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UMSITEC
Umwelt- und Sicherheitstechnik

OPERATING INSTRUCTIONS GAS SENSOR GMF 200 H

GMF 200 H for combustible gases
lighter than air heavier than air

GMF 200 H for refrigerants

Important!

The manual „Safety for Installers and Operators“ must be observed!
If not supplied with this manual, please request for information.

Sensor Technology

The sensor GMF 200 is powered by semiconductor sensors.
The sensor signal is converted to the measured current range of 4-20mA.

The sensor gives a corresponding output signal, which can generate a usable voltage signal at an evaluation device via a load resistor to ground.

The sensor cell must be heated that it can react to gases.
The heating current for the cell is depends on sensor and ranges from 80 to 200 mA at 5 V DC.

Sensor Connection

The gas sensor GMF 200 can be operated with an unregulated DC voltage of 8-36V.

As sensor feed line the shielded cable JY (St) 2x2x0.8 mm can be used.
The wire colors can be assigned as follows:

Red => + 24V (cl 1) white => 4-20mA (Cl 2), Black => 0 V (cl 3) yellow => PE (cl 4)

The drain wire at the evaluation unit must be twisted with the yellow wire and be connected to terminal 4 (PE conductor). The drain wire is connected in the cable with the shield.

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

CAUTION: **When installing, make sure that bare wire and bare drain wire are coated with an insulating and can not come into contact with the circuit.**

Is the metal housing mounted on grounded steel beams, the drain wire and the wire for clamp 4 (PE) must not be connected to the evaluation device.

Adjustment

The sensor which has to be adjusted must be 1 week in operation, so that it has stabilized, after you can start with the adjustment.

The sensors can be adjusted on two curve points:
2 alarm points or alarm + zero point

Aids

Voltmeter 0-20V
Screwdriver
Zero gas (synthetic air)
Calibration gas
Gas supply fittings (flow controller, flow meter 0-1 liter / min)
Gas supply adapter

1. Adjustment Curve point 1

Enter the gas concentration of alarm point 2 (main alarm) and adjust the voltage to the measuring pins "MP1" with the trimmer "P1" on 0,00..1,00 mV.
The gas flow rate should be approx. 0.2 liter/min. The gas temperature should correspond to the room temperature.

2. Adjustment 4-20 mA

Now set the trimmer "P2" so that you are able to measure the test gas concentration at the measuring pins “MP2” a voltage corresponding to the table value (see below).
(For example, for 40% LEL: 1,412 volts from the table of values)

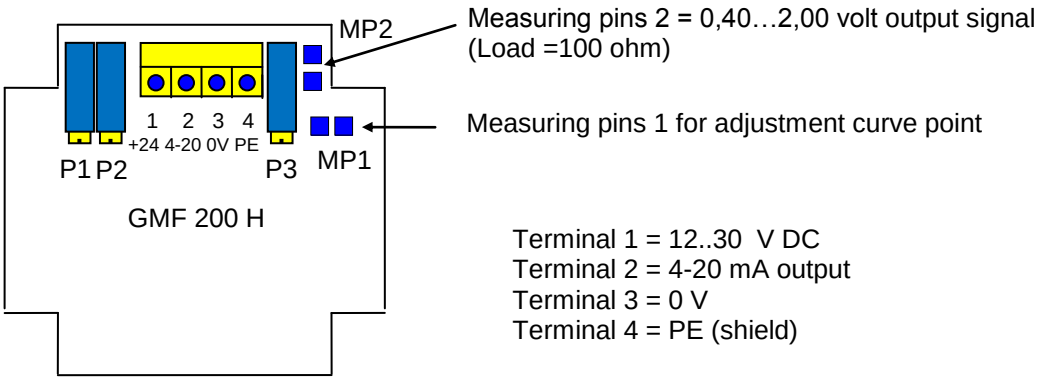
3. Adjustment zero point resp. adjusting curve point 2

Please make sure, that the sensor is applied for a few minutes without gas concentration or enter by means of a gas supply adapter with diffuser zero gas (synthetic air) and adjust the trimmer "P3" so that displays on the measurement indicator the signal conditioning 0,00 or at the measuring pin MP2 of the sensor is to be measured a **voltage** of 0.4 volts.
The signal curve of the sensor corresponds thereby
- exactly at setpoint 2
- and exactly at the zero point
the values of the evaluation table.

Alternative to the zero point, a gas concentration is to be applied to the corresponding switchpoint 1 and the sensor signal with "P3" is to be set to the table value of switching point 1

If the first curve point calibration done accurately, the associated value is not affected by the setting of the second curve point or the zero point, and these can also be adjusted if necessary.

Diagram of GMF 200 H



Terminal 1 = 12..30 V DC
Terminal 2 = 4-20 mA output
Terminal 3 = 0 V
Terminal 4 = PE (shield)

Evaluation Tables for Semiconductor Sensors with logarithmic Signal:

Measuring range 0…100% LEL		
Gas Concentration [%LEL]	Signal [mA]	Measuring pin MP2 [V] Load = 100 Ohm
0	4,00	0,400
10	9,06	0,906
20	11,16	1,116
25	12,00	1,200
30	12,76	1,276
40	14,12	1,412
100	20,00	2,000

Measuring range 0…500 ppm		
Gas Concentration [%LEL]	Signal [mA]	Measuring pin MP2 [V] Load = 100 Ohm
0	4,00	0,400
25	7,58	0,758
50	9,06	0,906
100	11,15	1,115
125	12,00	1,200
150	12,76	1,276
175	13,46	1,346
200	14,12	1,412
250	15,31	1,531
375	17,86	1,786
500	20,00	2,000

Measuring range 0…1500 ppm		
Gas Concentration [%LEL]	Signal [mA]	Measuring pin MP2 [V] Load = 100 Ohm
0	4,00	0,400
100	8,13	0,813
200	9,84	0,984
300	11,16	1,116
400	12,26	1,226
500	13,24	1,324
700	14,93	1,493
800	15,68	1,568
1000	17,06	1,706
1200	18,31	1,831
1500	20,00	2,000

Measuring range 0…1000 ppm		
Gas Concentration [%LEL]	Signal [mA]	Measuring pin MP2 [V] Load = 100 Ohm
0	4,00	0,400
50	7,58	0,758
100	9,06	0,906
200	11,15	1,115
250	12,00	1,200
300	12,76	1,276
350	13,46	1,346
400	14,12	1,412
500	15,31	1,531
750	17,86	1,786
1000	20,00	2,000

Measuring range 0…2000 ppm		
Gas Concentration [%LEL]	Signal [mA]	Measuring pin MP2 [V] Load = 100 Ohm
0	4,00	0,400
100	7,58	0,758
200	9,06	0,906
400	11,15	1,115
500	12,00	1,200
600	12,76	1,276
700	13,46	1,346
800	14,12	1,412
1000	15,31	1,531
1500	17,86	1,786
2000	20,00	2,000

Commissioning

The setting of the sensor must be checked during commissioning by applying test gas.

Maintenance

In order to maintain the functional reliability maintenance at specified intervals is necessary. The maintenance interval can be taken from inspection sticker on the evaluation unit. It is no longer than 1 year. The Ordinance on Industrial Safety calls for a maintenance interval of 4 months.

Decommissioning

If the sensor is longer than 4 weeks off, it must be checked with test gas and if need be recalibrated after one week of operation.

Warranty

As a manufacturer, we assume a warranty for the devices from date of purchase of 2 years.
This is valid in all countries where the devices are sold by authorized dealers.
Within this warranty period we will rectify by repair or replacement of appliances all defects that are based on material or manufacturing defects.

The warranty does not cover: damage due to improper use, normal wear and tear defects that affect the value or usability of the device only insignificantly.

In particular sensors with heated sensors (all semiconductors, pellistors, and zirconium oxide) may be formed by the evaporation of substances existing in the ambient air, solid material residues on the sensor pills, which may alter the sensitivity greatly or significantly reduce, thereby the durability may drop significantly.
Should the sensor by on-site existing foreign substances, such as coffee powder, oil vapors, refrigerant-oil mixture, halogens, floor coatings, etc. completely and / or partially destroyed and therefore must be replaced with a new sensor (moreover, it could not be called any pollutants in advance) so this do not represents a warranty case.

The oxygen sensor must be returned at allegedly technical defects to the main plant to Denkendorf for local technical examination. Only when the local investigation establishes beyond reasonable doubt, that it is a material or a manufacturing fault, this sensor – in the context of guarantee residual maturity - will be changed free of charge. All possibly further beyond that costs such as postage costs, travel costs, exchange and cost of technicians etc. will not be addional the expense of UMSITEC.

But if, for example, the investigation in our main plant in Denkendorf shows that the defect was caused by an on-site damage (accidentally or intentionally), misapplication, or incorrect operation, the incurred investigation costs will be charged to the account of the respective user / operator / maintenance company.

Interventions by unauthorized locations or when using other than original spare parts, the warranty will be voided immediately.

In order to avoid all possible problems from the outset, we advise from our practical experience of the past few years at initial transfer and / or upgrading of flooring in refrigeration units. Instead of the semiconductor sensor it would be better to upgrade to infrared sensor in advance.

Because, as already described above, with a probability bordering on certainty through such operations the conventional semiconductor sensor be destroyed very quickly on site.
A normal 1:1 exchange provides also no solution, because flooring outgasing exists for a long time and renewed semiconductor sensors be destroyed also immedeately on side. This is, as already described, not covered by guarantee.

Technical Data: GMF 200 H for combustible gases

Application:	dusty, dirty areas
Measuring principle:	semiconductor
Type of gas:	combustible gases and solvents
Measuring range:	0…100 % LEL
Accuracy:	<+-5% of measuring range
Response time T90:	< 20 sec
Temperature range:	-20..+60°C (environment)
Humidity range:	0..95% r.F.
Pressure range:	700-1300 hPa
Housing:	aluminium, LxWxH: 80x80x60mm
Protection type:	IP65
Gas inlet:	diffusion, sinter filter, IP44
Output signal:	4…20mA, logarithmic
Lifetime:	>10 years in dry, oil-free environment
CE-conformity:	emission: residential area immunity: industrial area
Weight:	430g
Supply:	12-36V DC
Consumption:	approx. 30 mA @ 24 V DC
Connecting cable:	JY (ST) Y 2x2x0,8 mm²

Selection: GMF 200 H for combustible gases

Bestell-Nr. / order number	Gasart / gas type	Messbereich / measuring range
GMF 200 H ACT UEG	Acetone	0...100 % LEL
GMF 200 H ACN UEG	Acetylene	0...100 % LEL
GMF 200 H HC UEG	Gasoline vapours	0...100 % LEL
GMF 200 H BUT UEG	Butane	0...100 % LEL
GMF 200 H ETA UEG	Ethane	0...100 % LEL
GMF 200 H ETL UEG	Ethanol	0...100 % LEL
GMF 200 H ETB UEG	Ethyl benzene	0...100 % LEL
GMF 200 H ETN UEG	Ethylene	0...100 % LEL
GMF 200 H CH2O 2000	Formaldehyde	0...2000 ppm
GMF 200 H HEP UEG	Heptane	0...100 % LEL
GMF 200 H HEX UEG	Hexane	0...100 % LEL
GMF 200 H IPRPL UEG	Isopropanol	0...100 % LEL
GMF 200 H CH4 UEG	Methane	0...100 % LEL
GMF 200 H MTL UEG	Methanol	0...100 % LEL
GMF 200 H MEK UEG	Methyl ethyl ketone	0...100 % LEL
GMF 200 H NON UEG	Nonane	0...100 % LEL
GMF 200 H PRP UEG	Propane	0...100 % LEL
GMF 200 H STY UEG	Styrene	0...100 % LEL
GMF 200 H THF UEG	Tetrahydrofuran	0...100 % LEL
GMF 200 H TOL UEG	Toluene	0...100 % LEL
GMF 200 H H2 UEG	Hydrogen	0...100 % LEL
GMF 200 H	further on request	further on request

Technical Data: GMF 200 H for refrigerants

Applications:	cooling centers, dusty, dirty areas
Measuring principle:	semiconductor
Gasart:	various refrigerants
Measuring range:	0…2000 ppm
Accuracy:	<+-5% FS
Response time T90:	< 60 sec
Temperature range:	-20..+50°C (environment)
Humidity range:	0..95% RH.
Pressure range:	700-1300 hPa
Housing:	aluminium, LxWxH: 80x80x60mm
Protection class:	IP65
Gas influx:	diffusion, sinter filter, IP44
Output signal:	4…20mA, logarithmic
Lifetime:	>10 years in dry, oil-free environments
CE-conformity:	emission: residential area immunity: industrial area
Weight:	430g
Supply:	12-36V DC
Consumption:	approx. 30 mA @ 24 V DC
Connecting cable:	JY (ST) Y 2x2x0,8 mm²

Selection: GMF 200 H for refrigerants

Order number	Gas type	Measuring range
GMF 200 H R11 2000	R11	0...2000 ppm
GMF 200 H R12 2000	R12	0...2000 ppm
GMF 200 H R22 2000	R22	0...2000 ppm
GMF 200 H R23 2000	R23	0...2000 ppm
GMF 200 H R123 2000	R123	0...2000 ppm
GMF 200 H R32 2000	R32	0...2000 ppm
GMF 200 H R134a 2000	R134a	0...2000 ppm
GMF 200 H R143 2000	R143	0...2000 ppm
GMF 200 H R152a 2000	R152a	0...2000 ppm
GMF 200 H R245 2000	R245	0...2000 ppm
GMF 200 H PRP UEG	R 290 Propane	0...100 %LEL
GMF 200 H R404A 2000	R404a	0...2000 ppm
GMF 200 H R407C 2000	R407c	0...2000 ppm
GMF 200 H R410A 2000	R410a	0...2000 ppm
GMF 200 H R417A 2000	R417C	0...2000 ppm
GMF 200 H R507a 2000	R507a	0...2000 ppm
GMF 200 H R507C 2000	R507C	0...2000 ppm
GMF 200 H BUT UEG	R 600 Butane	0...100 %LEL
GMF 200 H NH3 1500	R 717 NH3	0...1500 ppm
GMF 200 H	further on request	further on request

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Technical changes reserved