

CO2-M/A

## Multifunctional Air Quality Sensor for CO<sub>2</sub>, Mixed Gas VOC, Humidity and Temperature with Measuring Range Changeover



The multifunctional air quality sensor CO<sub>2</sub>-M/A measures the CO<sub>2</sub> concentration in the ambient air in the range of 0–10000 ppm (NDIR), mixed gas VOC in the range of 0...100% based on the calibration gas, the temperature and optionally the relative humidity, absolute humidity, mixing ratio or the dew point temperature of the ambient air.

The transducer converts the respective measurement results for further processing into a linear output signal 0–10 V or 4–20 mA. Furthermore, the device has a potential-free changeover contact. For which measured value this output is used, can be set individually by innovative DIP switch technology.

The CO<sub>2</sub> concentration is measured by a non-dispersive infrared sensor (NDIR). There are 3 different CO<sub>2</sub> scales (0–2000 ppm, 0–5000 ppm, 0–10000 ppm) to choose from, which can be switched as required by innovative DIP switch technology.

The relative humidity and temperature is measured by a capacitive humidity sensor. There are 4 different temperature ranges (–30...+70°C, –20...+80°C, 0...+50°C, 0...+100°C) as well as 4 different humidity measurement category (% r.H., g/m<sup>3</sup>, g/kg, TP °C) to choose from, which can be switched as required by innovative DIP switch technology.

The CO<sub>2</sub> and VOC zero point adjustment in response to the current environmental conditions can be started manual on the device at any time. The multifunctional air quality sensor starts in regular intervals an automatic re-calibration procedure, whereby a long-term stable CO<sub>2</sub> and VOC measurement is ensured.

### Specifications:

<b>Measurement range CO<sub>2</sub></b>	0–10000 ppm, scales 0–2000/5000/10000 ppm by DIP-switch selectable
<b>Measurement range VOC</b>	0...100% (good / bad air quality, referring to the calibration gas)

<b>Measurement range r.H.</b>	0...100% r.H.
<b>Measurement range abs. humidity</b>	0...50 g/m <sup>3</sup> , 0...80 g/m <sup>3</sup> (calculated) selectable by DIP switch
<b>Measurement range air fuel ratio</b>	0...50 g/kg, 0...80 g/kg (calculated) selectable by DIP switch
<b>Measurement range dew point</b>	-20 up to +50°C DP, -20 up to +80°C DP, 0 up to +50°C DP (calculated) selectable by DIP switch
<b>Measurement range temp.</b>	-30...+70°C, -20...+80°C, 0...+50°C, 0...+100°C selectable by DIP switch
<b>Accuracy</b>	CO <sub>2</sub> : 0-2000 ppm: ±50 ppm + 2% f. mv, 0-5000 ppm: ±50 ppm + 3% f. mv, 0-10000 ppm: ±100 ppm + 5% f. mv; VOC: ±15% FS; Humidity: ±3% r.H. (30%...70% r.H., else ±5% r.H. at 20°C); Temperature: 0,5 K (at 15...35°C, else ±1 K); all specifications at 20°C, 1013 mbar, auto-calibration ON;
<b>Temperature dependency</b>	CO <sub>2</sub> : ±5 ppm / K, Humidity: ±0,04% r.H. / K; Temperature: ±0,1°C / 10 K
<b>Pressure dependency</b>	CO <sub>2</sub> : 1,6% f. mv/kPa (compensated optional);
<b>Response time (t<sub>90</sub>)</b>	< 5 min
<b>Long term stability</b>	±1% FS/year
<b>Sensor</b>	CO <sub>2</sub> : Non-dispersiver Infrarot Sensor (NDIR); VOC: metal oxide sensor; Humidity/Temperature: capacitive humidity sensor
<b>Sensor protection</b>	sinter filter
<b>Running-in time</b>	10 min
<b>Supply voltage</b>	24 V AC/DC (±5%)
<b>Current consumption</b>	Ø 100 mA
<b>Analogue output 0-10 V</b>	3-wire connection
<b>Alarm output</b>	potential-free change-over contact max. 48 V (1 A), threshold can be defined by 270° potentiometer
<b>Electrical connection</b>	screw terminals max. 1,5 mm <sup>2</sup>
<b>Housing</b>	polyamide with snap closing screws, colour white like RAL 9010
<b>Cable gland</b>	PG11 high-strength cable gland with strain relief

<b>Dimensions</b>	Housing: L 150 x W 80 x H 62 mm
<b>Protection type</b>	IP65
<b>Protection class</b>	III
<b>Working range r.H.</b>	0...98% r.H. in contaminant-free, non-condensing air
<b>Working temperature</b>	0...+50°C
<b>Storage temperature</b>	-20...+50°C
<b>Initial operation</b>	After switch-on of the device follows a self-test and the tempering, which takes ca. 10 minutes depending on the environmental conditions. At this time the analogue output drifts from the actual measurement value.
<b>Automatic calibration</b>	To ensure an excellent long-term stability, in the interval of ca. 7 days (CO2) respectively ca. 20 days (VOC) starts an automatic recalibration. Through this automatic calibration possible drifts are compensated. This feature can be disabled on the device by DIP switch.
<b>Manual calibration</b>	The manual calibration of the output signal to 400 ppm (CO2 zero point) respectively 1 V (VOC zero point) will be started by pushing the button on the circuit board (push ca. 5 s until LED is blinking). Before this it is to ensure a non-stop operating of min. 10 minutes on fresh air. After successful calibration the LED will be deactivated.
<b>Installation</b>	screw fastening
<b>Approvals</b>	CE-conformity, EAC, RoHS

SKU	Description	Version CO2
CO2-M/A-UD	CO2: 0-2000/5000/10000 ppm (0-10V) VOC: 0-100% (0-10 V) Humidity: 0...100% r.F. (0-10 V) Temperature: -30...+70°C/-20...+80°C/0...+50°C/0...+100°C (0-10 V)	with Display