First Responder CG

User Handbook

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LIABILITY

Every care has been taken in the preparation of this document, but Teledyne GMI do not accept any responsibility for errors or omissions and their consequences. Information in this document is subject to change without notice. This document does not constitute a specification or basis for a contract. Your statutory rights under law are not affected.

MODIFICATION NOTICES

Teledyne 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 First Responder CG 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 Teledyne GMI. Reproduction or disassembly of such embodied programmes or algorithms is prohibited. Ownership of such software is not transferable and Teledyne GMI 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. Teledyne 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 must be exchanged in a safe area and fitted correctly before use. Never use damaged batteries or expose to extreme heat. See Section 5: OPERATOR MAINTENANCE.

- Only Teledyne 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.

- First Responder CG instruments are certified as:
  Ex ia d IIB T3   Ta = -20°C to +50°C (-4°F to 122°F) .

  SIRA 03ATEX2448X ⟨Ex⟩ II 2G.
  ⓊⓁ UL Class 1 Groups 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 2014/34/EU.

Any right of claim relating to product liability or consequential damage to any third party against Teledyne 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.

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1

INTRODUCTION

First Responder CG is the combination instrument for first call and emergency response technicians in the gas utilities industry.

Fig. 1-1 First Responder CG

The instrument is a highly flexible, four button portable gas detector which is designed to provide measurement of LEL and Volume flammable gas for leak detection and general safety monitoring. The First Responder also features a Carbon Monoxide (CO) range, a Hydrogen Sulphide (H2S) range, and Oxygen (O2), for internal atmosphere monitoring where odour call response is required.

The First Responder CG also features a Parts Per Million (PPM) range to increase sensitivity to smaller leaks. This is achieved using the external (EXT) semiconductor sensor located at the end of the 'flexi' probe, that provides a near instantaneous response in detecting small fitting leaks.

This high speed response and sensitivity Semiconductor Sensor Probe also enables initial external leakage surveys to be performed in the vicinity of property or pipelines enabling distribution leaks to be quickly found.

The instrument monitors all gases continuously, providing all round protection for users.

The First Responder CG is equipped with both audible and visual alarms and Geiger indications on the EXT flammable range.

The First Responder CG includes the following ranges:

- 0 to 4,500 ppm to 20 %LEL flammable EXT Range (External Semiconductor Sensor)
- 0 to 100% LEL
- 0 to 100% Volume Gas
- 0 to 1000 ppm Carbon Monoxide
- 0 to 100 ppm Hydrogen Sulphide
- 0 to 25% Oxygen

The First Responder CG has a variety of user configurable options. This handbook details the default configuration, with possible options detailed in *italic* text.

The First Responder CG instrument and Semiconductor Sensor Probe are listed by Underwriters Laboratories and are classified for use in Hazardous Locations Class 1, Groups C and D.

The First Responder CG is supplied in a carrying case with a selection of accessories. For a comprehensive list of accessories supplied with the instrument, and additional accessories available, see Section 7 ACCESSORIES.

The main features of the instrument are:

- Rugged polypropylene case, sealed to IP54 rating and suitable for outdoor use.

- Four 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 alarms with alarm levels pre-set.

- Automatic datalogging.

- Directly interfaces with the GMI Automatic Test / Calibration Unit (GDU*net*).

2

GENERAL INFORMATION

Ranges of Operation

The instrument calibration gas is shown on the instrument service label.

EXT Range (External Semiconductor Sensor), 0 – 4,500 ppm - 20 %LEL Flammable (TRAC mode only)

This range displays flammable gas parts per million (ppm) content up to 4,500pmm, then autoranges to %LEL (concentration up to 20% LEL). When this range is selected, EXT for external, is displayed in the top right corner of the LCD.

A 'Geiger' alarm provides assurance that the instrument is sensing for gas without the need for the operator to constantly view the display.

When the instrument is switched on, the visual Geiger indication is operational. To activate the audible Geiger indication, press **TRAC** *(Button Four). Each single press of* **TRAC** *(Button Four) will toggle the audible Geiger indication ON and OFF.*

When the audible Geiger is activated, the display changes between EXT and Aud, as illustrated in Figure 2-1.
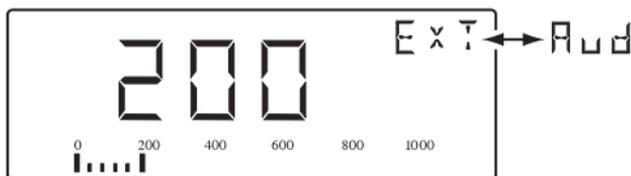
Fig. 2-1 EXTernal Range

PPM, 0 – 4500 ppm
(CGI mode only)

This range will measure very low levels of gas and indicates the PPM concentration of gas in air (45 ppm is equivalent to 0.1% LEL). This sensitive range will take longer than LEL and Volume Gas to stabilise.

For methane, when the measurement exceeds 4500 ppm, the instrument autoranges to LEL.

When the PPM range is selected, PPM is displayed in the top right corner of the LCD. From 0 to 1000 ppm the digital display resolves to 5 ppm. From 1000 to 4500 ppm the digital display resolves to 50 ppm. The analogue bar graph follows in 200 ppm steps. An example of the PPM display is shown in Figure 2-2.

The detection principle for this range is a catalytic reaction.

Fig. 2-2 PPM Range

LEL, 0 – 100%
(CGI and CSM modes only)

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 4.5% Volume methane in Air. Above 100% LEL, the instrument autoranges to Volume Gas.

When the LEL range is selected, LEL is displayed in the top right corner of the LCD. 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 2-3.

The detection principle for this range is a catalytic reaction.

Fig. 2-3 LEL Range

Volume Gas, 0 – 100 %
(CGI, CSM and PURGE modes only)

This range displays the total volume of flammable gas with respect to air.

When the Volume Gas range is selected, GAS is displayed in the top right corner of the LCD. The digital display resolves the signal to 0.1% GAS from 0 to 5%, and 1% GAS from 5% to 100%. The analogue bar graph follows in 4% steps. Figure 2-4 illustrates the Volume Gas display. The detection principle for this Volume Gas range is a catalytic reaction combined with thermal conductivity.
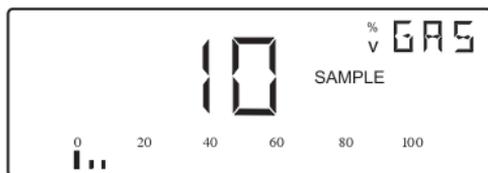
Fig. 2-4 Volume Gas Range

Carbon Monoxide, 0 – 1000 ppm
(CSM mode only)

This range displays the parts per million (ppm) Carbon Monoxide content up to 999 ppm. When the Carbon Monoxide range is selected, CO is displayed in the top right corner of the LCD.

The digital display resolves to 1 ppm CO. The analogue bar graph follows in 40 ppm steps. Above 1000 ppm, EEEE is displayed. Figure 2-5 illustrates the Carbon Monoxide display.

The Carbon Monoxide sensor is subject to the effect of pressure transients and should be operated at normal atmospheric pressure conditions. The sensor has a normal operating life of two years.

Fig. 2-5 Carbon Monoxide Range

Hydrogen Sulphide, 0 – 100 ppm
(CSM mode only)

The Hydrogen Sulphide range measures on the ppm scale. The digital display resolves to 1 ppm H2S. The analogue bar graph follows in 4 ppm steps. Above 100 ppm, EEEE is displayed. Figure 2-6 illustrates the Hydrogen Sulphide display.

The Hydrogen Sulphide sensor is subject to the effect of pressure transients and should be operated at normal atmospheric pressure conditions. The sensor has a normal operating life of two years.
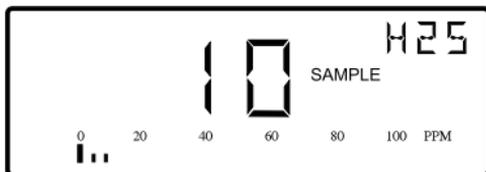
Fig. 2-6 Hydrogen Sulphide Range

Oxygen, 0 – 25%
(CSM and PURGE modes only)

This range displays the percentage Oxygen content of the sample. The instrument range is displayed in the top right corner of the LCD. The digital display resolves the signal to 0.1% O_2 from 0 to 21%, and 1% O_2 from 21% to 25%. The analogue bar graph follows in 4% steps. Figure 2-7 illustrates the Oxygen display.

The gas level is determined using an electrochemical cell, which like toxic sensors is sensitive to pressure transients.

The oxygen cell has an expected life of two years.
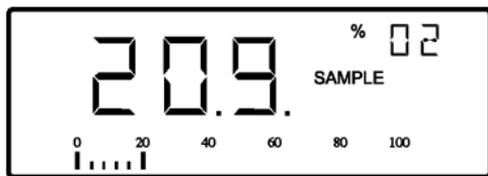
Fig. 2-7 Oxygen Range

Alarms

General Information

Alarms can have both audible and visual indications active. The audible alarm is rated up to 85 dB(A) at 1ft. (0.3m) approx. The visual alarm is a red LED indicator which protrudes from the instrument top plate, allowing viewing from any angle above the top plate.

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.

Alarms in CSM Mode

In this mode, the alarms will be activated when:

- 'HiHi' alarm if LEL gas reading exceeds 20%
- 'Hi' alarm if O2 gas reading exceeds 23.5%.
- 'Lo' alarm if O2 gas reading is less than 19.5%.
- 'Hi' alarm if CO gas reading exceeds 25ppm.
- LTEL CO alarm 25ppm.
- 'Hi' alarm if H2S gas reading exceeds 10ppm.
- STEL H2S alarm 15ppm.
- LTEL H2S alarm 10ppm.

Other values can be set as required.

In CSM mode, alarms are latching. This means that when an alarm level is exceeded, the instrument LED flashes and the sounder pulses rapidly. Latching alarms are cleared manually after the alarm level has fallen below the alarm limit.

Alarms can be configured to be non-latching. This means that the audible and visual alarms will automatically cancel once the alarm condition has cleared.

Alarms can be acknowledged in CSM mode. This means that the audible and visual alarms can be suspended allowing the user to view gas readings in other ranges. Alarms are acknowledged by a double press of **TRAC** (Button 4). If, after 30 seconds, the gas detected still exceeds the alarm level, the audible and visual alarms will be re-activated.

Alarms can be configured so they cannot be acknowledged. This forces the instrument to continually display the alarming range.

Alarms in TRAC Mode

By default, both the audible and visual alarms are disabled.

An option is available to have a 'Geiger' style alarm in the 'EXT' range. This means that, as the gas concentration increases, both the sounder and the red LED pulse at an increasing rate.

Datalogging

The First Responder CG provides the user with an automatic and manual datalogging function.

Automatic Datalogging

By default, the instrument has automatic datalogging enabled in CSM and PURGE modes and is confirmed by the 'STORE' flag being displayed, as illustrated in Figure 2-8.
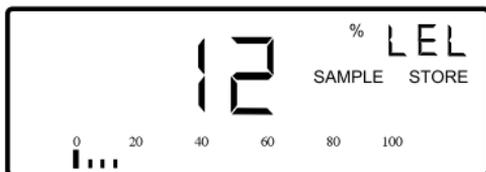
Fig. 2-8 Automatic Datalogging Enabled

During automatic datalogging the instrument stores the values of all gas ranges together with the current time and date at 60 second intervals.

Manual Datalogging

By default, the instrument has manual datalogging enabled in all modes (CGI, CSM, PURGE and TRAC).

The user can initiate a manual log with a double press of **PURGE** (Button 3), if the pump is running.

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 cover is attached to the main instrument body by means of two stainless steel hexagonal screws.

The instrument is sealed against dust and water to IP54 standard. The instrument sensors are protected from dust and water by membrane and cotton filters, when using probe handle assembly (Part No. 12481). Other probes with associated filters are available as accessories.

Batteries

Alkaline (LR20) Batteries

Alkaline batteries provide approximately 18 hours operational life (12 hours with external semiconductor sensor "flexi" probe) at ambient temperature of 59°F to 68°F (15°C to 20°C). 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 life is displayed during warm up. During operation the 'BAT' alarm flag is displayed when 1 to 2 hours of operating time remain at normal temperature. The instrument may still be used but eventually the 'BAT FAULT' alarm flag will be displayed, shortly after which the instrument will switch off automatically.

Filters

Probe Handle Assembly - Part No. 12481

A number of different filter types are available from Teledyne GMI. The minimum requirement is a cotton particulate filter and a hydrophobic filter. These filters, incorporated in the probe handle assembly, are available from Teledyne GMI. Filters must be checked at frequent intervals and where appropriate changed to ensure a clean sample path. Any filter which has been contaminated must be cleaned or replaced. See Filter Replacement in Section 5 OPERATOR MAINTENANCE.

Semiconductor Sensor "Flexi" Probe Assembly - Part No. 42200

A replacement filter disc, which is incorporated in the Probe end cap, is available from Teledyne GMI. Filters should be checked periodically and where appropriate changed to ensure a clean sample path. Any filter which has been contaminated must be replaced. See filter replacement instructions in Section 5 OPERATOR MAINTENANCE.

Semiconductor Survey "Bellows" Probe Assembly - Part No. 42444

A replacement Dust Filter disc, which is incorporated in the Semiconductor Survey "Bellows" Probe, is available from Teledyne GMI. A Water Filter assembly is available as an accessory for use with this probe. Filters should be checked periodically and, where appropriate, changed to ensure a clean sample path. Any filter which has been contaminated must be cleaned or replaced. See Filter Replacement in Section 5 OPERATOR MAINTENANCE.

Probe Handle Assembly - Part No. 13561

A Water or Dust Filter Assembly is available from Teledyne GMI for use with this probe handle. Either of the filter assemblies can be attached to the probe handle. Filters must be checked at frequent intervals and where appropriate changed to ensure a clean sample path. Any filter which has been contaminated must be cleaned or replaced. See Filter Replacement in Section 5 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.
- Semiconductor Sensor "Flexi" Probe is connected (if applicable)
- All gas ranges are operational and zeroed correctly.
- The calibration is still valid.

3

OPERATION

Instrument Features

The First Responder CG front plate features a panel of four operating buttons, a backlit LCD screen incorporating the analogue bar graph, a visual alarm LED and an infrared communication port.
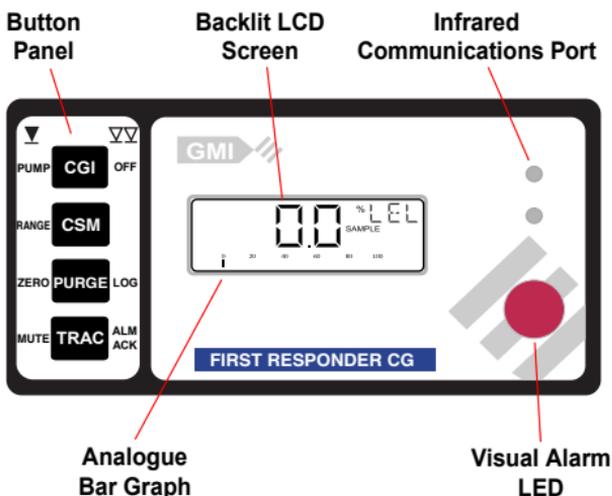
Fig. 3-1 Instrument Front Plate

Button Panel

The First Responder CG Button Panel features four operating buttons, as shown in Figure 3-2.

Typically each button has two functions, accessed with either a single press or a double press.
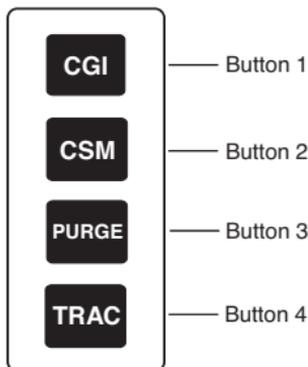
Fig. 3-2 Button Panel

Button function is dependent on the operating mode of the instrument.

The First Responder CG has four operating modes, CGI, CSM, PURGE and TRAC, each accessed by switching the instrument ON with buttons 1, 2, 3 and 4 respectively.

CGI mode
(Combustible Gas Indicator)

In this mode the instrument operates as a gas indicator, drawing a sample via a probe from points where gas is suspected to be present.

There are no alarms or confidence signal in this mode.

Switching ON in CGI Mode

Pressing and holding **CGI** (Button 1) turns the instrument ON in CGI mode and switches ON the pump. This initiates the instrument's warm-up cycle, an example of which is shown in Figure 3-3.

All LCD segments displayed
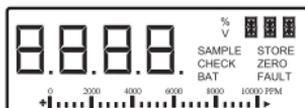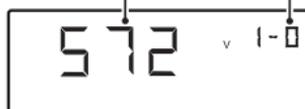
Instrument type   Software version

Battery status
(displayed as OK or LO at start-up)

Pump Test
(user to block the inlet for PASS)
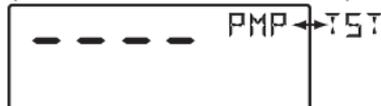
Current detection reading

Fig. 3-3 CGI Warm-up

Calibration Date Features

At the end of warm-up and before the First Responder CG is ready for measuring, the instrument will indicate on the display, how many days remain until calibration is required, as shown in Figure 3-4:

Calibration Due in 25 days

(Alternate flash)

Figure 3-4 Days until Calibration Required

If calibration is overdue, the instrument will automatically switch OFF.

The pre-set re-calibration interval is 30 days.

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

Switching OFF

A double press of **CGI** (Button 1) switches the instrument OFF.

Switching Pump OFF / ON

A single press of **CGI** (Button 1) switches the instrument pump OFF. A further press of Button 1 switches the pump ON again.

Manual Datalog

Manual datalogging is enabled in this mode.

To perform a manual datalog, a double press of **PURGE** (Button 3) is required.

Notes on CGI mode:

- This mode has PPM autoranging to LEL, and, LEL autoranging to Vol Gas.

- The pump can be switched OFF.

- Manual datalogging is enabled.

Summary of CGI Button Operation

CGI	Single Press	Double Press	Press and Hold
Button 1 CGI	Toggles Pump OFF / ON	Switch OFF Instrument	Switch ON Instrument
Button 2 CSM	–	–	–
Button 3 PURGE	Zero All ranges	Manual Log	–
Button 4 TRAC	–	–	–

Figure 3-5 CGI Button Operation

CSM mode
(Confined Space Monitor)

In this mode the instrument operates as a safety monitor for use when entering confined spaces which may contain hazardous gas mixtures (flammable, toxic and/or asphyxiant). The instrument samples the ambient atmosphere to which the operator is exposed and generates alarms for low / high Oxygen, high LEL, high Carbon Monoxide and high Hydrogen Sulphide gas.

When an alarm is activated, the instrument display will automatically change to the alarming range.

Switching ON in CSM Mode

Pressing and holding CSM (Button 2) turns the instrument ON in CSM mode and switches ON the pump. This initiates the instrument's warm-up cycle, an example of which is shown in Figure 3-6. The display of alarm levels after the warm-up sequence may be cancelled by a single press of any button.

All LCD segments displayed

High LEL alarm - alternates between LEL and HI

(High O2 alarm - alternates between 23.0% O2 and HI)

Instrument type

Software version

Low O2 alarm - alternates between O2 and LO

Battery status
(displayed as OK or LO at start-up)

High CO alarm - alternates between CO and HI

(High High CO alarm - alternates between 200ppm CO and HIHI)

Pump Test
(user to block the inlet for PASS)

High H2S alarm - alternates between H2S and HI

(High High H2S alarm - alternates between 50ppm H2S and HIHI)
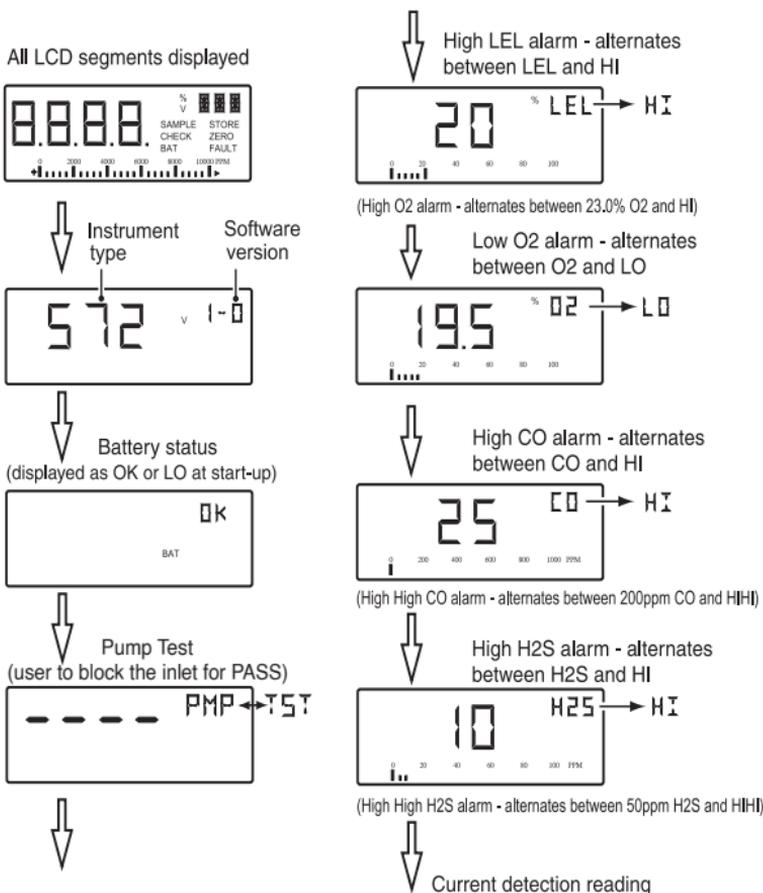
Current detection reading

Fig. 3-6 CSM Warm-up

Note: STEL and LTEL alarms not illustrated

Calibration Date Features

At the end of warm-up and before the First Responder CG is ready for measuring, the instrument will indicate on the

display, how many days remain until calibration is required, as shown in Figure 3-7:

Calibration Due in 25 days

(Alternate flash)

Figure 3-7 Days until Calibration Required

If calibration is overdue, the instrument will automatically switch OFF.

The pre-set re-calibration interval is 30 days.

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

Switching OFF

A double press of **CGI** (Button 1) switches the instrument OFF.

Changing Gas Range

Each single press of **CSM** (Button 2) changes the range selected. The display cycles through the ranges in the order LEL / Vol GAS - O2 - CO - H2S - LEL / Vol GAS, etc.

Manual Datalog

Manual datalogging is enabled in this mode.

To perform a manual datalog, a double press of **PURGE** (Button 3) is required.

Acknowledge Alarms

A double press of **TRAC** (Button 4) will acknowledge an alarm for 60 seconds.

If more than one gas alarm threshold has been exceeded,

a double press of TRAC (Button 4) will acknowledge each alarm in order of priority.

Notes on CSM mode:

- This mode has LEL, Vol GAS, O2, CO and H2S ranges.

- Audible and Visual alarms are only active in the LEL, O2, CO and H2S ranges. Alarms are latching and can be acknowledged.

- Audible and Visual confidence signal is enabled.

- The pump cannot be switched OFF.

- Automatic and manual datalogging is enabled. (Automatic datalog every 60 seconds).

Summary of CSM Button Operation

CSM	Single Press	Double Press	Press and Hold
Button 1 CGI	–	Switch OFF Instrument	–
Button 2 CSM	Next Range	–	Switch ON Instrument
Button 3 PURGE	–	Manual Log	–
Button 4 TRAC	–	Acknowledge Alarm	–

Figure 3-8 CSM Button Operation

PURGE mode

This mode facilitates the purging of pipework / installations and measures Volume Methane and Oxygen only.

There are no alarms or confidence signal in this mode.

Switching ON in PURGE Mode

Pressing and holding **PURGE** (Button 3) turns the instrument ON in PURGE mode and switches ON the pump. This initiates the instrument's warm-up cycle, an example of which is shown in Figure 3-9.

All LCD segments displayed
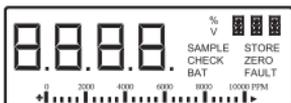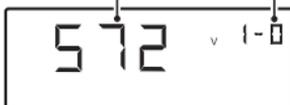
Instrument type — Software version

Battery status
(displayed as OK or LO at start-up)

Pump Test
(user to block the inlet for PASS)

Current detection reading

Fig. 3-9 PURGE Warm-up

Calibration Date Features

At the end of warm-up and before the First Responder CG is ready for measuring, the instrument will indicate on the display, how many days remain until calibration is required, as shown in Figure 3-10:

Calibration Due
in 25 days

Figure 3-10 Days until Calibration Required

If calibration is overdue, the instrument will automatically switch OFF.

The pre-set re-calibration interval is 30 days.

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

Switching OFF

A double press of CGI (Button 1) switches the instrument OFF.

Changing Gas Range

Each single press of CSM (Button 2) changes the range selected. The display changes the range from Vol GAS - O2 - Vol GAS, etc.

Display will alternate between gas range and 'PUR'.

Switching Pump OFF / ON

A single press of CGI (Button 1) switches the instrument pump OFF. A further press of Button 1 switches the pump ON again.

Zero Vol Gas Range

The Volume Gas range can be manually zeroed if the gas reading is between -5% and +5% Vol Gas.

To zero, a single press of PURGE (Button 3) is required and should be carried out in fresh air.

Note: Negative Volume Gas readings are displayed to a minus value of -10%, thereafter, 'EEE' is displayed.

Manual Datalog

Manual datalogging is enabled in this mode.

To perform a manual datalog, a double press of **PURGE** (Button 3) is required.

Notes on PURGE mode:

- This mode has Vol Gas and Oxygen ranges.
- 'PUR' (Purge) alternates in the range window.
- The pump can be switched OFF.
- There are no alarms or confidence signal in this mode.
- Automatic and manual datalogging is enabled. (Automatic datalog every 60 seconds).

Summary of PURGE Button Operation

| PURGE	Single Press	Double Press	Press and Hold
Button 1 CGI	Toggle Pump OFF / ON	Switch OFF Instrument	–
Button 2 CSM	Next Range	–	–
Button 3 PURGE	Zero Vol Gas Range	Manual Log	Switch ON Instrument
Button 4 TRAC	–	–	–

Figure 3-11 Purge Button Operation

TRAC mode
(Leak Detection)

In this mode the instrument utilises a semiconductor sensor for near instantaneous response to enable rapid leak detection of PPM Methane in small fittings.
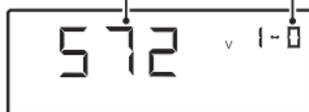
Switching ON in TRAC Mode

Pressing and holding **TRAC** (Button 4) turns the instrument ON in TRAC mode. This initiates the instrument's warm-up cycle, an example of which is shown in Figure 3-12.

All LCD segments displayed
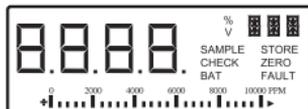
Instrument type

Software version

Battery status
(displayed as OK or LO at start-up)

Pump Test
(user to block the inlet for PASS)

Current detection reading

Fig. 3-12 TRAC Warm-up

Calibration Date Features

At the end of warm-up and before the First Responder CG is ready for measuring, the instrument will indicate on the display, how many days remain until calibration is required, as shown in Figure 3-13:

Calibration Due
in 25 days

Figure 3-13 Calibration Due Date

If calibration is overdue, the instrument will automatically switch OFF.

The pre-set re-calibration interval is 30 days.

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

Switching OFF

A double press of **CGI** (Button 1) switches the instrument OFF.

Changing Gas Range

Not applicable - Only the EXT range is available in TRAC mode.

Zero EXT Range

The EXT range can be manually zeroed.

To zero, a single press of **PURGE** (Button 3) is required and should be carried out in fresh air.

Manual Datalog

Manual datalogging is enabled in this mode.

To perform a manual datalog, a double press of **PURGE** (Button 3) is required.

Notes on TRAC mode:

- This mode only has EXT range (ppm to %LEL).

- By default, only the visual geiger alarm is enabled. The audible geiger alarm can be toggled by a single press of **TRAC** (Button 4).
  Display will alternate 'EXT' and 'Aud'.

- Automatic datalogging is disabled. Manual datalogging is enabled.

- The pump cannot be switched ON.

Summary of TRAC Button Operation

TRAC	Single Press	Double Press	Press and Hold
Button 1 CGI	–	Switch OFF Instrument	–
Button 2 CSM	–	–	–
Button 3 PURGE	Manual Zero	Manual Log	–
Button 4 TRAC	Geiger (Audible) Toggle	–	Switch ON Instrument

Figure 3-14 TRAC Button Operation

Switching Modes

To switch to a different mode of operation, firstly, double press **CGI** (Button 1) to initiate instrument switch OFF. Secondly, as the display indicates 'OFF' , as illustrated in Fig. 3-15, press the button which corresponds to the mode required. The instrument will now switch to the selected mode.

Fig. 3-15 Instrument Switching OFF

Connection of Probe

The First Responder CG instrument is equipped to accept two standard probe input types.

CGI, CSM and Purge modes Only

A Standard Probe and Handle assembly which is connected to the instrument via sample line inlet.
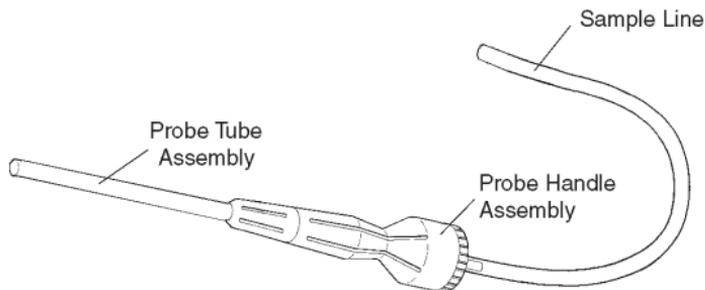

Fig. 3-16 Standard Probe and Handle

TRAC Mode Only

The EXT range Semiconductor Sensor "Flexi" Probe provides fast response gas detection and is connected to the instrument via an 8-Pin Plug.
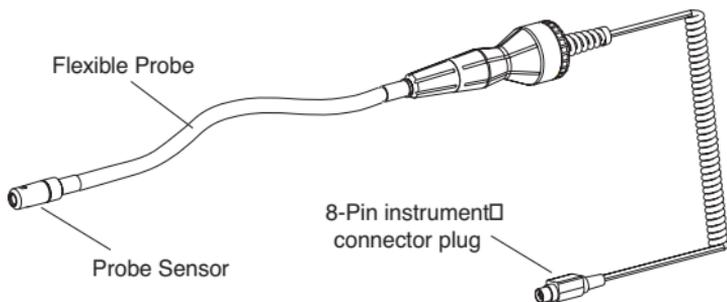

Flexible Probe

Probe Sensor

8-Pin instrument connector plug

Fig. 3-17 Semiconductor Sensor "Flexi" Probe

An optional Semiconductor Survey "Bellows" Probe is also available that provides fast response gas detection. This is connected to the instrument via both an 8-Pin Plug and sample line inlet.
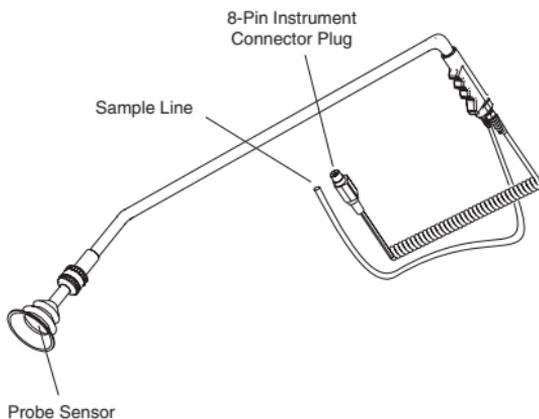

8-Pin Instrument Connector Plug

Sample Line

Probe Sensor

Fig. 3-18 Semiconductor Survey "Bellows" Probe

Instrument connection points for the three types of probe are shown in Figure 3-19.

Connection for
8-Pin Probe
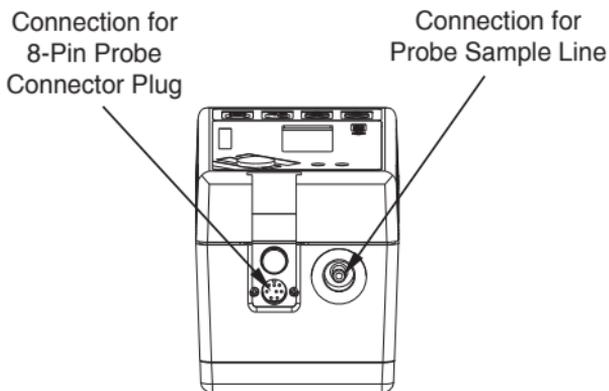Connector Plug

Connection for
Probe Sample Line

Fig. 3-19 Probe Connection

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.

'FAULT'

When in TRAC mode (EXT range), this message is displayed if the Semiconductor Sensor Probe is not connected.

'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.

The pump will switch off. The sample path should be checked and Button One pressed to clear sample fault and re-start 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

4

PROBES

The First Responder CG instrument is equipped to accept the following probes and associated accessories:

Standard Probe and Handle Assembly

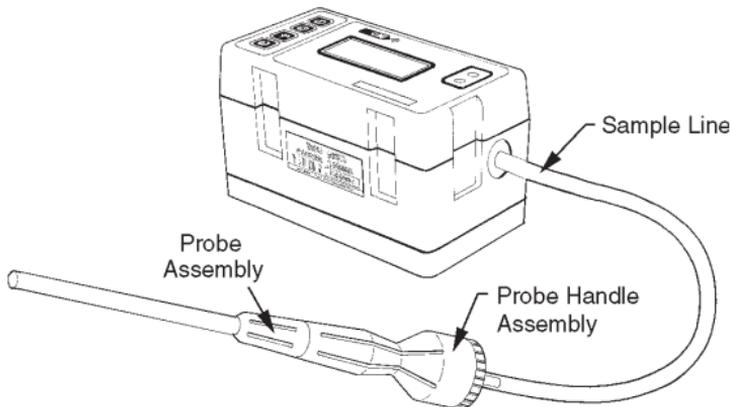| Part No.	Description
12393	31ins. (80cm.) Plastic Probe - Solid End
12481	Probe Handle Assembly - incl. filters
12712	Clear Sample Line x 4ft 10ins. (1.5 Metres) approx.

Fig. 4-1 Instrument / Standard Probe

Semiconductor Sensor (EXT) Probe

Part No.   Description

42200   Semiconductor Sensor (Flexi) Probe
               Assembly.

42220   Dust Cap

42169   Carry Pouch - Flexi Probe (not shown)

Semiconductor
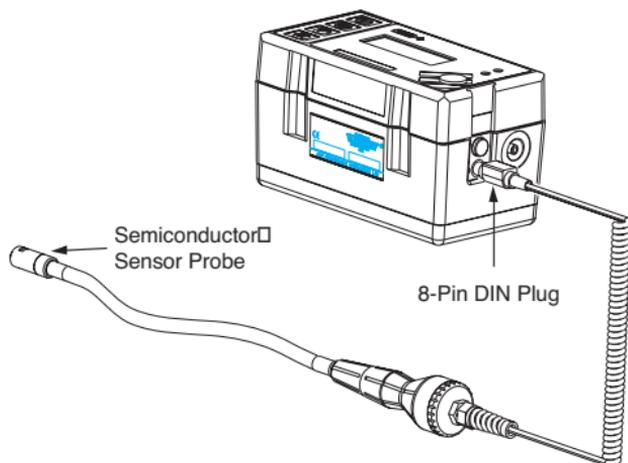Sensor Probe

8-Pin DIN Plug

*Fig. 4-2 Instrument / Semiconductor Sensor
(Flexi) Probe*

For a comprehensive list of accessories supplied with the
instrument, and additional accessories available, see Section
7 ACCESSORIES.

For examples of various probe applications, see Appendix
C APPLICATIONS.

Semiconductor (EXT) Survey Probe (Optional)

Part No.	*Description*
42444	*Semiconductor Survey (Bellows) Probe Assembly incl. Dust Filter*
42416	*Water Filter Assembly*

Semiconductor Survey Probe
c/w Dust Filter

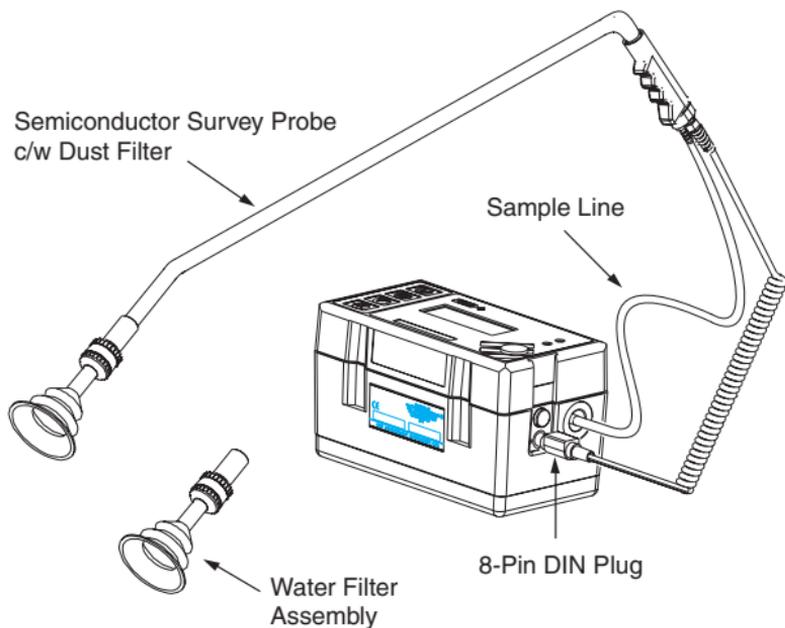Sample Line

Water Filter Assembly

8-Pin DIN Plug

Fig. 4-3 Instrument / Semiconductor Survey (Bellows) Probe

For a comprehensive list of accessories supplied with the instrument, and additional accessories available, see Section 7 ACCESSORIES.

For examples of various probe applications, see Appendix C APPLICATIONS.

Swan Neck Probe / Bellows Probe (Optional)

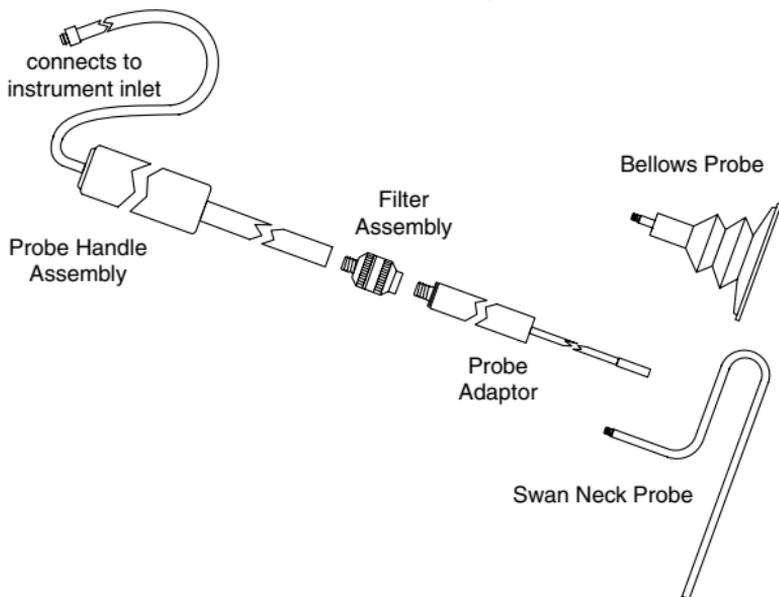| Part No.	Description
13655	Swan Neck Probe c/w Shroud
13563	Bellows Probe
13561	Probe Handle Assembly incl. Sample Line
13562	Probe Adaptor
42184	Dust Filter Assembly
42183	Water Filter Assembly

connects to
instrument inlet

Bellows Probe

Filter
Assembly

Probe Handle
Assembly

Probe
Adaptor

Swan Neck Probe

Fig. 4-4 Bellows / Swan Neck Probes

For a comprehensive list of accessories supplied with the instrument, and additional accessories available, see Section 7 ACCESSORIES.

For examples of various probe applications, see Appendix C APPLICATIONS.

5

OPERATOR MAINTENANCE

Replacing Alkaline (LR20) Batteries

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

1. Using the Hex Driver supplied (GMI Part No. 12451), loosen the two instrument base screws.

Fig. 5-1 Loosen Instrument Base Screws

2. Remove battery cover.

Fig. 5-2 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 substituted for alkaline.

---

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.

Probe Filter Replacement

Probe Handle Assembly - Part No. 12481

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 **CGI** (Button 1) to clear the 'SAMPLE FAULT' message. Replace the filter(s) if the message does not clear.

To replace the filter(s), proceed as follows:
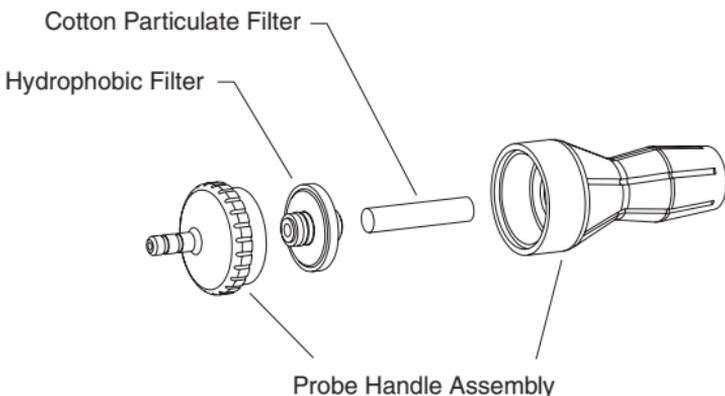
    1.   Unscrew the probe handle assembly.

Cotton Particulate Filter

Hydrophobic Filter

Probe Handle Assembly

Fig. 5-3 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.

Semiconductor Sensor (Flexi) Probe Assembly - Part No. 42200

The yellow plastic end cap, when removed, provides access to a filter disc. A replacement filter disc is available as an accessory.

Caution: The probe should never be used without suitable filters installed.
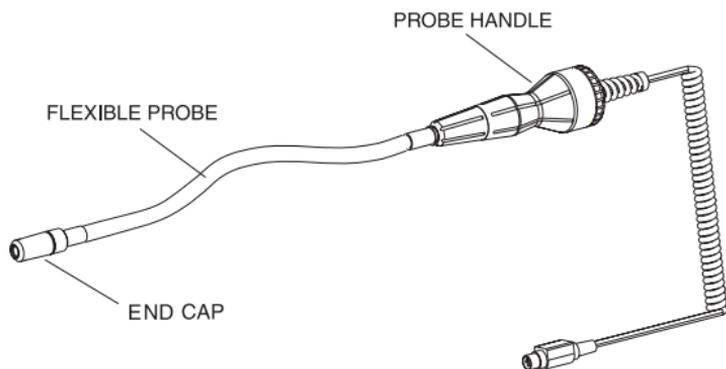

Fig. 5-4 Semiconductor Sensor "Flexi" Probe

To replace the filter disc, proceed as follows:

1. The yellow end cap is a push fit on to the probe detector cap. Carefully pull then remove the end cap.

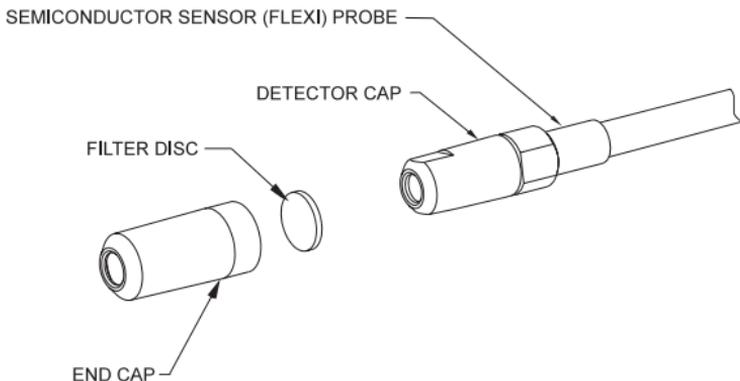Note: If the cap is a tight fit, grip the cap then remove using a twisting motion.

SEMICONDUCTOR SENSOR (FLEXI) PROBE

DETECTOR CAP

FILTER DISC

END CAP

Fig. 5-5 Filter Replacement

2. Using the hex driver (GMI Part No. 12451) or similar, push the old filter out from the front end of the cap.

3. Fit a new filter disc in the end cap then use the hex driver or similar flat ended instrument to make sure that the filter is correctly seated in the end cap internal recess.

Note: Care must be taken not to damage the filter.

4. The end cap is a push fit on the probe detector cap. Push the end cap until it is securely located on the probe collar.

Semiconductor Survey "Bellows" Probe Assembly (Option) - Part No. 42444

The dust filter assembly can be removed, as shown in Fig. 5-6, and replaced with a water filter assembly. The water filter assembly is available as an accessory. Replace the probe sealing washer if it shows signs of damage or wear.
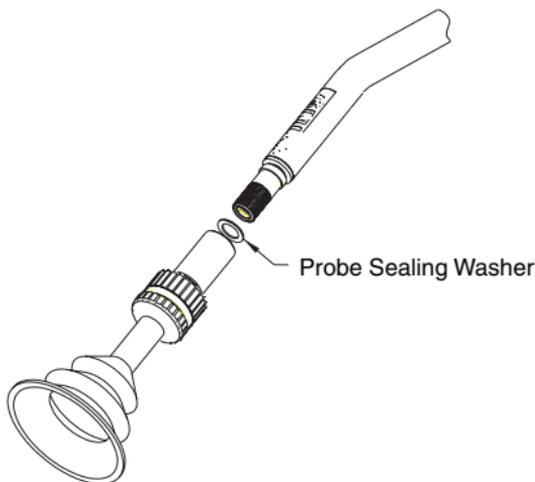

Probe Sealing Washer

Fig. 5-6 Semiconductor Survey "Bellows" Probe 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 **CGI** *(Button 1) to clear the 'SAMPLE FAULT' message. Replace the filter if the message does not clear.*

Dust Filter (Accessory)

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

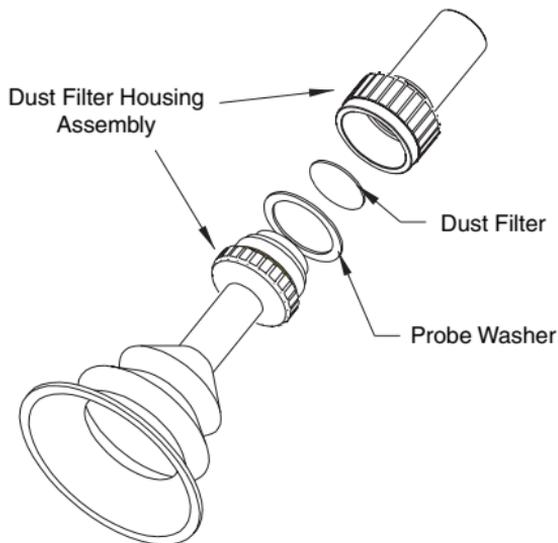1. *Unscrew the filter assembly (Fig. 5-7).*

Fig. 5-7 Dust Filter Assembly

2. *Remove Dust Filter, then discard.*

3. *Check Filter assembly Probe Washer for signs of damage or wear and replace if necessary.*

4. *Fit new Dust Filter.*

5. *Reassemble the Filter assembly.*

Water Filter (Accessory)

To replace the Hydrophobic Filter in the Water Filter assembly, proceed as follows:
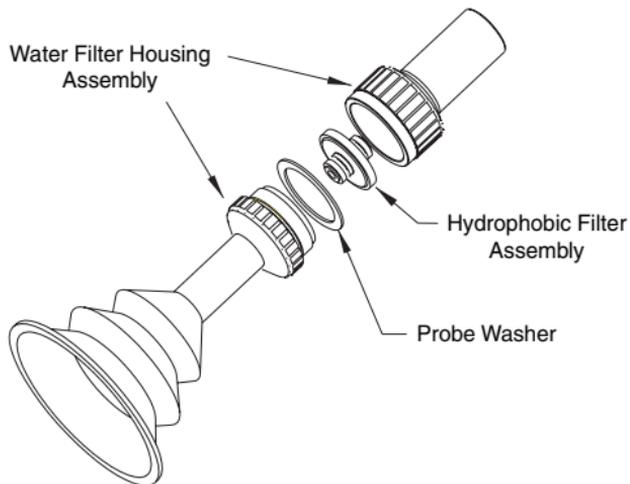
1.   *Unscrew the filter assembly (Fig. 5-8).*

Water Filter Housing Assembly

Hydrophobic Filter Assembly

Probe Washer

Fig. 5-8 Water Filter Assembly

2.   *Remove Hydrophobic Filter, then discard.*

3.   *Check Filter assembly Probe 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 Filter assembly.*

Probe Handle Assembly (Option) Part No. 13561

Fitting of an In-line filter assembly to the probe handle, as shown in Figure 5-9, will minimise the danger of water and / or dust ingress.
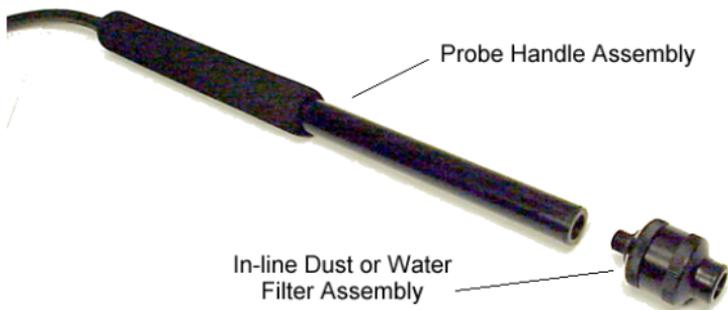

Probe Handle Assembly

In-line Dust or Water Filter Assembly

Fig. 5-9 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 **CGI** *(Button 1) 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 5-10).*

Probe Sealing Washer   Dust Filter

Probe Washer

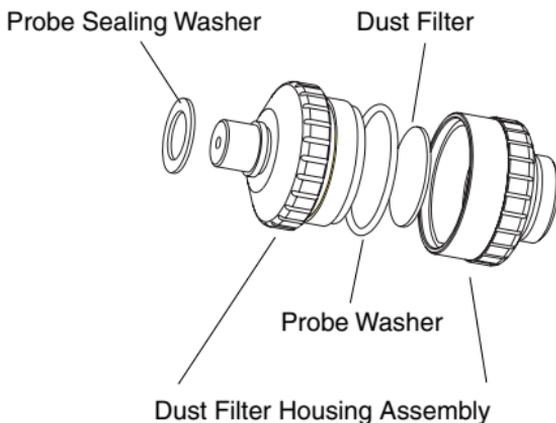Dust Filter Housing Assembly

Fig. 5-10 Dust Filter Assembly

2. *Remove Dust Filter, then discard.*

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

4. *Fit new Dust Filter.*

5. *Reassemble the 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 (Fig. 5-11).*

Water Filter Housing Assembly

Hydrophobic Filter

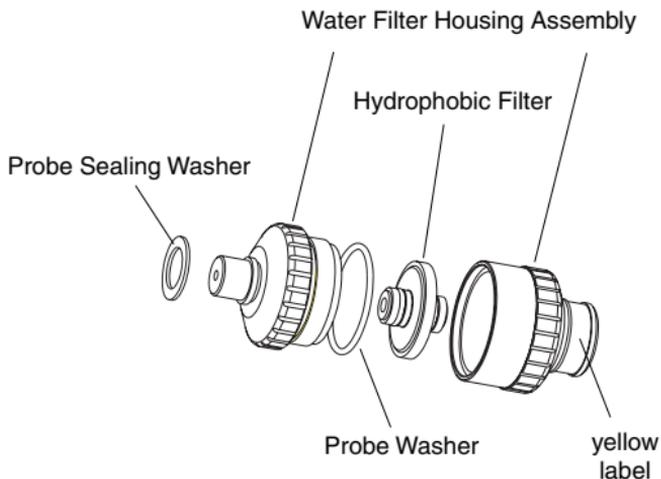Probe Sealing Washer

Probe Washer

yellow label

Fig. 5-11 Water Filter Assembly

2. *Remove Hydrophobic Filter, then discard.*

3. *Check Probe 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 Filter Housing assembly.*

Flue Probe Coalescing Filter Assembly (Accessory) - Part No. 42215

A coalescing filter is fitted in the filter bowl and housing assembly to minimise the danger of water 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, probe handle and coalescing filter assembly for blockage. Press `CGI` *(Button 1) to clear the 'SAMPLE FAULT' message. Replace the filter(s) if the message does not clear.*

To replace the filter, proceed as follows:

1. *Carefully unscrew the bowl from the filter housing and empty any water which may have collected.*

Fig. 5-12 *Coalescing Filter Assembly*

2. *Unscrew the spindle from filter housing then remove and discard the coalescing filter.*

3. *Using a dry cloth, clean the bowl, housing and spindle to make sure that they are free from dirt and water.*

4. *Fit a new coalescing filter to the spindle then replace in filter housing.*

5. *Replace the bowl and tighten to secure.*

6

CALIBRATION

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

Four methods of calibration are possible:

- Automatic Calibration. The GMI Gas Delivery Unit (GDU*net*) allows full automatic calibration.

- Field Calibration. Refer to APPENDIX B, FIELD CALIBRATION for further details.

- The GMI Instrument Management System (IMS) provides all the facilities of the GDU*net* with the added feature of instrument database management.

- Manual Calibration. The instrument can be linked to a PC running GMI Manual Calibration software.

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

7

ACCESSORIES

Accessories Supplied with First Responder CG Instrument
Part Number: 44542SCG are as follows:

Part Number	Description
42710	Carrying Case
10278	Alkaline Battery (LR20) x 4
12528	Carrying Harness
12451	Hex Driver (for base screws)
42200	Semiconductor Sensor (Flexi) Probe c/w Filter Disc
42220	Dust Cap - Instrument (Flexi) Probe Connection
12481	Probe Handle c/w Filters
12393	31ins. (80cm.) Plastic Probe - Solid End
10077	Cotton Particulate Filters (Box of 10) x 2
12712	Clear Sample Line x 4ft 10ins.(1.5 metres) approx.
42942	User Handbook
42943	Quick Operating Instructions

Optional Accessories Available

Part Number	Description
42169	Carry Pouch (use with 42200)
42197	Filter Disc (use with 42200)
42444	Semiconductor Survey (Bellows) Probe c/w Dust Filter

42416	Water Filter Assy. c/w Filter (use with 42444)
13561	Probe Handle Assembly
13562	Probe Adaptor Assembly (use with 13563, 13565 or 13413)
42183	Water Filter Assy. c/w Filter (use with 13561)
42184	Dust Filter Assy. c/w Filter (use with 13561)
13563	Bellows Probe (use with 13561)
13655	Swan Neck Probe c/w Shroud
12688	Probe Adaptor (Sample Line to Handle)
13427	14ins. (35cm.) Open End Plastic Probe
13413	Small Stainless Steel (Flue) Probe - Open End (use with 12481)
42215	Coalescing Filter Assembly (use with 13413)
75174	Coalescing Filter (use with 42215)
12358	Hydrophobic Filter (use with 12481, 42183 or 42416)
42388	Dust Filter - Box of 20 (use with 42184 or 42444)
12379	Probe Sealing Washer (use with 42183, 42184, 42444 or 42416)
42235	Probe Washer (use with 42183, 42184, 42444 or 42416)

Note: For other sampling probes and accessories, and for calibration gases, contact Teledyne GMI directly or a Teledyne GMI approved distributor.

8

ADDITIONAL INFORMATION

Training

Training Courses are available on all GMI products.

Contact GMI Marketing Department for further details:

Tel: +44 (0) 141 812 3211

e-mail: gmi_sales@teledyne.com

Website

www.teledynegasandflamedetection.com

A

TYPICAL OPERATING PARAMETERS

Typical operating parameters are as follows:

Gas	Range	Resolution	Zero	Accuracy
EXT	0 - 1000 ppm 1000 - 4500 ppm 10 - 20 %LEL	1 ppm 10 ppm 1%	5%	Typically 20%
PPM	0 - 1000 ppm 1000 - 4500 ppm	5 ppm 50 ppm	5%	Typically 20%
LEL	0 - 10% 10 - 100%	0.1% 1%	+/- 0.5%	2% +/- 1% LEL
Volume Gas	0 - 5% 5% - 100%	0.1% 1%	+/- 2%	1% +/- 1% Gas
Carbon Monoxide	0 - 1000 ppm	1 ppm	+/- 15 ppm	+/-15 ppm + 5% reading
Hydrogen Sulphide	0 - 100 ppm	1 ppm	+/- 2 ppm	+/-2 ppm + 10% reading
Oxygen	0 - 21% 21 - 25%	0.1% 1%	+/- 0.5% N/A	+/- 0.5% + 3% reading +/- 0.5% + 3% reading

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
7.08" (180mm.) x 3.74" (95mm.) x 4.13" (105mm.)

Weight
3.75lbs. (1.7kg) with alkaline batteries

Operating Temperature
-4 $^\circ$F to 122 $^\circ$F (-20 $^\circ$C to 50 $^\circ$C)

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
Standard Probe and Handle assembly connected to instrument with sample line and uses instrument integral pump with flow fail sensor. The sample path is protected by the hydrophobic filter and automatic pump switch off.

or

Semiconductor Sensor (Flexi) Probe connected to instrument with electrical harness.

or

Semiconductor Survey (Bellows) Probe connected to instrument with electrical harness and sample line and uses instrument integral pump with flow fail sensor. The sample path is protected by a dust or hydrophobic filter and automatic pump switch off.

Power Source

4 'D' size (LR20) alkaline cells providing approximately 18 hours runtime (12 hours runtime with external semiconductor sensor probe connected) at 68 $^{\circ}$F (20 $^{\circ}$C).

B

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 Teledyne GMI Manual Calibration software or the Workshop System.

In Field Calibration Mode (FCM) the buttons perform the functions indicated in Figure B-1.

CGI — Button 1	▽	PUMP
	▽ ▽	EXIT
	▼	SPAN
CSM — Button 2	▽	RANGE
	▽ ▽	ZERO
	▼	SAVE
PURGE — Button 3	▽	INCREASE
	▽ ▽	
	▼	ABANDON
TRAC — Button 4	▽	DECREASE
	▽ ▽	
	▼	CALIBRATE

symbols key:
- ▽ single press
- ▽▽ double press
- ▼ press & hold
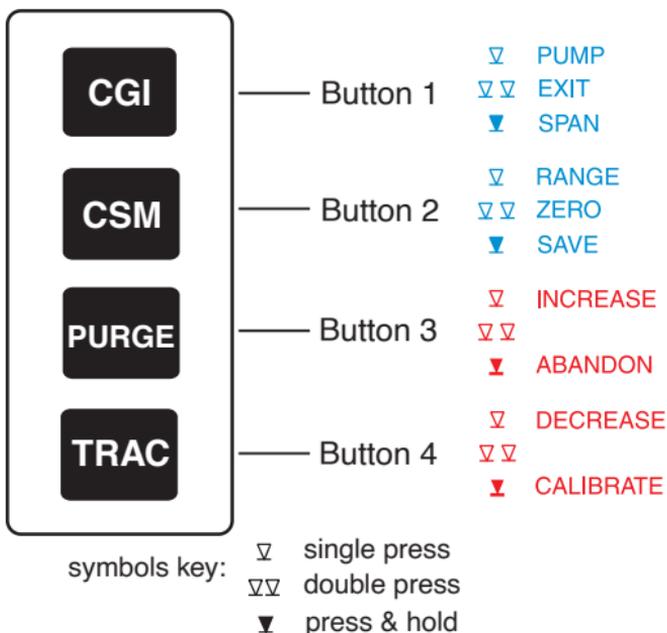
Fig. B-1 Button Functions

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 Teledyne GMI for details.
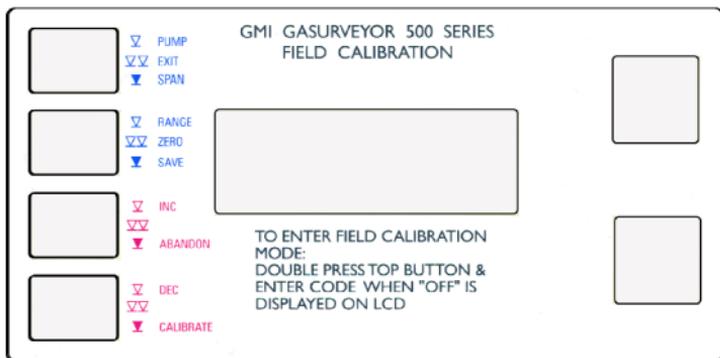
Fig. B-2 Instrument Overlay Card

Selectable Ranges in FCM

When in FCM the following ranges are manually selectable by pressing **CSM** (Button 2) : LEL - GAS - O2 - CO - H2S - LEL, etc.

Note: There is no requirement to calibrate EXT (PPM) range.

Entering FCM

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

2. Double press [CGI] (Button 1) to initiate instrument switch off. While OFF is displayed in the LCD and before the instrument actually switches off, enter the four button access code.

Note: Allow at least one second between button presses when entering the four button sequence. The default (factory set) entry code is button sequence 1,2,3,4. 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.
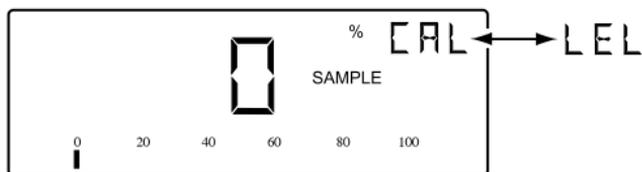
Fig. B-3 Field Calibration Display

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

	Single Press	Double Press	Press and Hold
Button 1 CGI	Toggle Pump On / Off	Exit CAL Mode	Enter SPAN Mode
Button 2 CSM	Next Range	Zero Current Range	Save CAL Data
Button 3 PURGE	Increase Set Point	–	Exit SPAN Without CAL
Button 4 TRAC	Decrease Set Point	–	Exit SPAN With CAL

Fig. B-4 FCM Button Functions

Zeroing the Instrument

Note: There is no requirement to calibrate EXT range.

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

2. Double press CSM (Button 2) to zero current gas range.

3. Press CSM (Button 2) 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 range 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 **CGI** (Button 1) 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.
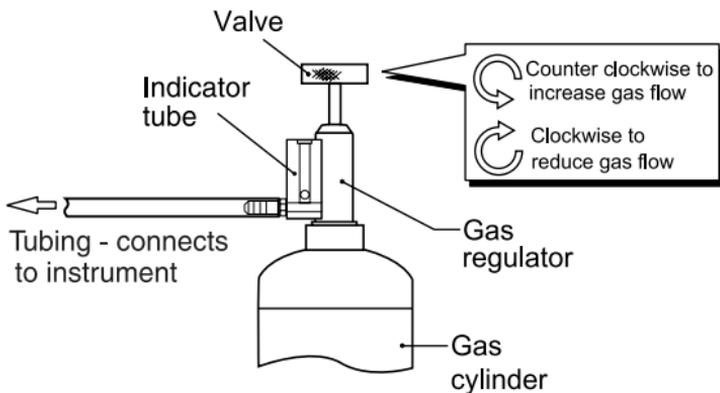
Fig. B-5 Connecting Gas

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 **CGI** (Button 1) 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.
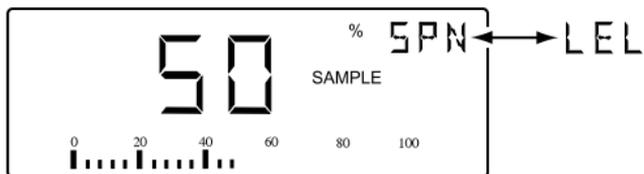
Fig. B-6 SPAN Mode Display

a. A single press of PURGE (Button 3) will produce small incremental changes to increase display reading, or a single press of TRAC (Button 4) will produce small decremental changes to decrease display reading, until the displayed gas value corresponds to the concentration of the calibration gas.

b. When required reading has been reached, press and hold TRAC (Button 4) 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 PURGE (Button 3).

9. The instrument display will now return to CAL mode display as shown in Figure B-7.
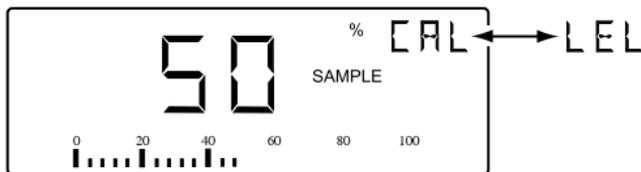
Fig. B-7 50% LEL Display

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 **CSM** (Button 2) to save CAL data.

2. Double press **CGI** (Button 1) to exit FCM.

Quit Without Saving Changes

1. Double press **CGI** (Button 1) to exit FCM.

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

C

APPLICATIONS

Plastic (Solid End) Probe

This probe is supplied with the First Responder CG and is designed for use with barhole probing and below ground surface gas monitoring.

Fig. C-1 Solid End Probe

The solid end feature prevents blocking of the probe when detecting gas leaks in soft earth.

The Plastic Probe (Part No. 12393) is generally used with the Probe Handle Assembly (Part No. 12481), incorporating both Cotton and Hydrophobic Filters to prevent the ingress of water or dirt. The Sample Line (Part No. 12712) connects the probe handle to the instrument and allows the pump to draw the sample into the instrument analysing chamber.

The probe is manufactured from a plastic material which is flexible and extremely robust. The probes wall thickness provides the flexible strength to withstand bending around a 50cm radius or sustaining damage to, or collapse of, the sampling path if accidentally stood on, by the operator.

Note: The Sample Line, Probe Handle Assembly and Filters are all supplied with the instrument. A longer probe, if required, is available as an accessory. Refer to Chapter 7 ACCESSORIES.

Semiconductor Sensor (Flexi) Probe

This external (EXT) range diffusion probe (Part No. 42200) is designed to provide a faster speed of response in detecting small fitting leaks, by eliminating the delay time taken by the pump drawing the sample into the instrument analysing chamber.
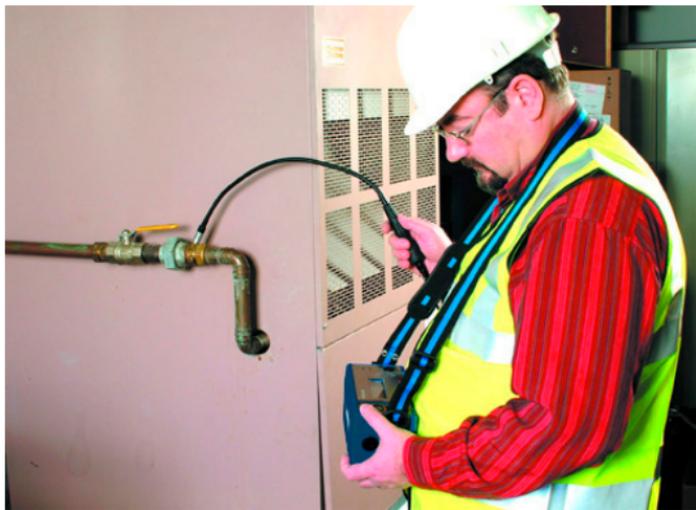
Fig. C-2 Semiconductor Sensor (Flexi) Probe

The probe sensor is located on the end of a flexible wand and hence is able to gain access behind gas fittings

The high speed of response and the sensitivity of the Semiconductor Sensor Probe also enables initial external leakage surveys to be performed in the vicinity of both domestic and industrial properties and pipelines, enabling distribution leaks to be quickly found.

See application examples on following page.

*Fig. C-3 Semiconductor Sensor (Flexi) Probe
Applications*

The Semiconductor Probe assembly has a carry pouch, which is available as an accessory, to provide protection during transit. The Probe Sensor is protected by a removable Plastic End Cap (Part No. 42187). The cap incorporates a Filter Disc (Part No. 42197) to prevent the ingress of dust.

The Probe is connected to the instrument via an 8-pin DIN plug.

Semiconductor Survey (Bellows) Probe

This probe is designed for use with the First Responder 2 and is available as an accessory. This external (EXT) range diffusion probe (Part No. 42444), complete with filter and bellows fitting, is designed to provide a near instantaneous response in detecting general survey leaks. This is a pumped probe with the detector at the sampling point. With the sensor at the end of the probe and the sample being drawn past it, any delay in diffusion is virtually eliminated.

Fig. C-4 Semiconductor Survey (Bellows) Probe

Fig. C-5 Probe / Filter

The probe incorporates a Dust Filter, with replaceable Disc, to prevent the ingress of dust. A Water Filter assembly (Part No. 42416), complete with replaceable hydrophobic filter is also available as an accessory.

The Probe is connected to the instrument via an 8-pin DIN plug and sample line.

Bellows Probe

This probe is also available as an accessory. The Bellows Probe (Part No. 13563) provides a method of obtaining more consistent readings by reducing the effect of wind and air dilution.

Fig. C-6 Bellows Probe

The Bellows Probe is of stainless steel construction housed in a flexible rubber boot. It is generally used with the Probe Adaptor which connects to the Probe Handle Assembly (Part No. 13561). The Probe Handle incorporates a sample line (Part No. 12712) which is connected to the instrument and allows the pump to draw the sample into the instrument analysing chamber.

Note: This model of Probe Handle does not incorporate an in-line filter. A Water Filter Assembly (Part No. 42183) or Dust Filter Assembly (Part No. 42184) is available and can be fitted as an accessory, if required. Refer to Chapter 7 ACCESSORIES.

Swan Neck Probe

This probe is also available as an accessory.

Fig. C-7 Swan Neck Probe

The Swan Neck Probe (Part No. 13655) has a number of small balanced holes in the probe length to give increased coverage in surveys. To prevent damage to the probe and provide an unrestricted sample path, the probe is supplied with a shroud assembly incorporating two skids which prevent probe contact with the ground surface. The Swan Neck Probe is of stainless steel construction and is generally used with the Probe Adaptor which connects to the Probe Handle Assembly (Part No. 13561). The Probe Handle incorporates a sample line which is connected to the instrument and allows the pump to draw the sample into the instrument analysing chamber.

Note: This model of Probe Handle does not incorporate an in-line filter. A Water Filter Assembly (Part No. 42183) or Dust Filter Assembly (Part No. 42184) is available and can be fitted as an accessory, if required. Refer to Chapter 7 ACCESSORIES.

Stainless Steel (Flue) Probe

This probe is also available as an accessory.

Fig. C-8 Flue Probe

When a flue sample is required, a Stainless Steel open ended probe (Part No. 13413) with Coalescing Filter Assembly (Part No. 42215), incorporating Coalescing Filter (Part No. 75174), is generally used. The purpose of the filter assembly is to isolate any moisture which could affect the sample reading. The flue probe and coalescing filter assembly is generally used with the Probe Handle Assembly (Part No. 12481), incorporating both Cotton and Hydrophobic Filters, to prevent the ingress of dirt. The Sample Line (Part No. 12712) connects the probe handle to the instrument and allows the pump to draw the sample into the instrument analysing chamber.

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Symbols

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