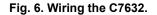
IMPORTANT
  1. *All low voltage connections to this device must be 24 Vac Class 2.*
  2. *All wiring must comply with applicable local codes, ordinances and regulations.*

Table 1. C7632 Wiring Connections (see Fig. 6).

Designation	C7632B Wire Color	Function
G+	Red	24 Vac
G0	Black	Common
CO_2	Brown	Analog Output Signal

$\triangle{1}$ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

M19799

Fig. 6. Wiring the C7632.

Output (Table 2)

Table 2. 0-10 Vdc Output Signal.

CO2 Level (ppm)	0	200	400	600	800	1000	1200	1400	1600	1800	2000
Voltage Output (Vdc)	0	1	2	3	4	5	6	7	8	9	10

CALIBRATION

Typically, calibration is unnecessary. No calibration kits are available. However, if CO_2 levels can be brought to a desirable level, the sensor can be reset using either zero or background calibration:

IMPORTANT
  • *With zero calibration, all CO_2 present during calibration skews the sensor zero level.*
  • *Using background calibration, practical operation (with a higher than zero level set) can be obtained.*

Zero Calibration

  1. Remove the sensor cover and set it aside.
  2. Apply a steady flow of CO_2-free gas at 0.1 to 0.5 liter per minute into the gas inlet tube located on the gold sensor.

  3. Execute calibration by shorting the proper two soldering pads (see Fig. 7).

     NOTE: The device should now provide accurate output.

  4. Check the output signal. (See Checkout section.)
  5. Reinstall the device.

Background Calibration

  1. Remove the sensor cover and set it aside.
  2. Ventilate the area and reduce occupancy to lower the CO_2 levels.
  3. Maintain a reasonable proximity from the sensor to avoid breathing on it, thus skewing calibration accuracy.
  4. Keep the sensor in this environment for three to four minutes.
  5. Execute calibration by shorting the proper two soldering pads (see Fig. 7).

     NOTE: The device should now provide accurate output.

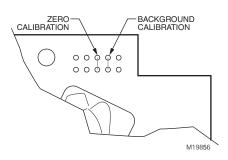 6. Check the output signal. (See Checkout section.)
  7. Reinstall the device.

Fig. 7. C7632 calibration pads.

CHECKOUT

Perform a quick test of the unit with the unit powered:
  1. After calibration:
     a. Check output signal immediately following proper calibration (with minimum environmental change):
        (1) Proper zero calibration: 0 Vdc.
        (2) Typical background calibration: 2 Vdc. Depending on ambient CO_2 level, range: 1.75 to 2.5 Vdc.
     b. If the output is incorrect, repeat calibration procedure.
     c. Otherwise, continue with checkout.
  2. Stand close to the unit and breathe air into the sensor.

     NOTE: When connected to a damper in a ventilation system, breathing on the sensor typically signals an increase in air flow.

  3. Check the output to ensure a strong rise in CO_2 level.

Honeywell

Printed in U.S.A. on recycled paper containing at least 10% post-consumer paper fibers.