CO2 concentration and temperature duct sensor with voltage output - type PCTU12

- 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 or without measuring the temperature
- very compact and a space-efficient design
- easy assembly into air-conditioning ducts

The sensors are designed to measure the concentration of CO2 and the air temperature with aggressive admixtures in the air-conditioning ducts. The output concentration of CO2 is the 0 ÷ 10V voltage signal. The output of the measured temperature may be a voltage signal of 0 ÷ 10V, a passive resistant output (Pt100,Pt1000, Ni1000...) or the instrument may not have the possibility to measure temperature.

The temperature sensor is located in the plastic ABS stem. The CO2 sensor is located inside the plastic head, into which the measured air is fed through the openings in the stem. Therefore, the openings must be directed in the direction of the airflow in the air-conditioning duct, as shown on the lid of the head. The electronics with the terminals are located on the board connector inside the plastic, polycarbonate, grey head. The sensors include a plastic central holder for mounting the sensors on the wall of the air-conditioning duct. In air-conditioning ducts with an increased level of dust, it is advisable to sometimes clean the inside of the head with the electronics and the cavities of the plastic stop from accumulated dust using dry, compressed air.

List of available types:

Types of outputs	CO2 = 0 ÷ 10V , temperature = 0 ÷ 10V	CO2 = 0 ÷ 10V , temperature = resistance sensor	CO2 = 0 ÷ 10V, temperature = NO
CO2 = 0 ÷ 2000ppm	**PCTU12 - 2K - L1**	**PCTU12 - 2K - x - L1**	**PCNU12 - 2K - L1**
CO2 = 0 ÷ 5000ppm	**PCTU12 - 5K - L1**	**PCTU12 - 5K - x - L1**	**PCNU12 - 5K - L1**
CO2 = 0 ÷ 10000ppm	**PCTU12 - 10K - L1**	**PCTU12 - 10K - x - L1**	**PCNU12 - 10K - L1**

Standard lehgth L1:

180 mm
240 mm

Standard temperature ranges for 0 ÷ 10V output:

-30 ÷ 60 °C
0 ÷ 35 °C
0 ÷ 50 °C
0 ÷ 100 °C

List of type of resistance sensors....x

Type of resistance sensor	Placement after x (PCTU12 -2K -PA-180)
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**

Basic technical parameters:

Supply voltage (Ucc)	15 to 30 VDC
Power consumption/ peak (<200ms)	0,37VA / 3,7VA
Accuracy - CO2 (range 0 - 2000ppm)	±30ppm ± 5% out of range
Accuracy - temperature (temperature = 0 - 10	±1% out of range
Accuracy - temperature (temperature = sensor)	Ni: class B; DIN43760 Pt: class B; EN60751
Recommended/Max. measurement current (temperature = sensor)	Pt1000, Ni1000 0,1mA / 1mA Pt100 1mA / 5mA
Load impedance of voltage outputs (Rz)	> 50kΩ
Time of stabilization	30 minutes
Galvanic separation of output	no
Range of recommended working temp./ RH	0 ÷ 50 °C/ 0 ÷ 95% RH without condensation
Range of recommended storage temp. / RH	-20 ÷ 60 °C/ 0 ÷ 95% RH without condensation
Protection type of stem	IP20
Protection type of head	IP65
Terminal board	CPP (wires max. 1 mm^2)
Cable gland	PG9 / 8 mm

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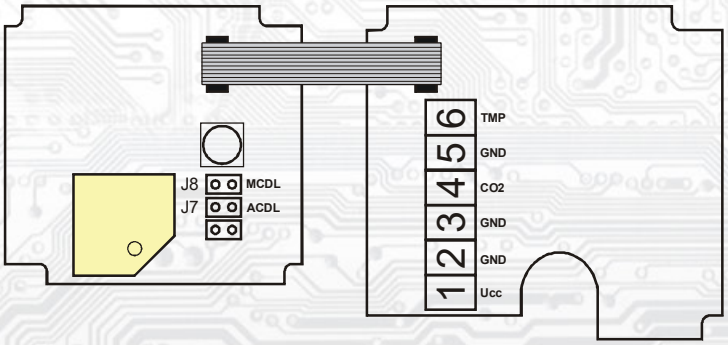
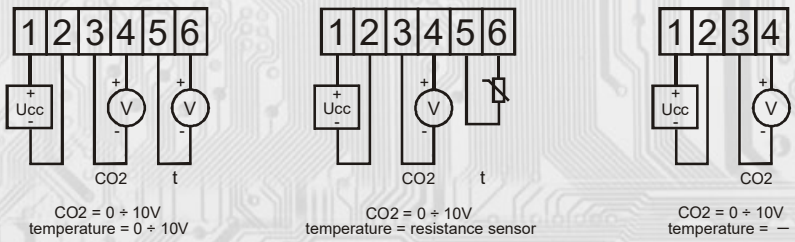
Connection plan (fig.1):



J7… ACDL (Automatic Calibration in Dimming Light mode)
J8… MCDL (ManualCalibrationin Dimming Light)

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

Connection (fig. 2):



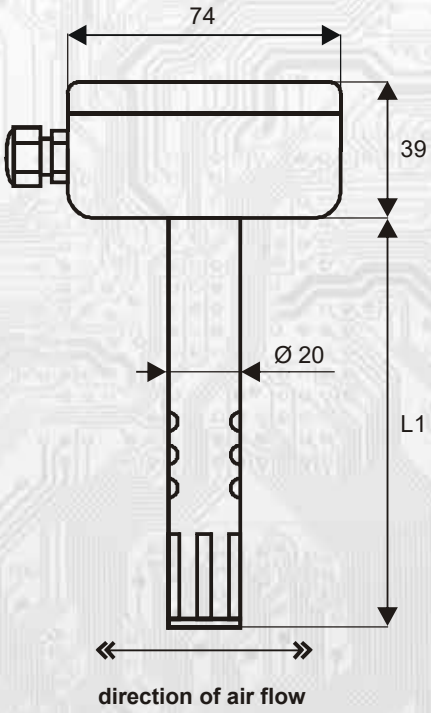
The function of the automatic calibration (ACDL) and the manual recalibration (MCDL):

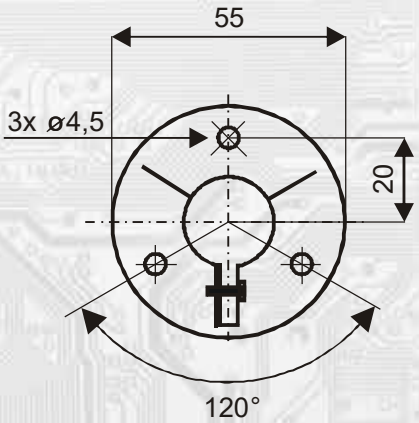
The CO2 sensor contains optical elements, which "age" during operations and the sensor losses its accuracy. In normal living rooms, where occasional complete air exchange of the room is assumed, ageing is compensated by setting the ACDL mode, which is the automatic calibration function. This function 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 J8 connector is short-circuited for 10 minutes. After 10 minutes, the connector is disconnected and the sensor works with modified values. The senor 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 J9.

Assembly and connection:

The sensors are designed to be assembled into air-conditioning ducts using the attached consoles. The air flow direction must be maintained according to the sticker on the lid in order to ensure air supply to the CO2 sensor inside the box. The wires are connected to a terminal bosrd (Fig. 1 and 2), which can be accessed by removing the screws and head cap.

Dimensions and accessories:





Method of ordering:

State the quantity of pieces and the sensor type in the order
An example of an order: 5 pieces sensor PCTU12-2K-PA-180

- Stem length (180mm)
- Temperature (sensor Pt 1000 / 3850 ppm)
- Range of concetration CO2 (0 ÷ 2000ppm)