WOELKE
ENGINEERED SAFETY

MONIMET

CH_4-Sensor/transmitter type GMM 01.13.xxx
CH_4-Monitor type GMM 01.13.xxx

- **I M1 Ex ia I Ma**
- **Measuring range 0.0...100.0 vol % CH4**
- **Version for gas exhaustion pipes and pipelines**
- **Thermal conductivity sensor with gas diffusion entry**
- **Pipe probe type RSM 01.xx with test gas connection (optional)**
- **Increased accuracy by compensation of prevailing humidity and temperature by microcontroller (patented)**
- **Integrated pressure compensation in the sensor chamber (optional)**
- **Illuminated four-digit display**
- **Output range of the output signal is variable**
- **Adjustments or status enquiries by means of a press button unit or a magnetic pointer. The housing need not be opened**
- **Code lock to prevent unauthorized manipulation (can be switched off)**
- **Fault self diagnosis with alpha numeric display**
- **Test of the output signal by simulated CH_4 values**
- **Choice between normed analog or digital output signals (optional)**
- **Two built-in limit switches with optocouplers or relays in the monitor**
- **Special housing suited to the working conditions in mines and industry.**
- **Housing protection rating IP65, sensor protection rating IP 54**

The permanently installed CH_4-Sensor/transmitter and CH_4-Monitor are characterised by their stable measurements, simple and secure operation, robustness and compact construction. They are destined for the continuous monitoring of the methane concentration in gas suction pipes.

These devices conform to the explosion protection rating of intrinsic safety „i“, category I M1 Ex ia I Ma. This means that this device can be used in the zone M1 of underground mines, even when unpermitted high concentrations of the methane gas are prevailing.

This certification conforms to the ATEX directive 2014/34/EU for devices and protective systems permitted for use in areas endangered by explosions.

The gas supply from the suction pipe is achieved by an pipe probe type RSM 01.xx. The pipe probe contains a dust filter and a connection for the test gases.

The measurement of the methane concentration in the sensor block is by means of an thermal conductivity sensor. The gas diffuses into the measuring chamber through a sinter metal disc.

To increase the measurement accuracy a microcontroller continuously compensates the prevailing temperature and humidity values.

A built-in pressure sensor (optional) assures for a high measurement accuracy over a wide pressure range.

The CH_4-Monitor differs from the CH_4-Sensor/transmitter because of an additional limit value unit which is equipped with optocouplers or relays.

The operation of the device is very simple: The operator places a small magnetic press button unit on the device. The housing need not be opened. As an alternative he can also use a magnetic pointer. A four digit code which can be entered initially, protects against unauthorized changing of the set values.

A self monitoring microcontroller system not only processes the measurement values precisely, it also carries out the operator specific instructions such as the entry of the code, signal instructions and messages, analog and digital outputs and test functions etc. A four digit back lit graphic display shows the measured values in 12 mm high digits.

These devices are protected against shocks, dust and humidity by a cast metal housing (impact strength 20 Joule) and are to be connected by means of a plug-in connector. The sensor block with the CH_4-sensor is attached on the lower side of the housing.

The adapter can be used for the mounting of the device. Alternatively, a steel hanger or thread holes on its rear side can also be used for the mounting.

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Technical Data

Certification	CE DMT 03 ATEX E 065 X according to directive 2014/34/EU
Zone, Explosion protection rating	Ex **I M1 Ex ia I Ma**
Principle of measurement	Thermal conductivity
Gas entry	Diffusion over pipe probe
Range of measurement	**0.0...100.0 % CH4**
Resolution	**0.1 % CH4**
Display sequence	**0.5 s**
Linearity	**≤ 2 % CH4**
Short-term stability (1 h)	**≤ 1 % CH4**
Long-term stability (4 Wochen)	**≤ 2 % CH4**
Response time t_{90} at flow velocities ≥ 1,0 m/s	< 53 s
at flow velocities ≥ 1,5 m/s	< 31 s
Response time t_{50} at flow velocities ≥ 1,0 m/s	≤ 30 s
at flow velocities ≥ 1,5 m/s	≤ 20 s
Volume flow for test gas feeding by pipe probe RSM 01	2 l/min
Adjustment range of the device code	0000...9999
Supply voltage	9...16 V–
Current consumption	
Sensor/transmitter with 1 mA- or 15 Hz output	72 mA
Sensor/transmitter with 20 mA output	92 mA
Monitor with Optocouplers and 1 mA- or 15 Hz output	75 mA
Monitor with relays and 1 mA- or 15 Hz output	85 mA
Monitor with Optocouplers and 20 mA output	95 mA
Monitor with relays and 20 mA output	105 mA
Frequency output	
Frequency range	6...15 Hz, switchable to 5...15 Hz
Output range adjustable between	1...100% CH_4
Optocoupler output	max.: 30 V, 100 mA, 100 mW
Current output (alternative to the frequency output)	
Ranges and loads	0.1/0.2...1 mA / ≤5200 Ω to 4...20 mA / ≤200 Ω
Output range adjustable from	1...100% CH_4
Test function by simulated measured values	10 decimal steps from 0% CH_4 to the final value of the range of the data transmission output
Limit switch Alarm 1 and Alarm 2 (Monitor)	
Setting range	0.1...100.0% CH_4
Optocoupler output (quiescent current principle)	max. 30 V, 100 mA, 100 mW
Relay output (quiescent current principle)	max. 30 V, 1 A, 30 W
Surroundings temperature	-20°C...+60°C
Humidity, non condensing	0... 99% rel.
Surroundings pressure	500…1300 hPa
Gas flow with pipe probe RSM 01.xxx	1…40 m/s
Working position	vertical, ± 75° in all directions
Run in time	65 seconds
EMC interference immunity	EN 50270 type 2
Dimensions without hanger	W 100 mm, D 100 mm, H 200 mm
Weight without alarm unit	4 kg
Type of protection	IP 65, Gas inlet port IP 54
Material / varnish paint	Die cast metal / RAL 5012 (blue)
Impact strength	20 Joule
Accessories to be ordered separately	
Connecting cable	VDL 4, 20m, max. length 100 m ($R_L \leq 7{,}8\ \Omega$)
Input filter	STF 3
Press button device	TAS 3
Pipe probe, 90 mm	RSM 01.90
Pipe probe, 160 mm	RSM 01.160

Subject to technical updates 22-11

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