Gas Measurement Instruments Ltd

PPM Gasurveyor 500
User Handbook

Q 09760

Issue 6

28/07/04

Part Number: 42142

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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 PPM Gasurveyor 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

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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.
- PPM Gasurveyor 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 03.06.99	All	New Handbook
Issue 2 18.05.01	All	Handbook revised to reflect updated instrument options and features.
Issue 3 22.03.02	All	Handbook revised to incorporate effect of CR 2272 and CR 2288.
Issue 4 01.05.02	All	Handbook revised to incorporate effect of CR 2305
Issue 5 17.07.03	All	Handbook revised to incorporate effect of CR 2291
Issue 6 28/07/04	All	Handbook revised to include Appendix C (translations)

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1

INTRODUCTION

The PPM Gasurveyor 500 is a two button instrument designed to measure Parts Per Million, Lower Explosive Level and Volume flammable gas. The instrument is designed to the latest standards and is certified for use in Hazardous Areas.

The PPM Gasurveyor 500 contains the following ranges:

- LEL, 0 to 100%
- Volume gas, 0 to 100%
- PPM Flammable
- Search mode (enhanced ppm flammable range)

- As the PPM Gasurveyor 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 features of the instrument are:

- Rugged 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 Geiger indication, configured in PPM Flammable and Search ranges, provides indication of gas concentration increase via the increased rate of sounder and LED pulse.
- Directly interfaces with the GMI Auto Test Calibration Systems.

2

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.

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.

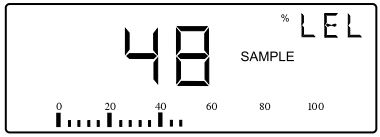


Figure 2.1 LEL Range

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.

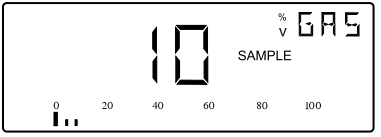


Figure 2.2 Volume Gas Range

PPM Flammable 0 – 1000 ppm

This range is used to measure very low levels of gas and indicates the parts per million concentration of the gas in air (1000 ppm is equivalent to 0.1% Volume Gas).

The digital display reading resolves to 5 ppm with the analogue bargraph following in steps of 40 ppm. The ppm range is more sensitive than LEL and Volume ranges and takes longer to stabilise. The detection principle is a catalytic reaction with the sensitivity of the sensors greatly enhanced compared to the LEL range. Digital signal correction techniques are used to minimise drift. The ppm range includes a manual zeroing procedure.

The ppm range has the option of using a 'threshold'. By this, we mean that we can display either a blank screen or simply a zero (0) on the display, up to a pre-set level.

This allows small readings, which may not be due to the gas we wish to find or very small amounts of gas, to be ignored if they fall below any pre-set action levels. This allows the operator to react only to significant levels.

The ppm range has no threshold set by default. If your instrument has a threshold, write the level here:

.....

The ppm range, by default, has the audible and visual Geiger indication configured which provides indication of gas concentration increase via the increased rate of sounder and LED pulse.

When the instrument is switched on, the visual Geiger indication is enabled and the audible Geiger indication is

disabled. To enable audible Geiger indication, press and hold Button Two ▼.

The display changes between PPM and Aud (if enabled) as shown in Figure 2.3.

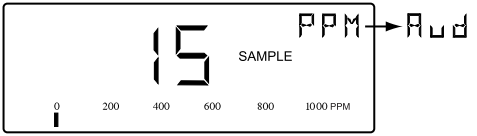


Figure 2.3 PPM Range

Threshold Display Options

The ppm range will by default, if a threshold is selected, display below the threshold as zero (0) on the screen.

The option is to display a blank screen for levels below the threshold, as shown in Figure 2.4.

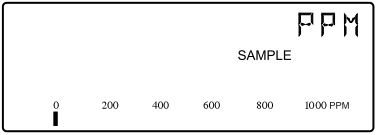


Figure 2.4 Threshold Display Option

Search Mode

Search mode is an enhanced variant of the ppm flammable range with increased resolution and faster response. Search mode can be used for detecting leaks which can then be classified using the more accurate ppm, LEL and Volume Gas ranges.

The Search range provides an indication of gas only, and it should not be used to carry out any assessment of gas levels.

The pump speed in this range is higher, which is apparent from the increased sound from the pump.

The Search range, by default, has the audible and visual Geiger indication configured which provides indication of gas concentration increase via the increased rate of sounder and LED pulse.

When the instrument is switched on, the visual Geiger indication is enabled and the audible Geiger indication is disabled. To enable audible Geiger indication, press and hold Button Two .

The display changes between search symbol and Aud (if enabled) as shown in Figure 2.5.

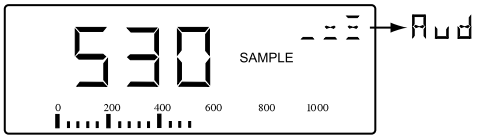


Figure 2.5 Search Mode

Geiger Indication

The Geiger provides indication that as the gas concentration increases, the sounder (if activated) and the LED, pulse at an increasing rate. When the PPM Gasurveyor 500 has PPM Flammable or Search range selected, or is switched on in full autorange mode then, by default, the visual Geiger indication is enabled and the audible Geiger indication is disabled.

To enable the audible Geiger indication, press and hold Button Two  .

A further press and hold of Button Two  will increase the audible level. A further press and hold of Button Two  will return to visual only Geiger indication.

Note: When Search mode is selected, the pump operates at an increased speed. If Search mode is selected when the pump is switched off, the pump then reactivates.

Construction

The instrument is housed in a tough, impact resistant, moulded case made of 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 to reset the battery indicator to 100%. 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 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

The PPM Gasurveyor 500 has a cotton particulate filter located behind the instrument inlet nozzle. The filter should be checked at frequent intervals or when the SAMPLE FAULT flag appears in the instrument display, and where appropriate, changed to ensure a clean sample path. In the event of the SAMPLE FAULT flag becoming activated, the pump should be stopped as soon as possible and the filter replaced. See Filter Replacement in Section 4 OPERATOR MAINTENANCE.

If SAMPLE FAULT still shows, after filter replacement, the instrument will require to be returned for servicing.

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.
- Any filters are clean and in good condition.
- The sample line and any other 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 , as shown in Figure 3.1:

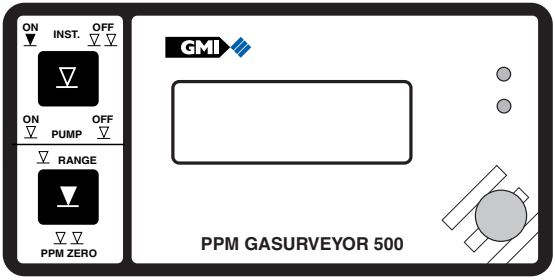


Figure 3.1 Instrument Front Plate

Mode 1

Switching ON with Button One provides three gas ranges, PPM, LEL / Gas, and Search.

Note: Geiger feature is not operational in Search or PPM range when instrument is switched on in normal mode.

Mode 2

Switching ON with Button Two provides full autorange mode which, following warm up cycle, automatically changes range between PPM / LEL / GAS

Figure 3.2 displays the warm up cycle for the PPM Gasurveyor 500.

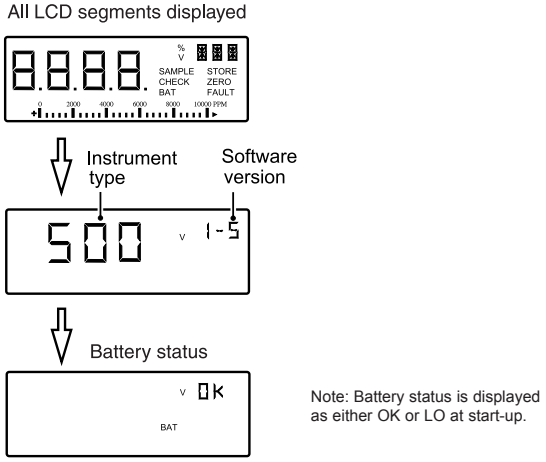


Figure 3.2 Warm Up

Calibration Date Features

At the end of warm-up and before the PPM Gasurveyor 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 PPM Gasurveyor 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 Off

A double press of Button One  turns the instrument off immediately.

The instrument switches off automatically after 30 minutes. 'OFF' is shown in the top right hand corner of the display. Pressing any button cancels this automatic switch-off. The instrument will then allow another 30 minutes of use.

This 30 minute period is set as a default.

The switch off time may be altered to any time between 1 and 1000 minutes

Changing Range

Each single press of Button Two  changes the range selected. The display cycles through the available ranges in the order LEL/GAS – PPM – LEL/GAS, etc.

Note: The instrument, by default, auto-ranges between LEL and Volume Gas.

Activate the Audible Geiger Indication (PPM or Search Range)

The audible Geiger indication can be activated by pressing and holding Button Two  .

A further press and hold of Button Two  will increase the audible level.

A further press and hold of Button Two  will return to visual only Geiger indication.

Zeroing the ppm or Search Range

A double press of Button Two zeroes the ppm range. This should be carried out in fresh air and may take a few minutes to reach the optimum zero stability. The display in Figure 3.4 occurs if a large adjustment is needed to reach the zero point.

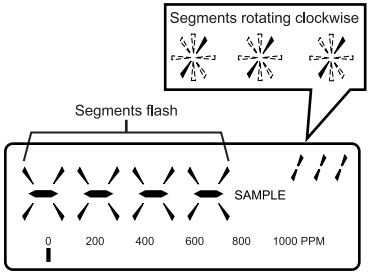


Figure 3.4 Zeroing Range

Summary of Button Operation

Measure Mode	Single Press	Double Press	Press and Hold
Button 1 	Toggle Pump On / Off	Switch Off Instrument	Switch On Instrument in normal mode
Button 2 	Next Range	Zero Current Range (ppm or Search)	Switch On Instrument in full autorange mode Enable / Disable or increase level of audible Geiger

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 switch.

‘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 normal mode the pump stops automatically. The sample line, filters etc. should be checked for water ingress or blockage and Switch One should then be used 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, leave the instrument on for a period of 30 minutes then switch off and on again. If the fault still 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.

'EEE'

'EEE' is displayed if the measurement in the Search or ppm ranges rises above 999 (instrument over range). The ppm range auto-ranges to LEL/Volume gas and hence does not show this message.

The message is also displayed if the measurement falls below -99 (incorrect zero setting) in either Search or ppm ranges.

'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.

4

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 batteries.

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.

---

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

A cotton particulate filter is fitted behind the instrument inlet nozzle to minimise the danger of moisture and dust ingress.

Caution: The instrument should never be switched on without a filter 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 instrument filter if the message does not clear.

To replace the filter, proceed as follows:

1) Use a two pence coin, or similar, to locate in the slot of the inlet nozzle, then unscrew in an anti-clockwise direction to remove both the nozzle and filter.

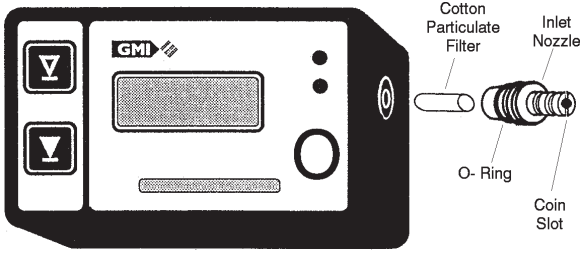


Figure 4.1 Filter Replacement

2) Discard the filter.
3) Check nozzle O-ring for damage, and replace if necessary.
4) Place a new cotton particulate filter in the nozzle recess, then insert nozzle and filter in the instrument inlet.
5) Use a coin once again, turning in a clockwise direction, to tighten the nozzle in the instrument inlet.

Note: Care must be taken not to overtighten the inlet nozzle.

Probe Handle Assembly - Part No. 13561

Fitting of an in-line filter assembly, which is available as an accessory, to the probe handle, as shown in Figure 4.2, will minimise the danger of dust and / or water ingress.

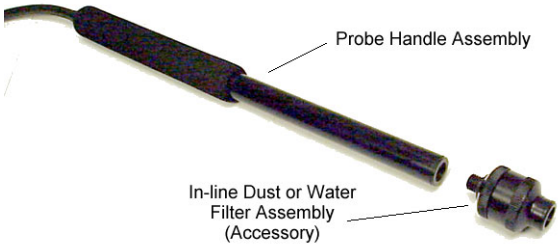


Figure 4.2 Probe Handle and In-line Filter Assembly

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 filter assembly for blockage. Press Button One ▽ to clear the 'SAMPLE FAULT' message. Replace the filter if the message does not clear.

In-line Dust Filter (Accessory)

To replace the Dust Filter in the Dust Filter Housing assembly, proceed as follows:

1) Unscrew the filter housing assembly (Figure 4.3).

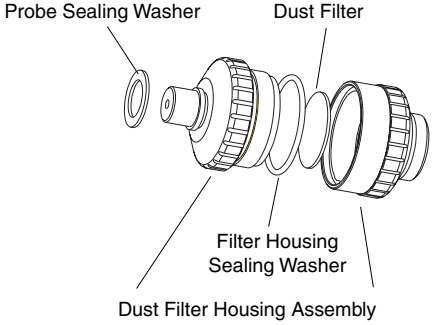


Figure 4.3 Dust Filter Assembly

2) Remove Dust Filter, then discard.

3) Check Filter Housing Sealing Washer and Probe Sealing Washer for signs of damage or wear and replace if necessary.
4) Fit new Dust Filter.
5) Reassemble the Dust Filter Housing assembly.

In-line Water Filter (Accessory)

To replace the Hydrophobic Filter in the Water Filter Housing assembly, proceed as follows:

1) Unscrew the filter housing assembly (Figure 4.4).

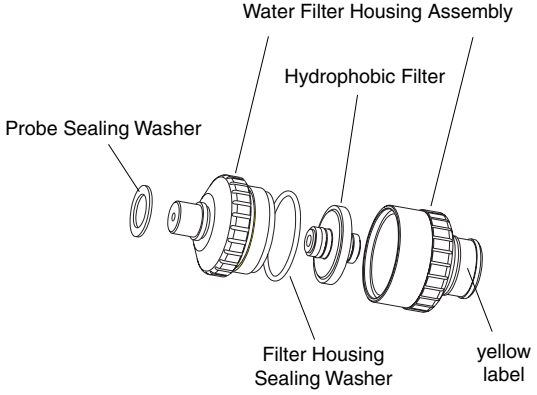


Figure 4.4 Water Filter Assembly

2) Remove Hydrophobic Filter, then discard.

3) Check Filter Housing Sealing Washer and Probe Sealing Washer for signs of damage or wear and replace if necessary.

4) Fit new Hydrophobic Filter.

   Note: The filter should be installed with the yellow label on the filter, facing the yellow label on the housing flange.

5) Reassemble the Water Filter Housing 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 PPM Gasurveyor 500 Instrument

Part Number **42500 / 42500R**

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.
13561	Probe Handle
13562	Probe Handle Adaptor (use with 13563 or 13565)
13563	Bellows Cup Probe
10077	Cotton Particulate Filters (Box of 10) x 2
42142	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
12006	O-ring (Inlet Nozzle)
42183	Water Filter Assy. c/w Hydrophobic Filter (use with 13561)
42184	Dust Filter Assy. c/w Dust Filter (use with 13561)
42235	Filter Housing Sealing Washer (use with 42183 or 42184)

12379	Probe Sealing Washer (use with 42183 or 42184)
42388	Dust Filter - Box of 20 (use with 42184)
12481	Probe Handle c/w Filters
12358	Hydrophobic Filter (use with 12481 or 42183)
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.
12480	Plastic Probe - Solid 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.
13565	Swan Neck Probe
13655	Probe Shroud c/w Skids (use with 13565)
12365	In-Line Hydrophobic Filter Holder
12688	Sample Line Adaptor
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

A

TYPICAL OPERATING PARAMETERS

Typical operating parameters are as follows:

Gas Range	Range	Resolution	Zero Stability	Accuracy
ppm	0 to 1000 ppm	5 ppm	+/- 30 ppm	5% +/- 25 ppm
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.

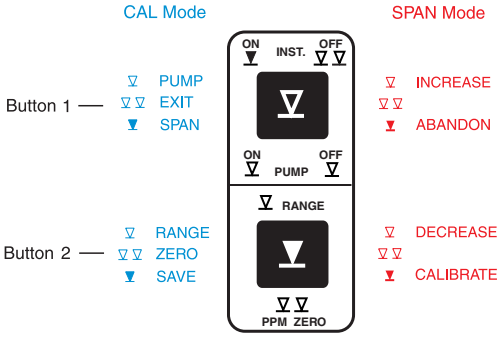


Figure B-1 Button Functions

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.

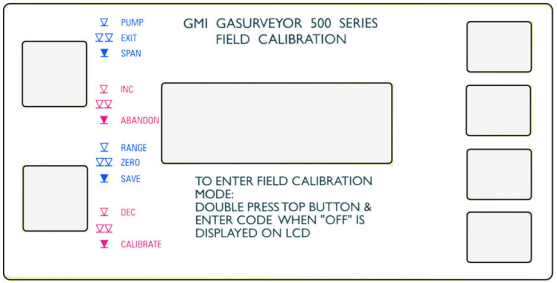


Figure B-2 Instrument Overlay Card

Selectable Ranges in FCM

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

Note: There is no requirement to calibrate Search range since this is derived from PPM.

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.

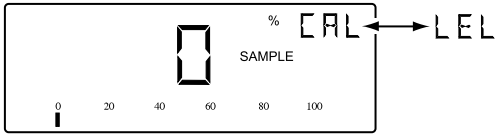


Figure B-3 Field Calibration Display

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

Note: There is no requirement to zero the Search range since this is derived from PPM.

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.

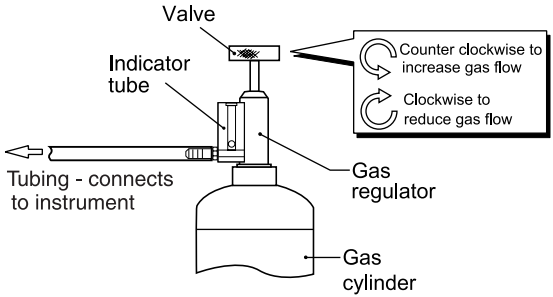


Figure B-5 Connecting Gas

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.

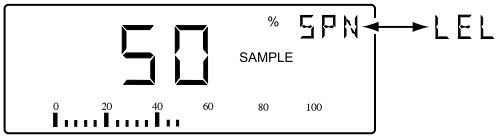


Figure B-6 SPAN Mode Display

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

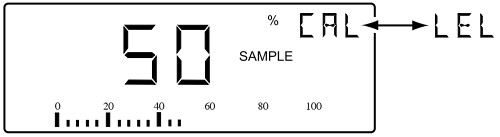


Figure B-8 50% LEL Display

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.

Note: When all ranges have been zeroed, calibrated correctly, CAL data saved and followed by CAL mode exit, the new CAL DUE date will be set to 12 months from now. (This can be altered to a different frequency, via the set-up program, e.g. 6 months from now. Contact GMI for details).

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 and calibration date remains in the instrument memory.

OPERATING INSTRUCTIONS

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

PPM Gasurveyor 500 instrument.

Each language and pages reference is as follows:

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

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.
- PPM Gasurveyor 500 instruments are certified as
  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.
- 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 normal 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.

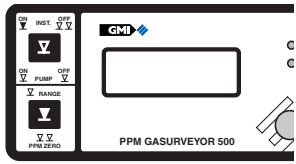
'BAT FAULT' Indication that the batteries should be replaced immediately.

'EEEE' Indication that the measurement in the Search or ppm range has risen above 999 (instrument over range). The ppm range auto ranges to LEL / Volume Gas and hence does not show this message.

The message is also displayed if the measurement falls below -99 (incorrect zero setting) in either the Search or ppm ranges.

'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)

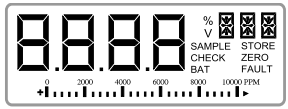
PPM ; LEL autoranging to Volume Gas ; Search

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

Switch ON (Mode 2)

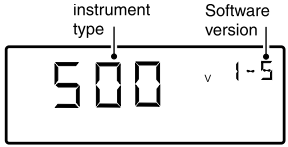
PPM autoranging to LEL autoranging to Volume Gas.

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.

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.

Changing Range

Each single press of Button Two ▼ changes the gas range. The display cycles through the available ranges in the order: LEL/GAS – PPM – LEL/GAS, etc.

Zeroing the PPM or Search Range

A double press of Button Two ▼ zeroes the ppm range. This should be carried out in fresh air and may take a few minutes to reach the optimum zero stability.

Activate Audible Geiger Indication (PPM / Search)

Press and hold Button Two ▼ to activate the audible Geiger indication.

A further press and hold of Button Two ▼ will increase the audible level.

A further press and hold of Button Two ▼ will return to 'visual only' Geiger indication.

Switch OFF

A double press of Button One ▽ turns the instrument Off.

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.
- PPM Gasurveyor 500 Instrumente sind zertfiziert nach:
  EEx iad IIC T4 (-20°C ≤ bis ≤ 50°C)

  BAS01ATEX2292 Ex εx II 2 G.

  CLASSIFIED 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

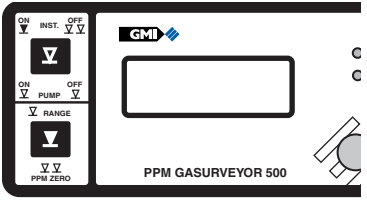
'EEE' Messung im ppm oder Search Modus über 999 (Bereichsueberschreitung) oder –99 (Nullpunkt falsch) Die autom. Umschaltung von ppm/ LEL / Volume Gas zeigt diese Anzeige nicht.

'1' Kalibrierfehler. Geraet zum ServicePart Number: 42482 Issue 1 (09/09/2003) PPM GASURVEYOR 500 Bedienungshinweise

Bedienung

TASTE 1

TASTE 2



Einschalten (Modus 1)

PPM ; LEL autom Umschaltung auf Volume Gas ; *optional Search*

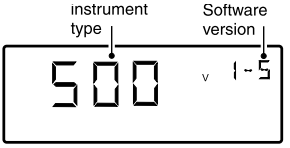
Taste 1 [▽] Druecken und Halten, Geraet und Pumpe ein und die Selbsttestphase beginnt:

Einschalten (Modus 2)

PPM autom.Umschaltung auf LEL und weiter auf Volume Gas.

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.

Pumpe Ein/Aus

Taste 1 ▽ 1x Druecken Stop der laufenden Pumpe und der Probenahme. Erneutes Drücken startet die Pumpe wieder.

Messbereichswechsel

Taste 2 ▼ 1x Druecken wechselt den Messbereich Im Display wechselt folgende Anzeige

LEL/GAS – PPM – LEL/GAS, etc.

Nullpunkt PPM (optional Search) *Bereich*

Taste 2 ▼ 2x Druecken setzt den Nullpunkt im ppm bzw. *optional Search* Bereich. Der Nullpunkt darf nur in Frischluft gesetzt werden um optimale Stabilitaet zu haben

Geiger Signal Ein / Aus

Im Bereich ppm brennbar bzw.optional search,oder wenn das Instrument mit Taste 2 ▼ gestartet wurde, ist das optische Geigersignal eingeschaltet und das akustische Geigersignal ausgeschaltet.

Druecken und Halten von Taste 2 ▼ schaltet das akustische Geigersignal ein. Erneutes Druecken und Halten von Taste 2 ▼ vermindert die Lautstaerke des akustischen Signals. Erneutes Druecken und Halten von Taste 2 ▼ schaltet zum optischen Geigersignal zurueck.

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.

SÄKERHETSAFETY

- 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.
- PPM Gasurveyor 500-instrument är klassat enligt
  ”EEx iad IIC T4” (-20°C ≤ Tamb ≤ 50°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 "One" 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.

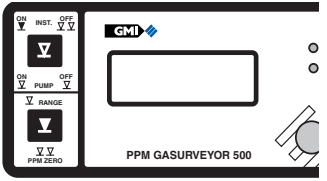
"EEEE" Betyder att vid mätning av brännbara gaser i ppm-området för giftiga gaser är koncentrationen mer än 999 ppm. Denna indikering syns även om mätaren går under -99 (felaktig nollpunkt) vid mätning av giftiga gaser.

'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 (Läge 1)
PPM ; % LEL automatiskt växlande till vol % Gas ; Läcksökning

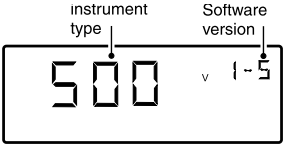
Tryck och håll nere knapp “1” [▽] för att sätta på instrumentet och pumpen. Detta startar en automatisk kontroll och uppvärmning av instrumentet:

Slå på (Läge 2)
PPM automatiskt växlande till % LEL till vol % Gas.

Tryck och håll nere knapp “2” [▽] för att sätta på 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.

Därefter visas datumet för nästa kalibrering.

Dessa meddelande följs av denaktuella gaskoncentrationen.

Pump AV / PÅ

Ett tryck på knapp “1” ▽ då pumpen går stoppar pumpen. Med ytterligare ett tryck startar pumpen igen.

Byte av mätområde

Ett tryck på knapp ”2” ▼ ändrar mätområdet

Displayen går igenom områdena enligt % LEL / vol % GAS – PPM – % LEL / vol % GAS etc.

Nollställning av mätområdena (ppm eller läcksökning)

Dubbeltryck på knapp ”2” ▼ nollställer mätområdet (skall utföras i ren luft). Det kan ta några minuter för värdet att stabiliseras.

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.
- PPM Gasurveyor 500 instrument er certificeret ifølge:

  EEx iad IIC T4 (-20°C ≤ Tamb ≤ 50°C).

  BAS01ATEX2292 Ex εx II 2 G.

  CLASSIFIED 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.

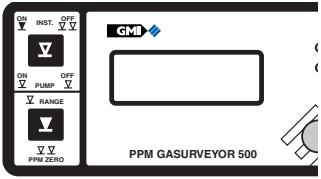
'STORE' Indikerer at instrumentet er på automatisk datalog.

'EEEE' Indikerer at målingen af PPM er oversteget 999 (som er højeste måling). PPM måling skifter automatisk over til LEL/vol gas, og viser derfor ikke denne besked.

Denne besked vises også hvis målingen falder under -99.

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

Tænd instrument



KNAP 1

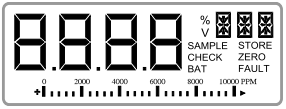
KNAP 2

Mode 1 (LEL/Volume Gas)

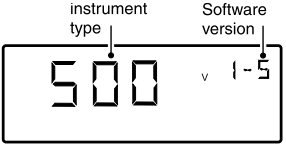
Tryk og hold nede den knap 1 [▽], så startes opvarmnings processen og pumpen.

Mode 2 (PPM/LEL/Volume Gas)

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.

Pumpe

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

Skift måling

Hvert tryk på knap 2 [▼], skifter måling Følgende er mulig: LEL/gas – PPM – LEL/gas, ect.

Nulstille PPM måling

Tryk 2 gange på knap 2 [▼], når PPM måling er valgt, nul stilles målingen. Dette bør gøres i frisk luft.

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/herlaadbare batterijen) moeten vervangen en heropgeladen worden in een veilige omgeving.
- De batterijen 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.
- PPM Gasurveyor 500 instrumenten zijn gecertifieerd zoals EEx iad IIC T4 (-20°C ≤ Tamb ≤ 50°C).

  BAS01ATEX2292 Ex Ex II 2 G.

  CLASSIFIED UL 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. Normaal 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.

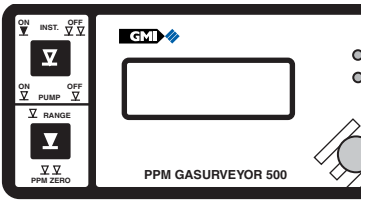
'EEEE' Indicatie dat de meting in het zoek of ppm bereik boven 999 is gestegen (instrument buiten bereik). Het ppm bereik autobereik van LEL / Volume Gas toont daardoor deze boodschap niet. De boodschap wordt ook getoond indien de meting onder –99 gaat (niet-correcte nul instelling) in de ppm of zoek bereiken.

'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

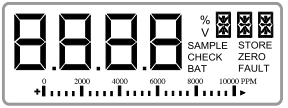


Schakel AAN (Mode 1)
PPM; LEL autobereik tot Volume Gas; zoek

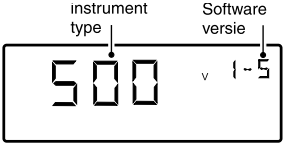
Druk op knop 1 en houdt ingedrukt om instrument en pomp aan te schakelen. Dit zorgt voor opwarming:

Schakel AAN (Mode 2)
PPM autobereik tot LEL autobereik tot Volume Gas.

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.

Pomp AAN / UIT

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

Wijzig bereik

Een enkele druk op knop 2 wijzigt het gas bereik.

De display loopt door de beschikbare bereiken in volgorde van: LEL/GAS – PPM – LEL/GAS; etc.

Op nul zetten van PPM Bereik of Zoek Bereik

Met ppm of zoek bereik geselecteerd, druk tweemaal op knop 2 tot nul. Dit moet in open lucht gebeuren en kan enkele minuten duren totdat de optimale nulstabiliteit bereikt is.

Schakel UIT

Een dubbele druk op knop 1 schakelt het instrument uit.

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GMI Head Office:

Inchinnan Business Park,
Renfrew,
PA4 9RG,
Scotland, U.K.
Telephone +44 (0)141 812 3211
Fax +44 (0)141 812 7820
e-mail: sales@gmiuk.com
http://www.gmiuk.com

GMI Instrument Service / Repair Centre:

Crownhill, 25 Cochran Close,
Milton Keynes,
MK8 OAJ,
England, U.K.
Telephone +44 (0)1908 568867
Fax +44 (0)1908 261056
e-mail: service@gmiuk.com