# CL-CO2  |  $CO_2$ sensor with 0-10V output and RS485 communication

Room sensor CL-CO2 is used to monitor the air quality inside buildings and effectively control ventilation (HVAC) systems according to current levels of air pollution. The sensor measures concentration of carbon dioxide ($CO_2$). It can be effectively used in offices, classrooms, shopping centers, homes, restaurants, fitness centers, commercial buildings, etc.

〉 measures carbon dioxide concentration
〉 selectable output - analog voltage 0 - 10V or RS485 communication with Modbus RTU protocol
〉 simple selection of measuring range 400 – 2000 ppm or 400 – 5000 ppm
〉 suitable for mounting inside an electrical installation box
〉 maintenance during operation is not required
〉 long life and stability

**Description:**

The measuring of $CO_2$ is based on the principle of infrared radiation attenuation dependence on the $CO_2$ concentration in the air (NDIR). Built-in auto-calibration function ensures very good long term stability.

It is possible to select 0 - 10V analog voltage output or the RS485 data output by jumper setting on the electronics board.
Measuring range can be chosen by jumper setting either 400 - 2000 ppm or 400 - 5000 ppm $CO_2$.

Sensor can efficiently manage ventilation and heat recovery units, based on current air quality.
The current air quality can easily be determined by looking at the RGB LED indicator.

For information on the communication protocol, use the document CL-Modbus-Communication.

Explanation of abbreviations and technical terms can be found on our website in the Glossary section.

**Technical data**

| Parameter | Value | Unit |
|---|---|---|
| Supply voltage range | 12 – 40 | V DC |
| | 15 – 30 | V AC |
| Average consumption | 0,2 | W |
| $CO_2$ measuring range [1] | 400 – 2000 / 400 – 5000 | ppm |
| $CO_2$ accuracy [2] | | |
| for range 400 - 2000 ppm | ± 40 ppm + ±4 % of reading | |
| for range 400 - 5000 ppm | ± 60 ppm + ±4 % of reading | |
| $CO_2$ startup [3] | max 1 | min |
| $CO_2$ step response [3] | (90 %) 80 | s |
| Working temperature | 0 to +50 | °C |
| Working humidity non condensing | 0 – 90 % | RH |
| Storage temperature | -20 to +60 | °C |
| Expected lifetime | min. 10 | years |
| Ingress protection | IP20 | |
| Dimensions | 57,2x44,4x25 | mm |
| **RS485 bus** [4] | | |
| A-B voltage difference | max 5 | V |
| A-B common input voltage | -7 to 12 | V |
| A-B common output voltage | max 3 | V |

[1] Measuring range can be chosen by jumper setting.
[2] At 15-30°C, 15-80%RH, 1013Pa.
[3] Depends on the actual placement and degree of covering the sensor.
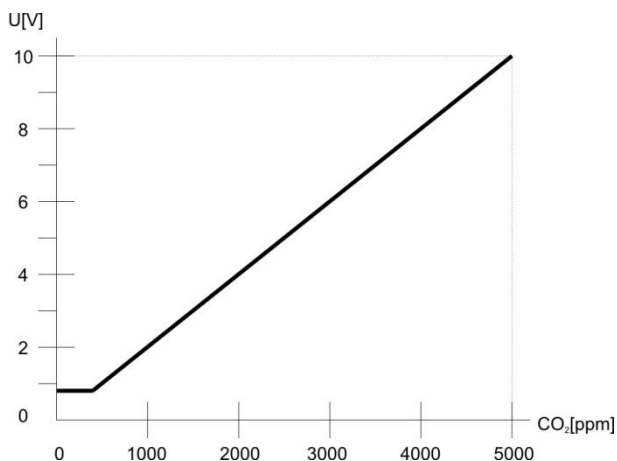[4] Not galvanic isolated.

# CL-CO2 | CO₂ sensor with 0-10V output and RS485 communication

**Output voltage dependency on CO$_2$ concentration for chosen range 400 - 2000ppm CO$_2$**
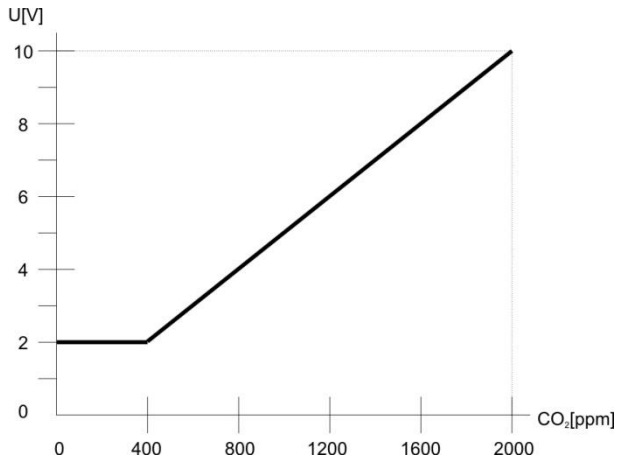


**Output voltage dependency on CO$_2$ concentration for chosen range 400 - 5000ppm CO$_2$**



**CO$_2$ sensor autocalibration function**

Autocalibration compensates for long-term aging of the key components of the sensor. This function is available only when sensor power supply is continuous and uninterrupted. Calibration during operation is not necessary.

**LED indication description**

Indication is active 20min from sensor supply power-on and then indication goes out. Subsequently, if in ordinary operation concentration level changes, the according color lights up only for 1min, otherwise light stays off. It is possible to set an alternative LED indication behavior - see CL-Modbus-Communication.

| white | green | red |
|---|---|---|
| < 600 ppm CO$_2$ | 600 až 1200 ppm | > 1200 ppm |

**White light:**

Less than 600 ppm CO$_2$. Maintaining low concentrations of CO$_2$ is not cost-effective - slightly increased concentration does not cause any health complications.

**Green light:**

More than or equal to 600 ppm CO$_2$ and less than or equal to 1200 ppm CO$_2$. Optimal balance of air quality and energy efficiency of ventilation, heating or air conditioning.

**Red light:**

More than 1200 ppm CO$_2$. Higher concentration of CO$_2$ - further increase of CO$_2$ concentrations above this level can cause fatigue, restlessness and headache. Ventilation is necessary.

**Sensor failure indication**

Red light is flashing.

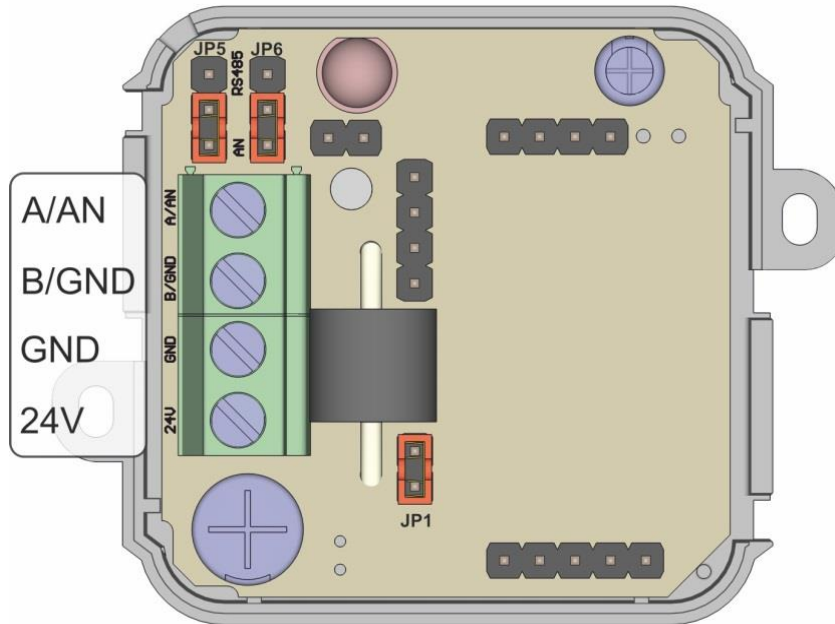**CAUTION:**

Warm-up: operational after 1 minute since power on. The declared accuracy is reached after 10 days of continuous power supply.
It is necessary to avoid severe mechanical and temperature shock of the sensor that have negative effect on sensor accuracy.

# CL-CO2 | CO₂ sensor with 0-10V output and RS485 communication
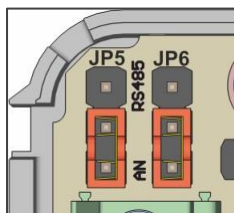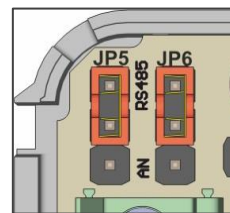
**Electronic board controls and terminals**



**Terminals**

| | |
|---|---|
| **A/AN** | RS485 signal line A / analog output 0-10V |
| **B/GND** | RS485 signal line B / analog output GND |
| **GND** | supply AC or DC (-) minus pole, GND |
| **24V** | supply AC or DC (+) plus pole |

**Jumpers on the electronics board for the output type and measuring range selection**
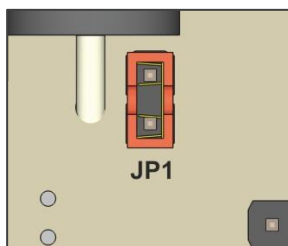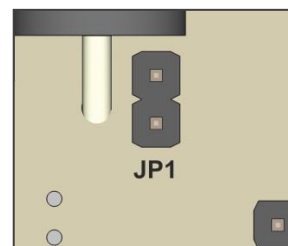
0-10V analog output



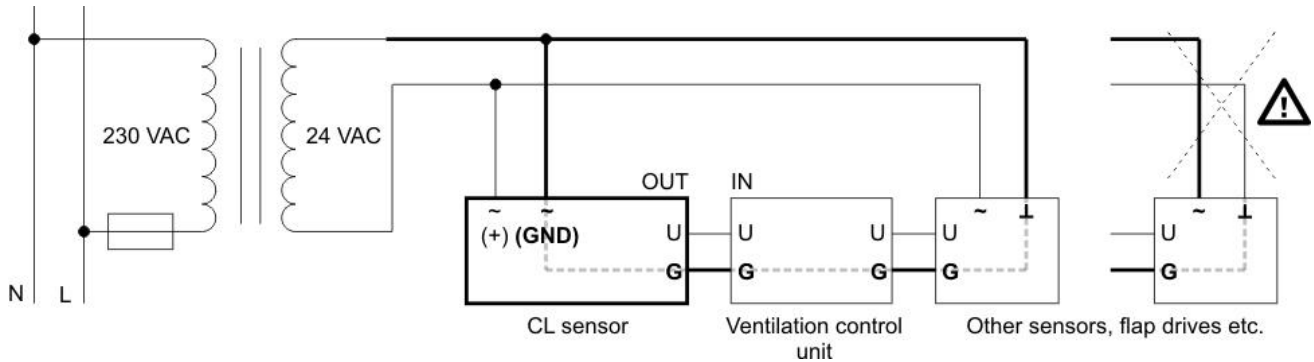RS485 bus data output



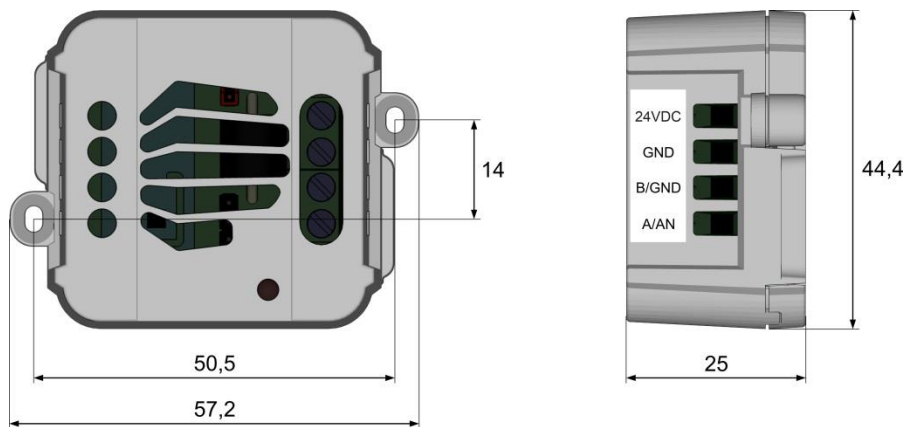Measuring range 400-2000 ppm CO₂



Measuring range 400-5000 ppm CO₂

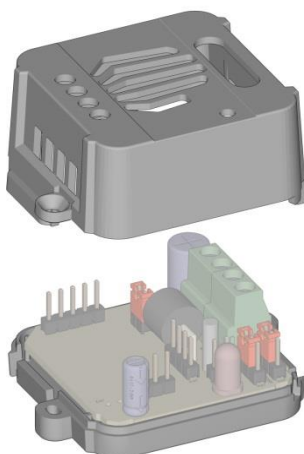# CL-CO2 | $CO_2$ sensor with 0-10V output and RS485 communication

**If you connect other devices to the same AC power source as the CL sensor, it is necessary to meet GND wiring of all analog inputs and outputs, as well as power wires.**



**Dimensions (mm)**



**Sensor assembly**



**Box color**

Black

**Way to use**

The product is intended for indoor use only. You can read the recommendations for sensor placement on our web pages.

**End of product life**

Discard the product in according to the electronic waste law and the EU directives.

*The producer reserves the right of technical changes in order to product improvements its properties and functions without previous notice.*