

# Portable & Fixed Gas Detection Equipment



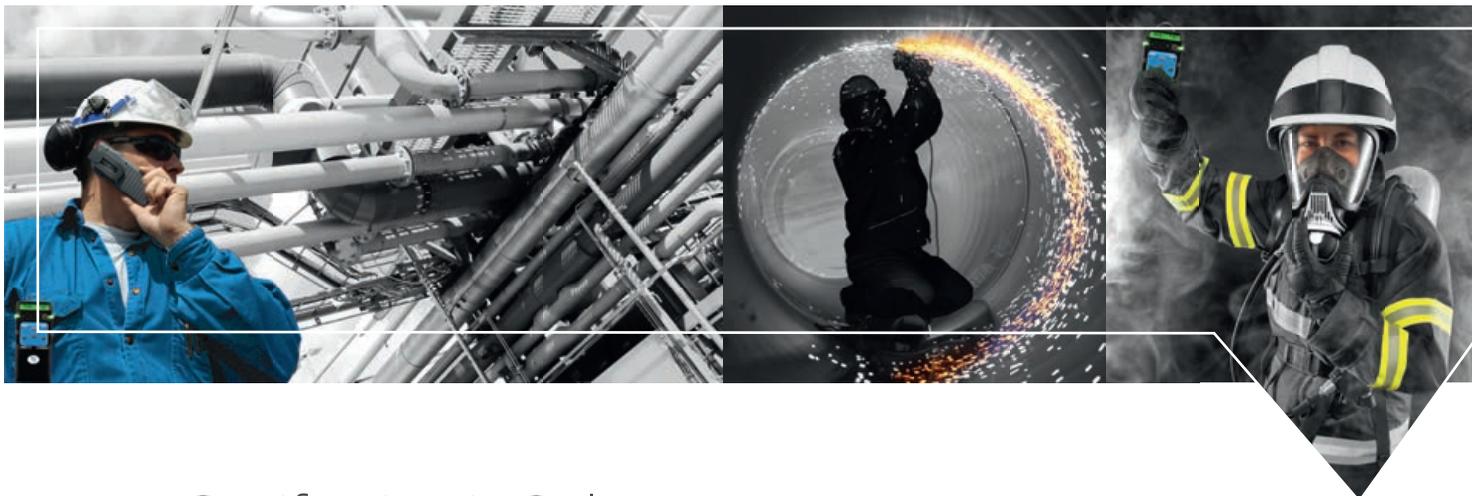


YOUR SAFETY IS  
NOT A BUSINESS,  
IT IS OUR  
RESPONSIBILITY

<b>SAFE</b> The prerequisites for safety are an eye for practical requirements in planning, detailed knowledge in development and care in every step of production and quality control.	
<b>GLOBAL</b> Five production sites, various regional sales offices, one goal: Your Safety!	<b>13%</b> of annual sales revenue is reinvested into R&D.
<b>QUALITY</b> Quality is the full package of consultation, product, service and the drive to be better.	<b>CERTIFIED</b> Regulations guarantee safety. GfG is ISO certified according to 9001:2015, ATEX and IECEx QAR QM.

Risks can't be avoided, but, they can be reduced. For six decades GfG has designed and supplied reliable gas detection equipment.

Our daily operations focus on ensuring the optimal protection of plant and personnel.



## Certification is Only the Beginning



All of our production processes and products comply with national and international regulations, as well as being certified by independent testing bodies.



At GfG, however, this is only the first step. We don't just follow the standards, we set them with our tradition of "Made in Germany" quality.



We pride ourselves and our products at excelling in all practical and standard tests. GfG products demonstrate user friendliness and practicality by continuously receiving awards for independent design and security.

### Expert Support from Planning to Operation

Safety, whether for personnel, plant or environmental protection, is achieved by products utilizing reliable technology, consultation during planning, support during commissioning and 1<sup>st</sup> class after-sales support.

*Projects that involve us in the planning stages will benefit from our extensive worldwide expertise.*

GfG's in house wealth of experience ensures detailed consultation and quality customer support worldwide. GfG can offer "tailored to suit" maintenance and training packages ensuring the best possible after-sales support and reduced cost of ownership.



Consultation



Commissioning



Service



Training

## Designed To Use

Successful industrial design combines art and engineering, and incorporates sustainability, usability and aesthetics.

Product assembly, safe placement of components and sensor technology places specific demands on the design. Usability is not the only important characteristic anymore, products are now expected to be highly effective and incredibly visually appealing. To correspond with the modern demands, GfG in cooperation with international industrial designers has developed product designs that meet the most sophisticated demands of customers worldwide.



## The Increasing Relevance of Real-Time Data

Industry requirements are constantly changing and industrial design must easily adapt to the changes. Modern gas detection transmitters now have sophisticated electronics. Originally designed as a measure to improve signal quality, it opens up new opportunities in automation and the Industrial Internet of Things (IIoT).

It is no longer a challenge to have real-time predictive analytics or automated documentation of maintenance remotely available.

## Detection Principles



### Catalytic Combustion (CC)

- » The sum measurement of flammable gases and vapours
- » 0 - 100 % LEL
- » High measuring accuracy



### Thermal Conductivity (TC)

- » Toxic and flammable gases
- » Large measuring range (up to 100 % Vol)
- » Suitable for an array of applications



### Photoionization Detector (PID)

- » Volatile organic compounds
- » Good zero point stability
- » Very high sensitivity
- » Multitude of gases measured



### Zirconium Dioxide (ZD)

- » Selective for oxygen
- » Quick response time
- » Immune to environmental conditions
- » Long service life



### Infrared (IR)

- » Combustible gases and CO<sub>2</sub>
- » Low cross-sensitivity
- » Accurate
- » Long service life



### Electrochemical (EC)

- » Toxic gases, O<sub>2</sub> and H<sub>2</sub>
- » Linear output
- » Very energy efficient
- » High sensitivity



## Portable Detectors and Fixed Detection Systems

*“There is no superlative to safe. There's only safe or unsafe. That's why we don't compromise at GfG.”*

*Hans-Jörg Hübner,  
Managing Director GfG*

The detection of potentially hazardous gas concentrations is subject to a wide variety of technical requirements.

Recognizing dangerous situations with either fixed or portable gas detection equipment is not the only concern. We also focus on the remote protection of employees, the initiation and resolution of alarms or the audit-proof documentation of essential safety systems.

GfG offers a broad range of sensors for many applications and a complete solution for our customers.

## Gas Detection or Gas Warning Device?

The difference is in the application not the product.

The question of whether a product is more of a gas detector or gas warning device depends primarily on the task at hand.

The sensors provide an indication to which exact method it is. Catalytic sensors (CC) measure %LEL and thus focus on timely alarms. This also applies to electrochemical sensors (EC), which monitor limit values in the ppm range.

Sensors that measure %Vol, on the other hand are more likely to be found in devices that measure gas. However, the limit is flexible, as shown by Zirconium Dioxide (ZD) sensors, which determine the oxygen content of the breathing air in %Vol. Their task is to sound an alarm if certain O<sub>2</sub> limit values are exceeded or not reached at all.

[GfG in Space](#)

*GfG sensors have also been used in ESA projects for ISS missions.*

# PORTABLE GAS DETECTORS



## RISK: CONFINED SPACES

The dangers that originate from closed rooms and shafts regardless of the industry, are easily underestimated. Careful clearance measurement of confined spaces and portable gas detectors help minimize the risks.

## LONE WORKERS

Additional functions for the safety of lone workers are becoming more relevant in portable gas detectors.

## MBE

GfG relies on Molecular Beam Epitaxy for the development of new, energy-efficient IR sensors.

## US\$ 2.9 BILLION

will be the volume of the global market for gas detection and gas alarm systems in 2024.

Source: marketwatch.com

## SENSOR "SLOTS"

say more about the capabilities of a device than the "number" of gases measured.

Occupational safety is not something to take lightly. GfG's portable gas detectors

provide safe and quick detection of leaks and dangerous situations.



## Polytector III G999 & Microtector III G888

Portable gas detectors are part of the personal safety equipment for many occupational groups. The G999 and G888 are two of the world's most convenient multi-gas detectors.

### Radio Module

Optional radio module for securing lone workers. Measured values and alarm status are sent to the GfG-Link G999L or a central monitoring station.

### Pump

For pre-entry checks of confined spaces or for leak detection. The pumping capacity: 0,5 ... 0,6 lpm.

### Triple Warning Signal

Alarms are indicated visually, acoustically and by a vibration alarm.

### Man-Down Alarm

Two integrated local warning levels and the automatic radio notification of the supervisor or the control centre.

### Simulating Alarms

By simulating an alarm, any gas values can be transmitted to devices with radio transmission, preparing your team should they ever encounter a real emergency situation.



Wide range of equipment options for multiple requirement profiles

Model	Sensors: Type/Max. Number					Radio	Pump	For Ex-Zone
	EC	CC	CC/CL	IR	PID			
G888C (4 <sup>1</sup> )	3 (4 <sup>2</sup> )	1	–	–	–	optional	–	1, 2
G888C (5 <sup>1</sup> )	3 (4 <sup>2</sup> )	1	–	1 (2 <sup>4</sup> )	–	optional	–	1, 2
G999C (5 <sup>1</sup> )	3 (4 <sup>2</sup> )	1 <sup>3</sup>	1 <sup>3</sup>	1 (2 <sup>4</sup> )	–	optional	optional	1, 2
G999P (5 <sup>1</sup> )	3 (4 <sup>2</sup> )	–	–	1 (2 <sup>4</sup> )	1	optional	optional	0, 1, 2
G999E (5 <sup>1</sup> )	4 (5 <sup>2</sup> )	–	–	1 (2 <sup>4</sup> )	–	optional	optional	0, 1, 2

<sup>1</sup> Number of sensor slots  
<sup>2</sup> Optional EC dual sensor

<sup>3</sup> Optional CC/CL dual sensor  
<sup>4</sup> Optional IR double sensor



## GfG-Link G999L

Depending on the location of the lone worker, response times of rescue teams alerted by an Alarm Response Center (ARC) may either be too long or not possible at all.

If such a situation exists, the mobile monitoring device, GfG-Link, is recommended. It allows the supervisor to wirelessly monitor gas concentrations and alarms (including man-down alarm) of up to 10 employees at a distance up to 700 meters (open field).



The GfG-Link can also be used to simulate alarm situations. In training mode it is possible to trigger specific alarms over the networked gas detectors to simulate dangerous situations and train correct response behaviour. The pager function also offers basic communication options.

« In training mode, alarms can be triggered for specific exercises. »

## Micro V G222E

Sometimes all you need is a simple, convenient and reliable solution. The Micro V G222E is the perfect single or dual gas detector for toxic gases, oxygen and hydrogen with Ex Zone 0 approval.

### Why not a single gas detection device?

Hazardous situations are often complicated and two specialized sensors are sufficiently more accurate and sensitive than the combined sensors.

### Smart EC Sensors

The two sensor slots can be used for a wide range of smart sensors for different gases and gas concentrations.

### Triple Warning Signal

The alarms are always indicated with visual, acoustic and vibrating alarms.

### Sensible Functionality

The Micro V has a robust housing and a functional design. The integrated measurement data log can be read out via the IrDA interface. A standard AA battery ensures a battery life of many months.



## TS888/999 & TX888/999 Test Stations

Portable gas detectors require regular inspection and if necessary, adjustment in accordance to international safety regulations.

The TS888/999 and TX888/999 are automated test stations that carry out daily bump tests for the Microtector III G888 and Polytector III G999. The TX888/999 also allows sensor adjustment.

As well as being a charging station, the stations allow configuration and data exchange via PC. In addition, they have an internal memory for instrument check documentation.

## DS400 & DS404 Docking Stations

Adjusting the G999 and G888 gas detectors using the TX888/999 test station does not replace routine full function checks. This requires a complete device management system, such as the DS400 & DS404 docking stations.

The automatic test stations DS400 and DS404, with one and four test gas cylinder connections, allow the adjustment of the zero point and sensitivity of the sensors in the G999 and G888 as well as the normal function tests (bump test). The data of the device tests are stored on the internal SD card and are available for audits at any time.

### DIC 888/999-B Drop in Charger

Convenient drop in charger for charging portable gas detectors in any location. The charger is powered by a 12V plug-in power supply unit or a car charging cable.



Docking station DS404

Test station TX888/999



Drop in Charger  
DIC 888/999-B

Appliance	Display / Bump Test	Sensor Adjustment	Functional Check	Charging Function	Gas Connections	Data Logger
DIC 888/999-B	–	–	–	●	–	–
TS888/999	●	–	–	optional	1	●
TX888/999	●	●	–	optional	1	●
DS400*	●	●	●	●	1	●
DS404*	●	●	●	●	4	●

\* In the version for the G999 and G888

# FIXED GAS DETECTION SYSTEMS

## ENERGY-SAVING POTENTIAL

In underground garages and tunnels, a smart control of the fan systems with the gas warning device, can drastically reduce energy costs.

## SENSOR POISONS

It is important to consider, not only the gases measured, but, also other substances that are present in the surrounding air that may "poison" the sensor.

## BIOGAZ D'ARGENT

Award for the G999 at the Biogaz Europe Concours de l'Innovation 2019.

## ANALYTICS

With new technology in predictive analytics and automation, the integration of fixed gas detection systems into IT systems is becoming increasingly important.

## CLIMATE RISK

1.7% (75 million tons) of the world's gas production is lost due to leaks.

Gases play a central role in industrial production, whether as a source of energy, a component of the production process or

as a waste product. In all cases, gas detection systems ensure the protection of people, plant and the environment.



## GMA200 Series

In combination with various transmitters, controllers ensure fixed gas monitoring for a wide variety of flammable, toxic gases and Oxygen.

The GMA200 series offers the appropriate controllers for different requirements, be it in terms of plant size, mounting preferences or structural requirements.

### SIL2 certification and type examination certificate

The four GMA200-M variants (GMA200-MW4, GMA200-MW16, GMA200-MT6 and GMA200-MT16) were developed in accordance with the product standards EN 50402 and IEC 61508 and certified by TÜV Rheinland. They can be used in a single channel HFT=0 structure up to SIL2 / PL d and in redundant HFT=1 architecture up to SIL3 / PL e.

« Controllers for all applications. »



Model	Interfaces			Max. Number of Measuring Points	Assembly		Internal Relays
	4-20 mA	RS485	ACDC*		Wall	TS 35	
GMA22-M	1	1	1	4	●	–	4
GMA200-MW4	4	3	–	16	●	–	6
GMA200-MW16	16	3	–	16	●	–	8
GMA200-MT6	6	3	–	16	–	●	8
GMA200-MT16	16	3	–	16	–	●	8
GMA200-CT64	16	3	–	64	–	●	8
GMA200-MGSS	1	2	–	4**	●	–	8

\* ACDC interface (Analog Carrier for Digital Communications) alternative to 4-20 mA interface

\*\* 1x pump, 1x CC and optionally 2xEC or 1x EC / 1x IR

# SPECIALIZED CONTROLLERS



**GMA200-CT64**

The GMA200-CT64 controller is designed for underground garages and multi-story car parks. The system constantly measures gas concentration, temperature, and humidity in individually monitored zones. The ventilation system can be time activated or controlled by the changes in measurement values, keeping all concentrations at an acceptable level.



**GMA200-MGSS**

The GMA200-MGSS combines all the necessary capabilities of a gas sampling device using minimum space. The actual measurement takes place internally, with up to three sensors available. Optional extras include, cooling coil, filter or water barrier or flashback arrestor for safe monitoring of areas with potentially flammable gas concentrations present.



**GMA200 Relay Module**

The relay modules GMA200-RT and GMA200-RTD (with display for the decentralized display of measured values) enable the possibility to easily extend the relay functionality of the GMA200 controllers. The relay modules consist of 16 configurable relays, with a maximum of four additional relay modules that are able to connect to the GMA200 controllers.



**GMA22-M**

The GMA22 controller is specially designed to meet the latest requirements for the monitoring of simple applications like boiler rooms, kitchens and gas meter enclosures.

The space-saving, wall mounted solution has a display and either a 4-20 mA input or up to four TIA-485 (-A) inputs and four internal relays. An internal data logger stores measurement results and information about situations and alarms.



## 28-Series Transmitters

The 28-Series transmitter is designed for use in hazardous areas and is available for explosive gases and vapours (CC) or for toxic gases, oxygen and hydrogen (EC).

« Ex-protected detection of explosive or toxic gases. »



### Alarm

Visual and audible alarm via bright LEDs and an integrated, explosion-proof horn.

### Bus

Modbus connection for data communication with several transmitters.

### External Relay

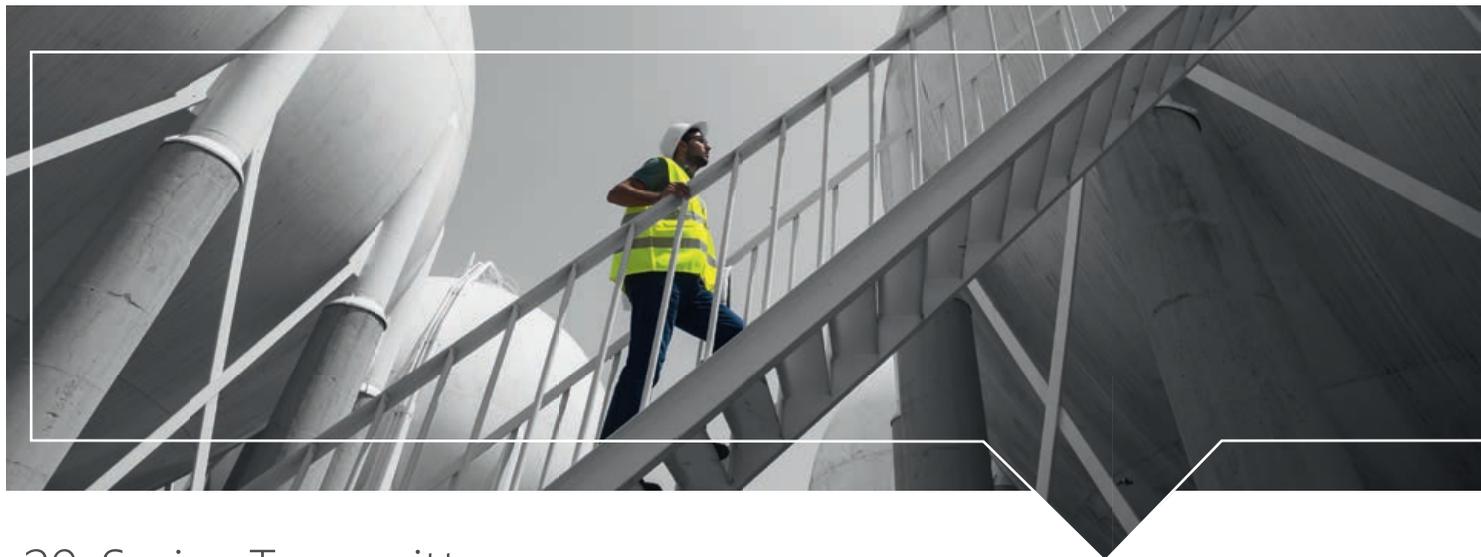
Additional relay output for connection of another alarm transmitter.

### Degrees of Protection

Increased safety [e] or intrinsically safe [i] with approval for Ex Zone 0.

Model	Sensors		Display	Alarm	External Relays	Bus	For Ex-Zone
	CC	EC					
CC28	●	–	–	–	–	–	1, 2
CC28 D	●	–	●	–	–	–	1, 2
CC28 DA	●	–	●	●	–	–	1, 2
EC28	–	●	–	–	–	–	1, 2
EC28 D	–	●	●	–	–	–	1, 2
EC28 DA	–	●	●	●	–	–	1, 2
EC28 DAR	–	●	●	●	●	–	1, 2
EC28 B	–	●	–	–	–	●	1, 2
EC28 DB	–	●	●	–	–	●	1, 2
EC28 DAB	–	●	●	●	–	●	1, 2
EC28 i <sup>1</sup>	–	●	–	–	–	–	0, 1, 2
EC28 Di <sup>1</sup>	–	●	●	–	–	–	0, 1, 2

<sup>1</sup> Intrinsically Safe [i]



## 29-Series Transmitters

Transmitters for flammable gases and CO<sub>2</sub> in explosion-proof housing. The IR29 transmitter sensor operates according to the infrared absorption principle. The adjusting to the type of gas monitored is carried out by specific optical filters in combination with applicable characteristic curves.

Model	Sensor	Display	Data Logger	Bus	For Ex-Zone
	IR				
IR29	●	–	●	–	1, 2
IR29 B	●	–	●	●	1, 2
IR29 D	●	●	●	–	1, 2
IR29 DB	●	●	●	●	1, 2
IR29 i	●	–	●	–	0, 1, 2
IR29 Di	●	●	●	–	0, 1, 2

### Bus

Modbus connection for data communication with several transmitters.

### Display

Output of the measured values additionally at the transmitter via an integrated display.

### Degrees of Protection

Increased safety [e] or intrinsically safe [i] with approval for Ex Zone 0.

« Long Life monitoring of flammable gases and CO<sub>2</sub> even in Ex zone 0. »





## 33-Series Transmitter

**The sensors for flammable gases and vapours of the 33-Series are in flameproof housing and meet the requirements of ignition protection type "D".**

For conventional industrial applications, the CC33 is available in painted die-cast aluminium housing with a 10mm thick bulletproof glass. For applications with special requirements, such as those in the food or oil industries, there is an unpainted stainless steel housing with a 15mm thick bulletproof glass pane. Both versions are also available with either a 4-20 mA/ACDC or TIA-485 (-A) interface.

The 33-Series also features high-quality and durable Viton seals that can withstand the toughest operating conditions for years. In addition, the cable entries and the sensor are designed as conical ½"-NPT or ¾"-NPT threads.

In combination with the optional Ex-protected horn, 33-Series transmitters can also be configured as stand-alone gas detection systems. The two alarm thresholds can be individually configured and the relays freely programmed.

« Also available with flameproof stainless steel housing. »





## 22-Series Transmitters

**GfG's 22-Transmitter series is characterized by its large sensor selection and compact design. This makes it the perfect choice for a wide range of applications where there are no increased explosion protection requirements.**

All models are available in model variant D with optional display and integrated visual and audible alarms.

- CC22:** Transmitter with CC sensor for the full measurement of flammable gases and vapors.
- CS22:** Long-life transmitter with semiconductor sensor for detection of ammonia and refrigerants.
- EC22:** Transmitter with electrochemical sensor for the monitoring of toxic gases, Oxygen, or Hydrogen.
- IR22:** Poison resistant transmitter with infrared sensor for flammable gases and CO<sub>2</sub>.
- ZD22:** Transmitter with zirconium dioxide sensor for selective long-term monitoring of O<sub>2</sub>.

« Proven transmitters  
for many industrial  
applications . »



# WATER MEASUREMENT TECHNOLOGY



« Water and air, the two essential fluids which all life depends on, have become global dustbins. »

Jacques-Yves Cousteau

**No element is as versatile in its properties and applications as water. This makes it all the more important to continuously monitor water quality in order to rule out or at least identify risks to people, the environment and facilities in good time.**

GfG offers you specially developed measuring systems for reliable monitoring of water and brine mixtures, selective ammonia and ammonium measurement, e.g. in refrigeration circuits and solutions for water treatment plants in which pH, redox or chlorine measuring technology is required.

The range is rounded off by suitable transmitters for detecting explosive, toxic gases and refrigerants.

## MiniCal III for Ion-selective Cooling Circuit Measurement

**Cooling water circuits with the refrigerant ammonia must be continuously monitored for leaks in order to ensure the long-term safety of plants and for compliance with environmental protection requirements.**

Selective measuring methods have proven themselves when applied directly in the secondary circuit. The MiniCal III system measures leaks selectively (0.2 ppm) even in the smallest concentrations, whether in normal water basins, in circuits or in brine mixtures such as ethylene glycol, propylene glycol, tyfoxite, pekasol, etc. The MiniCal III system is designed for measurement of the leakage rate for even the smallest concentrations.

The selection of the respective MiniCal settings depends on the installation placement. The medium is removed directly from the pipelines with return to the same origin, in basins or with free outlet. They are flexible to use, easy to assemble and feature a compact design.



## Partner for Smooth Operation

The GfG service team is a reliable partner from professional installation to technical approval and ongoing support.

### This also includes:

- » Preventative maintenance packages
- » Reliable supply of spare parts
- » Fast & efficient response

GfG's qualified and experienced engineers are available to attend site and in our internal service centres.

**Service-Number:** +49 231 56400-0



Commissioning



Service



Training

## Training Packages

Our qualified and experienced service technicians are available to you during our operation hours. Safety when using gas measuring instruments has the highest priority. It is essential to have regular inspection, calibration and maintenance of the equipment. Depending on the task, this requires suitably trained staff. There are roughly three qualification levels that can be distinguished:

### Instructed

Every employee who uses gas detectors or works in the vicinity of gas detection systems must have been instructed in their handling and correct behaviour in the event of an alarm.

### Qualified

After training, qualified staff can carry out regular bump tests and simple calibrations. GfG offers you appropriate training and further education for these two qualification levels.

### Certified

For all inspections and activities which may only be carried out by certified personnel, there are a variety of GfG service contracts.

Available in most countries, please contact your local GfG representative for more information regarding these contracts.



Worldwide availability  
and quality



smart  
**GasDetection**  
Technologies



**GfG Gesellschaft für Gerätebau mbH**

Klönnestraße 99  
44143 Dortmund  
Germany

**Phone:** +49 231 56400-0

**Fax:** +49 231 56400-895

**E-mail:** [info@gfg-mbh.com](mailto:info@gfg-mbh.com)

© GfG - Gesellschaft für Gerätebau mbH - 2019  
All of the information in this brochure is subject to change.

GfG product overview/DE/EN/05-2019  
Printed in Germany

[www.gasmessung.de](http://www.gasmessung.de)