Honeywell

C7110A1010

ROOM AIR QUALITY SENSOR

SPECIFICATION DATA & INSTALLATION INSTRUCTIONS

GENERAL

The C7110A1010 Room Air Quality Sensor is suitable for measuring air quality in rooms, offices, and production bays.

This mixed gas sensor can be used to control ventilation plants. It detects unpleasant odors, tobacco smoke, and vapors emitted by such materials as furniture, carpets, paint, glue, etc. As proven in practice, this device detects those substances typically present in air having a poor quality, some of which may otherwise go undetected by room occupants, themselves. This sensor has proven itself in numerous applications over many years.

NOTE: The mixed gas sensor does not measure or indicate the concentration of individual gases, and thus cannot be used for the monitoring or control of specific substances.

Models

order no.	description	output signal
C7110A1010	Room Air Quality Sensor	0...10 Vdc

FEATURES

- **Measurement of a variety of air quality factors**
- **Output signal: 0...10 Vdc, indicated by yellow status LED on front cover**
- **Trimming potentiometer to adjust output signal**
- **Easy installation and wiring connection**

SPECIFICATION

Supply voltage	15...30 Vdc / 24 Vac (+/-20%)
Power consumption	< 1 W
Output signal	0...10 Vdc (increases as air quality worsens); adjustable via trimming potentiometer
Min. impedance of load	5 kOhm (at output)
Weight /Dimensions	approx. 125 g / see page 3
Electrical connection	Screw terminal block for conductors up to 1.5 mm²
Air Quality Sensor	
Sensitivity/Linearity	see Fig. 1 on page 2
Dynamic behavior	see Fig. 6 on page 4
Ambient Limits	
Transport/storage temp.	-30...+60 °C (-22...+140 °F)
Operating temperature	0...+50 °C (+32...+122 °F)
Humidity	5...95%rh, non-condensing
Safety	
Protection class	III as per EN60730-1
Protection standard	IP30 as per EN60529
Flame retardant	Plastic ABS, V0 as per UL94
EMC environments	residential, commercial, light industrial, and industrial

CE

FUNCTION

The device contains a heated tin dioxide semiconductor sensor, the electrical conductivity of which varies in proportion to the concentration of reducing agents in the ambient air. This leads to a voltage at the measuring element which is amplified to an output voltage of 0 to 10 Vdc.

The following particles and gases can be detected: cigarette smoke, hydrogen, carbon monoxide, ethanol, ammonia, etc.

In contrast to CO_2 sensors, which selectively measure the concentration of only one type of gas, the C7110A1010 is a mixed gas sensor and as such functions as a broadband detector, i.e. the sensor signal does not indicate the type of gas or its concentration in ppm (parts per million). The complex and constantly changing composition of room air makes it necessary to perform broadband air quality measurement using such a broadband detector.

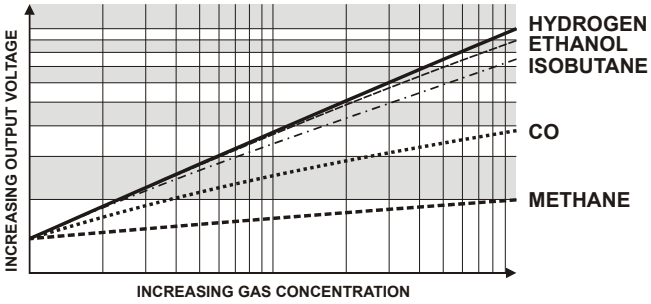

Fig. 1. Output voltage as a function of gas concentration

INSTALLATION

Wiring

All wiring must comply with local electrical codes and ordinances or as specified on installation wiring diagrams.

Wall module wiring can be sized from 16 to 22 AWG (1.5 to 0.34 mm^2), depending on the application. The maximum length of wire from a device to a wall module is 1000 ft (305 m). Twisted pair wire is recommended for wire runs longer than 100 ft (30.5 m).

Keep wiring at least one ft (305 mm) away from large inductive loads such as motors, line starters, lighting ballast, and large power distribution panels.

Run wall module wiring separately from 50 Vac or greater power wiring.

⚠ CAUTION

Low Voltage Equipment.

Risk of equipment damage.

The 24 Vac power source for this product must be a safety isolating transformer. A transformer that is CE certified and meets the Low Voltage Device (LVD) requirements must be used in Europe for all installations of this product.

Positioning

To avoid falsifying the measuring results, the device should be installed at sites at which typical air quality prevails.

Direct exposure to sunlight and drafts should be avoided.

If the device is mounted on a standard flush box, the end of the installation tube in the flush box must be sealed so to avoid any draft in the tube falsifying the measuring result.

Maintain a mounting clearance of approx. 4 in. (10 cm) to the right-hand side of the module in order to allow free airflow to the air quality sensor.

Mounting

1. The cover of the air quality sensor is fixed by a tab on the underside of the unit; to disassemble the cover and the sub-base, see Fig. 2. To access all of the mounting holes, pull off the perforated cover, bend down slightly the tab to release the printed circuit board, and leverage the printed circuit board out (see Fig. 3).

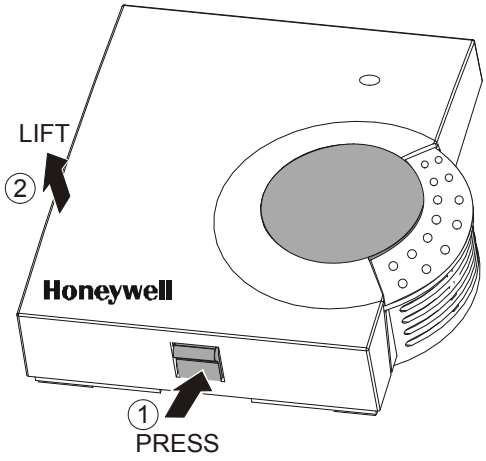

Fig. 2. Cover disassembly

2. **a)** Mount the sensor onto the wall outlet box, or
   b) bore wall holes as specified in Fig. 3 and mount the wall module with appropriate screws.

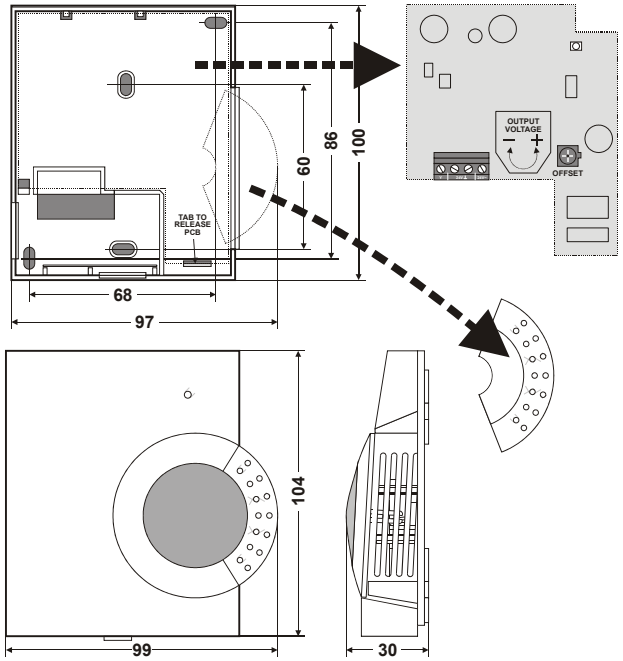

Fig. 3. Dimensions and mounting holes (mm)

IMPORTANT

Screw-type terminal blocks are designed to accept no more than one 16 AWG (1.5 mm²) conductor.

3. After re-inserting the printed circuit board and the perforated plate, connect the wires to the terminal block as follows:
   a) Strip 3/16 in. (5 mm) of insulation from the conductor.
   b) Insert the wire in the required terminal location (see Fig. 5) and tighten the screw to complete the termination.

4. Adjust the trimming potentiometer (see section "Adjusting the Offset Signal").

5. Remount the cover as shown in Fig. 4 and make sure that the tab on the underside engages.

6. The sensor is now operational. When the air quality deteriorates, the voltage of the output signal will rise.

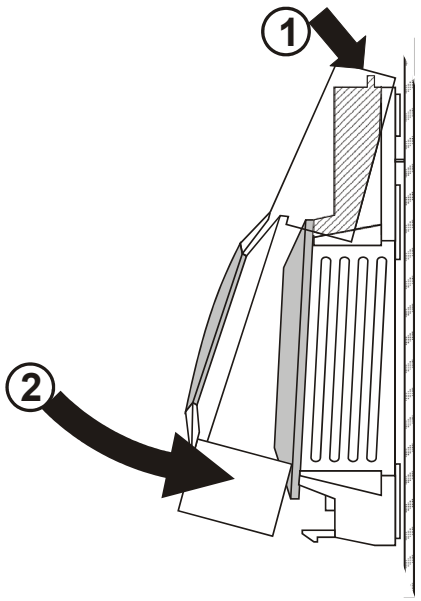

Fig. 4. Cover assembly

Adjusting the Offset Signal

After mounting the device, the output signal should be adjusted in accordance with expected ambient conditions and individual preferences.

The output signal is adjusted using the trimming potentiometer located on the sensor board (see Fig. 5).

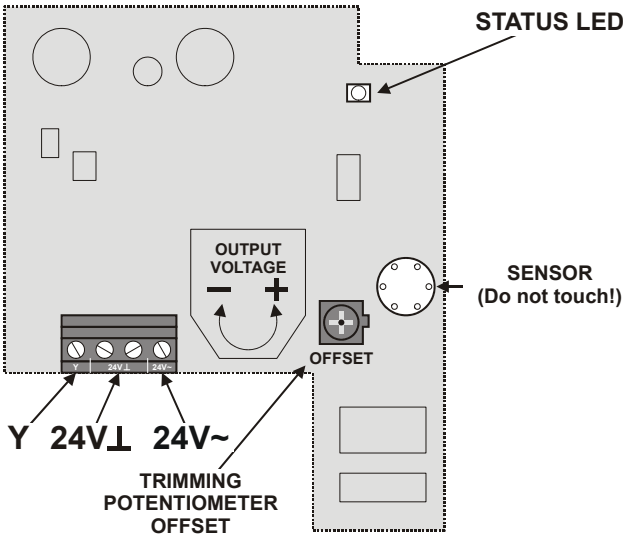

Fig. 5. Wiring Connection and Trimming Potentiometer

The offset of the output signal is increased or lowered by means of this potentiometer. The yellow status LED (see Fig. 5) indicates the corresponding signal strength:

- Turning the trimming potentiometer clockwise (CW) decreases the output signal (minimum brightness is reached at an output signal of 1.5 V)
- Turning the trimming potentiometer counterclockwise (CCW) increases the output signal (maximum brightness is reached at an output signal of 9 V).

The sensor cannot distinguish pleasant from unpleasant smells. The final determination of whether air quality is satisfactory or not must be made by the persons living or working in the room. Moreover, various air compositions are occurring in different rooms.

Thus, the default (factory) setting of the setpoint is provisional, only. The setpoint must be optimized to correspond to the subjective feelings of the room occupants.

Adjustment Procedure:

1. Connect sensor and switch operating voltage on.

2. Ensure good air conditions close to the sensor (by means of ventilation, etc.).

3. After approx. 30 minutes of operation, verify the output signal. The voltage level should lie in the range 1…3 V. Correct an excessively high or excessively low voltage level using the trimming potentiometer: The trimming potentiometer should be turned clockwise (CW) until the yellow status LED is almost extinguished. The output signal will then amount to approx. 1.5 V (max. brightness is reached at 9 V).

NOTE: When first operating the device or after the device has been powered down for more than 4 weeks (e.g., during storage), the output signal may vary during the first 48 hours of operation. In this case, you should verify the output signal after 48 hours of operation.

EXAMPLE OF DYNAMIC BEHAVIOR

Fig. 6 shows the dynamic characteristics of the C7110A1010, monitored during test measurements in a sample room. This voltage diagram as a function of different occupancy conditions is only an example and must be proven for other ambient conditions.

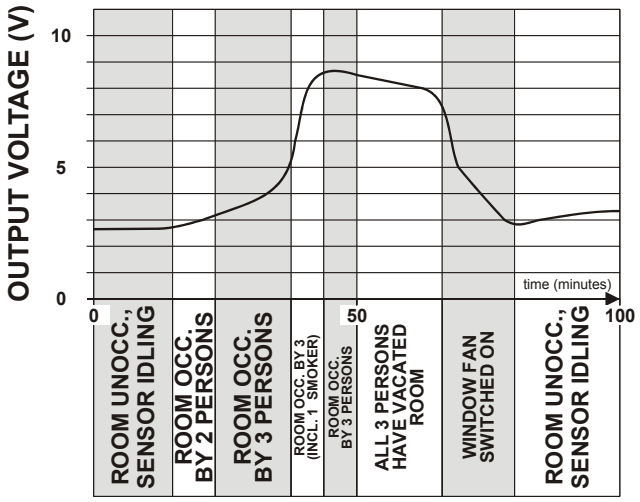

Fig. 6. Dynamic behavior of the C7110A1010

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