Heath
Gasurveyor 3-500
User's Manual

HEATH CONSULTANTS

Issue 4

20/07/04

Part Number: 42129

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Instrument Service / Repair contact details are also provided inside the back cover of this handbook.

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LIABILITY

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MODIFICATION NOTICES

GMI aim to notify customers of relevant changes in the product operation and maintain this manual up to date. In view of the policy of continuous product improvement there may be operational differences between the latest product and this manual.

This Handbook is an important part of the Gasurveyor 3-500 product. Please note the following points:

- It should be kept with the instrument for the life of the product.
- Amendments should be attached.
- This Handbook should be passed on to any subsequent owner/user of the instrument.
- Although every care is taken in the preparation of this Handbook it does not constitute a specification for the instrument.

SOFTWARE

Software supplied on EPROM or similar device for use in a particular product, may only be used in that product and may not be copied without the written permission of Gas Measurement Instruments Ltd. Reproduction or disassembly of such embodied programmes or algorithms is prohibited. Ownership of such software is not transferable and GMI Ltd does not warrant that the operation of the software will be error free or that the software will meet the customer's requirements.

DISPOSAL ADVICE

When no longer in use, dispose of the instrument carefully and with respect for the environment. GMI will dispose of the instrument without charge if returned to the factory.

SAFETY

- The instrument must be regularly serviced and calibrated by fully trained personnel in a safe area.
- **Batteries:** Alkaline batteries or *Rechargeable battery pack must be exchanged (*and recharged) in a safe area and fitted correctly before use. Never use damaged batteries or expose to extreme heat. See Section 4 : OPERATOR MAINTENANCE.
- Only GMI replacement parts should be used.
- If the instrument detects gas, follow your own organisation's procedures and operational guidelines.
- The combustion chamber is a flameproof assembly and must not be opened in the presence of a flammable atmosphere.
- Gasurveyor 3-500 instruments are certified as EEx iad IIC T4 ($-20^{o}C \leq$ Tamb $\leq 50^{o}C$). BAS01ATEX2292  II 2 G.

  UL Class 1 Groups A, B, C and D.
- This equipment is designed and manufactured to protect against other hazards as defined in paragraph 1.2.7 of Annex II of the ATEX Directive 94/9/EC

Any right of claim relating to product liability or consequential damage to any third party against GMI is removed if the warnings are not observed.

AREAS OF USE

Exposure to certain chemicals can result in a loss of sensitivity of the flammable sensor. Where such environments are known or suspected it is recommended that more frequent response checks are carried out. The chemical compounds that can cause loss of sensitivity include Silicones, Lead, Halogens and Sulphur. Do not use instrument in potentially hazardous atmospheres containing greater than 21% Oxygen. The enclosure material is polypropylene and must not be exposed to environments which are liable to result in mechanical or thermal degradation or to damage caused by contact with aggressive substances. Additional protection may be required in environments where the instrument enclosure is liable to damage.

STORAGE, HANDLING AND TRANSIT

The batteries in the rechargeable pack contain considerable energy and care should be taken in their handling and disposal. Battery packs should be removed if the instrument is stored for longer than 3 months. The instrument is designed to handle harsh environments. The sensing elements are sealed to IP54 and the rest of the instrument to IP64. If not subject to misuse or malicious damage, the instrument will provide many years of reliable service. The instrument contains electrochemical sensors with a life of 2 years. Under conditions of prolonged storage the sensors should be removed. The sensor contains potentially corrosive liquid and care should be taken when handling or disposing of the sensor, particularly when a leak is suspected.

REVISION RECORD

Date	Pages	Description Of Change
Issue 1 21.09.00	All	New Handbook
Issue 2 25.05.01	All	Handbook revised to reflect updated instrument options and features
Issue 3 17.07.03	All	Handbook revised to include effect of CR 2291
Issue 4 20/07/04	All	To include Appendix C (translations)

CONTENTS

1

INTRODUCTION

The Gasurveyor 3-500 is a two button flammable gas leak location and purge instrument, designed to measure Lower Explosive Level (LEL) and Volume flammable gas. The instrument is designed to the latest standards and is certified for use in Hazardous Areas.

The Gasurveyor 3-500 contains the following ranges:

- LEL, 0 to 100%
- Volume gas, 0 to 100%

As the Gasurveyor 3-500 has a wide variety of available user selected options, it is not possible to provide an operator handbook specific to each possible variation, therefore, what we have provided in the following pages is the standard default of how the instrument would

generally be configured, with the possible options detailed in *italic* text.

GMI recommend that you take the time to study your instrument and, where practical and with advice from your company's Purchasing / Management departments, highlight your particular instrument configuration.

The main default features of the instrument are:

- Rugged carbon loaded polypropylene case, sealed to IP54 rating and suitable for outdoor use.
- Two button operation allowing the user access to all features.
- LCD with backlighting which displays the current gas readings (in both digital and analogue forms) together with operational and status information.
- Audible and Visual alarm options, if selected, are pre-set to specific gas concentration levels.
- Directly interfaces with the GMI Auto Test Calibration Units.

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GENERAL INFORMATION

Ranges of Operation

LEL, 0 to 100%

The LEL range indicates the explosibility of the flammable gas in the sample. This is displayed as a percentage of the lower explosive limit (LEL) of the gas. For methane 100% LEL corresponds to 5% Volume methane in Air.

The instrument range is displayed in the top right corner of the display as % LEL. From 0 to 10% LEL the digital display resolves to 0.1% LEL. From 10 to 100% LEL the digital display resolves to 1% LEL. The analogue bar graph follows in 4% steps. An example of the LEL display is shown in Figure 2.1. Autoranging will automatically switch the range to Volume Gas when 100% LEL is reached.

The detection principle for this range is a catalytic reaction.

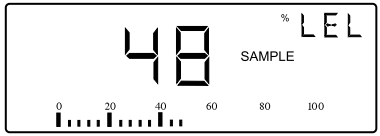

Figure 2.1 LEL Range

Volume Gas, 0 to 100 %

This range displays the total volume of a specific flammable gas with respect to air. The calibration gas is shown on the service label and for the purpose of this handbook is assumed to be methane. Instruments calibrated for methane in air should only be used for measuring such mixtures. To change the calibration gas, e.g. from methane to propane, the instrument must be recalibrated by suitably trained personnel.

On the Volume Gas range the instrument range is displayed in the top right corner of the LCD as GAS. The digital display resolves the signal to 1% GAS with the analogue bar graph following in steps of 4%. Figure 2.2 shows the Volume Gas display. The detection principle for the Volume Gas range is thermal conductivity.

When using PURGE mode to measure flammable gas in air or Nitrogen, or a combination of both background gases, the Gasurveyor 3-500 will use the thermal conductivity Volume gas range only.

The digital display will resolve the signal to 1% Gas, with the analogue bar graph following in steps of 4%.

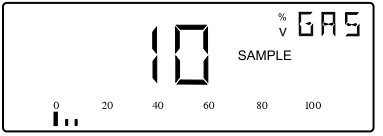

Figure 2.2 Volume Gas Range

LEL Displayed as % Volume Equivalent

The LEL Displayed as a % Volume Equivalent is available for methane in air calibrated instruments only.

In this mode, the range is displayed in the top right hand corner of the display, as % Gas. From 0 to 100% LEL Equivalent, the digital display resolves to 0.1% Gas.

Note: If you are using the Gasurveyor 3-500 instrument for purge operations using the Volume Gas range, ensure that LEL Displayed as a % Volume Equivalent range option, is not selected as a user option.

Alarms

The Gasurveyor 3-500, by default, has both audible and visual alarms off when operating.

The audible alarm is rated up to 85 dB(A). The visual alarm is a red LED indicator which protrudes from the instrument top plate, allowing viewing from any angle above the top plate.

The instrument, where selected, can have alarm levels for the Flammable LEL pre-set.

The Gasurveyor 3-500 has the facility to have two (2) instantaneous alarm levels for the flammable LEL range in the instrument. These are described as LOW and HIGH, although *generally only the high alarm would be active.*

When both instantaneous alarms are set, the LOW audible and visual alarm cycle will be activated for 0.5 seconds on and 0.5 seconds off. The HIGH audible and visual alarm cycle will be activated for 0.25 seconds on and 0.25 seconds off.

The option is to have the instantaneous alarms activated.

It is the responsibility of the user to ensure that the alarm levels, where set in the instrument, are appropriate for the safe operation and legal requirements for the country / industry in which the unit is being used.

Alarm Functions

The Gasurveyor 3-500, by default, has the alarm function on the flammable range disabled.

Where the alarm function is enabled, the instrument has the facility to have either latching or non-latching alarms.

Latching means that when the alarm level is exceeded, the LED will flash (visual) and the sounder will pulse rapidly (audible). Latching alarms are cleared manually, by a double press of Button Two ▼, *after the detected gas level has fallen below the alarm limit.*

Each alarm has to be acknowledged individually, e.g. If both LOW (10%) and HIGH (20%) instantaneous alarms have been set, then both would have to be acknowledged individually if LEL is greater than 20%. If the audible and/or visual indicators are set to off then the display alarm function would need to be acknowledged in the same way. Alarm display example is shown in Figure 2.3.

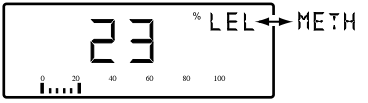

Figure 2.3 LEL Alarm Display Example

Non-Latching means that the alarms clear automatically when the gas level falls below the alarm limit.

For both latching and non-latching alarms, it is possible for both audible and visual indicators to be either On or OFF independent of each other.

Construction

The instrument is housed in a tough, impact resistant, moulded case made of carbon loaded polypropylene.

The top panel is protected by a stainless steel top plate covering a toughened glass LCD cover.

The battery pack is sealed and attached to the main instrument body by means of 2 stainless steel hexagonal screws.

The instrument is sealed against dust and water to IP54 standard. The sensors are protected from dust and water by membrane and cotton filters.

Batteries

Disposable Alkaline (LR20) Dry Cell Batteries

Alkaline batteries provide approximately 15 hours operational life at ambient temperature of 20°C (68°F). When the batteries are low or exhausted it is necessary to fit 4 new batteries. Do not mix old and new batteries.

An indication of the battery condition is displayed after power on and during warm-up, with status shown as either OK or LO. If LO condition is displayed, a maximum battery operational life of 120 minutes remains. During

operation the 'BAT' alarm flag is displayed when approximately 60 minutes of operating time remains at normal temperature. The instrument may continue to be used until it switches off automatically.

Rechargeable (NiCd) Battery Pack

The GMI rechargeable battery pack provides approximately nine hours operational life, from fully charged, at ambient temperature of 20°C (68°F). An indication of the battery condition is displayed after power on and during warm-up, with status shown as either OK or LO. If LO condition is displayed, a maximum battery operational life of 90 minutes remains. During operation the 'BAT' flag is displayed when approximately 30 minutes operating time is left at normal temperatures. The instrument will then turn off.

There are three GMI Battery Chargers: a Standard Charger, a Flatbed Charger and a Smart Charger. The Smart Charger has both slow and fast charge options as well as a serial link for communications with the instrument. See Rechargeable Battery Pack in Section 4 OPERATOR MAINTENANCE.

Filters

A number of different filter types are available from GMI. The minimum requirement is a cotton particulate filter and a hydrophobic filter which are incorporated in the probe handle assembly, supplied with the instrument. Filters must be checked at frequent intervals and where appropriate changed to ensure a clean sample path. If water

is drawn into the instrument any filter which has been contaminated must be cleaned or replaced. See Filter Replacement in Section 4 OPERATOR MAINTENANCE.

Liquid Crystal Display (LCD)

The LCD shows the current gas readings in both analogue and digital form together with operational and status information. The display is protected by a toughened glass cover. Backlighting is provided to enable the display to be seen under low ambient light conditions.

Before Use Checks

The following checks should be carried out before using the instrument on site:

- The instrument is clean and in good condition.
- The batteries have sufficient power left in them for the intended use of the instrument.
- The filters are clean and in good condition.
- The sample line and any accessories are in good condition and leak free.
- All gas ranges are operational and zeroed correctly.
- The calibration is still valid.

3

OPERATING INSTRUCTIONS

Modes of Operation

The instrument has two modes of operation which are accessed by switching the instrument ON with either Button One ▽ or Button Two ▼ . See Figure 3.1 below.

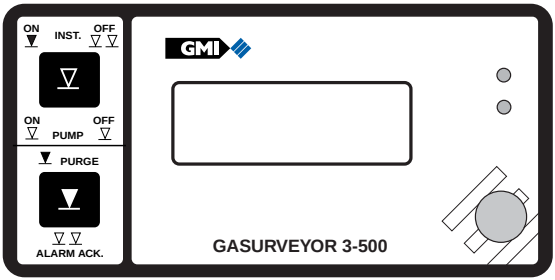

Figure 3.1 Instrument Front Plate

Mode 1. Switching ON with Button One ▽ provides two gas ranges:

a) LEL autoranging to Volume Gas.

Audible/visual alarms can operate in this mode.

Mode 2. Switching ON with Button Two 
provides access to only 0-100% Vol Gas range for purge applications. No audible/visual alarms are available in this mode.

Switching On

Press and hold Button One  to turn the instrument on. This initiates the instruments warm up cycle and switches on the pump. Figure 3.2 displays the warm up cycle for the Gasurveyor 3-500.

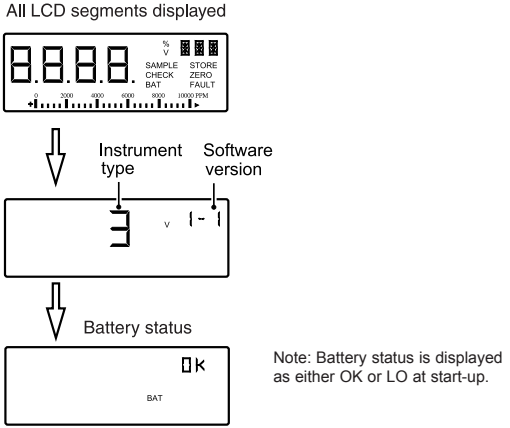

Figure 3.2 Warm Up

Calibration Date Features

At the end of warm-up and before the Gasurveyor 3-500 instrument is ready for measuring, the instrument will indicate on the display when the next calibration is due. This will be displayed as month and year, as shown in Figure 3.3:

Figure 3.3 Calibration Date

The re-calibration interval pre-set for all Gasurveyor 3-500 instruments is twelve (12) months.

This period can be altered as an option, however, you should ensure that the instrument is always within its calibration period prior to use.

An option which ensures that an 'out of calibration instrument' is not used, is the automatic switch-off when overdue.

Switching Off the Instrument Pump

A single press of Button One ▽, when the pump is running, turns the pump off and stops sampling. Pressing button one again turns the pump back on.

Switching On in Purge Mode

To switch on in Purge mode, press and hold Button Two  . The Gasurveyor 3-500 will initiate the warm-up sequence as explained previously. This mode uses the thermal conductivity Volume gas range only since inert Nitrogen atmospheres are likely to be present. When in purge mode, the PURGE flag is activated on the display, as shown in Figure 3.4.

Figure 3.4 Purge Mode

Switching Off

A double press of Button One  turns the instrument off.

Summary of Button Operation

Measure Mode	Single Press	Double Press	Press and Hold
Button 1 	Toggles Pump On / Off (during operation)	Switches Off Instrument	Switches On Instrument
Button 2 	–	Acknowledge Alarm	Switches On Instrument in Purge mode

Operator Messages / Fault Flags

Various messages can appear on the LCD screen to indicate instrument status.

'SAMPLE'

This indicates that the pump is running and the instrument is sampling.

'OFF'

This indicates that the instrument is about to switch off. This command can be cancelled by a single press of any button.

'SAMPLE FAULT'

This indicates a problem with the instrument's flow due to the sample path being blocked, water ingress, a blocked filter or pump failure.

In Measure and Purge mode, the pump stops automatically. The sample line, filters etc. should be checked for water ingress or blockage and Button One  should then be pressed to restart the pump.

'CHECK ZERO'

This indicates that there may have been a zero shift due to the presence of gas. Switch off the instrument and switch on again in fresh air.

'ZERO FAULT'

This indicates that the zero is outwith its calibration limits. Switch the instrument off and then on again in fresh air. If the fault does not clear, return the instrument for servicing.

'BAT'

This indicates that the batteries will soon require replacement. At this point there will be approximately 60 minutes operation left in a set of alkaline batteries, although this figure will vary depending on battery manufacturer, temperature conditions, usage etc. With rechargeable batteries the 'BAT' flag indicates approximately 30 minutes operation left.

As the battery power continues to fall, the LCD flashes a 'BAT FAULT' message. Subsequently the LCD displays

'OFF' and the instrument automatically switches off. The batteries should be replaced immediately.

'BAT FAULT'

This indicates that the batteries require replacing.

'1'

This message which can also appear after power on, indicates that a calibration data error has been detected. The instrument should be returned for servicing.

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OPERATOR MAINTENANCE

Rechargeable Battery Pack

Three battery chargers are available from GMI, a Standard Charger, a Flatbed Charger and a Smart Charger.

Standard Charger

The GMI Standard Charger takes approximately 14 hours to charge a flat battery.

Note: The 4-button instrument is for illustration purposes only.

Flatbed Charger

The GMI Flatbed Charger allows the Gasurveyor's battery pack to be charged in NORMAL mode, which takes approximately 14 hours to charge a flat battery. The Mode Select Switch can then be set to STAND-BY, where a trickle charge will maintain the battery in a fully charged state of readiness.

Note: The 4-button instrument is for illustration purposes only.

Smart Charger

The GMI Smart Charger provides both fast and standard charging facilities and can charge an instrument and spare battery pack simultaneously. Using the standard charging option, a battery pack can be recharged in 12 hours from a fully discharged state. Using the fast charge option a battery pack can be 90% recharged in approximately 60 minutes and fully recharged in 120 minutes. To ensure optimum life length, the rechargeable pack should be fully discharged and charged on a regular basis of, at least, every three months. The Smart Charger has the option of switching to discharge and fast charge cycle to provide this facility.

Note: The 4-button instrument is for illustration purposes only.

Replacing the Battery Pack

The following procedure should be carried out in a safe area:

1) Loosen the two instrument base screws (4mm hex) using the special tool provided.

2) Remove the battery pack.

3) Insert new battery pack.

4) Fasten base screws.

5) Check that instrument switches on and works to specification.

Recharging the Battery Pack

The battery pack should be recharged in the following situations:

The BAT or BAT FAULT message is displayed.

The instrument will not switch on.

The pump will not switch on.

It is recommended that the battery pack is fully discharged on a regular basis (once every three months). This can be done by running the instrument continuously or using the battery conditioning facility on the Smart Charger. The batteries can be charged on the instrument but the instrument itself should be switched off. Regular complete discharge will keep the battery pack in good condition.

Replacing Alkaline (LR20) Dry Cell Batteries

All four batteries should be replaced at any one time and in a safe area. GMI only recommend the use of Energiser or Duracell cells.

1) Loosen the two instrument base screws (4mm hex) using the special tool provided.

2) Remove battery cover.

3) Remove the old batteries.

4) Check battery compartment for damage to spring contacts or corrosion on springs.

Caution: Under no circumstances should rechargeable batteries be fitted in place of Alkaline batteries.

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5) Insert four new batteries observing correct polarity indication in battery compartment base.

6) Replace battery cover and fasten base screws.

7) Check that the instrument switches on and works to specification.

Filter Replacement

Hydrophobic and cotton particulate filters in the probe handle minimise the danger of water and dust ingress.

Caution: The instrument should never be switched on without suitable filters installed.

If a blockage occurs the 'SAMPLE FAULT' indicator is displayed. Check the sample line and probe handle for blockage. Press Button One ▽ to clear the 'SAMPLE FAULT' message. Replace the filter(s) if the message does not clear.

To replace the filter(s), proceed as follows:

1) Unscrew the probe handle assembly.

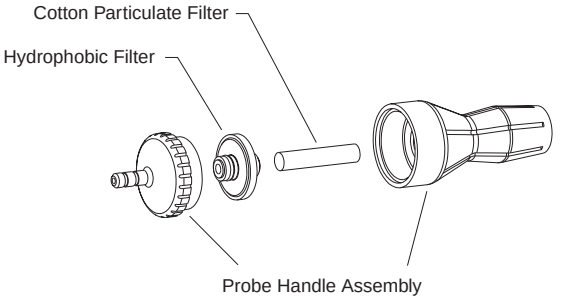


Figure 4.1 Filter Assembly

2) Remove the cotton particulate filter and discard.
3) Remove the hydrophobic filter.
4) Clean the probe handle to make sure that it is free from dirt and water.
5) Fit a new cotton particulate filter.
6) Fit the hydrophobic filter. The yellow label on the filter fits against the yellow label on the probe handle.
7) Reassemble the probe handle assembly.

5

CALIBRATION

The instrument has been calibrated for a particular flammable gas mixture. Where any doubt exists the instrument should be returned to GMI or an authorised distributor for calibration.

Four methods of calibration are possible:

- Field Calibration. See APPENDIX B, FIELD CALIBRATION for further details.
- Manual Calibration. The instrument can be linked to a PC running GMI Manual Calibration software.
- Automatic Calibration. The GMI Auto Test Calibration System allows calibration without manually changing gas cylinders. The system links to a PC running GMI Workshop software.
- The GMI Instrument Management System (IMS) provides all the facilities of the Auto Test Calibration System with the added feature of instrument database management.

Note: The calibration systems above (hardware and software) are manufactured by GMI. For more details contact GMI or an authorised distributor.

Calibration Validity

Calibration validity is the responsibility of the user. Under normal operating conditions a 12 month period can be expected. This is no guarantee, however, as the precise application of the product is unknown to GMI. Individual codes of practice may dictate shorter periods.

Regular checking establishes a pattern of reliability and enables the calibration check period to be modified in line with operational experience. The higher the risk, the more frequently calibration should be checked.

6

ACCESSORIES

Accessories Supplied with Gasurveyor 3-500 Instrument

Part Number **42503 / 42503R**

Part Number	Description
42119	Carrying Case
12370/2	Shoulder Harness
12451	4mm Hex. Driver
12712	Clear Sample Line x 1.5 metres. (4ft.10ins.) approx.
12480	Plastic Probe - Solid End 35cm. (1ft.2ins.) approx.
12481	Probe Handle c/w Filters
10077	Cotton Particulate Filters (Box of 10) x 2
12688	Sample Line Adaptor
42129	User Handbook

Additional Accessories Available

Part Number	Description
13184	Standard Charger / 240V Power Supply (UK PLug)
13317	Standard Charger / 220V Power Supply (Euro Plug)
13322	Standard Charger / 110V Power Supply (USA Plug)

12888	Standard Charger / 220V Power Supply (Australian Plug)
13179	Standard Charger w/o Power Supply
42121	Flatbed Charger / 240V Power Supply (UK PLug)
42122	Flatbed Charger / 220V Power Supply (Euro Plug)
42123	Flatbed Charger / 110V Power Supply (USA Plug)
12889	Flatbed Charger / 220V Power Supply (Australian Plug)
42124	Flatbed Charger w/o Power Supply
13180	240V Power Supply (UK Plug)
13320	220V Power Supply (Euro Plug)
13321	110V Power Supply (USA Plug)
12241	220V Power Supply (Australian Plug)
13100	Smart Charger with Datalogging Software c/w 240V Power Supply (UK Plug)
13440	Smart Charger with Datalogging Software c/w 220V Power Supply (Euro Plug)
13340	Smart Charger with Datalogging Software c/w 110V Power Supply (USA Plug)
12890	Smart Charger with Datalogging Software c/w 220V Power Supply (Australian Plug)
42114	Spare Rechargeable Battery Pack
13703	Manual Calibration for Windows (Software)
12552	Communications Link Adaptor
12358	Hydrophobic Filter (use with 12481)
12229	Stainless Steel Probe - Closed End 80cm. (2ft.6ins.) approx.
12393	Plastic Probe - Solid End 80cm. (2ft.6ins.) approx.
12394	Flexible Probe - Open End 35cm. (1ft.2ins.) approx.

13427	Plastic Probe - Open End 35cm. (1ft.2ins.) approx.
13413	Stainless Steel Probe - Open End 35cm. (1ft.2ins.) approx.
12895	Barbed Probe - Solid End 69cm. (2ft.3ins.) approx.
12894	Barbed Probe - Open End 69cm. (2ft.3ins.) approx.
13561	Probe Handle
13562	Probe Handle Adaptor (use with 13563 or 13565)
13563	Bellows Cup Probe
13565	Swan Neck Probe
13655	Probe Shroud c/w Skids (use with 13565)
12365	In-Line Hydrophobic Filter Holder
42141	Gasurveyor 500 Standard Accessory Pack. Consisting of: Gasurveyor 500 Carrying Case ; Standard Probe ; Probe Handle Assembly ; Sample Line Adaptor ; 2 Packs Cotton Filters.
42151	Gasurveyor 500 Gas Industry Survey Accessory Pack. Consisting of: Gas Industry Survey Carrying Case (Large) ; Probe Handle Assembly ; Probe Handle Adaptor ; Bellows Probe. Note: Large carrying case has space for special probes, e.g. Swan Neck

Note: For other sampling probes and accessories, and for calibration gases, contact GMI Ltd.

7

ADDITIONAL INFORMATION

Training

Training courses are available on all our products. Contact our Marketing Department for further details:

Tel: +44 (0) 141 812 3211

Fax: +44 (0) 141 812 7820

e-mail: sales@gmiuk.com

World Wide Web

Visit our web site at www.gmiuk.com

TYPICAL OPERATING PARAMETERS

Typical operating parameters are as follows:

Gas Range	Range	Resolution	Zero Stability	Accuracy
LEL	0 to 10% 10 to 100%	0.1% 1%	+/- 0.5% N/A	 2% +/- 1% LEL
Volume Gas	0 to 100%	1%	+/- 2%	1% +/- 1% Gas

Notes:

All the values above are at normal temperature and pressure.
Humidity is between 0% and 95% RH (non-condensing).
Pressure changes at the inlet and exhaust are minimised as they may cause transient changes in reading.

Size
180mm (7.08”) x 95mm (3.74”) x 105mm (4.13”)

Weight
1.7kg (3.75lbs.) with alkaline batteries

Operating Temperature
-20 °C to 50 °C (-4 °F to 122 °F)

Humidity
0 – 95% RH

Construction
Moulded polypropylene case protected to IP54

Display
LCD containing:

Analogue display scaled 0-10, 0-100, 0-1000 or 0-10000

4 digit digital display

3 character range indication

Operational flags

Sampling System
Integral pump with flow fail sensor.

The sample path is protected by the hydrophobic filter and automatic pump switch off.

Power Source

4 ‘D’ size alkaline cells giving approximately 15 hours runtime at 20 °C (68 °F)..

Rechargeble (NiCd) battery pack giving approximately 9 hours runtime at 20 °C (68 °F).

FIELD CALIBRATION

Field calibration allows simple calibration to be carried out in the field without the use of additional test equipment. Other calibration procedures require the use of the GMI Manual Calibration software or the Workshop System.

There are fundementals, in terms of instrument calibration, that should be noted:

- The gas should be of known traceable quality and have total analysis.
- The gas should be applied in the same manner as the instrument is used, e.g. at a known pressure which is constant and around, or slightly above, normal atmospheric pressure.
- The use of demand type regulators is not recommended on instruments with Oxygen or Toxic cells since these are affected by pressure pulses.

In Field Calibration Mode (FCM) the buttons perform the functions indicated in CAL Mode or SPAN Mode as shown in Figure B-1.

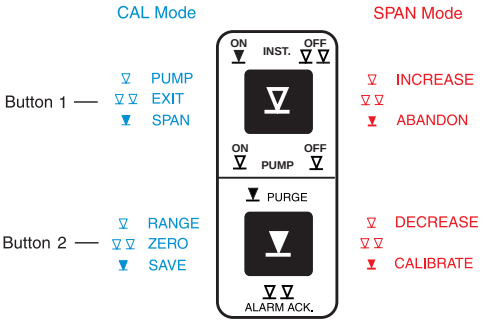


Figure B-1 Button Functions

To simplify button operation when calibrating the instrument, an overlay card, shown in Figure B-2, is available and can be placed over the top face of the instrument to identify calibration button functions. Contact GMI for details.

Figure B-2 Instrument Overlay Card

Selectable Ranges in FCM

When in FCM the following ranges are manually selectable by pressing Button Two : LEL, Volume GAS.

Entering FCM

1) Switch the instrument on and allow it to complete its warm-up checks.

2) Double press Button One to initiate instrument switch off. While OFF is displayed in the LCD and before the instrument actually switches off, enter the access code.

Note: Allow at least one second between button presses when entering the button sequence. The default (factory set) entry code is button sequence 1,2,1,2. Alternative codes are user selectable.

When the instrument is in FCM, the "CAL" message alternates on the display with the currently selected range. An example of the display is shown in Figure B-3.

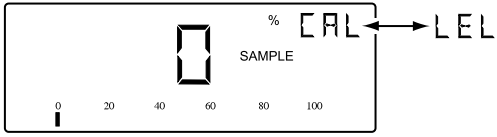


Figure B-3 Field Calibration Display

In CAL mode, the instrument buttons have the functions shown in Figure B-4.

CAL Mode	Single Press	Double Press	Press and Hold
Button 1 	Toggle Pump On / Off	Exit CAL Mode	Enter SPAN Mode
Button 2 	Next Range	Zero Current Range	Save CAL Data

Figure B-4 CAL Mode Button Functions

Zeroing the Instrument

1) Enter FCM. See the previous section ENTERING FCM.

2) Double press Button Two  to zero current gas range.

3) Single press Button Two  to select the next gas range.

4) Repeat steps 2 and 3 until all gas ranges have been zeroed.

5) Proceed to FIELD CALIBRATION PROCEDURE to calibrate the instrument.

Field Calibration Procedure

1) Zero gas ranges before attempting calibration. See previous section ZEROING THE INSTRUMENT for details.

2) Make sure that the instrument pump is running and the gas range selected is compatible with the calibration gas.

Note: A single press of Button One toggles the pump Off / On.

3) Remove the cap from calibration gas cylinder. Make sure that the regulator valve is in the fully closed position (Off) then connect the gas regulator to the gas cylinder (push down gently and tighten clockwise, hand tight). See Figure B-5 for details.

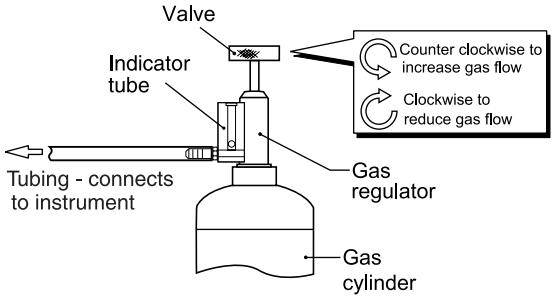


Figure B-5 Connecting Gas

4) Turn the regulator valve counter clockwise to open the valve slightly. Make sure that the gas is flowing before connecting the sample tubing to the instrument, otherwise an instrument sample fault may occur.

5) Connect tubing from regulator to instrument inlet then adjust the regulator valve to maintain a constant flow of gas (counter clockwise to increase flow and clockwise to decrease). The correct flow rate is achieved when the ball in the indicator tube floats just above its resting position.

6) Wait for the instrument gas reading to settle.

7) If the displayed reading corresponds to the concentration of calibration gas, i.e. 50% LEL (2.5% Methane in Air), proceed to paragraph 10.

8) If the displayed reading does not correspond to the concentration of calibration gas, i.e. 50% LEL (2.5% Methane in Air), press and hold Button One ▽ to enter SPAN mode.

   SPAN mode is indicated by the selected range, in this case LEL, and SPN alternating in the display as shown in Figure B-6.

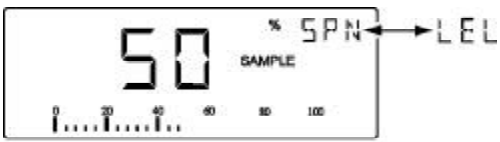


Figure B-6 SPAN Mode Display

In SPAN mode, the instrument buttons have the functions shown in Figure B-7.

SPAN Mode	Single Press	Double Press	Press and Hold
Button 1 ▽	Increase Set Point	–	Exit SPAN Without CAL
Button 2 ▼	Decrease Set Point	–	Exit SPAN With CAL

Figure B-7 SPAN Mode Button Functions

8a) In SPAN mode, a single press of Button One ▽ will produce small incremental changes to increase display reading, or a single press of Button Two ▼ will produce small decremental changes to decrease display reading, until the displayed gas value corresponds to the concentration of the calibration gas.

8b) When required reading has been reached, press and hold Button Two ▼ to exit SPAN mode with calibration. The display may jump above and below required reading momentarily as the instrument performs the calibration.

Note: If for any reason you require to exit SPAN mode without calibration of the instrument. press and hold Button One ▽.

9) The calibrated instrument display will now return to CAL mode display as shown in Figure B-8.

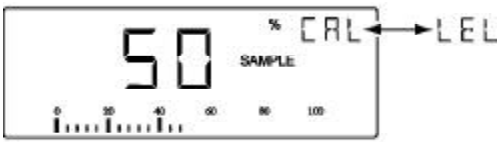


Figure B-8 50% LEL Display

10) Make sure that correct reading is displayed before disconnecting the calibration gas then disconnect tubing from instrument inlet and turn regulator valve on calibration gas cylinder in a clockwise direction to turn off gas flow.

11) Make sure that the regulator valve is in the fully closed position (Off) then disconnect the regulator from the gas cylinder (turn regulator body in a counter clockwise direction).

12) Replace the cap on the calibration gas cylinder.

13) Repeat steps 1 to 12 for each range to be calibrated otherwise quit FCM. See QUITTING FCM for further details.

Quitting FCM

Quit And Save Changes

1) Press and hold Button Two  to save CAL data.

2) Double press Button One  to exit FCM.

Quit Without Saving Changes

1) Double press Button One  to exit FCM.

Note: When you exit the FCM without saving the new CAL data, the old calibration data remains in the instrument memory.

OPERATING INSTRUCTIONS

The following multi-language instructions provide the user with a quick guide to the operation of the . .

 **Gasurveyor 3-500** instrument.

Each language and pages reference is as follows:

- **English** - pages C-2 to C-5
- **Français** (French) - pages C-6 to C-9
- **Deutsch** (German) - pages C-10 to C-13
- **Svensk** (Swedish) - pages C-14 to C-17
- **Dansk** (Danish) - pages C-18 to C-21
- **Nederlands** (Dutch) - pages C-22 to C-25

CHECKLIST

1. Check the instrument has no obvious faults.
2. Check accessories.
3. Read and understand handbook before use.
4. Switch ON (see overleaf)
5. Check battery levels.
6. Check “ZERO” in fresh air.

SAFETY

- The instrument must be regularly serviced and calibrated by fully trained personnel in a safe area.
- **Batteries:** Alkaline batteries or *Rechargeable battery pack must be exchanged (*and recharged) in a safe area and fitted correctly before use. Never use damaged batteries or expose to extreme heat.
- Only GMI replacement parts should be used.
- If the instrument detects gas, follow your own organisation’s procedures and operational guidelines.
- The combustion chamber is a flameproof assembly and must not be opened in the presence of a flammable atmosphere.
- Gasurveyor 3-500 instruments are certified as
  EEx iad IIC T4 (-20^{o}C ≤ Tamb ≤ 50^{o}C).

  BAS01ATEX2292  II 2 G.

  UL Class 1 Groups A, B, C and D.
- This equipment is designed and manufactured to protect against other hazards as defined in paragraph 1.2.7 of Annex II of the ATEX Directive 94/9/EC

Any right of claim relating to product liability or consequential damage to any third party against GMI is removed if the warnings are not observed.

AREAS OF USE

Exposure to certain chemicals can result in a loss of sensitivity of the flammable sensor. Where such environments are known or suspected it is recommended that more frequent response checks are carried out. The chemical compounds that can cause loss of sensitivity include Silicones, Lead, Halogens and Sulphur. Do not use instrument in potentially hazardous atmospheres containing greater than 21% Oxygen.

The enclosure material is polypropylene and must not be exposed to environments which are liable to result in mechanical or thermal degradation or to damage caused by contact with aggressive substances. Additional protection may be required in environments where the instrument enclosure is liable to damage.

OPERATOR MESSAGES / FAULT FLAGS

Various messages can appear on the LCD screen to indicate instrument status.

'SAMPLE' Indication that the pump is running and the instrument is sampling.

'OFF' Indication that the instrument is about to switch off. This command can be cancelled by a single press of any button.

'SAMPLE FAULT' Indication of a problem with the instrument's flow due to the sample path being blocked, water ingress, a blocked filter or pump failure. In Measure and Purge mode, the pump stops automatically.

The sample line, filters etc. should be checked for water ingress or blockage and Button One should then be pressed to restart the pump.

'CHECK ZERO' Indication that there may have been a zero shift due to the presence of gas. Switch off the instrument and switch on again in fresh air.

'ZERO FAULT' Indication that the zero is outwith its calibration limits. Switch the instrument off and then on again in fresh air. If the fault does not clear, return the instrument for servicing.

'BAT' Indication that the batteries will soon require replacement. At this point there will be approximately 60 minutes left in a set of alkaline batteries, although this figure will vary depending on battery manufacturer, temperature conditions, usage etc.

With rechargeable batteries the 'BAT' flag indicates approximately 30 minutes operation left.

As the battery power continues to fall, the LCD flashes a 'BAT FAULT' message. Subsequently the LCD displays 'OFF' and the instrument automatically switches off.

The batteries should be replaced immediately.

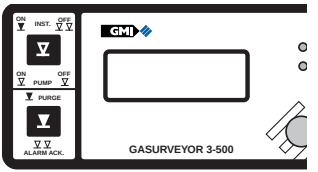
'BAT FAULT' Indication that the batteries should be replaced immediately.

'1' Indication, which can also appear after power on, that a calibration data error has been detected. The instrument should be returned for servicing.

OPERATION

BUTTON 1

BUTTON 2



Switch ON (Mode 1)

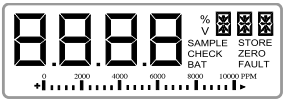
LEL autoranging to Volume Gas

Press and Hold Button One to switch instrument and pump On. This initiates the instrument's warm-up cycle:

Switch ON (Mode 2)

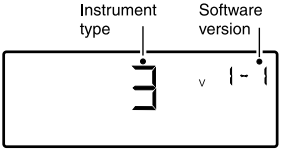
0 to 100% Volume Gas for Purge applications.

Press and Hold Button Two to switch instrument and pump On. This initiates the instrument's warm-up cycle:



All LCD segments are displayed

followed by Instrument Type and Software version,

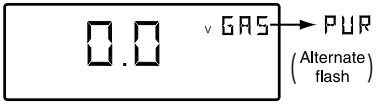


then Battery status, as shown:

Next, the instrument indicates, as month and year, when the next calibration is due. (February 2002 in example)

This display screen is followed by the current gas detection reading.

Note: When in Purge mode, the PURGE flag is activated on the display, as shown:



Pump ON / OFF

A single press of Button One  when the pump is running turns the pump off and stops sampling. A further press of Button One turns the pump back on.

Clearing Alarms

The Gasurveyor 3-500, by default, has the alarm function on the flammable range disabled.

If the alarm function is enabled, the instrument has the facility to have either latching or non-latching alarms.

Non-latching alarms clear automatically when the detected gas level falls below the threshold set in the instrument.

Latching alarms are cleared manually by a double press of Button Two , after the detected gas level has fallen below the threshold set in the instrument.

Switch OFF

A double press of Button One  turns the instrument Off.

Vérification :

1. Vérifier que l'appareil n'a pas de défauts évidents
2. Vérifier les accessoires
3. Lire et assimiler le mode d'emploi
4. Démarrer l'appareil (voir procédure)
5. Vérifier le niveau des piles ou accus
6. Vérifier les zéro « hors gaz »

Sécurité :

- L'appareil doit être régulièrement entretenu et étalonné par du personnel compétent et dans une zone « hors gaz »
- Alimentation: Les piles alcalines ou les packs rechargeables* doivent être échangées (*ou rechargés) dans une zone saine et installés correctement. Ne jamais utiliser de batteries endommagées ou les exposer à une chaleur extrême.
- Seules les pièces d'origine GMI doivent être utilisées.
- Si l'appareil détecte du gaz, suivez les procédures propres à votre entreprise.
- La chambre de mesure est équipée de pare-flammes et ne doit pas être ouverte en présence de gaz inflammable.
- * Les Gazmètres G3-500 sont certifiés
  EEx iad IIC T4 (-20°C ≤ Tamb ≤ 50°C).

  BAS01ATEX2292 Ex Ex II 2 G.

  CLASSIFIED UL UL Class 1 Groups A, B, C and D.
- Cet équipement est conçu et fabriqué contre les autres risques définis en paragraphe 1.2.7 de l'annexe II des directives ATEX 94/9/EC

Aucun droit de réclamation relatif à la fiabilité du produit ou aux conséquences pour une 3ème partie ne peut être retenu si ces avertissements n'ont pas été respectés.

Zone d'utilisation :

L'exposition à certains produits chimiques peut occasionner une perte de sensibilité du capteur inflammable. Quand ce type d'environnement est connu ou suspecté, il est recommandé que des vérifications de sensibilité soit faites plus souvent. Les constituants chimiques qui peuvent causer une perte de sensibilité incluent les silicones, plombs, Halogènes et sulfures. Ne pas utiliser l'appareil dans des atmosphères

contenant plus de 21% d'oxygène. Le boîtier de l'appareil est en polypropylène et ne doit pas être exposé à des environnements qui soient susceptibles d'apporter des dégradations mécaniques ou thermiques ou des dommages causés par des substances agressives. Une protection additionnelle peut être nécessaire dans les environnements ou le boîtier est susceptible d'être dégradé.

Messages opérateur / Messages de Défauts

Différents messages peuvent apparaître sur l'affichage LCD afin d'indiquer l'état de l'appareil.

« SAMPLE » indique que la pompe est en marche et qu'un échantillon est prélevé

« OFF » indique que l'appareil se prépare à s'arrêter. Cette commande peut être annulée par une pression sur l'un des boutons

« SAMPLE FAULT » indique un problème avec le débit de l'appareil à cause d'une obstruction sur la ligne de prélèvement, d'une entrée d'eau, un filtre bouché ou une panne de pompe. En mode mesure et balayage d'azote, la pompe s'arrête automatiquement.

« CHECK ZERO » indique qu'il peut y avoir un décalage de zéro du à la présence de gaz. Arrêter l'appareil puis le redémarrer en air frais

« BAT » indique que les piles ou batteries doivent être remplacées bientôt. A ce moment, il reste environ 60 minutes avec un jeu de piles alcalines. Attention, ces données varient en fonction du fabricant de piles, température, utilisation etc?

Avec les batteries rechargeables, le message « BAT » indique qu'il reste environ 30 minutes d'utilisation.

Quand le niveau d'énergie continue de tomber, l'affichage indique « Bat

« FAULT » en clignotant. Ensuite l'affichage indique « OFF » et l'appareil s'arrête automatiquement. Les piles ou batteries doivent être remplacées ou rechargées immédiatement.

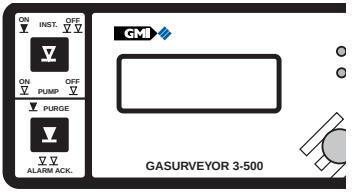
« BAT FAULT » indique que les batteries ou les piles doivent être remplacées ou rechargées immédiatement

« 1 » Indication qui peut apparaître à la mise sous tension lorsqu'une erreur de donnée d'étalonnage a été détectée. L'appareil doit être retourné au service de maintenance.

FONCTIONNEMENT

BOUTON 1

BOUTON 2

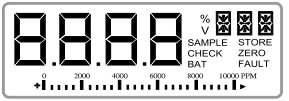


Mise en marche (Mode 1)
avec saut d'échelle automatique entre LIE et GAZ

Pressez et maintenir le bouton 1 pour mettre en marche l'appareil et la pompe. Ce-ci démarre le cycle d'initialisation.

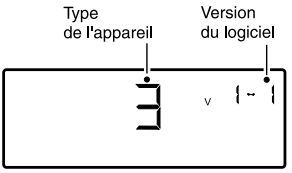
Mise en marche (Mode 2)
0 à 100% Volume Gaz pour les applications « Balayage d'Azote »

Pressez et maintenir le bouton 2 pour mettre en marche l'appareil et la pompe. Ce-ci démarre le cycle d'initialisation.



La totalité des segments LCD sont affichés

Suivi du type de l'appareil et de la version de l'appareil



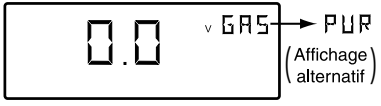
Suivi de l'état de la batterie ou des piles:

Ensuite l'appareil indique le mois et la date du prochain étalonnage

(Exemple Février 2002)

Cet affichage est suivi par la mesure du gaz détecté

Note : Dans le mode « Balayage d'azote » le message « PURGE » est affiché de la façon suivante :



Marche/Arrêt Pompe

Une pression sur le bouton 1 [▽] arrête la pompe quand celle-ci est en marche. Une autre pression sur le bouton 1 remet la pompe en marche.

Acquitter les alarmes

Par défaut, le Gasurveyor 3-500 n'a pas d'alarme active sur l'échelle inflammable. Si la fonction alarme est activée, l'appareil a la possibilité d'avoir des alarmes maintenues ou non-maintenues.

Les alarmes non-maintenues s'annulent automatiquement quand la mesure

descend en dessous du seuil réglé dans l'appareil.

Les alarmes maintenues sont annulées manuellement par une double pression sur le bouton 2 [▼], après que la mesure soit descendue en dessous du seuil réglé dans l'appareil.

Arrêt

Une double pression sur le bouton 1 [▽] arrête l'appareil.

Pruefliste

1. Gerät auf sichtbare Beschaedigungen pruefen
2. Zubehoer ueberpruefen
3. Vor der Inbetriebnahme das Handbuch lesen, oder mit der Handhabung des Instrument‘s vertraut sein
4. Gerät einschalten und laut Anleitung ueberpruefen
5. Batterieanzeige ueberpruefen
6. Nullpunkt in frischer Luft ueberpruefen

Sicherheitshinweise

- Das Instrument muss regelmaessig gewartet und durch Fachpersonal kalibriert werden
- Alkali oder wiederaufladbare Batterien duerfen nur in Ex freier Zone gewechselt oder aufgeladen werden. Sichere Befestigung vor Gebrauch pruefen. Keine beschädigten Batterien verwenden, und grosse Hitzeeinwirkungen auf die Batterien vermeiden
- Nur Original GMI Ersatzteile verwenden
- Beim Auftreten von Gas, die jeweils gueltigen Vorschriften befolgen
- Gas kann gefaehrlich sein, und ist daher mit Vorsicht zu behandeln

  Die Messkammer ist flammensicher ausgefüehrt und darf nicht in Ex Zonen geoeffnet werd
- Gasurveyor 3-500 Instrumente sind zertfiziert nach:

  EEx iad IIC T4 (-20°C ≤ bis ≤ 50°C)

  BAS01ATEX2292 Ex Ex II 2 G.

  CLASSIFIED UL UL Klasse 1 Gruppe A,B,C und D.
- Das Instrument ist zur geeignet zur Verwendung nach Paragraph1.2.7 Anh.II ATEX 94/9/EC

Alle Haftungsansprueche gegenüber GMI entfallen, wenn die Sicherheits- hinweise nicht beachtet werden

Verwendungsgebiete

Das auftreten von verschiedenen Chemikalien kann die Empfindlichkeit des Sensors fuer brennbare Gase beeinflussen. Beim vorhandensein dieser Stoffe ist ein kuerzeres Serviceintervall erforderlich. Folgende Komponenten fuehren zur verringerung der Sensorempfindlichkeit: Silicone, Halogene und Schwefel. Das Instrument darf nicht in Athmosphaeren mit mehr als 21% Sauerstoff verwendet werden. Im Gehaeuseaufbau sind Polypropylenzusaetze enthalten, es sind daher Umgebungen,welche zu mechanischen Beschaedigungen fuehren und Waerme enthalten zu vermeiden. Weiters ist das Instrument vor Beschaedigungen zu schuetzen.

Betriebshinweise /Stoerungsmeldungen

Verschiedene Anzeigen am Display geben den Geraetestatus an

'SAMPLE' Pumpe laeuft und Messung erfolgt.

'OFF' Instrument im Abschaltmodus, 1x Drücken einer beliebigen Taste unterbricht diesen Vorgang

'SAMPLE FAULT' Probenleitung,Filter oder Pumpe verlegt, ev.Wassereintritt, Pumpenstop automatisch, Filter, Leitung etc. pruefen. Mit Taste 1 Pumpe wieder starten.

'CHECK ZERO' Nullpunktdrift durch Einschalten in nicht gasfreier Umgebung. Geraet Ausschalten und wieder Einschalten in Frischluft

'ZERO FAULT' Nullpunkt ausserhalb der limitierten Werte. Geraet Ausschalten u. wieder Einschalten in Frischluft, wenn der Fehler bleibt, Geraet zum Service geben

'BAT' Batterien sollen bald gewechselt werden. Betrieb max.60 min. mit Alkaline Batterien abhaengig vom Hersteller, Verwendung, Temperatur etc.

Betrieb max.30 min. mit aufladbaren Batterien. Wenn die Batteriespannung laufend absinkt, blinkt

'BATFAULT'imDisplay, anschliessend erscheint OFF und das Geraet schaltet ab. Batteriewechsel erforderlich

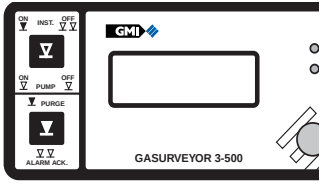
'BAT FAULT' Batteriewechsel erforderlich

'1' Kalibrierfehler. Geraet zum Service

Bedienung

TASTE 1

TASTE 2



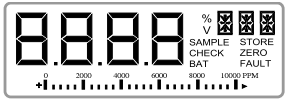
Einschalten (Modus 1)
LEL automatische Umschaltung auf Volume Gas

Taste 1 Druecken und Halten, Geraet und Pumpe ein und die Selbsttestphase beginnt:

Einschalten (Modus 2)
0 bis 100% Volume Gas ; Für Spülungs (Purge) Anwendungen.

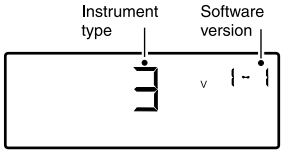
Taste 2 Druecken und Halten,

Gerät und Pumpe ein und die Selbsttestphase beginnt.



Alle LCD Segmente werden

kurz dargestellt, die Instrument Type, Softwareversion



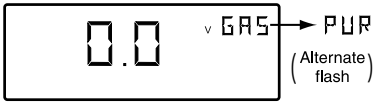
und der Batteriezustand,

sowie Monat und Jahr der naechst faelligen Kalibrierung.

z.B. February 2002.

Weiters wird das Kalibriergas angezeigt.

Hinweis: Im Purge Modus blinkt die Anzeige PURGE laufend



Pumpe Ein/Aus

Taste 1  1x Druecken

Stop der laufenden Pumpe und der Probenahme. Erneutes Drücken startet die Pumpe wieder

Alarmquittung

Der Gasurveyor 3-500, hat eine einschaltbare Alarmabgabe bei der Mesung von brennbaren Gasen.

Bei aktiviertem Alarm ist eine Selbsthaltung aus-oder einschaltbar.

Nicht selbsthaltende Alarme werden automatisch geloescht, wenn die Gasanzeige unter den eingestellten Wert abfaellt.

Selbsthaltende Alarme werden durch 2x Druecken von Taste 2 

geloescht, wenn die Gasanzeige unter den eingestellten Wert abfaellt.

Ausschalten

Taste 1  2x Druecken

CHECKLISTA

1. Kontrollera att instrumentet ej har några synliga fel.
2. Kontrollera samtliga tillbehör.
3. Läs och förstå instruktionsboken innan Du använder instrumentet
4. Slå på instrumentet (se nedanstående)
5. Kontrollera batteriets kapacitet.
6. Kontrollera “Nollan” I frisk luft.

SÄKERHET

- Instrumentet skall regelbundet kontrolleras och kalibreras av kunnig personal I härför avsedd miljö.
- **Batterier:** Alkaline batterier eller *Laddningsbara batteripaket måste laddas eller bytas utanför Ex-klassat område och monteras på rätt sätt Använd aldrig skadat batteri Det får ej heller utsättas för höga temperaturer.
- Endast GMI-orginaldelar får användas.
- Om instrumentet reagerar för gas skall Ert företags normala rutiner följas.
- Mätkammaren för brännbar gas är en Ex-klassad enhet och får ej öppnas då risk för sådan gas föreligger.
- Gasurveyor 3-500 instrumentet är klassat enligt
  ”EEx iad IIC T4” (-20^{o}C ≤ Tamb ≤ 50^{o}C).

  BAS01 “ATEX2292 Ex Ex II 2 G”.

  CLASSIFIED UL ”Class 1 Groups A, B, C and D”.
- Denna utrustning är konstruerad och tillverkad för att skydda mot andra risker än definitionen I paragraf 1.2.7 i Annex II i ATEX Direktivet 94/9/EC

All rätt till skadestånd med hänvisning till produktansvar eller skada hos tredje man gentemot GMI upphör om denna varning ej beaktas.

ANVÄNDNINGSOMRÅDE

Exponering för vissa kemikalier kan resultera I att sensorn för brännbara gaser skadas. I sådan atmosfär rekommenderas att ofta kontrollera instrumentets känslighet. De kemiska substanser som kan orsaka försämrad reaktion är bl.a. Silikoner, Bly, Halogener and Sulfider. Använd inte instrumentet där oxygenhalten kan överskrida 21vol%. Instrumenthuset är tillverkat av polypropylen och får ej utsättas för eller komma I kontakt med vissa kemikalier. En ytterligare skyddsväska kan vara nödvändigt då instrumentet används i speciella miljöer.

MEDDELANDEN / TECKEN I DISPLAYEN

Olika besked visas I displayen för att indikera instrumentets status.

'SAMPLE' Betyder att pumpen går och instrumentet suger.

'OFF' Betyder att instrumentet håller på att stängas av. Detta kommando kan avbrytas genom att trycka på någon knapp.

'SAMPLE FAULT' Betyder att flödet inte är korrekt. Detta kan bero på att sondslangen är blockerad, vätska har sugits in i instrumentet, filtret är igensatt eller fel på pumpen. När instrumentet körs i Measure- eller Purge-läge stanna pumpen automatiskt.

Sondslang och filter skall kontrolleras varefter knappen "1" trycks ner och återstartar pumpen.

'CHECK ZERO' Betyder att nolljusteringen ej kunnat utföras på grund av närvaro av gas. Stäng av instrumentet och återstarta det i ren luft..

'ZERO FAULT' Betyder att "nollan" ligger utanför sin gräns. Stäng av instrumentet och återstarta det i ren luft. Om felet ej försvinner lämnas instrumentet för service till kvalificerad personal.

'BAT' Betyder att batteriet snart behöver bytas. Då detta meddelande visa är den återstående drifttiden med alkalinebatterier ca. 60 minuter. Denna tid kan dock variera mycket beroende på fabrikat, temperatur m.m.

Med laddningsbart batteri visas 'BAT' när det återstår ca. 30 minuter.

Vartefter batterispänningen fortsätter att sjunka blinker 'BAT FAULT'. Slutligen visas 'OFF' och instrumentet stänger av sig automatiskt.

Batteriet skall omedelbart bytas eller laddas.

'BAT FAULT' Betyder att batteriet skall bytas omedelbart.

'1' Betyder även efter att instrumentet satts I gång att informationen angående kalibrering är felaktig Instrumentet skall lämnas för service.

BRUKSANVISNING

KNAPP 1

KNAPP 2

Slå på (Alternativ 1)
%LEL växlar automatiskt till vol%Gas

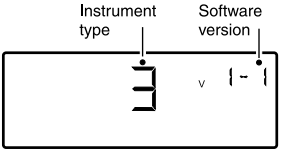
Tryck och håll nere knapp "1" [▽] för att sätta på instrumentet och pumpen. Detta startar en automatisk kontroll och uppvärmning av instrumentet:

Slå på (Alternativ 2)
0 till 100 vol% Gas för "Purge applications".

Tryck och hall knapp "2" [▼] för att starta instrumentet och pumpen. Detta startar en automatisk kontroll och uppvärmning av instrumentet.

Alla tecken visas i displayen

och åtföljs av Instrumentets beteckning, mjukvaruversion



och batteristatus.

Härefter visas med månad och år när instrumentet skall kalibreras.

Dessa meddelande följs av den aktuella gaskoncentrationen.

Anm. Är instrumentet "Purge mode" är indikeringen för "PURGE" synlig i displayen :

Pump AV / PÅ

Ett tryck på knapp "1"  då pumpen går stoppar pumpen. Med ytterligare ett tryck startar pumpen igen.

Kvittering av larm

Gasurveyor 3-500, har som standard larmfunktionen aktiverad vid mätning I LEL-området.

Om larmfunktionen är aktiverad så kan den vara antingen automatisk återgående eller ej.

Automatisk återgående larm upphör då gaskoncentrationen understiger larmgränsen.

Ej automatisk återgående larm måste kvitteras manuellt genom att dubbeltrycka på knapp "2"  , efter det att gaskoncentrationen understiger larmgränsen.

Stäng av

Ett dubbeltryck på knapp "1"  stänger av instrumentet. ("Off " visas i displayen och instrumentet går igenom en "avstängningssekvens" under ca. 5 sek.).

Tjek liste

1. Tjek at instrumentet ikke har nogle åbenlyse fejl.
2. Tjek tilbehør.
3. Læs og forstå burger manualen før brug.
4. Tænd instrumentet
5. Tjek batteriet level.
6. Tænd altid og nulstil i frisk luft.

Sikkerhed

- Instrumentet skal regelmæssigt serviceres og kalibreres af autoriseret personale.
- Opladning af batterier skal ske i et sikkert rum.
- Tjek batteriet sidder rigtigt fast på instrumentet før brug.
- Udsæt aldrig batteri eller instrumentet for ekstrem varme.
- Brug kun GMI reserve dele til instrumentet.
- Hvis instrumentet konstatere gas, følg da de procedure som din organisation har foreskrevet.
- Forbrændings kammer er brandsikker tilbehør, og må ikke åbnes i almindelig atmosfære.
- Ethvert krav i forbindelse med produkt ansvar eller følge skade på tredje part imod GMI, er fjernet hvis de ovenstående forskrivelser ikke håndhæves.
- Gasurveyor 3-500 instrument er certificeret ifølge: EEx iad IIC T4 (-20^{o}C ≤ Tamb ≤ 50^{o}C).

  BAS01ATEX2292 Ex εx II 2 G.

  CLASSIFIED UL UL Class 1 Groups A, B, C and D.

Bruger områder

Afdækning af bestemte kemikalier kan resultere i tab af følsomheden i LEL sensoren. Hvor disse omgivelser er kendte eller mistænkt, anbefales det at foretage målinger oftere. Den kemiske sammensætning som kan resultere i tab af følsomhed, inkludere silikoner, bly, halogen og svovl. Brug ikke instrumentet ved potentiel farlig atmosfære, der indeholder mere end 21 % ilt.

Bruger beskeder og fejl

Forskellige beskeder/tegn forekomme på displayet under brug.

'SAMPLE' fortæller at pumpen kører, og at instrumentet optager prøver.

'OFF' Indikerer at instrumentet er ved at slukke. Denne kommando kan afbrydes ved et tryk på en anden knap.

'SAMPLE FAULT' Fortæller at der er et problem under prøve sugning, som kan være følgende: opsugning af skidt, vand, filter blokering eller eb fejl i pumpen. Under måling og "purge" stopper pumpen automatisk. Tjek for disse fejl, og tryk på knap 1 for at genstarte pumpen.

'CHECK ZERO' Indikerer at der måske har været en fejl under måling. Sluk instrumentet og tænd igen i frisk luft.

'ZERO FAULT' Indikerer at nul grænsen er uden for kalibrerings området. Sluk instrumentet og tænd igen i frisk luft. Hvis fejlen ikke er væk, send instrumentet til service.

'BAT' Fortæller at batteriet snart løber tør for strøm. Alt efter kvaliteten at Alkaline batterier, vil der ca. vil være 60 minutter tilbage. Med genopladelige batterier er der ca. 30 minutter tilbage. Efter strømmen her fra falder, begynder `BAT FAULT` at blikke. Efter noget tid slukkes instrumentet automatisk.

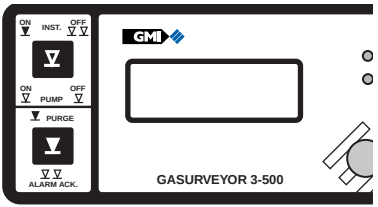
'BAT FAULT' Fortæller at batteriet straks skal skiftes.

'1' Kan fremkomme efter opstart, betyder at der er en kalibrering fejl. Instrumentet skal sendes til service.

Tænd Gasurveyor

KNAP 1

KNAP 2

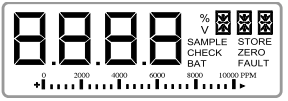


Mode 1 (LEL/Volume Gas)

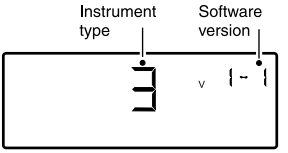
Tryk og hold nede den knap 1 [▽], så startes opvarmnings processen og pumpen.

Mode 2 (0-100 Volume Gas til purge)

Tryk og hold nede den knap 2 [▽], så startes opvarmnings processen og pumpen.



Under opvarmning identificeres model, serienummer, software version,



batteristatus,

kalibrerings måned og år.

Herefter vil displayet begynde at vise målinger.

Bemærk at når instrumentet er i "purge" mode, vil "purge" blinke på displayet.

Pumpe

Et tryk på knap 1 [▽], når pumpen kører, stopper pumpen og målingen.

Et tryk mere på knap 1 starter pumpen og målingen igen.

Alarms afbrydelse

Gasurveyor 3-500 har både hørlig og visuel alarm ved fejl under brug.

Når alarm er sat i stand, gar instrumentet muligheden for at enten have latching eller non-latching alarm.

Non-latching afbrydes automatisk, når gas niveauet kommer under alarm grænsen.

Latching alarmer afbrydes manuelt ved at trykke 2 gange på nederste knap, efter gas niveauet er faldet ned under alarm niveauet.

Alarms afbrydelse

Når man er tilbage til et gas frit område, eller målingen er kommet under alarm området, tryk og hold ned den grønne knap nede, så stopper hørlig og synlig alarmer.

Sluk Gasurveyor

Tryk 2 gange på knap 1 [▽].

CHECKLIST

1. Kijk na of het instrument geen zichtbare fouten vertoont.
2. Kijk de accessoires na.
3. Lees en begrijp het handboek voor gebruik.
4. Schakel het toestel aan (zie volgende bladzijde).
5. Kijk het batterijniveau na.
6. Controleer “NUL” in open lucht.

VEILIGHEID

- De instrumenten moeten regelmatig nagekeken en gekalibreerd worden door daartoe opgeleid personeel in een veilig lokaal.
- **Batterijen:** Alkaline batterijen en herlaadbare batterijen moeten vervangen en heropgeladen worden in een veilige omgeving en moeten precies passen voor gebruik. Gebruik nooit beschadigde batterijen of stel ze niet aan extreme hitte bloot.
- Alleen GMI wisselstukken mogen gebruikt worden.
- Indien het instrument gas detecteert, volg dan uw eigen bedrijfsprocedure en gebruiksaanwijzing.
- De verbrandingskamer is een brandvrij onderdeel en mag niet geopend worden in een ontvlambare atmosfeer.
- Gasurveyor 3-500 instrumenten zijn gecertifieerd zoals EEx iad IIC T4 (-20^{o}C ≤ Tamb ≤ 50^{o}C).

  BAS01ATEX2292   II 2 G.

  UL Klasse 1 Groepen A, B, C en D.

- Dit toestel is ontwikkeld en gemaakt om ons te beschermen tegen voorvallen zoals beschreven in paragraaf 1.2.7 van Annex II van de ATEX 94/9/EC

Elke recht op een claim met betrekking tot de betrouwbaarheid of de daardoor veroorzaakte schade van welke derde partij dan ook aan GMI zal verworpen worden indien de waarschuwingen genegeerd zijn.

PLAATSEN VAN GEBRUIK

Blootstelling aan bepaalde chemicaliën kan resulteren in een verlies van gevoeligheid van de brandsensor. Indien deze omgevingen bekend zijn of vermoed worden, is het aanbevolen om meer frequente check-ups uit te voeren. Chemische stoffen die een verlies van gevoeligheid kunnen veroorzaken zijn siliconen, lood, halogenen en zwavel. Gebruik het instrument niet in een schadelijke atmosfeer met meer dan 21 %

zuurstof. Het omhullende materiaal is polypropyleen en dit mag niet blootgesteld worden aan omgevingen die waarschijnlijk resulteren in mechanische of thermische degradatie of schade veroorzaakt door contact met aggressieve substanties. Bijkomende bescherming kan nodig zijn in omgevingen waar het omhulsel van het instrument onderhavig kan zijn aan schade.

GEBRUIKSBOODSCHAPPEN / FOUTMELDINGEN

Verschillende boodschappen kunnen op het LCD scherm verschijnen om de status van het instrument aan te duiden.

'SAMPLE' Indicatie dat de pomp draait en dat het instrument meet.

'OFF' Indicatie dat het instrument bijna gaat uitschakelen. Dit kan geannuleerd worden door een enkele druk op eendert welke knop.

'SAMPLE FAULT' Indicatie van een probleem met de instroom van het instrument doordat de invoer geblokkeerd is, door waterinsijpeling, een verstopte filter of falen van de pomp. Bij meting stopt de pomp automatisch. De invoer, filters etc. moeten gecontroleerd worden op waterinsijpeling of verstopping en knop één moet dan ingeduwd worden om de pomp te herstarten.

'CHECK ZERO' Indicatie dat het nulpunt gewijzigd kan zijn door de aanwezigheid van gas. Schakel het instrument uit en opnieuw aan in frisse lucht.

'ZERO FAULT' Indicatie dat het nulpunt buiten de kalibratielimieten valt. Schakel het instrument uit en opnieuw aan in frisse lucht. Indien de foutmelding niet verdwijnt, breng het toestel terug voor onderhoud.

'BAT' Indicatie dat de batterijen weldra aan vervanging toe zijn. Nu resten er nog ongeveer 60 minuten met alkaline batterijen, alhoewel dit erg afhankelijk is van de batterijenproducent, temperatuur, gebruik etc. Met herlaadbare batterijen duidt 'BAT' nog ongeveer 30 minuten resterende gebruiksduur aan. Naarmate de batterijkracht daalt, knippert op het LCD scherm 'BAT FAULT'. Daarna zal de LCD automatisch 'OFF' vertonen en schakelt het toestel zelf uit. De batterijen moeten dan onmiddellijk vervangen worden.

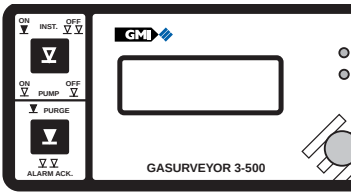
'BAT FAULT' Indicatie dat de batterijen onmiddellijk moeten vervangen worden.

'1' Indicatie, die ook na aanschakelen van de stroom kan verschijnen, dat een kalibratiegegevensfout werd opgespoord. Het instrument moet binnen voor onderhoud.

GEBRUIK

KNOP 1

KNOP 2

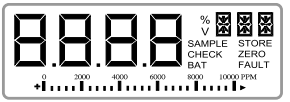


Schakel AAN (Mode 1)
LEL autobereik naar volume gas.

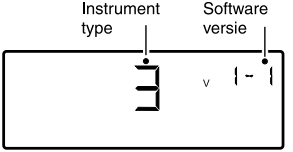
Druk op knop 1 ▽ en houdt ingedrukt om instrument en pomp aan te schakelen. Dit zorgt voor opwarming:

Schakel AAN (Mode 2)
0 tot 100% volume gas voor reinigingstoepassingen.

Druk op knop 2 ▽ en houdt ingedrukt om instrument en pomp aan te schakelen. Dit zorgt voor opwarming.



Alle LCD segmenten worden getoond.



gevolgd door het instument type en de software versie,

en daarna de batterij status, zoals getoond:

Dan toont het instrument, met maand en jaar, wanneer de volgende kalibratie moet plaatsvinden. (februari 2002 bijvoorbeeld)

De display wordt gevolgd door het lezen van de huidige gasdetectie.

Nota: In de reinigingstoestand is de PURGE geactiveerd, zoals getoond

Pomp AAN / UIT

Een enkele druk op knop 1 wanneer de pomp draait, schakelt de pomp uit en stopt het meten. Een volgende druk op knop 1 schakelt de pomp weer aan.

Alarmen verwijderen

De Gasurveyor 3-500 heeft standaard de alarmfunctie op het ontvlambare bereik uitgeschakeld. Indien de alarmfunctie aangeschakeld is, kunt u op het instrument kiezen tussen een alarm met of zonder automatische uitschakeling.

"Non-latching" alarmen stoppen automatisch indien het niveau van het gedetecteerde gas daalt onder het vooraf ingestelde punt in het toestel. "Latching" alarmen kunnen stopgezet worden door een dubbele druk op knop 2 , nadat het gedetecteerde gasniveau onder het vooraf ingestelde punt in het toestel is gedaald.

Schakel UIT

Een dubbele druk op knop 1 schakelt het instrument uit.

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