Zehnder CO_2 Sensor 9821-00

Installation manual

Contents

EN 3

Preface

Please read this document carefully before use.

This installation manual contains all the necessary information for a safe and correct installation of this CO_2 Sensor. Familiarise yourself with the system to prevent personal injury or damage to property.

Questions
Please contact your local Zehnder representative with any questions, contact details can be found at the back of this installation manual.

The CO_2 Sensor regularly undergoes new developments and improvements. This may cause the operation to deviate from the description in this manual. In that case, an up-to-date installation manual can be downloaded online or ordered from your local Zehnder representative.

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This installation manual has been compiled with the utmost care. However, the publisher cannot be held responsible for any damage caused by failure to follow safety or operating instructions. In the event of disputes, the Dutch text prevails.

Reading guide
The following symbols are used in this installation manual to draw the reader's attention to safety aspects and important information:

Symbol	Meaning
	Point of attention
	Risk of compromised performance or damage to the ventilation system
	Risk of personal injury

925 MHz operational frequency.

FOR USE IN ITU REGION 2 ONLY (Americas)

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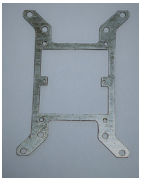
1. Unpacking and preparing for installation

1.1 Contents of the box

Model	Box contents
CO_2 RF67 Sensor	■ 2x cover (White & Ivory) ■ 2x wall plate for 2 gang box (White & Ivory) ■ 1x CO_2 Sensor ■ 1x mounting frame ■ 4x screws 6-32 ■ 2x screws 2-56 

1.2 Checking the delivery

1. Check that the packaging is not damaged.
2. Check that the parts are not damaged.
3. Check that all items of the contents are present.
4. Check if the correct CO_2 Sensor has been delivered.

Report damage, missing parts or incorrect delivery based on the identification plate on the back of the CO_2 Sensor (Figure 4.1 and Figure 4.2) directly to your local Zehnder office. Contact details can be found at the back of this installation manual.

1.3 Required tools and mounting materials

■ #3 Phillips head screwdriver or driver bit
■ #4 Phillips head screwdriver or driver bit
■ #3 Straight slot screwdriver or driver bit

2. Description and identification

2.1 General

The CO_2 Sensor measures the amount of CO_2 in the air of the room in which this sensor is installed. The device sends the results to the ventilation system. If the CO_2 level is too high, the system regulates the ventilation based on the maximum CO_2 values. As a result, healthy air quality in the room is maintained.
Reducing high CO_2 values in the air of the home is conducive to concentration, good sleep quality and helps prevent headaches.

Multiple CO_2 Sensors can be used within one home. For setup, see section 5 (C type), section 6 (RF type) and section 7 (0-10V type). Are there multiple active CO_2 Sensors? If so then the ventilation rate is based on the CO_2 Sensor that transmits the highest ventilation requirement to the ventilation system.

The CO_2 Sensor is a precision instrument with the best accuracy in its class. Each sensor is individually calibrated for optimum performance. Shocks during installation or installation at higher elevations can temporarily affect the accuracy, but are compensated for by the internal long-term compensation mechanisms.

2.2 Versions

Type	Power	Variant	Model/name
RF (Radio Frequency)	110V AC	67mm installation	Sensor CO_2 RF67

2.3 Ventilation settings

CO_2 C Sensor: setting a ventilation preset on one of the controls in the system will (temporarily) switch off automatic ventilation based on the measured CO_2 level, unless the 'always on' setting for the sensor is programmed in the installation settings of the ventilation unit. Refer also to the ventilation unit manual.

CO_2 RF Sensor: Whenever a switch is used, the automatic ventilation control uses this self-selected setting for a maximum of 12 hours. At this self-selected ventilation rate the measured CO_2 value does not influence the ventilation system. Refer also to the ventilation unit manual.

2.4 Combination possibilities

For the CO_2 RF Sensor: all RF sensors and controls can be combined with the CO_2 RF Sensor RF. The following applies here:
1) A maximum of 1 CO_2 Main Control RF from 2019 or earlier may be included in the system, which must be programmed as the first (as Master).
2) In general, the best operation is achieved when the CO_2 RF Sensor is connected to the ventilation unit as the first, except when a CO_2 Master Control RF is part of the system.
When combined with older sensors, the manual setting of a ventilation preset may only be possible for the sensor connected first.

Consult your local Zehnder representative for recommended combinations with other Zehnder RF controls and sensors.

3. Safety

3.1 Safety regarding assembly and installation

⚠ Dangerous electrical voltage! Risk of death or injury due to 110V electrical voltage.

- Work on the 110V mains must only be carried out by qualified electricians and meet all requirements of local electrical code.
- Disconnect the device from the power supply before starting assembly or disassembly.
- Only use undamaged connection cables.
- Keep the device away from water and humid environments.

⚠ Keep children and animals away from the mounting location during installation.

⚠ The CO_2 Sensor must only be mounted in the manner described in this installation manual.

⚠ Always follow local safety regulations during assembly of the device.

⚠ Check the device for damage caused by transport.

⚠ Check that the mains voltage corresponds to the local mains voltage.

3.2 Assembly instructions

Never install the CO_2 Sensor in toilets or shower rooms. Excessive humidity can damage the device.

Never place the CO_2 Sensor RF near large metal objects or devices that transmit wireless signals or cause electromagnetic interference (EMI).
This may interfere with the signal between the CO_2 Sensor and the ventilation unit.

Incorrect connection can damage the operation.

Only use suitable tools to install the CO_2 Sensor.

Do not use a power tool to tighten the screws.

Do not tighten screws too much.

Make sure that the device is not covered so that the air quality can be measured.

It is recommended to mounting the CO_2 Sensor between 36 and 54 inches above the floor so that it is visible and easy to operate.

Do not mount the CO_2 Sensor higher than 72 inches from the floor.

The CO_2 Sensor only measures the CO_2 values of the room in which the device is installed.

Always install the design cover (the plastic cover).

3.3 Installation instructions CO_2 C Sensor

The CO_2 C Sensor must be assigned to a zone. Eight sensors can be assigned to each zone.

By default, the CO_2 C Sensor controls to a CO_2 value of 1050ppm. Using the ComfoControl App and/or the display of the ventilation unit, sensor control can be adjusted to specific needs.

3.4 Installation instructions CO_2 RF Sensor

The RF signal can be amplified by installing an additional CO_2 Sensor or by using an RF repeater.

It is possible to connect eight (8) CO_2 RF Sensors to the ventilation unit.

The RF link to a ventilation unit will only work if the CO_2 Sensor is placed within range of this unit. If several sensors are used, at least one CO_2 Sensor must be mounted within range of the ventilation unit. The other CO_2 Sensors can be mounted outside the range of the ventilation unit. However, they must be mounted within the range of the previously installed CO_2 Sensor. The RF pairing should be within range of the ventilation unit.

The RF repeater function does not work during pairing.

The RF CO_2 Sensor can only be mounted in a plastic 2-gang box.

A metal 2-gang box will block the RF signal.

3.5 Warranty

Zehnder offers a 24-month warranty on this device. This period applies from the date of installation up to a maximum of 30 months after the production date of the device.

The warranty is void if:
- a defect is the result of inexpert or careless use of the device;
- a defect resulting from contaminating the device;
- parts from another manufacturer have been used;
- repairs have been carried out by unauthorised persons.

Not covered by the warranty:
- costs for disassembly and assembly on-site;
- wear and tear from normal use.

4. Assembly

4.1 View of the components

Exploded view

CO_2 RF67 (110V) Sensor

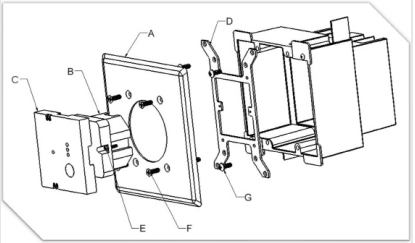


Figure 4.1 - CO_2 RF67 (110V) Sensor

Connection

RF

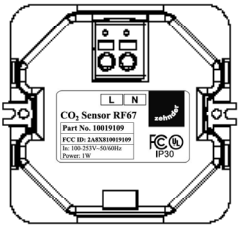


Figure 4.2 - Rear of CO_2 RF Sensor

4.2 Mounting of the CO_2 RF Sensor

All letters in this section refer to the previous images.

1. Switch off the mains power.
2. At the on wall sensor, feed the wires inside the plastic 2 gang junction box through the adapter plate ‘D’.
3. Attach the adapter plate ‘D’ (figure 4.1) to the plastic 2 gang box with 4 screws ‘G’. Feed the wires through the center hole in the cover plate ‘A’.
4. Attach cover plate ‘A’ (Ivory or White) with 4 screws ‘F’.
5. Connect the line wire to back the sensor ‘B’ at the connection marked ‘L’. Connect the neutral to the connection marked ‘N’.
6. Secure the sensor ‘B’ to the adapter plate with 2 screws ‘E’. Verify the up text and arrow on the sensor are pointing up. Take care not to bind the wires as the sensor is installed.
7. Select the sensor cover that matches the cover plate chosen. Snap the cover ‘C’ onto the sensor. The curved ‘Zehnder’ logo should be at the bottom right.

Always mount the plastic cover by hand.

Any electrical work should be completed by a trained licensed professional. All electrical work should comply to local codes.

Seal all openings in the 2 gang plastic junction box with approved sealant or caulking to seal the box from air inside the wall.

6. Installation of the CO_2 RF Sensor

6.1 General

The CO_2 RF Sensor is always set as the controller.

The CO_2 RF Sensor must be paired with the ventilation unit before first use.

Within 30 seconds during installation, press the operating button of the CO_2 Sensor to confirm a setting.

The combination of a CO_2 RF Sensor v2.03 with a ComfoAir Q requires firmware R1.8.0 or higher on said ventilation unit.

The combination of a CO_2 RF Sensor v2.03 with a ComfoSense C requires ComfoSense firmware v27 or higher.

6.2 Installation of the CO_2 RF Sensor

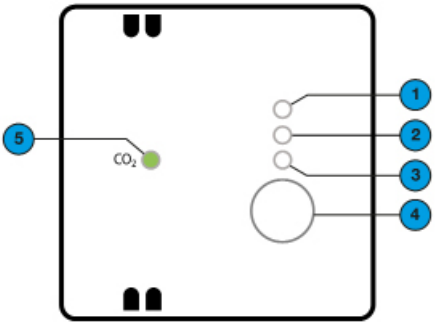


Figure 6.1 - Front of the CO_2 Sensor

Legend
1. Top LED
2. Middle LED
3. Bottom LED
4. Operating button
5. CO_2 LED

1. Activate the pairing mode in the ventilation unit:
   - ComfoAir E/ComfoAir PRO/ComfoFan S/CMFe/RPMe/VPMe/KPMe/ComfoAir 160/180/200/350/450/550 with RF receiver: isolate power to the ventilation unit, wait at least 5 seconds, then turn the power back on;
   - ComfoAir Q with RF receiver: activate the menu on the ventilation unit via ADVANCED. SETTINGS > RF SETTINGS > START RF PAIRING;
   - For other ventilation devices, please refer to the corresponding manual.

With an active pairing mode on a ventilation unit, there is 10 minutes to pair one CO_2 Sensor. For each additional CO_2 Sensor to be paired, the ventilation unit must be put into active pairing mode again.

2. Press the operating button for 5 seconds to activate the menu.
   1. The three LEDs on the right blink green 3 times.
   2. The CO_2 LED blinks green.
   3. The bottom LED on the right flashes red and the CO_2 LED flashes green to indicate the RF pairing option.

3. Press the operating button for 5 seconds to confirm the RF link selection.
   - The three LEDs on the right blink red 3 times to confirm activation of the RF link.

4. Briefly press the operating button and select one of the desired parings:
   - The bottom LED on the right turns red: this is the standard pairing mode. The CO_2 Sensor takes over the RF address of the ventilation unit. Previously registered units remain active.
   - The middle LED turns red: this is the pairing mode to register an additional ventilation unit to the CO_2 Sensor. The ventilation unit takes over the RF address of the CO_2 Sensor. Previously registered units must then be paired again in standard pairing mode.

Only use the pairing method described below if a new RF address must be assigned to the ventilation unit.

   - The top LED turns red: this is the pairing mode to generate a new RF address for the ventilation unit. Previously registered units must then be paired again in standard pairing mode.

5. After the above selection, press the operating button for 5 seconds to confirm the selection. After this, the pairing between the CO_2 Sensor and the ventilation unit starts.
   1. The CO_2 LED flashes orange, and the selected pairing mode LED flashes red. The ventilation unit is being sought. This may take some time.
   2. The CO_2 LED flashes orange and the selected pairing mode LED flashes green. Previously paired CO_2 Sensors are being sought. This may take some time.
   3. **The pairing worked:** The three LEDs on the right blink green 3 times.
   4. **The pairing failed:** The three LEDs on the right blink red 3 times.

6. Repeat the full procedure for pairing the next CO_2 Sensor, including resetting the ventilation unit to active pairing mode.

Pairing a CO_2 Sensor usually takes 1 minute.

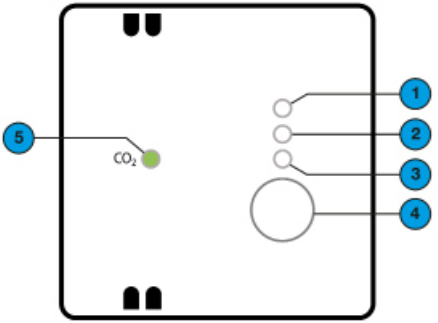
If the pairing has failed, try pairing the CO_2 Sensor by holding it closer to the ventilation unit.

7. Commissioning

7.1 Prerequisites for the correct functioning of the CO_2 Sensor

- Make sure that the device is not covered so that the air quality can be measured.
- Ensure sufficient air supply. To do this, for example, open a hinged window or existing ventilation grilles in the windows, window frames or sliding doors.
- The ventilation setting cannot be adjusted manually on every device. This is not possible on a CO_2 Sensor set by the installer as a sensor.

7.2 Setting the ventilation mode



Legend
1. Top LED
2. Middle LED
3. Bottom LED
4. Operating button
5. CO_2 LED

Figure 8.1 - Front of the CO_2 Sensor

1. Briefly press the operating button to select a ventilation mode.
2. Repeat step 1 until the LEDs light up to the right of the desired ventilation position.

When the ventilation mode is set to temporary manual, automatic control of the ventilation rate based on the maximum CO_2 values is switched off for a maximum of 12 hours. This depends on the settings on the ventilation unit, please refer to the ventilation unit manual.

When all LEDs are off: briefly press the operating button.

If only the CO_2 LED is lit, the device controls the ventilation based on the set maximum CO_2 values.

If the CO_2 LED of the CO_2 C Sensor is lit and one or more of the LEDs for the ventilation presets are also lit, the device controls the ventilation based on the measured CO_2 level between the set and maximum ventilation position.

7.3 LED brightness setting

Within 30 seconds during installation, press the operating button of the CO_2 Sensor to confirm a setting.

For an instruction video, please visit our website under CO_2 Sensors (new generation), or YouTube: https://bit.ly/31DPNjA

The 6 brightness settings for the LEDs can be adjusted from high to low:

- there are 4 settings descending from bright to dim;
- there is 1 setting where the LED is only visible in case of warnings;
- for the last setting the lights are completely off in all cases.

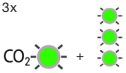
1. Press the operating button for 5 seconds to start the brightness menu:
   - All LEDs blink green 3 times.
   - The bottom LED on the right (RF type) flashes red for 30 seconds. The CO_2 LED flashes red.
2. Briefly press the operating button to select the brightness menu:
   - The top LED on the right flashes red.
3. Press the operating button for 5 seconds to enter the brightness menu:
   - All LEDs blink green 3 times.
4. Briefly press the operating button to select a different brightness.
5. Repeat step 4 until the desired brightness is selected.

   The mode in which only warnings are shown is indicated by a red CO_2 LED during this selection.

   The mode in which all the lights are off is displayed during this selection because all the LEDs are off.
6. Press the operating button for 5 seconds to confirm the selection:
   - All LEDs on the right blink green 3 times.
7. The brightness adjustment is complete and the CO_2 Sensor returns to standard functionality.

8. Malfunctions

8.1 Determine the CO_2 Sensor type

1. Activate the menu	
	3x 
2. Leave the menu	Wait 30 sec.

8.2 Malfunctions and alerts for the CO_2 C Sensor

Fault	Problem	Solution
All 4 LEDs flash orange (0.25Hz, 1x per 4s).	The CO_2 C Sensor is starting up.	Wait until the sensor has started up (about 10s).
All 4 LEDs flash orange (1Hz, 1x per 1s).	Too many CO_2 C Sensors are registered in a single zone (>8).	Set the zones correctly using the ComfoControl App or connect fewer CO_2 C Sensors.
All 4 LEDs flash red (1Hz, 1x per 1s).	There is no communication via ComfoNet.	Check the wiring and connections.
All 4 LEDs flash red (0.25Hz, 1x per 4s).	The CO_2 C Sensor is defective.	Replace the CO_2 C Sensor.

In case of recurring malfunctions, please contact your local Zehnder representative.

8.3 Malfunctions of the CO_2 RF Sensor

Fault	Problem	Solution
After pressing the confirmation button, the CO_2 LED displays the CO_2 level. The three LEDs on the right blink alternately green and red.	■ The CO_2 Sensor is not yet paired with a ventilation unit. ■ The installation has not been completed correctly.	Pair the CO_2 Sensor to the ventilation unit. Refer to section 4 for the correct installation.
The CO_2 LED flashes red 3 times. The selected ventilation mode flashes 3 times. The original mode is then displayed continuously.	The CO_2 Sensor is temporarily disconnected from the ventilation unit.	1. Remove objects that may block wireless communication. 2. Try operating the ventilation mode again.
The CO_2 LED flashes red continuously.	CO_2 level is too high. The sensor tries to increase ventilation, but there is no communication.	1. Remove objects that may block wireless communication. 2. Ensure sufficient air quality by opening windows and doors.

In case of recurring malfunctions, please contact your local Zehnder representative.

8.4 Unsafe situations

Situation	Safety	Action	Support
The CO_2 Sensor got wet.	Do not touch the CO_2 Sensor.	1. Disconnect power supplied to CO_2 Sensor. 2. Remove the CO_2 Sensor from the wall. 3. Dry all parts.	In the event of damage to the CO_2 Sensor, please contact your local Zehnder representative.

9. Maintenance

Regularly remove dust with a dry duster or very carefully with a vacuum cleaner.

Never clean the device with any moisture.

Never use cleaning agents.

10 Disassembly and disposal

If the CO_2 Sensor is disassembled, the waste disposal regulations applicable on-site and at the time of disassembly must be observed.

Dispose of the CO_2 Sensor in an environmentally friendly way. Do not dispose of the device together with household waste. The CO_2 Sensor can be handed in at a collection point for electronic waste.

It is the responsibility of the owner of the CO_2 Sensor to dispose of the device responsibly.

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit di ferent from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by Zehnder could void the user's authority to operate the equipment.

Supplier's Declaration of Conformity 47 CFR § 2.1077 Compliance Information

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.