Operations Manual

G400-MP2

Smart motorized pump for Microtector II series

GfG GESELLSCHAFT FÜR GERÄTEBAU MBH ▌ KLÖNNESTRASSE 99 ▌ D-44143 DORTMUND ▌ TELEFON +49 / (0)2 31 / 5 64 00 –0 ▌ FAX +49 / (0)2 31 / 51 63 13
INFO@GFG-MBH.COM ▌ WWW.GASMESSUNG.DE ▌ AMTSGERICHT DORTMUND HR B 2742 ▌ ZERTIFIZIERT NACH DIN EN ISO 9001:2000 ▌ ATEX QM ZERTIFIZIERT

Content

1. Introduction

1.1 For your safety

According to § 3 of the law about technical working media, this manual points out the proper use of the product and serves to prevent dangers.
This manual must be carefully read by all individuals who have or will have the responsibility for using and servicing this product. As any piece of complex equipment, the product will do the job designed to do, only, if it is used and serviced in accordance with the manufacturer's instructions.
If the product is not used and serviced in accordance with the instructions in this manual the warranty will be voided. Adjustments in the service mode must be done by experts only.

Before operating the pump check the charge status of the battery resp. of the rechargeable battery as well as the readiness of operation of the detector (see chapter "Indication of battery capacity", page 5).

The above does not alter statements regarding GfG's warranties and conditions of sale and delivery.

1.2 Application and use

The smart motorized pump G400-MP2 is used for personal safety in atmospheric conditions in combination with the portable gas detectors of the Microtector II series.

The smart pump G400-MP2 is approved for the use in explosion endangered areas and is subject to an EC-Type Examination Certificate issued by DEKRA EXAM, according to directive 2014/34/EU with following certificates:

ATEX Certificate:	BVS 07 ATEX E 011		
Labelling:	⟨Ex⟩ II 2G	Ex ia IIC T4 Gb	-20°C≤Ta≤+55°C (NiMH-II)
		Ex ia IIC T3 Gb	-20°C≤Ta≤+55°C (NiMH)
		Ex ia IIC T4/T3 Gb	-20°C≤Ta≤+45°/+55°C (Alkaline)
Labelling:	⟨Ex⟩ I M1	Ex ia I Ma	-20°C≤Ta≤+55°C

For the application in group I, category 2G depends on the temperature class of the supply module used. When using the rechargeable battery pack „NiMH II", temperature class T4 is valid for ambient temperatures from –20°C to +55°C, resp. temperature class T3 when using the rechargeable battery pack "NiMH". Both rechargeable battery packs come with a black casing and can be distinguished by means of an internal label showing type and temperature class. When using the Alkaline batteries (grey housing), temperature class T4 is valid for ambient temperatures from -20°C to +45°C resp. temperature class T3 for ambient temperatures of -20°C to +55°C. For the application in group I, category M1 the pump G400-MP2 can be used in environments -20°C≤T_a≤+55°C.

1.3 Special conditions for safe use

In explosion endangered areas the pump G400-MP2 must be used properly, i.e. the pump with a gas detector of the G400 series must be carried at your body and must not be laid down unattended, to prevent an electrostatic charge of the clip. The pump must be attached to the Microtector II gas detector before entering the explosion endangered are. It must not be removed from the detector in the hazardous area.
Always pay attention to the ignition protection with the temperature class of the gas detector.

If the pump G400-MP2 is going to be used in underground or surface mines which are endangered by black damp and/or combustible dust (device category I) following additional conditions apply: A mechanical impact must be avoided because the G400-MP2 is only specified for a lower degree of mechanical hazard according to EN 60079-0. The pump G400-MP2 has to be removed from hazardous areas immediately and getting cleaned if it becomes soiled by oil and grease or hydraulic liquids.

1.4 General description and design

The pump G400-MP2 is a very small and handy supplemental module for the gas detector Microtector II series. It allows sampling of gases from a safe position, without being exposed to hazardous atmospheres. The pump provides its own power supply, which works independent from that of the Microtector II series.

1.4.1 Connection to Microtector II series

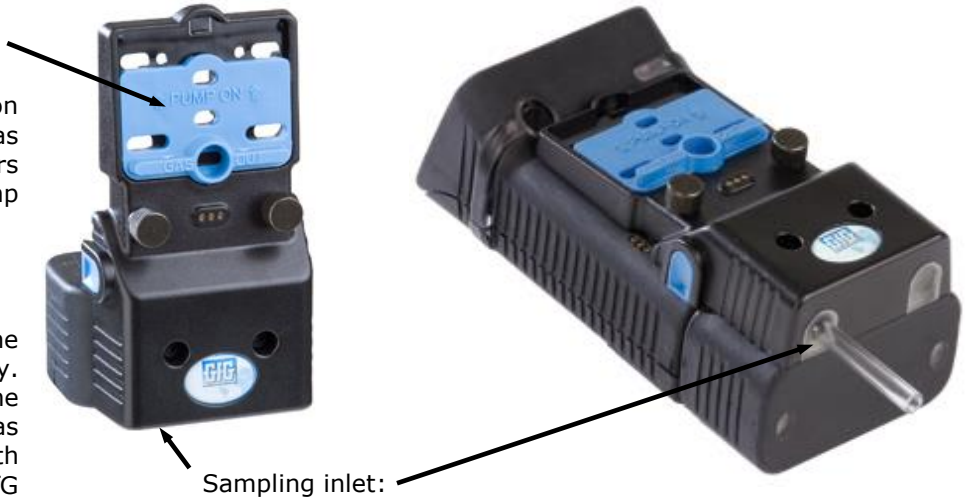
Plug the pump G400-MP2 on the gas detector Microtector II series and fix it by means of the knurled screws. For permanent attachment to the Microtector II series you can fix the pump by means of 2 additional screws (attached). You will find the mounting holes for the additional screw below the red sensor cover. For accessing the holes, slide the sensor cover upwards – push the lock smoothly with a screw driver – and remove it. Once the screws were mounted, fix the sensor cover again and slide it downwards.
For removing the pump from the Microtector II series, unscrew the knurled screws as well as the possibly mounted additional screws.

1.4.2 Sensor cover and inlet

Sensor cover

For both turning device on and off and closing gas diffusion inlet slide sensors cover up during pump operation.

The sampling inlet is at the bottom of the pump body. Here you can fix the accessories for taking gas samples (hose adapter with sampling line, probe, GfG telescopic probe).

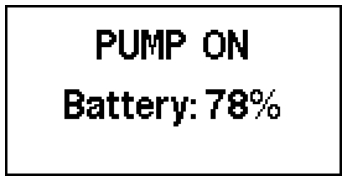


The sensor cover turns pump on and off and closes the diffusion inlets during sampling.

2. Operational Hints

2.1 Turning pump on and off

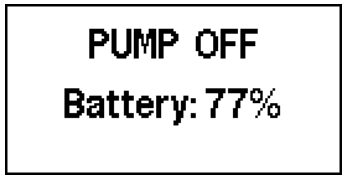
Slide the blue sensor cover upwards to turn the pump on. The display of the Microtector II shows the actual operational status of the pump.



With sufficient battery capacity the pump motor starts after a short delay (approx. 1 second). The display of the Microtector II shows the battery capacity.(*1)

NOTE! If the blue sensor cover is slided upwards violently, it may slip over its lock and the diffusion inlets are not properly covered. This may result in false detection, since ambient air could dilute the concentration of the gas sample. Make sure, therefore, that the diffusion inlets are closed properly.

Slide the blue sensor cover downwards to turn the pump off.



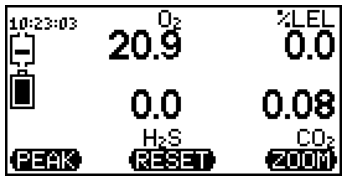
The pump symbol vanishes and the remaining battery capacity of the pump is shown in the display of the Microtector II.

The pump should be turned off after detection to prevent unnecessary discharging of the batteries.

To (*1): When using the NiMH F25 or NiMH-II A21 power pack, there can especially be an elevated residual capacity shown if relatively new batteries are being used. In extreme cases, a full battery can be indicated during half of the life. The residual capacity display then falls considerably faster. This normalises itself the older the batter becomes or in relation to the number of charging/discharging cycles. The battery alarm is triggered in good time however, irrespective of this.

2.2 Pump operation signal

During sampling a pump symbol is shown in the display of the Microtector II to indicate trouble-free operation.



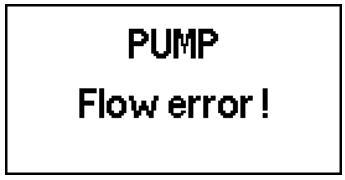
The trouble-free operation is indicated on the left side in the display of the Microtector II by an animated pump symbol.

This symbol blinks when the pump does not work properly.

Further status indication about alarm or failure is given by means of audible, visual or vibration alarm of the Microtector II.

2.3 LowFlow - alarm

During normal pump operation the gas flow is about 0.5l/min. If the gas flow is too low (<0.25l/min) or if the power supply of the pump motor is interrupted, the Microtector II gives audible, optical or vibration.



Additionally the display shows „Pump Flow error!"
Reason for that can be that the way of gas is possibly blocked or the sampling line is bent. For proper operation make sure that the gas way is free.

Attention: During LowFlow alarm proper detection of the Microtector II cannot be ensured.

2.4 Minimum pump time

For sampling gases out of sewers, rooms or drains a hose (with or without telescopic probe) can be used that is plugged on the intake. As the response time heavily depends on the inside volume of the intake appliance the lengths of the appliance shall be as short as possible. For the minimum pump time (T_{min} in seconds) you may use the following formula:

$$\mathbf{T_{min} = 10s + 3s/m*L_{hose} + T_{Tele}}$$

L_{hose} = lengths of hose (inner diameter 5 mm) in meter
T_{Tele} = 10s with telescopic probe, 0s without

2.5 Pump monitoring and failure

Display and alarms of the Microtector II are used to indicate the operational status of the G400-MP2 resp. to trigger fault alarms. Instrument and pump communicate over three gilded contact springs in the middle of the devices. The Microtector II monitors the communication link permanently.

When the data connection is disconnected, visual and audible alarm is triggered and the display shows "Pump connection lost!"

This status has to be reset by the middle key (RESET).

When the data connection is disconnected only partially the status of the pump cannot be monitored correctly. In this case remove the pump from the Microtector II

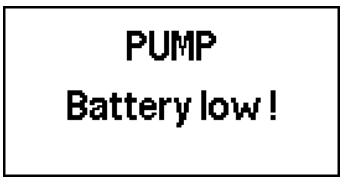
Remedy: Clean dirty contacts of the instrument and spring contacts of the pump or call GfG-Service.

The circuitry of the G400-MP2 is permanently monitored. A failure being detected triggers an audible and visual alarm.

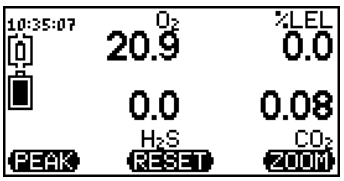
Remedy: Change batteries. In case of failure not being solved call GfG-Service.

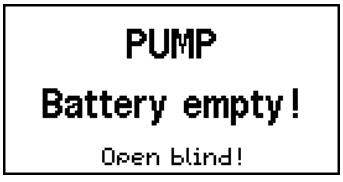
2.6 Monitoring battery capacity

The battery capacity of the pump is shown in the display of the Microtector II directly after switching on or off (see chapter 2.1 „Turning pump on and off"). A sufficient battery capacity and trouble-free operation is indicated on the left side in the display of the Microtector II by an animated pump symbol.



An low battery of the pump is indicated by display showing „Pump battery low!". During normal measurement display reads a blinking battery symbol.





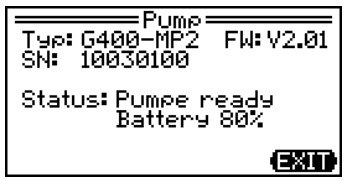
When the battery of the pump is completely exhausted the display shows „Pump battery empty! Open blind!".

The sensor cover has to be slided downwards in order to allow diffusion mode.

2.7 Information regarding the pump

The display of the Microtector II can show certain information about the pump.

Keeping middle key pressed opens the main menu of the Microtector II. Scroll down with the left key and select menu-point "Pump" with the middle key.



Model, firmware version (FW) and serial number (SN) of the pump are shown.

Status shows actual operational status and error messages as well as battery capacity.

Due to the fact that the charging status is calculated from the battery voltage, the value can vary when the pump is turned on or off.

2.8 Power supply

The pump G400-MP2 can be powered by an alkaline battery module or by a rechargeable NiMH battery pack. These power supply modules allow a continuous operation for up to 11 hours. The operational time may be reduced, however, by increased load of the pump motor (e.g. bent sampling line / blocked filter/low ambient temperature).
The pump G400-MP2 turns off automatically, if the battery voltage falls below the minimum level needed for proper functioning. At least 15 minutes before automatic deactivation the battery alarm will be triggered. In this case the display shows "Pump battery weak!"

2.8.1 Charging the battery pack

Attention: The unit must not be charged in explosion endangered areas. Charging contacts must be cleaned. (see appendix chapter 3.1 "Cleaning")

The rechargeable NiMH battery pack in the G400-MP2 has to be recharged by means of the blue cradle charger G400-DIC2.
A trouble-free charging process is only guaranteed if charger lies or is mounted in horizontal position and when Microtector II is assembled to the charger correctly. The pump charger is powered by GfG's plug-in mains unit. Alternatively the Pump Charger may also be connected to a car charging cable. The Pump Charger limits the voltage for the G400-MP2 to max. 6V.

The charging process is divided into quick and trickle charge. The right green LED signalizes the readiness of the charger. The right yellow LED signalizes the charging process for the pump (constant light: quick charge, blinking: trickle charge). Charging a completely discharged battery pack takes about 6-7 hours for quick charge. After that the charger automatically switches to trickle-charge to prevent over-charge. The display of the Microtector II does not show the charging status of the pump.

To provide maximum capacity of the battery pack it is necessary to charge only in dependency to the operational time and frequency. Do not use charger for storing the Microtector II and pump for several weeks.

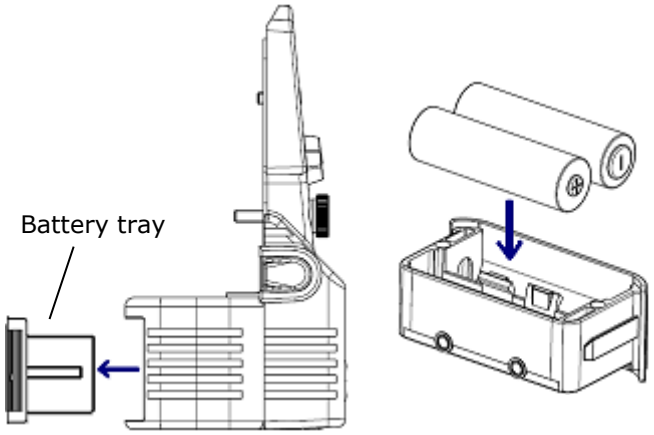
2.8.2 Replacement of batteries and battery pack

Note: The pump must not be opened in explosion endangered areas. You must not replace the alkaline or rechargeable battery module in hazardous areas.

Always turn the pump off before replacing the alkaline or rechargeable battery module. Watch out for the correct polarity of the new 1.5V AA alkaline batteries (see battery holder). These batteries must always be purchased from GfG as the manufacturer of the pump. In-house quality management ensures that only batteries are used which comply with the requirements of the EC-Type Examination Certificate.
The correct battery types are: **DURACELL PROCELL MN1500 LR6 AA or**
INDUSTRIAL BY DURACELL ID1500 AA (LR6)

Note

The batteries may only be replaced in safe areas. Watch out for correct polarity when inserting the batteries (see picture inside the battery tray). With incorrect polarity the pump will not turn on.



For replacing the batteries separate the battery tray from the pump. Unscrew the fixing screws on the front and pull the battery tray off.

Note:

- Batteries must not be replaced in EX-areas
- Watch out for correct polarity of the new batteries! (see pictograph on inner side of battery tray)
- Watch out for correct inserting of battery tray! (Characters on front must be readable.)

Tighten all screws after inserting the battery tray.

Please adhere to disposal notes!

3. Annex

3.1 Cleaning

Give the G400-MP2 pump a short sight check after use. Use a damp cloth to remove stains or soiling from the casing. Never use solvents or cleaning agents! Especially attend that outer charging contact areas and charging springs are clean. Bad contacts result in incorrect charging of the NiMH battery pack.

3.2 Inspection

Independently from maintenance the user has to do the following checks at least before every shift:

* Visual check for damages
* Check of battery capacity
* Check of sampling performance

3.3 Maintenance and regular function check

Depending on the process conditions and technical requirements, the maintenance is to be effected all 4 months. Maintenance includes measures which retain the nominal status of the pump G400-MP2.

* Visual check for damages
* Check of filter condition
* Check of pump battery capacity
* Check of confidence signal
* Check of sampling performance
* Check of LowFlow alarm
* In addition to the above we recommend to get the pump checked for proper functioning by an expert in combination with the (at least) annual maintenance of the Microtector II series.

3.4 Service

Service should be done by the manufacturer. Only genuine spare parts must be used for service and repair.

3.5 Changing the filter

To replace the internal filter insert, disconnect the pump from the Microtector II gas meter and remove the blue side cover from the rear.

Remove the 22mm long internal filter insert with a pair of tweezers and replace it with a new one.

Slide the blue filter cover back on without damaging the rubber seal underneath.

The attachment filter consists of the basic housing, the filter holder with hose connection and the filter insert.

To change the filter insert, remove the filter holder from the basic housing using a 3mm Allen key.

Remove the filter insert from the filter holder, e.g. using tweezers. It is also essential to remove the filter sleeve from the holder.

Insert a new filter insert into the holder. Some pressure is required for the last 2mm.

Screw the filter holder back into the basic housing using the 3mm Allen key.

3.6 Errors, Causes, Remedy

	Error / Message	Cause	Remedy
1.	Pump motor does not start	Ambient temperature below -10°C	Switch on the pump in a warm environment.
		Insufficient supply voltage	Charge battery or change battery
		Hardware defect	Make use of GfG service
2.	Pump motor "stutters" 5x	Memory error (Flash, RAM, parameter) or hardware defect	Remove and reassemble battery / rechargeable battery or contact GfG service
3.	Message "PUMP fault!"		
4.	Message "PUMP Flow error!"	Blocked or soiled intake path (hose, attachment filter, filter insert)	Remove blockage or dirt or replace filter.
5.	Message „PUMP connection lost!"	G400-MP2 not correctly mounted to gas detector or removed	Confirm message and if necessary mount G400-MP2 correctly and switch it on/off
6.	Message „PUMP connection disturbed!"	Dirty electrical contacts between the gas detector and the G400-MP2	Clean contact surfaces of the gas detector and spring contacts of the G400-MP2; use GfG service if necessary.
7.	Message „PUMP battery low!"	Low state of charge of the battery or rechargeable battery	Charge battery or change battery if necessary
8.	Message „PUMP Battery empty!"	Empty rechargeable battery or empty battery	Charge battery or change battery
9.	G400-MP2 lässt sich nicht laden	Charging contacts dirty	Clean charging contacts
		Battery or charger defective	Make use of GfG service
		G400-MP2 with alkaline battery compartment	Use the battery compartment

3.7 Spare parts and accessories

	Description	Part-No.
1.	Battery tray without alkaline batteries	1450200
2.	Alkaline battery (pack of 10)	1450204
3.	NiMH-II A21 rechargeable battery pack	1450206
4.	NiMH F25 rechargeable battery pack	1460206
5.	Sensor cover blue	1450330
6.	Sensor cover blue (pack of 10)	1450331
7.	Filter 22mm (pack of 10)	1450321
8.	Sampling tube 30cm, transparent	1450324
9.	Hose intake 5cm, transparent	1450323
10.	Filter complete with hose connection, nickel-plated brass	1450327
11.	Replacement filter 11mm (pack of 10)	1450328
12.	Charging cradle G400-DIC2BS (with holding bracket for Microtector II and pump with attached filter)	1450231
13.	Charging tray G400-DIC2DS (in docking station for Microtector II and pump with attached filter)	1450415
14.	Plug charger 100-240VAC (Euro plug)	1450216
15.	Car charger	1450218
16.	Telescopic probe CrNi 1.36m	1000205
17.	Special dust/water filter (pack of 3)	1000207
18.	Special sampling line 3m, anti-static, with dust/water filter	1000208
19.	Special sampling line 3m, anti-static, with dust/water filter and flow indicator	1000209
20.	Viton hose (resistant against solvents and hydrogen sulphide)	1000217
21.	Float probe	on request

3.8 Information on the environmentally safe disposal of used parts

According to GfG's general terms and conditions, the customer assumes responsibility for the environmentally safe disposal of the device or any device components (such as replaced sensors). In Germany, this is regulated by §§11, 12 ElektroG. On request, GfG in Dortmund can also handle the proper disposal.

3.9 Technical data

Type:	**G400-MP2**
Pump performance:	0,50 l/min for 0 mm water column 0,35 l/min for 300 mm water column max.100m hose length (depending on gas and hose)
Gas supply:	Sampling inlet during pump mode or Diffusion inlet when pump is turned off
Display and alarm:	Messages appear in the display of the Microtector II. Acoustic and visual alarms will be triggered by means of the Microtector II. Vibration alarm (optionally) integrated in the battery pack.
Power supply:	1. NiMH-battery pack A21 (black case), 2100mAh rechargeable 2. NiMH-battery pack F25 (black case), 2500mAh rechargeable Im=600mA (max. charging current) Um=6V DC (max. voltage) or 3. Alkaline batteries (grey case), not rechargeable with 2x Mignon 1.5V type: DURACELL PROCELL MN1500 LR6 AA or INDUSTRIAL BY DURACELL ID1500 AA (LR6)
Charging time of the NiMH battery pack:	approx. 6-7h
Operational time:	Pump ON: > 9h (NiMH battery pack F25) approx. 9h (NiMH-II battery pack A21) approx. 10h (Alkaline batteries) Pump OFF: approx. 10 days (Gas Detector ON) approx. 200 days (Gas Detector OFF)
Climate conditions:	
for operation:	-20...+55 °C | 5...95% r.h.
for storage:	-25...+55 °C | 5...95% r.h. (recommended 0...+30°C)
Casing: Material:	Plastic and rubberized compound
Dimensions:	68 x 109 x 21 (57) mm (W x H x D)
Weight:	180g with alkaline battery pack or 195g with NiMH battery pack
Protection:	IP40
Approvals and certificates:	
Labelling and ignition protection:	Ⓔx II2G Ex ia IIC T4 -20°C≤Ta≤+55°C for NiMH-II (black) Ex ia IIC T3 -20°C≤Ta≤+55°C for NiMH (black) Ex ia IIC T4/T3 -20°C≤Ta≤+45°C/+55°C for Alkaline (grey) Ⓔx I M1 Ex ia I Ma -20°C≤Ta≤+55°C
EC-Type Examination Certificate:	BVS 07 ATEX E 011 (without measuring function)
Electromagnetic compatibility:	DIN EN 50270:2006 Radio shielding: Type class I Interference resistance: Type class II
Production monitoring:	CE0158 (by notified body – DEKRA EXAM GmbH)

3.10 EC-Type Examination Certificate

DEKRA

Translation

5th Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate

BVS 07 ATEX E 011

Equipment: Pump type G400-MP2 and type G400-MP3

Manufacturer: GfG Gesellschaft für Gerätebau mbH

Address: 44143 Dortmund, Germany

Description

The pumps type G400-MP2 and type G400-MP3 can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report.

The marking of the pumps type G400-MP2 and type G400-MP3 was modified.

The pump type G400-MP2 may also be used in connection with the gas detector type G460 (BVS 06 ATEX E 017 X) in Group I Category M1 areas.

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 60079-0:2009	General requirements
EN 60079-1:2007	Flameproof enclosure 'd'
EN 60079-11:2007	Intrinsic safety 'i'
EN 50303:2000	Equipment for Group I Category M1

The marking of the pumps shall include the following:

II 2G Ex ia IIC T4/T3 Gb
I M1 Ex ia I Ma for type G400-MP2

II 2G Ex ia d IIC T4/T3 Gb
I M2 Ex ia d I Mb for type G400-MP3

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49 234/3696-105 Fax +49 234/3696-110 E-mail zs-exam@dekra.com
(until 31.03.2007 EXAM BBG Prüf- und Zertifizier GmbH)

DEKRA

Parameters

1 Type of protection and ambient temperature range of pump type G400-MP2 with different combination of individual components:

	Type of protection / EPL	Ambient temperature range
Pump with NiMH battery supply unit (marking Ex ia I, Ex ia IIC T3) (colour: black)	Ex ia IIC T3 Gb Ex ia I Ma	-20 °C ≤ T_a ≤ +55 °C -20 °C ≤ T_a ≤ +55 °C
Pump with NiMH-II battery supply unit (marking Ex ia I, Ex ia IIC T4) (colour: black)	Ex ia IIC T4 Gb Ex ia I Ma	-20 °C < T_a ≤ +55 °C -20 °C < T_a < +55 °C
Pump with alkaline battery supply unit (colour: grey)	Ex ia IIC T4 Gb Ex ia IIC T3 Gb Ex ia I Ma	-20 °C ≤ T_a ≤ +45 °C -20 °C < T_a < +55 °C -20 °C ≤ T_a < +55 °C

The type of protection and the ambient temperature range of the gas measuring device have to be regarded.

2 Type of protection and ambient temperature range of pump type G400-MP3 with different combination of individual components:

	Type of protection / EPL	Ambient temperature range
Pump with NiMH battery supply unit (marking Ex ia I, Ex ia IIC T3) (colour: black)	Ex ia d IIC T3 Gb Ex ia d I Mb	-20 °C ≤ T_a ≤ +55 °C -20 °C ≤ T_a < +55 °C
Pump with NiMH-II battery supply unit (marking Ex ia I, Ex ia IIC T4) (colour: black)	Ex ia d IIC T4 Gb Ex ia d I Mb	-20 °C ≤ T_a ≤ +55 °C -20 °C ≤ T_a ≤ +55 °C
Pump with alkaline battery supply unit (colour: grey)	Ex ia d IIC T4 Gb Ex ia d IIC T3 Gb Ex ia d I Mb	-20 °C ≤ T_a < +45 °C -20 °C ≤ T_a ≤ +55 °C -20 °C ≤ T_a ≤ +55 °C

The type of protection and the ambient temperature range of the gas measuring device have to be regarded.

3 NiMH battery supply unit:

Nominal voltage		2.4	V
Nominal capacitance		2500	mAh
Maximum charging voltage	U_m	DC 6	V

4 Alkaline battery supply unit:

Nominal voltage	3	V

The approved Alkaline battery types are listed in the manufacturer instructions of GfG Gesellschaft für Gerätebau mbH.

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49 234/3696-105 Fax +49 234/3696-110 E-mail zs-exam@dekra.com
(until 31.03.2007 EXAM BBG Prüf- und Zertifizier GmbH)

DEKRA

Special conditions for safe use

Unchanged

Test and assessment report

BVS PP 07.2006 EG as of 19.11.2010

DEKRA EXAM GmbH
Bochum, dated 19.11.2010

Signed: Dr. Franz Eickhoff
Certification body

Signed: Günther Schumann
Special services unit

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 19.11.2010
BVS-Rip/Her A 20100478

DEKRA EXAM GmbH

Certification body

Special services unit

DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49 234/3696-105 Fax +49 234/3696-110 E-mail zs-exam@dekra.com
(until 31.03.2007 EXAM BBG Prüf- und Zertifizier GmbH)

EU Declaration of Conformity

G400-MP2

Edited: 25.03.2010 Amended: 17.01.2024

GfG Gesellschaft für Gerätebau mbH

Klönnestraße 99
44143 Dortmund
Tel: +49 (231) 56400-0
Fax: +49 (231) 516313
E-Mail: info@gfg-mbh.com
www.gfg.biz

GfG Gesellschaft für Gerätebau mbH develops produces and sells gas sensors and gas warning devices which are subject to a **quality management system** as per DIN EN ISO 9001. Subject to supervision by means of a **quality system**, surveilled by the notified body, DEKRA Testing and Certification GmbH (0158), is the production of electrical apparatus of instrumentation Group I and II, categories M1, M2, 1G and 2G for gas sensors, gas detectors, gas warning systems in types of protection flameproof enclosures, increased safety, encapsulation and intrinsic safety, as well as their measuring function.

The Pump **G400-MP2** complies with directive **2014/34/EU** (ATEX) for devices and protective systems for proper use in potentially explosive atmospheres, directive **2014/30/EU** for electromagnetic compatibility and with directive **2011/65/EU** (RoHS) on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

For electrical explosion protection BVS 07 ATEX E 011

Labelling			
	II 2G Ex ia IIC T4 Gb	-20°C≤Ta≤+55°C	(NiMH-II)
	II 2G Ex ia IIC T3 Gb	-20°C≤Ta≤+55°C	(NiMH)
	II 2G Ex ia IIC T4/T3 Gb	-20°C≤Ta≤+45°C/+55°C	(Alkaline)
	I M1 Ex ia I Ma	-20°C≤Ta≤+55°C	(NiMH, NiMH-II)

EC-Type Examination Certificate according to directive 94/9/EG

- General requirements	EN 60079-0	: 2009
- Intrinsic safety "i"	EN 60079-11	: 2007
- Group1, category-M1-equipment	EN 50303	: 2000

Certified by the notified body with ID number 0158 (DEKRA EXAM, Dinnendahlstraße 9, D-44809 Bochum).

The directive 2014/34/EU is complied considering the following standards:

- General requirements	EN IEC 60079-0	: 2018 +AC :2020
- Intrinsic safety "i"	EN 60079-11	: 2012
- Group1, category-M1-equipment	EN 50303	: 2000

The rating of the danger of ignition was done and documented.

The directive 2014/30/EU is complied considering the following standard:

- Electromagnetic compatibility - Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen	EN 50270	: 2015
Emitted interference	Type class 1	
Interference immunity	Type class 2	

The EMC test laboratory AMETEK CTS Germany GmbH at Kamen has tested and certified the electromagnetic compatibility.

The directive 2011/65/EU is complied considering the following standard:

- Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances	EN 50581	: 2012

Dortmund, 17 January 2024

i.V.

.....

B. Siebrecht
QMB

ATEX EU-Kon7-2/ Siebrecht