

## NLII-CO2+T | Combined CO<sub>2</sub>/T sensor

Combined sensor NLII-CO2+T is used to continuously monitor air quality inside buildings and then control ventilation (HVAC) systems according to current levels of internal air quality. The sensor measures concentration of carbon dioxide (CO<sub>2</sub>) and temperature (T). It is suitable for offices, classrooms, shopping centers, homes, restaurants, fitness centers, commercial buildings, etc.

- > measures CO<sub>2</sub> and T
- > 2x analog voltage/current output
- > maintenance during operation is not required
- > long life and stability



### 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 (NDIR). Built-in auto-calibration function ensures very good long term stability.

The sensor has built-in two separate analog outputs - one for the actual concentration of CO<sub>2</sub> and the other for actual temperature.

So the sensor efficiently manages ventilation and heat recovery units, based on current room air quality.

The current air quality can easily be determined by looking at the three LED indicators.

The **eco** level means good indoor air quality necessary to achieve a sense of well-being and at the same time optimal energy costs for heating, ventilation or air conditioning.

### Technical data

Parameter	Value	Unit
Supply voltage range	12 – 35	V DC
	12 – 24	V AC
Average consumption	0,5	W
CO <sub>2</sub> measuring range	400 – 2000	ppm
CO <sub>2</sub> accuracy	± 35 ppm ±5 % of reading	
CO <sub>2</sub> rate rise	max 1	min
CO <sub>2</sub> step response	(90 %) 80	s
T measuring range	0 – 50	°C
T accuracy	± 0,4	°C
Working humidity non condensing	0 – 95 %	RH
Working temperature	0 to +50	°C
Storage temperature	-20 to +60	°C
Expected lifetime	min. 10	years
Ingress protection	IP20	
Dimensions	90x80x31	mm

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

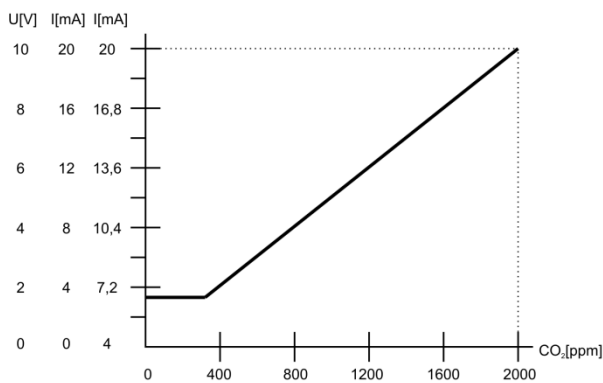


## NLII-CO2+T | Combined CO<sub>2</sub>/T sensor

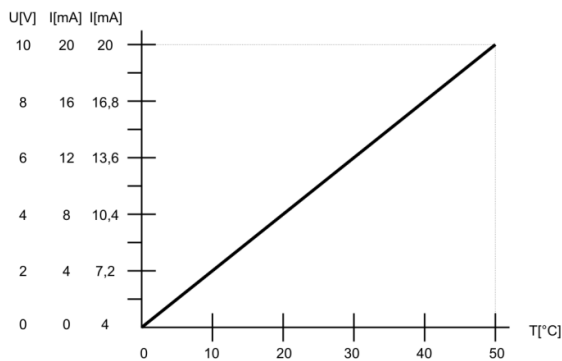
### CO<sub>2</sub> sensor autocalibration function

[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.

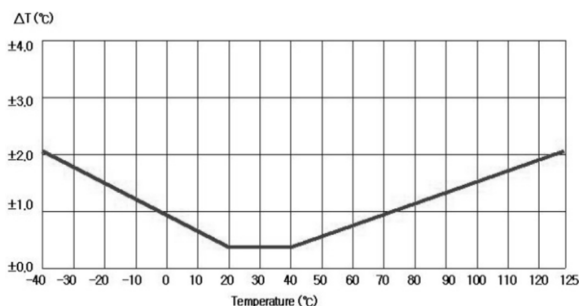
### Selected analog output values versus actual CO<sub>2</sub> concentration



### Selected analog output values versus actual T



### Typical T measurement accuracy



### LED indication description

#### White LED lights:

- Less than 600 ppm CO<sub>2</sub> or less than 18 °C.  
(according to the quantity selected for indication)
  - maintaining low concentrations of CO<sub>2</sub> is not cost-effective - slightly increased concentration does not cause any health complications
  - low temperature and its higher fluctuation is not economically profitable

#### Green LED lights:

- More than or equal to 600 ppm CO<sub>2</sub> or 18 °C and less than or equal to 1200 ppm CO<sub>2</sub> or 22 °C.  
(according to the quantity selected for indication)
  - optimal balance of air quality and energy efficiency of ventilation and air conditioning
  - optimal air temperature in terms of thermal contentment, health and energy demand

#### Yellow LED lights:

- More than 1200 ppm CO<sub>2</sub> or more than 22 °C.  
(according to the quantity selected for indication)
  - higher concentration of CO<sub>2</sub> - further increase of CO<sub>2</sub> concentrations above this level can cause fatigue, restlessness, headache
  - higher temperature T - high temperature can cause fatigue, restlessness, headache and feeling hot

### Sensor start after power on

All three LEDs flash simultaneously until the first readings are available, but no longer than 10 seconds.

### Sensor failure indication

All three LEDs are shining permanently.

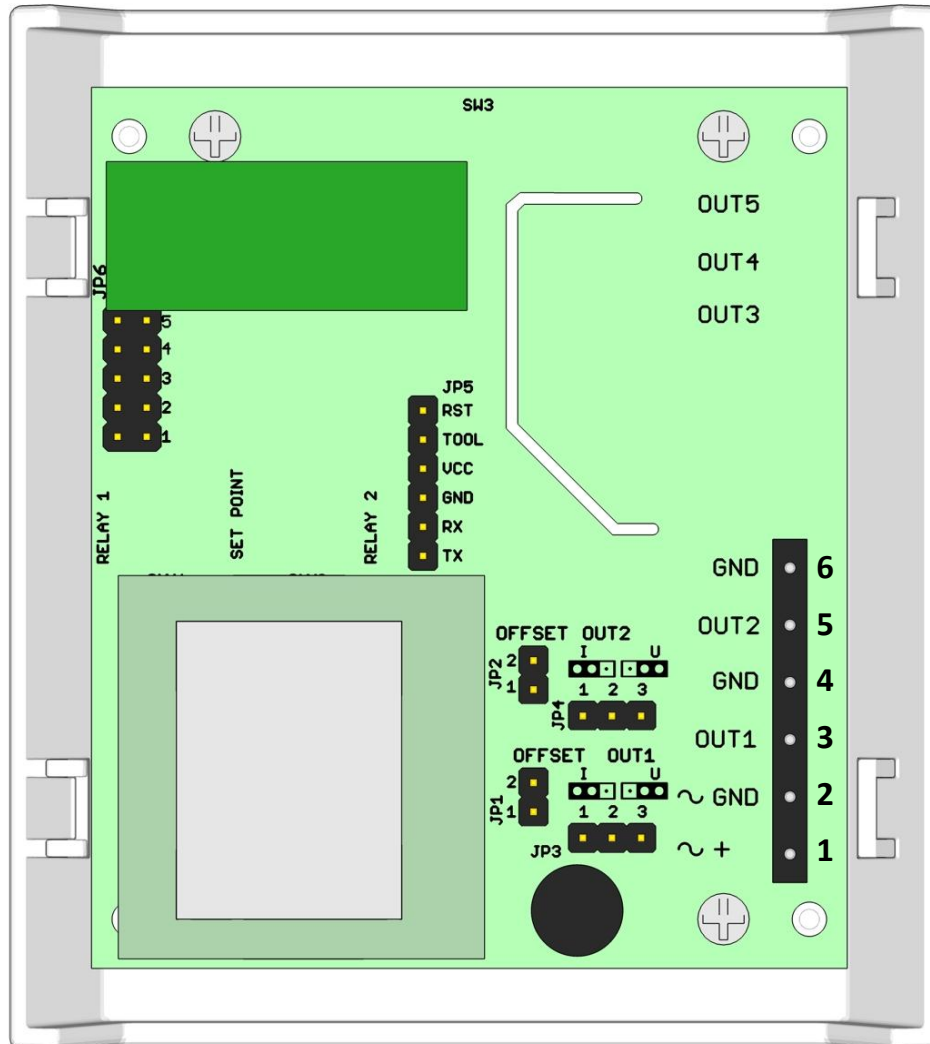
### CAUTION:

Warm-up: operational after 1 minute since power on. The declared accuracy is reached after 4 days of continuous power supply. It is necessary to avoid severe mechanical shock of the sensor.



## NLII-CO2+T | Combined CO<sub>2</sub>/T sensor

### Electronic board controls and terminals



#### Terminals

- 1. ~ + supply AC or DC (+) plus pole
- 2. ~ GND supply AC or DC (-) minus pole, GND
- 3. OUT1 CO<sub>2</sub> sensor analog output, 0-10 V or 0-20 mA or 4-20 mA
- 4. GND CO<sub>2</sub> sensor output GND
- 5. OUT2 T sensor analog output, 0-10 V or 0-20 mA or 4-20 mA
- 6. GND T sensor output GND

#### Jumpers

- JP1 – Current output offset T
- JP2 – Current output offset CO<sub>2</sub>
- JP3 – Voltage/current output CO<sub>2</sub>
- JP4 – Voltage/current output T
- JP6 – LED indication settings





## NLII-CO2+T | Combined CO<sub>2</sub>/T sensor

### Jumpers on the electronics board

Mark	Description	Settings	Meaning
JP1	<b>Current output offset T</b> - shift quiescent current from 0 mA to 4 mA	2 <input type="checkbox"/> 1 <input type="checkbox"/>	current output T 0-20 mA
		2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/>	current output T 4-20 mA
JP2	<b>Current output offset CO<sub>2</sub></b> - shift quiescent current from 0 mA to 4 mA	2 <input type="checkbox"/> 1 <input type="checkbox"/>	current output CO <sub>2</sub> 0-20 mA
		2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/>	current output CO <sub>2</sub> 4-20 mA
JP3	<b>Voltage/current output CO<sub>2</sub></b> - select the type of analog output - if the selected voltage output is CO <sub>2</sub> , JP2 must not be shorted	1 2 3 <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	voltage output CO <sub>2</sub>
		1 2 3 <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	current output CO <sub>2</sub>
JP4	<b>Voltage/current output T</b> - select the type of analog output - if voltage output T is selected, JP2 must not be shorted	1 2 3 <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	voltage output T
		1 2 3 <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	current output T
JP6 - 1 JP6 - 3	<b>Enabling LED indication</b> <b>Selecting the sensor for LED indication - CO<sub>2</sub> or T.</b> - LED indication according to ambient light - when ambient light is dimmed (at night), LED indicators turn off automatically.	<input type="checkbox"/> <input type="checkbox"/> 5 <input type="checkbox"/> <input type="checkbox"/> 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1	LED indikace podle CO <sub>2</sub>
		<input type="checkbox"/> <input type="checkbox"/> 5 <input type="checkbox"/> <input type="checkbox"/> 4 <input checked="" type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1	LED indikace podle T
		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 <input type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 1	LED indikace trvale zapnuta
JP6 - 4 JP6 - 5	<b>These positions are not intended for user setting.</b>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 <input type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 1	

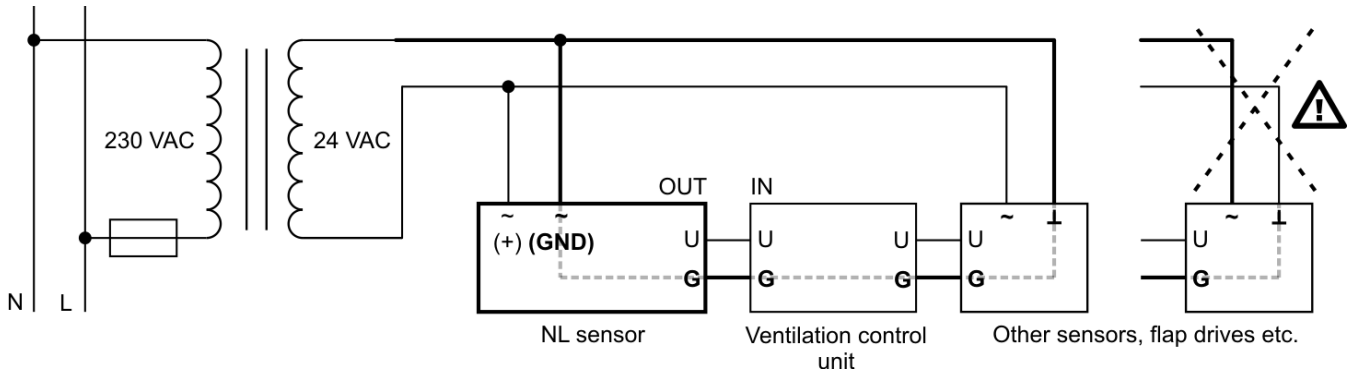
### Factory settings

LED indication: by CO<sub>2</sub>, indication turns off when ambient light dims  
 CO<sub>2</sub> analog output: voltage output  
 T analog output: voltage output

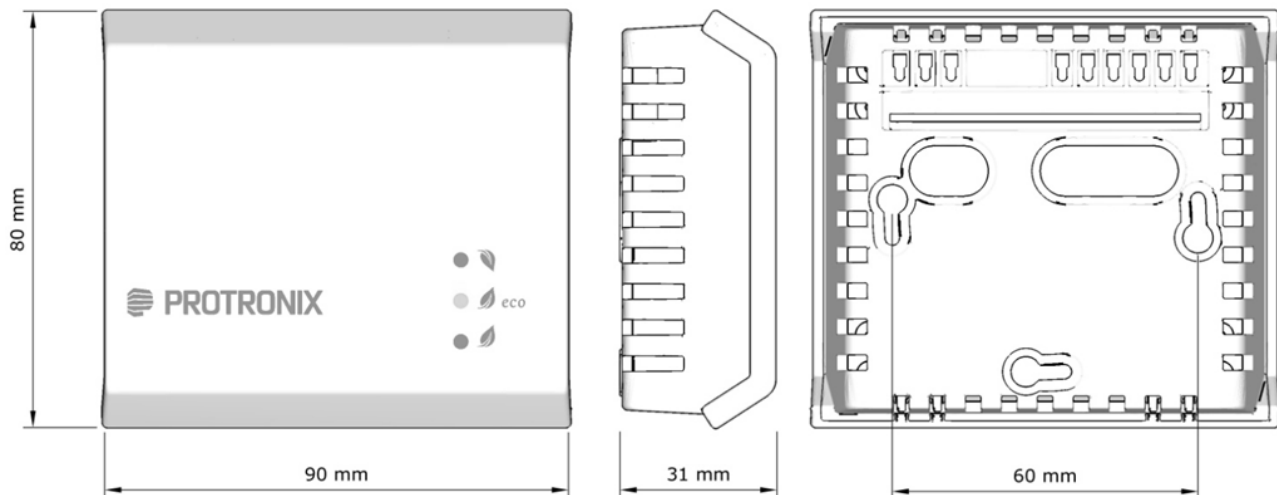


## NLII-CO2+T | Combined CO<sub>2</sub>/T sensor

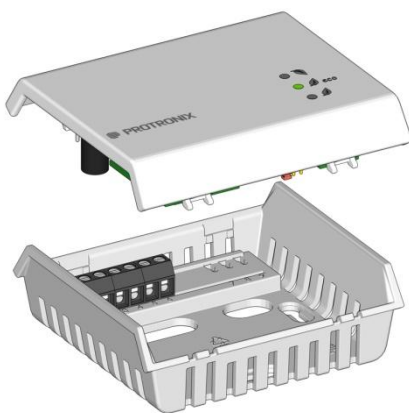
If you connect other devices to the same AC power source as the NL sensor, it is necessary to meet GND wiring of all analog inputs and outputs, as well as power wires.



### 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.

### 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.*

