Portable gas leak detector

Operating manual

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WARNINGS

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EC DECLARATION OF CONFORMITY

GAZOMAT™
11, Rue de l'Atome
67802 Bischheim – France

hereby declares that the product designed for use in explosive atmospheres and here designated as::

INSPECTRA® Laser version 100%gaz - Atex

Is in conformity:

- **With the 94/9/EC Directive of 23 March 1994**
- **With the 2004/108/EC Directive of 21 May 2007.**
- **With the explosion-proof standards relative to use in explosive atmospheres:**

  EN 60079-0 of 2006:

  Electrical apparatus for explosive gas atmospheres: - General requirements.

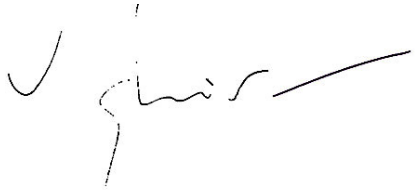
  EN 60079-11 of January 2007*:*

  Explosive atmospheres – Equipment protection by intrinsic safety « i ***».***

- With the type of apparatus that have been examined and fully approved by the **INERIS notified body**, identified under **number 0080,** with address rue J. Taffanel, 60550 Verneuil en Halatte, France, **and for which INERIS has issued an EC Type examination certificate under the number INERIS05ATEX0051** with its addenda under numbers 05ATEX0051/01 and 05ATEX0051/02.

- The manufacturing unit in Bischheim has been registered under the number **N° 03ATEXQ416 by the INERIS notified body** identified under the **number 0080, with address** rue J. Taffanel, 60550 Verneuil en Halatte.

Bischheim, November 10, 2011 Vincent GHIRCOIAS
Proxy for GAZOMAT™
T.D. WILLIAMSON France General Manager



CONTENTS

1 WARNINGS

1.1 READING OBLIGATION

All users must imperatively read this manual for their own safety, the safety of those around them and the safety of the device. Users are required to use the device as instructed by the manufacturer in order to get the most out of the device and keep it protected from damage.

GAZOMAT™ shall not be liable if the device is used other than as instructed.

The manufacturer shall not be liable in the event of any abnormal use of the product or any malicious tampering with the product.

1.2 INSPECTRA® LASER DEVICE VERSION

The INSPECTRA® Laser detector is marketed in three versions:

- 100% gas version without Atex certification, which is not to be used in explosive atmospheres.

- 100% gas version with Atex certification, which may be used in explosive atmospheres.

- 10,000 ppm version without Atex certification, which is **not** to be used in explosive atmospheres.

This manual informs the user of the conditions of use of each of the three versions of the INSPECTRA® detector. The user is responsible for identifying the device version being used and for following and implementing the corresponding safety measures. The user can identify the type of device from the marking on the front of the device (see paragraph 3.1), showing if the device is approved for use in areas with explosive atmospheres.

Never use the ***INSPECTRA® portable*** 100% gas version and the ***INSPECTRA® portable 10000 PPM VERSION*** with no  marking in atmospheres that are or are suspected to be hazardous. The device is not designed for use in explosive atmospheres.

1.3 EQUIPMENT GENERATING INVISIBLE LASER RADIATION

The INSPECTRA® detector contains a laser source. It is strictly forbidden to open the plastic housing of the device and to remove components from the inside of the housing, because of the risk of laser radiation exposure.

2 MARKING

The different device versions are marked with adhesive aluminium labels bearing the following information, depending on the version:

100% gas version without Atex certification. Not for use in explosive atmospheres.

INSPECTRA® LASER

GAZOMAT™
11, Rue de l'Atome
67802 Bischheim – France

100% version with Atex certification. May be used in explosive atmospheres.

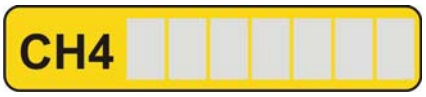
INSPECTRA® LASER
GAZOMAT™
11, Rue de l'Atome
67802 Bischheim – FRANCE


CE 0080 - N° 05ATEX0051
S


II2G Ex ib IIB T4
INERIS N° 05ATEX0051

The target gas detected by the INSPECTRA® LASER detector is stated on the label on the side of the device.

XXXMMYY (No. in 3 digits – Month – Year of manufacture



3 FIRST STARTING UP

The INSPECTRA® detector is first started up by:

GAZOMAT™
11 Rue de l'Atome
67802 Bischheim - France

4 INTRODUCTION

INSPECTRA® Laser is a portable gas detector that is designed to enable an operator moving on foot to locate leaks in methane gas distribution systems.

The device uses the principle of infrared laser light absorption by methane molecules. That detection principle makes the detector highly selective, and sensitive to a single ppm of methane gas.

The system comes in three versions:

- ***100% gas version :*** covers the measurement range from 1 ppm to 100% gas volume, **without Atex certification**, not for use in explosive atmospheres.
- ***100% gas version***: covers the measurement range from 1 ppm to 100% gas volume, **with Atex certification**, for use in explosive atmospheres.
- ***10,0000 ppm version***: covers the measurement range from 1 ppm to 10,000 ppm, **without Atex certification,** not for use in explosive atmospheres

The features of INSPECTRA® Laser make it extremely easy to use:

- Compact and lightweight
- Digital display
- User-friendly keypad: direct shortcut keys for fast and simple access to standard functions and menu keys for access to advanced functions;
- Carrying system that is easy to adapt to each personal build and the requirements relating to the use of the device in the field
- Use in all positions

The detector is easy to use and maintenance is limited to battery replacement and checking the condition of the dust filter. The system and accessories adapt to all work situations, from laboratory measurements to field gas leak detection.

Laser technology is intrinsically safe, as it does not generate hot points. It does not affect the sample gas and is not sensitive to flow fluctuations.

The INSPECTRA® LASER detector is not designed for use in a contaminated environment. No identified substances can deteriorate the INSPECTRA® LASER detector in its usual working environment. However, for use in a chemical environment that is liable to damage the sensor, please contact GAZOMAT™ for advice.

INSPECTRA® Laser is the only portable gas detector in the world to offer the best technology for detecting traces of gas and to put infrared laser technology at the service of the gas industry.

Safety requirements for the use of the INSPECTRA® Laser (94/9/CE)

CAUTION – It is strictly forbidden:

- To open the detector, particularly, in a hazardous or supposedly hazardous atmosphere.
- To change, to modify or to adapt external or internal parts or components of the detector.

- Rechargeable batteries authorized for use are as follows:

Make	SAFT
Reference	VTD 70 (VTD137) – 4000mAh
Type	NiCd
Size	LR20 - D
Voltage	1.2V

Any other make or type of rechargeable batteries will be considered as not in conformity and even dangerous for the operator.

It is imperative:

- To comply with the technical specifications.

It is recommended

To carefully read the instruction notice prior to using the detector.

In case of malfunction, please contact :

GAZOMAT™ After-Sales Departement
11, rue de l'atome – 67802 Bischheim Cedex - France
Phone : +33 (0)3 88 19 72 30
Fax : +33 (0)3 88 19 72 19

ETABLI PAR:	VERIFIE PAR :	APPROUVE PAR:
Technical department	Quality assurance	ATEX manager

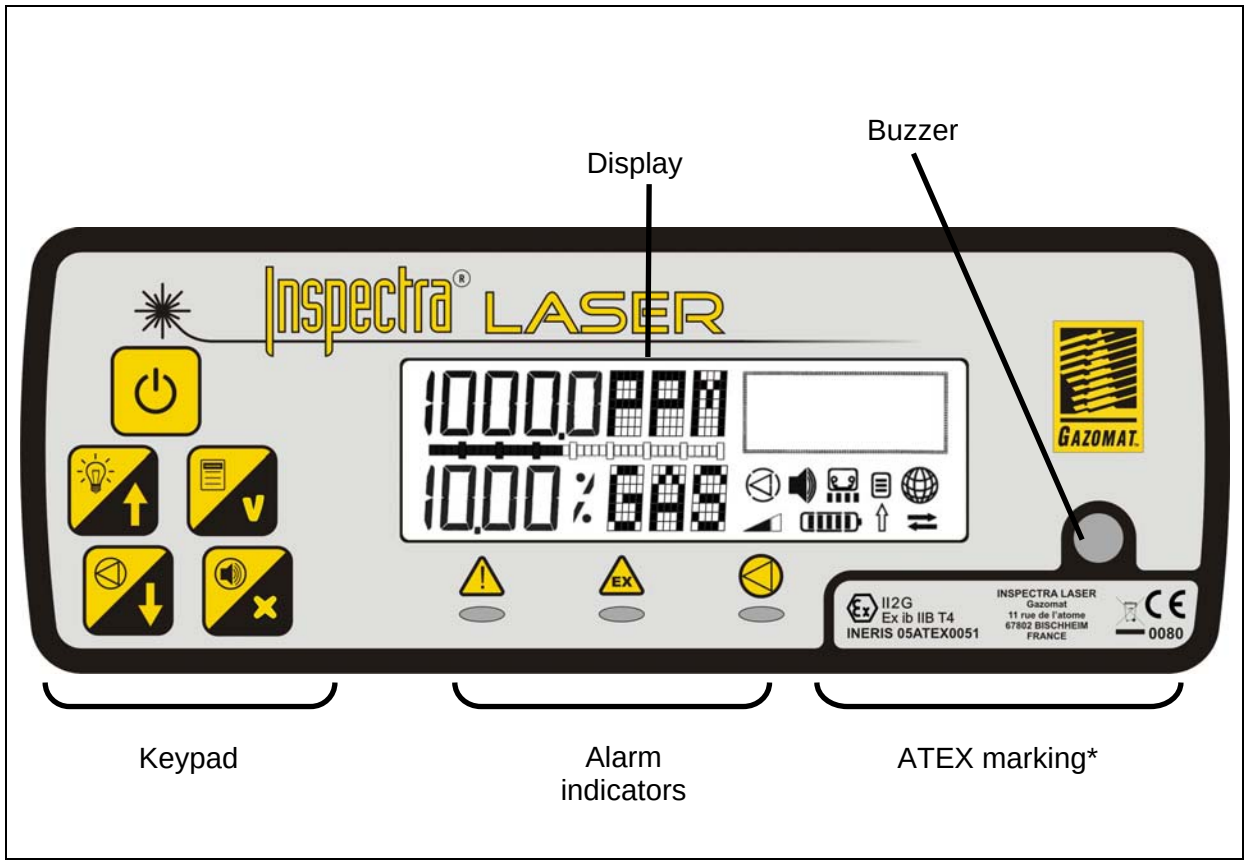
5 USER INTERFACE

5.1 DESCRIPTION

The user interface includes the following:

- Keypad
- Display
- Alarm indicators

The ATEX marking is provided on the front of the device, for the Atex version units.



Front

****Marking specific to the INSPECTRA® 100% gas volume version with ATEX CERTIFICATION***

5.2 KEYPAD

The keypad has five keys:

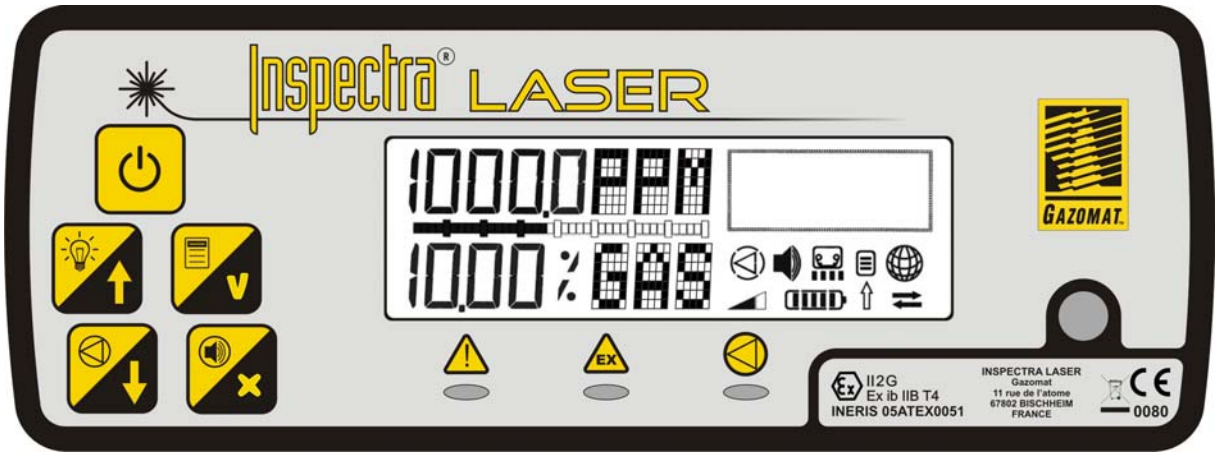
- On/Off key to switch the device on and off
- Four configuration keys with a dual function

The Direct function (symbol on a blue background) is used to access a standard function (e.g. backlighting of the display).

The Menu function (symbol on a grey background) is used to browse the menu and access advanced functions.

Key	*Direct function*	*Menu function*
 1	Device On/Off	-
 2	Backlighting On/Off	Up
 3	Entry into a menu (switch key to Menu function)	Confirm
 4	Pump On/Off	Down
 5	Mute selected alarm	Cancel

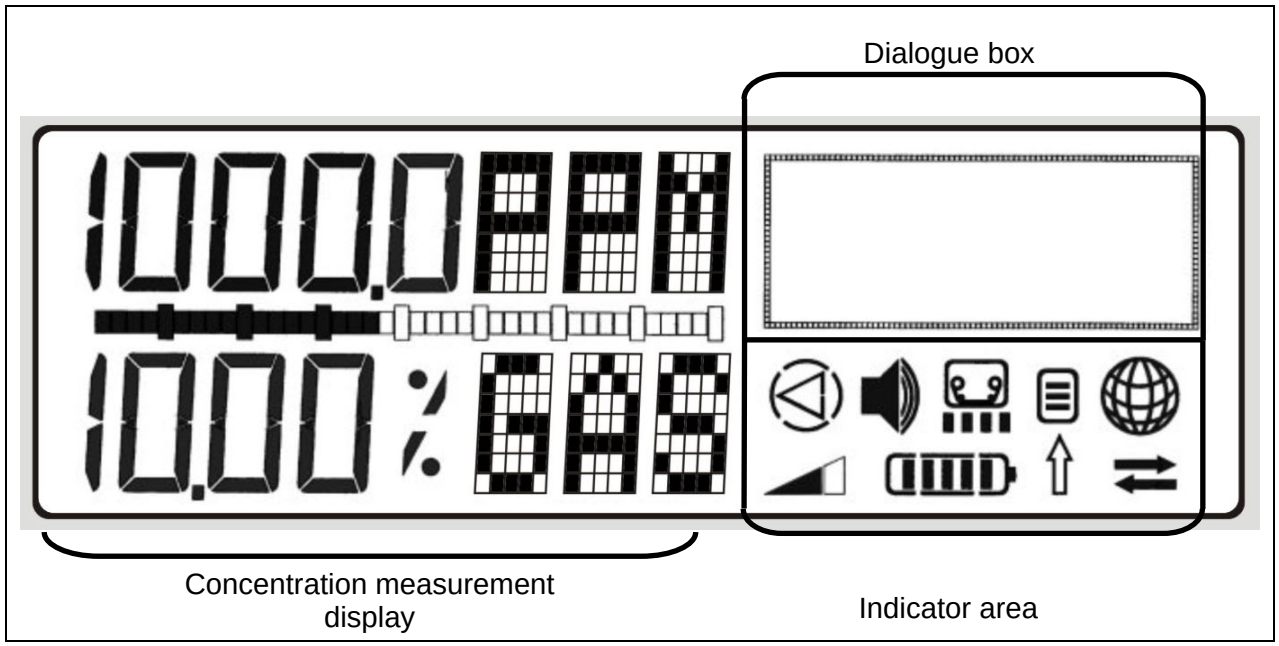
Key functions



5.3 DISPLAY

The display is made up of three areas:

- Measurement area
- Indicator area
- Dialogue area



Display

5.3.1 MEASUREMENT AREA

This area has two display scales for the measured CH_4 (methane) concentration.

The upper scale displays measurements in ppm ranging from 0 to 19,999 ppm (below 20,000 ppm).

The lower scale display measurements in % gas volume above 20,000 ppm.

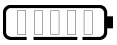
Below 20,000 ppm, measurements are displayed as follows :

Display below 20,000 PPM			Display above 20,000 PPM		
X X X X X	PPM	(5 digits)	_ _ _ _ _	PPM	
X.X %	GAS	(2 digits)	XXX.X %	GAS	(4 digits)

The two scales are separated by a status bar. The minimum and maximum levels of the bar are configurable from the menu.

5.3.2 INDICATOR AREA

Indicators are symbols that provide information to the operator about the status of the device and its working configuration.

Indicator	*Symbol*	*Status*
Pump status		Pump on
		Pump blocked
		Pump off
Pump speed		Speed 1
		Speed 2
		Off
Alarm		Selected alarm active
		Selected alarm muted
		No alarm selected
Battery level		Batteries charged
		Batteries down
Menu		Menu mode
Communication		Communication in progress (infrared)
Unused symbols		-

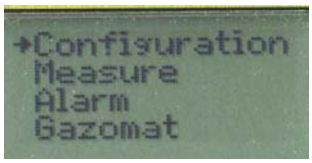
Indicators

5.3.3 DIALOGUE AREA

The dialogue area is a graphical area that can contain up to four alphanumeric lines. It displays the following:

- Menu (Menu mode)
- Selected advanced functions (Direct mode)

Dialogue area (Direct mode)



Dialogue area (Menu mode)

5.4 ALARM INDICATORS

Three alarm indicators are included in the display:

- Threshold alarm indicator
- Measured gas explosiveness risk indicator
- Pump status indicator

Symbol	*Indication*
	Threshold alarm not selected **OR** programmed limit not reached
	Threshold alarm selected **AND** programmed limit reached
	Gas concentration below LEL
	Gas concentration between LEL and UEL
	Gas concentration above UEL
	Pump on, speed 1 or 2
	Pump halted **OR** line blocked

Alarm indicators

5.5 WIRED COMMUNICATION PORT (OPTIONAL)

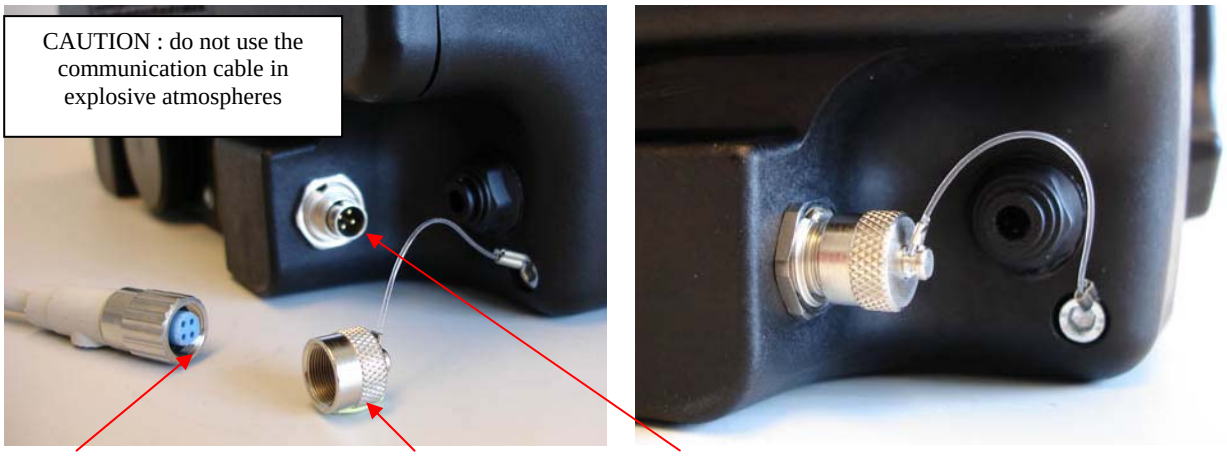
The communication interface is used for calibration, data saving and data retrieval operations in non-hazardous areas.

The communication interface is located under the device (see figure below).

Access to the communication port is protected by a cap, which may only be removed in non-hazardous areas.

Important: the connector is foolproof and the cable connector must be brought correctly before the communication port before it is plugged in gently. The connecting ring must then be screwed in.

Communication port components

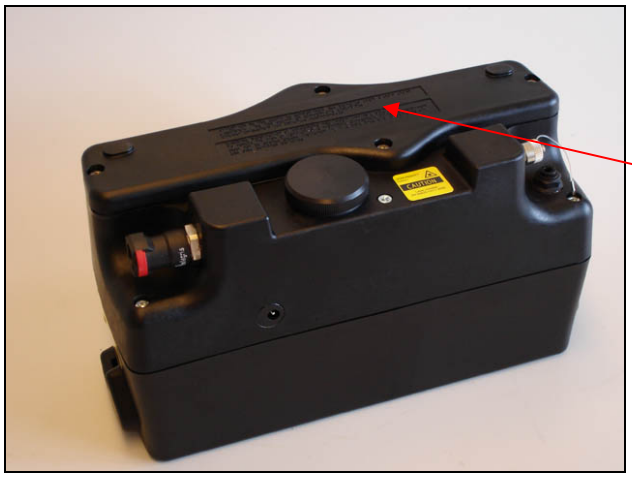


THE COMMUNICATION PORT MAY ONLY BE USED OUTSIDE ANY POTENTIALLY EXPLOSIVE ATMOSPHERES (IN A NON-HAZARDOUS AREA)

6 MECHANICAL ASPECTS

6.1 BATTERY COMPARTMENT

The battery compartment is located on the underside of the device and is accessible by raising the cover that is fixed by four screws.



6.2 GAS INLET AND OUTLET

The gas inlet is located on the underside of the device, in a protected recess. The gas outlet is also located on the underside of the device, in a protected recess.

THE BATTERY COMPARTMENT MAY ONLY BE OPENED OUTSIDE ANY POTENTIALLY EXPLOSIVE ATMOSPHERES (IN A NON-HAZARDOUS AREA)

1	The connector is used to rapidly connect the suction rod. Just insert the end of the rod in the connector.	
2	The suction rod is connected.	
3	The end of the suction rod can only be released by pressing the release button.	

6.3 HYDROPHOBIC FILTER HOUSING

The dust filter housing is located on the underside of the device and is accessible by unscrewing a cap with a pin wrench. The filter is kept sealed by an o-ring seal on the cap.

The housing contains a hydrophobic dust filter and an o-ring seal placed between the bottom of the housing and the filter.

	
Sealing cap of filter housing	*Cap and hydrophobic dust filter*

6.4 CARRYING STRAP GROOVES

The carrying strap is fed into two side grooves that are designed so that the device can be carried on the front or the side of the body or held in a hand.

6.5 SAMPLING CIRCUIT

The gas sample is brought to the sensor by means of the suction effect of the pump. A sampling rod can be connected to the device by means of the female quick coupler.

The telescopic rod has a suction cup for detecting gas on the ground, in natural holes or in the atmosphere.

The rigid rod is used to detect gas in areas that are uneven, narrow or hard to reach.

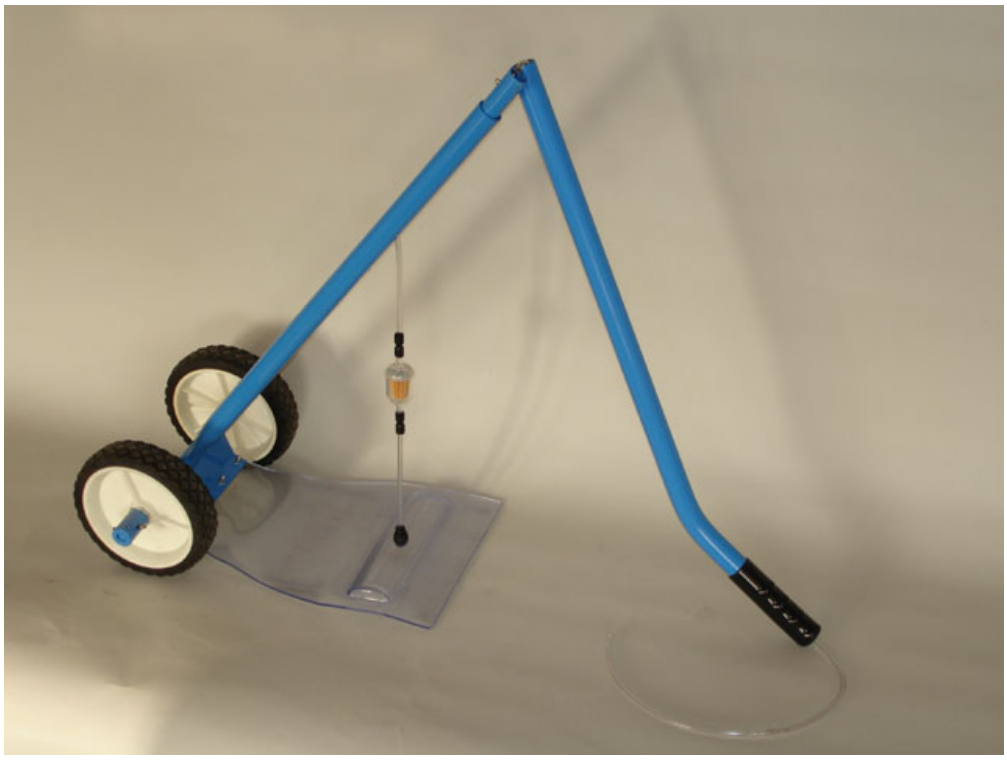
The operator can select from two suction speeds (speed 1 (35 l/h) and speed 2 (70 l/h)) in order to adapt the sampling speed to the requirements and reduce the dilution of the gas sample.

A new model of the telescopic rod is available since June 2010. With this new model, the rigid rod simply fits into the small inlet located inside the suction cup.

Pressing the black ring will free the rigid rod.

If the leaks from the floor are small or if it is windy, the operator may advantageously use the gas trap trolley, which protects the leakage point. It makes it easier to take the gas sample and detect small values.

The gas trap trolley can be connected to the device by a female quick coupler.



IMPORTANT:

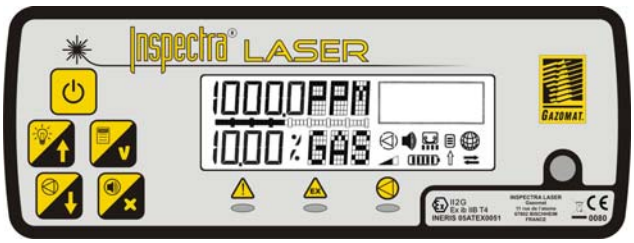
The use of the accessories (rigid rod, suction rod, gas trap trolley, more pipes etc.) has an effect on the device response time.

7 OPERATION

7.1 DEVICE ON/OFF

The device is switched on by pressing the On/Off button twice.

Switching on



The device is switched off by pressing and holding down (for at least 2 seconds) the On/Off button.

Switching off

7.2 STARTING UP

When the device starts up, it runs a self test in order to check if its components are operating correctly.

At the end of the self test:

- The measurement area displays flashing dashes on the upper or lower scale.
- The indicator area displays the pump status, the battery level and whether or not an alarm has been selected
- The dialogue area displays the selected advanced functions
- The pump runs at speed 1 (35 l/h).

The device is ready for operation when the upper and lower scales of the measuring area stop flashing.

Display status at the end of the self test

7.3 PRELIMINARY INSPECTION WITH THE GAS CHECK KIT

7.3.1 COMPOSITION AND USE OF THE GAS CHECK KIT

Before each use of INSPECTRA® Laser unit, the proper working of the device must be checked by means of the gas check kit.

The gas check kit is made up of the following:

1. an aluminium canister containing a mixture of methane (CH4) in air at a concentration of 10 ppm de methane + QSAir, mixture accurate to 5%. The canister may be used for about one hundred checks.
2. a flow regulator with a pressure gauge and a quick coupler
3. a pipe for connection to the INSPECTRA® Laser device.

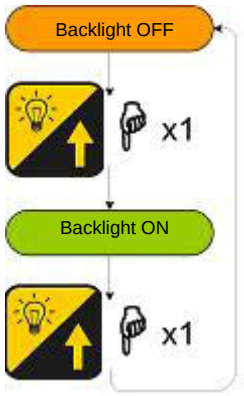
1	Start up the device by pressing the On/Off button twice.	
2	Screw the flow regulator onto the canister containing the mixture of CH4 in air.	
3	Connect the two pipes to each other	

4	Using the pressure gauge of the flow regulator, check that the residual pressure in the canister is sufficient for the check	
5	Connect the gas check kit to the detection device with the quick coupler located at the end of the connecting pipe. Insert the end piece into the connector with a red ring on the device.	
6	Wait for a few seconds and then check that the measurement displayed on the device is within the tolerance range of 10 ppm +/- 2 ppm.	
7	If the measurement is correct, the device is in working order and ready for use. The check is complete.	
8	Disconnect the connecting pipe from the detection device by pressing the red ring while pulling the end piece of the connecting pipe.	
9	Take care to unscrew the flow regulator from the gas canister to prevent gas leaks	
10	Important! Checking with the kit does not replace annual calibration or annual maintenance of detectors as recommended by GAZOMAT™.	

7.4 STANDARD FUNCTIONS

7.4.1 BACKLIGHTING ON/OFF

Depending on the conditions of use, the operator can switch the backlighting on or off from the screen by pressing a single key.



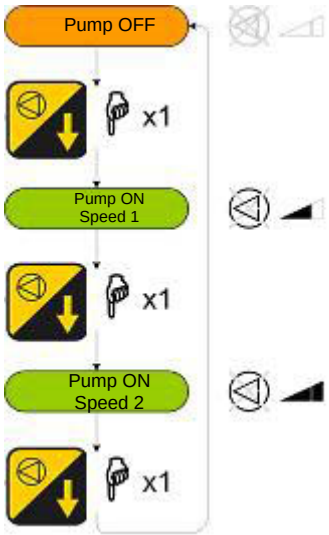
Backlight on/off

7.4.2 PUMP ON/OFF

The operator can select the pump speed in order to optimise the sampling conditions.

Speed	***Benefit***
Speed 1 (35 l/h)	Reduces the risk of dilutions and small leaks
Speed 2 (70 l/h)	Enables rapid sampling
Stop	Stops the pump automatically if it is blocked

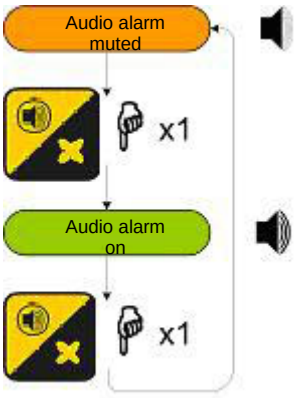
Pump speeds



Pump on/off

7.4.3 USER ALARM ON/OFF

For more discretion, the operator can elect to mute the selected user alarm.



User alarm on/off

Note that the key is not active as long as no user alarm has been selected.

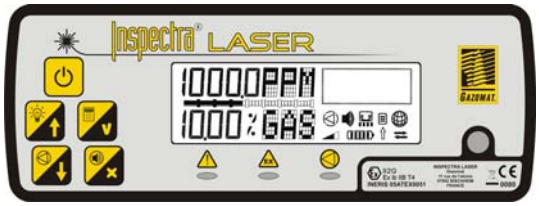
7.5 ADVANCED FUNCTIONS

7.5.1 ACCESS TO MENU

Advanced menu configuration is done by means of a menu. Access to the menu is protected by a specific procedure. To enter the menu:

1) Press **briefly** the Menu key once

(Press briefly)

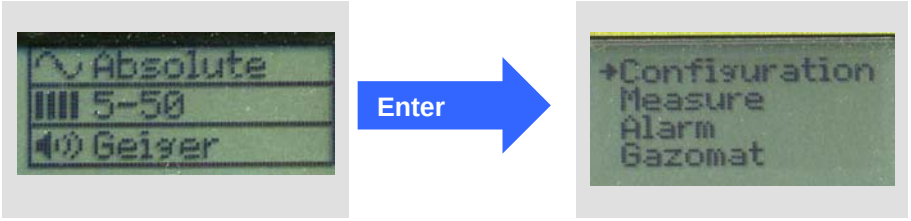


2) Press once the two Arrow keys **simultaneously for more than 2 seconds**

And simultaneously

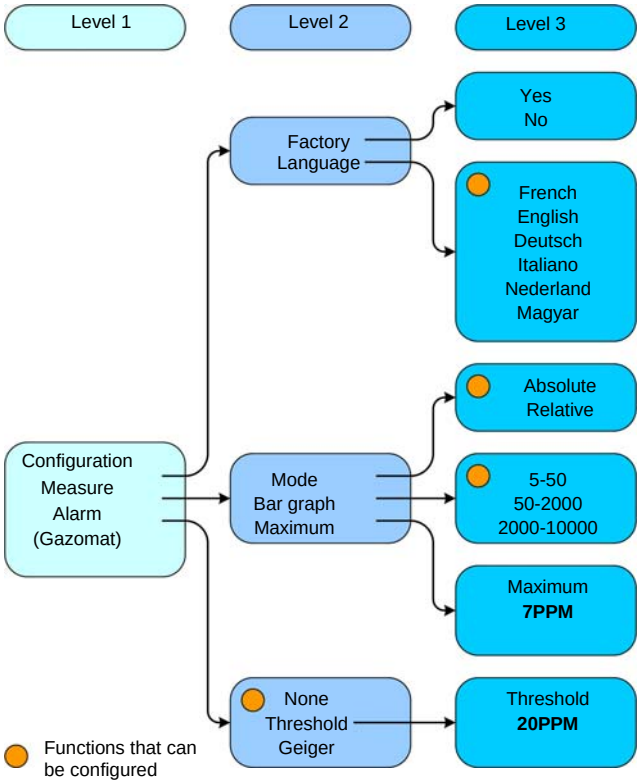
Access to the menu

Once you have entered the menu, the keys operate in Menu mode (symbol on grey background).



Dialogue area (before and after entry into the menu)

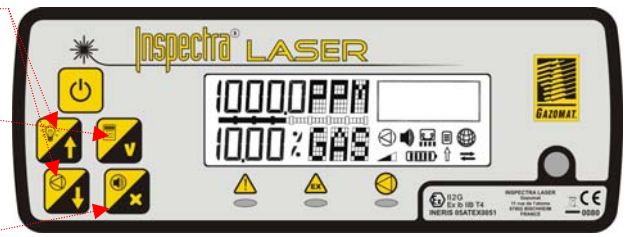
7.5.2 MENU STRUCTURE AND BROWSING



Menu structure

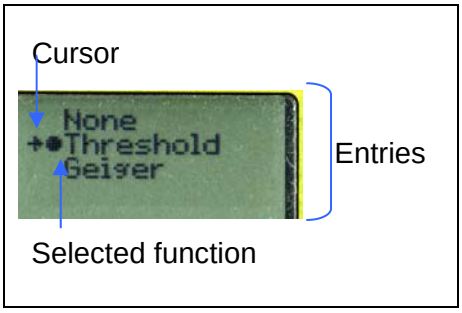
Keys 2, 3, 4 and 5 are used to browse the menu:

- Keys 2 and 4 (Up and Down) are used to scroll the menu entries
- Key 3 (Confirm) is used to move to a higher level of the menu or select a configurable function
- Key 5 (Cancel) is used to move to a lower level of the menu.



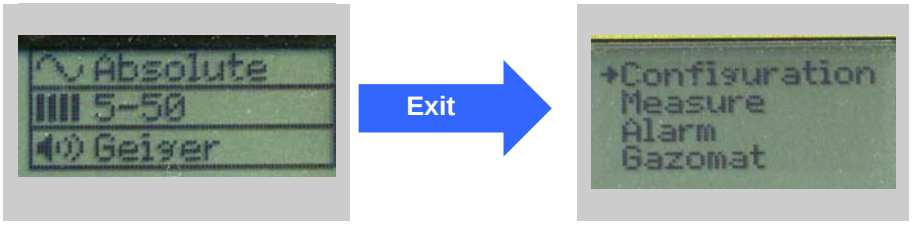
The entry pointed by the user is shown by an arrow (➔).

The function selected by the user is shown by a dot (●).



Browsing

To exit the menu, press the Cancel button, if and only if the level 1 menu is displayed (Configuration/Measurement/Alarm/System).



Exiting the menu

Once you exit the menu, the keys operate in Direct mode (symbol on a blue background).

Note that the configuration selected by the user is saved when the device is switched off and reloaded automatically when it is switched on again. Also, the configuration summary is displayed continuously in Direct mode.

System configuration summary

7.5.3 RESETTING THE CONFIGURABLE OPTIONS

The user can restore the factory configuration of the system from the Configuration menu.

Language	French
Measurement mode	Absolute
Bar values	5-50 ppm
User alarms	None

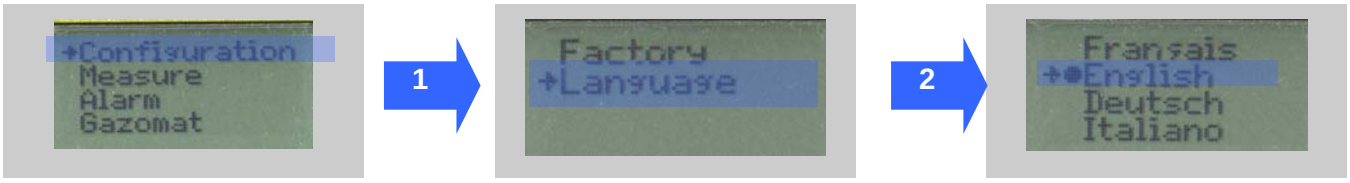
Factory configuration of options

Choice	*Menu path*
Reset factory configuration	**Configuration > Factory > Yes >**

Resetting the configurable options

7.5.4 SELECTING THE LANGUAGE

The user can select the device language from the Configuration menu.



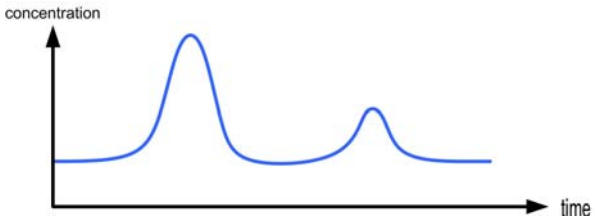
Choice	*Menu path*
French	**Configuration > Language > Français**
English	**Configuration > Language > English**
German	**Configuration > Language > Deutsch**
Italian	**Configuration > Language > Italiano**
Dutch	**Configuration > Language > Nederland**
Hungarian	**Configuration > Language > Magyar**

Selecting the language

7.5.5 SELECTING THE MEASUREMENT MODE

The device has two measurement modes - absolute and relative - that can be selected from the Measurement menu.

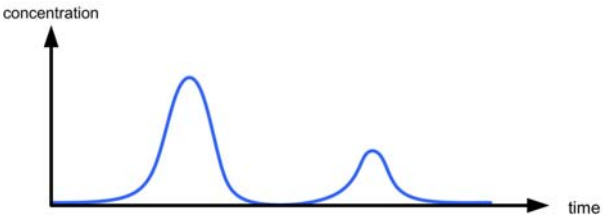
- **In Absolute mode**, the displayed concentration is the measured concentration as it is.



Absolute mode measurement

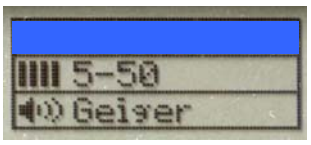
- **In Relative mode**, the displayed concentration is the measured concentration less the baseline value. This mode is used to detect concentration variations in relation to an ambient atmosphere containing methane in a slowly-changing concentration.

This mode is disabled when the measured concentration is greater than 50 ppm.

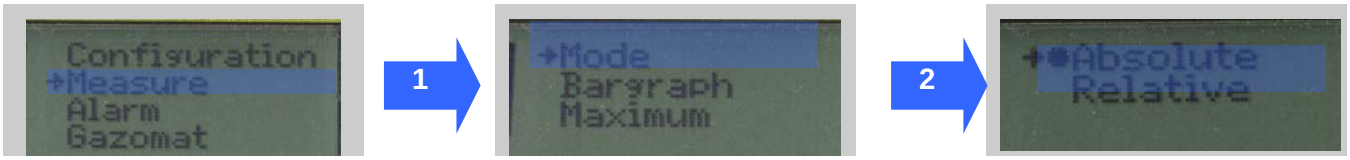


Relative mode measurement

Note that when the interface is in Direct mode, the selected measurement mode is displayed continuously.



Selected measurement mode



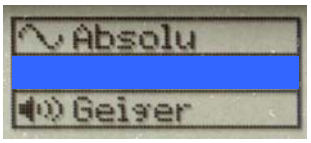
Choice	*Menu path*
Absolute	**Measure > Mode > Absolute**
Relative	**Measure > Mode > Relative**

Selecting the measurement mode

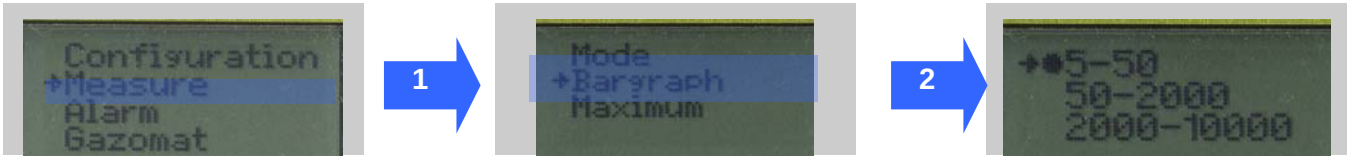
7.5.6 SELECTING THE MINIMUM AND MAXIMUM BAR LEVELS

The bar is made up of 40 segments and its display level is determined by the minimum and maximum levels. The first segment goes on if the displayed concentration is greater than or equal to the minimum level. The last segment goes on if the displayed concentration is greater than or equal to the maximum level. The levels are configurable from the Measurement menu.

Note that when the interface is in Direct mode, the selected levels are displayed continuously.



Selected bar levels



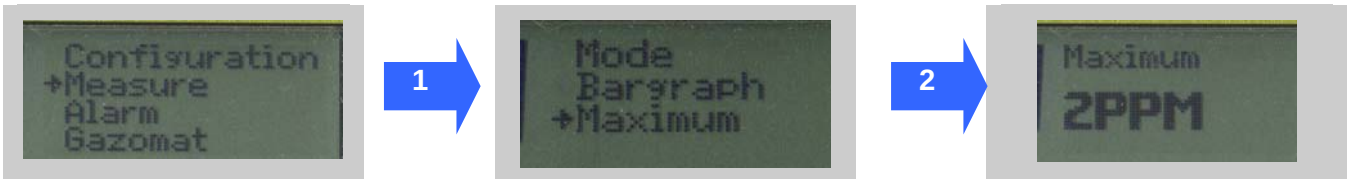
Choice		*Menu path*
min. = 5 ppm	max. = 50 ppm	**Measure > Bargraph > 5-50**
min. = 50 ppm	max. = 2000 ppm	**Measure > Bargraph > 50-2000**
min. = 2000 ppm	max. = 10000 ppm	**Measure > Bargraph > 2000-10000**

Selecting the minimum and maximum bar levels

7.5.7 DISPLAYING THE MEASURED MAXIMUM VALUE

While locating leaks, it may be of interest to know the maximum value, which may be displayed by means of the Measurement menu.

The maximum displayed can be reset by pressing key 3 (Confirm key).



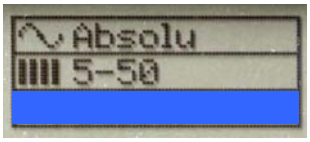
Choice	*Menu path*
Display the measured maximum value	**Measure > Maximum**

Displaying the measured maximum value

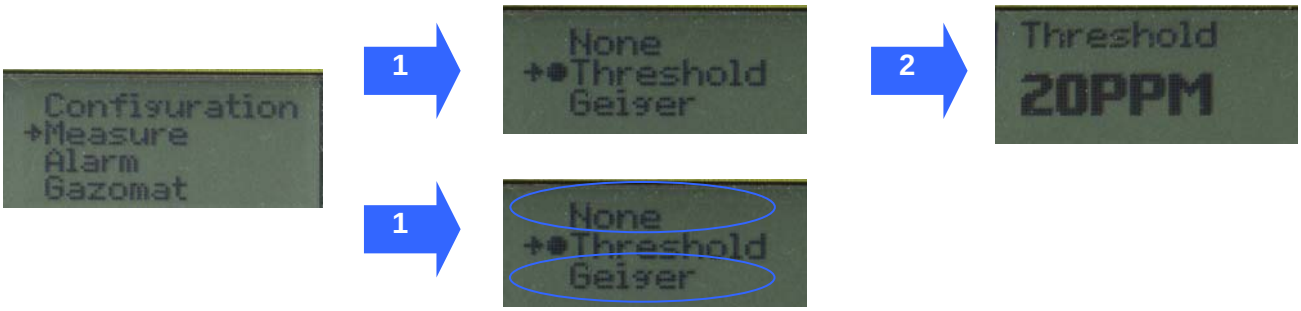
7.5.8 SELECTING THE USER ALARM

The user has a choice between two types of alarm.

Note that when the interface is in Direct mode, the selected alarm is displayed continuously.



Selected alarm



Choice	*Menu path*
None	**Alarm > None**
Threshold	**Alarm > Threshold**
Geiger	**Alarm > Geiger**

Selecting the user alarm

7.6 CONDITIONS OF USE – RANGE OF TEMPERATURE.

The Inspectra® detector is designed to operate in the range of temperature from -15°C to +40°C. If the ambient temperature is not within this range, the Inspectra® detector will deliver no measurements. It will remain in a "waiting" status, until the device's temperature comes back within the authorized temperature range.

"Wait" message – Detector outside the authorized temperature range

8 AUDIO ALARMS

8.1 USER ALARMS

The user has a choice between two types of configurable alarm:

- Threshold type alarm
- Geiger type alarm

8.1.1 THRESHOLD ALARM

The threshold alarm is a continuous alarm, which is set off when the measured concentration is greater than or equal to the set value. When the alarm is set off, the threshold alarm indicator lights up as well.

Symbol	*Indication*
	Threshold alarm not selected **OR** set threshold active
	Threshold alarm selected **AND** set threshold reached

8.1.2 GEIGER ALARM

The Geiger alarm is a discontinuous alarm, where the frequency is proportional to the measured concentration.

8.2 EXPLOSIVE RISK ALARM

The explosive risk alarm is a continuous alarm, which is set off when the measured concentration is greater than or equal to the LEL of methane gas (44000 ppm, i.e. 4.4% gas). The alarm is not configurable. For safety reasons, the user cannot mute or disable this alarm.

8.3 MALFUNCTIONING OF THE MEASURING ELEMENT

Some sensor defects are identified and displayed on the LCD matrix:

ERR00X with X = 1 - 7.

The error display is accompanied by an audio signal: two beeps at a frequency that increases gradually.

The sound alarm can be cleared by pressing keypad key 5.

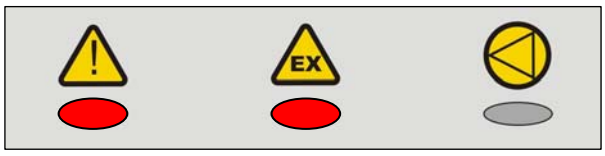
8.4 10,000-PPM MEASURING RANGE OVERRUN

With the 10,000-ppm version of the Inspectra® Laser detector, the maximum displayed value is 12,000 ppm. Beyond that concentration value, the measuring range is exceeded, leading to the following:

- the display remains blocked on 12,000 ppm and the value flashes.

- the sound alarm is activated.

- the limit alarm LED is activated at the same time with the explosive risk alarm LED.

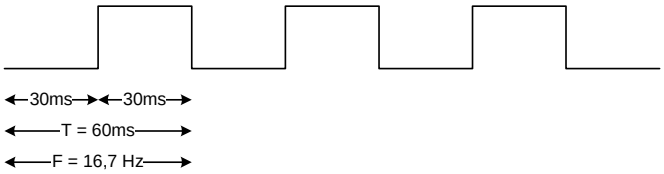


9 AUDIO INDICATORS

The audio indicators are not user configurable. They are made up of three beeps. Because they are brief, these signals have preference over audio alarms. If, for instance, the battery indicator is set off while the explosive risk alarm is already active, the latter is only interrupted, but not stopped in any event.

9.1 CALIBRATION INDICATOR

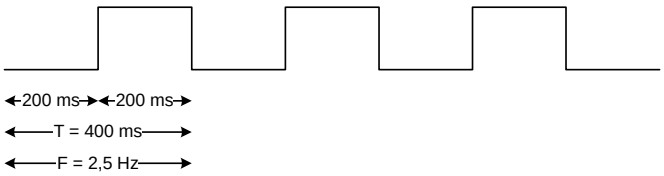
The calibration indicator is set off every time the measurement calibration is changed (increased or decreased). It is made up of three short beeps.



Calibration indicator

9.2 PUMP INDICATOR

The pump indicator is set off every time the pump is stopped, whether because of a block or by the user. It is made up of three medium beeps.



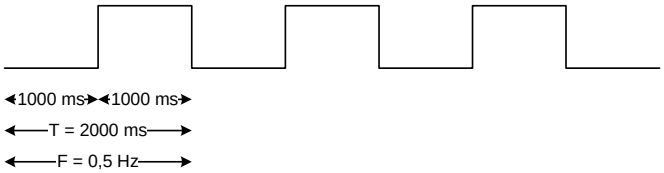
Pump indicator

Pump status	*Symbols*	*Alarm indicator*
Active	and or	
Stopped	and	
Blocked	and	

Pump status

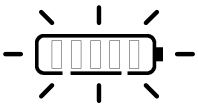
9.3 BATTERY INDICATOR

The battery indicator is set off when the battery is down (all the battery symbol segments are off). It is made up of three long beeps. The charge level is given for guidance and varies according to the cells or batteries used in the device.



Battery indicator

The indicator is set off only once, when the battery symbol starts to flash.



Battery down

10 MAINTENANCE

10.1 FILTER REPLACEMENT

Two filters keep the device protected from dust, impurities and water:

- One hydrophobic filter integrated into the device
- One dust filter integrated into the telescopic rod

The filters need to checked regularly and replaced if they are fouled.

Dust filter

Hydrophobic filter

NEVER USE THE DEVICE WITHOUT THE FILTERS

IF THE HYDROPHOBIC FILTER IS SOILED, REPLACE IT.

IF THE HYDROPHOBIC FILTER IS FULL OF WATER, IT MUST BE REPLACED, NOT DRIED

TRY NOT TO TAKE IN WATER OR ANY OTHER LIQUID

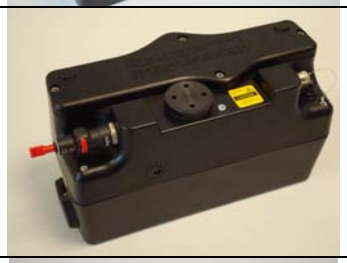
IF WATER IS FOUND, REPLACE THE FILTERS

10.1.1 REPLACING THE FILTER INTEGRATED INTO THE DEVICE

The filter in the device is a hydrophobic filter with a fine retention limit (0.45 µm). It is located on the underside of the device, in the filter housing.

The filter gets clogged immediately if any water enters the device, which stops the pump automatically. The pump alarm is triggered and the operator needs to take action.

1	Switch the device off with a long press on the On/Off button.	
2	The housing for the hydrophobic filter is closed by a cap with four holes.	
3	Use the pin wrench to unscrew the cap of the hydrophobic filter housing to replace the filter	
4	Unscrew the knurled cap with the pin wrench. During this operation, it is preferable to keep the filter enclosure down, so that any water runs out of the unit.	
5	Remove the hydrophobic filter and the black o-ring seal.	
6	Check the filter condition (pollution by impurities and water) Check the condition of the seal.	

7	View of the hydrophobic filter.	
8	Clean the filter enclosure with a dry cloth and clean the cap.	
9	The hydrophobic filter must necessarily be replaced if it is polluted by water; replace the o-ring seal if needed. Place the seal on the filter, fit the filter and seal in the housing and screw back the cap that shuts the housing of the hydrophobic filter.	
10	Tighten the cap of the hydrophobic filter housing **by hand, without tightening it**.	
11	Switch on the device and then insert the plugged quick coupler. 	
12	Use the pin wrench to tighten the cap till the pump stops completely. **Do not tighten any more: that could damage the seal of the cap.**	

Replacing the hydrophobic filter in the device

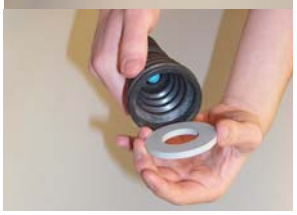
10.1.2 REPLACING THE FILTER IN THE TELESCOPIC ROD

Depending on the date of manufacture of your equipment, two different types of telescopic rod are available. To each model corresponds a specific procedure for replacing the dust filter.

Former model:

The filter is located in the end of the sampling rod. Just remove the end to get to the filter.

	
Telescopic rod with suction cup (former model)	***Dust filter***

1	Disconnect the rod.	
2	Remove the washer that holds the rubber bellows.	 
3	Hold the rod and the pipe vertically in order to let out any water and unscrew the filter.	

4	Check the filter condition (pollution by impurities and water) If the filter is dry and not soiled, it may be cleaned by blowing from the inside out.	
5	Change the filter if required (tighten moderately).	
6	Put the plastic washer back into the rubber bellows.	

New model (since June 2010):

The filter is located in the sampling rod, in the part between the suction cup and the rod itself.

	
Telescopic rod with suction cup (new model)	***Exploded view***

1	Disconnect the rod.	
2	Unscrew the rod.	
3	Hold the rod and the pipe vertically in order to let out any water. Then remove the black O-ring, and finally the filter.	  
4	Check the filter condition (pollution by impurities and water). If the filter is dry and not soiled, it may be cleaned by blowing from the inside out.	

5	Insert the new filter in place.	  
6	Screw the rod (tighten moderately).	

10.2 CHARGING AND REPLACING THE BATTERIES

The system can run on the following power source:

- Ni-Cd accumulator pack (3 1.2-V cells)

The device life is 8 hours. The remaining life is displayed continuously with the five-level battery indicator.

The device is supplied with a charger that is adapted to the batteries used in the device.

The NON ATEX version may operate with a rechargeable battery pack composed of Sanyo batteries offering a greater capacity.

10.2.1 CHARGING THE BATTERIES

The maximum device charging time is 14 hours.

Connecting the charger to the device

1	Connect the charger to the mains (220 V or 110 V depending on the type of charger)
2	Connect the charger jack to the connector on the side of the device (or on the adapter, in the case of external charging)
3	Charging is complete when the charger indicator flashes or goes off.

Accumulator pack charging procedure

THE DEVICE MAY ONLY BE CHARGED OUTSIDE ANY POTENTIALLY EXPLOSIVE ATMOSPHERES (IN A NON-HAZARDOUS AREA)

10.2.2 REPLACING THE BATTERIES

An additional rechargeable battery pack is available as an option for replacement during detection work.

Rechargeable battery pack

1	Switch off the device. Remove the cover of the battery compartment by unscrewing the four screws with a key.	
		
2	Disconnect the battery pack.	
		
3	Change the battery pack.	
4	Put back the battery compartment cover.	

Power source replacement procedure

THE RECHARGEABLE BATTERY PACK MAY ONLY BE CHANGED OUTSIDE ANY POTENTIALLY EXPLOSIVE ATMOSPHERES (IN A NON-HAZARDOUS AREA)

DO NOT RECHARGE THE ACCUMULATORS WHEN THE AMBIENT TEMPERATURE IS GREATER THAN +40°C OR LESS THAN +5°C

IN ORDER TO MAXIMISE THE LIFE OF THE BATTERIES, THE DEVICE SHOULD BE USED TILL THE BATTERIES ARE FULLY DOWN.

10.3 STORAGE AND ENVIRONMENT

Store the detector in a clean place, away from the elements.

11 TECHNICAL SPECIFICATIONS

Measurement ranges :
Range 1 : 0 - 10000 ppm

Range 2 : 0.1% to 100% V/V :

Detection threshold: 1 ppm methane

Response time : (160 ppm)

Standard t90 :	4.5 seconds
Standard t10 :	2 seconds
With suction rod t90 :	6 seconds
With suction rod t10 :	<3,5 seconds

Dimensions :

Length	:	263 mm
Width	:	113 mm
Height	:	141 mm
Weight	:	2.7 kg (avec batteries)
Case material	:	Fibreglass and carbon reinforced polyamide.

Display :
3 areas : Measurements, Indicators and Dialog window.
Measurement type height : 13 mm.

Keypad :
5 direct function keys.
Advanced function Control from pull-down menu

Power supply:
Batteries according to indicated references:
Rechargeable battery pack: 3.6 V - 5100 A/h Ni/Cd in compliance with ATEX directive.

Recharging time : 14 hours maximum

Autonomy:
8 hours at 20°C with all options functioning (backlighting, pump on speed 2).
6 hours at temperatures below 0°C with all functions on (backlighting, pump on speed 2).
6 hours at temperatures above 35°C with all functions on (backlighting, pump on speed 2).

Alarms : They activate visual (LEDS and LCD displays) and sound systems:
- Methane CH_4 concentration threshold
- Geiger
- Explosion risk due to Methane CH_4 concentration
- Pump : pump stopped, pump error

Status indicators : Change of condition
- battery charge level
- pump status (2 speeds)

Gas connection:
Quick-connect gas inlet coupling with locking mechanism : suction rod on the right side.
Quick-connect gas outlet coupling.

Electrical connections:
Male power plug 2.1 mm : for battery charger
Communication with a PC via a specialised communication link.

Options:
dapter cable for communication with a PC.

Operating conditions :
Humidity : from 5% to 80% relative humidity
Temperature : -15°C to +40°C
Pressure : Atmospheric pressure 1013mb ±100mb

Storage conditions (excluding batteries):
Humidity : < 90% relative humidity
Temperature : -20°C to +60°C

Degree of protection (IP Code) : IP 54.

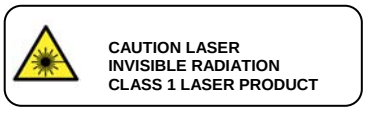
Accreditation :
Electrical equipment in Potentially Explosive Atmospheres:
-EN 60079-0 of 2006
-EN 60079-11of 2007

II2G Ex ib IIB T4
INERIS N° 05ATEX0051

Electromagnetic compatibility – Electrical apparatuses for the detection and measurement of combustible gases, toxic gases or oxygen
- NF EN 50270 Dec. 2000

Degrees of protection provided by enclosures (IP code)
- NF EN 60529 Oct 1992

Safety of laser products:
NF EN 60825-1:2008 + A1 (IEC)
Class 1 ; Wavelength=1650nm ; Pout < 35mW
Caution Laser inside the device



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Patented in the US and foreign countries.
Patent No. 7352463 & 1647820

12 PARTS AND ACCESSORIES FOR THE INSPECTRA® LASER

Description	Part number
INSPECTRA® LASER 1 ppm – 10 000 ppm Non ATEX	72.7606.0000.1050.00
INSPECTRA® LASER 1 ppm – 100% Vol. gas Non ATEX	72.7606.0000.1060.00
INSPECTRA® LASER 1 ppm – 100% Vol. gas ATEX	72.7606.0000.1070.00
Sampling rod telescopic with suction cup	72.7509.2250.4000.00
Charger for INSPECTRA® LASER	72.7601.3060.0520.00
Connection cable from charger to INSPECTRA® LASER	72.7601.3060.0521.00
Rechargeable battery pack	72.7606.1060.0500.00
Carrying straps for INSPECTRA® LASER	72.7601.3060.0430.00
Flexible hose (3 x 6) per meter	72.7501.3110.2000.00
1x water repellent filter	72.7503.3080.1000.00
1x dust-proof filter for suction cup of sampling telescopic rod	72.7606.3250.1000.00
Storage and carrying case (provided empty)	72.7601.3060.0500.00
3-mm male key with handle	72.7601.3060.0940.00
Pin wrench for filter cap	72.7606.3210.0010.00
Gas trap trolley	72.7509.1250.0001.00

13 LIST OF EQUIPMENT FOR THE GAS CHECK KIT

Description	Part number
34-litre 10-ppm Ch4-Air canister	72.7514.2320.0020.00
Automatic regulator for INSPECTRA® LASER	72.7514.2130.0010.00
Gas check kit canister support	72.7514.1150.0000.00

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