

UT090

Room temperature and CO₂ sensor



Summary

The room temperature and CO₂ sensor contains a temperature measuring element and a NDIR CO₂ sensor for measuring of carbon dioxide concentration in rooms with variable load. The output signals are analogue signals of 2× 0..10 V DC.

Application

- Air handling units in rooms with variable load: schools, theatres, auditing halls etc..
- Monitoring and record of temperature and CO₂ concentration in interiors

This datasheet applies only to devices up to S/N: 182395.

Function

The temperature is measured by an internal sensor, signal of which is processed in a microprocessor, and converted to normalized analogue output signal. The CO₂ value is measured by a communicative NDIR module, and its digital signal is converted to analogue output as well.

Measuring range

The measuring range of the temperature sensor is fixed: 0 to +50 °C. The value is proportional to the signal of 0..10 V at the AO1 terminal. The CO₂ measuring range is 0...2000 or 0...5000 ppm, selectable by SW1, the measured value is a 0..10 V signal at AO2.

CO₂ autocalibration

Transportation and ageing may cause sensor drift. The sensor records the lowest reading and expects that at least once per 8 days the CO₂ concentration reaches the outside air level (400 ppm). The lowest measured value is then assigned the 400 ppm level. Autocalibration does not work if the room is occupied 24 hours a day, or there are no periods when the gas level drops to background (e.g. greenhouses). Then, the autocalibration function can be disabled by SW2. The autocalibration is set to ON by default.

During the first days of operation, until the first autocalibration, the sensor may read values which differ from the real values by several hundreds ppm, e.g. 200 ppm at night etc. This error is automatically corrected with the first autocalibration.

Installation

Units are intended for operating in a normal and chemically non-aggressive environment. They do not need any servicing or maintenance. Install them in a vertical position at places where they can be operated easily and measure correct values of temperature and humidity, i.e. in the height of about 150 cm, with no direct sunlight or other heat / cool source (AHU outlets, refrigerator, electrical appliances). The device consists of two parts: bottom with screw terminal block and cover containing PCB, display, and the knob. The bottom part is fixed by 2 or 4 screws to any flat surface or a flush-mounting box \varnothing 50 mm. At the back of the bottom there is an aperture for cabling. The bottom should be installed and cabling connected first, and the upper part inserted after the construction works have been finished to prevent damage to the unit.

Opening the cover

When removing the display part, proceed as follows:

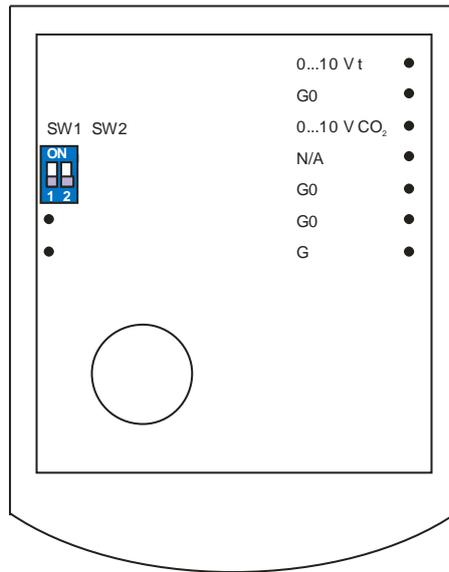
- press gently the side parts of the unit and pull the left of the display part by several millimeters
- pull the display part and remove it from the bottom.

Do not bend the display part too much, the connector pins could be damaged. The locks are only at the sides of the display part, not at the top nor bottom.

Technical data

Power supply Consumption	24 V AC +/- 10% or 16...35 V DC max. 3000 mVA
Temperature measuring range	0 ... 50 °C, \pm 0.5 °C
CO ₂ measuring range	0 ... 2000 ppm SW1 OFF (default), 0 ... 5000 ppm SW1 ON
CO ₂ measuring method	NDIR (Non-dispersive Infra Red)
CO ₂ measuring accuracy	\pm 30 ppm \pm 5 % of measured value
CO ₂ sensor response time (90 %)	60 s
CO ₂ sensor autocalibration	optional, active by default (SW2 ON)
Protection degree	IP20
Output	2x 0...10 V DC
Max. output current	2x 10 mA (with 1 kOhm load),
Short-circuit current	20 mA, permanently short-circuit proof
Resolution	12bit D/A converter
Terminals	screw terminals for wires 0,14 – 1,5 mm ²
Cover	ABS, RAL9010, other colours on request
Weight	0,15 kg
Dimensions	see below
CE-conformity	

Switches



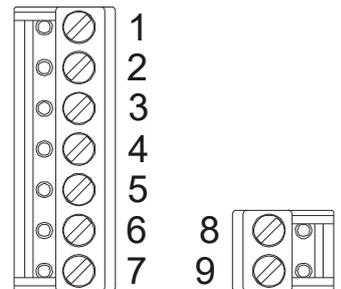
Back of the PCB

SW1	ON	CO ₂ measuring range 0...5000 ppm
	OFF	CO ₂ measuring range 0...2000 ppm (default)
SW2	ON	autocalibration active (default)
	OFF	autocalibration inactive

Terminals

As seen when removing the display part. The wiring goes towards the center of the unit so that the cable can be brought through the aperture in the middle of the bottom part.

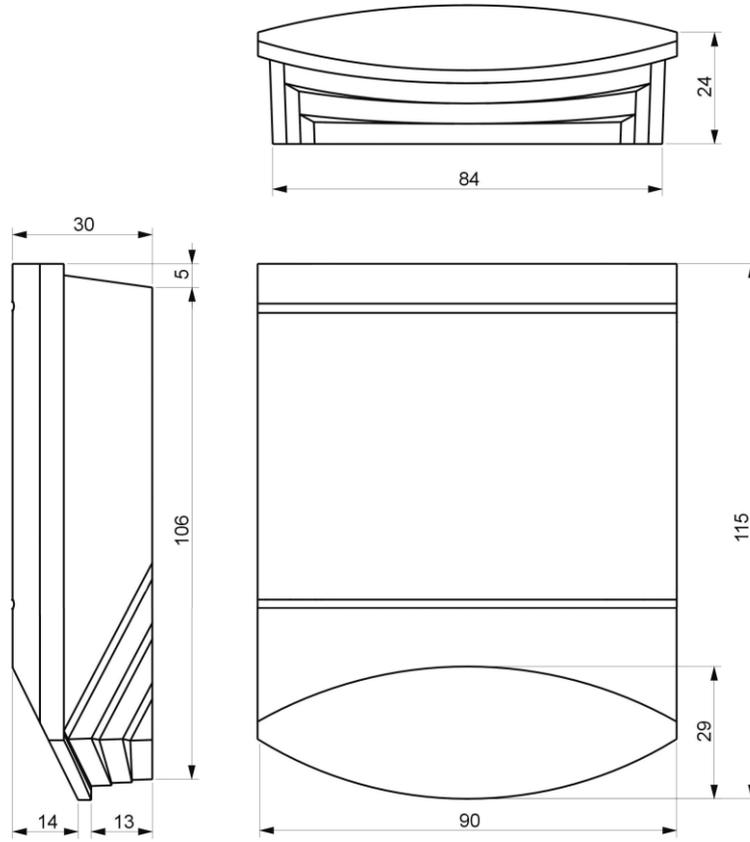
1: T	output: temperature 0...10V against G0
2: G0	power (-), output reference point
3: CO2	output: CO ₂ 0...10V against G0
4: N/A	not used
5: G0	power (-), output reference point
6: G0	power (-), output reference point
7: G	power (+)



Related products

UT001	Pt1000 room temperature sensor
UI09...	communicative room units with t, rH, CO ₂ sensors

Dimensions



05/2020 Subject to technical changes.