

**Worldwide Supplier of Gas  
Detection Solutions**



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# Microtector G333

## Operation Manual

	Page
<b>Introduction</b>	<b>3</b>
<b>For your Safety</b>	<b>3</b>
<b>Application and Purpose</b>	<b>3</b>
<b>Hints for safe use</b>	<b>4</b>
<b>General Description</b>	<b>4</b>
<b>Detection Principles</b>	<b>4</b>
<b>Design</b>	<b>5</b>
<b>Operational Hints</b>	<b>6</b>
<b>Detection Mode</b>	<b>6</b>
Turning On	6
Turning Off	6
Readiness for Operation	6
Display of Long- and Short-Term Values, Peak and Minimum Values	7
Deleting Stored Values	7
Alarm	7
Battery Capacity - Battery Alarm	8
Individual Gas Display	9
Display Illumination	10
<b>Special Notes for LEL Monitoring</b>	<b>10</b>
<b>Influence of Interfering Gases and Oxygen</b>	<b>10</b>
<b>Special Notes for Oxygen Monitoring</b>	<b>11</b>
<b>Service Mode</b>	<b>11</b>
Main Menu	11
Adjustment of Display Contrast - LCD	11
Adjustment of Confidence Beep - SIG	12
Automatic Adjustment in Fresh Air - AIR	12
Access for Service Menu - SRV	12
Service Menu Structure	13
Menu Control in Service Menu	13
Selection of Sensors for Service Adjustments	14
Zeropoint Adjustment - ZP	15
Sensitivity Calibration - CA	15
Alarm Thresholds - AL	16
Completing Service Mode	17
Selection of Language	17
Turning the Tolerance Band On/Off	18
Charging the battery pack	18
<b>Annex</b>	<b>19</b>
<b>Cleaning</b>	<b>19</b>
<b>Maintenance</b>	<b>19</b>
Service and Adjustment	19
Function test by an expert	19
<b>Trouble Shooting</b>	<b>20</b>
<b>Accessories</b>	<b>20</b>
<b>Spare Parts</b>	<b>21</b>
<b>Alarm Thresholds - Standard Setpoints</b>	<b>21</b>
<b>Alarm Thresholds – Standard Setpoints</b>	<b>22</b>
<b>Types of Sensors and Detection Ranges</b>	<b>22</b>
<b>Sensor Specification</b>	<b>23</b>
<b>Technical Data</b>	<b>24</b>
<b>EC-Type Examination Certificate</b>	<b>25</b>

# Introduction

## 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. As any piece of complex equipment, the GfG G333 will do the job designed to do, only, if it is used and serviced in accordance with the manufacturer's instructions. This manual must be carefully read by all individuals who have or will have the responsibility for using and servicing this product.

The warranties made by GfG with respect to the product are voided, if the product is not used and serviced in accordance with the instructions in this manual. Please protect yourself and your employees by following them. The above does not alter statements regarding GfG's warranties and conditions of sale and delivery.

## Application and Purpose

The G333 is a handheld detector for personal protection from gas hazards. The detector measures permanently in diffusion mode and gives a visual and audible alarm, if a gas-induced danger builds up.

The G333 is approved for the use in explosion endangered areas and is subject to an EC-Type Examination Certificate issued by EXAM BBG Prüf- und Zertifizier GmbH, according to regulation 94/9/EG (ATEX100a):

Certificate: BVS 03 ATEX E 173 X

Labelling:  II 2G EEx ib d IIC T4

For the G333 the Deutsche Montan Technologie GmbH has issued an EC Type Examination Certificate according to guideline 94/9/EG (ATEX100a) for the use in explosion endangered areas with a measuring function for explosion protection:

Certificate: BVS 03 ATEX G 015 X

The DMT-Gesellschaft für Forschung und Prüfung mbH, Prüflaboratorium für Grubenbewetterung has tested the G750 for its general technological suitability. The tests were based on the standards DIN EN 50054 „Electrical Devices for Tracing and Measuring of Combustible Gases - General Requirements and Test Methods“, DIN EN 50057 „Electrical Devices for Tracing and Measuring of Combustible Gases - Requirements for the Operational Behaviour of Devices of Group II with a Detection Range up to 100 % of the Lower Explosion Limit“, DIN EN 50104 „Electrical Devices for Tracing and Measuring of Oxygen - Requirements for the Operational Behaviour and Test Methods“, the guideline T017 of BG Chemie „Warning Devices for Hydrogen Sulfide“, the guideline T 022 of BG Chemie „Gas Warning Equipment for Landfill Application - Test of Functioning“ and DIN EN 50271 „Electrical Devices for Detection and Measurement of Combustible Gases, Toxic Gases or Oxygen - Requirements and Tests for Warning Equipment using Software and/or Digital Technology“.

<b>The tests of the measuring function included the following sensors and detection ranges:</b>				
EC-Type Examination Certificate	MK201-2	0 ... 100 %LEL	CH <sub>4</sub>	Methane
BVS 03 ATEX G 015 X	MK201-2	0 ... 100 %LEL	C <sub>3</sub> H <sub>8</sub>	Propane
Function test	MK342-3	0 ... 25.0 Vol %	O <sub>2</sub>	Oxygen
PFG-Nr. 41300498	MK344-3	0 ... 300 ppm	CO	Carbon monoxide
	MK345-3	0 ... 100 ppm	H <sub>2</sub> S	Hydrogen sulfide

The functions marked (#) have not been part of the function and accuracy test. The test included the detection ranges mentioned below.

## Hints for safe use

When using the gas detector, make sure that the operative conditions stated in the operation manual are complied with.

Before the gas detector is being used, a test has to be effected (in Germany according to BG-Chemie, directive T 023). This test includes the following checks:

- Battery capacity
- Display with zero gas and with test gas

If necessary the sensor has to be adjusted with fresh air (see page 12).

**Atmosphere in motion may cause too high gas concentrations being displayed in the hydrogen sulfide detection range. This has to be considered for the use of the detector.**

If the detector has been exposed to combustible gases in concentrations of more than the full scale deflection in the detection range 0 - 100 %LEL, it has to be adjusted before further use.

For use according to EC-Type Examination Certificate BVS 03 ATEX G 015X the operational bleep has to be activated (page 12).

For use according to EC-Type Examination Certificate BVS 03 ATEX G 014X the alarms must not be deactivated and when measuring combustible gases in detection range 0 – 100 % LEL alarm 1 and 2 must not be set higher than 60 % LEL.

## General Description

The G333 is a very handy and compact 1- up to 4<sup>(#)</sup>-gas detector for toxic and combustible gases as well as for oxygen deficiency and oxygen surplus. Depending on the model, the G333 is available with one, two or three sensors. All measured gas concentrations are displayed simultaneously. For every gas measured you can set at least 2 individual alarm thresholds. For toxic gases the G333 provides additional thresholds for Short Term Exposure Level (STEL) and Time Weighted Average (TWA).

## Detection Principles

The G333 uses different detection principles for measuring up to four different gases. Catalytic combustion (CC) has proven a reliable method for monitoring explosion hazards caused by combustible gases. Electrochemical sensors (EC) are used for measuring toxic gases and oxygen.

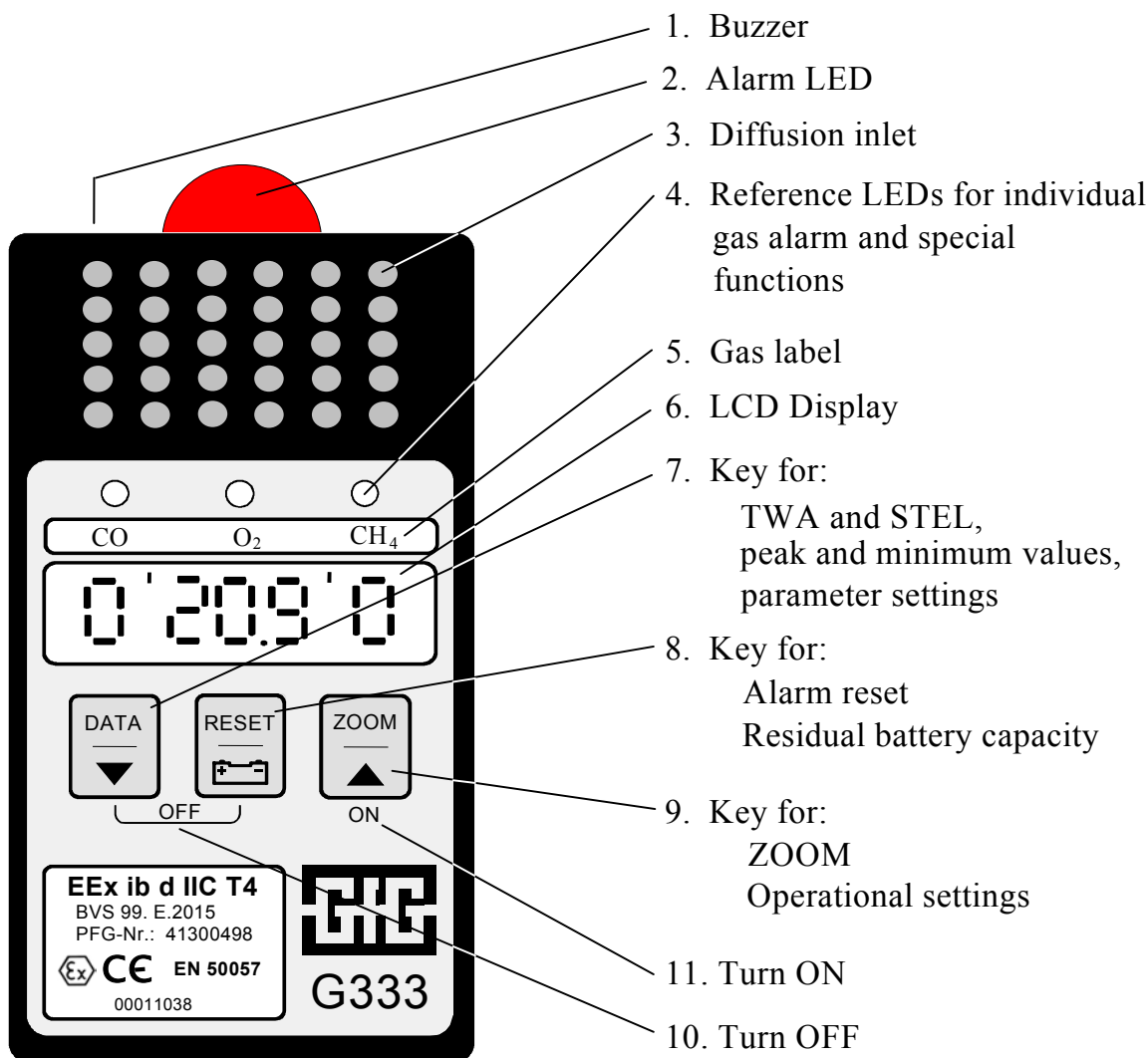
### Catalytic combustion (CC)

For measuring combustible gases and vapours up to 100 % LEL, a catalytic combustion sensor is used. The gas diffuses through a sintered filter into the sensor chamber with an active and a passive filament. At the heated active filament the gas is burnt, thus causing a temperature increase, which results in a change of the electrical resistance. The change of resistance is proportional to the gas concentration. The active and the passive filament (reference sensor) are exposed to the same ambient conditions, ensuring a compensation of environmental effects (e.g. temperature changes).

### Electrochemical sensor (EC)

The electrochemical sensors contain the electrolyte, a working electrode (anode), a counter electrode (cathode) and, depending on the sensor type, a reference electrode. By selection of specific electrodes and electrolytes the sensors are adapted to the gas to be measured. The conversion of the gas between the electrolyte and the electrode generates an electrical signal, which is proportional to the gas concentration. GfG sensors use the capillary diffusion barrier technology. This method and an additional temperature compensation minimize interferences by changes in atmospheric pressure and temperature.

# Design



Remarks concerning the serial number SN:03071038

03	Year
07	Month
1038	sequential number

The casing of the G333 is made of an impact-proof, anti static compound. The G333 is operated by means of only 3 keys (pos. 7 to 9) for both the detection mode and the service mode. There are no potentiometers, which are often subject to failure. In the detection mode the large 8-digit display (pos. 6) shows the current concentrations of all gases either at the same time or in magnified figures with additional information (see Individual Gas Display). The red reference-LEDs above the display (pos. 4) indicate which gas or alarm is currently being displayed. The gases enter the sensor chamber through the diffusion inlet (pos. 3). Alarm is signalled by blinking of the reference LED for the respective gas (pos. 4), by flashing of the big red alarm LED (pos. 2) and by an audible warning from a buzzer (fig. 1).

# Operational Hints

## Detection Mode

The detection mode includes functions, which the user of the G333 has to be familiar with.

### Turning On

Attention: Turn the G333 on in gas-free atmosphere, before you enter a possibly confined space.

Press the right button  to turn the G333 on.

The G333 needs a warm-up time of approx. 30 seconds. During this time the G333 does a self check, which includes the testing of the display segments, all LEDs and the buzzer. When the self check is completed, the detector configuration is indicated by displaying the gases, detection ranges and units. For the remaining warm-up time the display alternately reads "START" and a countdown of the seconds remaining.

During the detection mode you may activate a confidence beep, which reminds you in regular intervals that the detector is still working properly. The interval can be set from 15 to 90 seconds.

### Turning Off

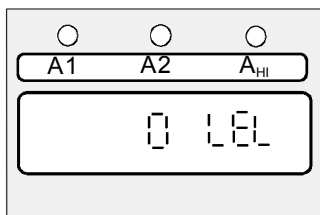
To turn the G333 off, press the two keys   simultaneously for approx. 3 seconds.

OFF

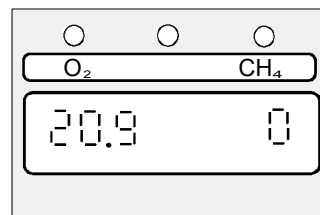
### Readiness for Operation

Once the G333 is turned on, all gases are measured continuously and their values are displayed simultaneously. If your G333 model is a multi-gas detector, the values are separated by an inverted comma (') for better reading.

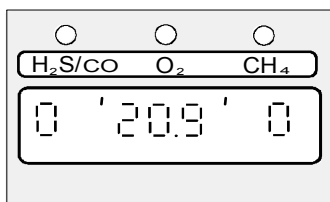
**G333 for 1 Gas**



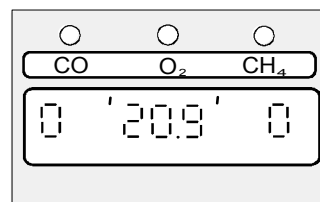
**G333 for 2 Gases**



**G333 for 4 Gases (#)**



**G333 for 3 Gases**



The measurement values are always displayed in the order TX - OX - EX:


**TX** - toxic gases, e.g. hydrogen sulphide, H<sub>2</sub>S


**OX** - oxygen, O<sub>2</sub>


**EX** - combustible gases, e.g. methane, CH<sub>4</sub>

A label above the display indicates the gases the G333 has been calibrated for. The display order of the measurement values is equivalent to the marking on the label. For special indications, like individual gas display or alarm, the reference-LEDs for the respective gas light up additionally, thus giving an exact definition for the displayed "TX" - "OX" - "EX" concentrations.

## Display of Long- and Short-Term Values, Peak and Minimum Values



Press the left key  to display the stored values mentioned below:

Key 	Display	Measurement value (example)	Reference LED	Meaning	Description
Press once	HI	14.0	EX	Peak value EX	The peak value is the highest concentration measured since the G333 has been turned on.
Press repeatedly	LO	19.5	OX	Minimum value	The minimum value is the lowest concentration measured since the G333 has been turned on. The minimum value is only displayed for oxygen.
Press repeatedly	HI	150	TX	Peak value TX	The peak value is the highest concentration measured since the G333 has been turned on.
Press repeatedly	STEL	012	TX	Short Term Exposure Level	The short-term value is the average calculated from the past 15 minutes.
Press repeatedly	TWA	005	TX	Time Weighted Average	The long-term value is an average referred to 8 hours.

To display the stored values one after the other, press the left key  repeatedly. If you do not hit any key for 10 seconds, the G333 returns automatically to the standard multi-gas display mode.

## Deleting Stored Values

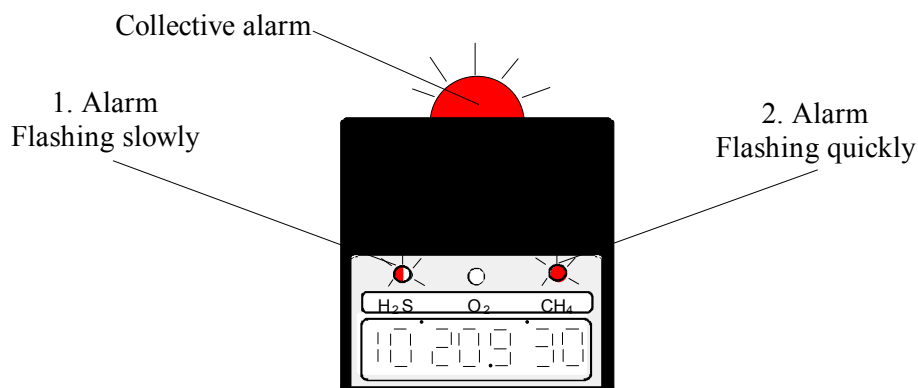
The peak values (HI) for TX and EX and the minimum value (LO) for OX can be deleted:

- Press the key  to display the value which is to be deleted.
- Press the middle key  to delete the selected value.

The peak (HI), minimum (LO), TWA (TA) and STEL (ST) values are also deleted when the G333 is turned off.

## Alarm

As soon as the measured gas concentration exceeds (TX, EX) or falls below (OX) a pre-set threshold, the reference LEDs indicate which gas has caused the alarm. Additionally a loud acoustic signal and the big red alarm LED provide a collective audible and visual alarm for gas hazards.



The above example shows alarm 1 for CO (carbon monoxide) and alarm 2 for CH<sub>4</sub> (methane).

The G333 provides several alarm thresholds for every detection range:

Range	Short Form	Alarm Thresholds		Alarm Storage
TX	AL1	First alarm	exceeding	non-latching
	AL2	Second alarm,	exceeding	latching
	STL	Short-term value	exceeding	non-latching
	TWA	Long-term value	exceeding	latching
OX	AL1	First alarm	falling below (↓)	non-latching
	AL2	Second alarm	falling below (↓)	latching
	AL3	Third alarm	exceeding (↑)	latching
EX	AL1	First alarm	exceeding	non-latching
	AL2	Second alarm	exceeding	latching
	AL3	Third alarm	exceeding	latching

The alarm thresholds **AL1**, **AL2** and **AL3** are current value alarms. For monitoring of exposure levels you can use short-term (**STEL**) and long-term (**TWA**) values. The short term exposure level calculates an average over a period of 15 minutes. The STEL alarm is non-latching. It reset automatically, when the gas concentration has fallen below the threshold. The long-term value is calculated as an average over an 8 hours shift. The TWA alarm cannot be reset. It is only cancelled, when the detector is turned off.

The alarms are indicated by different flash and sound frequencies of the buzzer, the big red alarm LED and the small reference LEDs:

Alarm threshold	Audible and visual alarm	Alarm signal	Priority
AL 3	fast sound and flash frequency (3 pulses in 1.0 s)		
TWA	fast sound and flash frequency (3 pulses in 1.0 s)		
STEL	medium sound and flash frequency (2 pulses in 1.2 s)		
AL 2	medium sound and flash frequency (2 pulses in 1.2 s)		
AL 1	slow sound and flash frequency (1 pulse in 1.5 s)		

The alarms AL2, AL3 and TWA are latching, i.e. the warnings remain active even if the gas concentration has fallen below (for oxygen: exceeded) the threshold. You can reset the alarm by means of the middle key . Alarms AL2 and AL3 can only be reset, if the gas concentration is below (for oxygen: above) the alarm threshold. Alarm AL 1 is non-latching and resets automatically as soon as the gas concentration falls below the setpoint. The alarms have the following priority: Overrange, gas alarms (AL3, TWA, STEL, AL2, AL1), range deviation, power failure (Err).

## Battery Capacity - Battery Alarm

The fully charged battery pack of the G333 allows a permanent operation of more than 13 hours. The operational time may be reduced by frequent alarms and by turning the display illumination on. The residual battery capacity is indicated on pressing the middle key for approx. 1.5 seconds.

In detection mode the G333 gives an audible and visual battery alarm and displays „**LOW BAT**“, when the capacity has reduced to approx. 5 %. The alarm signal lasts 2 seconds and repeats in intervals of 6 seconds. You can reset the battery alarm by means of the middle key . With a short audible signal every 6 seconds the G333 reminds you of the low battery status. After approx. 5 minutes the battery alarm is activated again.



The residual battery capacity after the first battery alarm is sufficient for another 15 minutes operation at least. Should the capacity fall to 0 %, the detector gives a very quick interval signal and then turns off automatically to prevent deep discharge and resulting damage of the battery.

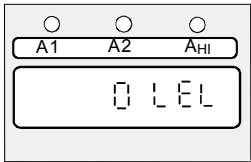
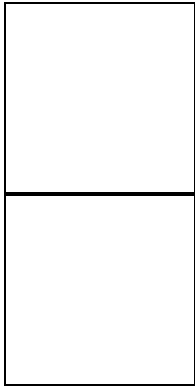
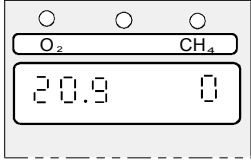
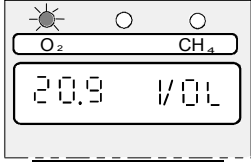
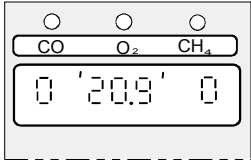
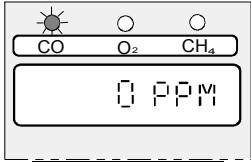
When the battery alarm has been activated, the G333 should be connected to its charger.

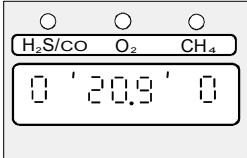
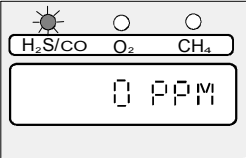
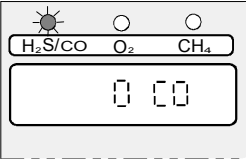
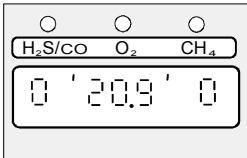
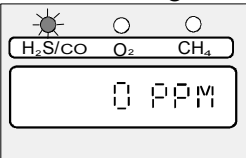
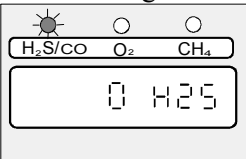
**Attention: The charger must not be used in hazardous areas. Recharging has always to be effected in non-Ex areas.**



## Individual Gas Display

Pressing the right key  activates the individual gas display. The gas concentrations and the detection units, e.g. ppm, Vol, LEL, are indicated one after the other by repeated pressing of the right key . The measurement values are displayed in the order TX, OX, EX. The relevant reference LED lights up and indicates the presently displayed gas.

	Standard display	ZOOM
G333 for 1 Gas		
G333 for 2 Gases		
G333 for 3 Gases		

G333 for 4 Gases (#)		<p>First individual gas display</p>  <p>alternating with</p> 
G333 for 4 Gases (#)		<p>Second individual gas display</p>  <p>alternating with</p> 

In case you do not hit any key for approx. 10 seconds, the G333 turns the individual gas display off and returns to the standard display.


## Display Illumination

For display illumination in the detection mode press any of the three keys shortly. The light will go out automatically after approximately 5 seconds. In case of alarm the display illumination is activated automatically.

## Special Notes for LEL Monitoring

For LEL monitoring the G333 uses a catalytic combustion (CC) sensor. Due to this principle the G333 cannot distinguish between measurement values in the LEL range and those in the high Vol.-% range (e.g. > 20 Vol.-% CH<sub>4</sub>).

In case the detector also includes an oxygen sensor, you can determine gas concentrations in the high Vol.-% range, which are not accurately measured by the CC sensor. It is absolutely necessary, however, that you have already turned the detector on in an EX-free environment.

If the detector does not provide an oxygen sensor, an exceeded LEL range remains stored, until it is cancelled by pressing the middle key  twice. After the first hit on this key the detector displays „GAS POSSIBLY OVER 100 LEL“. Only pressing the key again during this message deletes the storage of this error report. You have to make sure, however, that there is no high Vol.-% concentration. Cancellation is only possible, if the gas concentration is within the detection range.

## Influence of Interfering Gases and Oxygen

It is to be considered, that the measurement of gas and/or vapour concentrations in the LEL range cannot be done accurately, if the oxygen concentration is below 10 Vol.-%. In this case the CC sensor suffers from a lack of oxygen, which is necessary for the „catalytic combustion“. The EX-approval does not cover the use of the detector in oxygen enriched atmospheres.

Certain components, known as „sensor or catalyst poisons“, may affect the signal behaviour of the CC sensor. The "sensitivity", i.e. the capability of the sensor to give signals, reduces. Components of this kind are e.g. sulphuric, lead or silicone compounds.

## Special Notes for Oxygen Monitoring

Sour gases like CO<sub>2</sub> and SO<sub>2</sub> are easily absorbed by the electrolyte of the oxygen sensor. This results in an increased oxygen signal of e.g. approx. 0.3 % of the measurement value per 1 Vol.-% CO<sub>2</sub>. The oxygen sensor is not suitable for permanent use in concentrations above 25 Vol.-% CO<sub>2</sub>. Should a carrier gas with a molecular weight different from that of nitrogen is used, you may also register display deviations.

There are no cross sensitivities from toxic gases in the range of TLV concentrations.

## Service Mode



In the service mode the detector does not provide threshold monitoring or battery alarm.

In case you do not hit any key for some time, the G333 returns automatically to detection mode.

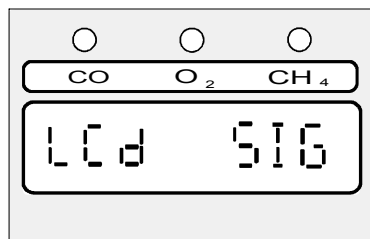
## Main Menu



The main menu is divided into two groups. In the **left group** you can select, if you want to do an automatic zero-point adjustment in fresh air (**AIR**) or if you want to do service adjustments (**SRV**). In the **right group** you can change the display contrast (**LCD**) or set the interval for the confidence beep (**SIG**).

From detection mode you can activate the main menu as follows:



- For „LCD“ or „SIG“ keep key  pressed for approx. 3 seconds.
- For „AIR“ or „SRV“ keep key  pressed for approx. 3 seconds.


Should you have selected the right group of the main menu, the detector reads:






Key	Selection
	Changing of LCD contrast
	Changing of interval for confidence beep

## Adjustment of Display Contrast - LCD

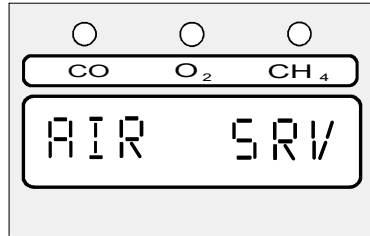
You can adjust the contrast of the display for different light conditions or best personal visibility. Select the desired function and press the keys  and  to change the contrast from 0 to 100 %.



Press the middle key  to return to the standard detection mode.

## Adjustment of Confidence Beep - SIG

During the detection mode, the G333 may beep in regular intervals to remind the user that it is still turned on. The time interval can be set from 15 to 90 seconds. You can also turn off the signal completely. Use the keys  and  to set the desired time interval, which is indicated in the display. The readout „ - - “ means that the confidence beep is turned off. Press the middle key  to return to the standard detection mode. For use according to EC-Type Examination Certificate BVS 03 ATEX G 015X the operational bleep has to be activated.

Should you have selected the left group of the main menu, the detector reads:






Key	Selection
	Activation of automatic zeropoint adjustment in fresh air for all sensor signals
	Change to access code entering and start of service menu

## Automatic Adjustment in Fresh Air - AIR

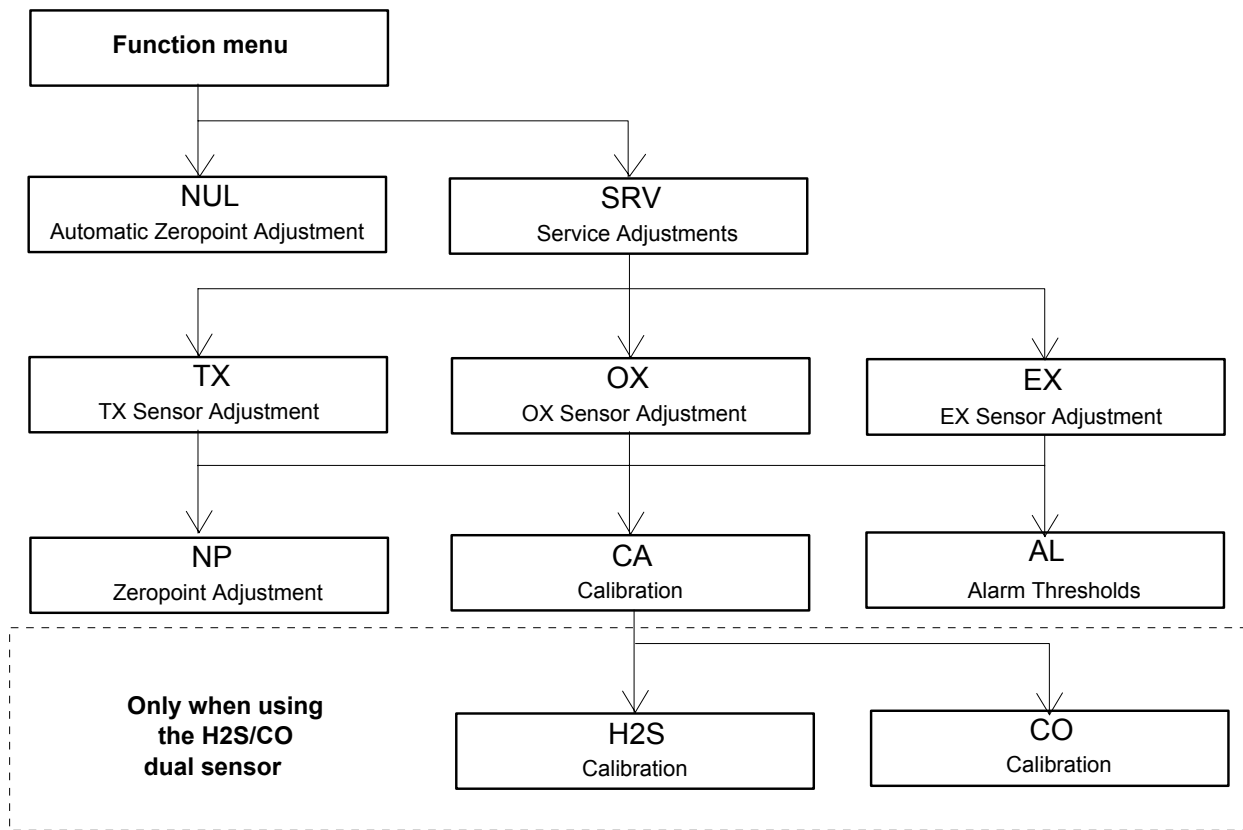
Selecting menu point "AIR" (fresh air) activates the program for the automatic zeropoint adjustment in fresh air. This adjustment is effected for one gas after the other and must be done in „fresh“ ambient air. Once the fresh air adjustment is completed, the G333 returns to detection mode.

As an alternative for the automatic adjustment you may also set the zeropoint for every sensor individually in the service menu „Zeropoint Adjustment - ZP“ (for the ranges TX and EX) resp. "Calibration - CA" (for the OX range).

## Access for Service Menu - SRV

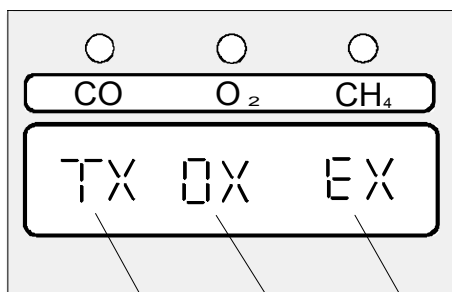
In the service menu you can calibrate the zeropoints and sensitivities of every sensor and set the alarm thresholds. You have to enter an access code to prevent inadvertent misadjustment or unauthorized modification of parameters. The code consists of 4 figures, which are entered one after the other. The figures are changed by means of the right key  resp. the left key  and confirmed with the middle key . After correct entering all 4 figures you enter the service menu. Your G333 detector has the code "0011". Incorrect entering of the code results in the display message "FAULT" and the G333 returns to detection mode.




## Service Menu Structure






## Menu Control in Service Menu

Adjustments in the service mode are menu controlled. The 3 keys control those functions which are indicated directly above the relative key, e.g.:



Pressing key  changes to EX-range (CH<sub>4</sub>)  
 Pressing key  changes to OX-range (O<sub>2</sub>)  
 Pressing key  changes to TX-range (CO)

The above example shows that the left key  refers to the adjustments of the TX-range, the middle key  refers to the adjustments of the OX-range and the right key  refers to the adjustments of the EX-range. The functions are activated by pressing the relevant keys.

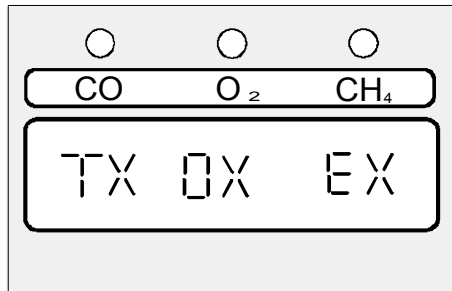
### Remark:

The G333 returns to the previous menu point, if you do not hit any key within 10 seconds. Every automatic change of menu points activates a short audible signal.

## Selection of Sensors for Service Adjustments

The menu point "SRV" allows the individual adjustment of zero point (ZP), calibration (CA) and alarm thresholds (AL) for each of the TX, OX and EX sensors. First select the sensor which is to be adjusted.

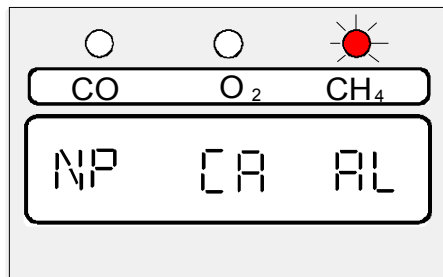
**Note:** Depending on the model, the G333 provides sensors for 1, 2, 3 or 4<sup>(#)</sup> gases. The zeropoint, calibration and alarm settings are described for 4-gas<sup>(#)</sup> detectors. Certain adjustments may not be possible for detectors without sensors for one or several gases.



Use the keys below to select the sensors for the ranges TX, OX or EX:

Key	Selection of sensor
	<b>TX</b> for toxic gases, carbon monoxide (CO) and/or hydrogen sulphide (H <sub>2</sub> S)
	<b>OX</b> for oxygen (O <sub>2</sub> )
	<b>EX</b> for combustible gases, methane (CH <sub>4</sub> ) and propane (C <sub>3</sub> H <sub>8</sub> )

The reference LED for the selected sensor lights up. All further settings refer to the selected sensor.



In the above example the sensor for methane (CH<sub>4</sub>) has been selected. The reference LED for CH<sub>4</sub> lights up during all further adjustments.

In the menu you can select one of the functions zeropoint adjustment (ZP), calibration (CA) and changing alarm thresholds (AL). The relevant function always refers to the previously selected sensor.

For selecting the desired function use the keys described below:







Key	Selection of function:
	<b>ZP</b> - Zeropoint adjustment (zeropoint)
	<b>CA</b> - Sensitivity adjustment (Calibration)
	<b>AL</b> - Changing alarm thresholds

If you do not hit any key within approx. 10 seconds, the G333 completes the service mode. Should you have made changes to certain values in the service mode, the G333 asks you whether or not you want to store the changed values.


## Zeropoint Adjustment - ZP

The zeropoint adjustment sets the display for the selected sensor to zero. Zeroing for the ranges EX and TX can be done in fresh ambient air. For adjustment of the OX range supply 100 % nitrogen (N<sub>2</sub>) by means of the calibration adapter.

Adhere to the following procedure to adjust the zeropoint:

- Select the sensor for either "TX", "OX" or "EX", whichever is to be zeroed.
- For zeroing "OX", use the calibration adapter and supply 100 % nitrogen (N<sub>2</sub>) with a flow rate of 0.5...0.6 l/min.
- Start the zeropoint program in the service menu.
- The zeropoint program starts automatically, when you select menu point "ZP" (press the left key ).
- The nominal value is shown in the display. Use the keys  or  to set the nominal value (e.g. 0.0) to your test gas concentration.
- Press the middle key  to confirm the changed resp. the displayed nominal value.
- Now the display reads the actual value. When the displayed value has stabilized, use the keys  or  to adjust the value and to set the sensor signal to the new value.

### Note:

- The zeropoint can only be adjusted, if the currently measured gas concentration is less than 7.7 % of the detection range. Should the G333 recognize a higher measurement value, it does not start the zeropoint program and reads the message „- - -“, together with 5 beeps. In this case the sensor can only be calibrated by specially trained service engineers.
- Should you hear 3 beeps during the adjustment routine, and should it be impossible to set the actual value to the nominal value, the sensor zero might be beyond the allowed adjustment range. In this case please call for GfG service. It might be necessary to replace the sensor.
- Press the middle key  to complete the zeropoint adjustment.

## Sensitivity Calibration - CA

During calibration the display sensitivity of the G333 is adjusted. Before starting calibration, make sure that the zeropoint adjustment has been effected. For calibration you need a suitable test gas, e.g.:







Range	Test gas
TX	Carbon monoxide (CO), hydrogen sulphide (H <sub>2</sub> S)
OX	Fresh air or test gas with 20.9 Vol.-% oxygen (O <sub>2</sub> ) in nitrogen (N <sub>2</sub> )
EX	Methane (CH <sub>4</sub> )

You can see the recommended test gas from the test report of your G333. For calibration the test gas concentration should be approximately 2/3 of full scale.


### Note for calibration of the OX sensor

Calibration of the OX sensor can be done in fresh ambient air or by supplying synthetic air with an oxygen concentration of 20.9 Vol.-% in nitrogen.

Adhere to the following procedure for calibration:

- Select either "TX", "OX" or "EX".
- **Note:** For G333 models with the dual sensor  $H_2S/CO^{(H)}$ , the "TX" selection is followed by a further question for calibration to either  $H_2S$  or  $CO$ . Correct measurement of both gases is only possible, if the sensor is calibrated properly for both gases ( $H_2S$  and  $CO$ ).
- Place the G333 in the calibration adapter and expose it to a constant test gas for at least 3 minutes to avoid incorrect caused by gas absorption. The flow rate should be 0.5...0.6 l/min.
- Start the calibration program.
- The calibration program starts automatically on selection of menu point "CA" (press the left key ).
- The nominal value is shown in the display. If the displayed value is not equivalent to your test gas concentration, use keys  or  to set the correct value.
- Press the middle key  to confirm the displayed nominal value.
- Now the actual value is displayed. Once the measurement value has stabilized, use the keys  or  to adjust the value and to set the sensor signal to the new value.

#### Note:

- The sensitivity can only be calibrated, if the currently measured gas concentration is higher than 7.7 % of the detection range. Should the G333 recognize a lower measurement value, it does not start the sensitivity calibration and the display reads „- - -“, together with 5 beeps.
- Should you hear 3 beeps during the calibration routine, and should it be impossible to set the actual value to the nominal value, the sensor sensitivity might be beyond the allowed adjustment range. In this case please call for GfG service. It might be necessary to replace the sensor.
- Press the middle key  to complete the calibration program.

## Alarm Thresholds - AL

The G333 provides two alarm thresholds for the toxic gases (e.g. hydrogen sulfide, carbon monoxide) and three instantaneous alarm thresholds for oxygen and combustible gases (e.g. methane). The alarms are activated, if the gas concentration exceeds resp. falls below the set threshold. For the toxic gases the detector provides an additional warning for exceeded long-term (TWA) and short-term (STEL) averages. Each threshold can be set individually, independent from each other, within the relevant detection range. Alarm A1-A3 are defined as a default and are programmed by production. For toxic gases alarm A3 is not applicable.

### Setting of alarm thresholds for combustible gases

<b>AL1</b>	First alarm threshold (display of % LEL) usually 20 % LEL
<b>AL2</b>	Second alarm threshold usually 40 % LEL; <b>recommended: ≤ 60 % LEL !</b>
<b>AL3</b>	Third alarm threshold (usually for exceeded detection range)

### Setting of alarm thresholds for oxygen

<b>AL1</b>	First alarm threshold (for oxygen always falling below)	usually 19 Vol %
<b>AL2</b>	Second alarm threshold (for oxygen always falling below)	usually 17 Vol %
<b>AL3</b>	Third alarm threshold (always exceeding)	usually 23 Vol %








## Setting of alarm thresholds for toxic gases

<b>AL1</b>	First alarm threshold (display of ppm)	usually TLV
<b>AL2</b>	Second alarm threshold	usually double TLV
<b>AL3</b>	Third alarm threshold not applicable	

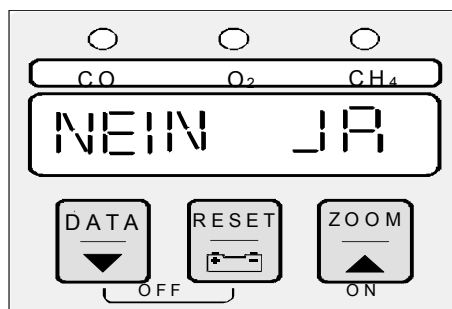
The G333 provides several alarm thresholds for every gas. The "TX" range offers additional TWA and STEL alarms. Every threshold can be altered independently from each other over the full detection range.

**Note:** For G333 models with the dual sensor  $H_2S/CO^{(*)}$ , the alarm adjustment for toxic gases is done for hydrogen sulphide ( $H_2S$ ). The alarm threshold for carbon monoxide (CO) is resulting automatically in the ratio 1:3. Thus, the relation between the Threshold Limit Value for  $H_2S$  (TLV = 10 ppm) and CO (TLV = 30 ppm) is being considered.



- Select sensor "TX", "OX" or "EX" for setting the alarm thresholds.
- 
- Press the right key  to select the menu point "AL".
- 
- Use the right key  or the left key  to change the alarm threshold.
- 
- Press the middle key  for the next alarm setpoint and adjust it as described above.
- 
- The entering procedure for the alarm thresholds is automatically completed by pressing the middle key . It is also complete, if you do not hit any key within 10 seconds.

## Completing Service Mode

The G333 stops the service mode automatically, if you do not hit any key within 10 seconds. Should you have changed any parameter, the G333 asks you whether or not you want to store the changed values:



### Important:

Display	Key	Meaning
NO		All settings done in the service mode are ignored and the G333 returns to the standard detection mode.
YES		All settings done in the service mode are stored and the G333 returns to the standard detection mode.

## Selection of Language

The G333 provides a German and an English language module. Should you wish to select the other language, just enter <GERM> or <ENGL> instead of the access code, when you change to the service mode.

## Turning the Tolerance Band On/Off

For toxic and combustible gases the G333 suppresses very low measurement value fluctuations around the zeropoint. For oxygen measurement, fluctuations of +/-0.2 Vol.-% at 20.9 Vol.-% (fresh air) are suppressed. This tolerance band is activated by the manufacturer but can also be turned off by entering <REAL> for de-activation or <BAND> for activation instead of the access code, when changing to service mode. For detailed information about the width of the tolerance band please refer to „Types of Sensors and Detection Ranges“.

## Charging the battery pack

For reasons of EX-protection the battery cells and fuses are potted with their enclosure.

### Hints for recharging the battery pack

For recharging the battery pack use GfG's universal charger or plug-in charger. Before charging the detector must be switched off. Recharging **MUST NOT** be done in hazardous areas.

### Universal Charger

The universal charger recharges the batteries completely within 8 hours. Once this is completed, the universal charger turns to „trickle charge“. A lower charging current keeps the batteries fully charged and prevents overcharging. In case you keep the battery pack connected to the charger for a long time, you should discharge and recharge it again after a period of approx. 6 weeks.

### Plug-in Charger

With the plug-in charger, the charging time is approx. 12 to 24 hours. Make sure that the plug-in charger is disconnected from the battery pack after this time, to prevent overcharging and subsequent damaging the batteries.

# Annex

## Cleaning

After having used the G333, you should give it a quick outside inspection. The casing may be cleaned with a damp cloth. Do not use any solvents or cleaning agents!

## Maintenance

DIN EN 50073 „Leitfaden für Auswahl, Installation, Einsatz und Wartung von Geräten für die Detektion und die Messung brennbarer Gase oder von Sauerstoff“ (guideline for selection, installation, application and service of devices for detection of combustible gases or oxygen), DIN EN 45544-4 „Arbeitsplatzatmosphäre – Elektrische Geräte für die direkte Detektion und direkte Konzentrationsmessung toxischer Gase und Dämpfe, Teil 4: Leitfaden für Auswahl, Installation, Einsatz und Instandhaltung“ (working place atmosphere – electrical devices for direct detection and direct concentration measurement of toxic gases and vapours, Part 4: guideline for selection, installation, application and maintenance) as well as the respective national rules have to be considered. For Germany rules of the professional associations: BGR 104 (formerly ZH 1/10) „Explosionsschutz-Regeln“, memorandum T 023 (BGI 518) „Gaswarneinrichtungen für den Explosionsschutz – Einsatz und Betrieb“, memorandum T 021 (BGI 836) „Gaswarneinrichtungen für toxische Gase/Dämpfe und Sauerstoff“ and BGV B6 „Unfallverhütungsvorschriften Gase“ (short: UVV-Gase).

Maintenance includes service, calibration and adjustment as well as repair if necessary. Actions for maintenance have to be documented.

For the replacement of parts it is, for safety reasons, allowed to use only genuine spare parts of the manufacturer of the gas detector parts which are specified in the operational manual (T 023 part 10.1; T 021 part 9.1).

## Service and Adjustment

Service and adjustment include measures, which keep the required status of the gas detection system. This includes a regular test and adjustment of sensitivity and zeropoint. The definition of appropriate adjustment intervals depends on mode and frequency of using the device and depends on the degree of the noted signal deviation.

The adjustment interval for sensors for detection of combustible gases should be usually not longer than 4 month (T 023 part 10.2) resp. for sensors for detection of toxic gases not longer than 6 month (T 021 part 9.3).

For an average typical use of a device GfG suggests to adjust all sensors every 6 months. It is recommended to instruct GfG service team with this duty.

## Function test by an expert

Additional to maintenance and adjustment the function of a portable gas detector has to be tested before initial startup and at least once a year by an expert (T 023 part 10.3; T 021 part 9.4).

The function test includes:

- Capacity of energy supply
- Zeropoint and sensitivity adjustment
- Time until the alarm activates, e.g. with test gas
- Response time according to detector specifications

The check must be done by an expert, and the result must be confirmed in writing.

## Trouble Shooting

Failure, Message on Display	Cause	Solution
Detector cannot be turned on	- Exhausted battery pack - Blown fuse - Faulty keyboard	- Recharge battery pack - Call GfG service
Detector cannot be recharged	- Faulty charger or charging cable - Blown fuse in G333	- Use other charger or cable - Call GfG service
“RAM-ERR“ and turning off	- Faulty working memory	- Call GfG service
“ROM-ERR“ and turning off	- Faulty program memory	- Call GfG service
“MEM-ERR“	- Faulty parameter memory	- Call GfG service
“NO-SENS“	- No sensor activated	- Call GfG service
Functions not selectable	- Faulty keyboard	- Call GfG service
--- flashing	- Value is too high and cannot be displayed - ADC overrange	- Leave area with high gas concentration - Check calibration of detector
positive value flashes	- Overrange	- Leave area with high gas concentration - Check calibration of detector
negative value flashes	- Negative range deviation	- Adjust zeropoint
--- flashing	- Value is too low and cannot be displayed - ADC range deviated	- Adjust zeropoint - Call GfG service
“ERR“ or “ER“	- EX sensor is operated on wrong voltage	- Call GfG service
“ - - - - “ during zeropoint adjustment in service mode	- Zeroing is done with test gas - Zeropoint is too positive	- Use zero gas for zeroing - Call GfG service
“ - - - - “ during calibration in service mode	- Sensitivity calibration was done with insufficient test gas concentration - Sensor has lost its sensitivity	- Use test gas concentration of 50-100 % of detection range - Replace sensor

## Accessories

	Description	Part No.
1.	Universal charger, 230 V/50 Hz (standard/trickle charge)	1333240
2.	Universal charger, 115 V/60 Hz (standard/trickle charge)	1333242
3.	Universal charger for cars, 12...24 VDC, in aluminum transport case	1333243
4.	G333 Plug-in charger, 230 V (charging time 12 to 24 hours)	1333244
5.	G333 Spare charging cable for universal charger	1333245
6.	G333 Leather case with shoulder strap	1333204
7.	G333 Calibration adapter	1315206

## Spare Parts

	Description	ID	Part No.
1.	Oxygen sensor 0 .. 25 Vol.-% O <sub>2</sub>	MK 342-3	1333412
2.	Oxygen sensor 0 .. 25 Vol.-% O <sub>2</sub> (#)	MK 376-3	1333416
3.	H <sub>2</sub> S/CO Dual sensor 0 .. 100 ppm H <sub>2</sub> S / 0 .. 300 ppm CO (#)	MK 343-3	1333411
4.	Carbon monoxide sensor 0 .. 300 ppm CO	MK 344-3	1333414
5.	Hydrogen sulfide sensor 0 .. 100 ppm H <sub>2</sub> S	MK 345-3	1333413
6.	Methane sensor 0 .. 100 % LEL CH <sub>4</sub>	MK 201-2	1333415
7.	Propane sensor 0 .. 100 % LEL C <sub>3</sub> H <sub>8</sub>	MK 201-2	1333415
8.	Sensor card		1333303
9.	NiMH battery pack		1333302
10.	CPU card		1333304
11.	Casing top with alarm electronics and sensor holder		1333305
12.	Casing top		1333306
13.	Keypad		1333307
14.	Front cover complete with keypad		1333308

Spare parts and accessories should be stored at an ambient temperature of 0...30 °C. Storage time should not exceed 5 years. Electrochemical sensors should be stored for max. 6 months. Make sure, that the ambient atmosphere is free from corrosive gases and sensor poisons.

## Alarm Thresholds - Standard Setpoints

### Standard setting of alarm thresholds for combustible gases and oxygen

Detection range	Alarm 1	Alarm 2	Alarm 3
0...100 % LEL CH <sub>4</sub> *	20.0 % LEL	40.0 % LEL	100.0 % LEL
0...100 % LEL C <sub>3</sub> H <sub>8</sub> *	20.0 % LEL	40.0 % LEL	100.0 % LEL
0...25.0 Vol.-% O <sub>2</sub>	19.0 Vol.-% (↓)	17.0 Vol.-% (↓)	23.0 Vol.-% (↑)

*1 LEL values as per DIN EN 50054 (edition 1998)	*2 LEL values as per DIN EN 61779-1 (edition 2000) resp. data base CHEMSAFE
5.0 Vol% CH <sub>4</sub>	4.4 Vol% CH <sub>4</sub>
2.0 Vol% C <sub>3</sub> H <sub>8</sub>	1.7 Vol% C <sub>3</sub> H <sub>8</sub>

### Standard setting of alarm thresholds for toxic gases without exposure alarm

Detection range	Alarm 1	Alarm 2	STEL	TWA
0...300 ppm CO	30 ppm	60 ppm	-	-
0...100 ppm H <sub>2</sub> S	10 ppm	20 ppm	-	-

### Standard setting of alarm thresholds for toxic gases with exposure alarm as per TRGS900

Detection range	Alarm 1	Alarm 2	STEL	TWA
0...300 ppm CO	30 ppm	180 ppm	120 ppm (15')	30 ppm (8h)
0...100 ppm H <sub>2</sub> S	10 ppm	20 ppm	10 ppm (15')	10 ppm (8h)

# Alarm Thresholds – Standard Setpoints

Standard setting of alarm thresholds for combustible gases and oxygen

Range	Alarm 1	Alarm 2	Alarm 3
0...100 %LEL CH4 *2	20.0 %LEL	40.0 %LEL	100.0 %LEL
0...100 %LEL C3H8 *2	20.0 %LEL	40.0 %LEL	100.0 %LEL
0...25.0 Vol% O2	19.0 Vol% (↓)	17.0 Vol% (↓)	23.0 Vol% (↑)

<b>*2 LEL values as per DIN EN 61779-1 (edition 2000) resp. data base CHEMSAFE</b>
4.4 Vol% CH4
1.7 Vol% C3H8

Standard setting of alarm thresholds for toxic gases without exposition warning

Range	Alarm 1	Alarm 2	STEL	TWA
0...300 ppm CO	30 ppm	60 ppm	-	-
0...100 ppm H2S	10 ppm	20 ppm	-	-

Standard setting of alarm thresholds for toxic gases with exposition warning as per TRGS900

Range	Alarm 1	Alarm 2	STEL	TWA
0...300 ppm CO	30 ppm	180 ppm	120 ppm (15')	30 ppm (8h)
0...100 ppm H2S	10 ppm	20 ppm	10 ppm (15')	10 ppm (8h)

## Types of Sensors and Detection Ranges

Plug space	Sensor type (ID)	Detection range	Gas	Resolution	T-Band *
<b>EX</b>	MK 201-2	0 .. 100 % LEL	CH <sub>4</sub> Methane	1 % LEL	±2 % LEL
	MK 201-2	0 .. 100 % LEL	C <sub>3</sub> H <sub>8</sub> Propane	1 % LEL	±2 % LEL
<b>OX</b>	MK 342-3	0 .. 25 Vol.-%	O <sub>2</sub> Oxygen	0.1 Vol.-%	±0.2 Vol.-%
	MK 376-3 <sup>(#)</sup>	0 .. 25 Vol.-%	O <sub>2</sub> Oxygen	0.1 Vol.-%	±0.2 Vol.-%
<b>TX</b>	MK 343-3 <sup>(#)</sup>	0 .. 100 ppm and 0 .. 300 ppm	H <sub>2</sub> S Hydrogen sulfide CO Carbon monoxide	1 ppm 1 ppm	±1 ppm ±3 ppm
	MK 343-3 <sup>(#)</sup>	0 .. 700 ppm	CO Carbon monoxide	1 ppm	±7 ppm
	MK 344-3	0 .. 300 ppm	CO Carbon monoxide	1 ppm	±3 ppm
	MK 345-3	0 .. 100 ppm	H <sub>2</sub> S Hydrogen sulfide	1 ppm	±1 ppm

- T-Band = Tolerance band

# Sensor Specification

<b>MK201-2 Catalytic combustion sensor for combustible gases and vapours (as per EN 50057)</b>		
Response time:	$T_{50}$ : < 7 sec seconds	$T_{90}$ : <30 seconds
Pressure	950...1100 hPa:	max. $\pm 5$ % of full scale or $\pm 15$ % of display (referred to 1013 hPa)
Humidity	5%...90% r.F.:	max. $\pm 5$ % of full scale or $\pm 15$ % of display (referred to 55 % r.h.)
Temperature	-20...+ 50°C:	max. $\pm 3$ % of full scale or $\pm 10$ % of display (referred to 20°C)
Cross sensitivities at 50% LEL: (#)	2.20Vol.% CH <sub>4</sub> : 100% 0.50 Vol.% C <sub>6</sub> H <sub>14</sub> : approx..53% 2.00 Vol.% H <sub>2</sub> : approx.180% 0.85Vol.% C <sub>3</sub> H <sub>8</sub> : approx.77% 0.55 Vol.% C <sub>7</sub> H <sub>16</sub> : approx.43% 2.75 Vol.% CH <sub>4</sub> O: approx.140% 0.70Vol.% C <sub>4</sub> H <sub>10</sub> : approx.70% 0.40 Vol.% C <sub>8</sub> H <sub>18</sub> : approx.40% 1.55 Vol.% C <sub>2</sub> H <sub>6</sub> O: approx.115% 0.70Vol.% C <sub>3</sub> H <sub>12</sub> : approx.73% 0.35 Vol.% C <sub>8</sub> H <sub>20</sub> : approx.37% This specification refers to the methane range. It may vary from sensor to sensor deutlich and depends on the gas concentration and on the age of the sensor.	
Expected lifetime:	3 years	
<b>MK342-3 (as per EN 50104) / MK 376-3 (#) Electrochemical sensor for oxygen O<sub>2</sub></b>		
Response time:	$T_{20}$ : <5 seconds	$T_{90}$ : <10 seconds
Pressure	800...1200 hPa:	max. $\pm 0.2$ Vol.-% or $\pm 2.5$ % of full scale (referred to 1000 hPa)
Humidity	10%...90% r.F.:	max. $\pm 0.2$ Vol.-% or $\pm 2.5$ % of full scale (referred to 50 % r.h.)
Temperature	-20...+50°C:	max. $\pm 0.5$ Vol.-% or $\pm 2.5$ % of display (referred to 20°C)
Expected lifetime:	MK 342-3 = 1 year / MK 376-3 = 2 years	
<b>MK343-3 Electrochemical sensor for hydrogen sulfide H<sub>2</sub>S and carbon monoxide CO (#)</b>		
Response time:	$T_{20}$ : <5 seconds	$T_{90}$ : <60 seconds
Pressure	800...1200 hPa:	max. $\pm 3$ ppm or $\pm 7$ % of display (referred to 1000 hPa)
Humidity	20%...90% r.F.:	max. $\pm 3$ ppm or $\pm 7$ % of display (referred to 50 % r.h.)
Temperature	0...+50°C:	max. $\pm 3$ ppm or $\pm 10$ % of display (referred to 20°C)
Temperature	-20...+50°C:	max. $\pm 3$ ppm or $\pm 20$ % of display (referred to 20°C)
Cross sensitivities - H <sub>2</sub> S range	CO: $\approx 40$ % , H <sub>2</sub> : <15% , NO <sub>2</sub> : $\approx 25$ % , SO <sub>2</sub> : $\approx 20$ % , NO: $\approx 12$ % , Cl <sub>2</sub> : 0..-40% (*1)	
Cross sensitivities - CO range	H <sub>2</sub> S: $\approx 250$ % , H <sub>2</sub> : <40% , NO <sub>2</sub> : $\approx 60$ % , SO <sub>2</sub> : $\approx 50$ % , NO: $\approx 30$ % , Cl <sub>2</sub> : 0..-100% (*1)	
Expected lifetime:	3 years	
<b>MK344-3 Electrochemical sensor for carbon monoxide CO</b>		
Response time:	$T_{20}$ : <5 seconds	$T_{90}$ : <85 seconds (> 100ppm)
Pressure	800...1200 hPa:	max. $\pm 3$ ppm or $\pm 7$ % of display (referred to 1000 hPa)
Humidity	20%...90% r.F.:	max. $\pm 3$ ppm or $\pm 7$ % of display (referred to 50 % r.h.)
Temperature	0...+50°C:	max. $\pm 3$ ppm or $\pm 10$ % of display (referred to 20°C)
Temperature	-20...+50°C:	max. $\pm 3$ ppm or $\pm 20$ % of display (referred to 20°C)
Cross sensitivities:	H <sub>2</sub> S: $\approx 7$ % , H <sub>2</sub> : <40% , C <sub>2</sub> H <sub>4</sub> : <85% , NO: <9% , NO <sub>2</sub> : 0...-20% , SO <sub>2</sub> : 0% (*1)	
Expected lifetime:	3 years	
<b>MK345-3 Electrochemical sensor for hydrogen sulfide H<sub>2</sub>S (as per T 017)</b>		
Response time:	$T_{20}$ : <5 sec	$T_{90}$ : <45 sec
Pressure	800...1200 hPa:	max. $\pm 3$ ppm or $\pm 10$ % of display (referred to 1000 hPa)
Humidity	20%...90% r.F.:	max. $\pm 3$ ppm or $\pm 10$ % of display (referred to 50 % r.h.)
Temperature	-10...+40°C:	max. $\pm 3$ ppm or $\pm 10$ % of display (referred to 20°C)
Temperature	-20...+50°C:	max. $\pm 3$ ppm or $\pm 20$ % of display (referred to 20°C)
Cross sensitivities:	SO <sub>2</sub> : $\approx 20$ % , NO <sub>2</sub> : $\approx 20$ % , NO: <2% , CO: <0,5% , H <sub>2</sub> <0,1% (*1)	
Expected lifetime:	3 years	

(\*1) Gas display referred to the supplied concentration

## Technical Data

<b>Type:</b>	G333
<b>Detection principle:</b>	Combustible gases and vapours (EX): catalytic combustion (CC) Toxic gases (TX): electrochemical sensor (EC) Oxygen (OX): electrochemical sensor (EC)
<b>Detection ranges:</b>	see para „Types of Sensors and Detection Ranges“
<b>Response time T<sub>90</sub>:</b>	10...60 seconds - see para „Sensor Specification“
<b>Expected sensor life:</b>	1...3 years - see para „Sensor Specification“
<b>Climate conditions:</b>	see para „Sensor Specification“
<b>Display:</b>	8-digit, 15 segment LCD, illuminated
<b>Alarm:</b>	visual and audible warning depending on gas either 3 or 2 current value and 2 peak value alarms see para „Alarm Thresholds - Standard Setpoints“
<b>Gas supply:</b>	Diffusion
<b>Zeropoint/Calibration:</b>	with calibration adapter at a flow rate of 0.5...0.6 l/min
<b>Climate conditions</b>	for operation: -20...+40°C / 5...95 % r.h. / 700...1300hPa (EX-protection) -20...+50°C / 5...95 % r.h. / 700...1300hPa (Function test) for storage: -25...+55°C / 0...99 % r.h. / 700...1300hPa (recommended 0...+30°C)
<b>Time of operation:</b>	> 13 hours, depending on sensor configuration
<b>Power supply:</b>	rechargeable NiMH battery pack, 1200mAh
<b>Enclosure</b>	Casing material: Polyamid Dimensions: 60 x 133 x 33 mm (WxHxD) Weight: 385 g Protection: IP54
<b>Approvals and Tests:</b>	Labelling and Ignition Protection: Ⓢ II 2G EEx ib d IIC T4 Classification: EC-Type Examination Certificate: BVS 03 ATEX E 173 X (without measuring function) BVS 03 ATEX G 015 X (with measuring function, see page 3) Function Test: PFG-Nr. 41300498 (for tested detection ranges see page 3) EMC Test: EN 50081-1, EN 50081-2 as well as EN 50270 type 1 and type 2 Production supervision: CE 0158 (by named testing body - EXAM)

### Worldwide Supplier of Gas Detection Solutions

168-000.04\_OM.doc, Edition 16.03.2005. We reserve the right of modification  
Firmware Version 2.30



Gesellschaft für Gerätebau mbH  
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# EC-Type Examination Certificate



(13) Anlage zur  
**EG-Baumusterprüfbescheinigung**

**BVS 03 ATEX E 173 X**

(14) 15.1 Gegenstand und Typ  
Gasmessgerät Typ G3333

15.2 Beschreibung

Das Gasmessgerät ist ein tragbares Gerät mit Stromversorgungsakkumulator, dessen Ladung außerhalb des explosionsgefährdeten Bereiches erfolgt. Die durch die hinter einer Abdeckung steckbar angeordneten 3 Sensoren (bis zu 2 elektrochemische Zellen und / oder ein druckfester Sensor für brennbare Gase und Dämpfe) gewonnenen Messwerte werden von einem LC-Display angezeigt. Bei Über- bzw. Unterschreiten einstellbarer Konzentrationswerte wird ein optisches und akustisches Signal abgegeben.

(15) 15.3 Kenngrößen  
Ladestromkreis: Stromstärke bis 500 mA

(16) Prüfprotokoll  
BVS PP 03.2144 EG, Stand 04.07.2003

(17) Besondere Bedingungen für die sichere Anwendung  
Die Messfunktion für den Explosionsschutz gemäß EN 50054 und EN 50057 ist nicht Gegenstand dieser EG-Baumusterprüfbescheinigung.

Seite 2 von 2 zu BVS 03 ATEX E 173 X  
Dieses Zertifikat darf nur unverändert weitervertriebt werden.  
Dimmstraße 9 44809 Bochum Telefon-Phone 0201/172-3947 Telefax-Fax 0201/172-3948  
(bis 31.05.2003: Deutsche Motan Technologie GmbH, Am Technologiepark 1, 45307 Essen)



(1) **EG-Baumusterprüfbescheinigung**

(2) **- Richtlinie 94/9/EG -**  
Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung  
in explosionsgefährdeten Bereichen

(3) **BVS 03 ATEX E 173 X**

(4) **Gerät: Gasmessgerät Typ G3333**

(5) **Hersteller: Gesellschaft für Gerätebau mbH**

(6) **Anschrift: D 44143 Dortmund**

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Die Zertifizierungsstelle der EXAM BBG Prüf- und Zertifizier GmbH, benannte Stelle Nr. 0158 gemäß Artikel 9 der Richtlinie 94/9/EG des Europäischen Parlaments und des Rates vom 23. März 1994, bescheinigt, dass das Gerät die grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie erfüllt.  
Die Ergebnisse der Prüfung sind in dem Prüfprotokoll BVS PP 03.2144 EG niedergelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

EN 50014:1997 + A1 - A2 Allgemeine Bestimmungen  
EN 50018:2000 + A1 Druckfeste Kapselung  
EN 50020:1994 Eigensicherheit

(10) Falls das Zeichen „X“ hinter der Bescheinigungsnummer steht, wird in der Anlage zu dieser Bescheinigung auf besondere Bedingungen für die sichere Anwendung des Gerätes hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf die Konzeption und die Baumusterprüfung des beschriebenen Gerätes in Übereinstimmung mit der Richtlinie 94/9/EG.  
Für Herstellung und Inverkehrbringen des Gerätes sind weitere Anforderungen der Richtlinie zu erfüllen, die nicht durch diese Bescheinigung abgedeckt sind.

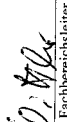
(12) Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

 **II 2G EEx ib d IIC T4**

**EXAM BBG Prüf- und Zertifizier GmbH**

Bochum, den 04. Juli 2003

  
EXAM Zertifizierungsstelle

  
Fachbereichsleiter

Seite 1 von 2 zu BVS 03 ATEX E 173 X  
Dieses Zertifikat darf nur unverändert weitervertriebt werden.  
Dimmstraße 9 44809 Bochum Telefon-Phone 0201/172-3947 Telefax-Fax 0201/172-3948  
(bis 31.05.2003: Deutsche Motan Technologie GmbH, Am Technologiepark 1, 45307 Essen)



Translation

EC-Type Examination Certificate

- (1) - Directive 94/9/EC - Equipment and protective systems intended for use in potentially explosive atmospheres
- (2) BVS 03 ATEX G 015 X
- (3) Equipment: Gas detector type G333 Microtector
- (4) Manufacturer: Gesellschaft für Gerätebau mbH
- (5) Address: D-44143 Dortmund
- (6) The design and construction of this equipment and any acceptable variation thereto are specified in the schedule to this type examination certificate.
- (7) The certification body of Deutsche Montan Technologie GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the test reports PFG-no. 41300498P and 41300498P NI.
- (8) The Essential Health and Safety Requirements with respect to the measuring function for explosion protection are assured by application of:  
DIN EN 50054 (VDE 0400 part 1 / 07/1999)  
DIN EN 50057 (VDE 0400 part 4 / 07/1999)  
DIN EN 50271 (VDE 0400 part 21 / 03/2002)  
This EC-type examination certificate covers the measuring function for methane and propane for devices with software version 2.30.
- (9) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.
- (10) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

page 1 of 3 to BVS 03 ATEX G 015 X  
 This certificate may only be reproduced in its entirety and without change  
 Dimensionalstrasse 9 44809 Bochum Telefon-Phone 0201172-3947 Telefax-Fax 0201172-3948  
 until 31.05.2003 Deutsche Montan Technologie GmbH, Am Technologiepark 1, 45307 Essen



- (12) The marking of the equipment shall include the following:

II 2G EEx ib d IIC T4

Deutsche Montan Technologie GmbH  
 Bochum, dated 18. September 2003

Signed: Jockers  
 Certification body

Signed: Bredenbrocker  
 Special services unit



Appendix to

EC-Type Examination Certificate

BVS 03 ATEX G 015 X

(13)

(14)

(15)

1.5.1 Subject and type  
 gas detector type G333 Microtector

1.5.2 Description

The gas detector type G333 Microtector is a portable device for the measurement of combustible gases or vapours mixed with air, of toxic gases and oxygen. The device can be equipped with a sensor for the measurement of combustible gases and vapours, a sensor for the measurement of oxygen and a sensor for the measurement of toxic gases. It is not necessary that all sensors are equipped.

1.5.3 Parameters

see EC-type examination certificate BVS 03 ATEX E 173 X

(16)

Test and assessment report

EC-type examination certificate BVS 03 ATEX E 173 X dated 04/07/2003  
 PFG-no. 41300498P dated 11/12/1998  
 PFG-no. 41300498P NI dated 17/09/2003

(17)

Special conditions for safe use

- The following special properties have to be considered at operation of the gas detector:
  - The operating beep shall be activated.
  - The indication of the gas detector shall be tested for the application of zero gas and test gas before use. If necessary, the gas detector shall be calibrated.

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, 18. September 2003  
 PFG-Kie

Deutsche Montan Technologie GmbH

Certification body

Special services unit

page 3 of 3 to BVS 03 ATEX G 015 X  
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 Dimensionalstrasse 9 44809 Bochum Telefon-Phone 0201172-3947 Telefax-Fax 0201172-3948  
 until 31.05.2003 Deutsche Montan Technologie GmbH, Am Technologiepark 1, 45307 Essen

## EC- Declaration of Conformity GfG Gesellschaft für Gerätebau mbH

### G 333 Microtector

Klönnestrasse 99  
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Edited: 13.09.2004 Amended:

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 : 2000 - Certificate-Register No. 0410030302 -.

Subject to supervision by means of a **quality system** -Certificate No. BVS 03 ATEX ZQS / E 187- issued by the notified body, EXAM BBG Prüf- und Zertifizier GmbH, 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 ignition protection classes explosion- proof encasing, increased safety, encapsulation and intrinsic safety, as well as their measuring function.

The portable Detector G 333 complies with **directive 94/9/EC** for devices and protective systems for proper use in explosion endangered areas (ATEX directive) and with **council directive 89/336/EEC** for electromagnetic compatibility.

**For electrical explosion protection**  
**For the measurement function**  
**Labelling**

BVS 03 ATEX E 173 X  
BVS 03 ATEX G 015 X  
⊕ II 2G EEx ib d IIC T4  
CE<sup>0158</sup>

The directives have been complied with under consideration of the standards mentioned below:

#### ■ Electrical explosion protection

Electrical apparatus for potentially explosive atmospheres.

- General requirements EN 50014 1997+ A1 – A2
- Flameproof enclosure „d“ EN 50018 2000+ A1
- Intrinsic safety „i“ EN 50020 1994

#### ■ Safe and accurate measuring function

Electrical apparatus for the detection and measurement of combustible gases -

- General requirements and test methods DIN EN 50054 1999- 07
- Performance requirements for Group II apparatus indicating up to 100 % lower explosive limit. DIN EN 50057 1999- 07
- Electrical apparatus for the detection and measurement of combustible gases, toxic gases or oxygen. Requirements and tests for apparatus using software and/or digital technologies. DIN EN 50271 2002- 05
- \* Electrical apparatus for the detection and measurement of oxygen. Performance requirements and test methods. EN 50104- 1996
- \* Warning devices for hydrogen sulfide Instructions T 017 1996

#### ■ Electromagnetic compatibility

- Electrical apparatus for the detection and measurement of combustible gases, toxic gases and oxygen. EN 50270 1999 (2000- 01) Amendment (2000- 10)
- Radioshielding type class 1 + 2
- Interference type class 1 + 2

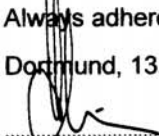
Standards marked \* are only valid for detectors subject to PFG-No. 41300498

The evaluation of the basic safety and health requirements has been done, documented and filed by a notified body with register no. 0158 ( EXAM BBG Prüf- und Zertifizier GmbH, Dinnendahlstraße 9 D-44809 Bochum ).

The EMC testing laboratory EM TEST GmbH, Kamen has been charged with testing and evaluation of the electromagnetic compatibility.

Always adhere to the safety notes of the operation manual 168-000.04.

Dortmund, 13.09.2004

  
MBA H.J. Hübner  
President CEO

ATEX EG-Kon008/H. Rische