

NLII-RH | Combined sensor humidity/temperature

Room sensor NLII-RH is used to monitor the air quality inside buildings and power control ventilation (HVAC) systems according to current levels of air pollution. The sensor measures the relative humidity (RH) and temperature (T). It is suitable for living rooms, bathrooms, warehouses, ateliers etc.

- › measures RH and temperature
- › 2x analog voltage/current output
- › 2x output relay – 2x NO/C
- › cascade switching
- › not required maintenance during operation
- › long life and stability



Type of sensor	RH output	T output	Relay
NLII-RH -R	0-10 V/0-20 mA/4-20 mA ¹⁾	-	1x switching contact
NLII-RH +T	0-10 V/0-20 mA/4-20 mA ¹⁾	0-10 V/0-20 mA/4-20 mA ¹⁾	-
NLII-RH +T-R	0-10 V/0-20 mA/4-20 mA ¹⁾	0-10 V/0-20 mA/4-20 mA ¹⁾	2x NO/C

¹⁾ It is possible to select by jumper type of analog output..

Measurement of the relative humidity is based on the principle of capacitive polymer sensor.

The sensor has built-in two separate analog outputs - one for the actual concentration of T and the other for the current relative humidity.

If the sensor contains 2 relays can be set two switching modes: standard (always one relay switched according to one quantity), a cascade mode (according to a selected quantity switch two relays with different levels of switching).

Cascade switching, for example, can be used to switch power air conditioning units. The two rotary switches can be independently set the level at which the corresponding relay switches.

Sensor can efficiently manage ventilation and heat recovery units, based on current air quality.

By three LED indicators can be easily checked the current air quality. Preferred eco level means good indoor air quality needed to achieve a sense of well-being and at the same time can reduce energy costs for heating or air conditioning.

Based on these measurements can be directly controlled ventilation, air conditioning and heat recovery units in an efficient manner.



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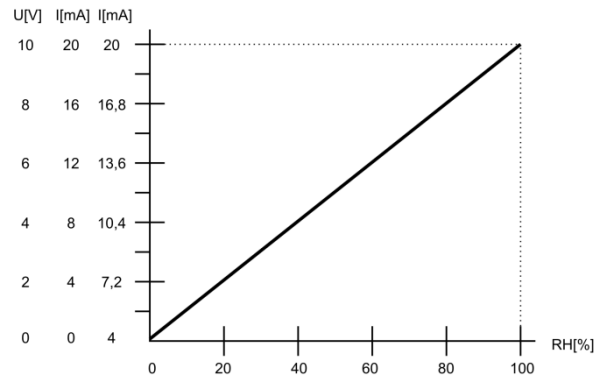
Table of parameters

Parameter	Value	
Supply voltage range	14 V – 40 V DC or 18 V – 30 V AC	
Average consumption	0,5	W
Ingress protection	IP20	
RH measuring range	0 – 100 %	RH
RH accuracy 20 – 80 %	± 3 %	RH
RH accuracy 0 – 100 %	± 6 %	RH
RH switching hysteresis	5 %	RH
T measuring range	0 – 40	°C
T accuracy	± 0,4	°C
T switching hysteresis	0,5	°C
Max. switching voltage	250/30	V AC / V DC
Max. switching current	5/5	A AC / A DC
Working humidity non condensing	0 – 90 %	RH
Working temperature	0 to +50	°C
Storage temperature	-20 to +60	°C
Expected lifetime	min. 10	years
Dimensions	90x80x31	mm

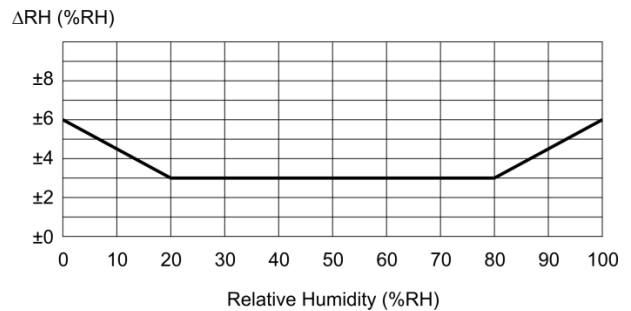
T sensor auto-calibration function

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

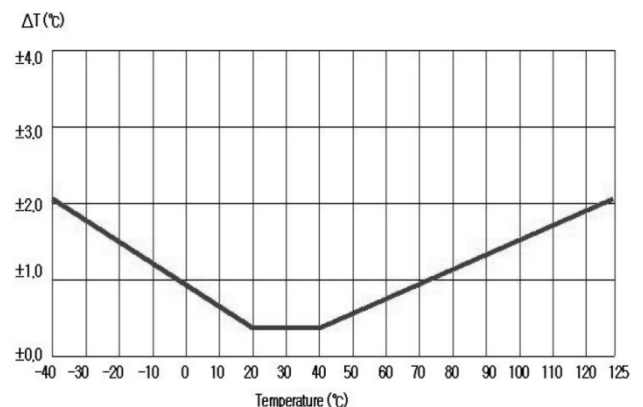
Selected analog output values versus RH concentration



Typical measurement accuracy RH at 25 °C



Typical measurement accuracy T:



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LED indication description



White LED lights:

Less than 40 % RH or less than 18 °C.

(according to the values selected for indication)

- low concentrations of RH. too dry air feels cooler person perceives as compared to the same hot air with high relative humidity, dryness of mucous membranes - respiratory problems
- keeping too low a temperature and the higher fluctuate is not economically profitable



Green LED lights:

More than or equal to 40 % RH or 18 °C

and less than or equal to 60 % RH or 22 °C.

(according to the values selected for indication)

- optimal relative humidity to human stay
- optimal balance of air quality and energy consumption for ventilation and air conditioning



Yellow LED lights:

More than 60 % RH or more than 22 °C.

(according to the values selected for indication)

- too high humidity, the risk of mold growth and associated health complications
- higher temperature T - High temperature can cause fatigue, restlessness, headache and feeling hot

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.

Failure indication sensor

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

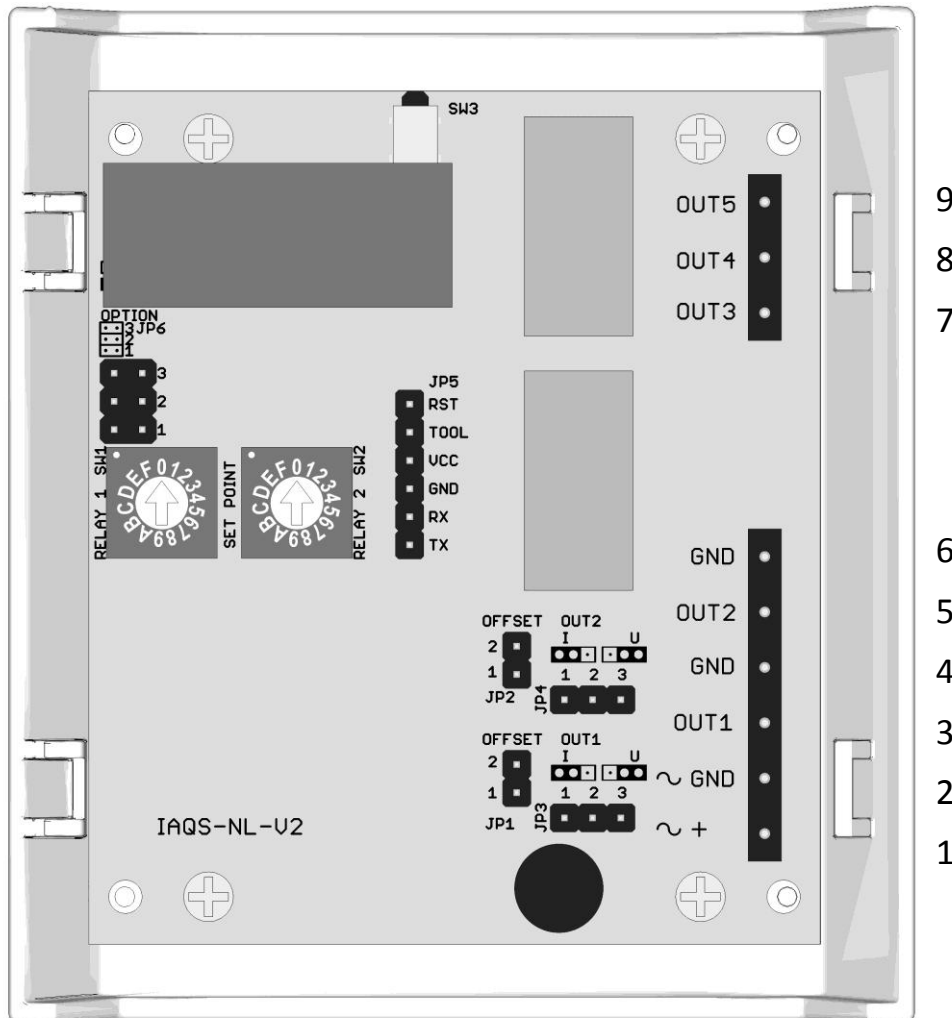
CAUTION:

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.



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Views electronic boards controls and terminals



Jumpers description

1. ~ + power AC or DC (+) plus pole
2. ~ GND power AC or DC (-) minus pole, GND
3. OUT1 T sensor analog output, 0-10 V or 0-20 mA or 4-20 mA
4. GND T sensor output
5. OUT2 RH sensor analog output, 0-10 V or 0-20 mA or 4-20 mA
6. GND RH sensor output
7. OUT3 NO relay 2 output, normally closed contact (T)
8. OUT4 C output relay, common contact
9. OUT5 NO relay 1 output, normally open contact (T)

Setting switching relay by rotary switch SET POINT

- RELAY 1 SW1** – level control switching for RH
RELAY 2 SW2 – level control switching for T

Jumpers on the electronics board

- JP1** – Current output offset RH
JP2 – Current output offset T
JP3 – Voltage/current output T
JP4 – Voltage/current output RH
JP6 – LED indication and switching settings



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Jumpers on the electronics board

Mark	Description	Settings	Significance
JP1	Current output offset RH - shift quiescent current from 0 mA to 4 mA	2 <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/>	current output RH 0-20 mA
		2 <input type="checkbox"/> 1 <input checked="" type="checkbox"/>	current output RH 4-20 mA
JP2	Current output offset T - shift quiescent current from 0 mA to 4 mA	2 <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/>	current output T 0-20 mA
		2 <input type="checkbox"/> 1 <input checked="" type="checkbox"/>	current output T 4-20 mA
JP3	Voltage/current output T - select the type of analog output - if the selected voltage output T, JP2 may not be short-circuited	1 2 3 <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	voltage output T
		1 2 3 <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	current output T
JP4	Voltage/current output RH - select the type of analog output - if the selected voltage output RH, JP1 may not be short-circuited	1 2 3 <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	voltage output RH
		1 2 3 <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	current output RH
JP6 - 1	Enabling LED indication	1 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/>	LED indication enabled
		1 <input type="checkbox"/> <input type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/>	LED indication disabled
JP6 - 2 JP6 - 3	Enabling cascade switching and switching settings according T or RH - if the selected standard mode switching, T and RH sensor control their every relay - if elected cascade mode switching, the chosen one sensor controls two relays according to the adjusted level of the rotary switch SET POINT (for both switches applies table according to the selected sensor)	1 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	standard mode switching switching and LED indication by RH
		1 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input type="checkbox"/> 3 <input checked="" type="checkbox"/> <input type="checkbox"/>	standard mode switching switching and LED indication by T
		1 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input checked="" type="checkbox"/>	cascade mode switching switching and LED indication by RH
		1 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input type="checkbox"/> 3 <input checked="" type="checkbox"/> <input type="checkbox"/>	cascade mode switching switching and LED indication by T

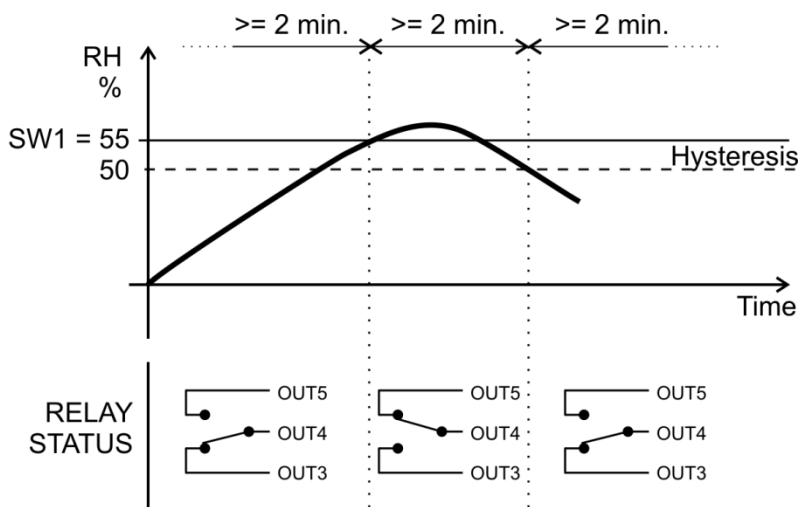


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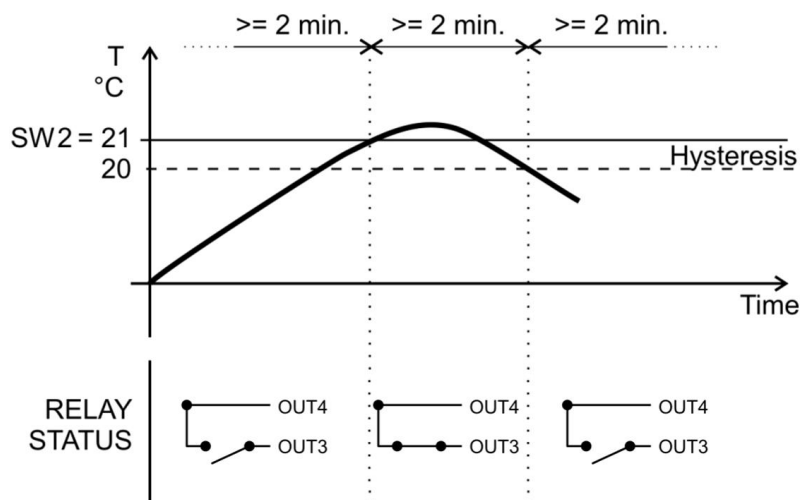
Setting the relay switching using rotary switch SET POINT

The relay switches on when the level measured variable rises above the level of the rotary switch SET POINT. The relay switches off when the level measured variable falls above the level of the rotary switch SET POINT minus hysteresis value of 5 % RH. Minimal lag between changes in state relays are 2 minutes.

Standard switching one relay (NLII-RH-R)

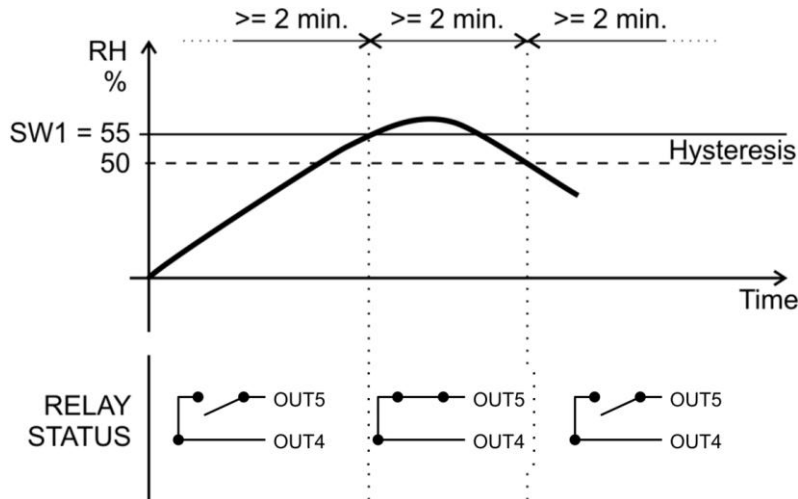


Standard switching with two relay for T (NLII-RH+T-R)

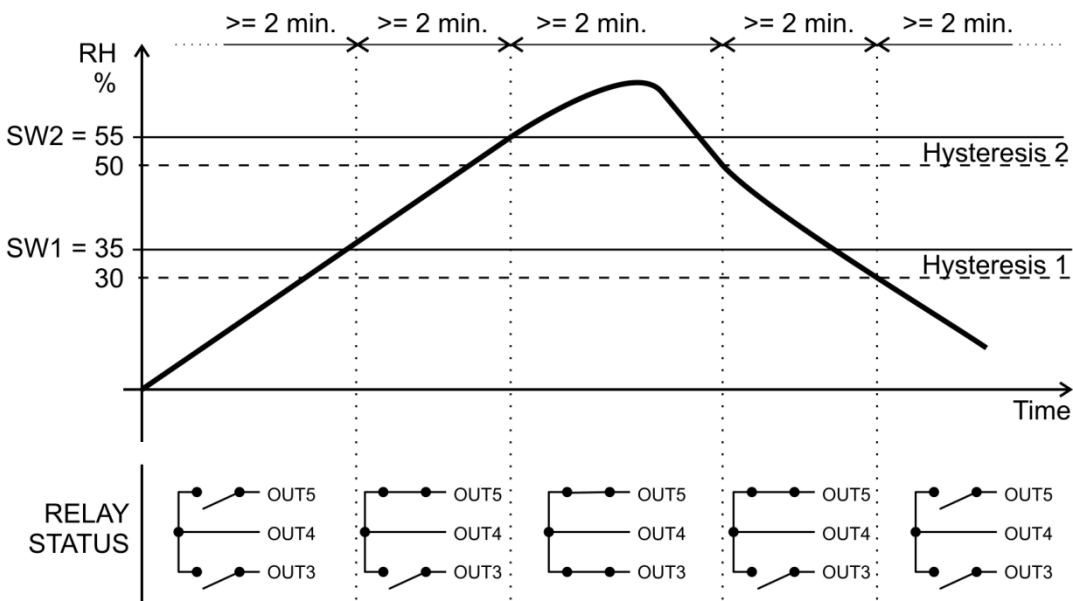


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Standard switching with two relay for RH (NLII-RH+T-R)



Cascade switch with two relays (NLII-RH+T-R)



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Setting switching levels

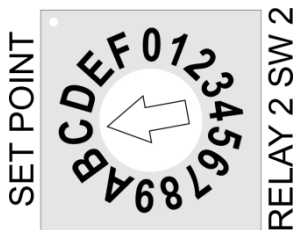
Required temperature T

SET POINT	T [°C]
0	10
1	11
2	12
3	13
4	14
5	15
6	16
7	17
8	18
9	19
A	20
B	21
C	22
D	23
E	24
F	25

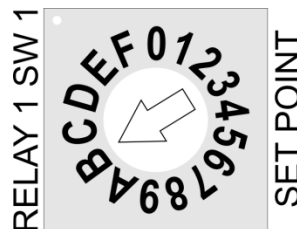
Required relative humidity (RH)

SET POINT	RH [%]
0	relay off
1	10
2	20
3	30
4	40
5	50
6	60
7	70
8	80
9	90
A	35
B	45
C	55
D	65
E	75
F	85

Example for setting the temperature to 22 °C:



Example for setting a relative humidity of 45%:



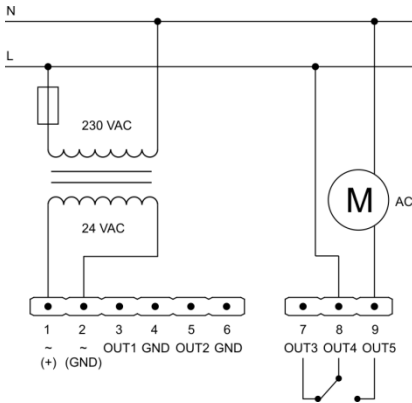
Factory settings

LED indication: RH
 T analog output: voltage output
 RH analog output: voltage output
 Relay switching mode: Standard
 Switching level T: 21 °C
 Switching level RH: 55%

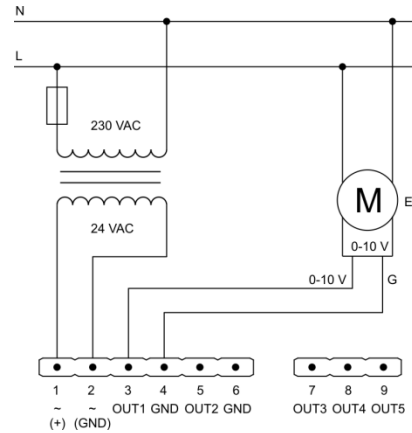


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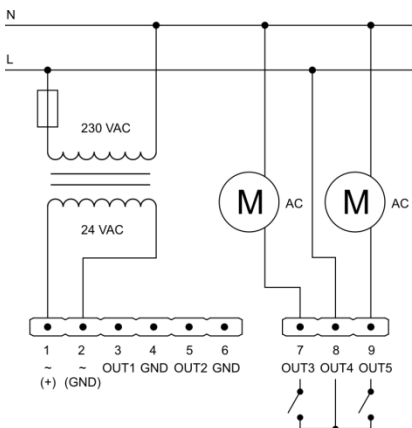
Example of sensor connection RH by one relay (1x switching contact)



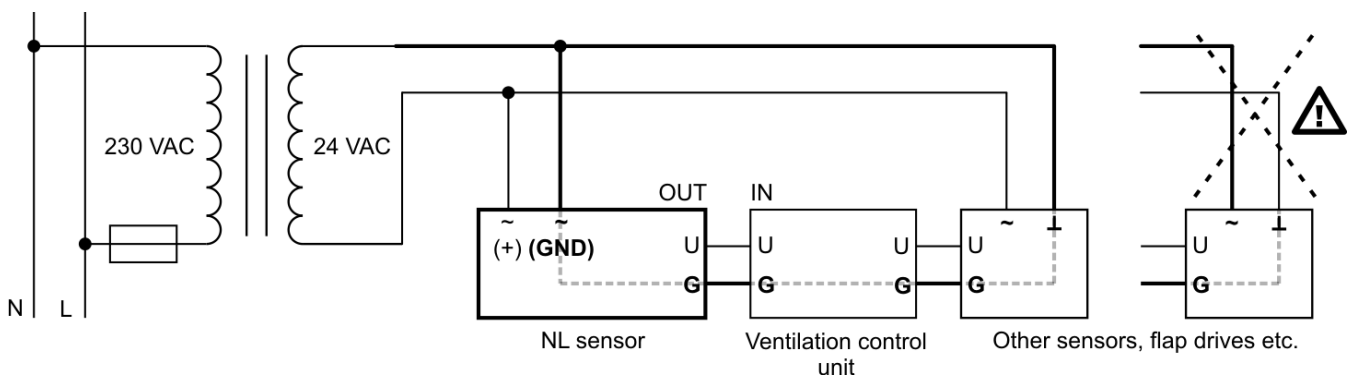
Example of sensor connection RH for direct EC motor control using signal 0-10 V



Example of sensor connection RH with two relays (2x NO/C)

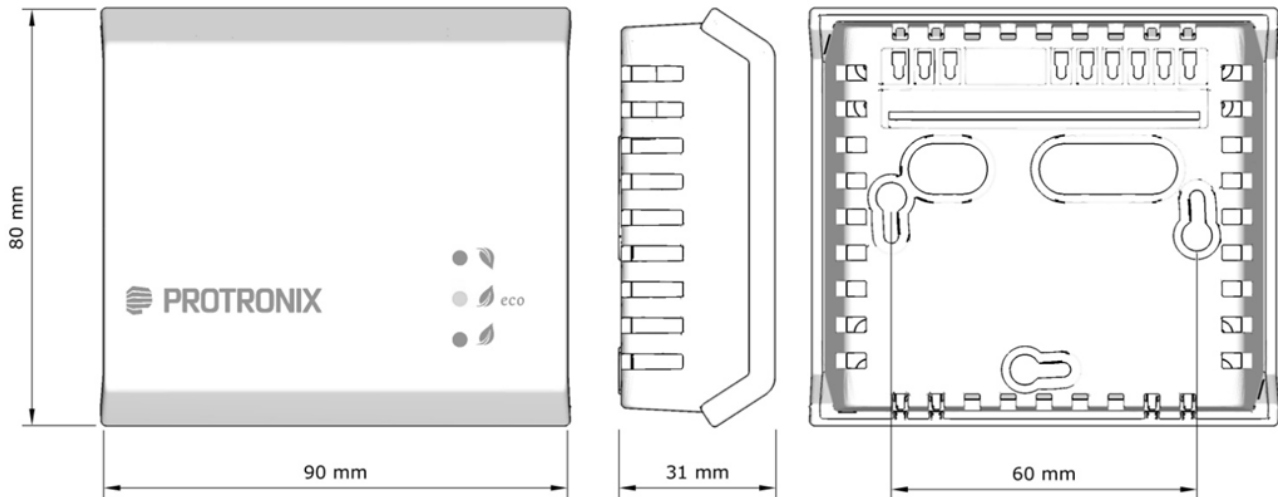


If you connect other devices to the same AC power source as the NL sensor, it is necessary to meet GND wiring of all analog inputs and outputs, as well as power wires.



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Dimensions



Sensor assembly



Box color

Front: White - RAL9016
Base: gray - RAL7035

Way to use

The product is intended for indoor use only.

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.

