



PolyGard®2

## Multi-Gas-Controller MGC2

**Gas measuring, monitoring and warning controller based on state-of-the-art micro-technology for continuous monitoring of the ambient air to detect toxic and combustible gases, refrigerants or oxygen.**

The Multi-Gas-Controller is designed for the connection of max. analog three sensors with 4-20 mA signal, e.g. of the SC2 series. The controller monitors the measured values and activates the alarm relays if the set alarm thresholds for pre-alarm and main alert are exceeded. In addition, the values are provided for direct connection to a superior BMS via an RS-485 interface and also as 4-20 mA output.

The SIL 2 compliant self-monitoring function in the MGC2 activates the fault message in case of an internal error as well as in case of a fault at the 4-20 mA input / output current signals.

Other options such as LCD display, three-color status LED, warning buzzer, digital input for acknowledgment or test function, various communication protocols ensure proper adaptation to the wide range of applications in gas detection technology.

For convenient commissioning the MGC2 can be pre-configured and parametrised with factory-set defaults.



### APPLICATION

The MGC2 is designed for detection and warning of gases in many commercial and industrial applications.

### FEATURES

- Internal function monitoring with integrated hardware watchdog
- Hardware and software according to SIL2 compliant development process
- Easy maintenance / calibration by replacing the MC2 sensors or via comfortable on-site calibration
- Modular technology (plug-in and exchangeable)
- Reverse polarity protected, overload and short-circuit proof
- Three analog inputs 4-20 mA, e.g. MC2 series
- Three relays with change-over contact, potential-free max. 250 V AC, 5 A
- Two transistor outputs, 24 V DC, 0.1 A (plus switching)
- Serial RS 485 interface with protocol for DGC06, or Modbus protocol as an option
- Different types of housing with IP 65
- Two digital inputs
- Status LED for alarm, fault, operation and service (option)
- LCD display (option)
- Warning buzzer (option)
- Reset button (option)
- Operating voltage 230 V AC, with wide range input 90 to 240 V AC (option)
- UPS (option)
- Conformity to:
  - EN 50271 / IEC 61508
  - EN 60079-29-1
  - EN 61010-1
  - ANSI/UL 61010-1
  - CAN/CSA-C22.2 No. 61010-1





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## SPECIFICATIONS

### Electrical

|                             |  |
|-----------------------------|--|
| Power supply                | 24 V DC reverse-polarity protected   |
| Power consumption (24 V DC) | Max. 60 mA (1.5 VA)  |
| - per sensor (MC2)          | Max. 85 mA (2.1 VA)  |
| - horn / warning light      | Max. 40 mA (1.0 VA)  |
| Alarm relays (3)            | 250 V AC, 5 A, potential-free, change-over contact (SPDT)  |
| Transistor output (2)       | 24 V DC / 0.1 A (switching to plus)  |
| Digital input (2)           | Potential-free   |
| Analog input (3)            | 4 – 20 mA overload and short-circuit proof, input resistance 200 Ω   |
| Analog output signal (1)    | Proportional, overload and short-circuit proof, load ≤ 500 Ohm<br>4 - 20 mA = measuring range<br>3.0 < 4 mA = underrange<br>> 20 - 21.2 mA = overrange<br>2.0 mA = fault |

### Ambient conditions

|                     |                                      |
|---------------------|--------------------------------------|
| Temperature range   | -25 °C to +50 °C (-13 °F to +122 °F) |
| Humidity range      | 15 - 95 % RH not-condensing          |
| Storage temperature | +5 °C to +30 °C (+41 °F to +86 °F)   |
| Storage time        | 6 months                             |

### Serial interface

|           |                     |
|-----------|---------------------|
| Field bus | RS 485 / 19200 Baud |
| Tool bus  | 2-wire / 19200 Baud |

### Physical

|   |  |
|---|--|
| Housing type C                                | Polycarbonate  |
| Combustion                                    | UL 94 V2   |
| Housing colour                                | RAL 7032 (light grey)  |
| Dimension housing (W x H x D)                 | 130 x 130 x 75 mm (5.12 x 5.12 x 2.95 in.)                               |
| Weight  | ca. 0.6 kg (1.32 lb.)  |
| Protection class                              | IP 65  |
| Installation                                  | Wall mounting  |
| Cable entry                                   | Standard 6 x M20/25  |
| Wire connection: Digital input, analog output | Screw-type terminal min. 0.25 mm <sup>2</sup> , max. 1.3 mm <sup>2</sup> |
| Power supply, relays                          | Screw-type terminal min. 0.25 mm <sup>2</sup> , max. 2.5 mm <sup>2</sup> |

### Directives

|  |                                  |
|--|----------------------------------|
|  | EMC directives 2014/30/EU        |
|  | Low voltage directive 2014/35/EU |
|  | CE                               |
|  | Conformity to:                   |
|  | EN 50271 / IEC 61508             |
|  | 60079-29-1                       |
|  | EN 61010-1:2010                  |
|  | ANSI/UL 61010-1                  |
|  | CAN/CSA-C22.2 No. 61010-1        |

### Warranty

|  |                    |
|--|--------------------|
|  | 1 year on material |
|--|--------------------|





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## Options

|                                  |  |
|----------------------------------|--|
| <b>LCD display</b>               |  |
| LCD                              | Two lines, 16 characters each, background highlighted in two colours |
| Operation                        | Menu driven via six push-buttons                                     |
| Power consumption                | 5 V, 60 mA, 0.3 VA   |
| <b>Status LED</b>                |  |
| Colour / mode                    | Red / yellow / green (alarm – fault – operation - service)           |
| Protection class                 | IP 65  |
| <b>Warning buzzer</b>            |  |
| Acoustic pressure                | > 90 dB (A)  |
| Frequency                        | 2300 Hz  |
| Protection class                 | IP 65  |
| <b>Power supply 230 V AC</b>     |  |
| Wide range input                 | 90 -240 V AC - 50/60 Hz  |
| Output rating type 5             | 5 VA   |
| Output rating type 7             | 15 VA  |
| <b>UPS</b>                       |  |
| Power unit with wide range input | 90 -240 V AC - 50/60 Hz  |
| Output rating                    | 15 VA  |
| Rechargeable battery             | 12 V, 0.8 Ah   |
| Operating time                   | > 60 min   |
| <b>Power supply 12 V DC</b>      |  |
| Power consumption (12 V DC)      | 12 V DC reverse-polarity protected                                   |
| - per sensor (SC2 or MC2)        | Max. 120 mA (1.5 VA)   |
| - horn / warning light           | Max. 170 mA (2.1 VA)   |
|                                  | Max. 80 mA (1.0 VA)  |

### SHORT DESCRIPTION OF THE FUNCTION: DIGITAL OUTPUTS WITH THREE RELAYS

| Action  | Reaction Relay 1 (Alarm1) | Reaction Relay 2 (Alarm2) | Reaction Warning light (Alarm 2) | Reaction Horn (Alarm 2) | Reaction Relay 3 (Alarm2 + fault) | Reaction LED   |
|---|---------------------------|---------------------------|----------------------------------|-------------------------|-----------------------------------|----------------|
| Gas signal < alarm threshold 1  | OFF                       | OFF                       | OFF                              | OFF                     | ON                                | GREEN          |
| Gas signal > alarm threshold 1  | ON                        | OFF                       | OFF                              | OFF                     | OFF                               | RED            |
| Gas signal > alarm threshold 2  | ON                        | ON                        | ON                               | ON                      | ON                                | RED            |
| Gas signal ≥ alarm threshold 2, but button Horn OFF activated         | OFF                       |                           | ON                               | OFF after delay ON      |                                   | RED            |
| Gas signal < (alarm threshold 2 - hysteresis) but ≥ alarm threshold 1 | ON                        | OFF                       | OFF                              | OFF                     | OFF                               | RED            |
| No alarm, no fault  | OFF                       | OFF                       | OFF                              | OFF                     | ON                                | GREEN          |
| No fault, but maintenance due   | OFF                       | OFF                       | OFF                              | OFF                     | ON                                | GREEN flashing |
| Internal error  | OFF                       | OFF                       | ON                               | OFF                     | OFF                               | YELLOW         |

Note 1: Status OFF = Relay is configured “Alarm ON = Relay” or the MGC2 is free from tension.

Note 2: Alarm thresholds can have the same value, therefore the relays and/or the horn and flashlight can be triggered together.





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## ORDERING INFORMATION

|               |          |          |          |          |          |          |          |           |   |
|---------------|----------|----------|----------|----------|----------|----------|----------|-----------|---|
| <b>MGC2-X</b> | <b>X</b> | <b>3</b> | <b>X</b> | <b>X</b> | <b>2</b> | <b>3</b> | <b>X</b> | <b>0</b>  |   |
|               |          |          |          |          |          |          |          |           | <b>WARNING DEVICES</b>                            |
|               |          |          |          |          |          |          |          | <b>0</b>  | Without built-on warning device                   |
|               |          |          |          |          |          |          |          |           | <b>DISPLAY</b>                                    |
|               |          |          |          |          |          |          |          | <b>0</b>  | Without display                                   |
|               |          |          |          |          |          |          |          | <b>2</b>  | With display/keypad                               |
|               |          |          |          |          |          |          |          |           | <b>ANALOG INPUT</b>                               |
|               |          |          |          |          |          |          |          | <b>3</b>  | 3 x Analog input                                  |
|               |          |          |          |          |          |          |          |           | <b>DIGITAL INPUT</b>                              |
|               |          |          |          |          |          |          |          | <b>2</b>  | 2 x Digital input                                 |
|               |          |          |          |          |          |          |          |           | <b>OUTPUT SIGNAL – ANALOG / BUS</b>               |
|               |          |          |          |          |          |          |          | <b>2</b>  | RS 485 with DGC 06 protocol                       |
|               |          |          |          |          |          |          |          | <b>3</b>  | Analog output & RS 485 with DGC 06 protocol       |
|               |          |          |          |          |          |          |          | <b>5</b>  | Analog output & RS 485 with Modbus protocol       |
|               |          |          |          |          |          |          |          |           | <b>VISUAL/ AUDIBLE WARNING DEVICES</b>            |
|               |          |          |          |          |          |          |          | <b>0</b>  | Without visual / acoustic indicator               |
|               |          |          |          |          |          |          |          | <b>1</b>  | Buzzer  |
|               |          |          |          |          |          |          |          | <b>2</b>  | Status-LED red                                    |
|               |          |          |          |          |          |          |          | <b>3</b>  | Buzzer & status-LED red                           |
|               |          |          |          |          |          |          |          | <b>4</b>  | Buzzer & status-LED (red, yellow, green)          |
|               |          |          |          |          |          |          |          | <b>5</b>  | Status-LED (red, yellow, green)                   |
|               |          |          |          |          |          |          |          |           | <b>ALARM RELAYS</b>                               |
|               |          |          |          |          |          |          |          | <b>3</b>  | 3 x Alarm relays                                  |
|               |          |          |          |          |          |          |          |           | <b>POWER SUPPLY</b>                               |
|               |          |          |          |          |          |          |          | <b>1*</b> | 12 V DC   |
|               |          |          |          |          |          |          |          | <b>2</b>  | 24 V AC/DC  |
|               |          |          |          |          |          |          |          | <b>5</b>  | 90 – 240 V AC / 24 V DC, 5 VA                     |
|               |          |          |          |          |          |          |          | <b>7</b>  | 90 – 240 V AC / 24 V DC, 15 VA                    |
|               |          |          |          |          |          |          |          | <b>8*</b> | USV 90 – 240 V AC /12 V DC, 15 VA, 0.8 Ah         |
|               |          |          |          |          |          |          |          | <b>9*</b> | USV 90 – 240 V AC /24 V DC, 15 VA, 0.8 Ah         |
|               |          |          |          |          |          |          |          |           | <b>HOUSING</b>                                    |
|               |          |          |          |          |          |          |          | <b>0*</b> | Without housing                                   |
|               |          |          |          |          |          |          |          | <b>A*</b> | Housing type A 90 x 130 x 57                      |
|               |          |          |          |          |          |          |          | <b>C</b>  | Housing type C 130 x 130 x 75 <sup>1</sup>        |
|               |          |          |          |          |          |          |          | <b>E</b>  | Housing type E 130 x 130 x 99                     |
|               |          |          |          |          |          |          |          | <b>M*</b> | In-wall housing type M 150 x 120 x 80 mm          |
|               |          |          |          |          |          |          |          | <b>N*</b> | In-wall housing type N 145 x 90 x 70 mm           |
|               |          |          |          |          |          |          |          | <b>O*</b> | In-wall housing type O 110 x 90 x 70 mm           |
|               |          |          |          |          |          |          |          | <b>P*</b> | Door installation housing type P 150 x 96 x 50 mm |

\*only on request

<sup>1</sup>Version with display and voltage supply 15 VA only with housing type E

Standard versions: MGC2-C-2-3-0-3-2-3-0-0

MGC2-C-7-3-0-3-2-3-0-0





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## ELECTRICAL CONNECTION

