

- long-term stability - NDIR sensor
- maintenance-free operations
- measuring the concentration of CO2 with an output signal of 0 ÷ 10V
- measuring temperature with an output signal of 0 ÷ 10V, by a passive sensor
- temperature control via built-in comparator (relay)
- the possibility to regulate CO2 built-in comparator with an output switch relay
- very compact and a space-efficient design
- mounting on the wall or on the installation box

These sensors are designed for measurement CO2 concentration, and temperature in interior.

The output of the CO2 concentration is the voltage signal, 0 ÷ 10V in a range of 0 ÷ 2000ppm and possible relay outputs of the comparator, which is adjustable in the range of 400 ÷ 2000ppm with 200ppm hysteresis switching.

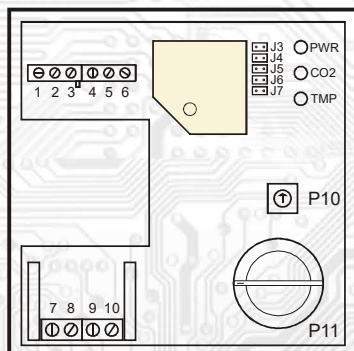
The output of the temperature is the voltage signal, 0 ÷ 10V in a range of 0 ÷ 50 °C or 0 ÷ 35 °C and possible relay outputs of the comparator, which is adjustable in the range of 14 ÷ 30 °C with 0,5 °C hysteresis switching.

If the temperature neither requires a relay output nor a voltage signal, the instrument may be equipped with a passive temperature sensor (Pt100, Pt1000, Ni1000) or it may not have the option to measure temperature. If passive temperature sensors are used, it is to be assumed that due to the internal warming of the instrument by its own power (higher energy demands of the CO2 sensors), the sensor is heated by up to +2°C. Therefore, it is recommended to measure the difference in temperature after approx. 60 minutes of operations and enter this difference as a correction into the system. If a voltage signal and comparator is used, a certain correction is already included in the calibration of the instrument (specifically 2.0°C). Setting the comparator level for the CO2 switch relay is done with a trimmer accessible after removing the lid of the instrument by a suitable instrument (a flat screwdriver). For example, if the trimmer is rotated with the arrow to the centre of the scale, the relevant relay will switch on (the CO2 LED will switch on) if the measured CO2 level exceeds 1200ppm and the LED switches off once the CO2 level drops below 1000ppm. This applies if the negation switching the J3 connector is not selected. In this case, the logic of switching would be the opposite under the same CO2 concentration levels. Setting the comparator level for the switching relay of the temperature is done by setting the control buttons to the required value. For example, if the arrow is rotated to 22°C, the relevant relay (the LED TMP light will switch on) will switch on once the measured temperature level exceeds 22.25°C and will switch off once the level drops below 21.75°C. This applies if the negation switching the J4 connector is not selected. In this case, the logic of switching would be the opposite under the same temperature levels.

Technical parameters:

Supply voltage (Ucc)	24 VDC ±20%
Power consumption/ peak (<200ms)	35mA / 170mA
Accuracy - CO2 (range 0 - 2000ppm)	±30ppm ±5% of the scale
Accuracy - temperature (temperature = 0 - 10V)	±2°C
Time of stabilization	1 hour
CO2 range (0 ÷ 10V)	0 ÷ 2000 ppm
Standard temperature range (0 ÷ 10V)	0 ÷ 35 °C 0 ÷ 50 °C
Load impedance of voltage outputs (Rz)	> 50kΩ
Setting range of CO2 comparison	400 ÷ 2000 ppm
CO2 comparison hysteresis	200 ppm
Range of temperature comparison	14 ÷ 30 °C
Hysteresis of temperature comparison	0,5 °C
Max. switching voltage / current	50VAC, 100VDC / 6A
Accuracy temperature	Sensor Pt...class B, EN60751 Sensor Ni....class B, DIN43760
Recommended/Max. measurement current	Pt1000, Ni1000 0,1mA / 1mA Pt100 1mA / 5mA
Galvanic separation of voltage output	no
Galvanic separation of relay output	yes <250V
Range of recommended working temp	0 ÷ 50 °C / 0 ÷ 95%RH without condensation
Range of recommended storage temp. / RH	-20 ÷ 50 °C / 0 ÷ 95 %RH without condensation
Protection type	IP40
Type of terminals for voltage signals and power supply	CPP (wires max. 1 mm ²)
Terminal Block Type of Relay Switch Contacts	COB (wires. 1.5 mm ²)
Dimensions (V x Š x H)	85 x 85 x 24 mm

Connection plan (fig. 1):



Terminal 1.....+Ucc, positive pole
Terminal 2.....GND, negative pole
Terminal 3.....common pole of output CO2 (GND)
Terminal 4.....positive pole of output CO2 (0-10V)
Terminal 5.....common pole of output temperature (GND)
Terminal 6.....positive pole of output temperature 0÷10V or resistance output of CO2 sensor.
Terminal 2, 3 and terminal 5 are galvanically connected

Terminals 7, 8.....switch contacts of the CO2 comparator relay
Terminals 9, 10.....switch contacts of the temperature comparator relay

P10.....setting a comparison level of CO2 concentration (range 400 ÷ 2000ppm)
P11.....setting a comparison level of temperature (range 14 ÷ 30 °C)

J3.....negating the relay output of CO2. The relay will switch with a lower CO2 concentration than that set by the P10 trimmer

J4.....negating the relay output of temperature. The relay will switch with a higher temperature than that set by the P11 trimmer

J6.....ACDL (Automatic Calibration in Dimming Light mode)

J7.....MCDL (Manual Calibration in Dimming Light)

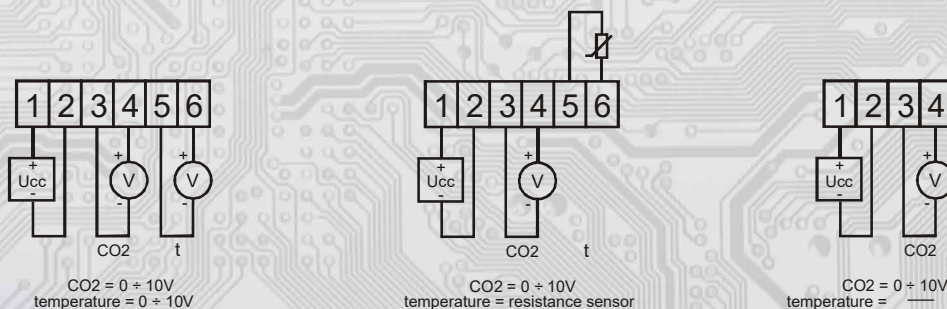
List of available types:

Type	CO2 - transmitter	CO2 comparator,	temperature - transmitter,	temperature - comparator
CTUR2 - 2K - 0 ÷ 50	0÷2000ppm=0÷10V	400 ÷ 2000ppm	0÷50°C = 0÷10V	14 ÷ 30°C
CTUR2 - 2K - 0 ÷ 35	0÷2000ppm=0÷10V	400 ÷ 2000ppm	0÷35°C = 0÷10V	14 ÷ 30°C
CTUR1 - 2K - 0 ÷ 50	0÷2000ppm=0÷10V	400 ÷ 2000ppm	0÷50°C = 0÷10V	---
CTUR1 - 2K - 0 ÷ 35	0÷2000ppm=0÷10V	400 ÷ 2000ppm	0÷35°C = 0÷10V	---
CTUR1 - 2K - x	0÷2000ppm=0÷10V	400 ÷ 2000ppm	Resistance sensor	---
CNUR1 - 2K	0÷2000ppm=0÷10V	400 ÷ 2000ppm	---	---
CNUR0 - 2K	0÷2000ppm=0÷10V	---	---	---

List of type of resistance sensors....x

Type of resistance sensor	Placement after x (eg CTUR1-2K-PA)
Pt 100 / 3850 ppm	P
Pt 1000 / 3850 ppm	PA
Ni 1000 / 6180 ppm	S
Ni 1000 / 5000 ppm	L
Ni 891 / 6371 ppm	J
Ntc 20kΩ	H

Connection (fig. 2):



The function of the automatic calibration (ACDL) and the manual recalibration (MCDL):

The CO2 sensor contains optical elements, which "age" during operations and the sensor loses its accuracy. In normal living rooms, where occasional complete air exchange of the room is assumed, ageing is compensated by setting the ACDL mode, which is the automatic calibration function. This function is activated by a permanent short-circuit of the J7 connector, when the first automatic calibration takes place after 3 days and then after every week.

In areas, where it is not possible to use the automatic calibration function, it is advisable to occasionally use the manual recalibration function. This is done by placing sensors with a connected voltage supply into the ventilated area, preferably into an outdoor environment (CO2 content = approx. 400ppm) for at least 30 minutes. Then, the J7 connector is short-circuited for 10 minutes. After 10 minutes, the connector is disconnected and the sensor works with modified values. The sensor must be placed in a ventilated area for the duration of the recalibration.

The instrument is supplied calibrated from the manufacturer without any set mode. It is up to the user to choose how the calibration will take place. The majority of the users use the optimal automatic calibration function (ACDL), thereby connected to J6.

Assembly and connection

The devices are designed for direct wall mounting or mounting on installation box. The electrical connection of the conductors is done on the terminal according to Fig. 1 and 2 for the power supply and voltage outputs using a conductor with a max. cross-section of 1mm² and for relay outputs using a conductor with a max. cross-section of 1.5 mm². After connecting the terminals, the P10 trimmer is set to the required comparator levels of CO2 concentration and fit the front cover.

Method of ordering

State the quantity of pieces and the sensor

Type in the order: An example of an order: 5 pieces sensor CTUR1-2K-PA

└ temperature (sensor Pt1000)

└ CO2 concentration (output 0 - 10V) with comparator