

Gas Detection.



## Technical Datasheet



PolyGard®2

# Digital-Gas-Controller DGC-06

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Specifications subject to change without notice.

Up-to-date data sheets and user manuals can be found in the download area of [www.msr-24.com](http://www.msr-24.com).

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## DESCRIPTION

### **Measuring, warning and controlling device series for toxic, combustible gases and vapours as well as refrigerants.**

The DGC-06 Digital-Gas-Controller is designed in accordance with the standard EN 50545-1, among others. It can monitor and manage up to 128 gas sensors, that means 96 digital PolyGard®2/PolyXeta®2 and/or 32 analog (4–20 mA) sensors.

4 free adjustable alarm thresholds are provided per sensor. For the alarm messages the controller system offers up to 128 relays with potential-free change-over contact and up to 16 analog outputs with 4–20 mA signal.

The free adjustable parameters and set points enable a very flexible use in the gas measuring technique. Simple and comfortable commissioning, however, is granted by the configuration with default parameters.

Configuration, parameterization and operation are easy to do directly at the controller without special programming knowledge due to the logical, simple menu structure. The PCE06 Software enables the loading, changing and storing of the application parameters via a serial interface.

The DGC-06 is equipped with a self-monitoring system, with power failure message as well as with a functional control of the registered digital/analog sensors according to the requirements of the gas measuring technique. In addition, the DGC-06 is available with a battery backed, uninterruptible power supply incl. low voltage control.

The optional data logger permits to protocol all measured values, alarms and faults.

Different interface und protocol options are available for the connection to a superior BMS.

## APPLICATION

The DGC-06 is used for the monitoring and warning of toxic and combustible gases and vapours as well as of Freon refrigerants within a wide range of the gas measurement technique. Numerous adjustable parameters and set-points permit individual adaptation to many applications.

The DGC-06 fulfils the functions of monitoring carbon monoxide (CO) in garages, tunnels and cart tracks etc. according to the current EN 50545-1.

In addition, the functions of leakage monitoring in refrigeration plants are fulfilled in accordance with the requirements of EN 378, VBG 20 and the guideline "Safety requirements for ammonia refrigeration plants".

## FEATURES

- For 128 gas sensors, 96 digital PolyGard®2/PolyXeta®2 and/or 32 analog (4–20 mA) sensors
- Suitable for more than 50 different toxic, combustibile and refrigerant Freon gases
- Simple and comfortable commissioning by configuration with standard parameters
- Logical system menu
- Flexible configuration thanks to programmable parameters and setpoints
- 4 free adjustable alarm thresholds per sensor
- 5 menu languages, free adjustable
- Several alarm relays configurable per alarm
- Access to menu operation via 4 code levels
- Project protection
- Temporary blocking of transmitters by the customer possible
- Alarm release by falling or increasing gas concentrations selectable for each alarm threshold
- Connector for PCE06 Software at the controller module
- Up to 32 relays with change-over contact, potential-free, max. 250 V AC, 5 A, 30 V DC, 2 A (via GC-06 module and 1–7 EP-06 modules) and
- Up to 96 relays with change-over contact, potential-free, max. 250 V AC, 5 A, 30 V DC, 2 A (via MSC2/MSB2) or
- Up to 96 relays with change-over contact, potential-free, max. 30 V AC, 0.5 A (locally via WSB2)
- Fault relay with normally open contact, potential-free, max. 250 V AC, 5 A, 30 V DC, 2 A
- Up to 16 analog outputs, 4–20 mA, with selective signal output for special mode, fault, etc.
- Up to 7 EP-06 expansion modules with integrated repeater function connectable
- Serial interface RS-485 with Modbus RTU protocol
- EN 50545-1 Certificate / TÜV Rheinland
- SIL2 Level compliant
- Shapely, durable housing
- Option: Housing lockable
- Option: Integrated battery backed UPS, incl. function monitoring and deep discharge protection (in separate housing)
- Option: Flashing light at power failure
- Option: Integrated warning buzzer
- Option: USB port for data logger function for all measured values, alarms and faults
- Option: Communication module with TCP/IP interface and Modbus RTU protocol
- Option: Communication module for BACnet
- Option: Version according ANSI/UL2017 & UL 61010 1 & CAN/CSA-C22.2 No. 61010-1



Figure 1: DGC-06 with UPS  
(UPS in separate housing in the background)



Figure 2: DGC-06 in housing type 1 and type 3

## SPECIFICATIONS

All specifications were collected under optimal test conditions.

We confirm compliance with the minimum requirements of the applicable standard.

<b>ELECTRICAL</b>	
Power supply	110/230 V AC, 50/60 Hz; 24 V DC $\pm$ 20 %
Power consumption (incl. sensors)	Min. 30 W, 0.15 A, max. ca. 160 W, 0.7 A Depending on type and configuration
Analog input (max. 32)	4–20 mA, overload and short-circuit proof, input resistance 130 $\Omega$
Tension for external analog transmitter	24 V DC $\pm$ 20 %, max. 130 mA / per sensor
Analog output (max 16) configurable for each input	Proportional, overload and short-circuit proof, charge $\leq$ 500 $\Omega$ 4–20 mA = measuring range 3.0 to <4 mA = underrange > 20– 21.2 mA = overrange 2.0 mA = fault
Relay (max. 32)	250 V AC, 5 A; 30 V DC, 2 A, potential-free, change-over (SPDT)
Fault relay (1)	250 V AC, 5 A; 30 V DC, 2 A, potential-free, normally open (SPST)
<b>VISUALISATION</b>	
LCD	2 lines, 16 characters each, illuminated
Status LED (4 colours)	Green = Power, yellow = Fault, Light red = Alarm 1, dark red = Alarm 2
Operation	6 pushbuttons
Menu language (selectable)	German, English, USA, French, Italian
<b>INTERFACE FIELD BUS</b>	
Transceiver	RS-485 / 19200 Baud
<b>INTERFACE MODBUS RTU RS-485</b>	
Function	Transmission of current and average values, alarm and relay status, and analog output states in Modbus RTU RS 485 protocol to external devices (see GA_GC06_Modbus_Supplement_E)
<b>GASE</b>	
	Digital PolyGard®2/PolyXeta®2 and analog sensors for toxic, combustible & refrigerant gases and oxygen
<b>AMBIENT CONDITIONS</b>	
Humidity	15 $\pm$ 95 % RH non-condensing
Working temperature range	-5 °C to +40 °C (23 °F to 104 °F)
Storage temperature range	0 °C to +40 °C (32 °F to 104 °F)
<b>PHYSICAL</b>	
Housing	
• Standard	Plastic housing with view cover
• UL housing	Polymeric housing with view cover, rated UL-94 V2
Colour	RAL 7035
Protection class	IP65
Weight	Min. 2.7 kg (4.4 lb), max. 13 kg (28,7 lb) depending on type
Mounting	Wall mounting
Cable entry	M 16; M 20; M 25
Dimensions (W x H x D): Type 1	298 x 260 x 140 mm (11.7 x 10.2 x 5.5 in.)
According UL2017	315 x 300 x 155 mm (12,4 x 11,8 x 6,1 in.)
Dimensions (W x H x D): Type 2	298 x 420 x 140 mm (11.7 x 16.5 x 5.5 in.)
According UL2017	315 x 450 x 155 mm (12,4 x 17,7 x 6,1 in.)
Dimensions (W x H x D): Type 3	298 x 570 x 140 mm (11.7 x 22.4 x 5.5 in.)
According UL2017	315 x 600 x 155 mm (12,4 x 23,6 x 6,1 in.)
Dimensions (W x H x D): Type 4	410 x 655 x 140 mm (16.1 x 25.8 x 5.5 in.)
According UL2017	315 x 730 x 155 mm (12,4 x 28,7 x 6,1 in.)
Wire connection:	
• Power supply	Screw type terminal: 0.5–2.5 mm <sup>2</sup> (22–14 AWG)
• Output relays	2x spring type terminal: 0.5–1.5 mm <sup>2</sup> (22–16 AWG)
• Digital/analog signals	Spring type: 0.5–1.5 mm <sup>2</sup> (22–16 AWG)

<b>REGULATIONS</b>	
Directives	EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU EN 50271 EN 61010-1:2010 ANSI/UL 2017 / UL 61010-1 CAN/CSA-C22.2 No. 61010-1 EN 50545-1 UKCA  Conformity to: IEC/EN 61508-1-3 EN 50402 EN 378
Warranty	2 years on device
<b>OPTIONS</b>	
<b>UPS (see also DB_DGC06_UPS)</b>	
Battery backed uninterrupted supply for controller, sensors, warning signs and horns	Supply duration depending on the connected system components, maintenance-free rechargeable batteries with function control and deep discharge protection
Power supply voltage	24 V DC (24,0–27.3 V) supply only from DGC-06
Output voltage	19.3–27.3 V DC
Charging voltage	26.5–27.3 V DC
Deep discharge limit	19.2 V DC
Quantity of batteries / voltage	2 / 12 V DC / maintenance-free
Capacity	7.2 Ah or 12 Ah
Humidity	15–95 % RH non-condensing
Working temperature range	-5 °C to +30 °C (23 °F to 86 °F)
Storage temperature range	-5 °C to +40 °C (23 °F to 104 °F)
Housing: Standard According to UL2017	Plastic housing with view cover Polymeric housing, view cover, rated UL-94 V2
Colour	RAL 7035
Protection class	IP65
Weight	Min. ca. 8.3 kg (18.3 lb) Max. ca. 11.0 kg (24.3 lb) (depending on type)
Mounting	Wall mounting
Cable entry	M20, M25, M32
Dimensions (W x H x D): Standard According to UL2017	410 x 285 x 140 mm (16.1 x 25.8 x 5.5 in.) 315 x 450 x 155 mm (1.4 x 17.7 x 6.1 in.)
Wire connection	Screw type terminal: 0.5–2.5 mm <sup>2</sup>
<b>FLASHING LIGHT AT POWER FAILURE</b>	
LED	Battery backed
Operation duration	10 h (flashing)
<b>WARNING BUZZER</b>	
Acoustic pressure	85 dB (distance 1000 mm)
Frequency	3.5 kHz
<b>DATA LOGGER</b>	
Function	Storage of measured values, of faults and alarm status with time and date stamp on an USB flash drive
Log rate	Log rate adjustable from 10 to 10,000 sec.
Data format	Output of the data in standard Excel format
<b>COMMUNICATION MODULE BACNET-06</b>	
Technical data, function and protocol see datasheet DB_BAC06	
<b>COMMUNICATION MODULE MODBUS RTU TCP/IP</b>	
Technical data, function and protocol see datasheet DB_MODIP	

## ORDERING INFORMATION

<b>DGC-06-</b>	<b>X-</b>	<b>X-</b>	<b>X-</b>	<b>XXX100XXX</b>	
				<b>000100000</b>	No further options
				<b>1XX100XXX</b>	Power failure flashing light
				<b>X1X100XXX</b>	Warning buzzer (standard for UL version)
				<b>X2X100X0X</b>	Version according UL2017 & 61010-1 (incl. warning buzzer)
				<b>XX1100XXX</b>	Data logger incl. USB flash drive
				<b>XXX1001XX<sup>1</sup></b>	Cable entry from below
				<b>XXX1002XX<sup>1</sup></b>	Cable entry from below and above
				<b>XXX100X1X</b>	Housing lockable (not for UL version)
				<b>XXX100XX?<sup>2</sup></b>	Communication module BACnet-06 (P or Q see DB_BAC)
				<b>XXX100XXZ<sup>2</sup></b>	Communication module Modbus TCP/IP (see DB_MODIP)
					<b>Options</b>
				<b>1</b>	Type 1: 1x GC-06 module
				<b>2</b>	Type 2: 1x GC-06 module and max. 2x EP-06 modules
				<b>3</b>	Type 3: 1x GC-06 module and max. 4x EP-06 modules
				<b>4</b>	Type 4: 1x GC-06 module and max. 7x EP-06 modules
					<b>Housing type</b>
				<b>AR AI AO</b>	
				(AR: Alarm-Relay / AI: Analog Input / AO: Analog Output)	
				<b>0</b>	04 04 02
				<b>1</b>	08 08 04
				<b>2</b>	12 12 06
				<b>3</b>	16 16 08
				<b>4</b>	20 20 10
				<b>5</b>	24 24 12
				<b>6</b>	28 28 14
				<b>7</b>	32 32 16
					<b>Number of EP-06 modules</b>
				<b>0</b>	Supply 24 V DC
				<b>2</b>	Power unit: 230/110 V AC <-> 24 V DC, 6.5 A
				<b>4</b>	UPS: 230/110 V AC <-> 24 V DC, 7.2 Ah
				<b>5</b>	UPS: 230/110 V AC <-> 24 V DC, 12 Ah
					<b>Power supply / UPS<sup>3</sup></b>

<sup>1</sup> Standard is from above

<sup>2</sup> Space requirements for the modules is respected in the factory state. Number code see data sheet.

<sup>3</sup> Higher capacity or without power unit on request

### EXAMPLE

DGC-06 Digital-Gas-Controller, for max. 96 digital PolyGard<sup>®</sup>2 sensors, UPS 7.2 Ah, 12 alarm relays, power failure flashing light and data logger (ordering number: DGC-06-4-2-2-101100000)

## ELECTRICAL CONNECTION

### GC-06 module with power supply unit

