

## NL-ECO-CO2-230V | Room sensor CO<sub>2</sub> 230V

Room sensor NL-ECO-CO2-230V is used for indoor air quality monitoring and for effective control of ventilation (HVAC) systems according to actual air quality. The sensor measures concentration of carbon dioxide (CO<sub>2</sub>) in air. It can be effectively used in offices, classrooms, shopping centers, homes, restaurants, fitness centers, commercial buildings, etc.

- > measures CO<sub>2</sub>
- > precise optical principle NDIR
- > LED indication with automatic turn off at night
- > analog voltage output 0-10V
- > output relay NO/C
- > maintenance or calibration not required during operation
- > long-term stability
- > verified lifetime >10 years

### Description

The measuring of CO<sub>2</sub> is based on the principle of infrared radiation attenuation dependence on the CO<sub>2</sub> concentration in the air (Non Dispersive Infra Red).

Built-in auto-calibration function ensures very good long term stability.

The sensor has one analog output for the actual CO<sub>2</sub> concentration.

Ventilation and heat recovery units can be effectively controlled based on the output signal of the sensor in very efficient way.

The trigger level of CO<sub>2</sub> concentration output relay is set by a rotary element.

Current air quality can be easily checked by three LED indicators with built-in automatic shut-off at night.

Explanation of abbreviations and technical terms can be found on our website in the [Glossary](#) section.



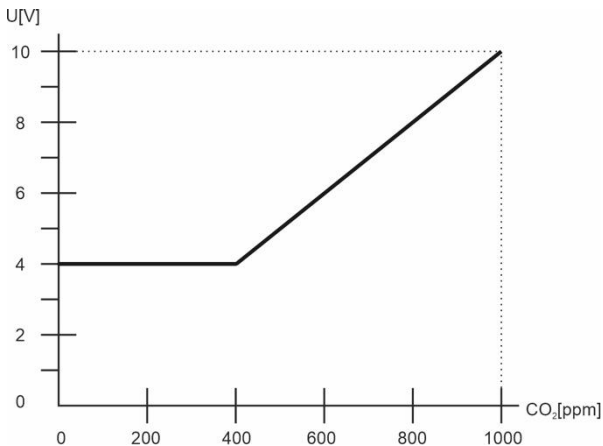
### Technical data

Parameter	Value	Unit
Power supply	230	V AC
Power consumption	max 1,5	W
CO <sub>2</sub> measuring range <sup>1)</sup>	400 – 1000 400 – 2000 400 – 5000	ppm
CO <sub>2</sub> accuracy <sup>2)</sup>	- for ranges 400 – 1000 and 400 - 2000 ppm - for range 400 - 5000 ppm	± 40 ppm + ±4 % of reading ± 60 ppm + ±4 % of reading
CO <sub>2</sub> relay - hysteresis	5 % from range (100ppm/250ppm)	
CO <sub>2</sub> rate rise	max 1	min
CO <sub>2</sub> step response	(90 %) 80	s
Voltage output <sup>3)</sup>	0 – 10	V DC
Max. switching voltage	250/30	V AC / V DC
Max. switching current	5/5	A AC / A DC
Working humidity non condensing	0 – 95 %	RH
Working temperature	0 to +50	°C
Storage temperature	-20 to +60	°C
Expected lifetime	10	years
Ingress protection	IP20	
Dimensions	90x80x31	mm
<sup>1)</sup> Measuring range can be chosen by jumper setting. Default range is 400 - 2000ppm.		
<sup>2)</sup> At 15 – 35 °C, 0-80% RH.		
<sup>3)</sup> Minimum achievable output value corresponds to minimum value of the measuring range.		

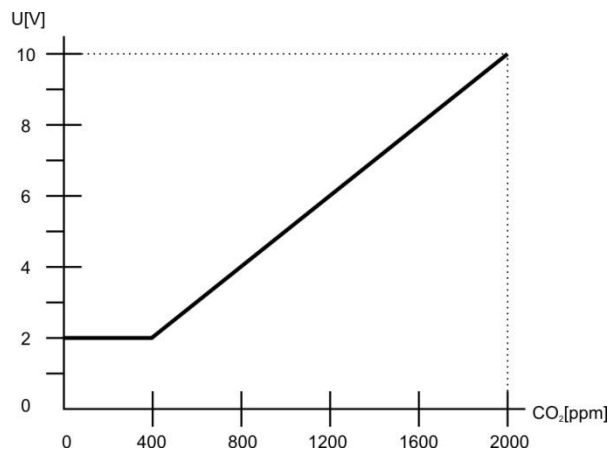


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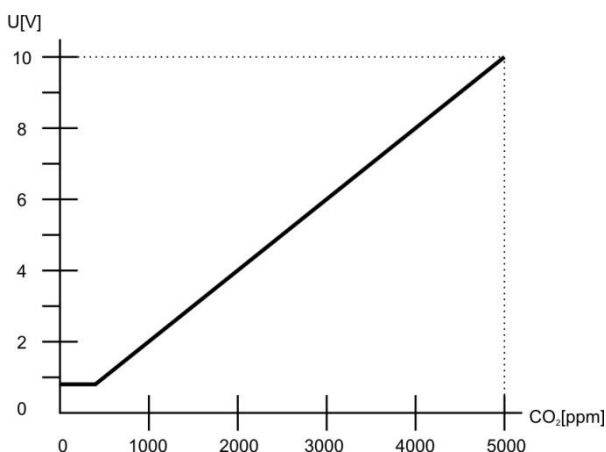
**Voltage output versus CO<sub>2</sub> concentration for range 400 - 1000 ppm:**



**Voltage output versus CO<sub>2</sub> concentration for range 400 - 2000 ppm:**



**Voltage output versus CO<sub>2</sub> concentration for range 400 - 5000 ppm:**



**CO<sub>2</sub> sensor autocalibration function**

Autocalibration compensates for long-term aging of the key components of the sensor. This function is active during permanent sensor power supply. Calibration during operation throughout the whole lifetime of the sensor is not needed.

**LED indication description**

**White LED lights:**

- Less than 600 ppm CO<sub>2</sub>.
- excellent air quality, low concentrations of CO<sub>2</sub>
  - maintaining this level is not cost-effective, especially during the winter

**Green LED lights:**

- More than or equal to 600 ppm CO<sub>2</sub>, less than or equal to 1200 ppm CO<sub>2</sub>.
- optimal balance of air quality and energy consumption for ventilation and air conditioning
  - maintaining the CO<sub>2</sub> concentration in this range does not significantly reduce the comfort of the indoor environment

**Yellow LED lights:**

- More than 1200 ppm CO<sub>2</sub>.
- higher concentration of CO<sub>2</sub> – lower air quality, this can already cause negative effects associated with low air quality such as restlessness, weakness, fatigue, headache, dizziness etc.

**Sensor start after power on**

All three LEDs are shining simultaneously in the meantime, pending the availability of the first measured value. But no longer than 10 seconds. The sensor is fully operational after 1 minute since power on.

The declared accuracy is reached after 4 days of continuous power supply.

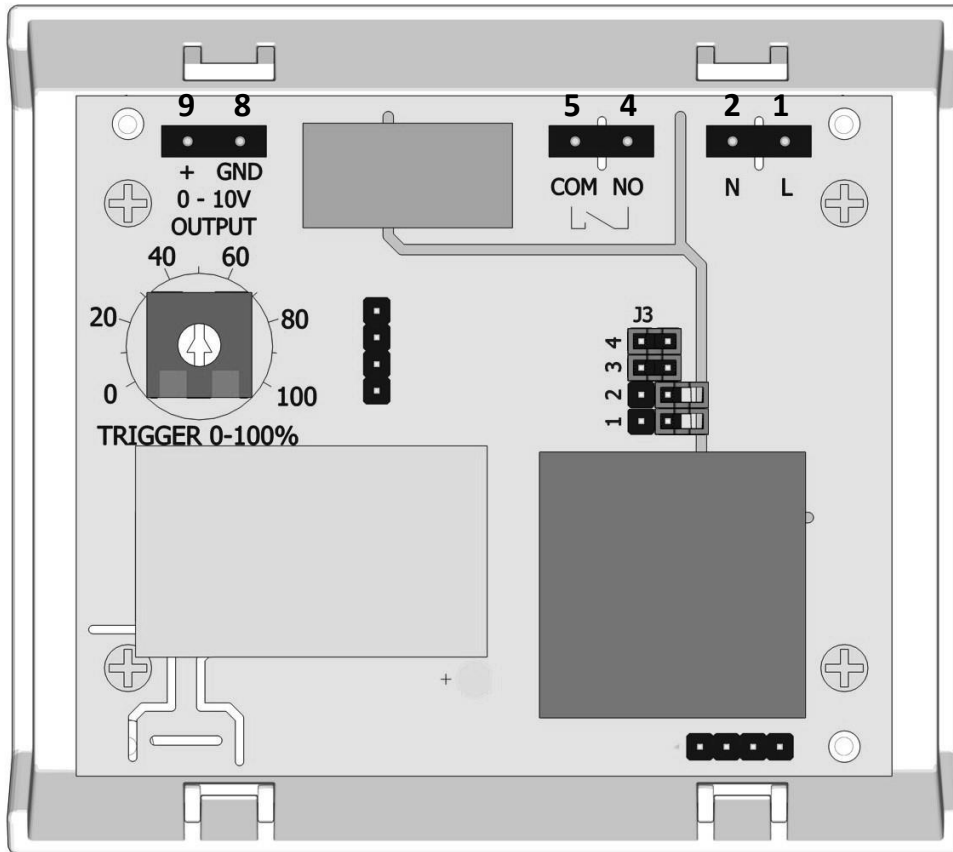
**Sensor failure indication**

All three LED's lights up at the same time permanently.



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**Electronic board controls and terminals**



**Terminals**

**POWER**

<b>1. L</b>	supply AC - L
<b>2. N</b>	supply AC - N



<b>4. NO</b>	output relay, normally open contact
<b>5. COM</b>	output relay, common contact

**OUTPUT**

<b>8. GND</b>	output – minus pole, GND
<b>9. +</b>	analog output 0-10 V

**Jumpers J3**

jumper	meaning	fitted	not fitted
<b>2</b>	LED indication	always	automatic
<b>3</b>	autocalibration	enabled	disabled

**Measuring range setting**

range	jumper 1	jumper 4
400 – 1000 ppm	closed	open
400 – 2000 ppm	open	closed
400 – 5000 ppm	open	open

**Factory setting**

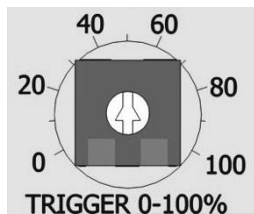
LED indication	automatic
Autocalibration	enabled
Switching level	50%
Measuring range	2000 ppm CO <sub>2</sub>



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**Setting the relay trigger level using rotary selector**

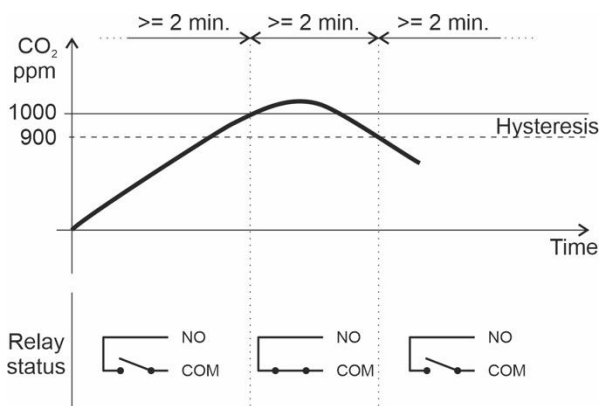
The 0 - 100% selector setting corresponds to the value of selected CO<sub>2</sub> measuring range – see example below.



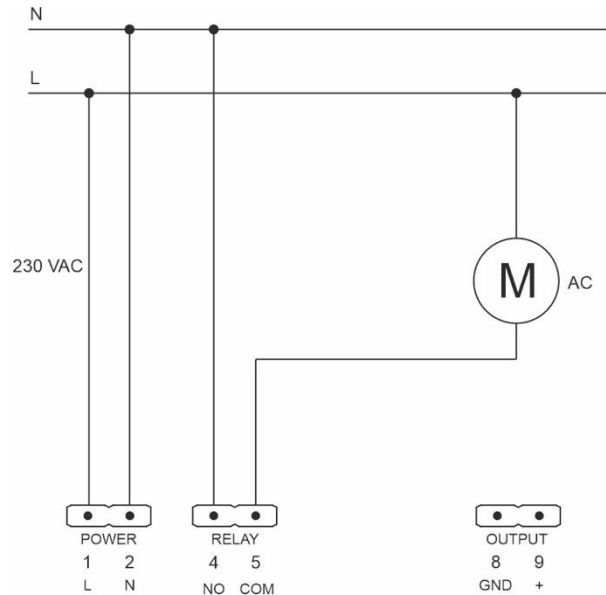
The relay switches on when the measured value rises above the trigger level.  
The relay switches off when the measured value falls below the trigger level minus hysteresis value (5% from measuring range).  
Minimal lag between relay state - changes is 2 minutes.

Selector value	CO <sub>2</sub> (1000ppm)	CO <sub>2</sub> (2000ppm)	CO <sub>2</sub> (5000ppm)
0 %	0	0	0
10 %	100	200	500
20 %	200	400	1000
30 %	300	600	1500
40 %	400	800	2000
50 %	500	1000	2500
60 %	600	1200	3000
70 %	700	1400	3500
80 %	800	1600	4000
90 %	900	1800	4500
100 %	1000	2000	5000

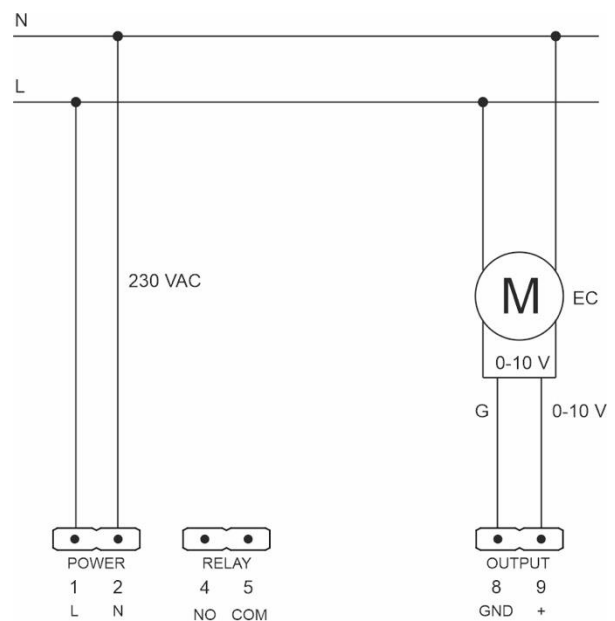
**Relay switching example** – selected measuring range 2000ppm, hysteresis 5% ~ 100ppm, selected switching level value 50% (50% correspond to 1000ppm CO<sub>2</sub>)



**Sensor connection using the output relay**



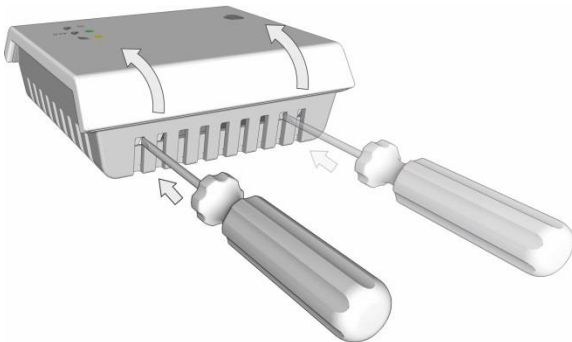
**Sensor connection - direct EC motor control using signal 0-10 V**



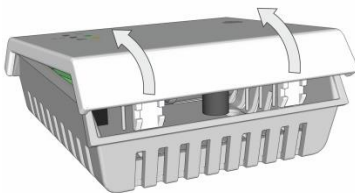
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**Sensor box disassembly**

Push on the two locks with a flat head screwdriver to release the upper part of the box. Then, tilt it in the indicated direction (see the picture below).

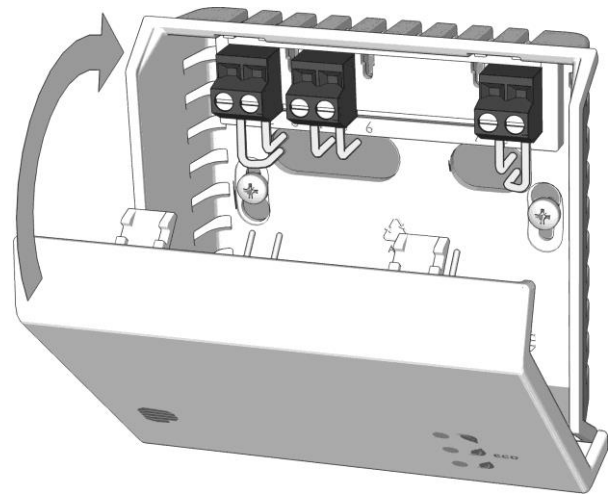


Continue to move the upper part with all the electronics until it is separated from the lower part.

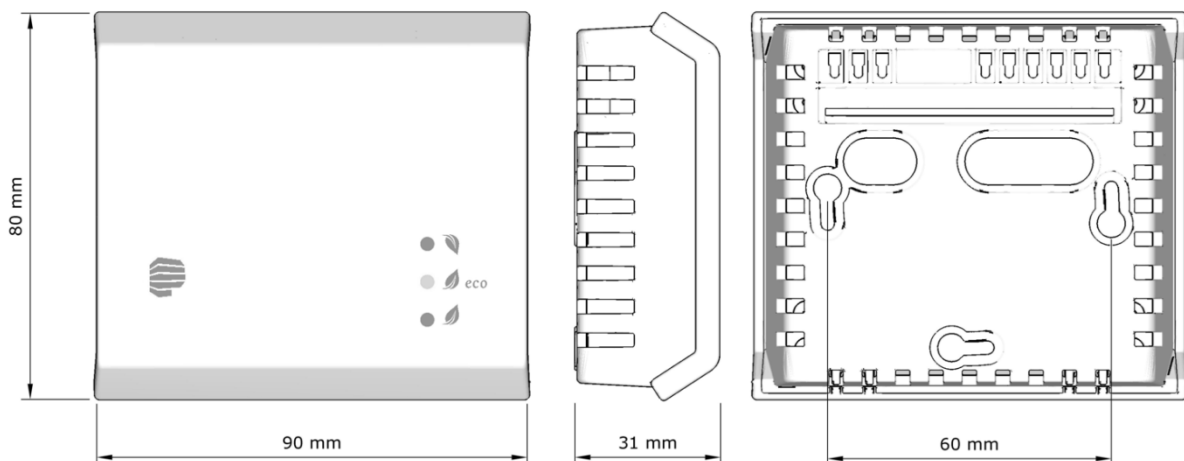


**Wall mounting**

Install the base of the box with terminals on the wall using screws and dowels (included in the package). Connect the wiring according to the description of the terminals. Place the lid with the electronics on the bottom hinges and tilt it to the base until the plastic locks on the top engage.



**Dimensions**



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### Box color

White - RAL9016.

### Way to use

The product is intended for indoor use only. You can read the [recommendations for sensor placement](#) on our web pages. It is necessary to avoid severe mechanical shock of the sensor.

### Safety warning

- The connection and operation of the product must be carried out by a professionally qualified person according to the procedures and information provided in this manual.
- Comply with the given storage and operating conditions of the product. Failure to comply with these conditions may result in damage to the product and possibly loss of warranty.
- Violent mechanical shocks to the sensor must be avoided.
- In case of a defect, do not try to repair the product yourself; instead contact the supplier or the manufacturer directly.

### 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.*

