BIOGAS 5000 Gas Analyzer

Operating Manual

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1.0 Manual guidelines

1.1 Document history

Issued By	Issue Date	Change Control ID	Issue No.	Reason for Change
LA	JAN 2012	5K-MNL-BIOGAS 5000	1.00	New Instructions.
SMarcell	29-Aug-2012		1.10	Minor corrections

1.2 Hazard warnings and safety symbols

 Warning	Information in this manual that may affect the safety of users and others is preceded by the warning symbol. Caution - Failure to follow the correct information may result in physical injury, which in some cases could be fatal. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

General product label symbols are listed as follows:

	CE conformity-The CE-marking is the manufacturer's statement to the EU authorities that the product complies with all relevant CE-marking Directives.		If the CSA mark appears with the indicator "US" or "NRTL" it means that the product is certified for the U.S. market, to the applicable U.S. standards.
	VDE mark is a symbol for electrical, mechanical, thermal, toxic, radiological and other hazards.		Separate collection, handling and disposal for waste electrical and electronic equipment and its components.
	Electric shock warning.		Refer to operators manual.
	Double insulated construction - does not require an Earth.		Specific marking of explosion protection (ATEX only).
II 2G	Equipment group and category. G = gases; the type of explosive atmosphere.		IECEx licensed mark (IECEx only).
	Fuse.		Equipment for indoor use only.

1.3 Notes

Important/useful information and instructions are shown clearly throughout the manual in a note format. For example:

✍ Note: For further information please contact Technical Support at LANDTEC at

2.0 Introduction

This manual explains how to use the BIOGAS 5000 portable gas analyzer. The BIOGAS 5000 is easy to use, calibrate and configure and enables consistent collection of data for improved analysis and accurate reporting, while helping to check the digester process is running efficiently.

The 5000 series of gas analyzers complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1) This device may not cause harmful interference.

2) This device must accept any interference received, including interference that may cause undesired operation.

2.1 Safety instructions

⚠ Warning	The 5000 series of gas analyzers can be used for measuring gases from anaerobic digesters, water treatment plants, and other sources as described in this manual. The operator may be exposed to harmful gases during the use of the instrument. Inhaling these gases may be harmful to health and in some cases may be fatal. It is the responsibility of the user to ensure that he/she is adequately trained in the safety aspects of the gases being used and that appropriate procedures be followed. In particular, where hazardous gases are being used the gas exhausted from the analyzer must be piped to an area where it is safe to discharge the gas. Hazardous gas can also be expelled from the instrument when purging with clean air.

✍ Note: A Gas analyzer is a sensitive piece of scientific equipment, and should be treated as such. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.

2.2 Instructions for safe use

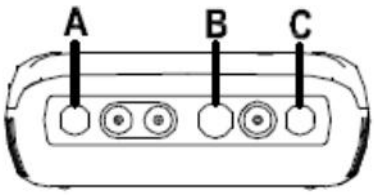
<u>For ATEX and IECEx the 5000 series of gas analyzers are certified to Hazardous Area Classification</u>

Ex II 2G Ex ib IIA T1 Gb (Ta = -10ºC to +50ºC)

It is vital that instructions be followed closely. It is the responsibility of the operator to determine the protection concept and classification required for a particular application.

(Reference European ATEX Directive 94/9/EC, Annex II, 1.0.6.)
The following instructions apply to equipment covered by certificate numbers SIRA 11ATEX2197X and IECEx Directive SIR 11.0089X:

- The equipment may be used with flammable gases and vapors with apparatus group IIA and temperature class T1.
- The equipment is only certified for use in ambient temperatures in the range -10ºC to +50ºC and should not be used outside this range.
- The equipment must not be used in an atmosphere of greater than 21% oxygen.
- Repair of this equipment shall be carried out in accordance with the applicable code of practice.
- When used in a hazardous area only use GF5.2 temperature probe (SIRA 11ATEX2197X and IECEx SIR11.0089X). And For connector C, the GF5.4 anemometer (BVS 04ATEXE194) for use with ATEX only. The analyzer should not be connected to any other devices in the hazardous area including the GF-USB lead (connector A) or GF3.9 battery charger (connector B) supplied with the analyzer.



Do not charge, recharge or open in a potentially explosive atmosphere.
In hazardous area only use “Temperature Probe GF5.2” in Connector B.
Connector C (Uo=10V,Io=5mA,Po=50mW,Ci=0,Li=0,Co=100uF,Lo=1000mH),
Connector B (Uo=5V,Io=6mA,Po=7mW,Ci=0,Li=0,Co=100uF,Lo=1000mH)

MAXIMUM NON-HAZARDOUS SUPPLIES:
Connector A - Um=6V Connector B - Um=10.1V

- If the equipment is likely to come into contact with aggressive substances, e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials, then it is the responsibility of the user to take suitable precautions, e.g. regular checks as part of routine inspections or establishing from the material’s data sheet that it is resistant to specific chemicals that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.
- The relative pressure range is +/-500 mbar. Note, however, that the input pressure should not exceed +/- 500 mbar relative to atmospheric pressure and the output pressure should not exceed +/- 100 mbar relative to atmospheric pressure.

For CSA (Canada) the 5000 series gas analyzers are certified to Hazardous Area Classification

CLASS 2258 03 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems - For Hazardous Locations

C US
M.C.#243446

Ex ib IIA:

Model GA 5000, GEM 5000 and BIOGAS 5000 Methane Detectors; portable, battery powered with non-field-replaceable Battery Pack P/N 20087; intrinsically safe and providing intrinsically safe circuits ("[ib]" for Zone 1) to Model GF5.2 Temperature Probe (Connector B) and with entity output parameters as tabulated below; Temperature Code T1; -10 ºC ≤ Tamb. ≤ +50ºC.

Connector	Entity Parameters						
	Uo (V)	Io (mA)	Po (mW)	Co (uF)	Lo (mH)	Ci (uF)	Li (mH)
B	5.0	6	7	100	1000	0	0
C	10.0	5	50	100	1000	0	0

✍ Note: This device has been investigated for electrical safety features only.

For CSA (USA) the 5000 series gas analyzers are certified to Hazardous Area Classification

CLASS 2258 83 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non-Incendive Systems – For Hazardous Locations - CERTIFIED TO U.S. STANDARDS

C US
M.C.#243446

AEx ib IIA:

Model GA 5000, GEM 5000 and BIOGAS 5000 Methane Detectors; portable, battery powered with non-field-replaceable Battery Pack P/N 20087; intrinsically safe and providing intrinsically safe circuits ("[ib]" for Zone 1) to Model GF5.2 Temperature Probe (Connector B) and with entity output parameters as tabulated below; Temperature Code T1; -10 ºC ≤ Tamb. ≤ +50ºC.

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	Uo (V)	Io (mA)	Po (mW)	Co (uF)	Lo (mH)	Ci (uF)	Li (mH)
B	5.0	6	7	100	1000	0	0
C	10.0	5	50	100	1000	0	0

✍ Note: This device has been investigated for electrical safety features only.

2.3 MCERTS (applied for)

MCERTS is the UK Environment Agency's Monitoring Certification Scheme. The scheme provides a framework within which environmental measurements can be made in accordance with the Agency's quality requirements. The scheme covers a range of monitoring, sampling and inspection activities.

The BIOGAS 5000 instrument is MCERTS certified only if:

õ The MCERTS logo appears on the screen after initial power on.

✍ Note: MCERTS - Cross sensitivity tests using hydrogen sulphide were not carried out on this instrument. Therefore, users should be aware if H_2S is present on sites, as there may be an interferential effect.

MCERTS promotes public confidence in monitoring data and provides industry with a proven framework for choosing monitoring systems and services that meet the Environment Agency's performance requirements.

The Environment Agency has established its Monitoring Certification Scheme (MCERTS) to deliver quality environmental measurements. The MCERTS product certification scheme provides for the certification of products according to Environment Agency performance standards, based on relevant CEN, ISO and national standards.

MCERTS certified instruments have been tested by an independent body to ensure that they meet certain performance requirements. In addition the manufacturer of an MCERTS product is regularly audited to ensure that the performance requirements of the certification are being continually met.

The 5000 series of gas analyzers have been certified to Version 3.1 of the 'Performance Standards for Portable Emission Monitoring Systems'.

2.4 Declaration of conformity

Products	• GA5000 - Landfill Gas Analyzer • GEM5000 - Landfill Gas Analyzer and Extraction Monitor • BIOGAS 5000 – Anaerobic Digester Gas Analyzer

Geotechnical Instruments (UK) Limited declares that the item(s) described above are in compliance with the following standards:

ATEX Directive 94/9/EC

Certification body	SIRA Certification Service
Notified body number	0518
Address	Rake Lane, Eccleston, Chester, CH4 9JN
SIRA certificate number	SIRA 11ATEX2197X
Standards applied	EN60079-0 :2006 EN60079-0 :2009 EN60079-11 :2007

IECEx

Certification body	SIRA Certification Service
Notified body number	0518

Address	Rake Lane, Eccleston, Chester, CH4 9JN
IECEx certificate number	SIR 11.0089X
Standards applied	IEC60079-0 :2004 Ed4 IEC60079-0 :2007 Ed5 IEC60079-11 :2006 Ed5

CSA (Canada and USA)

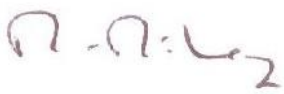
Certification body	CSA International
Address	178 Rexdale Boulevard, Toronto, ON, Canada M9W 1R3
CSA Certificate number	CSA 11 2445306
Standards applied	C22.2 No. 0-10 - General Requirements – Canadian Electrical Code, Part II CAN/CSA-C22.2 No. 60079-0:07 - Electrical apparatus for explosive gas atmospheres - Part 0: General Requirements CAN/CSA-C22.2 No. 60079-1:07 - Electrical apparatus for explosive gas atmospheres - Part 1: Flameproof enclosures "d" CAN/CSA-E60079-11:02 - Electrical apparatus for explosive gas atmospheres - Part 11: Intrinsic Safety "i" ANSI/UL 60079-0:09 - Electrical Apparatus for Explosive Gas Atmospheres - Part 0: General Requirements ANSI/UL 60079-1:09 - Electrical Apparatus for Explosive Gas Atmospheres - Part 1: Flameproof Enclosures “d” ANSI/UL 60079-11:09 - Electrical apparatus for Explosive Gas Atmospheres - Part 11: Intrinsic Safety “i”

EMC Directive 2004/108/EC

EN 301 489 Pt 1 (V1.9.1 – 2011-04)	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
EN 301 489 Pt 17 (V2.1.1 – 2009-05)	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment; Part 17: Specific conditions for Broadband Data Transmission Systems EMC for broadband data transmission systems

EN 301 489 Pt 19 (V1.2.1 – 2002-11)	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications EMC for Receive Only Mobile Earth Stations (ROMES)
BS EN 61000-3-2: 2006 + A2:2009	Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
BS EN 61000-3-3: 2008	Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

Signed:



Dr. Roger Riley
NPI Director and Authorized Person

3.0 The BIOGAS 5000 gas analyzer

3.1 The BIOGAS 5000

Figure 1--BIOGAS 5000 Gas Analyzer

The BIOGAS 5000 gas analyzer is designed for anaerobic digestion.

Benefits:

- õ Enables consistent collection of data for improved analysis and accurate reporting.
- õ No need for self-certification of anemometer.
- õ Easy to use and calibrate.
- õ User configurable operation.
- õ Helps check digester process is running efficiently.

Features:

- õ ATEX, IECEx certified.
- õ MCERTS (applied for).
- õ Robust design for market leading reliability.
- õ CH_4 and CO_2 accuracy ±0.5% after calibration.
- õ Measures % CH_4, CO_2 and O_2.
- õ H_2S to 0-500ppm or 10,000ppm.
- õ Modular and upgradeable.
- õ 3 year warranty.
- õ Stores and downloads readings.
- õ User selectable languages.

Applications:

- õ Farm digester gas monitoring.

- Food processing biogas monitoring.
- Waste water biogas monitoring.
- Methane recovery.

3.2 BIOGAS 5000 standard product

BIOGAS 5000

Reference:

A	Hard carry case
B	In-line water trap tubing & filter
C	Gas analyzer instrument
D	Operating manual CD
E	Mains battery charger and adaptors: - UK - Europe - US - Australia

4.0 BIOGAS 5000 optional products and accessories

4.1 Optional products

The BIOGAS 5000 gas analyzer has a number of optional products for purchase which enhance the usability and enable further analysis of data and reading information.

✍ Note: For more information on the features listed in this section please contact Sales at LANDTEC at +1 (909) 783-3636 or email Sales@landtecna.com.

4.1.2 BioPro Orifice plate (optional)

LANDTEC recommends the use of orifice plates as good practice when using the BIOGAS 5000 gas analyzer, enabling repeatability in flow measurement via a fixed method.

4.1.3 Temperature probe (optional)

The BIOGAS 5000 gas analyzer has the facility to automatically display and record the borehole temperature via an optional temperature probe.

When a temperature probe is fitted the temperature reading will be displayed on the 'Main Gas Read Screen' and recorded with all other data.

✍ Note: Temperature probes with an Ex label are part of the BIOGAS 5000 Ex certification SIRA 11ATEX2197X and IECEx SIR11.0089X, and therefore certified for use under the same conditions as the analyzer.

GPS (optional)

An optional GPS feature is available for the BIOGAS 5000 gas analyzer. It enables the gas technician to automatically locate sample locations using GPS satellite signal from predefined sample location IDs uploaded from LANDTEC System Gas Analyzer Manager or set on the analyzer when out in the field prior to taking a reading. The GPS reading data is stored with each reading providing an audit trail, as it confirms where the reading was taken.

4.1.6 Bluetooth dongle (optional)

An optional Bluetooth feature enables the operator to set and utilize Bluetooth technology. This may be useful when downloading gas readings from the analyzer to the PC instead of connecting the analyzer to a PC via a USB lead. Bluetooth may also be used to transfer Site IDs to other 5000 series gas analyzers if required. Bluetooth is activated by plugging the dongle into a pc USB port and switching on the Bluetooth option feature in the settings on the analyzer.

4.2 Instrument accessory products

Optional accessory and replacement parts must ONLY be purchased for the BIOGAS 5000 gas analyzer directly from QED or your agent. Please contact sales@qedenv.com for further details on pricing and how to order.

Ref	Description	Part Number
	High Visibility Hard carry case	5K-HCase
	Soft carry case	5K-SCase
	Battery charger	5K-BC
	Temperature probe (ATEX certified)	5K-TP
	Hose Kit—In-line water trap filter, tubing, chrome quick connects	5K-HK
	Water trap with barbed filters (pack of 1) Water trap with barbed filters (pack of 5)	3-00000-5083 (QTY 1) 1-00000-5083 (QTY 5)
	Chrome Quick Connects / Gas ports connectors (pack of 5)	1-22502-0000
	Flexible Clear sampling tube length PVC tubing (1/4”id)	3-00000-0006
	Flexible Blue Tint sampling tube (1/4”id)	3-00000-0005
	Flexible Yellow Tint Exhaust tubing (1/4”id)	3-00000-7013
	3PSI pressure Relief Valve	2-00000-1226
	LANDTEC System Gas Analyzer Manager (LSGAM)	LSGAM
	USB Cable	5K-USB
	Bluetooth Dongle	BTDongle
	H_2S filter—Used to remove hydrogen sulfide from your sample gas stream.	1-00000-5155 (QTY 5) 3-00000-5155 (QTY 1)

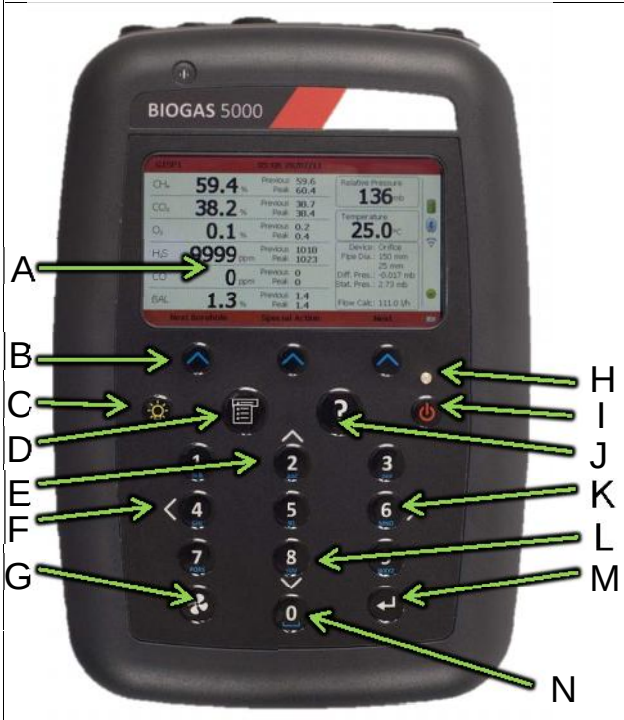
Ref	Description	Part Number
	Filter Adsorber / Charcoal Filter used to remove non-methane hydrocarbons from the gas sample	1-00000-5084 (Qty 4) 3-00000-5084 (QTY 1)
	Printed Manual	5K-MNL-BIOGAS 5000
	Check gas regulator and tubing for calibration gas. Calibration gas cylinder. Please contact sales@landtecna.com for gas cylinder concentrations	CGKit
	Calibration gas* "Mix-N-Match" from any combination of the following gas(es):	CG-Case (Qty 12 Cyl.) CG-4PKG (Qty 4 Cyl.)

Part#	CH_4	CO_2	O_2	N_2
CG-50-35-00	50	35	0	15
CG-15-15-00	15	15	0	70
CG-00-00-04	0	0	4	96
CG-N2	0	0	0	100

5.0 BIOGAS 5000 instrument features

5.1 Physical characteristics of the instrument panel

Front view:

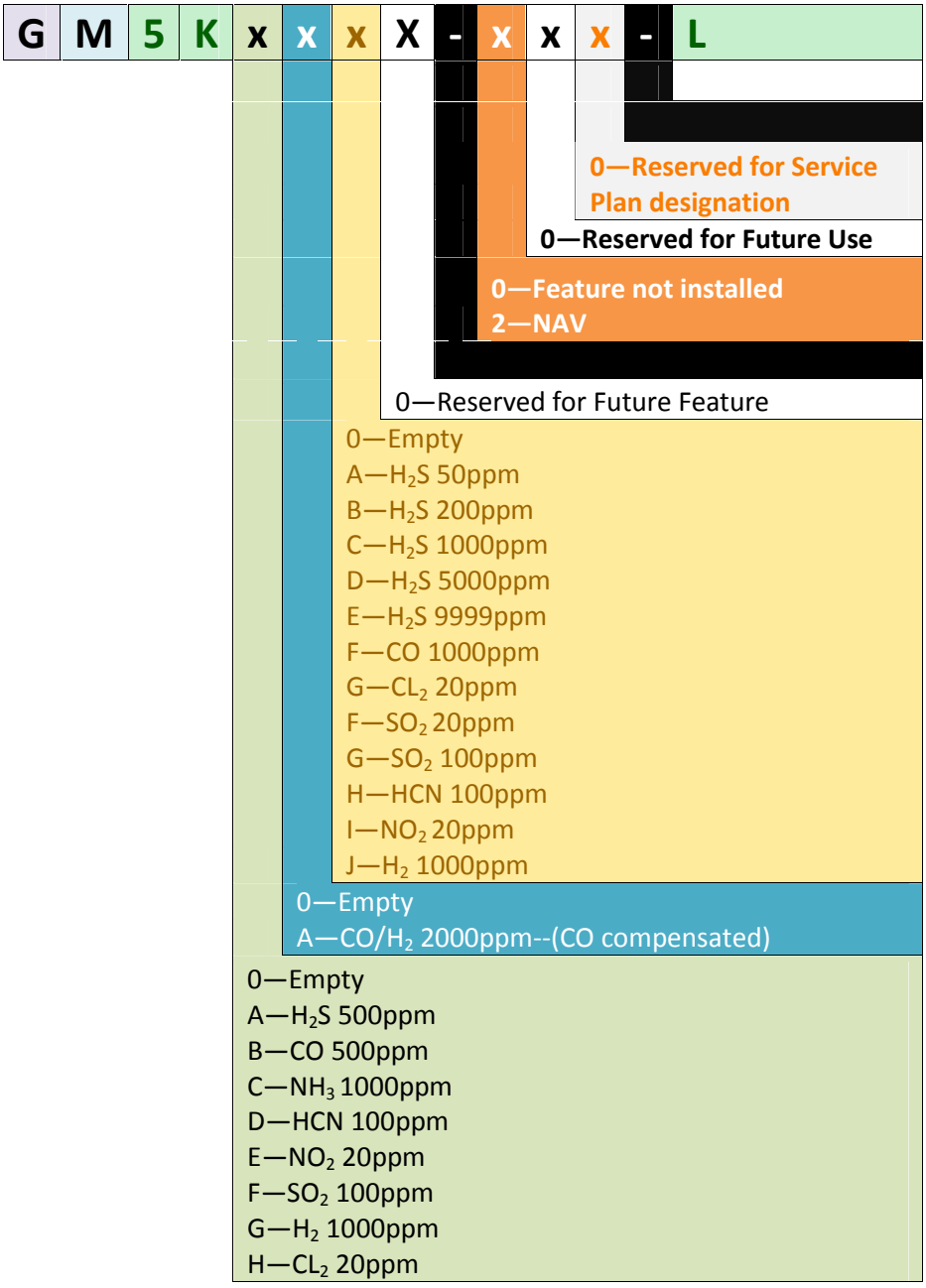


Reference:	
A	Main Gas Read Screen
B	Soft-keys
C	Backlight Key
D	Menu Key
E	Key 2 – Page Up
F	Key 4 – Scroll Left
G	Pump Key
H	LED Light
I	On/Off Key
J	Assistance Key
K	Key 6 – Scroll Right
L	Key 8 – Page Down
M	Enter Key
N	General Keys

Back view:	Reference:	
	O	Serial Number
	P	Part Number
	Q	Certification Number
	R	Recalibration Due

5000 Part Number Legend

The BIOGAS 5000 part number consists of a variety of options that can be fitted to meet specific customer needs. All 5000 series instruments begin with GM5K followed by a series of options. An "x" represents an option. A "0" represents option not selected or reserved for future use.



Typical Configurations:

GM5K0000-000-L	BIOGAS 5000 Base Model
GM5K0000-200-L	BIOGAS 5000 with GPS option
GM5KAA00-000-L	BIOGAS 5000 with CO & H_2S (500PPM)

5.2 Analyzer features and keys

A	Main Reading Screen		Start and end screen when using the instrument.
B	Soft-keys		The function of the three ‘soft-keys’ on the front of the instrument panel is determined by menu options taken. Functions vary from screen to screen.
C	Backlight Key		Enables the operator to backlight the analyzer display panel.
D	Menu Key		Press the ‘Menu’ key to view and maintain User, Device and Operation settings.
E	Page Up Key		Also ‘Key 2’. Press scroll up to view further information on the instrument screen.
F	Scroll Left Key		Also ‘Key 4’. Enables the operator to scroll left to display more information.
G	Pump Key		Press the ‘Pump’ key to start or stop the pump.
H	LED Light		LED power light is visible on the front of the analyzer when the instrument is powered on.
I	On/Off Key		Press the ‘On/Off’ key briefly to switch the instrument on and off.
J	Assistance Key		Press the ‘Assistance’ key to view help text relevant to the analyzer screen you are currently displaying.
K	Scroll Right Key		Also ‘Key 6’. Press scroll right to view further information on the instrument screen.
L	Page Down Key		Also ‘Key 8’. Enables the operator to scroll down to display more information.
M	Enter Key		The ‘Enter’ key accepts/confirms choices made by the operator. Also required to confirm numeric data entry.
N	General Keys		Keys 0, 1, 2, 3, 4, 5, 6, 7, 8, 9
O	Model Number		Instrument model type identification.
P	Serial Number		Unique identification for the instrument. Verification of the serial number will be required if Technical Support assistance is needed.
Q	Part Number		Manufacturer part number.
R	Certification Number		Displays instrument certification information.
S	Recalibration Due		The date displayed is the date the instrument is due to be calibrated.

5.3 Instrument connection points

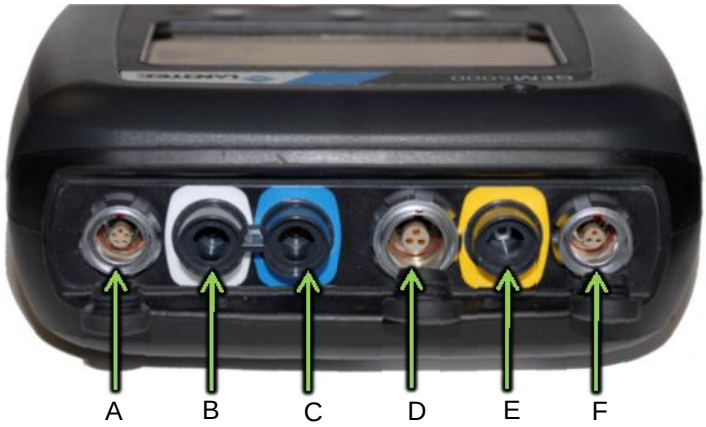


Figure 2—Instrument Top View

Ref:	Connection Point:	Function:
A	Connector A & Dust Cap	Attach the USB cable for PC-to-analyzer connectivity.
B	Inlet Port & Static Pressure Port (White port)	Attach the sample tube to take a gas sample. Also used to measure the static pressure.
C	Differential Pressure Port (Blue port)	Attach the sample tube to measure differential pressure.
D	Connector B & Dust Cap	Attach the temperature probe and also used to attach the wall charger to the analyzer for charging.
E	Gas Outlet Port (Yellow port)	The gas outlet port is the point at which the sample gas is expelled. Tubing may also be attached to the port.
F	Connector C & Dust Cap	Reserved for future accessories that will be developed.
	Dust Caps	Dust caps are used to protect the connector points of the instrument.

6.0 General operational instructions

6.1 Switching the instrument on

1) To switch on the analyzer, press and hold the ‘On/Off’ key. The LANDTEC logo will display followed by the instrument warm up.

2) Following the instrument warm up, the ‘Date and Time’ screen is displayed prompting the technician to set the date and time and required format.

3) When complete select the soft-key to ‘Exit’ and the ‘Power On Self-test’ screen is displayed followed by instrument status. Instrument status displays the instruments service due date, serial number, options, service scheme and software version. Text will also display stating ‘Self-test complete’.

4) When complete the instrument will display the ‘Main Gas Read Screen’.

6.1.1 Power on self-test

When switched on, the read-out will perform a pre-determined self-test sequence. During this time many of the analyzer’s functions are tested, including:

- General operation
- Gas flow measurement
- Calibration
- Screen Backlight / Brightness
- Battery charge level

During the self-test the following information is also displayed:

- Manufacturer’s service due date
- The last gas check date
- Software version programmed
- Date format
- Serial number
- Operating language
- Model specific features

✍ Note: The self-test should only be done with the analyzer sampling fresh air.

6.2 Switching the analyzer off

1) To switch off the analyzer, press and hold the ‘On/Off’ key, at which point a clean air purge will be carried out and the instrument will then switch off.

2) If for any reason the analyzer ‘locks up’ and will not switch off in this manner, press and hold the ‘On/Off’ key for approximately 20 seconds until the light above the power key turns red; this will force the instrument to switch off.

6.3 Instrument status icons

The following icons may be displayed on the instrument screen:

Icon	Description	Icon	Description
	Battery charge state Gives the operator an estimation of the battery charge state. For example 100% (green icon) gives about 8 hours use in the field and 50% (orange icon) would mean that there is approximately 4 hours battery life remaining.		Battery charge state The red battery icon indicates less than 1 hour of charge remaining.
	Pump status The black pump icon is displayed along with a counter showing the pump run-time. This counts down where the operator has specified the pump run-time; if not it counts up; the icon turns red when stalled.		Pump stalled The red pump icon is displayed when the pump stalls. The instrument's gas inlet (or outlet) may be blocked. This warning is most commonly caused by a water-logged or dirty sample filter. Change the sample filter and check for obvious blockages in the sample tubes. Alternatively, a small amount of adjustment can be made to the low flow detection point to compensate for minor changes in the performance of the pump fitted to the instrument.
	GPS signal strength This icon shows the signal strength the analyzer's GPS module is able to provide. Full, okay and fair strength respectively.		GPS failure The GPS was unable to get a line of sight lock on enough satellites. Or, it may be that it hasn't had time to get a lock.
	This indicates when Bluetooth has been enabled. The color changes from grey to blue when connected.		USB connected to PC (flickers when transferring data)
	Onboard Diagnostics Indicator		Language This icon indicates the currently selected operating language. This can be changed via the main menu.

6.4 Instrument LED power indications

When the instrument is powered on a LED power light is visible on the front of the analyzer, located above the 'On/Off key'. The following LED power light states are as follows:

Steady yellow	Unit turning on. This will extinguish when software has loaded correctly.
Flashing (rapid)	Unit is powering off.
Flashing (slow)	Power off is being delayed for purge/shutdown handling.
Flashing yellow	Unit is turning off due to power button being pressed.
Flashing red	Unit is turning off due to critically low battery.

✍ Note: Pressing and holding the power button for ~20s resets the analyzer.

6.5 Changing between parameters

By default, the instrument displays the 'Main Gas Read Screen' (for gas measurement). The instrument will return to this screen after power on or when returning from the menus. The 'Scroll' keys can be used to switch to another measurement screen.

6.6 Entering data

During normal operation the operator may be prompted to enter data or information via the keypad, i.e. entering an ID code or setting an alarm level.

When entering data into the instrument all fields are fixed format and are populated from the left.

Text:

Entering text uses similar multi-tap functionality as a mobile phone. Key the numeric/alpha key pad the required number of times to select the appropriate letter. To key numeric data continue to press the numeric/alpha key until the required number is displayed.

Numeric data:

To enter a new date 09/11/11 the operator would type in 091111 using the numeric keypad in the following sequence:-

* 0_/__/__
* 09/__/__
* 09/1_/__
* 09/11/__
* 09/11/1_
* 09/11/11

Press the 'Enter' key to confirm/accept data keyed.

Any mistakes can be corrected using the soft-key 'Delete' which will delete the last digit typed. Alternatively, the sequence can be retyped before the 'Enter' key is pressed and the existing numbers will be pushed off the screen.

✍ Note: The instrument will not allow invalid data to be entered; this should be deleted and re-entered.

6.7 Instrument main gas read screen

The 'Main Gas Read Screen' is considered to be the normal operating screen and all operations are carried out from this starting point.

The actual data shown on this display will depend on the version of the instrument and the options that have been selected. In general, all of the main readings will be shown.

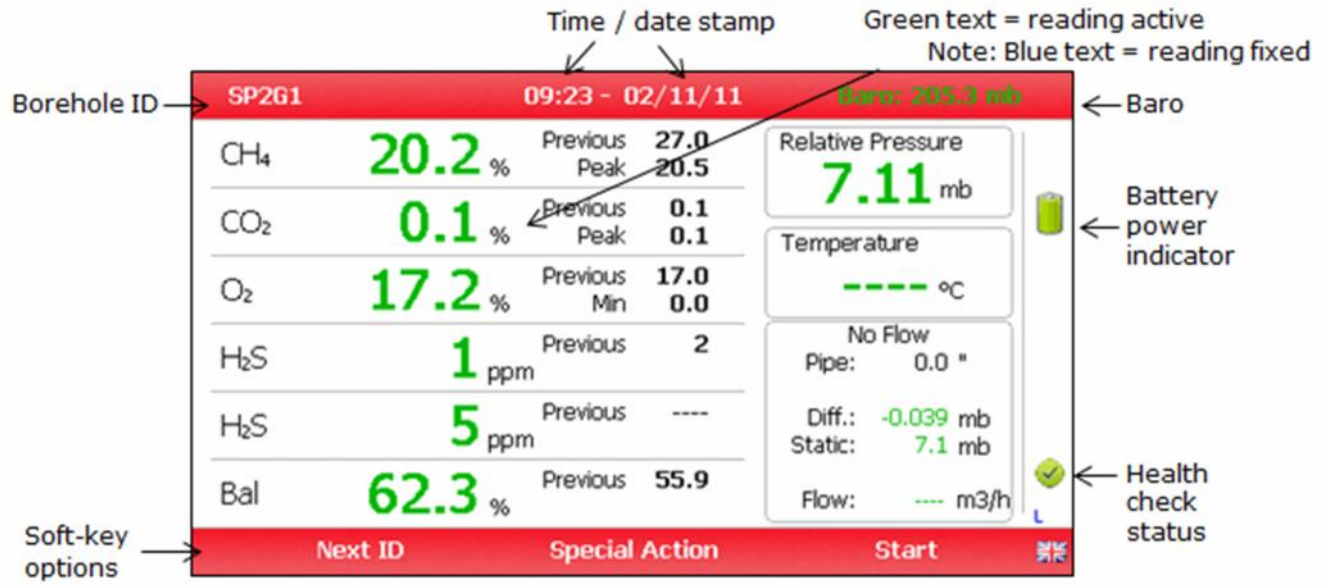


Figure 3—Main Gas Reading Screen

6.8 Physical Storage

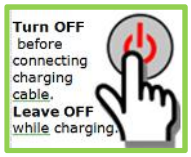
The analyzer should not be exposed to extreme temperature. For example, do not keep the analyzer in a hot car. When not in use analyzers should be kept in a clean, dry and warm environment, such as an office and protect the analyzer with either the soft carry case or store in the hard carry case provided with the instrument.

The instrument should be discharged and fully charged at least once every four weeks, regardless of indicated charge state. Allowing the instrument to sit for longer than four weeks without charging it is likely to cause discharge of the batteries to a point where the batteries will NO LONGER BE ABLE TO TAKE A CHARGE. Such a discharge will require a factory service and battery replacement.

6.9 Battery/charging

The battery used in the 5000 series of gas analyzers is nickel metal hydride and manufactured as a pack from six individual cells. This type of battery is not so susceptible to the top-up charging 'memory effects' as nickel cadmium batteries, although it is not recommended that the unit be given small top-up charges.

✍ Note: To charge, the analyzer must be switched OFF before attaching the charger. Switching the analyzer on or off during charging will cancel the current charge. The analyzer should be left OFF during the charging cycle.



⚠ Warning	The battery charger is NOT covered by the Ex certification. The battery must be charged only in a safe area.

The battery charger is intelligent and will indicate when the unit is charging and charged.

The charger should only be disconnected when fully charged is indicated.

The instrument must be charged ONLY using the battery charger supplied with the instrument. The battery charger supplied is intended for indoor use only. Please ensure adequate ventilation while charging.

✍ Note: Connect the charger to the mains attaching the appropriate adaptor. Contact LANDTEC for further information

Battery Charger front and back drawing:

Charger:	Input voltage:	100-240V AC +/- 10%
	Input frequency:	50-60Hz +/- 10%
	Input current:	0.4A@100VAC
		0.2A@240VAC
	Output voltage:	10.1VDC max
	Output current:	1.5A max

✍ Note: This charger has been internally restricted to 1.5A

A full charge will take approximately 3-4 hours. Typically, a fully charged battery will last 7-8 hours. A quick 30 minute charge can be used to give approximately one hour of use in the field but may shorten the battery life. The battery charge status will be indicated on the

charger plug. Temperature can dramatically affect the battery life; please take this into account when estimating battery life. The unit should be switched-off while charging to give a complete and consistent charge. Turning off Bluetooth and dimming the contrast will increase battery life.

6.10 Cleaning instructions

Do NOT use any cleaning agents to clean the analyzer or battery charger as they may have an adverse effect on the safe use of these devices. The analyzer can be wiped off with a damp cloth.

6.11 Memory

The analyzer's memory is stored in sections for readings and configuration information.

✍ Note: The analyzer should never be stored for prolonged periods with valuable data in its memory. It is advisable to download all readings at the end of each day's monitoring. To clear the memory, please refer to the section covering LANDTEC System Gas Analyzer Manager (LSGAM).

6.12 Warning and error codes

Upon the initial startup of the analyzer a self-test is performed. If any notable warnings or errors exist they will be displayed. BEFORE using the instrument with warnings or errors it is advised that you should contact Technical Support at +1 (734) 995-2547 or email service@qedenv.com.

When switched on the instrument will perform a predetermined self-test sequence taking approximately ten seconds. During this time many of the instrument's working parameters and settings are checked. If any operational parameters are out of specification or if the pre-programmed recommended calibration/service date has passed, errors and/or warnings may be displayed.

✍Note: For further information please refer to section "Error! Reference source not found. Error! Reference source not found.".

7.0 Operator settings

7.1 Menu key

The ‘Menu’ key enables the operator to select options to set up specific parameters and perform operational tasks prior to sample readings being taken or to view data and information stored in the instrument.

1) Select the ‘Menu’ key on the front of the analyzer and the following screen is displayed:

Figure 4—Device Settings

2) Press the relevant numeric key on the analyzer keypad to select the required option.

3) To exit this menu, select the soft-key ‘Exit’ on the front of the analyzer and the operator is returned to Main Gas Read Screen.

7.2 Device settings

7.2.1 Date and time

This option enables the operator to set the instrument date and time or to receive and update the settings automatically from satellite signal.

1) Select the ‘Menu’ key on the front of the analyzer to display the ‘Device Settings’ menu followed by ‘Key 1 – Date and Time’ and the following screen is displayed:

Figure 5—Date and Time

2) Select 'Key 1 – Set Date' and key in the required date. Type the date using the numeric keypad. Press the soft-key 'Date Format' to toggle and select the required date format i.e. dd/mm/yy. Press the 'Enter' key to confirm and update the date setting.

3) Select 'Key 2 – Set Time' and key in the required time (hh:mm). Type the time using the numeric keypad and press the 'Enter' key to confirm the update.

4) The operator may also change the default time zone. Selecting the 'Key 4 Scroll-left' or 'Key 6 – Scroll right' to move through the different time zones. Press the 'Enter' key to confirm your default setting.

5) Select the soft-key 'Exit' to exit and return to the 'Device Settings' menu.

7.2.2 Bluetooth

This option enables the operator to set and utilize Bluetooth technology. This may be useful when downloading gas readings from the analyzer to the PC instead of connecting the analyzer to a PC via a USB lead. Bluetooth may also be used to transfer Site IDs to other 5000 series gas analyzers if required.

1) Select the 'Menu' key on the front of the analyzer to display the 'Device Settings' menu.

2) Select 'Key 2 – Bluetooth' and the following screen is displayed:

Figure 6—Bluetooth Options

3) Enter the 'Pairing PIN' value when prompted by your computer for the device's pairing code.

4) Select soft-key 'Exit' to exit the screen and return to the 'Device Settings' menu.

7.2.3 Device information

This option displays default instrument information and settings such as serial number, service due date, last zero calibration date and last span calibration date.

1) Select the 'Menu' key on the front of the analyzer to display the 'Device Settings' menu.

2) Select 'Key 3 – Device Information' and the following screen is displayed:

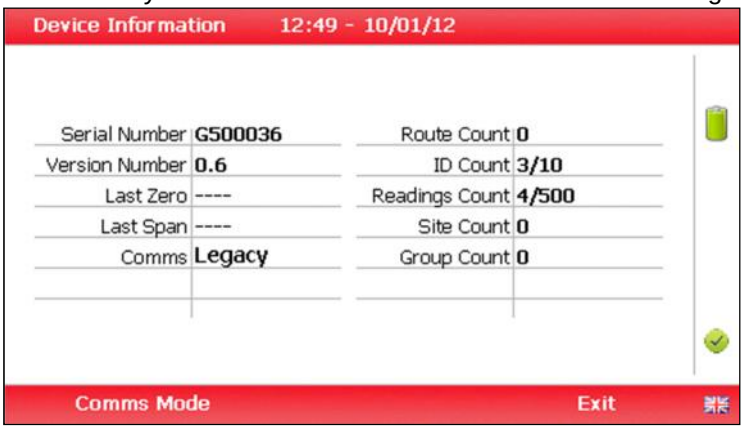


Figure 7—Device Information

3) The information displayed on this screen is fixed only and cannot be edited by the operator. The one exception to this is the Comms. Comms refers to communications mode. The Comms Mode can be changed by using the Comms Mode soft-key. The operator may be asked for instrument information such as serial number, service due

date and version number when contacting LANDTEC.

✍ Note: The Comms setting 'Legacy' mode is for use with LSGAM software. GA5K mode is reserved for future applications.

4) Select soft-key 'Exit' to exit the screen and return to the 'Device Settings' menu.

7.2.4 Space has been left for a future feature

1) Select the 'Menu' key and the 'Device Settings' menu is displayed.

2) The 'Key 4' has been reserved for future functionality.

7.2.5 Navigation (optional)

This option enables the operator to switch the 'GPS Navigation' functionality on or off. (This is optional and dependent upon purchasing the navigation option). The power on self-test screen will display "GPS" in the enabled options screen if the analyzer has been fitted with GPS

1) Select the 'Menu' key and the 'Device Settings' menu is displayed.

2) Select 'Key 5 – Navigation On' to switch on the GPS navigation functionality or 'Key 5 – Navigation Off' to switch the GPS navigation functionality off.

✍ Note: For further information please refer to section '8.0 – Taking Readings'

1) Select soft-key 'Next' to display the next screen, 'Previous' to return to the previous screen, or select soft-key 'Exit' to exit this screen and return to the 'Device Settings' menu.

✍Note: For further information please contact Technical Support at LANDTEC at +1 (734) 995-2547 or email service@gedenv.com.

7.3 User settings

To access the 'User settings' menu, select the 'Menu' key on the front of the analyzer to display the 'Device Settings' menu followed by the soft-key to display 'User Settings' menu. The following menu is displayed:

Figure 8—User Settings Menu

To exit the user ings menu select the soft-key 'Exit'.

7.3.1 Operating language

This option enables the operator to specify the operating language displayed for the instrument.

1) Select 'Key 1 – Operating Language' and the following screen is displayed:

Figure 9—Set Language

2) Set the required language for the gas analyzer by selecting the appropriate function key. Choose from:

Key 1	English
Key 2	Spanish
Key 3	French
Key 4	German
Key 5	Italian

3) To exit this option, select the soft-key ‘Exit’ and the operator is returned to the ‘User Settings’ menu.

7.3.2 Units of measurement

Units of measure are controlled through the LSGAM Software and cannot be directly changed on the Analyzer. This protects from the potential storing of different units of measure for the same project.

7.3.3 Select by route/group (requires LSGAM)

This is a future enhancement option to enable the operator to display IDs by group or by specific route which have been uploaded from LANDTEC System Gas Analyzer Manager (LSGAM) software to the instrument.

7.3.4 Adjust backlight

This option enables the operator to adjust the backlight (brightness). Having this set to a darker setting will help preserve the battery power

1) Select ‘Key 4 – Adjust Backlight’ and the following screen is displayed:

Figure 10—Adjust backlight

2) Manual adjustment of the instrument backlight is available via this option and can be carried out with use of ‘Key 4 - Scroll left’ (<) darker and ‘Key 6 - Scroll right’ (>) lighter.

3) Select the soft-key ‘Save’ to store the setting or select soft-key ‘Exit’ to exit the screen without saving the change.

4) The operator will return to the ‘User settings’ menu.

✍ Note: The manually set contrast setting is retained when the read-out is switched off and may require resetting when next switched on.

7.3.5 Adjust volume

This option enables the operator to adjust the volume for the internal speaker, for example the alarm tone. A lower setting will help preserve the battery power.

1) Select the ‘Menu’ button on the front of the analyzer to display the ‘Device Settings’ menu. Press the soft-key to display ‘User Settings’.

2) Select ‘Key 5 – Adjust Volume’ and the following screen is displayed:

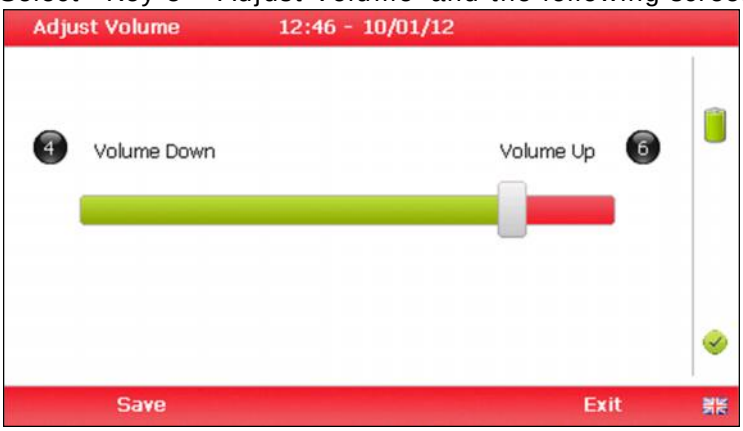


Figure 11—Adjust Volume

3) Manual adjustment of the volume is available via this option and can be carried out with use of ‘Key 4 - Scroll left’ (<) volume down and ‘Key 6 - Scroll right’ (>) volume up.

4) Select the soft-key ‘Save’ to store the setting or select soft-key ‘Exit’ to exit the screen without saving the change.

5) The operator will return to the ‘User settings’ menu.

7.4 Operation settings

To access the ‘Operation settings’ menu, select the ‘Menu’ key on the front of the analyzer to display the ‘Device Settings’ menu followed by the soft-key to display the ‘Operation Settings’ menu. The following menu is displayed:

Figure 12—Operation settings menu

7.4.1 Timers

The timers function enables the operator to set standard purge times and set auto-power off if the unit is untouched for the period of time specified.

1) Select 'Key 1 – Timers' and the following screen is displayed:

Figure 13—Timers

1) Select 'Key 1' to edit the purge time. Enter the 'Pump Running Time' in seconds; this is the length of time you wish to run the pump to draw the sample, e.g. key in 030 then press the 'Enter' key to accept.

2) Select 'Key 2' to edit the auto power off time. Enter the 'Auto power off' in minutes; the instrument will automatically power off to preserve the battery life after the specified time if no activity has occurred on the instrument. Press the 'Enter' key to accept.

3) Select the soft-key 'Exit' key to exit the screen and return to the 'Operation settings' menu.

✍ Note: Setting the purge time and auto power off functions to zero, disables the option. It is not recommended to reduce the purge time to below 30

seconds.

7.4.2 Gas Check

This option displays the 'Gas Check' menu and enables the operator to zero and span the gas channels on the instrument. Historical/previous gas checks data can also be viewed and factory settings can be restored.

1) Select the 'Menu' button on the front of the analyzer to display the 'Device Settings' menu. Press the soft key to display 'Operation Settings'.

2) Select 'Key 2 – Gas Check' and the following menu is displayed:

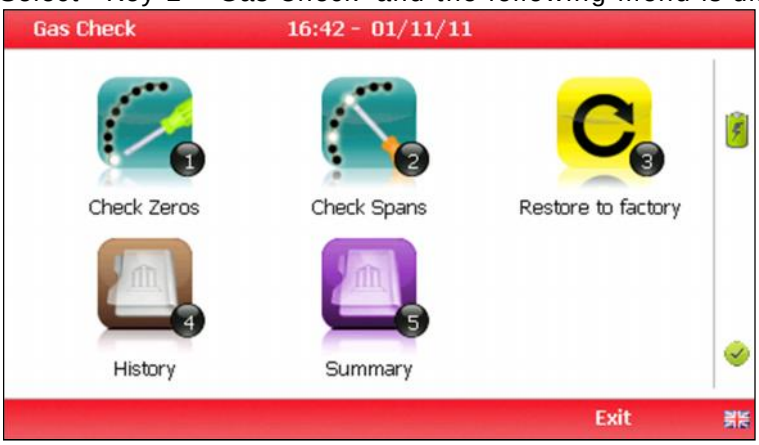


Figure 14—Gas Check

3) For more information about the Gas Check Menu please refer to section 9.0 – Calibration.

4) Select soft-key 'Exit' to exit operation settings and return to the main screen.

7.4.3 View data

This option enables the operator to view the readings collected and stored on the instrument. Readings many be downloaded to the optional LANDTEC System Gas Analyzer Manager (LSGAM) software if further analysis is required.

1) Select the 'Menu' button on the front of the analyzer to display the 'Device Settings' menu. Press the soft-key to display 'Operation Settings'.

2) Select 'Key 3 – View Data' and the following screen is displayed:

Figure 15—View data

3) Toggle through the reading by selecting 'Key 4 – Scroll left' and 'Key 6 – Scroll right' on the analyzer. Select 'Key 2 – Page up' and 'Key 8 – Page down' to page through the auxiliary channels listed.

4) Select the soft-key 'Filter' to filter the data by sample point ID, or specify before or after date. Press the soft-key 'Exit' to exit the filter menu and return to the 'View Data' screen.

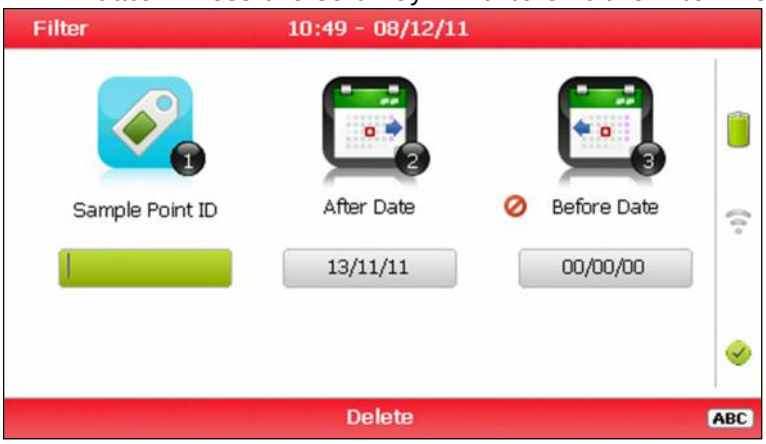


Figure 16—Filter data

5) Select the soft-key 'Delete' followed by the appropriate soft-key to delete a single reading or all filtered readings. Press soft-key 'Cancel' to cancel the deletion request.

6) Select the soft-key 'Exit' to exit the view data screen.

7.4.4 Set alarms

This option enables the operator to define the conditions for which an alarm will be triggered. These conditions apply to the general operation of the instrument and are not ID specific. A summary of the alarm settings can be found in 'Key 3 – Summary'.

1) Select the 'Menu' button on the front of the analyzer to display the 'Device Settings' menu. Press the soft key to display 'Operation Settings'.

2) Select ‘Key 4 – Set Alarms’ and the following menu is displayed:

Figure 17—Set alarms

3) Select ‘Key 2’ to select the gas for which you wish to set an alarm trigger followed by ‘Key 1’ to change the trigger condition of an alarm.

4) To manually adjust the alarm set press (<) ‘Key 4 – Scroll left’ or (>) ‘Key 6 – Scroll right’ and enter the trigger value.

5) To disable all alarm settings select the soft-key ‘Disable All’.

6) Select the ‘Enter’ key’ to store the setting or select soft-key ‘Exit’ to exit the screen without saving the change.

7) A summary of the alarm settings can be displayed using ‘Key 3 – Summary’. Select soft-key ‘Exit’ to exit alarms summary and the operator returns to the ‘Operation Settings’ menu.

7.4.5 Adjust flow fail

This option enables the operator to adjust the flow fail tolerance of the instrument, i.e. the operator can adjust the sensitivity for when the pump will stop operating on the presence of a blockage or low flow.

1) Select the ‘Menu’ button on the front of the analyzer to display the ‘Device Settings’ menu. Press the soft-key to display ‘Operation Settings’.

2) Select ‘Key 5 – Adjust Flow Fail’ and the following screen is displayed:

Figure 18—Adjust flow fail

3) Manual adjustment of the flow fail is available via this option and can be carried out with use of 'Key 4 – Scroll left' (<) less sensitive and 'Key 6 – Scroll right' (>) more sensitive.

4) Select the soft-key 'Save' to store the setting or select soft-key 'Exit' to exit the screen without saving the change.

5) The operator will return to the 'Operation settings' menu.

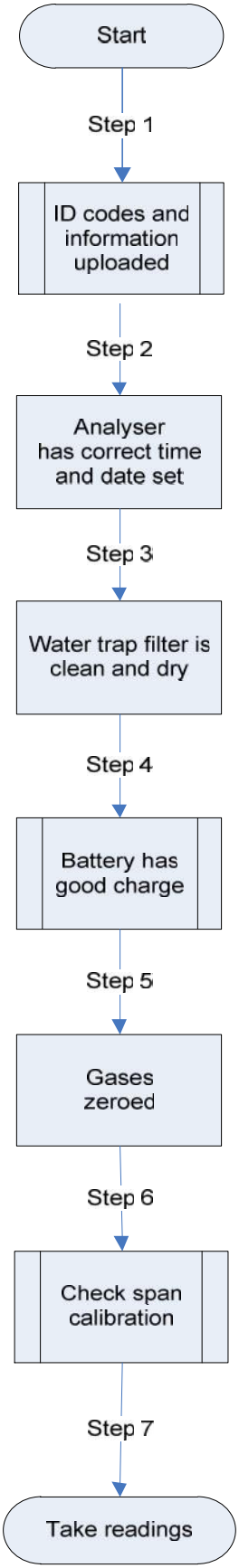
✍ Note: The default setting displays the bar in the center. BEFORE altering this setting, please contact Technical Support at QED at +1 (734) 995-2547 or email service@qedenv.com

7.5 Exit menu

1) Press the 'Menu' button on the front of the analyzer to exit settings.

8.0 Taking readings

8.1 Preliminary checks before taking readings (best practice)



Prior to use, it is good practice to ensure that:

Step 1 If using GAM - all necessary ID codes and information have been uploaded from GAM to the analyzer.

Step 2 The instrument has the correct time and date set.

Step 3 The water trap filter is fitted and is clean and dry.

Step 4 The battery has a good charge (minimum 25% charge, even if only a few readings are required).

Step 5 The channels have been zeroed, without gas concentration present.

Step 6 If necessary check the span calibration with a known concentration calibration gas.

Step 7 Take readings.

⚠ Warning	Inhaling hydrogen sulphide gas (H_2S) or other harmful gases can cause death. It is the responsibility of the user to ensure that he/she is adequately trained in the safety aspects of using H_2S and other harmful gases. In particular, where hazardous gases are being used the gas exhausted from the analyzer must be piped to an area where it is safe to discharge the gas. Hazardous gas can also be expelled from the instrument when purging with clean air.

Good practice

- õ Travel to site with the gas analyzer in the vehicle's interior - not in the trunk, where it may be subjected to extremes of temperature and possible shock damage. Do not place the gas analyzer against anything hot (e.g. gas extraction pipe, car body or in an unattended car during the summer) as this will cause a temperature increase in the gas analyzer and may cause erroneous readings.

- õ When moving around a site, protect the gas analyzer from strong direct sunlight and heavy rain.

- õ Always use the water trap! If the water trap becomes flooded, change the filter and ensure all tubes are clear of moisture before re-use.

  ✍ Note: If the exhaust of a GA5000 series gas analyzer is connected to a pressurized system then this results in a flow of gas out of the inlet flow port.

8.2 Update site data

Prior to taking the readings at a particular site, the site data should be updated. This is accessed via the 'Special Action' menu. The answers to these questions are then stored and appended to each reading stored thereafter, until the site data is updated for another site. If using LANDTEC System Gas Analyzer Manager (LSGAM) software this data will be uploaded to GAM along with the reading data.

8.3 Special actions

This menu enables the operator to perform the additional following functions out of sequence if so desired.

1) From the 'Main Gas Read Screen' select the soft-key 'Special Actions' and the following menu is displayed:

Figure 19—Special actions menu

✍ Note: The list of special action options displayed on the special action menu is dependent upon device type and sequence.

The following actions may be available:

Action	Function
Restart Process	This action enables the operator to restart the current process again from the beginning. The operator will return the Main Gas Read Screen.
Site Questions	This action enables the operator to update site questions prior to taking a reading.
ID Questions	This action enables the operator to update ID questions specific to sample points prior to taking a reading.
Enter Temperature	This action enables the operator to enter the temperature manually.
Flow	This action enables the operator to take a flow reading at any time.

1) Select the soft-key ‘Exit’ to exit this menu and return to the ‘Main Gas Read Screen’.

8.4 Flow Devices

The BIOGAS 5000 gas analyzer enables flow measurements to be recorded by using either:

- õ BioFlo / Orifice plate.
- õ UserInput.

8.7 Cross gas effects on chemical cells

Cross-gas effects on methane, carbon dioxide and oxygen

Methane is measured using dual beam infrared absorption. Analyzers are calibrated using certified methane mixtures and will give correct readings provided there are no other hydrocarbon gases present within the sample (e.g. ethane, propane, butane, etc). If there are other hydrocarbons present, the methane reading will be elevated (never lower) than the actual methane concentration being monitored.

The extent to which the methane reading is affected depends upon the concentration of the methane in the sample and the concentration of the other hydrocarbons. The effect is totally non-linear and difficult to predict.

Carbon dioxide is measured by infrared absorption at a wavelength specific to carbon dioxide. Therefore, the carbon dioxide reading will not be affected by any other gases usually found on landfill sites.

The oxygen sensor is a galvanic cell type and suffers virtually no influence from CO_2, CO, H_2S, NO_2, SO_2 or H_2, unlike many other types of oxygen cell.

The infrared sensors will not be 'poisoned' by other hydrocarbons and will revert to normal operation as soon as the gas sample has been 'purged'.

H_2S Measurement:

H_2S measurement could be affected by other gases. The main cross gas effects are:

- SO_2: 20% effect
- NO_2: 20% effect

Other cross sensitivities are possible. If you suspect a cross sensitivity problem please contact your supplier for additional information.

✍ Note: Other gases could cause cross-gas effects. If you suspect a cross sensitivity problem please contact the Technical Support Team at QED at+1 (734) 995-2547.

8.8 How to use a temperature probe (optional)

The temperature probe enables the site engineer to measure the temperature of the gas within a sample point. The BIOGAS 5000 gas analyzer uses the temperature of the gas to give more accurate flow measurement readings as part of the instrument calculation.

Figure 20—5000 Series Instrument & Temperature Probe

Instructions for use:

1) The temperature probe reading is taken along with the gas measurement reading.

2) The analyzer must be at the 'Main Gas Read Screen'.

3) Attach the temperature probe to 'connector B' (refer to section 5.3 – Instrument connections points).

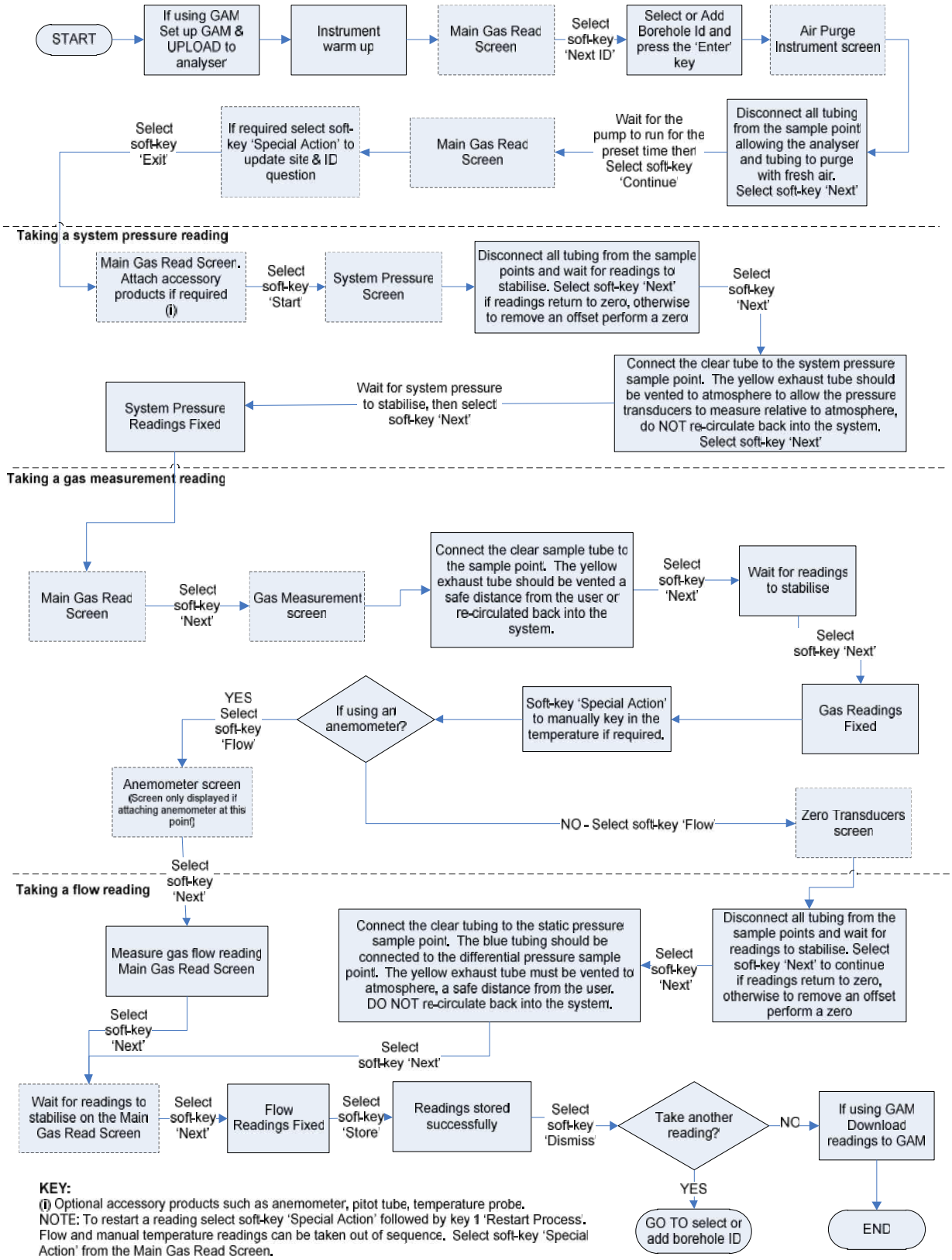
4) Insert the temperature probe into the sample point (borehole) at the same time as you attach the sample tube to the sample point (two sample points are required for the borehole).

5) Follow the instructions on the front of the instrument when taking your gas and measurement reading.

6) At the point in which the operator presses 'Enter' to store the gas reading the temperature is recorded.

✍ Note: Temperature probe readings can be analyzed further when downloaded to LANDTEC System Gas Analyzer Manager (LSGAM).

8.9 Taking gas and flow measurement



9.0 Calibration

9.1 Calibration introduction

The BIOGAS 5000 gas analyzer is carefully calibrated at manufacture and when returned for service. However, it is sometimes desirable to be able to carry out a calibration process between services.

This section outlines the correct procedures to enable the site engineer to field calibrate the gas analyzer.

✍ Note: This does not replace the factory service and calibration. If this calibration is completed incorrectly it may decrease the accuracy of the gas analyzer.

CH_4, CO_2 and O_2 can be measured by BIOGAS 5000 gas analyzer as standard; these channels can be user calibrated. The analyzers have other gas channel options that are specified at manufacture; these too can be calibrated. This section will describe in detail how to calibrate the three standard gas channels plus the CO channel.

The BIOGAS 5000 instrument can have a H_2 compensated CO channel. This option requires that H_2 be used in the calibration process and is also set out within this section.

For the other gas channel options contact LANDTEC for advice.

Two important terms that are used within this section are ‘Zero’ and ‘Span’.

Zero: The point at which the gas analyzer is calibrated when there is none of the target gases present.

Span: The point at which the gas analyzer is calibrated when a known quantity of the target gas is present.

9.2 Frequency of calibration – best practice

The BIOGAS 5000 gas analyzers can be checked against a known concentration of gas, to give confidence that the analyzer is operating as expected at the time and conditions in which it is being used.

It is recommended that the instrument be regularly serviced and calibrated by LANDTEC in accordance with the due date on the instrument.

When defining the frequency of user calibration, the following are factors to be considered:

- The frequency of use of the analyzer. (daily?/monthly?)
- The level of confidence and accuracy required for readings to be taken.
- Historical user calibration data.
- Site specific requirements or conditions.
- Historical understanding of expected readings on site.

Zeroing of the gas analyzer should be undertaken at the start of each day’s monitoring.

Use historical data to drive your frequency of calibration.
If there is no historical data a good starting point for a daily monitoring round is performing a calibration once every week or every other week.

The results of the calibrations will need to be recorded to monitor over time whether the frequency of calibration needs to be increased or decreased relative to the confidence required.
The confidence required will be driven by the site specific / user requirements.

When undertaking the monitoring with an understanding of the history of the gas levels of that site, a calibration check could be triggered if the readings measured are different to what is expected.

✍Note: For assistance please contact Technical Support at QED at +1 (734) 995-2547

9.3 Calibration gases

User calibration of a gas analyzer will greatly improve the data accuracy in the range of the calibration gases used. This may cause less accurate readings of concentrations outside this calibrated range. Users should select the correct calibration gas for the expected gas levels on their particular application.

- To improve calibration at lower levels requires the use of gas mixtures 1 and 2.
- To improve higher levels use gas mixture 3.
- For standard CO only 100ppm CO gas is needed.
- For CO (H_2 compensated) both CO 100ppm and H_2 1000ppm gases are needed.

The following table indicates the different gas mixture canisters used for calibration:

Calibration gas	CH_4	CO_2	O_2
Mixture 1	0%	0%	4%
Mixture 2	15%	15%	0%
Mixture 3	50%	35%	0%

These are for general use but other gas concentrations can be used.

✍ Note: Other gases could cause cross-gas effects. If you suspect a cross sensitivity problem please contact the Technical Support Team at QED at +1 (734) 995-2547.

The above gases and most other gas concentrations can be supplied by QED. For further information please contact Sales at +1 (734) 995-2547 or email sales@qedenv.com.

⚠ Warning	Calibration gases can be dangerous. For each gas used the appropriate material safety data sheet must be read and understood before proceeding.

9.4 Calibration set-up

⚠ Warning	Do NOT attach the gas supply to the gas analyzer before putting the analyzer into the 'Gas Check' screen. Select 'Check Spans' from the 'Operation Settings' menu.

The regulator supplied with the calibration kit has been configured to deliver a fixed flow.

As the regulator's flow is factory set, it only requires a few turns to open, no adjustment is necessary.

⚠ Warning	Exhaust port When the gas analyzer is being calibrated, there are two possible exits for the gas, via the usual manner out of the exhaust (yellow) port of the analyzer or in cases of over-pressurization the 1/16" port on the red pressure relief valve located on the regulator. It is recommended that both ports have exhaust tubing attached. The exhaust tubing must emerge in a well-ventilated area. Ensure there are no leaks in the tubing and connections. The calibration of the gas analyzer should be carried out in a safe area with all necessary precautions taken when using potentially dangerous, explosive or toxic gases.

9.5 Calibration equipment

The diagram below displays the regulator and tubing equipment for user calibration:

Figure 21—Calibration Gas Cylinder

- Certified calibration gas in 110 liter gas canisters are supplied with the LANDTEC calibration kit. Please refer to the QED website www.qedenv.com for further information.

- The regulator supplied with the calibration kit is pre-set for flow and pressure rates that are factory set.

9.6 Gas analyzer

For the BIOGAS 5000 gas analyzer the calibration options can be found by selecting the 'Menu' key followed by soft-key 'Operation Settings'. Select 'Key 2 – Gas Check' then follow the instructions on the analyzer screen by selecting 'Key 2 – Check Spans'.

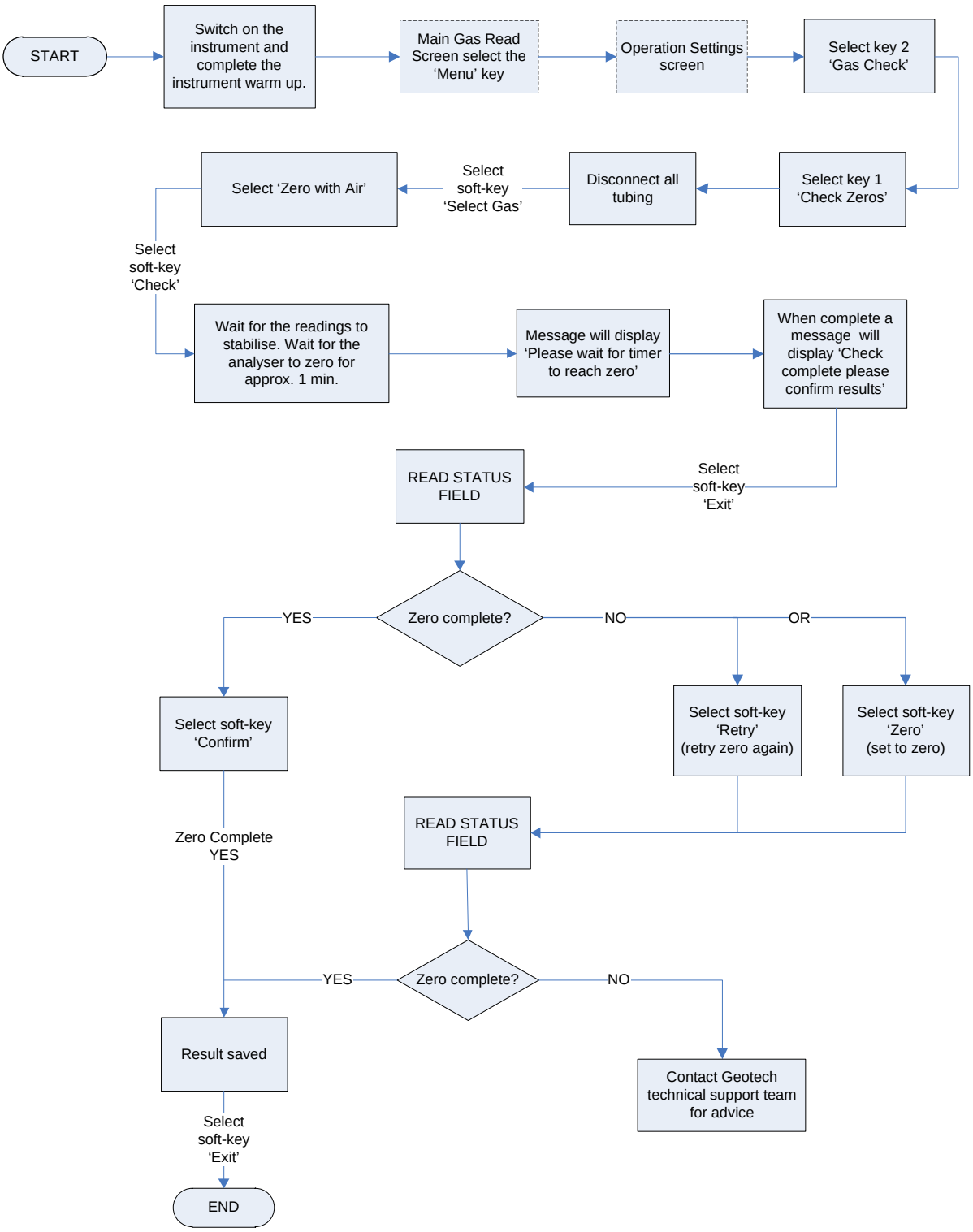
Figure 22—Gas Check

✍ Note: Certain gas channels may not be active and will be shown as ‘N/A’.

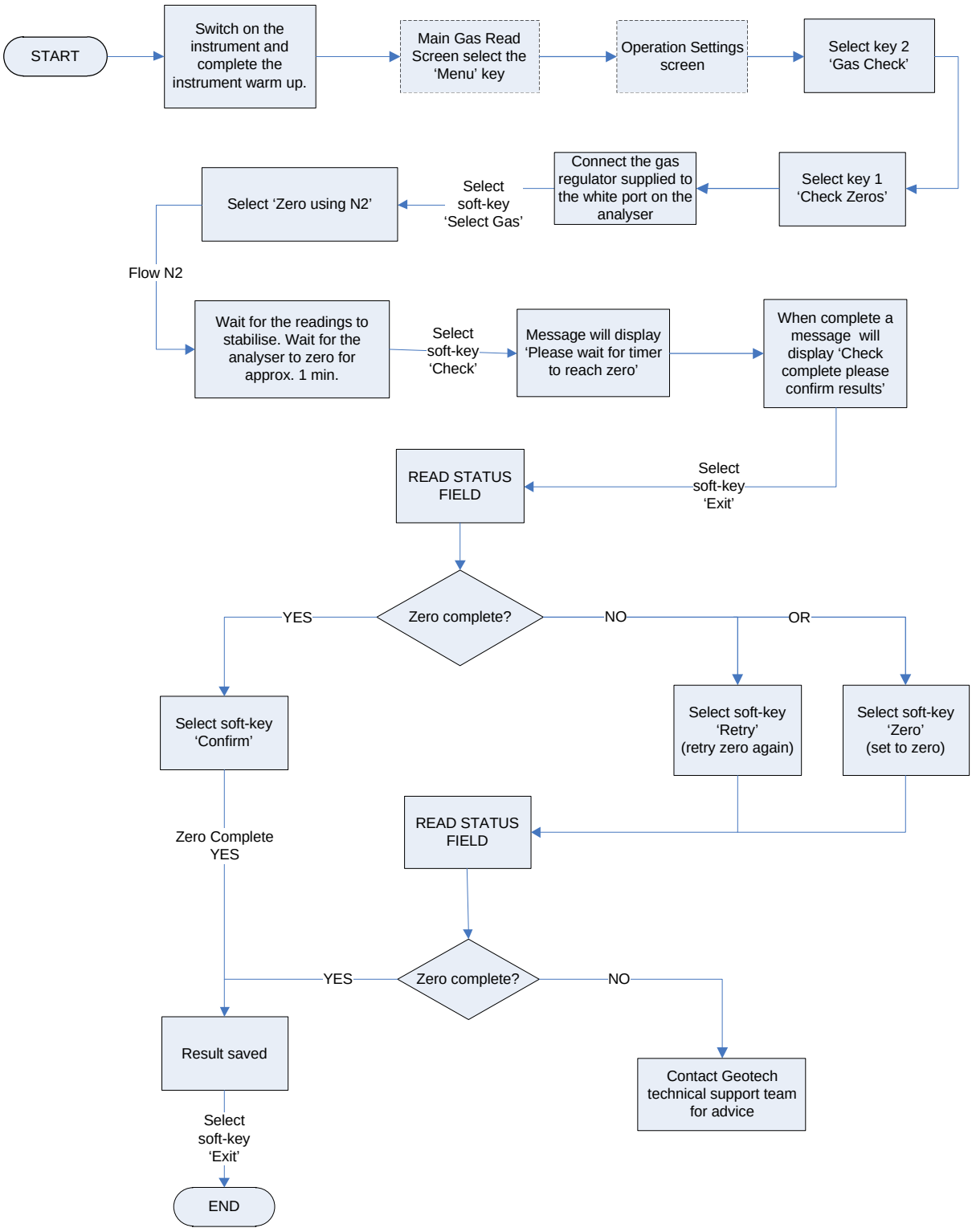
9.7 Calibration processes – best practice

The following process diagrams outline the calibration steps.

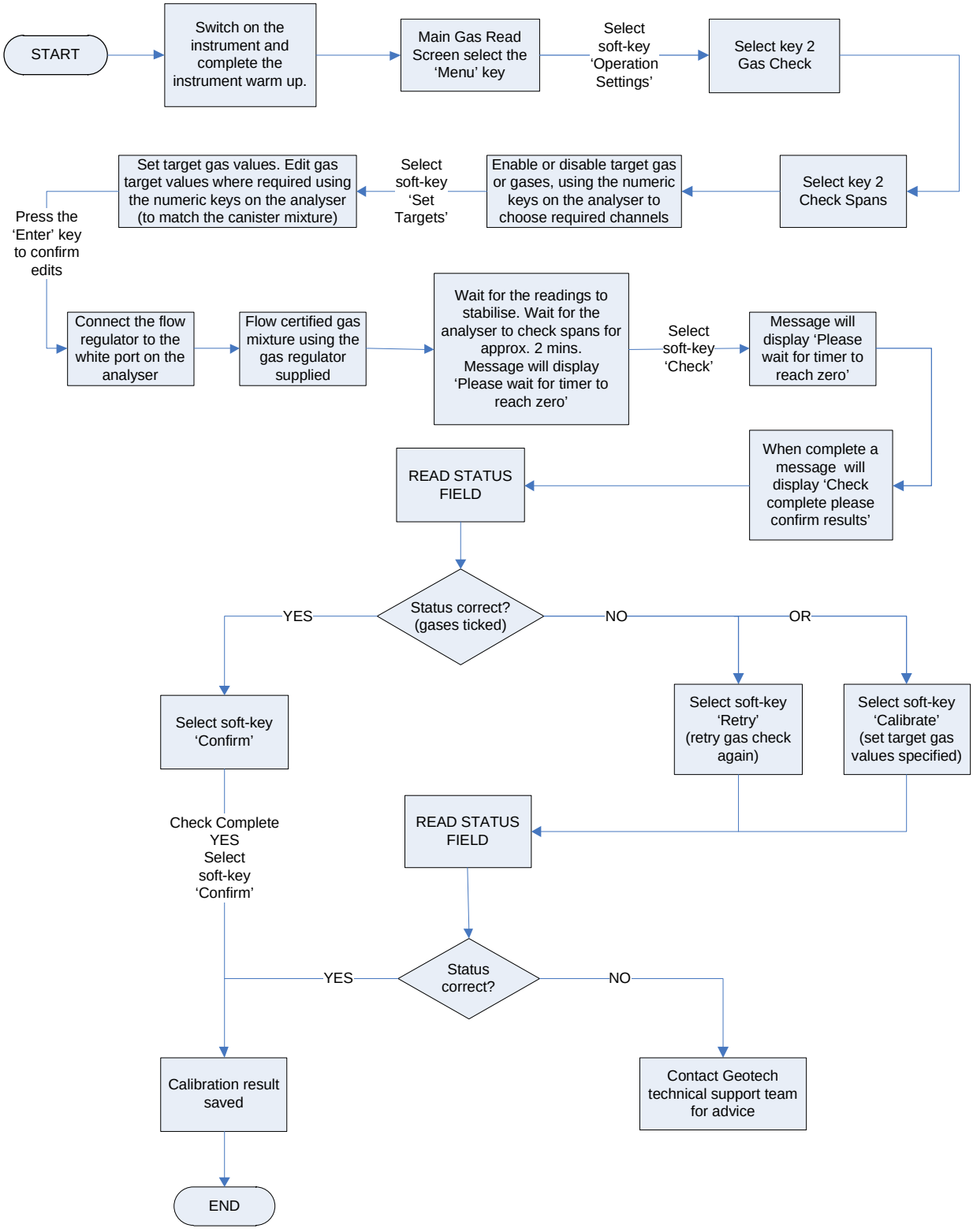
9.7.1 Check zeros – zero using air



9.7.2 Check zeros – zero using N_2



9.7.3 Calibration (Check Spans) – mixtures 1, 2 & 3



9.8 Restore to factory

This option will reset the gas analyzer to all of its factory programmed settings and will clear ALL the user defined calibration points.

If in any doubt please contact Technical Support at QED at +1 (734) 995-2547

1) Select the 'Menu' key.

2) Select soft-key 'Operation Settings'.

3) Select 'Key 2 - Gas Check'.

4) Select 'Key 3 - Restore to factory' followed by the soft-key 'Confirm' or 'Cancel'.

5) A validation message is displayed 'Reset user calibration?' Press the soft-key 'Confirm' to continue with the factory settings or soft-key 'Cancel' to cancel the operation and return to the Gas Check menu.

9.9 Calibration history

The BIOGAS 5000 gas analyzer has the facility to log user calibrations in an 'Event Log' which is accessible for review on the instrument from the Operation Settings→Gas Check Menus. This can be used as an aid to ensuring that gas measurements are valid and accurate. Both good and failed calibration results are recorded for each channel calibrated.

1) Select the 'Menu' key.

2) Select soft-key 'Operation Settings'.

3) Select 'Key 2 - Gas Check'.

4) Select 'Key 4 – History'.

5) The operator may view the calibration data stored. Use the soft-key 'Filter' to add a sort filter to the history enquiry.

9.10 Calibration summary

The BIOGAS 5000 gas analyzer has the facility to log the history of user calibrations.

1) Select the 'Menu' key.

2) Select soft-key 'Operation Settings'.

3) Select 'Key 2 - Gas Check'.

4) Select 'Key 5 – Summary'.

5) The operator may view the calibration data history stored by ID, technician, timestamp, type and calibration result. Use the soft-key 'Exit' to exit and return to the 'Gas Check' menu.

10.0 Problem solving

This section outlines various warning and error messages which the operator may receive during general operation of the instrument. For further assistance please contact Technical Support at QED at +1 (734) 995-2547 or email service@qedenv.com.

10.1 Warning and error display

When switched on the instrument will perform a pre-determined self-test sequence taking approximately 15 seconds. During this time many of the instrument's working parameters and settings are checked.

If any operational parameters are out of specification or the pre-programmed recommended calibration/service date has passed, errors or warnings may be displayed.

Use the 'Scroll up' and 'Scroll down' keys to move through the list if required.

Only three warnings/errors can be displayed at any time.

To ascertain if more errors have occurred use 'Key 8' – Scroll down' and 'Key 2' - Scroll up' through the list.

Warnings displayed:

All warnings displayed will be prefixed by the word WARNING followed by a relevant description.

There are two types of warning that may be displayed:

1. General warnings that may not affect the instrument's function and those where the self-test has detected a function that is outside the usual programmed operating criteria, e.g. battery charge low, memory nearly full.

2. Operational parameters that could affect the performance of the analyzer: Cell out of calibration, CH_4 out of calibration, CO_2 out of calibration.

The most likely reason for the errors is either an incorrect user calibration or sensor failure. If an incorrect user calibration has caused the warning it should be correctable by way of returning the instrument to factory settings, zeroing or carrying out a user calibration as necessary for the relevant function.

11.0 Event log

The BIOGAS 5000 gas analyzer incorporates the facility to log significant events performed on the analyzer via the 'Event Log'. This can be used as an aid to QED service staff as a diagnostic tool.

Events are stored in the event log automatically. No user intervention is required. If the log becomes almost full, a warning will be given on the start-up screen. If the log becomes full then no further events will be stored.

At the present time, the log cannot be downloaded, viewed or cleared by the QED System Gas Analyzer Manager.

✍Note: The event log cannot be viewed directly on the analyzer.

12.0 Service

The GEM5000 gas analyzer should be regularly serviced to ensure correct and accurate operation. LANDTEC recommends a service and recalibration every 12 months.

The BIOGAS 5000 range is ATEX certified for use in potentially explosive areas. As such it should be serviced only by qualified engineers. Failure to observe this will result in the warranty becoming invalid and could invalidate the ATEX certification.

⚠ Warning	If the BIOGAS 5000 is to be serviced by trained LANDTEC personnel. Service by any untrained personnel will negate service. If serviced by unqualified engineers, the ATEX certification may be invalidated and the instrument may be unsafe for use in a potentially explosive atmosphere.

User serviceable parts:

There are no user serviceable parts inside the instrument.

The following parts can be user serviced:

In-line water filter	This should be regularly inspected for obstructions, moisture or damage and changed if needed. The instrument should never be operated without the in-line water filter as this may result in water entering the instrument.
Sample tubing	Always ensure that sample tubes are not contaminated or damaged.
Gas port connectors	Periodically check that the O-rings on the gas port connectors are not damaged. A damaged O-ring can let air into the sample gas and result in incorrect readings. If the O-ring is damaged, the complete gas port connector should be replaced.

13.0 Warranty policy

This instrument is guaranteed, to the original end user purchaser, against defect in materials and workmanship for a period of 1 year from the date of the shipment to the user. The 1 year warranty may be extended up to 3 years with the purchase of a “Diamond Service Agreement”. Please contact your LANDTEC representative for more details.

During this period QED will repair or replace defective parts on an exchange basis.

The decision to repair or replace will be determined by QED.

To maintain this warranty, the purchaser must perform maintenance and calibration as prescribed in the operating manual.

Normal wear and tear, and parts damaged by abuse, misuse, negligence or accidents are specifically excluded from the warranty.

✍Note: Please contact Technical Support at +1 (734) 995-2547 for further information.

14.0 Sample certificate of calibration

This is a sample certificate of calibration supplied at the time of purchase and updated when the instrument is serviced.

CERTIFICATION OF CALIBRATION

ISSUED BY: Landtec North America Instrument Services Facility
Date Of Calibration: March 6, 2012
Certificate Number: G500038_6/6442

No. 66916

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Approved By Signatory

Jose Munoz
Laboratory Inspection

LANDTEC

Landtec North America Instrument Services Facility,
850 South Via Lata, Suite 112, Colton CA, 92324
Web site: www.landtecna.com

Customer: ***LANDTEC Valued Customer***

850 S Via Lata
Suite 112
Colton, CA 92324

Sample

Description: GEM5000 *Model:* GEM5000
Serial Number: G500038

Accredited Results:

Methane (CH4)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
50.01	50.01	1.10
15.02	15.02	0.66
5.00	5.00	0.42

Carbon Dioxide (CO2)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
49.99	49.94	1.20
14.99	14.67	0.71
4.99	4.76	0.43

Oxygen (O2)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
21.01	21.05	0.25

Gas cylinders are traceable and details can be provided if requested.

CH4, CO2 33.2°C/91.7°F Barometric Pressure: 28.73"hg

O2 readings recorded at: 24.1°C/75.4°F

Method of Test: The analyser is calibrated in a temperature controlled chamber using reference gases.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with NIST requirements.

This certificate is issued in accordance with the laboratory accreditation requirements of the National Institute of Standards and Technology. It provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Institute of Standards and Technology or other recognised national standards laboratories. Certification only applies to results shown. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATION OF CALIBRATION

PJLA ACCREDITED CALIBRATION LABORATORY NO. 66916

Certificate Number
G500038_6/6442
Page 2 of 2

Non-Accredited results:

Barometer (mb)	
Reference	Reading
0975mb / 28.80"hg	0973mb / 28.73"hg

As received gas check readings:

Methane (CH4)	
Certified Gas (%)	Instrument Reading (%)
60.01	59.72
15.02	14.98
5	4.98

Carbon Dioxide (CO2)	
Certified Gas (%)	Instrument Reading (%)
39.99	40.11
14.99	15.00
4.99	4.98

Oxygen (O2)	
Certified Gas (%)	Instrument Reading (%)
21.01	20.70

As received Gas readings recorded at: 24.28°C/75.7°F
As received Barometric Pressure recorded at: 29.01 "hg

As received gas check readings are only recorded if the instrument is received in a working condition. Where the instrument is received damaged no reading can be taken.

End of Certificate

15.0 Important notice to all customers

The recycle bin symbol displayed on the instrument signifies that the apparatus must not be disposed of through the normal municipal waste stream but through a recycling process.

When your instrument is at the end of its life, please contact the Sales team at QED who will advise you on the next step in order to properly dispose of the instrument.

16.0 Appendices – safety instructions

16.1 Instructions for safe use – Italian language

Istruzioni per la sicurezza

⚠ Avvertenza	Gli analizzatori di gas serie 5000 possono essere utilizzati per misurare i gas provenienti da discariche o da altre fonti, come descritto in questo manuale. L'operatore può essere esposto a gas nocivi durante l'utilizzo dello strumento. L'inalazione di questi gas può danneggiare la salute e in alcuni casi essere letale. Spetta all'utente controllare di essere sufficientemente informato sugli aspetti riguardanti la sicurezza dei gas utilizzati e di seguire le procedure appropriate. In particolare nel caso di gas pericolosi, quelli scaricati dall'analizzatore devono essere convogliati in un'area in cui lo scaricotale operazione possa essere effettuatao in condizioni di sicurezza. È possibile che lo strumento scarichi gas pericolosi anche durante lo spurgoquando viene utilizzato per spurgare con aria pulita.

✍ Nota: gli analizzatori di gas sono apparecchi scientifici delicati e vanno trattati come tali. Utilizzando l'apparecchio in modo diverso da quanto specificato dalla casa produttrice, l'apparecchio stesso potrebbe non fornire più la protezione prevista.

Gli analizzatori di gas serie 5000 sono conformi alla Parte 15 delle norme FCC. L'utilizzo è soggetto alle seguenti due condizioni:

1) il dispositivo non deve causare interferenze dannose

2) il dispositivo deve accettare le interferenze che riceve, anche se possono causare effetti indesiderati per il suo funzionamento.

Gli analizzatori di gas della serie 5000 sono certificati con riferimento alla classificazione delle aree pericolose secondo ATEX e IECEx.

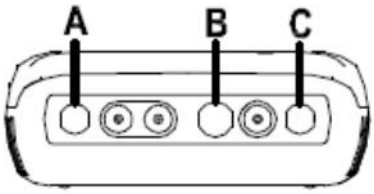
Ex II 2G Ex ib IIA T1 Gb (Ta = da -10ºC a +50ºC)

È essenziale seguire scrupolosamente le istruzioni. Spetta all'operatore definire il concetto di protezione e la classificazione richiesta per una data applicazione.

Istruzioni per l'uso in sicurezza - Italiano

(Riferimento alla Direttiva europea ATEX 94/9/CEC, Allegato II, 1.0.6.)
Le seguenti istruzioni si applicano agli apparecchi coperti dai certificati SIRA 11ATEX2197X e SIR 11.0089X della Direttiva IECEx:

- Gli apparecchi possono essere utilizzati con gas e vapori infiammabili di gruppo IIA e temperature di classe T1.
- Gli apparecchi sono certificati solo per l'uso a temperatura ambiente compresa tra -10ºC e +50ºC e non vanno utilizzati al di fuori di questo intervallo.
- Gli apparecchi non vanno utilizzati in un'atmosfera che contenga più del 21% di ossigeno.
- Le riparazioni di questi apparecchi vanno effettuate in conformità al codice professionale rilevante.
- In aree pericolose, utilizzare solo la sonda di temperatura GF5.2 (SIRA 11ATEX2197X e IECEx SIR11.0089X). Per il connettore C, l'anemometro GF5.4 (BVS 04ATEXE194) da usare esclusivamente con apparecchi ATEX. Nella zona pericolosa, l'analizzatore non va collegato ad altri dispositivi in dotazione, come il cavo GF-USB (per il connettore A) o il caricabatteria GF3.9 (per il connettore B).



Non caricare, ricaricare o aprire in un'atmosfera potenzialmente esplosiva.
In aree pericolose, utilizzare solo la "sonda di temperatura GF5.2" con il connettore B.
Connettore C (Uo=10V,Io=5mA,Po=50mW,Ci=0,Li=0,Co=100uF,Lo=1000mH),
Connettore B (Uo=5V,Io=6mA,Po=7mW,Ci=0,Li=0,Co=100uF,Lo=1000mH)

ALIMENTAZIONI MASSIME NON PERICOLOSE:
Connettore A - Um=6V Connettore B - Um=10,1V

- Se esiste la possibilità che l'apparecchio potrebbe venirevenga in contatto con sostanze aggressive, ad esempio liquidi acidi o gas che possono attaccare i metalli o solventi che possono agire su materiali polimerici, spetta all'utente adottare le precauzioni necessarie, ad es. controlli regolari come da programma o verifica della resistenza a sostanze chimiche specifiche consultando la scheda tecnica, per evitare effetti negativi e non compromettere il tipo di protezione di cui è dotato l'apparecchio.

- L'intervallo di pressione relativa è di +/-500 mbar. Si noti tuttavia che la pressione in entrata non deve superare +/- 500 mbar relativamente alla pressione atmosferica e la pressione in uscita non deve superare +/- 100 mbar relativamente alla pressione atmosferica.

<u>Gli analizzatori di gas della serie 5000 sono certificati con riferimento alla classificazione delle aree pericolose secondo CSA (Canada)</u>

CLASSE 2258 03 - APPARECCHIATURE DI CONTROLLO DEI PROCESSI - Sistemi intrinsecamente sicuri e ignifughi - Per luoghi pericolosi.

C US
M.C.#243446

Ex ib IIA

Rilevatori di metano Modello GA 5000, GEM 5000 e BIOGAS 5000; portatili, a batteria, con pacco batterie non sostituibile sul campo, cod. parte 20087; intrinsecamente sicuri, per circuiti intrinsecamente sicuri ("[ib]" per Zona 1) fino alla sonda di temperatura Modello GF5.2 (Connettore B) e con parametri di entità in uscita come indicato nella tabella sottostante; Codice temperatura T1; -10 ºC ≤ Tamb. ≤ +50ºC.

Connettore	Parametri entità						
	Uo (V)	Io (mA)	Po (mW)	Co (uF)	Lo (mH)	Ci (uF)	Li (mH)
B	5.0	6	7	100	1000	0	0
C	10,0	5	50	100	1000	0	0

✍ Nota: questo dispositivo è stato controllato solo per quanto riguarda le caratteristiche di sicurezza elettrica.

Gli analizzatori di gas della serie 5000 sono certificati con riferimento alla classificazione delle aree pericolose secondo CSA (USA)

CLASSE 2258 83 - APPARECCHIATURE DI CONTROLLO DEI PROCESSI - Sistemi intrinsecamente sicuri e ignifughi - Per luoghi pericolosi - CERTIFICATE PER USA NORME

C US
M.C.#243446

AEx ib IIA

Rilevatori di metano Modello GA 5000, GEM 5000 e BIOGAS 5000; portatili, a batteria, con pacco batterie non sostituibile sul campo, cod. parte 20087; intrinsecamente sicuri, per circuiti intrinsecamente sicuri ("[ib]" per Zona 1) fino alla sonda di temperatura Modello GF5.2 (Connettore B) e con parametri di entità in uscita come indicato nella tabella sottostante; Codice temperatura T1; -10 ºC ≤ Tamb. ≤ +50ºC.

Connettore	Parametri entità						
	Uo (V)	Io (mA)	Po (mW)	Co (uF)	Lo (mH)	Ci (uF)	Li (mH)
B	5,0	6	7	100	1000	0	0
C	10,0	5	50	100	1000	0	0

✍ Nota: questo dispositivo è stato controllato solo per quanto riguarda le caratteristiche di sicurezza elettrica.

MCERTS

MCERTS sta per Monitoring Certification Scheme, il programma di certificazione della Environment Agency, l'enteistituzione britannicoa per la protezione ambientale. Il programma offre uno schema in base al quale effettuare le misurazioni ambientali rispettando i requisiti qualitativi dell'Environment Agency e comprende varie attività di monitoraggio, campionatura e ispezione.

Lo strumento BIOGAS 5000 ha la certificazione MCERTS solo se:

õ Dopo l'accensione iniziale, sullo schermo compare il logo MCERTS.

✍ Nota: MCERTS - Su questo strumento non si sono effettuati test di sensibilità incrociata con l'utilizzo di idrogeno solforato. Pertanto gli utenti devono accertare la presenza di H_2S, che potrebbe avere un effetto interferenziale.

MCERTS promuove fiducia nel monitoraggio dei dati e offre al settore una struttura sperimentata per scegliere sistemi e servizi di monitoraggio che soddisfino i requisiti dell'Environment Agency.

L'Environment Agency ha istituito il Monitoring Certification Scheme (MCERTS) per conseguire misurazioni ambientali qualitativamente valide. Il programma MCERTS offre la certificazione dei prodotti secondo gli standard qualitativi dell'Environment Agency, in base alle norme CEN, ISO e nazionali.

Gli strumenti con certificazione MCERTS sono stati testati da un organismo indipendente per verificare che soddisfino determinate caratteristiche di prestazione. Inoltre le aziende dei prodotti MCERTS vengono regolarmente controllate per accertare che le caratteristiche di prestazione da attestare nel certificato siano sempre conseguite.

Gli analizzatori di gas della serie 5000 sono stati certificati secondo la versione 3.1 delle 'Caratteristiche di prestazione dei sistemi portatili di monitoraggio delle emissioni'.

Batteria e ricarica

La batteria utilizzata negli analizzatori di gas della serie 5000 è al nichel-idruro metallico e viene prodotta come pacco con sei celle individuali. Anche se questo tipo di batteria non è soggetta all''effetto memoria' della ricarica come quelle al nichel cadmio, non è consigliabileraccomandabile effettuare piccole ricariche parziali.

Il caricabatteria va scollegato solo quando indica la carica completa.

⚠ Avvertenza	Il caricabatteria NON è coperto dalla certificazione Ex. La batteria va caricata solo in un'area sicura.

Il caricabatteria è intelligente e indica lo stato di carica in corso o avvenuta.

Lo strumento va caricato utilizzando ESCLUSIVAMENTE il caricabatteria fornito in dotazione, che è inteso solo per l'uso in un locale interno. Effettuare la ricarica in un locale ventilato.

Caricabatteria:	Tensione d'ingresso:	100-240V CA +/- 10%
	Frequenza d'ingresso:	50-60Hz +/- 10%
	Corrente d'ingresso:	0,4A@100VCA .. 0,2A@240VCA
	Tensione d'uscita:	10,1VCC max
	Corrente d'uscita:	1,5A max

✍ Nota: collegare il caricabatteria all'elettricità di rete utilizzando l'adattatore necessario. Per ulteriori informazioni rivolgersi alla casa produttrice.

Istruzioni per la pulizia

NON utilizzare detergenti per pulire l'analizzatore o il caricabatteria, perché potrebbero avere un effetto negativo sulla sicurezza del loro uso.

Prassi ottimali per rilevare le letture

⚠ Avvertenza	L'inalazione del gas di solfuro d'idrogeno (H_2S) o di altri gas nocivi può causare la morte. Spetta all'utente accertarsi di essere sufficientemente addestrato negli aspetti della sicurezza relativi all'uso di H_2S e altri gas nocivi. In particolare nel caso di gas pericolosi, quelli scaricati dall'analizzatore devono essere convogliati in un'area in cui lo scaricotale operazione possa essere effettuatao in condizioni di sicurezza. È possibile che lo strumento scarichi gas pericolosi anche durante lo spurgoquando viene utilizzato per spurgare con aria pulita.

Prassi ottimali

õ Nel recarsi al luogo di utilizzo, collocare l'analizzatore di gas nell'abitacolo del veicolo, non nel bagagliaio, dove potrebbe essere soggetto a estremi di temperatura e danneggiarsi per eventuali urti. Non appoggiare l'analizzatore di gas contro superfici calde (ad es. tubo di aspirazione del gas, carrozzeria di un'autovettura o interno di un'autovettura incustodita in estate), perché ciò fa aumentare la temperatura dell'analizzatore di gas e può falsare le letture.

õ Negli spostamenti nell'area di utilizzo dell'analizzatore di gas, proteggerlo dalla luce diretta del sole e dagli scrosci di pioggia.

Usare sempre il sifone per lo scarico della condensa!. Se il sifone si allaga, cambiare il filtro e controllare che tutti i tubi siano liberi dalla condensa prima di riutilizzarlo

✍ Nota: se lo scarico di un analizzatore di gas serie GA5000 è collegato ad un sistema pressurizzato, ciò fa uscire un flusso di gas dall'entrata.

Taratura

⚠ Avvertenza	I gas di taratura possono essere pericolosi. Per ciascun gas da utilizzare, leggere preventivamente la relativa scheda tecnica di sicurezza, accertandosi di comprenderne il contenuto.

Il regolatore fornito col kit di taratura è stato configurato per permettere l'erogazione di un flusso fisso.

Dato che il flusso del regolatore è impostato in fabbrica, può essere aperto con una semplice rotazione, senza effettuare regolazioni.

⚠ Avvertenza	Luce di scarico Durante la taratura dell'analizzatore, vi sono due possibili uscite per il gas: come di norma dalla luce di scarico

	(gialla)dell'analizzatore o, in caso di sovrapressione, dalla luce di 1/16" della valvola limitatrice di pressione rossa situata sul regolatore. Si raccomanda che entrambe le luci siano dotate di tubi di scarico, che devono sboccare in un'area ben ventilata. Controllare che i tubi e i raccordi non presentino perdite. La taratura dell'analizzatore di gas va eseguita in un'area idonea, adottando tutte le precauzioni necessarie per l'utilizzo di gas potenzialmente pericolosi, esplosivi o tossici.

✍ Nota: è possibile anche che il gas esca dall'uscita del flusso interno (blu) dell'analizzatore di gas (vale solo per GA5000).

Manutenzione

Gli analizzatori di gas della serie 5000 devono essere sottoposti a regolare controllo di manutenzione per accertare che il funzionamento sia corretto e preciso. QED raccomanda che la manutenzione e la taratura siano effettuate ogni 6 mesi.

Gli analizzatori di gas della serie 5000 hanno la certificazione ATEX per l'utilizzo in aree potenzialmente esplosive. In quanto tali, la loro manutenzione deve essere affidata esclusivamente a tecnici qualificati. La mancata osservanza di questa regola invalida la garanzia ed eventualmente anche la certificazione ATEX.

⚠ Avvertenza	Se la manutenzione dell'analizzatore di gas viene effettuata da tecnici non qualificati, la certificazione ATEX può venirne compromessa, pregiudicando così l'utilizzo in condizioni di sicurezza dello strumento in un'atmosfera potenzialmente esplosiva.

Parti riparabili dall'utente:

Non vi sono parti riparabili dall'utente all'interno dello strumento.
Le parti seguenti possono essere riparate:

Filtro acqua in linea	Va controllato regolarmente per evidenziare eventuali ostruzioni, condensa o danneggiamenti e sostituito se necessario. Lo strumento non va mai usato senza il filtro in linea, per evitare possibili infiltrazioni dperché vi entrerebbe l'acqua.
Tubi di campionamento	Controllare sempre che i tubi di campionamento non siano contaminati o danneggiati.
Raccordi del gas	Controllare periodicamente che i gommini O-ring dei raccordi del gas non siano danneggiati. Se danneggiati, gli O-ring lasciano entrare aria nei tubi di campionamento, sfalsando le letture. Se l'O-ring risulta danneggiato, è necessario sostituire tutto il raccordo.

Materiale del filtro H_2S	Quando il materiale del filtro cambia colore e diventa grigio chiaro, il filtro va sostituito.

Dichiarazione di conformità – Italiano

Prodotti	• GA5000 – Analizzatore di gas per discariche • GEM5000 - Analizzatore di gas e monitor di estrazione per discariche e monitor per l'estrazione • BIOGAS 5000 – Analizzatore di gas per impianti di digestione anaerobica

QED Environmental Systems Ltd dichiara che gli articoli sopra descritti sono conformi ai seguenti standard:

Direttiva ATEX 94/9/CE

Organismo di certificazione	SIRA Certification Service Servizio di certificazione SIRA
Numero dell'organismo notificato	0518
Indirizzo	Rake Lane, Eccleston, Chester, CH4 9JN, GB
N° certificazione SIRA	SIRA 11ATEX2197X
Norme applicate	EN60079-0 :2006 EN60079-0 :2009 EN60079-11 :2007

IECEx

Organismo di certificazione	SIRA Certification Service Servizio di certificazione SIRA
Numero dell'organismo notificato	0518
Indirizzo	Rake Lane, Eccleston, Chester, CH4 9JN, GB
N° certificazione IECEx	SIR 11.0089X
Norme applicate	IEC60079-0 :2004 Ed4 IEC60079-0 :2007 Ed5 IEC60079-11 :2006 Ed5

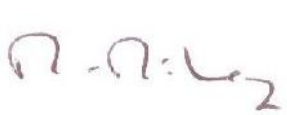
CSA (Canada e USA)

Organismo di certificazione	CSA International
Indirizzo	178 Rexdale Boulevard, Toronto, ON, Canada M9W 1R3
N° certificazione CSA	CSA 11 2445306
Norme applicate	C22.2 No. 0-10 - Requisiti generali – Codice elettrico canadese, Parte II CAN/CSA-C22.2 No. 60079-0:07 - Apparecchi elettrici per atmosfere con gas esplosivi - Parte 0: Requisiti generali CAN/CSA-C22.2 No. 60079-1:07 - Apparecchi elettrici per atmosfere con gas esplosivi - Parte 1: Custodie a prova di esplosione "d" CAN/CSA-E60079-11:02 - Apparecchi elettrici per atmosfere con gas esplosivi - Parte 11: Sicurezza intrinseca "i" ANSI/UL 60079-0:09 - Apparecchi elettrici per atmosfere con gas esplosivi - Parte 0: Requisiti generali ANSI/UL 60079-1:09 - Apparecchi elettrici per atmosfere con gas esplosivi - Parte 1: Custodie a prova di esplosione "d" ANSI/UL 60079-11:09 - Apparecchi elettrici per atmosfere con gas esplosivi - Parte 11: Sicurezza intrinseca "i"

Direttiva EMC 2004/108/CE

EN 301 489 P. 1 (V1.9.1 – 2011-04)	Compatibilità elettromagnetica e questioni relative allo spettro delle radiofrequenze (ERM) Norma di compatibilità elettromagnetica (EMC) per apparecchiature e servizi radio Parte 1: Prescrizioni tecniche comuni
EN 301 489 P. 17 (V2.1.1 – 2009-05)	Compatibilità elettromagnetica e questioni relative allo spettro delle radiofrequenze (ERM) Norma di compatibilità elettromagnetica (EMC) per apparecchiature radio Parte 17: Condizioni specifiche per sistemi di trasmissione dati su banda larga EMC per sistemi di trasmissione dati su banda larga
EN 301 489 P. 19 (V1.2.1 – 2002-11)	Compatibilità elettromagnetica e questioni relative allo spettro delle radiofrequenze (ERM) Norma di compatibilità elettromagnetica (EMC) per apparecchiature e servizi radio Parte 19: Condizioni specifiche per soli ricevitori di stazioni mobili terrestri (ROMES) operativi nella banda 1,5 GHz che forniscono comunicazioni di dati EMC per soli ricevitori di stazioni mobili terrestri (ROMES)
BS EN 61000-3-2: 2006 + A2:2009	Limiti di compatibilità elettromagnetica (EMC) . Limiti per le emissioni di corrente armonica (apparecchiature con corrente di ingresso ≤ 16 A per fase)
BS EN 61000-3-3: 2008	Limiti di compatibilità elettromagnetica (EMC) . Limitazione delle fluttuazioni di tensione e del flicker in sistemi di alimentazione in bassa tensione per apparecchiature con corrente nominale ≤ 16 A e non soggette ad allacciamento su condizione

Firmato



Dr. Roger Riley

16.2 Instructions for safe use – German language

Sicherheitsvorschriften

⚠ Warnhinweise	Die Gasanalysatoren der 5000er Serie können zum Messen der Gase von Deponien und anderen Quellen wie in diesem Handbuch beschrieben verwendet werden. Der Bediener kann bei Verwendung des Geräts schädlichen Gasen ausgesetzt werden. Das Einatmen dieser Gase kann gesundheitsschädlich und in manchen Fällen sogar tödlich sein. Es liegt in der Verantwortung des Benutzers sicherzustellen, dass er/sie angemessen über die Sicherheitsaspekte der eingesetzten Gase geschult ist und geeignete Verfahren befolgt werden. Vor allem beim Einsatz gefährlicher Gase muss das vom Analysator ausströmende Gas in einen Bereich geleitet werden, in dem das Gas sicher abgeführt werden kann. Gefährliches Gas kann ebenso vom Gerät ausgestoßen werden, wenn es mit sauberer Luft gereinigt wird.

✍ Hinweis: Gasanalysatoren sind empfindliche wissenschaftliche Geräte und sollten entsprechend behandelt werden. Wenn das Gerät anders als vom Hersteller spezifiziert verwendet wird, kann der vom Gerät gebotene Schutz beeinträchtigt werden.

Die Gasanalysatoren der 5000er Serie erfüllen Abschnitt 15 der FCC-Vorschriften. Der Betrieb unterliegt den folgenden zwei Bedingungen:

1) Dieses Gerät darf keine schädlichen Funkstörungen verursachen.

2) Dieses Gerät muss mögliche empfangene Funkstörungen und dadurch verursachte Funktionsstörungen dulden.

Für ATEX und IECEx sind die Gasanalysatoren der 5000er Serie für den Einsatz in explosionsgefährdeten Bereichen zertifiziert.

Ex II 2G EX ib IIA T1 Gb (Ta = -10°C bis +50°C)

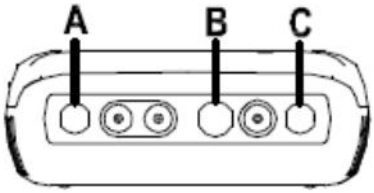
Die Vorschriften müssen unbedingt genau befolgt werden. Es liegt in der Verantwortung des Betreibers, das Schutzkonzept und die erforderliche Schutzklasse für eine bestimmte Anwendung festzulegen.

Vorschriften zur sicheren Verwendung - Deutsch

(Siehe Europäische ATEX-Richtlinie 94/9/EC, Anhang II, 1.0.6.)
Die folgenden Vorschriften gelten für Geräte, die in den Zertifikaten Nr. SIRA 11ATEX2197X und IECEx Richtlinie SIR 11.0089X behandelt werden:

- Die Geräte dürfen mit brennbaren Gasen und Dämpfen mit Apparategruppe IIA und Temperaturklasse T1 eingesetzt werden.

- Die Geräte sind nur für den Einsatz bei Umgebungstemperaturen im Bereich von -10 °C bis +50 °C zertifiziert und sollten nicht außerhalb dieses Bereichs eingesetzt werden.
- Die Geräte dürfen nicht in einer Atmosphäre mit mehr als 21 % Sauerstoffgehalt eingesetzt werden.
- Die Reparatur dieser Geräte darf nur entsprechend der maßgeblichen Anleitung durchgeführt werden.
- Bei Einsatz in einem explosionsgefährdeten Bereich darf nur Temperaturfühler GF5.2 (SIRA 11ATEX2197X und IECExSIR11.0089X) verwendet werden. Anemometer GF5.4 (BVS 04ATEXE194), nur für den Einsatz mit ATEX, in Anschluss C. Der Analysator darf nicht an andere Geräte im explosionsgefährdeten Bereich angeschlossen werden, einschließlich des im Lieferumfang enthaltenen GF-USB-Kabels (Anschluss A) bzw. Ladegeräts GF3.9 (Anschluss B).



In einer explosionsgefährdeten Atmosphäre nicht laden, wieder aufladen oder öffnen.
In einem explosionsgefährdeten Bereich nur „Temperaturfühler GF5.2“ in Anschluss B verwenden.
Anschluss C (Uo=10 V, Io=5 mA, Po=50 mW, Ci=0, Li=0, Co=100 uF, Lo=1000 mH),
Anschluss B (Uo=5 V, Io=6 mA, Po=7 mW, Ci=0, Li=0, Co=100 uF, Lo=1000 mH)

MAXIMALE VERSORGUNG IN NICHT EXPLOSIONSGEFÄHRDETEN BEREICHEN:
Anschluss A - Um=6 V Anschluss B - Um=10,1 V

- Falls die Möglichkeit besteht, dass die Geräte mit aggressiven Substanzen in Berührung kommen, z. B. mit sauren Flüssigkeiten oder Gasen, die Metalle angreifen können, oder mit Lösungsmitteln, die Polymerwerkstoffe schädigen können, liegt es in der Verantwortung des Benutzers, geeignete Sicherheitsvorkehrungen zu treffen, z. B. regelmäßige Kontrollen als Teil der Routineinspektionen oder die Prüfung des Materialdatenblatts darauf, ob das Gerät mit speziellen Chemikalien kompatibel ist, die es vor Schäden schützen, um zu gewährleisten, dass diese Art des Schutzes nicht beeinträchtigt wird.

- Der relative Druckbereich ist +/-500 mbar. Es ist jedoch zu beachten, dass der Eingangsdruck +/- 500 mbar relativ zum Atmosphärendruck nicht überschreiten darfund dass der Ausgangsdruck +/- 100 mbar relativ zum Atmosphärendruck nicht überschreiten darf.

<u>Für CSA (Kanada) sind die Gasanalysatoren der 5000er Serie für den Einsatz in explosionsgefährdeten Bereichen zertifiziert.</u>

KLASSE 2258 03 - PROZESSKONTROLLGERÄT - Eigensichere und nicht zündgefährliche Systeme - Für explosionsgefährdete Standorte

C US
M.C.#243446

Ex ib IIA:

Methandetektoren Modell GA 5000, GEM 5000 und BIOGAS 5000; tragbar, batteriebetrieben mit nicht im Feld austauschbarem Akkupack Teilenr. 20087; eigensicher, bietet eigensichere Kreise („[ib]“ für Zone 1) für Temperaturfühler Modell GFS.2 (Anschluss B), mit Entitätsausgabenparameter wie unten aufgeführt; Temperaturcode T1; -10 °C ≤ Tamb. ≤ +50 °C.

Anschluss	Entitätsparameter						
	Uo (V)	Io (mA)	Po (mW)	Co (uF)	Lo (mH)	Ci (uF)	Li (mH)
B	5,0	6	7	100	1000	0	0
C	10,0	5	50	100	1000	0	0

✍ Hinweis: Dieses Gerät wurde nur auf elektrische Sicherheitsfunktionen untersucht.

<u>Für CSA (USA) sind die Gasanalysatoren der 5000er Serie für den Einsatz in explosionsgefährdeten Bereichen zertifiziert.</u>

KLASSE 2258 83 - PROZESSKONTROLLGERÄT - Eigensichere und nicht zündgefährliche Systeme - Für explosionsgefährdete Standorte - NACH US-AMERIKANISCHEN NORMEN ZERTIFIZIERT

C US
M.C.#243446

AEx ib IIA:

Methandetektoren Modell GA 5000, GEM 5000 und BIOGAS 5000; tragbar, batteriebetrieben mit nicht im Feld austauschbarem Akkupack Teilenr. 20087; eigensicher, bietet eigensichere Kreise („[ib]“ für Zone 1) für Temperaturfühler Modell GFS.2 (Anschluss B), mit Entitätsausgabenparameter wie unten aufgeführt; Temperaturcode T1; -10 °C ≤ Tamb. ≤ +50 °C.

Anschluss	Entitätsparameter						
	Uo (V)	Io (mA)	Po (mW)	Co (uF)	Lo (mH)	Ci (uF)	Li (mH)
B	5,0	6	7	100	1000	0	0
C	10,0	5	50	100	1000	0	0

✍ Hinweis: Dieses Gerät wurde nur auf elektrische Sicherheitsfunktionen untersucht.

<u>MCERTS</u>

MCERTS ist das Monitoring Certification Scheme (Zertifizierungsprogramm für Überwachungsgeräte) der britischen Umweltagentur. Das Programm bietet einen Rahmen, in dem Umgebungsmessungen gemäß den Qualitätsanforderungen der Agentur durchgeführt werden können. Es umfasst eine Reihe von Überwachungs-, Probenahme- und Prüfaufgaben.

Das Instrument BIOGAS 5000 ist nur MCERTS-zertifiziert, falls:

õ Das MCERTS-Logo nach dem erstmaligen Einschalten auf dem Bildschirm erscheint.

✍ Hinweis: MCERTS - Bei diesem Gerät wurden keine Störempfindlichkeitsprüfungen mit Schwefelwasserstoff durchgeführt. Daher sollten Benutzer wissen, ob H_2S vor Ort vorhanden ist, da dies eine Störwirkung zur Folge haben könnte.

MCERTS fördert das öffentliche Vertrauen in Überwachungsdaten und liefert der Industrie einen erprobten Rahmen zur Auswahl von Überwachungssystemen und -dienstleistungen, die die Leistungsanforderungen der Umweltagentur erfüllen.

Die britische Umweltagentur hat MCERTS (Monitoring Certification Scheme) initiiert, um hochwertige Umweltmessungen bereitzustellen. Das MCERTS Produktzertifizierungsprogramm ermöglicht die Zertifizierung von Produkten gemäß den Leistungsstandards der Umweltagentur basierend auf den entsprechenden CEN-, ISO- und nationalen Normen.

MCERTS-zertifizierte Geräte wurden durch eine unabhängige Stelle geprüft, um zu gewährleisten, dass bestimmte Leistungsanforderungen erfüllt werden. Darüber hinaus wird der Hersteller eines MCERTS-Produkts regelmäßig geprüft, um zu gewährleisten, dass die Leistungsanforderungen der Zertifizierung durchgehend erfüllt werden.

Die Gasanalysatoren der 5000er Serie wurden gemäß Version 3.1 der „Leistungsanforderungen für tragbare Emissionsüberwachungssysteme“ zertifiziert.

Akku und Aufladen

Bei dem Akku, der in den Gasanalysatoren der 5000er Serie verwendet wird, handelt es sich um einen Nickel-Metallhydrid-Akku, der als Akkupack aus sechs einzelnen Zellen hergestellt wird. Dieser Akkutyp ist weniger stark für den Memoryeffekt anfällig als Nickel-Kadmium-Akkus. Trotzdem wird davon abgeraten, das Gerät mit kleinen Ladungen nachzuladen.

Das Ladegerät sollte nur getrennt werden, wenn komplette Ladung angezeigt wird.

⚠ Warnhinweise	Das Akkuladegerät ist NICHT in der ATEX-Zertifizierung enthalten. Der Akku darf nur in einem sicheren Bereich aufgeladen werden.

Das Akkuladegerät ist intelligent und zeigt an, wenn die Einheit aufgeladen wird bzw. wenn sie vollständig aufgeladen ist.

Das Gerät darf NUR mit dem mitgelieferten Akkuladegerät aufgeladen werden. Das Akkuladegerät ist nur für den Gebrauch in Innenräumen vorgesehen. Bitte sorgen Sie für ausreichende Belüftung während des Aufladens.

Ladegerät:	Eingangsspannung:	100-240 V AC +/- 10 %
	Eingangsfrequenz:	50-60 Hz +/- 10 %
	Eingangsstromstärke:	0,4 A bei 100 VAC .. 0,2 A bei 240 VAC
	Ausgangsspannung:	Max. 10,1 VDC
	Ausgangsstromstärke:	Max. 1,5 A

✍ Hinweis: Schließen Sie das Ladegerät durch Verbinden des entsprechenden Adapters an das Stromnetz an. Wenden Sie sich für weitere Informationen an den Hersteller.

Reinigungsanweisungen

Ve vrwenden Sie KEINE Reinigungsmittel zum Reinigen des Analysegeräts oder Akkuladegeräts, da sie die sichere Verwendung dieser Geräte beeinträchtigen können.

Good Practice beim Ablesen

⚠ Warnhinweise	Das Einatmen von Schwefelwasserstoffgas (H_2S) oder anderer schädlicher Gase kann tödlich sein. Es liegt in der Verantwortung des Benutzers sicherzustellen, dass er/sie angemessen über die Sicherheitsaspekte beim Einsatz von H_2S und anderer schädlicher Gase geschult ist. Vor allem beim Einsatz gefährlicher Gase muss das vom Analysator ausströmende Gas in einen Bereich geleitet werden, in dem das Gas sicher abgeführt werden kann. Gefährliches Gas kann ebenso vom Gerät ausgestossen werden, wenn es mit sauberer Luft ausgeblasen wird.

Good Practice

- Transportieren Sie den Gasanalysator im Inneren des Fahrzeugs an den Einsatzort - nicht auf der Ladefläche, wo er Temperaturschwankungen und möglichen Stößen ausgeliefert ist. Platzieren Sie den Gasanalysator nicht direkt an oder auf etwas Heißem (z. B. Gasleitung, Karosserie oder in einem unbeaufsichtigten Auto während des Sommers), da dies einen Temperaturanstieg im Gasanalysator verursacht und zu fehlerhaften Messwerten führen kann.

- Schützen Sie den Gasanalysator am Einsatzort vor starkem, direktem Sonnenlicht und starkem Regen.

Verwenden Sie stets den Wasserabscheider! Wenn der Wasserabscheider überschwemmt wird, tauschen Sie den Filter aus, und stellen Sie sicher, dass alle Schläuche frei von Feuchtigkeit sind, bevor Sie sie erneut verwenden.

✍ Hinweis: Wenn der Auslass eines Gasanalysators der Serie GA5000 an ein druckbeaufschlagtes System angeschlossen ist, dann führt dies zu einem Gasstrom aus dem Einlassstromanschluss.

Kalibrieren

⚠ Warnhinweise	Eichgase können gefährlich sein. Vor dem Verfahren müssen die Materialsicherheitsdatenblätter aller verwendeten Gase gelesen und verstanden werden.

Der mit dem Kalibrierset gelieferte Regulator wurde so konfiguriert, dass er einen unveränderlichen Durchfluss liefert.

Da der Durchfluss des Regulators werkseitig eingestellt ist, lässt der Regulator sich mit nur wenigen Drehungen öffnen; eine Einstellung ist nicht erforderlich.

⚠ Warnhinweise	Austrittsöffnung Wenn der Gasanalysator kalibriert wird, gibt es zwei mögliche Ausgänge für das Gas: auf die übliche Art über die Austrittsöffnung (gelb) des Analysators oder bei Überdruck über die 1/16"Öffnung des roten Druckentlastungsventils, das sich am Regler befindet. Für beide Öffnungen wird das Anbringen von Auslassrohrleitungen empfohlen. Die Auslassrohrleitungen müssen in einen gut belüfteten Bereich führen. Stellen Sie sicher, dass es in den Rohrleitungen und an den Verbindungen keine Undichtigkeiten gibt. Das Kalibrieren des Gasanalysators muss in einem sicheren Bereich unter Anwendung aller notwendigen Sicherheitsvorkehrungen durchgeführt werden, wenn möglicherweise gefährliche, explosive oder toxische Gase eingesetzt werden.

✍ Hinweis: Es besteht außerdem die Möglichkeit, dass Gas aus dem internen Strömungsanschluss (blau) des Gasanalysators ausgestoßen wird (gilt nur für GA5000).

Wartung

Die Gasanalysatoren der 5000er Serie müssen regelmäßig gewartet werden, um den korrekten und genauen Betrieb zu gewährleisten. LANDTEC empfiehlt ein Wartungs- und Neukalibrierungsintervall von 6 Monaten.

Die Gasanalysatoren der 5000er Serie sind für den Einsatz in explosionsgefährdeten Bereichen ATEX-zertifiziert. Daher dürfen sie nur von qualifizierten Technikern gewartet werden. Im Falle der Nichtbefolgung erlischt die Garantie, und die ATEX-Zertifizierung kann ihre Gültigkeit verlieren.

⚠ Warnhinweise	Falls derGasanalysator von unqualifizierten Technikern gewartet wird, kann die ATEX-Zertifizierung ihre Gültigkeit verlieren, und das Gerät ist möglicherweise für den Einsatz in einer explosionsgefährdeten Atmosphäre nicht mehr sicher.

Teile, die durch den Benutzer gewartet werden können:

Im Gerät gibt es keine Teile, die durch den Benutzer gewartet werden können.

Die folgenden Teile können durch den Benutzer gewartet werden:

Wasserleitungsfilter	Er muss regelmäßig auf Verstopfungen, Feuchtigkeit bzw. Beschädigungen untersucht und, falls erforderlich, ausgetauscht werden. Das Gerät darf nie ohne den Wasserleitungsfilter betrieben werden, da dies dazu

	führen könnte, dass Wasser in das Gerät eindringt.
Probenrohrleitungen	Stellen Sie stets sicher, dass die Probenrohrleitungen weder verunreinigt noch beschädigt sind.
Gasausgangsanschlüsse	Prüfen Sie periodisch, ob die O-Ringe an den Gasausgangsanschlüssen beschädigt sind. Durch einen beschädigten O-Ring kann Luft in das Messgas eindringen und zu falschen Messwerten führen. Falls der O-Ring beschädigt ist, muss der gesamte Gasausgangsanschluss ausgetauscht werden.
H_2S Filtermaterial	Sobald die Farbe des Filtermaterials leicht grau wird, muss der Filter ausgetauscht werden.

Konformitätserklärung - Deutsch

Produkte	• GA5000 - Deponiegasanalysator • GEM5000 - Deponiegasanalysator und Extraktionsüberwachungsgerät • BIOGAS 5000 - Gasanalysator für anaerobe Biogasanlage

QED Environmental Systems Limited erklärt, dass das/die oben beschriebene(n) Produkt(e) den folgenden Normen entsprechen:

ATEX-Richtlinie 94/9/EG

Zertifizierungsstelle	SIRA Certification Service
Nummer der benannten Stelle	0518
Adresse	Rake Lane, Eccleston, Chester, CH4 9JN, UK
SIRA Bescheinigungsnummer	SIRA 11ATEX2197X
Angewendete Normen	EN60079-0 :2006 EN60079-0 :2009 EN60079-11 :2007

IECEx

Zertifizierungsstelle	SIRA Certification Service
Nummer der benannten Stelle	0518
Adresse	Rake Lane, Eccleston, Chester, CH4 9JN, UK
IECEx Bescheinigungsnummer	SIR 11.0089X
Angewendete Normen	IEC60079-0 :2004 Ed4 IEC60079-0 :2007 Ed5 IEC60079-11 :2006 Ed5

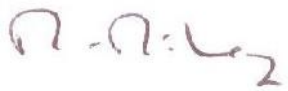
CSA (Kanada und USA)

Zertifizierungsstelle	CSA International
Adresse	178 Rexdale Boulevard, Toronto, ON, Kanada M9W 1R3
CSA Bescheinigungsnummer	CSA 11 2445306
Angewendete Normen	C22.2 Nr. 0-10 – Allgemeine Anforderungen – Kanadische Elektrorichtlinie, Teil II CAN/CSA-C22.2 Nr. 60079-0:07 - Elektrisches Gerät für explosionsfähige Gasatmosphären - Teil 0: Allgemeine Anforderungen CAN/CSA-C22.2 Nr. 60079-1:07 - Elektrisches Gerät für explosionsfähige Gasatmosphären - Teil 1: Druckfeste Kapselung „d“ CAN/CSA-E60079-11:02 - Elektrisches Gerät für explosionsfähige Gasatmosphären - Teil 11: Eigensicherheit „i“ ANSI/UL 60079-0:09 - Elektrisches Gerät für explosionsfähige Gasatmosphären - Teil 0: Allgemeine Anforderungen ANSI/UL 60079-1:09 - Elektrisches Gerät für explosionsfähige Gasatmosphären - Teil 1: Druckfeste Kapselung „d“ ANSI/UL 60079-11:09 - Elektrisches Gerät für explosionsfähige Gasatmosphären - Teil 11: Eigensicherheit „i“

EMC Richtlinie 2004/108/EG

EN 301 489 Teil 1 (V1.9.1 - 2011-04)	Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM); Elektromagnetische Verträglichkeit (EMV) für Funkeinrichtungen und -dienste; Teil 1: Gemeinsame technische Anforderungen
EN 301 489 Teil 17 (V2.1.1 - 2009-05)	Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM); Elektromagnetische Verträglichkeit (EMV) für Funkeinrichtungen; Teil 17: Spezifische Bedingungen für Breitband-Datenübertragungssysteme EMV für Breitbandübertragungssysteme
EN 301 489 Teil 19 (V1.2.1. - 2002-11)	Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM); Elektromagnetische Verträglichkeit (EMV) für Funkeinrichtungen und -dienste; Teil 19: Spezifische Bedingungen für mobile Empfangs-Erdfunkstellen (ROMES) zur Datenübertragung im 1,5-GHz-Frequenzband EMV für mobile Empfangs-Erdfunkstellen (ROMES)
BS EN 61000-3-2: 2006 + A2:2009	Elektromagnetische Verträglichkeit (EMV). Grenzwerte. Emissionsgrenzwerte für Oberschwingungsstrom (Geräteeingangsstrom ≤ 16 A je Leiter)
BS EN 61000-3-3: 2008	Elektromagnetische Verträglichkeit (EMV). Grenzwerte. Begrenzung von Spannungsänderungen, Spannungsschwankungen und Flimmern in öffentlichen Niederspannungs-Versorgungsnetzen für Geräte mit einem Bemessungsstrom ≤ 16 A je Leiter, die keiner Sonderanschlussbedingung unterliegen.

Unterschrift:



Dr. Roger Riley

16.3 Instructions for safe use – French language

Instructions concernant la sécurité

⚠ Avertissement	Les analyseurs de gaz de la série 5000 sont conçus pour mesurer les gaz des sites d'enfouissement et d'autres sources, comme le décrit le présent manuel. L'opérateur risque d'être exposé à des gaz nocifs pendant l'utilisation de l'instrument. L'inhalation de ces gaz peut être nuisible à la santé et, dans certains cas, mortelle. Il incombe à l'utilisateur de s'assurer qu'il a reçu une formation adaptée aux aspects de la sécurité des gaz utilisés et de s'assurer du respect des procédures appropriées. En particulier, lors de l'utilisation de gaz dangereux, les gaz en sortie de l'analyseur doivent être évacués dans une zone où ils ne présentent aucun danger. Des gaz dangereux peuvent être également expulsés de l'instrument lors d'une purge à l'air propre.

✍ Remarque : Les analyseurs de gaz sont des instruments scientifiques sensibles qu'il convient de traiter en conséquence. Toute utilisation du matériel non conforme aux instructions du fabricant risque d'amoindrir la protection assurée par l'instrument.

Les analyseurs de gaz de la série 5000 sont conformes à l'article 15 de la réglementation FCC (Federal Communications Commission - Conseil supérieur de l'audiovisuel américain). Son utilisation est soumise aux deux conditions suivantes :

1) Cet appareil ne doit pas provoquer d'interférences nuisibles.

2) Cet appareil doit accepter toutes les interférences reçues, y compris celles qui pourraient provoquer un fonctionnement indésirable.

Dans le cadre des certifications ATEX et IECEx, l'analyseur de gaz de la série 5000 est certifié pour la catégorie zone dangereuse.

Ex II 2G Ex ib IIA T1 Gb (Ta = -10ºC à +50ºC)

Il est absolument indispensable de respecter les instructions contenues dans ce manuel. Il incombe à l'utilisateur de déterminer le type et la classification de protection requise pour une application spécifique.

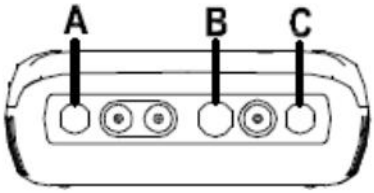
Instructions pour une utilisation sûre– Français

(Référence Directive européenne ATEX 94/9/CE, Annexe II, 1.0.6.)
Les instructions suivantes s'appliquent au matériel couvert par les numéros de certificat SIRA 11ATEX2197X et IECEx Directive SIR 11.0089X :

- Le matériel est utilisable avec des gaz et des vapeurs inflammables et des appareils de

groupe IIA et de classe de température T1.

- Le matériel est certifié uniquement pour une utilisation à température ambiante entre -10ºC et +50ºC et ne doit pas être utilisé en dehors de cette plage.
- Le matériel ne doit pas être utilisé dans une atmosphère contenant plus de 21% d'oxygène.
- Ce matériel devra être réparé conformément au code de pratique applicable.
- Lors d'une utilisation en zone dangereuse, utilizer exclusivement une sonde de température GF5.2 (SIRA 11ATEX2197X et IECEx SIR11.0089X). Pour le connecteur C, l'anémomètre GF5.4 (BVS 04ATEXE194) ne s'utilize qu'avec les dispositifs certifiés ATEX. L'analyseur ne doit être raccordé à aucun autre dispositif dans la zone dangereuse, ni au câble GF-USB (connecteur A) ni au chargeur de batterie GF3.9 (connecteur B) fourni avec l'analyseur.



Ne pas charger, recharger ni ouvrir en atmosphère potentiellement explosive.
Dans une zone dangereuse, utiliser exclusivement la sonde de température GF5.2 branchée dans le connecteur B.
Connecteur C (Uo=10 V, Io=5 mA, Po=50 mW, Ci=0, Li=0, Co=100 uF, Lo=1 000 mH),
Connecteur B (Uo=5 V, Io=6 mA, Po=7 mW, Ci=0, Li=0, Co=100 uF, Lo=1 000 mH)

ALIMENTATIONS MAXIMALES NON DANGEREUSES :
Connecteur A - Um=6 V Connecteur B - Um=10,1 V

- Si le matériel est amené à être en contact avec des substances corrosives, par exemple des liquides ou des gaz acides susceptibles d'attaquer les métaux, ou des solvants pouvant affecter des polymères, il incombe alors à l'utilisateur de prendre des précautions appropriées, par exemple des contrôles réguliers dans le cadre d'inspections systématiques, ou des vérifications sur la fiche technique de la résistance du matériau à des produits chimiques spécifiques, ceci afin de préserver l'intégrité de la protection.

- La plage de pression relative est de +/-500 mbar. Cependant, il convient de noter que la pression d'entrée ne doit pas dépasser +/- 500 mbar par rapport à la pression atmosphérique et la pression de sortie ne doit pas dépasser +/- 100 mbar par rapport à la pression atmosphérique.

<u>Pour CSA (Canada), l'analyseur de gaz de la série 5000 est certifié pour la catégorie zone dangereuse</u>

CLASSE 2258 03 - ÉQUIPEMENT DE CONTRÔLE DES PROCÉDÉS - Appareils à sécurité intrinsèque et appareils non incendiaires pour emplacements dangereux

C US
M.C.#243446

Ex ib IIA :

Détecteurs de méthane Modèle GA 5000, GEM 5000 et BIOGAS 5000 ; appareils portatifs, avec batterie alimentée par bloc de batterie (numéro de pièce 20087) non remplaçable sur place ; à sécurité intrinsèque et fournissant des circuits à sécurité intrinsèque (« [ib] » pour zone 1) pour sonde de température modèle GF5.2 (connecteur B) et avec paramètres de sortie comme indiqué au tableau ci-dessous ; code de température T1; -10 ºC ≤ Tamb. ≤ +50 ºC.

Connecteur	Paramètres						
	Uo (V)	Io (mA)	Po (mW)	Co (uF)	Lo (mH)	Ci (uF)	Li (mH)
B	5,0	6	7	100	1 000	0	0
C	10,0	5	50	100	1 000	0	0

✍ Remarque : Les tests effectués sur cet appareil concernaient uniquement la sécurité électrique.

Pour CSA (États-Unis), l'analyseur de gaz de la série 5000 est certifié pour la catégorie zone dangereuse

CLASSE 2258 83 - ÉQUIPEMENT DE CONTRÔLE DES PROCÉDÉS - Appareils à sécurité intrinsèque et appareils non incendiaires pour emplacements dangereux - CERTIFICATION AUX NORMES AMÉRICAINES (ÉTATS-UNIS)

C US
M.C.#243446

AEx ib IIA :

Détecteurs de méthane Modèle GA 5000, GEM 5000 et BIOGAS 5000 ; appareils portatifs, avec batterie alimentée par bloc de batterie (numéro de pièce 20087) non remplaçable sur place ; à sécurité intrinsèque et fournissant des circuits à sécurité intrinsèque (« [ib] » pour zone 1) pour sonde de température modèle GF5.2 (connecteur B) et avec paramètres de sortie comme indiqué au tableau ci-dessous ; code de température T1; -10 ºC ≤ Tamb. ≤ +50 ºC.

Connecteur	Paramètres						
	Uo (V)	Io (mA)	Po (mW)	Co (uF)	Lo (mH)	Ci (uF)	Li (mH)
B	5,0	6	7	100	1 000	0	0
C	10,0	5	50	100	1 000	0	0

✍ Remarque : Les tests effectués sur cet appareil concernaient uniquement la sécurité électrique.

MCERTS

MCERTS est le programme de certification de la surveillance, établi par l'agence britannique à l'Environnement. Ce programme forme le cadre dans lequel des mesures environnementales peuvent être effectuées conformément aux exigences de qualité de l'agence. Il couvre un ensemble d'activités de surveillance, d'échantillonnage et d'inspection.

L'instrument BIOGAS 5000 n'est certifié MCERTS que si :

õ Le logo MCERTS s'affiche à l'écran après la mise sous tension de l'instrument.

✍ Remarque : MCERTS - Cet instrument n'a pas fait l'objet de tests de sensibilité croisée utilisant le sulfure d'hydrogène. Par conséquent, les utilisateurs doivent être conscients qu'en cas de présence de H_2S sur les sites, il peut y avoir un effet d'interférence.

Le programme MCERTS contribue à renforcer la confiance du public vis-à-vis des données de surveillance et donne à l'industrie des paramètres sûrs pour le choix de systèmes et de services de surveillance répondant aux exigences de performance de l'agence.

L'agence à l'Environnement a établi ce programme MCERTS (Monitoring Certification Scheme) pour fournir des valeurs mesurées environnementales de qualité. La certification MCERTS concerne les produits aux normes de performance de l'agence à l'Environnement, sur la base des normes nationales, CEN et ISO pertinentes.

Les instruments certifiés MCERTS sont testés par un organisme indépendant pour assurer leur conformité à certaines exigences de performance. En outre, le fabricant de produits MCERTS fait l'objet d'audits réguliers pour s'assurer du respect continu des exigences de performance de ses produits aux fins de certification.

Les analyseurs de gaz de la série 5000 ont été certifiés conformément à la version 3.1 des « Normes de performance des systèmes portatifs de surveillance des émissions de substances dans l'atmosphère ».

Batterie et mise en charge

Les analyseurs de gaz de la série 5000 sont dotés d'une batterie au nickel-métal-hydrure, à six cellules individuelles intégrées. Ce type de batterie n'est pas aussi sensible à « l'effet de mémoire » qui affecte les capacités des piles au nickel cadmium. Il est cependant déconseillé de recharger la batterie par à-coups.

Débrancher le chargeur uniquement après indication de pleine charge.

⚠ Avertissement	Le chargeur de batterie n'est PAS couvert par la certification Ex. La batterie ne doit être chargée que dans un endroit sûr.

Le chargeur de batterie est intelligent et indique que la batterie est en cours de chargement ou chargée.

La batterie doit être chargée UNIQUEMENT à l'aide du chargeur fourni avec l'instrument. Le chargeur de batterie doit être utilisé uniquement à l'intérieur. Veiller à assurer une ventilation adéquate pendant le chargement.

Chargeur :
- Tension d'entrée : 100-240 V CA +/- 10 %
- Fréquence d'entrée : 50-60 Hz +/- 10 %
- Courant d'entrée : 0,4 A@100 V CA.. 0,2 A@240 V CA

- Tension de sortie : 10,1 V CC max
- Courant de sortie : 1,5 A max

✍ Remarque : connecter le chargeur à l'alimentation secteur à l'aide de l'adaptateur approprié. Contacter le fabricant pour de plus amples informations.

Instructions de nettoyage

Ne PAS utiliser d'agents nettoyants pour nettoyer l'analyseur ou le chargeur de batterie car ces produits risquent d'avoir un effet préjudiciable sur l'utilisation sûre de ces appareils.

Bonnes pratiques lors des mesures

⚠ Avertissement	L'inhalation de sulfure d'hydrogène (H_2S) ou d'autres gaz dangereux peut entraîner la mort. Il incombe à l'utilisateur de s'assurer qu'il a reçu la formation adaptée aux aspects sécurité de l'utilisation de H_2S et d'autres gaz dangereux. En particulier, lors de l'utilisation de gaz dangereux, les gaz en sortie de l'analyseur doivent être évacués dans une zone où ils ne présentent aucun danger. Des gaz dangereux peuvent aussi être expulsés de l'instrument lors d'une purge à l'air propre.

Bonnes pratiques

- Lors d'un déplacement vers un site d'utilisation, transporter l'instrument dans l'habitacle du véhicule, et non pas dans le coffre où il pourrait être soumis à des températures extrêmes, voire à des chocs risquant de l'endommager. Ne pas placer l'analyseur de gaz contre des surfaces chaudes (conduite d'extraction de gaz, carrosserie d'une voiture ou voiture laissée sans surveillance en été, par exemple) car les effets de la chaleur sur l'analyseur risquent d'entraîner des valeurs mesurées incorrectes.

- Lors du déplacement sur site, protéger l'analyseur de gaz de la lumière solaire directe et des fortes intempéries.

Toujours utiliser le piège à eau ! Si le piège à eau déborde, changer le filtre et vérifier que tous les tuyaux ne présentent aucune trace d'humidité avant toute utilisation.

✍ Remarque : si l'évacuation d'un analyseur de gaz de la série GA5000 est connectée à un système sous pression, un flux de gaz s'échappera du port de débit d'entrée.

Étalonnage

⚠ Avertissement	Les gaz d'étalonnage peuvent être dangereux.

	Pour chaque gaz utilisé, il convient de lire et de comprendre la fiche de données de sécurité correspondante avant de poursuivre.

Le régulateur fourni avec le kit d'étalonnage a été configuré pour assurer un débit fixe.

Le débit du régulateur étant réglé en usine, il ne faut que quelques tours pour l'ouvrir et aucun réglage n'est nécessaire.

⚠ Avertissement	Orifice d'évacuation Lors de l'étalonnage de l'analyseur de gaz, le gaz peut être évacué par deux orifices : par l'orifice d'évacuation normal (jaune) de l'analyseur ou, dans les cas de surpression, par l'orifice de 1/16 de pouce de la soupape de surpression rouge située sur le régulateur. Il est recommandé de raccorder des tuyaux d'évacuation à ces deux orifices. Le tuyau d'évacuation doit laisser les gaz s'échapper dans un endroit bien ventilé. Vérifier que les tuyaux et les raccords ne présentent aucune fuite. L'étalonnage de l'analyseur de gaz doit s'effectuer dans un endroit sûr, en observant toutes les précautions nécessaires en présence de gaz potentiellement dangereux, explosifs ou toxiques.

✍ Remarque : le gaz peut être aussi expulsé au niveau du port de débit interne (bleu) de l'analyseur de gaz (applicable uniquement au modèle GA5000).

Entretien

Pour un fonctionnement correct et précis, l'analyseur de gaz de la série 5000 doit faire l'objet d'un entretien régulier. QED recommande un entretien et un réétalonnage tous les 6 mois.

Les analyseurs de gaz de la série 5000 sont certifiés ATEX pour l'utilisation en environnements potentiellement explosifs. En conséquence, leur entretien doit être effectué uniquement par des techniciens qualifiés. Le non-respect de cette exigence entraînera l'annulation de la garantie, voire de la certification ATEX.

⚠ Avertissement	Si l'analyseur de gaz fait l'objet d'un entretien par des techniciens non qualifiés, la certification ATEX risque d'être annulée et l'appareil peut ne pas être sûr en cas d'utilisation dans un environnement potentiellement explosif.

Composants pouvant faire l'objet d'un entretien par l'utilisateur :

L'appareil ne contient aucun composant interne pouvant faire l'objet d'un entretien par l'utilisateur.

Les composants suivants peuvent faire l'objet d'un entretien par l'utilisateur :

Filtre à eau en ligne	Contrôler ce filtre régulièrement pour rechercher la présence d'obstructions, d'humidité ou de dommages ; le remplacer si besoin est. L'appareil ne doit jamais être utilisé sans le filtre à eau en ligne pour prévenir la pénétration d'eau dans l'appareil.
Tuyau d'échantillonnage	Toujours vérifier que les tuyaux d'échantillonnage ne sont ni contaminés ni endommagés.
Raccords d'orifices de gaz	Contrôler périodiquement les joints toriques des raccords d'orifices de gaz pour s'assurer qu'ils ne sont pas endommagés. Un joint torique endommagé peut laisser passer l'air dans le gaz d'échantillonnage et entraîner des valeurs mesurées incorrectes. Remplacer le raccord complet si le joint torique est endommagé.
Matériau du filtre à H_2S	Remplacer le filtre lorsque le matériau du filtre change de couleur et devient gris clair.

Déclaration de conformité – English Language [Français]

Produits	• GA5000 - Analyseur de gaz de sites d'enfouissement • GEM5000 - Analyseur de gaz de sites d'enfouissement et moniteur d'extraction • BIOGAS 5000 – Analyseur de gaz de digesteur anaérobie

QED Environmental System Ltd déclare que les articles décrits ci-dessus sont conformes aux normes suivantes :

ATEX Directive 94/9/EC

Certification body	SIRA Certification Service [Service de certification SIRA]
Numéro d'organisme notifié	0518
Adresse	Rake Lane, Eccleston, Chester, CH4 9JN, Royaume-Uni
Numéro de certificat SIRA	SIRA 11ATEX2197X
Normes appliquées	EN60079-0 :2006 EN60079-0 :2009 EN60079-11 :2007

IECEx

Organisme de certification	SIRA Certification Service [Service de certification SIRA]
Numéro d'organisme notifié	0518
Adresse	Rake Lane, Eccleston, Chester, CH4 9JN, Royaume-Uni
Numéro de certificat IECEx	SIR 11.0089X
Normes appliquées	IEC60079-0 :2004 Ed4 IEC60079-0 :2007 Ed5 IEC60079-11 :2006 Ed5

CSA (Canada et États-Unis)

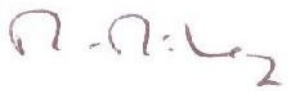
Organisme de certification	CSA International
Adresse	178 Rexdale Boulevard, Toronto, ON, Canada M9W 1R3
Numéro de certificat CSA	CSA 11 2445306
Normes appliquées	C22.2 No. 0-10 - Règles générales - Code canadien de l'électricité, Deuxième partie CAN/CSA-C22.2 No. 60079-0:07 - Matériel électrique pour atmosphères gazeuses explosives - Partie 0 : Règles générales CAN/CSA-C22.2 No. 60079-1:07 - Matériel électrique pour atmosphères gazeuses explosives - Partie 1 : Enceintes antidéflagrantes « d » CAN/CSA-E60079-11:02 - Matériel électrique pour atmosphères gazeuses explosives - Partie 11 : Sécurité intrinsèque « i » ANSI/UL 60079-0:09 - Matériel électrique pour atmosphères gazeuses explosives - Partie 0 : Règles générales ANSI/UL 60079-1:09 - Matériel électrique pour atmosphères gazeuses explosives - Partie 1 : Enceintes antidéflagrantes « d » ANSI/UL 60079-11:09 - Matériel électrique pour atmosphères gazeuses explosives - Partie 11 : Sécurité intrinsèque « i »

Directive CEM 2004/108/CEE

EN 301 489 Partie 1 (V1.9.1 – 2011-04) EN 301 489 Partie 17 (V2.1.1 – 2009-05)	Compatibilité électromagnétique et spectre radioélectrique (ERM) ; Norme de compatibilité électromagnétique (CEM) pour les équipements et services radio ; Partie 1: Exigences techniques communes Compatibilité électromagnétique et spectre radioélectrique (ERM) ; Norme de compatibilité électromagnétique (CEM) pour les équipements et services radio ; Partie 17 : Conditions particulières pour

EN 301 489 Partie 19 (V1.2.1 – 2002-11)	Les systèmes de transmission de données à large bande CEM pour les systèmes de transmission de données à large bande Compatibilité électromagnétique et spectre radioélectrique (ERM) ; Norme de compatibilité électromagnétique (CEM) pour les équipements et services radio ; Partie 19 : Conditions particulières pour les stations terriennes mobiles fonctionnant seulement en réception (ROMES) dans la bande de fréquences de 1,5 GHz pour la réception de données
BS EN 61000-3-2 : 2006 + A2:2009	CEM pour les stations terriennes mobiles fonctionnant seulement en réception (ROMES)
BS EN 61000-3-3 : 2008	Compatibilité électromagnétique (CEM) Limites. Limites pour les émissions de courant harmonique (courant appelé par les appareils ≤16 A par phase) Compatibilité électromagnétique (CEM) Limites. Limitation des variations de tension, des fluctuations de tension et de l'oscillation dans les réseaux publics d'alimentation basse tension, pour les matériels ayant un courant assigné ≤16 A par phase et non soumis à un raccordement conditionnel

Signature:



Dr. Roger Riley

16.4 Instructions for safe use – Spanish language

Instrucciones de seguridad

⚠ Advertencia	La serie 5000 de analizadores de gas puede usarse para medir gases de vertederos y otras fuentes de la forma descrita en este manual. El operario puede estar expuesto a gases perjudiciales durante el uso del instrumento. La inhalación de estos gases puede ser nociva para la salud y, en algunos casos, incluso mortal. El usuario es responsable de garantizar que está debidamente formado en los aspectos de seguridad de los gases utilizados y que se respetan los procedimientos adecuados, especialmente en los lugares en los que se usan gases peligrosos, en los cuales el gas emitido por el analizador debe conducirse por un tubo hasta una zona en la que pueda liberarse con seguridad. El instrumento también puede emitir gases peligrosos si se purga con aire limpio.

✍ Nota: los analizadores de gas son instrumentos especialmente delicados del equipamiento científico y deben tratarse con especial cuidado. Un uso del equipo no conforme a las especificaciones del fabricante podría afectar al sistema de protección.

La serie 5000 de los analizadores de gas cumple las estipulaciones establecidas en la Parte 15 de la normativa de la FCC. El funcionamiento depende de las dos condiciones siguientes:

1) El instrumento no debe causar interferencias perjudiciales.

2) El instrumento debe admitir cualquier interferencia que pueda recibir, incluidas aquellas que podrían causar un funcionamiento no deseado.

En cuanto a las directivas ATEX e IECEx, la serie 5000 de analizadores de gas ha recibido la certificación de clasificación de área peligrosa

Ex II 2G Ex ib IIA T1 Gb (Ta = de -10 ºC a +50 ºC)

Es de vital importancia que se sigan rigurosamente las instrucciones. El operario es responsable de determinar la noción de protección y la clasificación necesaria para cada aplicación específica.

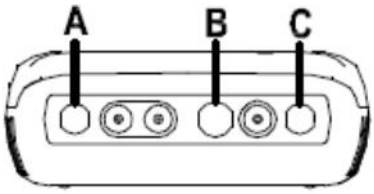
Instrucciones de seguridad (español)

(Directiva europea ATEX de referencia 94/9/CE, anexo II, 1.0.6.)
Las siguientes instrucciones se aplican a los instrumentos cubiertos por los números de certificado SIRA 11ATEX2197X y la norma IECEx SIR 11.0089X:

- El instrumento puede utilizarse con gases y vapores inflamables con el grupo de

aparatos IIA y la clase de temperatura T1.

- El instrumento sólo está certificado para su uso a temperatura ambiente, comprendida entre -10 ºC y +50 ºC, y no debe utilizarse a diferentes temperaturas.
- El instrumento no debe usarse en lugares con una concentración de oxígeno superior al 21 %.
- La reparación del instrumento ha de realizarse de acuerdo con el código profesional aplicable.
- Si se utiliza en un área peligrosa, utilice solo la sonda de temperatura GF5.2 (SIRA 11ATEX2197X e IECEx SIR11.0089X). En cuanto al conector C, utilice el anemómetro GF5.4 (BVS 04ATEXE194) únicamente con ATEX. En las mencionadas zonas de riesgo, el analizador no debe conectarse a ningún otro aparato en el área peligrosa, incluidos el cable GF-USB (conector A) o el cargador de batería GF3.9 (conector B) suministrados con el propio analizador.



No cargar, recargar o abrir en lugares en los que exista riesgo de explosión.
En áreas peligrosas, utilice solo la "sonda de temperatura GF5.2" en el conector B.
Conector C (Uo=10 V, Io=5 mA, Po=50 mW, Ci=0, Li=0, Co=100 uF, Lo=1000 mH),
Conector B (Uo=5 V, Io=6 mA, Po=7 mW, Ci=0, Li=0, Co=100 uF, Lo=1000 mH)

SUMINISTROS MÁXIMOS NO PELIGROSOS:
Conector A - Um=6 V Conector B - Um=10,1 V

- En caso de riesgo de contacto con sustancias agresivas, p. ej. líquidos o gases ácidos que pueden atacar a los metales o disolventes que pueden afectar a los materiales poliméricos, el usuario es responsable de adoptar las medidas de precaución adecuadas, como las comprobaciones periódicas que sean necesarias como parte de las inspecciones rutinarias o determinar, a partir de la hoja de especificaciones del material, su resistencia a determinados productos químicos que puedan anular sus cualidades de protección, gracias a lo cual se asegura que el tipo de protección no queda comprometido.

- El intervalo de presión relativa es +/- 500 mbar. Tenga en cuenta que, sin embargo, la presión de entrada no debería exceder +/- 500 mbar ni la presión de salida +/- 100 mbar en relación a la presión atmosférica.

<u>Con respecto a la CSA (Canadá), la serie 5000 de analizadores de gas cuenta con la certificación de clasificación de área peligrosa</u>

CLASE 2258 03 - EQUIPO DE CONTROL DE PROCESOS - Sistemas intrínsecamente seguros y no inflamables - Para ubicaciones peligrosas

C US
M.C.#243446

Ex ib IIA:

Detectores de metano modelos GA 5000, GEM 5000 y BIOGAS 5000; paquete de batería portátil, alimentado por batería no recambiable en el lugar de uso N/P 20087; intrínsecamente seguro y con circuitos intrínsecamente seguros ("[ib]" para zona 1) a la sonda de temperatura (conector B) modelo GF5.2 y con los parámetros de salida de entidad como se indica en la siguiente tabla; código de temperatura T1; temperatura ambiente de -10 ºC a +50 ºC.≤≤

Conector	Parámetros de entidad						
	Uo (V)	Io (mA)	Po (mW)	Co (uF)	Lo (mH)	Ci (uF)	Li (mH)
B	5,0	6	7	100	1000	0	0
C	10,0	5	50	100	1000	0	0

✍ Nota: Se ha investigado este instrumento únicamente en relación a las características de seguridad eléctrica.

Con respecto a la CSA (EE. UU.), la serie 5000 de analizadores de gas cuenta con la certificación de clasificación de área peligrosa

CLASE 2258 83 - EQUIPO DE CONTROL DE PROCESOS - Sistemas intrínsecamente seguros y no inflamables - Para ubicaciones peligrosas - CERTIFICADO PARA LA NORMATIVA DE EE. UU.

C US
M.C.#243446

AEx ib IIA:

Detectores de metano modelos GA 5000, GEM 5000 y BIOGAS 5000; paquete de batería portátil, alimentado por batería no recambiable en el lugar de uso N/P 20087; intrínsecamente seguro y con circuitos intrínsecamente seguros ("[ib]" para zona 1) a la sonda de temperatura (conector B) modelo GF5.2 y con los parámetros de salida de entidad como se indica en la siguiente tabla; código de temperatura T1; temperatura ambiente de -10 ºC a +50 ºC.≤≤

Conector	Parámetros de entidad						
	Uo (V)	Io (mA)	Po (mW)	Co (uF)	Lo (mH)	Ci (uF)	Li (mH)
B	5,0	6	7	100	1000	0	0
C	10,0	5	50	100	1000	0	0

✍ Nota: Se ha investigado este instrumento únicamente en relación a las características de seguridad eléctrica.

MCERTS

MCERTS es el Esquema de certificación de control de la Agencia del Medio Ambiente del Reino Unido. Dicho esquema constituye el marco en el que realizar las mediciones medioambientales de acuerdo con los requisitos de calidad de la Agencia, y engloba toda una serie de actividades de control, recogida de muestras e inspección.

El instrumento BIOGAS 5000 cuenta con la certificación de MCERTS solo si:

õ Aparece el logotipo de MCERTS en la pantalla al encenderlo.

✍ Nota: MCERTS - no se han llevado a cabo en este instrumento pruebas de sensibilidad cruzada con sulfuro de hidrógeno. Por lo tanto, el usuario debe tener en cuenta la posibilidad de interferencias en caso de presencia de H_2S.

El MCERTS proporciona fiabilidad y confianza a la supervisión de datos y ofrece a la industria un marco contrastado para la elección de los sistemas de supervisión y servicios conformes con las exigencias de rendimiento de la Agencia del Medio Ambiente.

El objetivo de la creación del Esquema de certificación de control (MCERTS) de la Agencia del Medio Ambiente es realizar controles medioambientales de calidad. El MCERTS ofrece certificaciones de productos de acuerdo con las normas de rendimiento de la Agencia del Medio Ambiente, tomando como base normas relevantes CEN, ISO y nacionales.

Los instrumentos con la certificación MCERTS han sido evaluados por un organismo independiente con el fin de garantizar el cumplimiento con determinadas exigencias de rendimiento. Además, el fabricante de un producto con certificación MCERTS está sometido a auditorías periódicas que garantizan el constante cumplimiento con las exigencias de rendimiento del certificado.

La serie 5000 de analizadores de gas cuenta con la certificación de la versión 3.1 de las Normas de rendimiento para sistemas portátiles de control de emisiones.

Batería y carga

La batería de la serie 5000 de analizadores de gas es un paquete de hidruro metálico de níquel compuesto por seis células individuales. Este tipo de batería es menos susceptible a los "efectos de memorización" en las cargas máximas que las baterías de níquel-cadmio, si bien no es recomendable cargar la unidad al máximo.

No desconecte el cargador hasta que se indique que el instrumento está totalmente cargado.

⚠ Advertencia	NO se aplica la certificación Ex al cargador de la batería. Cargue siempre la batería en lugares seguros.

El cargador inteligente de la batería indica el estado de carga de la unidad y el fin de la carga.

El instrumento debe cargarse SÓLO con el cargador suministrado con el instrumento. El cargador de batería está concebido para su uso en interior. Asegúrese de que la ventilación es adecuada mientras carga la unidad.

Cargador: Voltaje de entrada: 100-240 V CA +/- 10%
Frecuencia de entrada: 50-60 Hz +/- 10%
Corriente de entrada: 0,4 A a 100 VCA .. 0,2 A a 240 VCA

Tensión de salida: 10,1 VCC máx.
Corriente de salida: 1,5 A máx.

✍ Nota: Conecte el cargador a la red eléctrica con el adaptador apropiado. Para más información, póngase en contacto con el fabricante.

Instrucciones de limpieza

NO utilice agentes limpiadores para limpiar el analizador o el cargador de la batería, ya que podrían tener efectos adversos en el uso seguro de los dispositivos.

Consejos de utilidad para efectuar lecturas

⚠ Advertencia	La inhalación de sulfuro de hidrógeno (H_2S) o de otros gases nocivos puede ser mortal. El usuario es responsable de garantizar que está debidamente formado en aspectos de seguridad en cuanto al uso de H_2S y de otros gases nocivos especialmente en los lugares en los que se usan gases peligrosos, en los cuales el gas emitido por el analizador debe conducirse por un tubo hasta una zona en la que pueda liberarse con seguridad. El instrumento también puede emitir gases peligrosos si se purga con aire limpio.

Consejos de utilidad

- En los desplazamientos, el analizador de gas debe llevarse en el interior del vehículo (nunca en el maletero), con objeto de evitar daños por temperaturas extremas o posibles impactos. No coloque el analizador de gas sobre superficies calientes (p. ej., tuberías de extracción de gas, carrocerías o vehículos aparcados a altas temperaturas); el aumento de la temperatura del analizador de gas afectaría a la precisión de las lecturas.

- Cuando se mueva por una zona, proteja el analizador de gas de la luz solar directa y la lluvia intensa.

Utilice siempre el colector de agua. Si rebosa, cambie el filtro y asegúrese de que ningún tubo esté húmedo antes de volver a usarlo.

✍ Nota: Si el escape de un analizador de gas de la serie GA5000 se conecta a un sistema presurizado, el gas se saldrá del orificio de entrada.

Calibrado

⚠ Advertencia	Los gases de calibrado pueden ser peligrosos. Lea atentamente las especificaciones de seguridad de cada gas utilizado antes de proceder al calibrado.

El regulador suministrado con el juego de calibrado está configurado para proporcionar un caudal fijo.

Dado que el caudal del regulador se ajusta en fábrica, solo hay que girarlo unas vueltas para abrirlo; no es necesario ajustarlo.

⚠ Advertencia	Orificios de escape Durante el calibrado del analizador de gas, existen dos salidas posibles para el gas: por la vía habitual, es decir, el orificio de escape del analizador (amarillo) o, en caso de sobrepresión, el orificio de 1,58 mm de la válvula roja de alivio

	de la presión situado en el regulador. Se recomienda conectar tubos de escape en ambos orificios. Los tubos de escape deben llegar a un área con ventilación suficiente. Asegúrese de que no haya fugas en los tubos ni las conexiones. El calibrado del analizador de gas debe realizarse en un área segura con todas las precauciones necesarias en el uso de gases potencialmente peligrosos, explosivos o tóxicos.

✍ Nota: También es posible que salga gas del orificio de caudal interno (azul) del analizador de gas (solo se aplica al GA5000).

Mantenimiento

Debe realizarse regularmente el mantenimiento de la serie 5000 de analizadores de gas con el fin de garantizar el funcionamiento correcto y preciso. QED recomienda que se lleve a cabo el mantenimiento y el recalibrado cada 6 meses.

La serie 5000 de analizadores de gas cuenta con la certificación ATEX para su uso en lugares con riesgo de explosión. Por lo tanto, únicamente los ingenieros cualificados pueden realizar el mantenimiento. En caso contrario, la garantía quedará anulada y podría invalidar la certificación ATEX.

⚠ Advertencia	Toda operación de mantenimiento del analizador de gas realizada por personal no cualificado puede dar lugar a la invalidación de la certificación ATEX, pudiendo igualmente afectar a la seguridad del uso del instrumento en lugares con riesgo de explosión.

Mantenimiento realizable por el usuario:

Este instrumento no contiene ninguna pieza o componente interior de cuyo mantenimiento pueda encargarse el usuario.

No obstante, el usuario puede encargarse del mantenimiento de los siguientes elementos:

Filtro de agua en línea	Comprobar periódicamente obstrucciones, humedad o daños y cambiar en caso necesario. No usar el instrumento sin el filtro de agua en línea; de lo contrario, podría penetrar agua en el interior.
Tubo de muestreo	Comprobar que no están contaminados ni dañados.
Conectores de los orificios de gas	Comprobar periódicamente que las juntas tóricas de los conectores de los orificios de gas no están dañadas. Una junta tórica dañada puede dejar pasar el aire en el gas de muestra y afectar a la precisión de las lecturas. En caso de daños en la junta tórica, sustituir todo el conector.

Material filtrante de H_2S	Si observa que el material filtrante cambia a un color gris claro, sustituir el filtro.

Declaración de conformidad (español)

Productos	• GA5000: analizador de gas para vertederos • GEM5000: analizador de gas para vertederos y monitor de extracción • BIOGAS 5000: analizador de gas para digestores anaerobios

QED Environmental Systems Limited declara la conformidad de los productos descritos con las siguientes normas:

Directiva ATEX 94/9/CE

Organismo de certificación	Servicio de certificación SIRA
Número de organismo notificado	0518
Dirección	Rake Lane, Eccleston (Chester) - CH4 9JN
Número de certificado SIRA	SIRA 11ATEX2197X
Normas aplicadas	EN60079-0 :2006 EN60079-0 :2009 EN60079-11 :2007

IECEx

Organismo de certificación	Servicio de certificación SIRA
Número de organismo notificado	0518
Dirección	Rake Lane, Eccleston (Chester) - CH4 9JN
Número de certificado IECEx	SIR 11.0089X
Normas aplicadas	IEC60079-0 :2004 Ed4 IEC60079-0 :2007 Ed5 IEC60079-11 :2006 Ed5

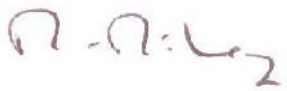
CSA (Canadá y EE. UU.)

Organismo de certificación	CSA International
Dirección	178 Rexdale Boulevard, Toronto, ON, Canadá M9W 1R3
Número de certificado CSA	CSA 11 2445306
Normas aplicadas	C22.2 N° 0-10 - Requisitos generales – Código Eléctrico Canadiense, Parte II CAN/CSA-C22.2 N° 60079-0:07 - Aparatos eléctricos para atmósferas explosivas - Parte 0: Requisitos generales CAN/CSA-C22.2 N° 60079-1:07 - Aparatos eléctricos para atmósferas explosivas - Parte 1: Compartimiento ignífugo "d" CAN/CSA-E60079-11:02 - Aparatos eléctricos para atmósferas explosivas - Parte 11: Seguridad intrínseca "i" ANSI/UL 60079-0:09 - Aparatos eléctricos para atmósferas explosivas - Parte 0: Requisitos generales ANSI/UL 60079-1:09 - Aparatos eléctricos para atmósferas explosivas - Parte 1: Compartimiento ignífugo "d" ANSI/UL 60079-11:09 - Aparatos eléctricos para atmósferas explosivas - Parte 11: Seguridad intrínseca "i"

Directiva CEM 2004/108/CEE

EN 301 489 Pt 1 (V1.9.1 – 2011-04)	Compatibilidad electromagnética y espectro radioeléctrico (ERM); Normativa de compatibilidad electromagnética (CEM) para equipos y servicios de radio; Parte 1: Requisitos técnicos comunes
EN 301 489 Pt 17 (V1.9.1 – 2009-04)	Compatibilidad electromagnética y espectro radioeléctrico (ERM); Normativa de compatibilidad electromagnética (CEM) para equipos de radio; Parte 17: Condiciones específicas para sistemas de transmisión de datos de banda ancha CEM para sistemas de transmisión de datos de banda ancha
EN 301 489 Pt 19 (V1.2.1 – 2002-11)	Compatibilidad electromagnética y espectro radioeléctrico (ERM); Normativa de compatibilidad electromagnética (CEM) para equipos y servicios de radio; Parte 19: Condiciones específicas para estaciones terrenas móviles de solo recepción (ROMES) que funcionan en la banda de 1,5 GHz proporcionando comunicaciones de datos CEM para estaciones terrenas móviles de solo recepción (ROMES)
BS EN 61000-3-2: 2006 + A2:2009	Compatibilidad electromagnética (CEM). Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada ≤ 16 A por fase)
BS EN 61000-3-3: 2008	Compatibilidad electromagnética (CEM). Límites. Límites de las variaciones de tensión, fluctuaciones de tensión y flicker en las redes públicas de alimentación de baja tensión para equipos con corriente asignada ≤ 16 A por fase y no sujetos a una conexión adicional.

Firmado:



Dr. Roger Riley

17.0 Glossary of terms

5000 series	The 5000 series refers to the GA5000, GEM5000 and the BIOGAS 5000 gas analyzers.
Analyzer error messages	Operational errors are prefixed on the analyzer by the word ERROR followed by an error code. Refer to the list of standard error codes for more information.
Analyzer warning	Analyzer warnings are prefixed by the word WARNING followed by a relevant description. There are two types of warning messages displayed; general warnings that may not necessarily affect the instrument's function (for example, battery power low) and operational parameters that could affect the performance of the analyzer (for example, CH_4 out of calibration).
Anemometer probe	Device for measuring velocity of gas in the pipe. The BIOGAS 5000 analyzer can be set to convert into a flow. See also flow measurement.
ATEX certification	The BIOGAS 5000 is ATEX certified to zone 1 & 2 areas above ground, not in mines.
Auxiliary channel	This refers to the channels where external devices will be connected or displayed.
Backlight	The analyzer has a built-in backlight for low ambient light conditions. This can be toggled on/off using the backlight key.
Barometric pressure	The atmospheric pressure at the given location.
Borehole	Typical location from which a gas sample is obtained.
Calibration	The gas analyzer is carefully calibrated against known standards.
Calibration record	The BIOGAS 5000 instrument has the facility to log user calibrations as a validation tool.
CH_4	Methane
Chemical cells	A method of gas detection that works on the basis of a chemical reaction with the target gas.

Clean air purge	Process used to clear out gas from the sample tube and analyzer prior to taking a new reading.
CO	Carbon monoxide
CO_2	Carbon dioxide
Download	Terminology used for the movement of data from the analyzer to the GAM application on the PC.
Dual beam infrared absorption	Method of gas detection by measuring how much infrared is absorbed by the target gas.
Event log	Used as an aid to monitoring the use of the analyzer. It can also be used as a diagnostic tool. The event log can be viewed via Gas Analyzer Manager. It cannot be viewed on the analyzer screen.
Exhaust port	The usual manner for the gas to exit the analyzer is via the exhaust port located on the top side of the analyzer. This port should have an exhaust tube attached.
Exhaust tube	Clear plastic tubing used to expel gases from the exhaust port.
Factory settings	Default settings preset at time of manufacture or service.
Firmware	Firmware is the term by which the internal analyzer software is known and is not accessible by the client. This firmware is updated to the latest version when the analyzer is returned in US for servicing.
Flow measurement	Flow can be measured by either gas velocity m/s or volume flow rate m^3/hr. This measurement of flow relates to the use of the anemometer and not the internal flow measurement technique.
Flow port	For the measurement of gas flow at the sample point.
Gas Analyzer Manager	Also referred to as GAM. PC based software which enables the operator to upload and download information to/from the analyzer. Gas Analyzer Manager enables operators to maximize the operation of their gas analyzer. It

	features a simple upload and download facility and is fully compatible with the latest Microsoft™ operating systems. This is optional.
Gas channels	The gases that are analyzed by the instrument.
Gas velocity	The positional rate of change of the gas. Measured using the optional anemometer.
General warnings	Displayed throughout the documentation with a warning symbol. Warning information may affect the safety of operators.
H_2	Hydrogen
H_2S	Hydrogen Sulphide
H_2S filter	Filter required for removal of H_2S. When the filter material changes color to a light grey color or if H_2S values are displayed, then the filter should be replaced.
Hydro-carbons	Organic compound consisting of only hydrogen and carbon.
In-line water filter	The component used to help protect the instrument from water ingress.
LCD display	Liquid Crystal Display
LEL	Lower Explosive Limit. Lower explosive limit of methane in air. 5% methane in air is the point at which it becomes explosive. 100% LEL equates to 5% methane.
m/s	Meters per second – measurement of gas velocity.
m^3/hr	Meters cubed per hour – volumetric flow rate measurement.
Main Gas Read Screen	The main analyzer screen for normal operations and all operations are carried out from this screen.
Material data sheet	Document from which information about a certain substance can be obtained.
MCERTS certification	MCERTS is the UK Environment Agency's Monitoring Certification Scheme. The scheme provides a framework within which

	environmental measurements can be made in accordance with the Agency's quality requirements. The scheme covers a range of monitoring, sampling and inspection activities.
Memory	Location where data and ID information is stored. The analyzer memory should not be used as a permanent storage medium. Stored data should be regularly transferred to the PC using the GAM download software.
NO_2	Nitrogen dioxide
Operating language	The operator can choose the default operating language for the analyzer. Choices are English, German, Spanish, French and Italian.
PPM	Parts per million
Pump	Used to draw the gas sample from the sample point to the analyzer. Select the pump key on the analyzer to activate.
ID	The user definable identification tag allocated to a sample point.
Relative pressure	The pressure at the sample point 'relative' to atmospheric (barometric) pressure.
Relative pressure transducer	The internal component used to measure the relative pressure.
Residual N_2	The calculation for the residual N_2 used on the latest version of the BIOGAS 5000 platform is as follows: Residual N_2 = Balance – (O_2% x 3.76) Where, Balance = 100% - (CH_4% + CO_2% + O_2%) and 3.76 is the ratio of O_2 to N_2 in ambient air (79/21)
Sample tube	The tube used to obtain a sample of gas from the sample point to the analyzer.
Span	The point at which the gas analyzer is calibrated when a known quantity of the target gas is present.
Span multi gas	Term by which the span calibration of the three main gas channels is known. This option must only be used when the calibration gas being used is a combination of CH_4, CO_2 and O_2.

Technician ID	An alpha-numeric code tagged to each gas reading. Facility only available via LANDTEC System Gas Analyzer Manager (LSGAM). This is an optional feature.
Temperature probe	External device used to measure the gas temperature at the sample point. This is optional.
Update site data	Enables the operator to answer pre-defined questions relating to the site, environment etc. These questions are defined via GAM software.
Upload	Terminology used for the movement of data from the PC via GAM software application to the analyzer.
Volume flow rate	The volume of a gas that passes through a given surface per unit of time, e.g. m^3/hr
Warm-up self-test	Pre-determined self-test sequence to test the analyzer functions which takes place after the analyzer is switched on.
Warranty	The instrument is under guarantee against defect in materials and workmanship for a period of 3 years from the date of shipment to the operator and is subject to the recommended service and recalibration requirements.
Water trap	Device used to protect the instrument from water or moisture ingress.
Zero	The point at which the gas analyzer is calibrated when there is none of the target gas present.
Zero transducers	This option allows the relative pressure transducer to be zeroed.