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UMSITEC
Umwelt- und Sicherheitstechnik

# OPERATING INSTRUCTION GAS SENSOR GMF 402 E

**GMF 402 E**

## Attention!

**The devices may only be operated if this operating instruction has been understood and is applied.**
**The annex "Safety for installers and operators" must be observed!**

## Sensoric

The sensor GMF 402 E is operated with electrochemical sensors, whose signal is converted to the measured current range of 4-20mA.

The sensor provide a corresponding output signal, which can generate in an evaluation unit via a load resistor to ground an usable voltage signal.

## Mounting

**The sensor is suitable for a wall or ceiling mounting.**

## Sensor connection

In order to supply the gas sensor GMF 402 E an unregulated DC voltage from 12.5 - 30V is required. The maximum load at 12.5 volts ist 400 ohm.

The shielded cable JY ( St) 2x2x0.8 mm have to be used as sensor supply cable.
The wire colors must be assigned as follows :

red = > +24 V ( K 1 ), white => 4 - 20mA (class 2 ), yellow => shielded (housing)

**If the sensor is mounted to masonry, the drain wire on the evaluation unit must be twisted with the yellow wire to be connected to terminal 4 (PE conductor).**

The drain wire on the sensor must be connected to the metal housing.

CAUTION: **When installing, make sure that bare cable end and the bare drain wire be covered with insulation and cannot come into contact with the circuit.**
Is the metal housing mounted on grounded steel beams, the drain wire and the wire for terminal 4 (PE) must not be connected on the evaluation unit.

## Adjustment

Electrochemical sensors must have been in operation about 1 hour, so that you can start with the adjustment.
The test gas shall be the ambient temperature, that means the same temperature as the sensor.

## Maintenance aids

Voltage meter 0-20 V
Screwdriver
Calibration gas
Gas control valves (flow controller, flow measure 0-1 liters / min)
Gas feeding adapter

## Adjust zero point

1. The zero point is adjusted by moving the jumper plug to "N".

2. 4mA zero-point adjustment:

   Set the trimmer "N" so that you can measure at the measuring pin "MP2"
   a voltage of 0.40 volts.
   This corresponds to a measuring loop current of 4mA.

The jumper is replugged then to the operating position **"B"**, that means the sensor signal is on now.

In addition zero gas (synthetic air) can be feeded in order to compensate the neutral current of the sensor. For this purpose the trimmer **"N**" is readjusted until the voltage at the measuring pin **"MP2**" is again exactly 0:40 volts.

## Reinforcement adjustment

Enter now for a gas concentration and set the voltage to the measuring pin "MP2" with the trimmer "V" on a value to be calculated.

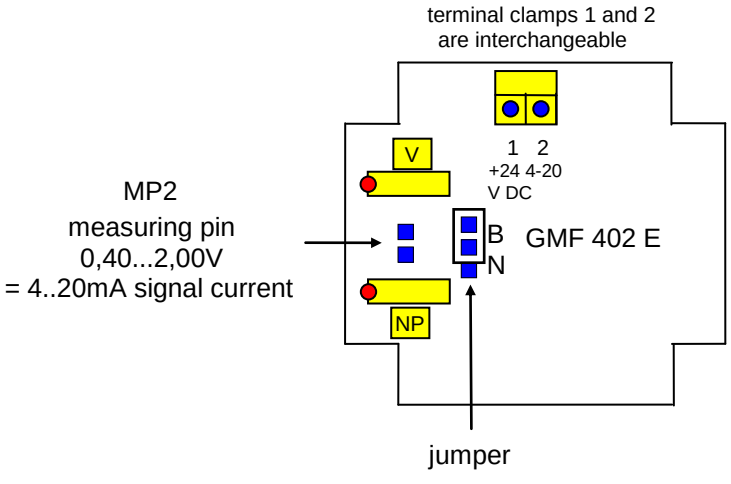
The value is calculated by the following formula:

Umeas = 1.6 volt * gas concentration / measuring range + 0.4 volt

(For example, 200 ppm CO at a range of 300 ppm: 1.466 volts
for 20.9 vol% oxygen at a range of 25 vol%: 1.738 volts)

The zero point is slightly affected when changing the gain adjustment
It should be followed up.

## Connection diagram and position of the potentiometer of the GMF 402 E



## Table values for output signals

**Measuring range 0...100 ppm:**

| Concentration: | **0 ppm** | 10 ppm | 20 ppm | **25 ppm** | 30 ppm | 40 ppm | **50 ppm** | **75 ppm** | **100 ppm** |
|---|---|---|---|---|---|---|---|---|---|
| Measuring current: | **4 mA** | 5,6 mA | 7.2 mA | **8,0 mA** | 8.8 mA | 10.4 mA | **12,0 mA** | **16,0 mA** | **20.0 mA** |
| Pins MP2: | **0.400 V** | 0.56 V | 0.72 V | **0.80 V** | 0.88 V | 1.04 V | **1,20 V** | **1,60 V** | **2.000 V** |

**Measuring range 0...300 ppm:**

| Concentration: | **0 ppm** | **30 ppm** | 40 ppm | 50ppm | **60 ppm** | 80 ppm | **100 ppm** | 250 ppm | **300 ppm** |
|---|---|---|---|---|---|---|---|---|---|
| Measuring current: | **4 mA** | **5,6 mA** | 6,13mA | 6,67mA | **7,2 mA** | 8,27mA | **9,33 mA** | 17,33mA | **20.0 mA** |
| Pins MP2: | **0.400 V** | **0.56 V** | 0.613 V | 0.667 V | **0.72 V** | 0,827 V | **0,93 V** | 1,733 V | **2.000 V** |

**Measuring range 0...1000 ppm:**

| Concentration: | **0 ppm** | 100 ppm | 200 ppm | **250 ppm** | 300 ppm | 400 ppm | **500 ppm** | **750 ppm** | **1000 ppm** |
|---|---|---|---|---|---|---|---|---|---|
| Measuring current: | **4 mA** | 5,6 mA | 7.2 mA | **8,0 mA** | 8.8 mA | 10.4 mA | **12,0 mA** | **16,0 mA** | **20.0 mA** |
| Pins MP2: | **0.400 V** | 0.56 V | 0.72 V | **0.80 V** | 0.88 V | 1.04 V | **1,20 V** | **1,60 V** | **2.000 V** |

## Commissioning

**The setting of the sensor must be checked during commissioning by a test gas feeding.**

## Maintenance

In order to maintain the functional reliability, maintenance at certain intervals is required.
The maintenance interval can be seen from the test sticker on the controller. There is a maximum of 1/2 year.

## Decommissioning

Is the sensor for longer than 4 weeks out of operation, it must be checked after a week uptime with test gas or be recalibrated if necessary.

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Subject to technical changes