



ANNOVEX

CH₄-Sensor/transmitter type GMA 01.03.xxx

CH₄-Monitor type GMA 01.03.xxx

- I M1 Ex ia I Ma
- Measuring range 0.0...5.00...100.0 vol % CH₄
- Catalytic combustion and thermal conductivity sensor with gas diffusion entry
- Protection of the catalytic combustion sensor against high gas concentrations
- Increased accuracy by compensation of prevailing humidity and temperature by microcontroller (patented)
- 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 CH₄ values
- Choice between normed analog or digital output signals (optional)
- Two built-in limit switches with optocouplers or relays in the monitor
- Audio visual alarm unit optional (Monitor)
- Sensor can be replaced on site
- Housing protection rating IP65, sensor protection rating IP 54

The economical, permanently installed CH₄-Sensor/transmitter and CH₄-Monitor are characterised by their stable measurements, simple and secure operation, robustness, low weight and compact construction.

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 CH₄-Monitor differs from the CH₄-Sensor/transmitter because of an additional limit value unit which is equipped with optocouplers or relays.

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

To increase the measurement accuracy especially in the range of higher concentrations, a microcontroller continuously compensates the prevailing temperature and humidity values.

A primary filter, which can be easily replaced, protects the sinter metal against dirt.

The test gases can be fed into the measurement chamber by means of a plug-on adapter of the type PGA 3.

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 placed in a fibre reinforced resin housing (impact strength 7 Joule) and are to be connected by means of a plug-in connector. The sensor block with the CH₄-sensor is located next to the connector and it can be replaced easily on the underground site.



For the suspension of the device a steel hanger is attached. Holes on the back of the device permit a rigid mounting.

In addition, the CH₄-Monitor can be equipped with an audio visual alarm unit for giving alarms in the monitored area (see opposite illustration).



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Technical Data

Certification	 DMT 03 ATEX E 065 X according to directive 2014/34/EU
Zone, Explosion protection rating	 I M1 Ex ia I Ma
Range of measurement	0.00...5.00...100.0 % CH₄ (V/V)
Error of measurement according to EN 60079-29-1: Measuring range 0 - 2 % CH ₄ (V/V) Measuring range 2 - 100 % CH ₄ (V/V) Influence of temperature, humidity and pressure	< ± 0.1 % (V/V) < ± 5 % of the measured value fulfils EN 60079-29-1
Resolution	0.01 % CH ₄ for the measuring range 0...5 % CH ₄ 0.1 % CH ₄ for the measuring range 5...100 % CH ₄
Measured value response time t ₉₀ Display sequence	≤ 18 s 0.5 s
Adjustment range of the device code	0000...9999
Supply voltage	9...16 V–
Current consumption	
Sensor/transmitter with 1 mA- or 15 Hz output	122 mA
Sensor/transmitter with 20 mA output	142 mA
Monitor with Optocouplers and 1 mA- or 15 Hz output	125 mA
Monitor with relays and 1 mA- or 15 Hz output	135 mA
Monitor with Optocouplers and 20 mA output	145 mA
Monitor with relays and 20 mA output	155 mA
Current consumption of the audio visual alarm unit	additionally 100 mA max.
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 / ≤200 Ω to 4...20 mA / ≤200 Ω
Output range adjustable from	1...100 vol % 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	0.01...99.99 vol % 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
Setting range of the rapid switch-off	0.05...0.3 Δ% CH ₄ / s
Audio visual alarm unit optional (Monitor)	
Signal tone	Sweeping 2400-2850 Hz at 7 Hz
Sound intensity	max. 103 dB (1m)
Flashing light	10 red, ultra highbright, pulsed LEDs
Signal frequency Alarm 1, Alarm 2	0.5 Hz, 1 Hz
Surroundings temperature	-20°C...+60°C
Humidity, non condensing	0... 99% rel.
Dimensions without hanger, without alarm unit	W 122 mm, D 90 mm, H 179 mm
Dimensions without hanger, with alarm unit	W 122 mm, D 90 mm, H 310 mm
Weight without alarm unit	2 kg
Type of protection	IP 65, Gas inlet port IP 54
Material / Impact strength	Polyester, surface resistance <10 ⁹ Ohm / >7 Joule
Accessories to be ordered separately	
Connecting cable	VDL 4, 20m, max. length 100 m (R _L ≤ 7,8 Ω)
Input filter	KSF 3
Test gas adapter	PGA 3
Test gas set	PGS 3
Press button device	TAS 3
Subject to technical updates	22-11