User Manual

GMA200-MT

(Preliminary version, updated June 2013)

Gas detection controller for mounting rail assembly

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1.   Introduction

1.1 For your safety

This user manual states the intended use of the product according to section 3 of the German Product Safety Act (ProdSG) and helps to prevent hazards.

It must be read and observed by all persons who operate, service, maintain and inspect this product. This product can serve its intended purpose only if it is operated, serviced, maintained and inspected according to the instructions given by GfG Gesellschaft für Gerätebau mbH.

Otherwise, the warranty provided by GfG Gesellschaft für Gerätebau mbH becomes void. Settings in service mode should only be carried out by experts.

1.2 Application and purpose

The GMA200-MT6 and GMA200-MT16 are gas detection controllers for mounting rail assembly. Combined with connected transmitters, they form a fixed gas warning system for the continuous measurement of gas concentrations and are used to issue a warning about combustible gases or vapours in the range below the lower explosion limit and about toxic gases in the ambient air, as well as to measure oxygen.

External relay modules GMA200-RT are additionally available.

The GMA200Config software program is required to configure the controllers GMA200-MT6 and GMA200-MT16 and the relay module GMA200-RT.

Operation and maintenance of the various transmitters, the relay module GMA200–RT and the GMA200Config software are described in separate user manuals.

1.3 Special conditions for safe operation

According to the requirements stipulated, e.g., by DIN EN 60079-29-1 section 4.2.3.2, DIN EN 45544 and DIN EN 50104 at least one alarm threshold with self-locking must be configured for potentially hazardous gas concentrations.

2.   Gas detection controller GMA200-MT

2.1 General description

The fundamental configuration and design of the gas detection controllers GMA200-MT6 and GMA200-MT16 ensure flexible, simple and clearly structured operation in industrial and commercial applications for measuring combustible and toxic gases/vapours and oxygen concentrations.

Using the "GMA200Config" software program, it is possible to quickly and easily configure measuring points and relays even when extending already installed GMA200 gas warning systems. Among other things, measuring point designation, transmitter type, gas type and measuring range, as well as three individual or specified alarm thresholds, can be configured for each measuring point.

2.2 Device design

Up to 6 transmitters can be connected to the analogue inputs of the GMA200-MT6 and up to 16 transmitters with 4-20 mA or 0.2-1 mA output to the GMA200-MT16. A microprocessor evaluates the analogue input signals of the connected transmitters, and a clearly structured display and the LEDs indicate the status of the gas detection controller, each measuring point and the relays.
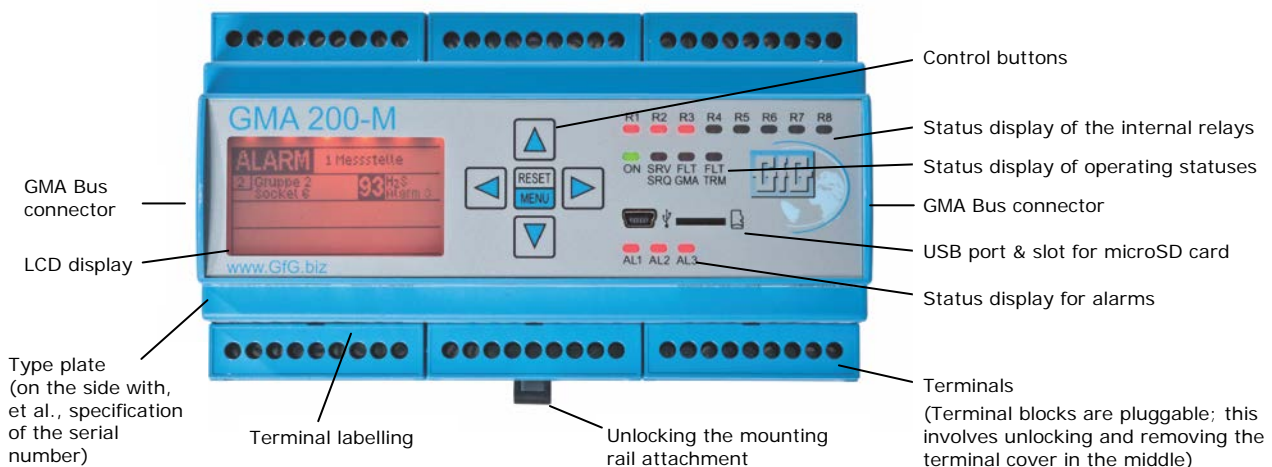
2.2.1   LED status displays
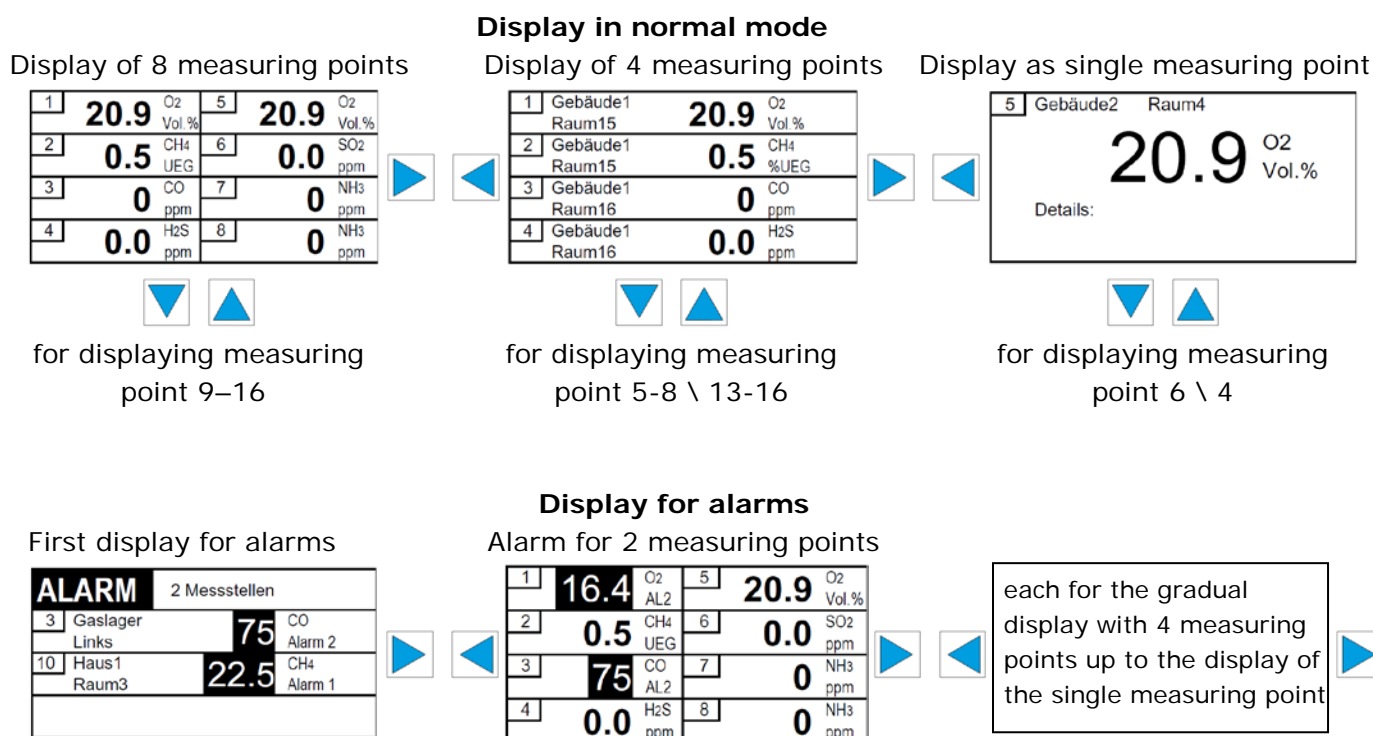
During operation, LED status displays at the controller GMA200 indicate the following statuses according to the event:

- Operating status (ON) → green
- Alarm 1 (AL1) → red
- Alarm 2 (AL2) → red
- Alarm 3 (AL3) → red
- Service (SRV/SRQ) required → yellow
- Fault (FLT) GMA → yellow
- Fault (FLT) TRM → yellow
- Relay 1 (R1) – Relay 8 (R8) → red
  (Relay activated in case of an alarm or fault)

2.2.2 Graphical display

Currently measured values are shown on the display for each measuring point. The display for the measuring points can be optionally set via the menu navigation (also see section 4.1), e.g.:

Display in normal mode

Display of 8 measuring points   Display of 4 measuring points   Display as single measuring point

for displaying measuring point 9–16   for displaying measuring point 5-8 \ 13-16   for displaying measuring point 6 \ 4

Display for alarms

First display for alarms   Alarm for 2 measuring points

each for the gradual display with 4 measuring points up to the display of the single measuring point

The display is backlit; the light intensity can be increased via any control button. In the event of a gas alarm or faults, the display lighting is automatically activated with a red background.

2.3 Internal relays of the GMA200-MT

The controllers GMA200-MT6/-MT16 feature a total of 8 relays. In order to realise specified safety measures and alarms, 6 relays can be freely configured using the GMA200Config software program. An additional relay is available for each controller as a safety-related fault message and maintenance relay.

2.4 External relay with the relay module GMA200-RT

The relay module GMA200-RT enables the addition of a further 16 freely configurable relays. A total of 4 relay modules with 64 additional relays can be managed via the controller GMA200-MT. The relay modules RT are connected to the controller GMA200 via the digital interface RS-485 which also enables the spatial separation of the relay modules (max. 1,000 m).

The relay module is not described in this user manual
(see UM 222-000.24).

2.5 Relay configuration

Configuration of the relays using the GMA200Config software offers extensive options, e.g. the allocation of individual or several measuring points to relays.

Configuration options:

Single alarm per measuring point and alarm threshold
Configuration of And / Or conjunctions, collective or group alarms
Fault messages
Voting functions
Open-circuit principle / Closed-circuit principle

3. Assembly and installation instructions

3.1 Site of installation

The GMA200-MT6 and GMA200-MT16 are designed for assembly on mounting rails in control cabinets or wall-mounted housings and should not be installed in potentially explosive atmospheres. They should be installed in areas with as little vibration as possible.

3.2 Electrical connections

The voltage supply and transmitter are connected according to the terminal assignment diagram located at the GMA200 housing near the terminal covers.
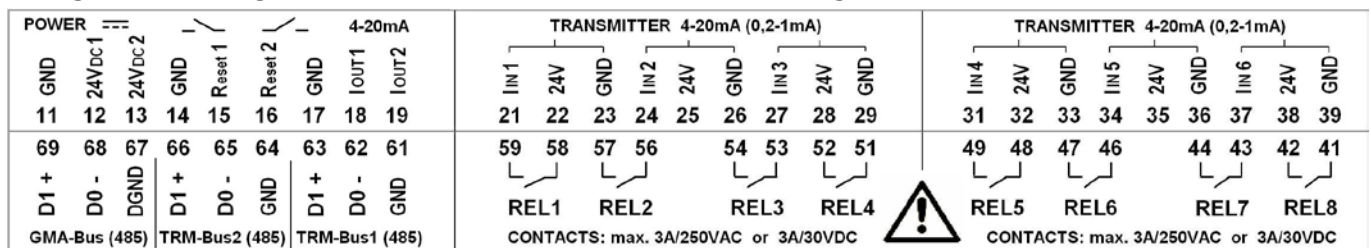
The top terminal assignment applies to the GMA200-MT6 and the bottom terminal assignment applies to the GMA200-MT16.
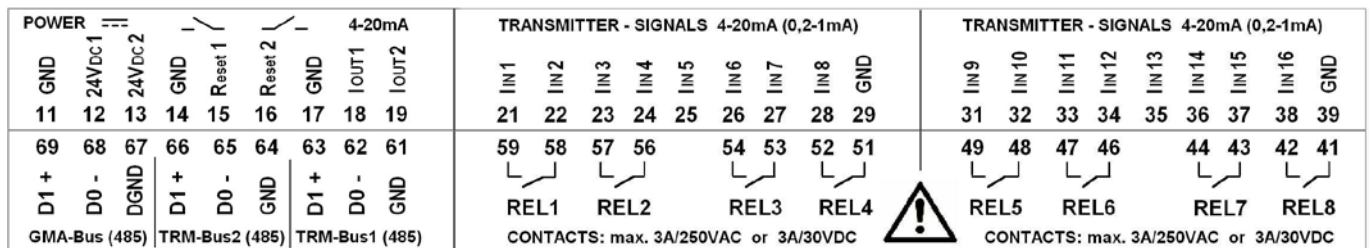
This symbol shown on the terminal assignment diagram means:
General warning, see user manual

3.2.1 Safety information

Electrical installation must always be carried out to DIN VDE 0100 or a similar country-specific standard. Cables with hazardous live voltages, e.g. 230 V AC, and cables with non-hazardous live voltages, e.g. 24 V DC, must be laid separately. The applied cables must be suitable for the connected transmitters or devices.

If maintenance work is carried out at the GMA200-MT6/-MT16 during operation, please note that hazardous live voltages may be present at the relay terminals Y41-59. Never come into contact with these terminals.

3.2.2 Floating relay contacts

Additional external warning equipment, e.g. control lamps, acoustic signal transmitters, etc., can be connected to the terminals Y41-59 (contacts of the relays 1-8). The contacts of the adjacent relays 1&2, 3&4, 5&6 and 7&8 should only be operated with the same voltage category.

Hazardous live voltages (e.g. 230 V AC) and protective extra-low voltages (e.g. 24 V DC) should not be connected together at these adjacent relays.

3.2.3 24 V DC voltage supply

The GMA200-MT6 and MT16 are usually supplied with voltage via an external 24 V DC power supply unit or a 24 V DC power supply network. This voltage is connected to the terminals Y12 (24 V DC1) and Y11 (GND). A second 24 V DC power supply unit or a second 24 V DC power supply network can be optionally connected to the terminals Y13 (24 V DC2) and Y14 (GND) to ensure a redundant voltage supply. The used power supply unit should comply with EN60950-1 or feature reinforced or double insulation between the mains supply circuit and output voltage circuit similar to devices of protection class II (protective insulation ▣).

If the GMA200-MT6/-MT16 is operated in a 24 V DC power supply network, it must be safety extra-low voltage (SELV) or protective extra-low voltage (PELV). Besides, the same requirements as for the previously described power supply units apply to the 24 V DC power supply network.

3.2.4 Connection of transmitters with an analogue interface

When using the GMA200-MT6, six transmitters with analogue 4-20 mA or 0.2-1 mA output signals can be connected to the terminals Y21-39. Three terminals (I_{IN}, 24 V, GND) are available for each transmitter. The wire cross section to be used depends on the power consumption of the transmitters and the length of the cable. Please refer to the user manual of the connected transmitters for detailed information.

When using the GMA200-MT16, only the signal lines of 16 transmitters with an analogue 4-20 mA or 0.2-1 mA interface can be connected to the terminals Y21-38. Only one terminal (I_{IN}) is available per transmitter; the power supply of the transmitters must therefore occur separately and be connected via external terminals.

3.2.5 Connection of transmitters with a digital interface (RS485)

Transmitters with a digital interface (RS485) can be connected to the terminals Y61-63 (TRM- Bus1) or Y64-66 (TRM Bus2).
Three terminals (GND, D0-, D1+) are available per transmitter bus. The 24 V power supply of the transmitters is connected according to the type of GMA200.

When using the GMA200-MT6, free 24 V terminals (Y22, Y25, Y28, Y32, Y35 or Y38) can be used for the 24 V transmitter power supply. The total power consumption of all connected transmitters should, however, not exceed 900 mA. Please refer to the user manuals of the connected transmitters for detailed information. The wire cross section to be used depends on the power consumption of the transmitters and the length of the cable.

When using the GMA200-MT16, the 24 V DC power supply of the transmitters must occur separately and be connected via external terminals.

3.2.6 Connection of further devices with a digital interface (RS485)

In order to extend the GMA200-MTx with additional relays, further relay modules can be connected to the terminals Y61-63 (TRM Bus1), Y64-66 (TRM Bus2) or Y67-69 (GMA Bus) or at the GMA Bus connector. If the GMA Bus is used for this extension, it must be configured as the master (addr.0).
In order to further process the measuring data of the GMA200-MTx, a central unit or a respective Bus interface can be connected to the terminals Y67-69 (GMA Bus) or the GMA Bus connector. In this case, the GMA Bus connection must be configured as the slave (addr.1…255).

3.2.7 Using the alarm acknowledgement inputs

Two freely configurable alarm acknowledgement inputs (Reset1, Reset2) are located at the terminals Y15 and Y16 for connecting external acknowledgement buttons.
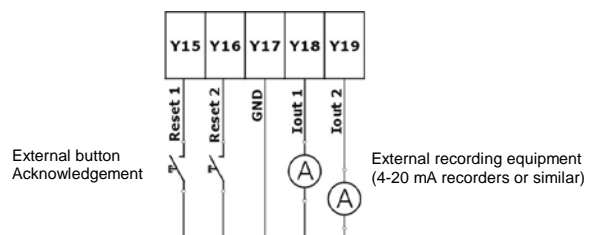
This type of input must be connected to GND to acknowledge alarms.

3.2.8 Using the 4-20 mA current outputs

Two freely configurable 4-20 mA power outputs (Iout1, Iout2) are located at the terminals Y18 and Y19. External recording equipment or recorders can be connected to these outputs to GND (see figure in section 3.2.7).

3.3 Commissioning

Commissioning can commence after assembling the GMA200-MT6 or MT16 as well as all the transmitters and additional control modules, and once the voltage supply has been connected.

The gas warning system must be inspected and commissioned by an expert after installation. Inspections must be carried out in accordance with the manufacturer's instructions and executed by a fully trained and qualified expert. The expert must record the result in writing (see data sheet T023/2009, section 8.1 and DIN EN 60079-29-2, section 8.9). GfG service technicians as well as experts authorised by us are at your disposal.

4.   Operating instructions

4.1 Measuring mode

Normal measuring mode of the GMA200 is achieved approx. 10 seconds after connection to the voltage supply. Device readiness is indicated by a short optical signal.
Depending on the type of transmitter and its warm-up period, allocation to the respective measuring point "SRT" takes place in the display during the warm-up period. The warm-up period is usually between 1 and 2 minutes depending on the type of transmitter.
In normal measuring mode, all LEDs are inactive and the operation display ON lights up green. All configured measuring points (max. 8 measuring points, see section 2.2.2, Changes of the Display, see section 5) are shown in the display.

4.2 Alarms

Three alarm thresholds can be configured within the measuring range for each measuring point. If the alarm thresholds are exceeded or not achieved, the alarm LEDs AL1, AL2, AL3 (collective alarm display) and the integrated acoustic alarm are activated. Detailed information on the gas concentration level, the alarm status (AL1, AL2 or AL3) of the respective measuring point are simultaneously shown in the graphical display (see section 2.2.2).

The configured relays and the relay LEDs R1-R6 (typical configuration) are additionally activated according to the configuration.

4.2.1   Alarm configuration

The following settings can be configured for each measuring point using the GMA200Config software:

Alarm threshold Alarm 1   (can also be changed in the
                          Main menu / Service menu)
Alarm threshold Alarm 2   (can also be changed in the
                          Main menu / Service menu)
Alarm threshold Alarm 3   (can also be changed in the
                          Main menu / Service menu)
Alarm exceeded, self-locking
Alarm exceeded, non-self-locking
Alarm not achieved, self-locking
Alarm not achieved, non-self-locking
Alarm with switch-on delay (up to max. 3 minutes)
Alarm with switch-off delay (up to max. 60 minutes)

4.2.2   Alarm acknowledgement (Reset)

Non-self-locking alarm:
  A non-self-locking alarm is automatically reset if the gas concentration is below (above) the alarm threshold and the assigned relay(s) is / are deactivated.

Self-locking alarm:
  A self-locking alarm remains even if the gas concentration is below (above) the alarm thresholds. The alarm and the assigned relay(s) can only be acknowledged if the alarm threshold has not been achieved (has been exceeded).

Acknowledgeable alarm relays:
  Relays can be configured as acknowledgeable and are reserved for connection to acoustic/optical messages only. Acknowledgement can occur via the Reset button at the controller module. Alternatively, acknowledgement is also possible via external reset inputs.

4.3 Relays

The GMA200-MT is equipped with 6 freely programmable relays (normally open contact) which can be configured using the HMA200Config software:

- Single alarm per measuring point and alarm threshold
- Fault messages
- And/Or conjunctions
- Collective or group alarms
- Voting function, e.g. 2 of 3 measuring points
- Open-circuit principle / Closed-circuit principle

Furthermore, two additional relays are available as a safety-related fault message and for service or maintenance messages.

Up to four external relay modules (GMA200–RT) can be used for extension purposes (see section 2.4.).

4.4 Faults

Fault messages are categorised as GMA controller faults and transmitter measuring point faults.

FLT/TRM   Transmitter or measuring point fault:
          A fault can be caused, e.g., by a defective signal line or a defective transmitter.

Note: Observe the respective information in the user manual of the connected transmitter.

FLT/GMA   GMA controller fault

          Possible causes:
- Defective electronics
- Operating voltage has not been achieved
- Communication error to the external GMA modules (relay module GMA200-RT)
- One or more defective internal relays or external relays (relay module GM200-RT)
- Program error (error in the parameters, check sums, etc.)

Please contact our Service in case of faults.

4.5 Data logger function (configured using the GMA200Config software)

The gas warning system GMA200 can be equipped with a microSD card for saving measured values.

The following is permanently recorded at individually configured intervals:

Mean values – recording intervals: 5/10/15/20/30 seconds or
                                           1/2/3/5/10/15/20/30/60 minutes

Instantaneous values – recording intervals: 5/10/15/20/30/60 seconds

as well as alarm events and faults.

Depending on the configuration, the measured values are saved under a file name according to the calendar:

- Daily (file name: Year/Month/Day/Type*)
  e.g. 13-0622M.txt
- Weekly (file name: Year/W/Calendar week)
  e.g. 13-W24M.txt
- Monthly (file name: Year/Month/Type*) e.g. 13-06M.txt
- Annually (file name: Year/Type*) e.g. 13-00M.txt

*M= Mean value / A=Instantaneous value in case of an alarm

The SD card must be removed and read out externally.

Important information: Prior to removing the SD card, stop or deactivate the data recording (also see the additional information on the service menu).

- Activate the GMA200 menu by pressing and holding ![RESET MENU]
- Select "Status Datenlogger" (Status data logger); to acknowledge, press ![►]
- Select "Stop Rec" (pause function) by pressing ![RESET MENU]
- The status (still available storage capacity) is also displayed in this menu item.

Proceed as follows to deactivate the data recording:

- Select "Service Menü" (service menu) via ![▼]
- Enter the password (see section 5.3)
- Select "Datenlogger" (Data logger) ![▼] and acknowledge via ![RESET MENU]
  - Activate the measured value recording ![►]
  - Deactivate the measured value recording ![RESET MENU]
- Press ![◄] repeatedly to exit the service menu

4.6 Analogue outputs

A 4-20 mA output can be configured for 2 measuring points for transfer, e.g., to a superordinate control centre or for external measured value recording.

5.   Keyboard and menus

Alarms are acknowledged and the main menu used via the clearly structured keyboard at the controller.

5.1 Operation and menu navigation

Menu navigation occurs via the control keyboard at the controller:

RESET MENU Function when pressed:
Alarm acknowledgement for self-locking alarms, main menu activation

▶ Function when pressed:
Access detailed information in the main menu (see section 5.2), change the measured value display to single measuring point display, toggle from the alarm display function to display, select cursor position for entering the password in the service menu.

▲ Function when pressed:
Toggle to menu items in the main menu, with single measuring point display to single view of other measuring points, toggle to total display (1-8, 9-16), select numerical values for entering the password in the service menu.

◀ Function when pressed: Exit the detailed information in the main menu, exit the main menu, toggle the display to display of all measuring points, toggle the display function to alarm display function, select cursor position for entering the password in the service menu.

▼ Function when pressed: Toggle to menu items in the main menu, with single measuring point display to single view of other measuring points, activate the auto-scroll function (10 sec. or 10 min., automatic change-over of the display), select numerical values for entering the password in the service menu.

5.2 Main menu

Press and hold down the RESET MENU button to access the main menu.
The main menu is divided into:

- Status GMA
- Status data logger
- Info GMA
- Info measuring points
- Info relays
- Info analogue outputs
- Tests (test LCD display, LED/horn, external switch)
- Service menu (password protected, see section 5.2)

User navigation in the main menu occurs via the keyboard at the controller GMA200 (see section 5.1).

5.3 Service menu

Access to the service menu is password protected and set to "0000" as standard upon delivery.

Access to the service menu is locked if the controller is connected to the GMA200Config software. The connection must be disconnected first.
The configuration cannot be changed if the service menu is active at the same time.

The service menu is divided into:

- System settings
  Time/Date, Password, Language, BUS settings, Display contrast,
  Horn volume
- Data logger
  SD card: REC activation and deactivation of measured value recording
- Measuring points
  Change alarm thresholds, carry out fine adjustments, lock (deactivate the measuring points)
- Relays
  Test (electrical test of the relay function), lock (deactivate the relays), trigger timer
- Analogue outputs
  Test, measuring point assignment

The following appears in the display if changes have been carried out and when exiting the menu item:

```
=========== Exit=============
         NEW SETTING
SAVE?


  Abbr. ◄        Nein ▣          Ja ►
```
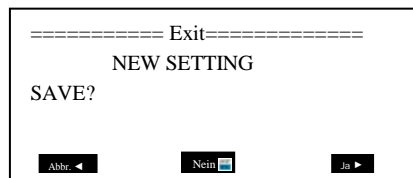
Note: Safety-relevant changes should only be carried out by authorised and expert staff.

6. Annex

6.1 Cleaning and care

External soiling of the device housing can be removed using a cloth dampened with water when the device is de-energised. Do not use solvents or cleaning agents!

6.2 Maintenance and service

Maintenance and service include regular visual inspections, functional testing and system checks, as well as repairs to the gas warning system. (see DIN EN 60079-29-2 section 11 and, in Germany, the data sheets BGI 518 T023 and BGI 836 T021, section 9).

6.2.1 Visual inspection

Visual inspections should be carried out on a regular basis with a maximum interval of one month and include the following tasks:

- Check the operation display and the status messages, e.g. operation display "On", alarm and fault displays "Off"
- Check for mechanical damage and external soiling

6.2.2 Functional testing

Functional testing can be carried out at specific intervals, which depend on the gas hazard being monitored. With gas warning systems for explosion protection, the time limit is 4 months, and when measuring toxic gases and oxygen, the time limit is 6 months according to the requirements stipulated in the guidelines BGI 518 T023 and BGI 836 T021 of the German Berufsgenossenschaft BG RCI.

It includes the following tasks:

- Visual inspection according to section 4.2.1
- Testing and evaluation of the measured value displays
- Triggering the alarm thresholds
- Triggering the test functions for display elements as well as optical and acoustic signal transducers, without triggering switching functions
- Inspection of saved messages, faults and maintenance requirements

6.2.3 System check

The system check must be carried out at regular intervals. The time between intervals should not exceed 1 year. It includes the following tasks:
- Functional testing according to section 3.7.2
- Inspection of all safety functions, including triggering of switching functions.
- Monitoring of parameterisation via target / actual comparison
- Inspection of signalling and registration modules

6.2.4   Repair

This includes all repair and replacement tasks. These tasks should only be carried out by the manufacturer and persons who have been authorised to do so by the manufacturer – GfG Gesellschaft für Gerätebau mbH. Only original spare parts and original modules inspected and approved by the manufacturer should be used.

6.3 Spare parts and accessories

	Description	Order No.
1.	36 W power supply unit for mounting rail assembly (input: 85-264 V AC output: 24 V DC / 1.5 A)	1000271
2.	60 W power supply unit for mounting rail assembly (input: 88-264 V AC output: 24 V DC / 2.5 A)	1000272
3.	100 W power supply unit for mounting rail assembly (input: 88-264 V AC output: 24 V DC / 4.2 A)	1000273
4.	GMA200-BC terminals for GMA Bus connector	2200200
5.	microSD card 2 GB	2200202
6.	Spare fuse T 500 mA (F1 for GMA200) PU=10 pieces	2200301
7.	Spare fuse M 1 A (F2 for transmitter supply) PU=10 pieces	2200302
8.	Flat ribbon cable for GMA200-MT/-RT (L=22 cm)	2200309
9.	Terminal cover for GMA200-MT/-RT (9-hole)	2200310

6.4 Information on the environmentally sound disposal of used parts

According to section 11 of the General Terms and Conditions of the company GfG, the purchaser of the device agrees to dispose of the device or device components in an environmentally sound manner in line with sections 11 and 12 of the German Electrical and Electronic Equipment Act (ElektroG). If desired, the company GfG in Dortmund, Germany, can also carry out correct disposal.

6.5 Technical data

| Type designation:	GMA200-MT6	GMA200-MT16
Display & control elements	2.2" graphical display and 5 buttons 15 status LEDs for alarms, operating and relay statuses	
Ambient conditions for storage: for operation: Site of installation:	-25..+60 °C | 0..99 % RH (recommended 0…+30 °C) -20..+50 °C | 0..99 % RH in a control cabinet or in a wall housing up to a height of 2,000 m above sea level	

Power supply
Operating voltage:
 	
Power consumption:
 	
Fuses:
	24 V DC (20-30 V DC
	                          permissible)
	max. 5 W (without transmitter)
	max. 30 W (with transmitters)
	F1= T 500 mA (for GMA200)
	F2= M 1 A (for transmitter)
		24 V DC (20-30 V DC
		                       permissible)
		max. 5 W
		
		F1= T 500mA

Transmitter connections Supply: Analogue signals I_{IN}: Digital signals TRM Bus1+2:	24 V DC (20-30 V DC see above) 6x 150 mA or Itotal= 900 mA with other configuration 6x 4-20 mA or 0.2-1 mA (resistance approx. 50..100 Ω, I_{max}= 70 mA permanently / 500 mA temporarily) RS485; half-duplex; max. 38,400 Baud	not possible 16x 4-20 mA or 0.2-1 mA
RS485 connections TRM Bus1+2: GMA Bus:	RS485; half-duplex; max. 38,400 Baud (for GMA200 relay modules only) RS485; half-duplex; galvanically isolated; max. 230,400 Baud (for GMA200 relay modules, control centre, PC, PLC or Gateway)	
Relay outputs Contacts: Contact rating: Insulation distances:	8 relays each with a normally open contact 3 A / 250 V AC or 3 A / 30 V DC Basic insulation between the relays: 1&2, 3&4, 5&6, 7&8 Double insulation between the relays: 2&3, 4&5, 6&7	
Analogue outputs I_{OUT}1+2:	4-20 mA (resistance max. 560 Ω)	
Alarm acknowledgement inputs Reset1+2:	0-3 V DC (alarm acknowledgement occurs at contact with GND; U_{MAX}= 30 V DC)	
USB connection	Mini USB port for device configuration via PC	
Housing Attachment: Protection class: Material: Weight: Dimensions:	on mounting rail TS35 according to DIN 60715 IP20 Plastic approx. 370 g 162 x 97 x 62 mm (W x H x D)	
Connection cables Terminal blocks: Cable:	0.8..2.5 mm^2 cross section 2-4-wire 0.5-1.5 mm^2 LiYY, NYM (for GMA200 supply) 2-4-wire 0.5-1.5 mm^2 LiYY, LiYCY (for transmitter) 2-wire 1 x 2 x 0.22 mm^2 BUS-LD (for GMA Bus with a length >10 m)	

Approvals/Tests
Electromagnetic compatibility
 	
Electrical safety
	EN 50270:2006 Emitted interference: Type class I
	                          Interference resistance: Type class II
	EN 61010:2010 Degree of soiling 2
	                          Overvoltage category III for relay contacts	

EG-Konformitätserklärung

GfG Gesellschaft für Gerätebau mbH

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GMA200-MT6
GMA200-MT16
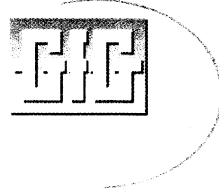
Erstellt: 12.04.2013   Geändert: www.gfg.biz

Die GfG Gesellschaft für Gerätebau mbH entwickelt, produziert und vertreibt Gassensoren und Gaswarnanlagen unter Anwendung eines **Qualitätsmanagementsystems** nach DIN EN ISO 9001 Überwacht wird die Produktion von elektrischen Betriebsmitteln der Gerätegruppen I und II, Kategorien M1, M2, 1G und 2G für Gassensoren, Gasmessgeräte, Gaswarnanlagen in den Zündschutzarten Druckfeste Kapselung, Erhöhte Sicherheit, Vergusskapselung und Eigensicherheit mit deren Messfunktion mit Hilfe eines **Qualitätssicherungssystems** – Zertifikats-Nr. BVS 03 ATEX ZQS / E 187 - durch die benannte Stelle, DEKRA EXAM GmbH.

Die Gasmesscomputer der Serie **GMA200-MT** entsprechen der **Richtlinie 2004/108/EG** für die elektromagnetische Verträglichkeit und der **Richtlinie 2006/95/EG** für Niederspannungen.

Kennzeichnung   CE

Die Richtlinien wurden unter Berücksichtigung der folgenden Normen eingehalten:

■ **Elektromagnetische Verträglichkeit**

- Elektrische Geräte für die Detektion und Messung von brennbaren Gasen, toxischen Gasen und Sauerstoff.   EN 50270
Störaussendung: Typ 1
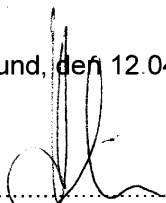Störfestigkeit: Typ 2

■ **Elektrische Sicherheit**
- Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte. Allgemeine Anforderungen.   EN 61010-1

Mit der Prüfung und Bewertung der elektromagnetischen Verträglichkeit wurde das EMV Messlabor EM TEST GmbH, Kamen beauftragt. Mit der Prüfung und Bewertung der elektrischen Sicherheit wurde das Ingenieurbüro du.tronic Consulting & Engineering, Ratingen beauftragt.

Die Sicherheitshinweise in der Betriebsanleitung 222-000.20 sind zu beachten.

Dortmund, den 12.04.2013

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Dipl. Kfm. H.-J. Hübner
Geschäftsführer