

## $\mu$ -Gard<sup>®</sup> Analog Transmitter

### DESCRIPTION

Analog transmitter for the continuous monitoring of gases and vapours in the ambient air. Used in garages, chiller rooms and heating systems, the  $\mu$ -Gard MA series analog transmitter is a reliable gas detector.

### APPLICATION

For the detection of gases within a wide range of commercial applications. Due to the 4 – 20 mA or 2 - 10 V analog signal the transmitter is compatible to the  $\mu$ -Gard gas controller series ADC of MSR-E.

### FEATURES

- Continuous monitoring
- Easy maintenance / calibration
- Reverse polarity protected
- Overload and short-circuit protected
- Long life sensor
- Low zero point drift
- Poisoning stable
- 4 – 20 mA analog signal output (standard)
- 2 - 10 V analog signal (selectable)



### CONNECTING DIAGRAM

MA-X_Transmitter	
1	24 VDC
2	4..20 mA/2-10V DC
3	0 VDC

# GAS ALARM SYSTEMS

## SPECIFICATIONS

	MA-0 CO	MA-9 O <sub>2</sub>	MA-9 NO	MA-2 NO <sub>2</sub>	MA-5 SO <sub>2</sub>	MA-2 NH <sub>3</sub>	MA-2 Ex	MA-2 NH <sub>3</sub>	MA-3 NH <sub>3</sub>	MA-4 Freon	MA-4 Ex	MA-3 ETO
<b>Sensor element</b>	Electrochemical, diffusion						Catalytic bead (Pellistor)	Semiconductor sensor				
Response time t <sub>90</sub> (s)	≤ 50	≤ 15	≤ 45	≤ 25	≤ 15	≤ 120	≤ 10 (Methane)	≤ 100	≤ 50	≤ 30 Meth.	≤ 50	
Stability & resolution	± 3 ppm	± 0,1 vol. %	± 0,2 ppm	± 0,2 ppm	0,2 ppm	<± 20 ppm	± 1% of reading	---	---	---	---	---
Repeatability (% of reading)	± 3 %	---	---	± 2 %	± 2 %	---	---	---	---	---	---	---
Long term zero point drift of reading/ year	< 5%	---	< 0,3 ppm	< 0,2 ppm	< 0,2 ppm	---	± < 6% LEL (Methane)	---	---	---	---	---
Long term sensitivity drift (% reading/month)	---	< 4% /12	< 5% /12	< 2% /1	< 2% /1	< 2% /1	± < 1,5% Methane	---	---	---	---	---
Sensor life expectancy (normal operating environment) in years	≥ 5	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 3	≥ 5				
Max. storage time	6 months							12 months				
<b>Operating Environment</b>												
Humidity non-condensing	10 – 95 % RH						10 – 95 % RH	10 – 95 % RH				
<b>Temperature</b>												
Working temperature	-10 to + 50 °C					-30 to + 50 °C	-15 to + 50 °C	-15 to + 50 °C				
Storage temperature	5 °C to + 40 °C						0 to + 50 °C	0 to + 50 °C				
Pressure range	Atmospheric ±10%											
<b>Electrical</b>												
Power supply	18 - 28 VDC (reverse polarity protected)											
Power consumption	Electrochemical sensor: 22 mA, max. 0,6 VA Pellistor/ Semiconductor sensor: 35 mA, max. 0.85 VA											
<b>Physical characteristics</b>												
Enclosure type A	Polycarbonate											
Flammability	UL 94: V2											
Enclosure color	RAL 7032 (light grey)											
Dimensions	(W x D x H) 94 x 130 x 57 mm											
Weight	Approx. 0.3 kg											
Protection class	IP 65											
Installation	Wall or pillar mounting											
Cable entry	Standard 1 x M20											
Wire connection	Screw type terminal, min. 0.25 mm <sup>2</sup> (24 AWG) max. 2.5 mm <sup>2</sup> (14 AWG)											
Wire distance	Max. loop resist. 500 Ω (= wire resistor + controller input resistor)											
<b>Output signal</b>												
Analog output signal												
Standard: 4-20 mA	Proportional, 4 – 20 mA, load ≤ 500 Ω overload and short-circuit proofed											
Selectable: 2-10 V	Proportional, 2 – 10 V, load ≥ 50 kΩ overload and short-circuit proofed											
<b>Guidelines</b>	EMC- Directive 2004/108/EEC, CE											
<b>Warranty</b>	12 months on material (without sensor)											

# GAS ALARM SYSTEMS

## ORDERING INFORMATION

MA-X-XXXX-F-X

### Version

4	Factory calibration 0 – 20 ppm	<sup>5, 6</sup>
6	Factory calibration 0 – 50 ppm	<sup>1, 5, 8</sup>
7	Factory calibration 0 – 100 ppm	<sup>1</sup>
8	Factory calibration 0 – 150 ppm	<sup>1</sup>
9	Factory calibration 0 – 200 ppm	<sup>1</sup>
A	Factory calibration 0 – 250 ppm	<sup>1</sup>
B	Factory calibration 0 – 300 ppm	<sup>1, 2, 19 to 24</sup>
C	Factory calibration 0 – 400 ppm	<sup>1</sup>
D	Factory calibration 0 – 500 ppm	<sup>1</sup>
E	Factory calibration 0 – 1000 ppm	<sup>1, 2</sup>
F	Factory calibration 20 – 2000 ppm	<sup>12 to 25, 34</sup>
K	Factory calibration 0 – 25 vol %	<sup>7</sup>
L	Factory calibration 0 – 50% LEL	<sup>36</sup>
M	Factory calibration 0 – 100 % LEL	<sup>3, 30, 31, 35</sup>
Q	Factory calibration 30 – 300 ppm	<sup>4</sup>

### Enclosure

F	Plastic enclosure (87 x 45.5 mm)	IP43
F1	Plastic enclosure (87 x 45,5 mm)	IP44
A	Plastic enclosure (130 x 94 x 57 mm)	IP65
D	Plastic enclosure (65 x 94 x 57 mm)	IP43
D1	Plastic enclosure (65 x 94 x 57 mm)	IP54
5	Stainless steel enclosure	

### Gas

<sup>1</sup> 0-1110	Carbon monoxide	CO
<sup>2</sup> 5-1120	Ammonia	NH <sub>3</sub> El.Chem.
<sup>3</sup> 2-1120	Ammonia	NH <sub>3</sub> Pellistor
<sup>4</sup> 3-1120	Ammonia	NH <sub>3</sub> Semiconductor sensor
<sup>5</sup> 9-1129	Nitrogen monoxide	NO
<sup>6</sup> 2-1130	Nitrogen dioxide	NO <sub>2</sub>
<sup>7</sup> 9-1195	Oxygen	O <sub>2</sub>
<sup>8</sup> 5-1196	Sulphur dioxide	SO <sub>2</sub>
<sup>12</sup> 4-2070	Freon	R 22
<sup>13</sup> 4-2071	Freon	R 401a
<sup>14</sup> 4-2072	Freon	R 401b
<sup>15</sup> 4-2073	Freon	R 402a
<sup>16</sup> 4-2074	Freon	R 402b
<sup>17</sup> 4-2075	Freon	R 408a
<sup>18</sup> 4-2076	Freon	R 409a
<sup>19</sup> 4-2077	Freon	R 134a
<sup>20</sup> 4-2078	Freon	R 404a
<sup>21</sup> 4-2079	Freon	R 416a
<sup>22</sup> 4-2069	Freon	R 507
<sup>23</sup> 4-2068	Freon	R 410a
<sup>24</sup> 4-2067	Freon	R 411a
<sup>25</sup> 4-2064	Freon	R 123
<sup>30</sup> 2-3400	Methane	CH <sub>4</sub>
<sup>31</sup> 2-3480	Propane	C <sub>3</sub> H <sub>8</sub>
<sup>36</sup> 4-3H55	Methane	CH <sub>4</sub> (Semiconductor sensor)
<sup>35</sup> 4-3H80	Propane/ LPG	C <sub>3</sub> H <sub>8</sub> (Semiconductor sensor)
<sup>34</sup> 3-2089	Ethylene	C <sub>2</sub> H <sub>4</sub> (Semiconductor sensor)

**Example:** Freon Transmitter for R 134 a, plastic enclosure, factory calibration 20 – 2000 ppm  
Order number: MA-4-2077-F-F