

NL-ECO-IVOC | Room sensor VOC

Room sensor NL-ECO-IVOC is used to monitor indoor air quality and effectively control ventilation (HVAC) systems according to current air quality. The sensor measures the concentration of gaseous organic substances (VOC - Volatile Organic Compounds) in air. It can be effectively used in restaurants, kitchens, fitness centres, toilets, changing rooms, gyms, commercial buildings, schools, households etc.

- › measures VOC
- › LED indication with automatic turn off according to ambient light (at night)
- › analogue voltage output 0-10V
- › eCO₂ output compatible with CO₂ standard
- › alternatively choose one of 3 TVOC output measurement ranges
- › output relay NO/C
- › maintenance or calibration not required during operation
- › long life and stability

Description:

Built-in advanced VOC sensor is sensitive to volatile organic compounds typically contained in the stuffy air - gaseous metabolic products of human bodies and other gaseous pollutants such as formaldehyde, cooking vapours, fumes from paints, varnishes, adhesives, detergents, etc. that CO₂ sensor does not detect. NL-ECO-IVOC sensor detects gaseous pollutant substances in the air that are the main reason for ventilation. The sensor approximates to human perception of air quality.

Sensor use special algorithm to estimate a CO₂ concentration based on the assumption that the TVOC (Total Volatile Organic Compounds) produced by humans is proportional to their exhaled CO₂. So the analogue voltage output of the sensor is adjusted as equivalent to a standard CO₂ sensor in range of 400–2000 ppm of estimated CO₂, so called eCO₂. Instead of the eCO₂ output, you can choose one of three TVOC output ranges.

The trigger level of VOC concentration output relay can be set by a rotary element.

Ventilation and heat recovery units can be directly controlled based on the output signal of sensor in very efficient way. Current air quality can be easily checked by three LED indicators. When ambient light is dimmed, the indicators turn off automatically to not disturb you when falling asleep.

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



Table of parameters:

Parameter	Value	Unit
Supply voltage range	12 – 35	V DC
	12 – 24	V AC
Consumption	max 1,5	W
Measuring range ¹⁾	400 – 2000	ppm
Relay - hysteresis	5% from range (100ppm)	
Voltage output ²⁾	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	10 – 95 %	RH
Working temperature	0 to +50	°C
Storage temperature	-20 to +60	°C
Expected lifetime	10	years
Ingress protection	IP20	
Dimensions	90x80x31	mm
¹⁾ Calculated CO ₂ concentration, CO ₂ equivalent (eCO ₂).		
²⁾ Minimum achievable output value corresponds to minimum value of the measuring range.		

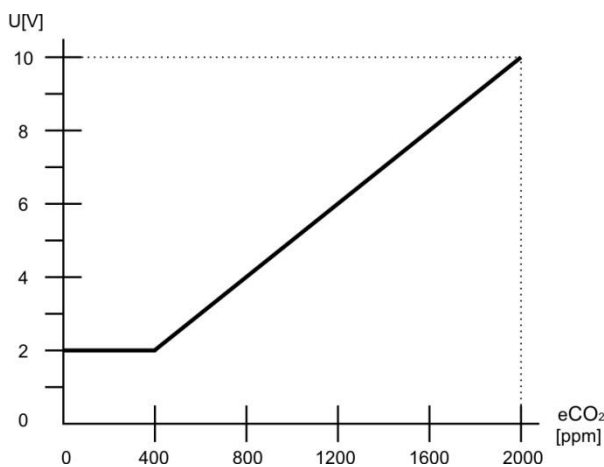


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iVOC sensor autocalibration function

Built-in auto-calibration function compensates for long-term aging of the key components of the sensor. This function is available only during permanent sensor power supply. Calibration during operation throughout the lifetime of the sensor is not needed.

Analogue output voltage versus eCO₂



LED indication description

White LED lights:



Less than 600 ppm eCO₂.

- excellent air quality, low concentrations of VOC
- maintaining this level is not cost-effective

Green LED lights:



More than or equal to 600 ppm eCO₂, less than or equal to 1200 ppm eCO₂.

- optimal balance of air quality and energy consumption for ventilation and air condition

Yellow LED lights:



More than 1200 ppm eCO₂.

- higher concentration of CO₂, lower air quality, that can cause fatigue, restlessness, headache and feeling uncomfortable, hot etc.

Sensor start after power on

For 6 minutes after power on will the sensor warm-up. The LEDs will show the condition of the air according to LED indication description after the warm-up is done.

The sensor is fully operational after 6 minute since power on.

The declared accuracy is reached after 12 hours of continuous power supply.

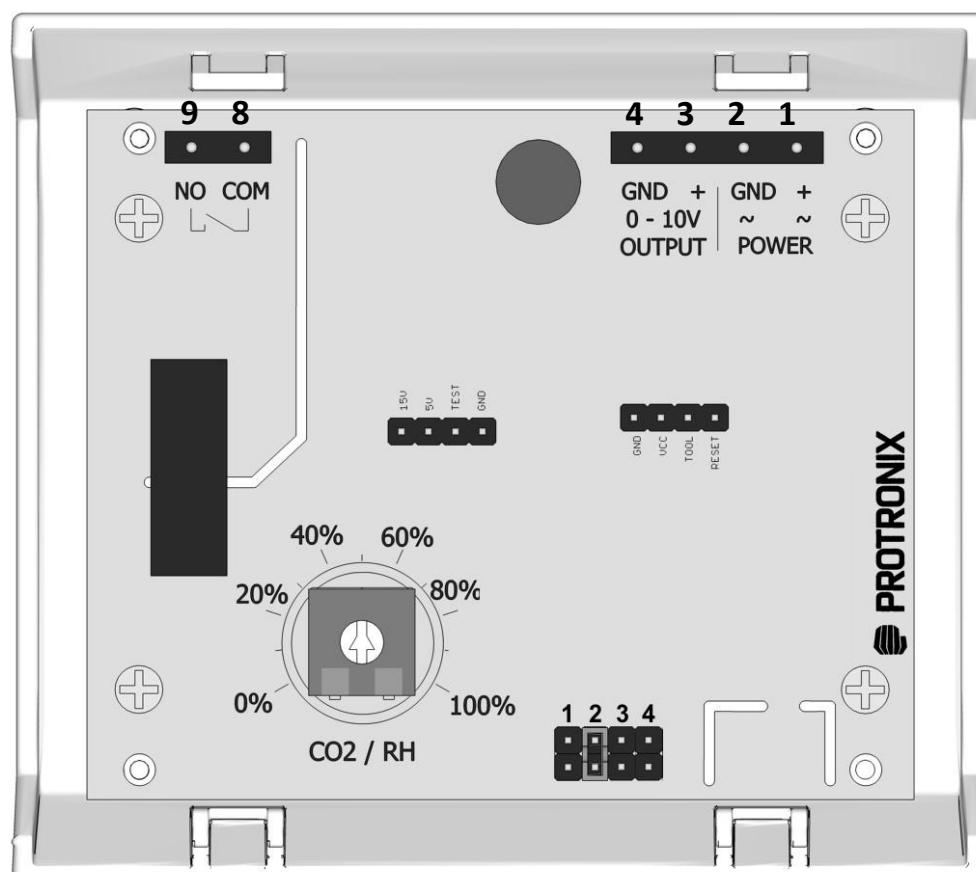
Sensor failure indication

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



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Electronic board controls and terminals



Terminals

POWER

1. ~ +	supply AC or DC (+) plus pole
2. ~ GND	supply AC or DC (-) minus pole, GND

OUTPUT

3. +	analog output 0-10 V
4. GND	output – minus pole



8. COM	output relay, common contact
9. NO	output relay, normally open contact

Jumpers

jumper	meaning	fitted	not fitted
2	LED indication	always	automatic
1	this position is not for user setting		

0-10 V output configuration

Output type	jumper 3	jumper 4
eCO ₂ : 400 – 2000 ppm	-	-
TVOC: 0–1 mg/m ³	-	✓
TVOC: 0-5 mg/m ³	✓	-
TVOC: 0-10 mg/m ³	✓	✓

Factory setting

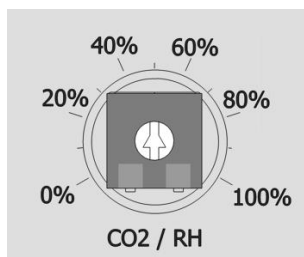
Output type	eCO ₂
LED indication	always
Switching level	50%



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Setting the relay switching level using rotary selector

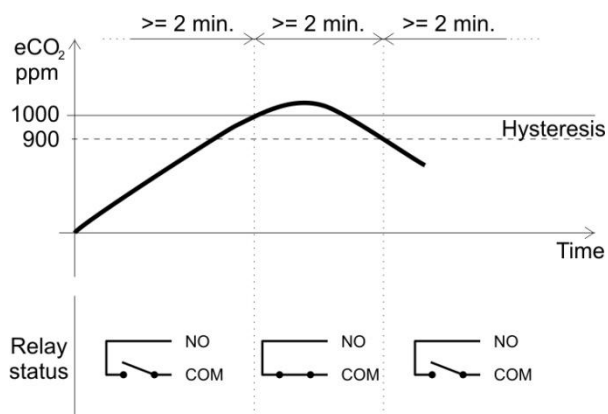
The 0 - 100% selector setting corresponds to the value of selected eCO₂ measuring range – see example below.



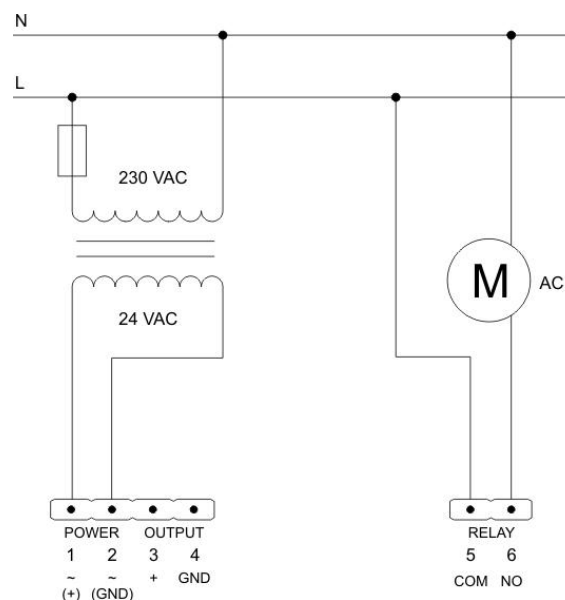
The relay switches on when the level measured value rises above the level of the rotary selector.
The relay switches off when the level measured value falls below the level of the rotary selector minus hysteresis value of 5% from measuring range.
Minimal lag between changes in state relays are 2 minutes.

selector value	eCO ₂
0%	0
20 %	400
40 %	800
60 %	1200
80 %	1600
100 %	2000

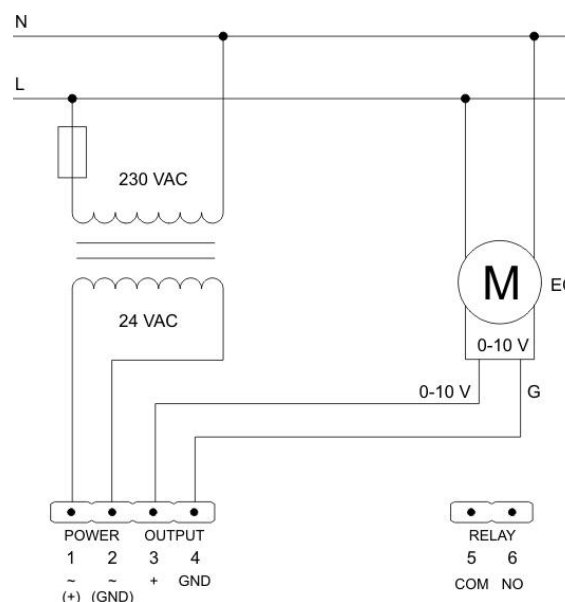
Relay switching example – hysteresis 5% = 100ppm, selected switching level value 50% (50% correspond to 1000ppm eCO₂)



Sensor connection using the output relay

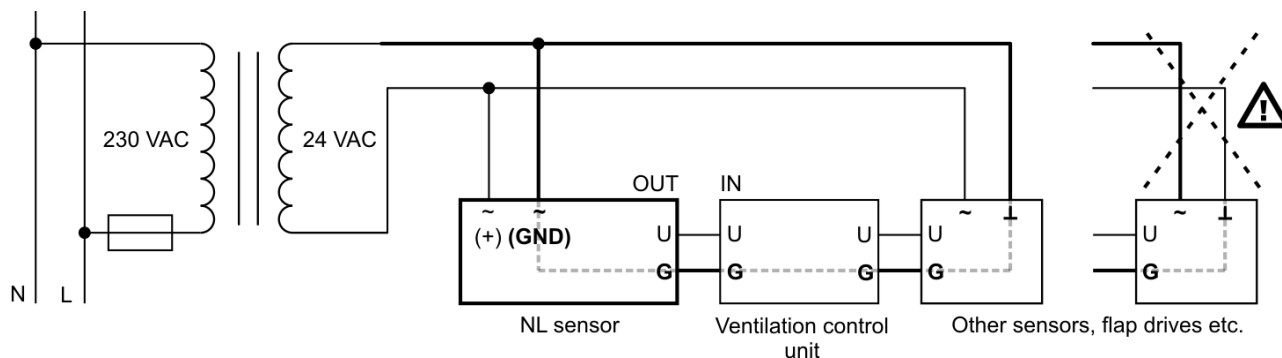


Sensor connection - direct EC motor control using signal 0-10 V

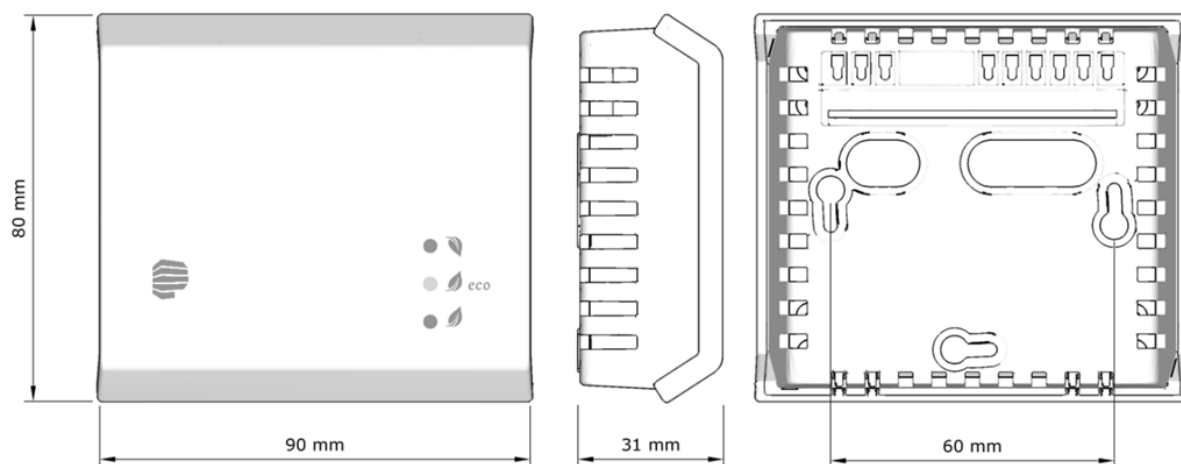


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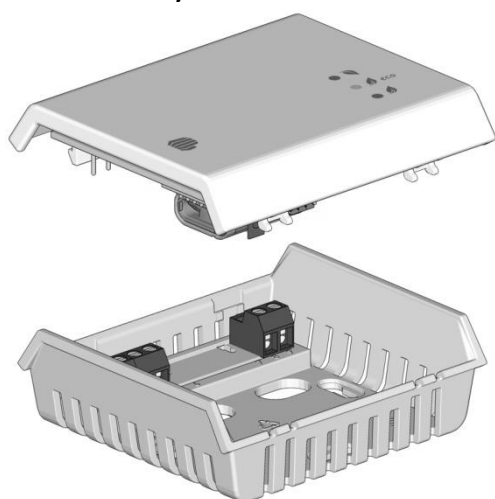
If you connect other devices to the same AC power source as the NL sensor, it is necessary to meet GND wiring of all analog inputs and outputs, as well as power wires.



Dimensions



Sensor assembly



Box color

Front: White - RAL9016. Base: gray - RAL7035.

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.

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.

