

Gas Detection.



Technical Datasheet



PolyGard®

Digital-Gas-Controller DGC

DESCRIPTION

APPLICATION

FEATURES

SPECIFICATIONS

ORDERING INFORMATION

ELECTRICAL CONNECTION

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DESCRIPTION

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

The DGC 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®/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 setpoints enable a very flexible use in many applications of the gas measuring technique. Simple and comfortable commissioning, however, is also 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. Alternatively, the PCE Software enables the convenient loading, changing and storing of the application parameters via a serial interface.

The DGC 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.

For very high reliability and availability, the Gas-Controller can be connected to the battery-backed DGC-USV uninterruptible power supply system with deep discharge protection and undervoltage monitoring.

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 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 setpoints permit individual adaptation to many applications.

The DGC 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®/PolyXeta®2 and/or 32 analog (4–20 mA) sensors
- Suitable for more than 50 different toxic, combustible 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
- 6 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 PCE 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 module and 1–7 EP6 modules)
- Up to 96 relays with change-over contact, potential-free, max. 250 V AC, 5 A, 30 V DC, 2 A (locally via MSC/MSB)
- Up to 96 relays with change-over contact, potential-free, max. 30 V AC, 0.5 A (locally via WSB)
- 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 expansion modules with integrated repeater function connectable
- Serial interface RS-485 with Modbus RTU protocol
- Prepared for DGC-USV: Battery-backed, uninterruptible power supply with deep discharge protection and battery monitoring
- SIL2 Level compliant
- Shapely, durable housing
- Housing lockable (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 (option)



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



Figure 2: DGC in housing type 1 and type 3

SPECIFICATIONS

ELECTRICAL	
Power supply	110/230 V AC, 50/60 Hz; 24 V DC \pm 20 %
Power consumption (incl. sensors)	Min. 30 W, max. ca. 160 W Depending on type and configuration
Analog input (max. 32)	4–20 mA, overload and short-circuit proof, input resistance 130 Ω
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 Ω 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)
VISUALISATION	
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 (UK), Spanish, French, Italian, English (USA)
INTERFACE FIELD BUS	
Transceiver	RS-485 / 19200 Baud
INTERFACE MODBUS RTU RS-485	
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_GC_Modbus_Supplement_E)
GASE	
	Digital PolyGard®/PolyXeta®2 and analog sensors for toxic, combustible & refrigerant gases and oxygen
AMBIENT CONDITIONS	
Working temperature range	-5 °C to +40 °C (23 °F to 104 °F)
Humidity range	15–95 % RH non-condensing
RECOMMENDED STORAGE CONDITIONS (without sensors)	
Storage temperature range	0 °C to +40 °C (32 °F to 104 °F)
Storage time	Ca. 6 months
Humidity range	15–95 % RH non-condensing
PHYSICAL	
Housing	
• Standard	Plastic housing with view cover
• According to UL	Polymeric housing with view cover, rated UL-94 V2
Colour	Similar to RAL 7035 (light grey)
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 ² (22–14 AWG)
• Output relays	2x spring type terminal: 0.5–1.5 mm ² (22–16 AWG)
• Digital/analog signals	Spring type: 0.5–1.5 mm ² (22–16 AWG)

REGULATIONS	
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 Conformity to: EN IEC 61508-1-3 EN 50402 EN 50545-1 EN 378
Warranty	2 years on device
OPTIONS	
FLASHING LIGHT AT POWER FAILURE	
LED	Battery-buffered
Operation duration	10 h (flashing)
WARNING BUZZER	
Acoustic pressure	85 dB (distance 1 m)
Frequency	3500 Hz
DATA LOGGER	
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
COMMUNICATION MODULE BACNET	
Technical data, function and protocol see datasheet DB_BAC	
COMMUNICATION MODULE MODBUS RTU TCP/IP	
Technical data, function and protocol see datasheet DB_MODIP	

All specifications were collected under optimal test conditions.

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

The T 021 (DGVU-I-213-056) and T 023 (DGVU-I-213-057) as well as T 055 leaflets must be observed.

SOFTWARE VARIANTS

The DGC software is available in several variants, which differ in terms of the number of configurable measuring points and outputs.

The number of measuring points has a direct influence on the cycle time - the time required by the system to fully analyse all connected measuring points and then update the system states of all components.

A shorter cycle time results in a faster reaction time of the overall system.

Number of Digital Points	Number of EP Modules	Number of Analog Points	Number of Signal Relays	Number of Alarm Relays	Number of Analog Outputs	Cycle time (approx.)
96	7	8 x 4 = 32	96	32	16	8000 ms
64	7	8 x 4 = 32	64	32	16	5300 ms
32	4	5 x 4 = 20	32	20	10	2600 ms
16	2	3 x 4 = 12	16	12	6	1300 ms

Table 1: Software Variants

ORDERING INFORMATION

DGC-06-	X-	X-	X-	XXX1X0XXX	
				0001X0000	Without further options
				XXX110XXX	96 measuring points (7x EP possible)
				XXX120XXX	64 measuring points (7x EP possible)
				XXX130XXX	32 measuring points (4x EP possible)
				XXX140XXX	16 measuring points (2x EP possible)
				1XX1X0XXX	Power failure flashing light
				X1X1X0XXX ¹	Warning buzzer (standard for UL version)
				X2X1X0X0X ^{2, 3}	Version according UL2017 & 61010-1 (incl. warning buzzer)
				XX11X0XXX	Data logger incl. USB flash drive
				XXX1X00XX	Cable entry only from above (standard)
				XXX1X01XX	Cable entry only from below
				XXX1X02XX	Cable entry from below and above
				XXX1X0X1X	Housing lockable (not for UL version)
				XXX1X0XX7 ⁴	Communication module BACnet (P or Q, see DB_BAC)
				XXX1X0XXZ ⁴	Communication module Modbus TCP/IP (see DB_MODIP)
					Options
				1	Type 1: 1x GC module
				2	Type 2: 1x GC module and max. 2x EP modules
				3	Type 3: 1x GC module and max. 4x EP modules
				4	Type 4: 1x GC module and max. 7x EP modules
					Housing type
				AR AI AO	
				(AR: Alarm-Relay / AI: Analog Input / AO: Analog Output)	
				0	04 04 02
				1	08 08 04
				2	12 12 06
				3	16 16 08
				4	20 20 10
				5	24 24 12
				6	28 28 14
				7	32 32 16
					Number of EP modules
				0	Supply 24 V DC
				2 ⁵	Power unit: 230/110 V AC <> 24 V DC, 6.5 A
					Power supply

¹ In the DGC variant without EP module, the internal warning buzzer occupies alarm relay 4 on the GC module.

² For UL version in conjunction with 230/110 V AC power supply unit, only the standard cable entry from above is possible.

³ Only available for version with 96 measuring points

⁴ Space requirements for the modules is respected in the factory state. For ordering code see datasheet of device.

⁵ Suitable for battery-backed power supply via DGC-USV. For ordering information see datasheet DB_DGC-USV.

EXAMPLE

DGC Digital-Gas-Controller, for max. 96 digital PolyGard® sensors, 12 alarm relays, power failure flashing light and data logger (ordering number: DGC-06-2-2-2-101110000)

ELECTRICAL CONNECTION

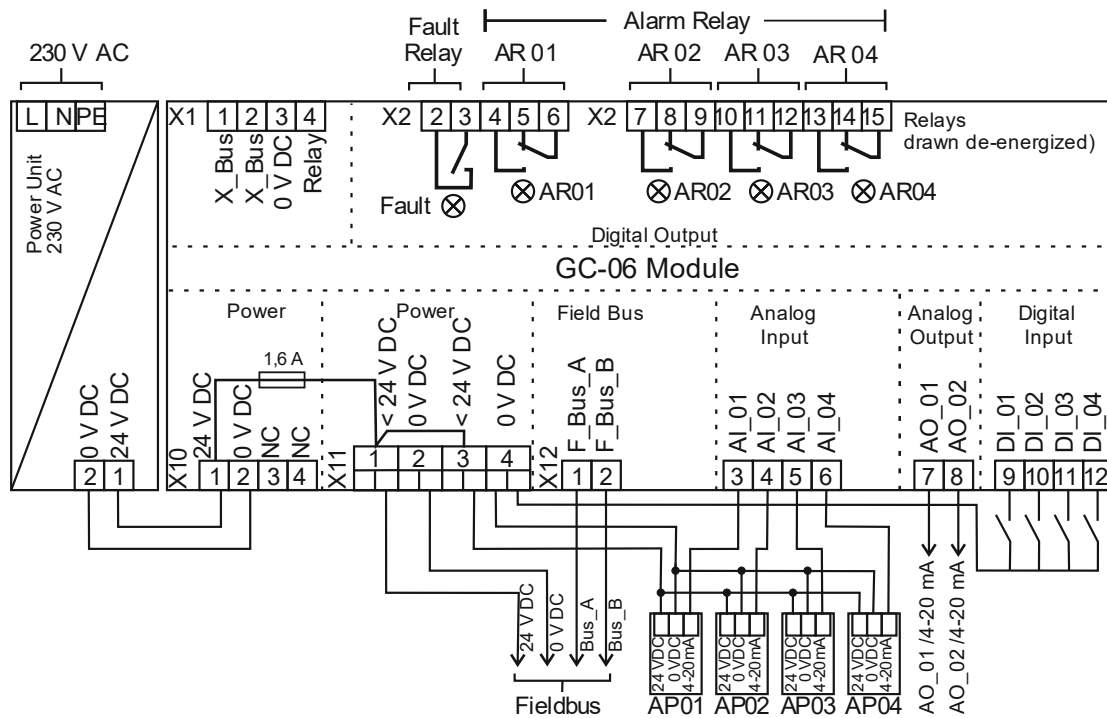


Figure 3: GC module with power supply unit



Documents



Catalog



YouTube