# Extrima

## Hydrogen Leak Detector
(HW II)


## User's manual

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INFICON

# Contents

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# 1. General



**EXTRIMA** is an extremely sensitive and selective, intrinsically safe detector for hydrogen gas ($H_2$). It is especially designed for leak detection using Hydrogen Tracer Gas, (Hydrogen diluted with Nitrogen down to a safe concentration), which is the most effective and economical tracer gas for leak testing.

**EXTRIMA** detects hydrogen in air at atmospheric pressure with no need for vacuum pumping. It is especially suitable for applications where high sensitivity and selectivity is required in combination with simplicity and reliability.

The instrument has three main functions:
**Detection Mode, Analysis Mode and Combined Mode.**
- Detection Mode is used when there is a need to detect and locate a leak quickly. The results are shown as a moving bar.

- Analysis Mode is used when there is a requirement to analyse the concentration of hydrogen gas in the air and thus determine the size of the leak. The results are shown by figures in PPM or other unit, selected by the user.

In Combined Mode a moving bar and figures are shown. In all three cases the results are also indicated by an audio signal. The frequency of the sound depends on the measured signal, which allows the user to work without having visual contact with the display.

## Ex

An intrinsically safe instrument is constructed to remove all ignition sources. This means that even in the event of a failure in the circuits, the surface temperature and available spark energy is limited to given values.

The guidelines for the protective measures are given in international standards. A third party, a so called Certification Body has assessed and tested the compliance with the relevant standards and issued a certificate stating the classification that the instrument fulfills.

Read this User Guide carefully before using the instrument. You must, under all circumstances read and understand the section **Special conditions for safe use** on page 5. On page 13, there is a description of how to get started quickly. However, to be able to utilise all the functions of the instrument, one should also read all the other sections in the guide. When running through the menu section for the first time, it is a good idea to have the instrument in front of you so that the build of the menu system can be recognised quickly.

## The major advantages of Hydrogen Tracer Gas* are:

- It is the cheapest of all tracer gases (standard industrial grade mixtures).
- The natural background concentration in air is only 0.5 ppm.
- Hydrogen is very easily vented away from the test area, thereby minimizing background problems.
- Hydrogen is non-toxic, 100% environmentally friendly and non-flammable.
- Hydrogen is a renewable natural resource.
- Hydrogen is a low viscosity gas which spreads very rapidly inside the test object and easily penetrates a leak. After testing it is remarkably easy to eliminate the gas from the test area.

***Whenever the word Hydrogen Tracer Gas is used throughout this manual it implies that the hydrogen gas is safely mixed with Nitrogen in the proportions 5% $H_2$ - 95% $N_2$.**

# 2. Safety



The safety terms WARNING, CAUTION and **NOTE** are used in these instructions to highlight particular dangers and/or to provide additional information on aspects that may not be readily apparent.

**WARNING:** indicates that death, severe personal injury and/or substantial property damage will occur if proper precautions are not taken.

**CAUTION:** indicates that minor personal injury and/or property damage can occur if proper precautions are not taken.

**NOTE:** indicates and provides additional technical information, which may not be very obvious even to qualified personnel.

Compliance with other, not particularly emphasised notes, with regard to transport, assembly, operation and maintenance and with regard to technical documentation (e.g. in the operating instruction, product documentation or on the product itself) is essential, in order to avoid faults, which in themselves might directly or indirectly cause severe personal injury or property damage.

## Special conditions for safe use

The 'X' suffix to the certificate number relates to the following special conditions for safe use:

**As aluminum is used at the accessible surface of this equipment, in the event of rare incidents, ignition sources due to impact and friction sparks could occur. This shall be considered when EXTRIMA Hydrogen Leak Detector is used in locations that specifically require group II, category 1G equipment, i.e. Zone 0 or Division 1 applications.**

Examples of materials quoted as possibly able to create sparks on impact with aluminum are concrete and rust.
Proper care must be taken to avoid impact with aluminum surface when working in Zone 0 areas where impact with such materials can occur. Protecting the instrument with a leather or antistatic synthetic protection case is recommended.

**Extrima must not be used in applications where there is risk for exposure to acetylene / ethylene.**
Avoid also storage in potential acetylene atmospheres. Acetylides, prone to ignition by friction impact, can potentially form on the bronze filter in the probe tip.

Extrima Hydrogen Leak Detector is certified for use in Gas groups IIA, IIB and IIC (**excluding Acetylene**) and in Zones 0, 1 and 2.

# Traduction française pour CANADA

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## Conditions spéciaux pour une utilisation en toute sécurité

Le X après le numéro de certificat ATEX concerne les conditions particulières suivantes pour une utilisation en toute sécurité:

**L'aluminium étant utilisé sur la surface accessible de cet équipement, en cas d'incidents rares, des sources d'inflammation dues à des chocs et des étincelles de friction pourraient se produire. Ceci doit être pris en compte lorsque le détecteur de fuites d'hydrogène EXTRIMA est utilisé dans des endroits qui nécessitent spécifiquement un équipement de groupe II, catégorie 1G, c'est-à-dire applications Zone 0 ou Division 1.**

Des exemples de matériaux cités comme étant susceptibles de créer des étincelles lors d'un impact avec l'aluminium sont le béton et la rouille.

Des précautions appropriées doivent être prises pour éviter les impacts avec la surface en aluminium lorsque vous travaillez dans la zone 0 où un impact avec de tels matériaux peut se produire. Il est recommandé de protéger l'instrument avec un étui de protection en cuir ou synthétique antistatique.

**Extrima ne doit pas être utilisé dans des applications où il existe un risque d'exposition à l'acétylène / éthylène.**
Eviter également le stockage dans des atmosphères potentielles d'acétylène. Des acétylures, susceptibles de s'enflammer par friction, peuvent potentiellement se former sur le filtre en bronze de la pointe de la sonde.

Le détecteur de fuites d'hydrogène Extrima est certifié pour une utilisation dans les groupes de gaz IIA, IIB et IIC (**à l'exception de l'acétylène**) et dans les zones 0, 1 et 2.

# Summary of scope of certificate



**The following instructions apply to equipment covered by certificate numbers:**

| | |
|---|---|
| **Sira 07ATEX2117X** | **Ex ia IIC T3 Ga, 1G** |
| **CSAE 21UKEX2586X** | **Ex ia IIC T3 Ga** |
| **CSA 1981011** | **Class I Zone 0 ia IIC T3 (US)** |
| | **Ex ia IIC T3 Ga (Canada)** |
| **IECEx SP 07.0002 X** | **Ex ia IIC T3 Ga** |
| **TIIS TC22765X** | **Ex ia IIC T3 Ga** |

Ambient Temperature: -20°C to +50°C

1. The equipment may be used with flammable gases and vapours with apparatus groups IIA, IIB and IIC and with temperature classes T1, T2, and T3.

2. The equipment is only certified for use in ambient temperatures in the range –20°C to +50°C.

3. The certificate number has an 'X' suffix which indicates that special conditions of installation and use apply (see above).

4. The equipment is portable and is not intended for fixed installation. Assembly for operation, see page 13.

5. Repair of this equipment may only be carried out by service organisations authorised by INFICON, Sweden.

6. If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection is not compromised.

Aggressive substances — e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.

Suitable precautions — e.g. regular checks as part of routine inspections (see also under "Caution" below).

7. There are no special checking or maintenance conditions.

8. Safety is not guaranteed if equipment is used in conditions not covered by the certification

# Safety regulations

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## Warning

**• Pure hydrogen is a flammable gas. Only use ready-made Hydrogen Tracer Gas of 5% Hydrogen in Nitrogen. This is an absolutely safe, standard industrial gas mixture used in various industrial applications. The normal risks associated with all compressed gases must however be considered. As the tracer gas mix contains no oxygen, releasing large amounts of gas in a confined space may lead to asphyxiation.**

**• Whenever the word Hydrogen tracer gas is used throughout this manual it implies that the hydrogen gas is safely mixed with Nitrogen in the proportions 5% $H_2$ - 95% $N_2$.**

**• Compressed gases contain a great deal of stored energy. Always carefully secure gas bottles before connecting pressure regulator. Never transport gas bottle with pressure regulator fitted.**

**• Before connecting tracer gas: confirm that the connectors or test object is designed for working at the test pressure.**

**• Pressurising objects at too high pressures can result in a burst object. This in turn can result in serious injury or even death. Never pressurise objects that have not previously been burst tested or otherwise approved for the chosen test pressure. INFICON can not take any responsibility for the consequences arising from the inapropriate use of certain test pressures.**

**• Pressure shocks might cause strong sounds which can cause impairment of hearing.**

**• Charge battery in safe area only! Read the section Special conditions for safe use on page 5 and Charging on page 38, before using the instrument.**

**• Check that all relevant legislation and safety standards are complied with before putting EXTRIMA into service.**

!

## Caution

• Do not open detector! Service of this equipment may only be carried out by service organisations authorised therefore by INFICON, Sweden.

• If the detector gets outer damage it must be controlled and repaired by service organisation authorised by INFICON.

Replacement of Hand Probe and Probe Cable may be carried out by the user.

• Do **not** expose the probe to a hydrogen concentration higher than 0.1 % when the instrument is not put into operation, this might damage or destroy the probe sensor.

• When the instrument is put into operation the sensor withstands temporary exposure to hydrogen concentration up to 100%. Avoid long exposures to high concentrations.

# Hydrogen Tracer Gas for leak detection

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**NOTE! Whenever the word Hydrogen tracer gas is used throughout this manual it implies that the hydrogen gas is safely mixed with Nitrogen in the proportions 5% $H_2$ - 95% $N_2$.**

When a mixture of less than 5.5% hydrogen in nitrogen mixes with air there is not sufficient energy to support a flame, irrespective of the ratio of air-to-gas.

When a mixture of more than 5.5% hydrogen in nitrogen is released into air there is a region of ratios of air-to-gas where the mixture is flammable. When, for example, a mixture of 10% hydrogen in nitrogen mixes with air there is still very little energy available.

Only in exceptional circumstances can a flame be self-supporting. However, such mixtures cannot detonate.

**Hydrogen/nitrogen mixtures containing more than approximately 15% hydrogen can detonate when mixed in certain proportions with air.**

**Never make your own mixtures.** Only use ready-made mixtures, or use a certified hydrogen/nitrogen mixer installed by your gas supplier.

Warning!

- **Never use a gas mixture containing more than 5% hydrogen.**
- **Never make your own gas mixtures.**

# 3. Working principle

## Theory



The **EXTRIMA** detector is based on microelectronic sensor technology known as GAS-FET technology. The sensor is a field effect transistor in an integrated circuit. The gate electrode of the transistor is made of a hydrogen absorbing metal alloy (metal hydride). When this device is exposed to hydrogen the gas molecules adsorb on its surface, dissociate into hydrogen ions (protons), and diffuse rapidly into the gate metal. The absorption of hydrogen ions affects the work function (surface potential) of the metal, which gives the same effect as if the gate voltage of the transistor was changed.

Only hydrogen ions can diffuse into the metal. This excludes cross sensitivity from substances that do not contain hydrogen. Also, the dissociation of hydrogen from other molecules is very inefficient, a fact that makes these sensors practically insensitive to other substances. The only, relatively common, substance being detected is $H_2S$, hydrogen sulphide. This gas is, however, extremely toxic and has a very strong and distinct smell. It is therefore never present in interfering concentrations in normal working environments.

The electrical output signal from these sensors is not at all as stable and repeatable as, for example, sensors for physical parameters such as temperature, pressure, etc. Therefore the output signal must undergo signal interpretation in order to give reliable measurements. This is done by a microprocessor in the instrument, which also controls the sensor temperature with high accuracy, and other sensor diagnostics in order to ensure functionality. It also automatically compensates for background gas.

There is always some hydrogen gas in the background. In fresh air this is as low as 0.5 ppm (parts per million).

## Background compensation

There is always some hydrogen gas in the background. In fresh air this is as low as 0.5 ppm (parts per million).

EXTRIMA actively adjusts itself to the background. This is done automatically at start-up and thereafter it slowly adapts itself to slow variations in the background concentration. By adjusting slowly (minutes) it avoids taking an actual leak for an increased background, and vice versa. Therefore a sudden rise in background concentration will be detected, but if the concentration remains constant it will be gradually cancelled out over a period of several minutes.

For example, if the background concentration, for some reason, should suddenly rise to 10 ppm $H_2$, then the detector will give a corresponding signal which will, very slowly, decline to zero. If you thereafter expose the probe to a leak which gives rise to another 10 ppm $H_2$, the detector will give essentially the same signal as if there was no background concentration.

## Interferences

Some examples of hydrogen sources which could cause interferences:

- Engine exhaust
- Battery charging stations
- Welding smoke
- Cigarette smoke
- Breathing air
- Human flatulence
- Scratching on aluminium

**Hydrogen Leak Detector EXTRIMA** is extremely selective. Among naturally occurring gases only Hydrogen Sulphide (extremely toxic) gives a comparable response to hydrogen. The detector will also react to some synthetic gases, predominantly used within the semiconductor industry, such as Silane, Phosphine, Arsine etc. Exposure to such synthetic gases severely reduces the life of the Hydrogen sensor.

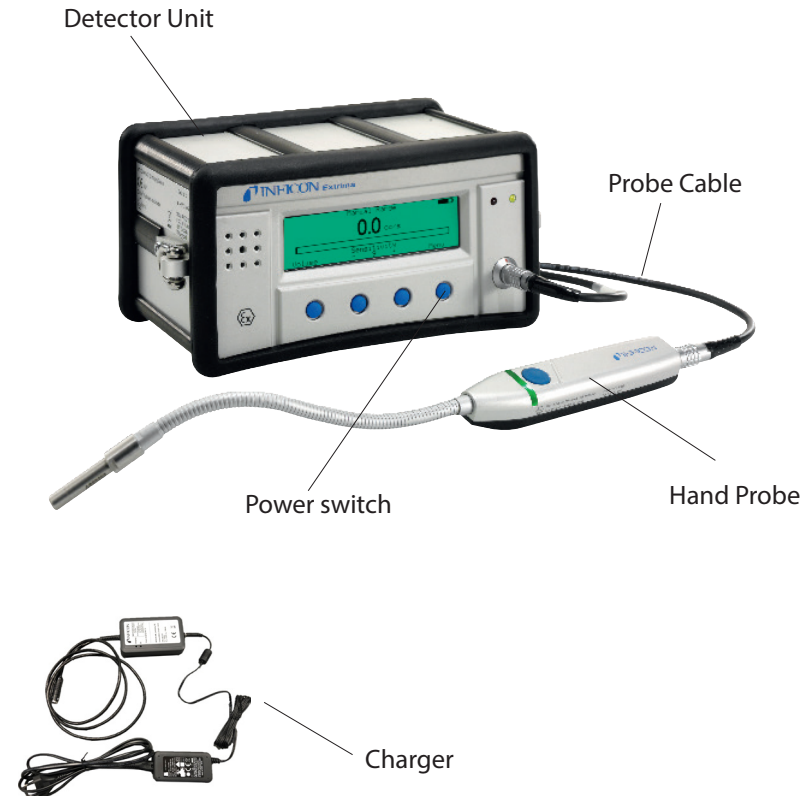
# 4. Main parts



**EXTRIMA** consists of five main parts:

- Detector unit with display, controls, and connections
- Hand Probe PX57-Flex
- Probe cable with connectors
- Charger
- User's Manual

EXTRIMA



# 5. To get started

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**EXTRIMA** is very easy to setup:

• Connect the Hand Probe to the instrument using the probe cable.

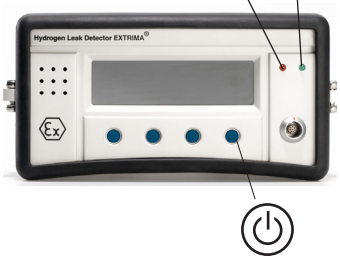
• Switch on the power using the right button. The display lights and an indicator bar shows that the sensor is stabilising and the detector is booting up. Green LED flashes slowly.


Avoid exposing the probe to hydrogen during the stabilisation period.

Indicator bar

• When the stabilisation period is over (typically 90 seconds) the green LED goes out.

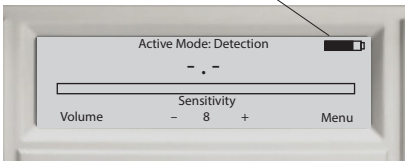
Red Green




• The display will start in **Detection Mode, Analysis Mode or Combined Mode,** depending on which mode was used when the detector was switched off.

• The leak detector is now ready for operation.

Battery status indicator




**Note!** The instrument is water-proof, but the sensor has to be protected if there is a risk of contact with water.
See page 31.

## Shut down

If the display shows a sub menu you first have to press **Esc** to get to one of the main modes.

To shut down **EXTRIMA**, press the right button. The display shows:
Shut down **Extrima**? Press **YES**.

## Basic leak detection

**EXTRIMA** has three different modes: **Detection Mode, Analysis Mode and Combined Mode.** The Combined Mode is the default mode.

In **Detection Mode** you will see a bar and hear a sound with a frequency that increases as the probe approaches the leak, and decreases as the probe is moved away from the leak. No figures are shown on the display, and the frequency is not an accurate measure of the leak rate.

You will soon get used to listening for changes in the frequency rather than to the actual frequency. Move the probe over the surface of the tested object to detect and precisely locate a leak, even when there are other leaks nearby. Keep moving the probe to find out where the signal increases and where it decreases. Let the audio signal guide you to the exact position of the leak.

If you expose the probe to a constant gas concentration you will hear the frequency continue to increase slowly until it eventually levels off, and very slowly declines again. This takes 30 - 45 seconds for small leaks and just a few seconds for large leaks. The decline is the automatic background adjustment coming into action. A gas concentration being constant for several minutes is being taken as an increased background level.

**N.B.** Do not leave the probe tip in front of a large leak for long times. Remove the tip when the leak has been located.

In **Analysis Mode** figures are shown on the display. These figures are an accurate measurement of the leak rate.

The detector determines the gas concentration from the change as the probe goes from being exposed to background to being position right on the leak.

The detector does not continuously monitor the gas concentration but takes just one reading instead. Another suitable alternative name for this mode could be Sampling Mode. It is important to keep this in mind when using the detector in this mode.

In **Combined Mode** the bar and the sound in Detection Mode is combined with the figures in Analysis Mode, this means that at the same the signal is displayed as a bar and the measured value is displayed in figures.

When you have located the leak you can measure its size in the following way:

• Remove the probe from the leak into fresh air.

• Wait until 0.0 appears on screen and the put the tip of the probe right on the leak.

### Note!

**• The tip of the hand probe gets warm when the instrument is in use. This is normal.**

### Important!

**• Always connect the probe before switching on the instrument.**

**• Never put the probe in water or any other liquid.**

# 6. Controls and indicators

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## Display

The display shows:

• The indicator bar in **Detection Mode** and values in **Analysis Mode** or both in **Combined Mode.**

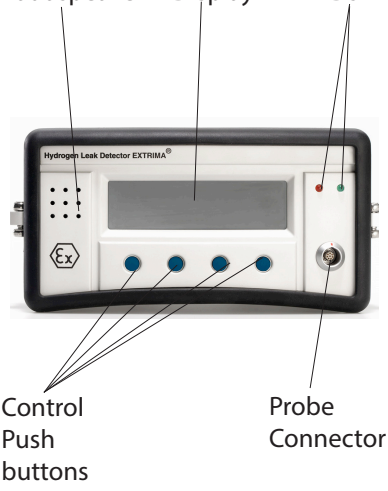
• The six main menus. Their positions are indicated on a horizontal scale. Change from one menu to another using the < and > buttons.

• The main menus have submenus, which are also indicated by horizontal scales and can be selected using the < and > buttons.

• Scales for setting numeric values, languages, etc.

• Messages.

• A battery status indicator in the upper right corner.




The display has a "screen-saver" function. See page 27.

## Push buttons

The functions of the push buttons are shown at the lower edge of the display.

• Change from one menu item to another using the < and > buttons.

• Press **Enter** to move down to the nearest submenu.

• Press **Save** to save the set value.

• Press **Undo** to restore the previously set value.

• Press Esc to move up to the nearest higher level(s).

## LEDs

The two LEDs on the instrument and the two LEDs on the probe indicate the status of the instrument as follows:

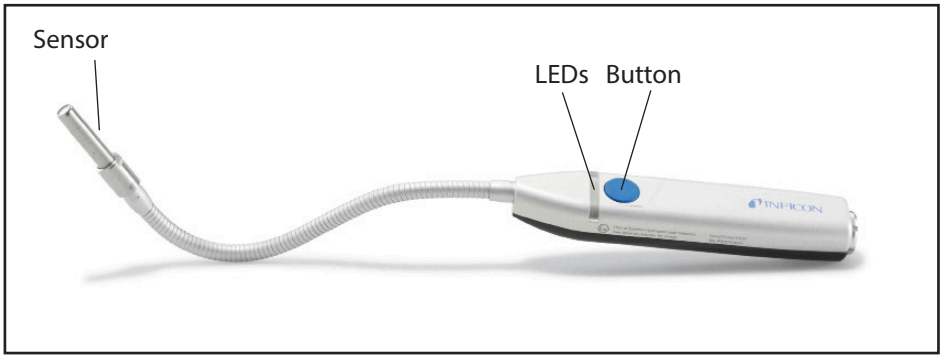
• Green LED flashing slowly during warming up phase.

• Steady green LED indicates that instrument is ready and hydrogen signal below leak limit.

• Red fixed light together with **LEAK** on display means the instrument has detected a leak larger than the set alarm limit.

• Red LED flashing. Check message on display. See Trouble-shooting on page 39.

## Probe




## LEDs

The two LEDs indicate the status of the instrument as described on previous page. During leak location the green LEDs guide the user to the leak by increasing flashing. Red LED lits over the Leak Alarm Limit.

## Push button

The push button is used to switch between **Manual Range, Auto Range** and **Dynamic Range.**

The button can also be used to start calibration when instrument is in **Calibration Mode.**

# 7. Menu system

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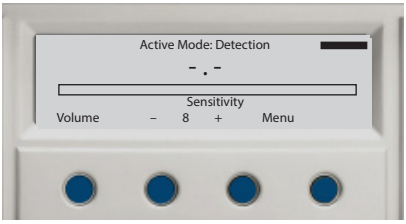
The menu system is designed in the form of a tree structure similar to that used in mobile telephones. The display shows all the levels when browsing down through the menus so that you can always see exactly where you are.

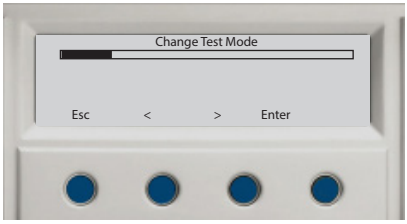
## Main menus

To enter the menus, press **Menu** (button on the far right). Press < and > to choose between the six main menus, which are explained in detail on the following pages.



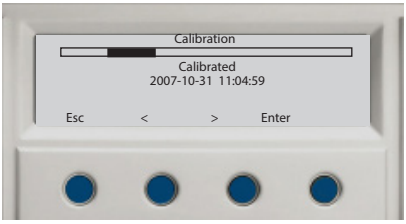

## Change Test Mode

Move between **Detection Mode**, **Analysis Mode** and **Combined Mode**.
See page 19.



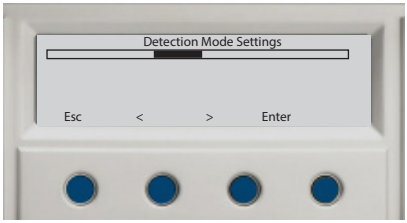

## Calibration

The instrument must be calibrated to ensure that the correct values are displayed in the **Analysis Mode**. Calibration is described on page 20 and 34.



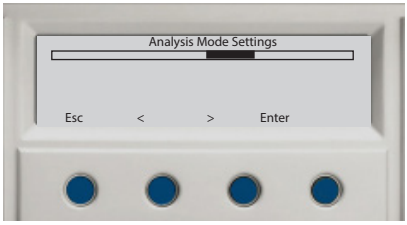
## Detection Mode Settings

Select **Sensitivity, Range Setting, Direct Sensitivity Adjustment, Leak Alarm Indication** and **Lowest Frequency.** See page 23 and 24.



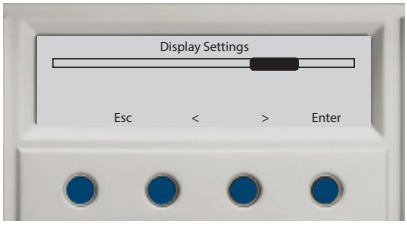

## Analysis Mode Settings

Select **Leak Alarm Level, Leak Rate Unit, Min. Presentation Time, Leak Alarm Indications,** and **Lowest Frequency.** See page 25 and 26.



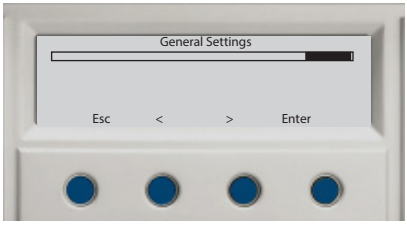

## Display Settings

Select Contrast, Brightness and **Screen Save Timeout** for the display. See page 27.




## General Settings

Various general settings.
See page 28.




**The following is applicable to the settings described on this page and subsequent pages:**

- If no setting is made in a menu or its submenus within 60 seconds, the instrument will revert to the **Detection Mode/Analysis Mode.**

- All changes in values are valid only when saved using the **Save** button.

- Use the **Undo** button to delete a change in value and revert to the previous setting.

Use the **Esc** button to browse backwards through the menus to the start position **Detection Mode/Analysis Mode.**

# Change Test Mode

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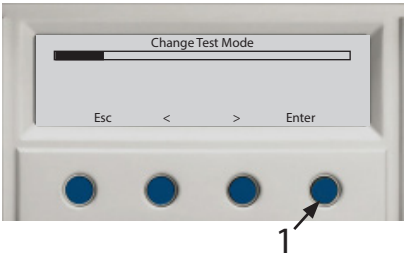
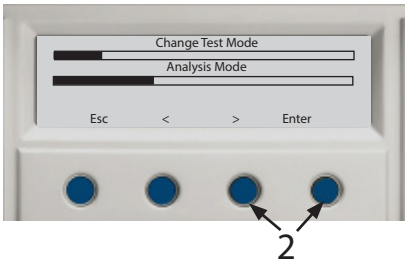
Select the main menu **Change Test Mode** as described on page 17.

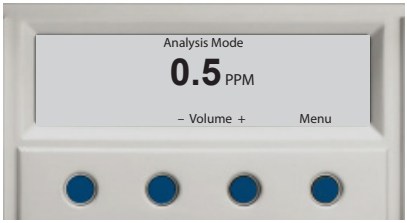



1. Press **Enter**.

2. Select **Analysis Mode** by pressing **Enter** again, or select **Detection Mode** or **Combined Mode** by pressing >.




**Tip!**
To change quickly from **Detection Mode** to **Analysis Mode** or vice versa, press the right-hand button three times in succession.




## Explanations

In **Detection Mode**, the signal is displayed in the form of a bar. The length of the bar varies with the gas concentration.

In **Analysis Mode** the measured value is displayed in figures, (see page 33). The default unit is in PPM but it is possible to choose other units, see page 26.

In **Combined Mode** you can see the signal displayed as a bar and the measured value in figures at the same time.

# Calibration

Select the **Calibration** menu as described on page 17.

1. Press **Enter**.

2. Select:
**Calibrate**
**Calibration Coefficient**
**Calibration Time or**
**Password Protected Calibration**

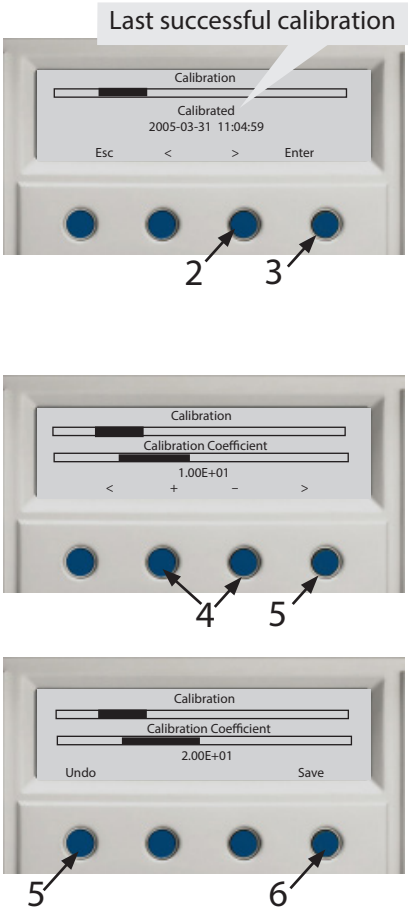
3. Press **Enter**. If **Enter Password** is displayed, this means that the setting function is protected by a password, see page 34.

4. Set the desired value using + and –.
Use > to move to next character and after the last character.

5. Press **Undo** to delete the setting and revert to the previous value.

6. Press **Save** to save the set value. The setting scale will flash to confirm the setting.

Revert to Detection Mode/Analysis Mode by pressing Esc twice.




## Explanations

### Calibration Time
The number of seconds that measurement is in progress when calibrating in the **Analysis Mode**. The default value is 8 seconds but values from 5 to 30 seconds can be used.

### Calibration Coefficient
Calibration parameter. See page 35.

### Password Protected Calibration
The calibration function can be protected using the password so that calibrating cannot be done by unauthorised users. **Note!** Factory default is no password.

# Calibrate

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Select the sub menu Calibrate.

When starting calibration, the sensor must not sense gas, i.e. no measured value should be displayed in **Analysis Mode**.

1. Press **Enter**. The display shows **Expose to background and press Start**.

2. Expose the probe to background air, press **Start** or the button on the probe, to begin the calibration procedure.

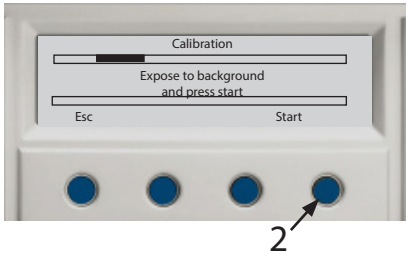
3. An increase in the length of bar can be seen on the display during calibration. While the bar is moving, expose the probe to the calibration gas or reference leak. The display then shows **Gas Detected**.

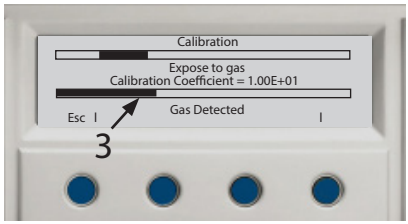
The probe does not have to be exposed to calibration gas during the whole **Calibration Time** (while the bar is moving). The instrument only measures the change as the probe goes from background air to calibration gas.

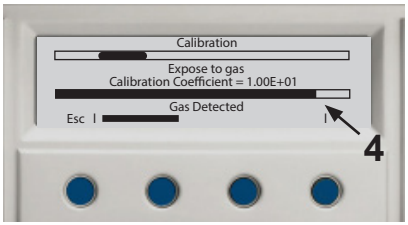
4. Remove the calibration gas at the latest when the bar reaches its end position.

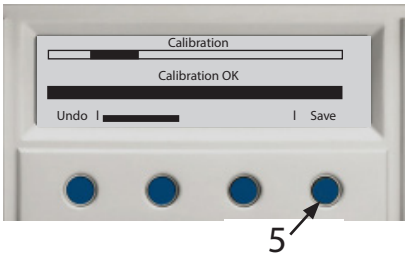
**Note!** If the message "**No Gas or Unstable Signal**" is displayed repeatedly — go back to **Detection Mode** and check functionality.

5. The display will show **Calibration OK** if the calibration was successful. Press **Save**. If you do not press **Save** at this point, the instrument will revert to the previous value after one minute.



If **Repeat Calibration** is displayed this means that the measured value deviated more than 10% from the previous calibration value. Press **Recalibrate** to repeat steps 2 – 5.

**Important!** Allow 30 seconds between repeated calibrations for greatest accuracy.

**Note!** Calibration may have to to be repeated several times, especially after probe replacement.

**Important!** When performing calibration — make sure to follow the above instructions step by step.


**Sensor condition indicator.**
The indicator bar extends in length when the sensor is detecting reference gas. The length of the bar shows the condition of the sensor. The bar will become shorter if the sensor has lost some in sensitivity, but is still useful. The sensitivity is too low when you can´t carry out the calibration or get a Low sensitivity warning.

### Low sensitivity warning

The Detector will warn if sensitivity of sensor is too low to safely detect a leak equal to the set leak alarm limit. The warning can be ignored and calibration updated.

### Irregular reference warning

The Detector will warn if the calibration signal is unreasonably high. This can happen e.g. if 5% tracer gas mix has been used instead of proper reference gas or if the reference leak has an extra non-intentional leak. Warning can be ignored and the calibration updated.

### Password

If desired, the calibration can be set under the general password to prevent the operator from calibrating by mistake. In this case you will have to enter the password to start the calibration routine. Setting password protection on calibration is done in the **General Settings** menu. Note that you must also set a password. The instrument is delivered with no password set.

## Explanation

The instrument must be calibrated to ensure it displays the correct values in **Analysis Mode**. Before calibration the **Calibration Coefficient** must be set correctly as described on page 35.

Regarding the interval between calibration occasions, etc., see **Calibration** on page 34.

# Detection Mode Settings

EN

**Note!** Detection Mode settings only affects **Detection Mode**. To calibrate the **Analysis Mode**, see page 21.

If Direct Sensitivity Adjustment is OFF, Sensitivity can be adjusted as described below.

The chosen Sensitivity will only be stored in memory if adjusted in the menu system.

Select the main menu **Detection Mode Settings** as described on page 18.

1. Press **Enter.**

2. Select:
**Sensitivity**
**Range Settings**
**Direct Sensitivity Adjustment**
**Leak Alarm Indication**
**Lowest Frequency** using < and >.

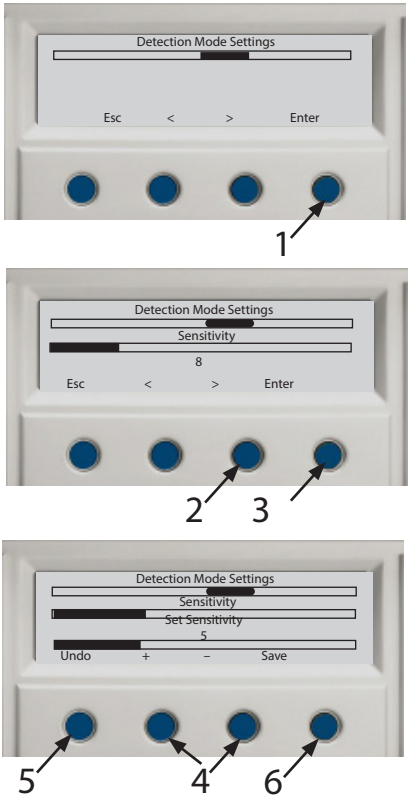
3. Press **Enter**.

4. Adjust the desired parameter using the + and – buttons.

(5. Press **Undo** to delete the setting and revert to the previous value.)

6. Press **Save** to save the set value. The setting scale will flash to confirm the setting.

Revert to **Detection Mode** by pressing **Esc** twice.



# Explanations

## Sensitivity

The sensitivity of the instrument in **Detection Mode** is adjusted by changing the **Sensitivity**. The default value is 5, but values from 1 to 13 can be used. Each step doubles the senstivity. In Dynamic Range the sensitivity is Low, Mid or High.

## Range Setting

Select type of Detection Mode Range: Manual Range, Auto Range or Dynamic Range.

In Manual Range the detection mode sensitivity can be set manually. In Auto Range the sensitivity can be set, but will be changed automatically if necessary. In Dynamic Range sensitivity changes automatically by using an nonlinear presentation on the bar, high sensitivity at the beginning of the bar and low sensitivity at the end of the bar. In this mode both small leaks and gross leaks can be detected in the same range.

## Direct Sensitivity Adjustment

The detection mode sensitivity can be changed directly from the **Detection Mode** main screen by pressing **Sensitivity + and –**. This feature can be turned off by setting **Direct Sensitivity Adjustment** to **OFF**. Sensitivity changes made in the main screen are not stored in the memory and the instrument will start with the sensitivity stored in the **Detection Mode Settings** menu.

## Leak Alarm Indication

If **Leak Alarm Indication** is set to OFF a leak will not be indicated neither by the word LEAK on the display nor by light or sound signals.

## Lowest Frequency (Detection Mode Settings)

The lowest frequency of the sound can be adjusted using **Lowest Frequency**, i.e. when no gas is detected. The default value is 1 Hz but values from 0 to 10 Hz can be used. 0 Hz means that the loudspeaker is silent when the detector has reverted to background level. The setting is not valid in Dynamic Range.

# Analysis Mode Settings

EN

Select the main menu **Analysis Mode Settings** as described on page 18.

1. Press **Enter**.

2. Select:
**Leak Alarm Level**
**Leak Rate Unit**
**Min. Presentation Time**
Leak Alarm Indications or
Lowest Frequency using < and >.

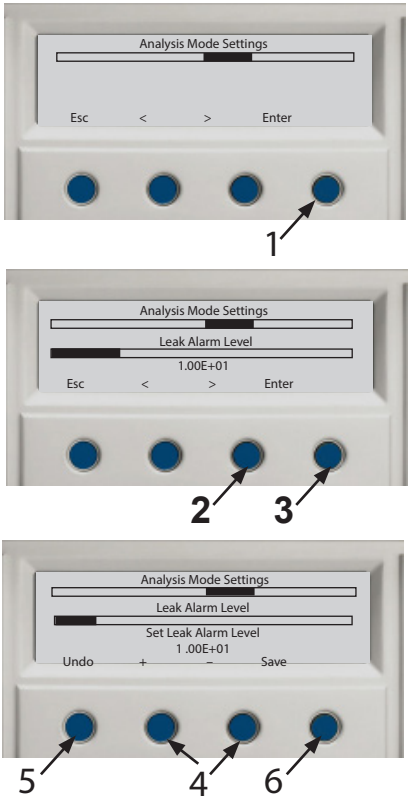
3. Press **Enter**.

4. Adjust the desired parameter using the + and – buttons.

(5. Press **Undo** to delete the setting and revert to the previous value.)

6. Press **Save** to save the set value. The setting scale will flash to confirm the setting.

Revert to **Detection Mode** by pressing **Esc** twice.



# Explanations

## Leak Alarm Level
The level at which an indication should be considered as a leak. The default setting is 1.00E+01=10.

## Leak Rate Unit
Select unit to be displayed in Analysis mode. See further explanation on page 35.

## Min Presentation Time
The measured value is shown until the sensor has recovered. A longer time can be set by increasing the Min Presentation Time. The default value is 1 second, but values from 0 - 120 seconds can be used. Applies only to Analysis Mode.The Screen Save function will dim the display lamp after a certain time of inactivity.

## Leak Alarm Indications
There are four choices of leak alarm indication:
• LEDs only: This is the default setting. No other indication than red LED on front and probe.
• Flashing Backlight: The backlight starts to flash when signal exceeds leak limit.
• Chopped audio signal: The audio signal is chopped (silent/loud) when signal exceeds leak limit.
• Backlight & Audio: A combination of both backlight flashing and audio chopping when signal exceeds leak alarm limit.

## **Lowest Frequency** (Analysis Mode Settings)
The lowest frequency of the sound can be adjusted using **Lowest Frequency**, i.e. when no gas is detected. The default value is 1 Hz but values from 0 to 10 Hz can be used. 0 Hz means that the loudspeaker is silent when the detector has reverted to background level. The setting is not valid in Combined Mode.

## Display Settings

EN

Select the main menu **Display Settings** as described on page 18.

1. Press **Enter**.

2. Select
**Contrast**
Brightness or
**Screen Save Timeout**
using the < and > buttons.

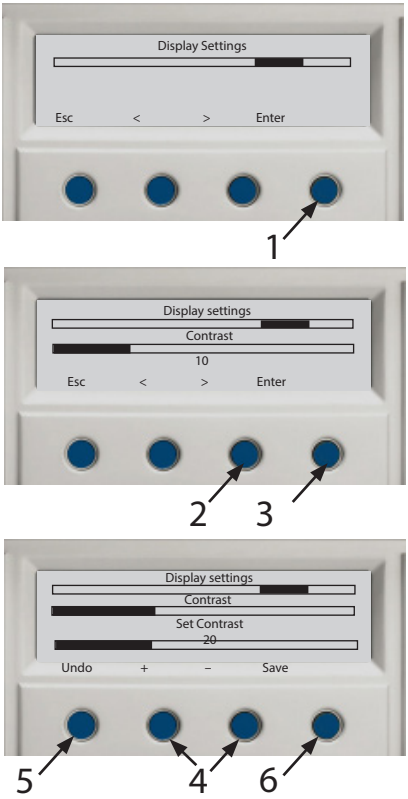
3. Press **Enter**.

4. Adjust the desired parameter using + and –.

(5. Press Undo to delete the setting and revert to the previous value.)

6. Press Save to save the set value. The setting scale will flash to confirm the setting.

Revert to Detection Mode/Analysis Mode by pressing Esc twice.




## Explanations

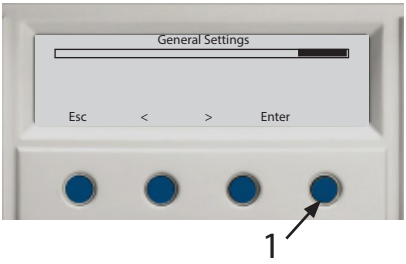
To obtain a good screen display, adjust the brightness and contrast to suit the current light conditions at the work place. To save energy you can choose a lower brightness value.

The **Screen Save Timeout** can be set between 1 and 60 minutes. At the timeout the LCD backlight is automatically reduced. Display returns to normal brightness when a button is pressed, gas is being detected or an instrument error is detected. The function is deactivated if set to Zero.

# General Settings

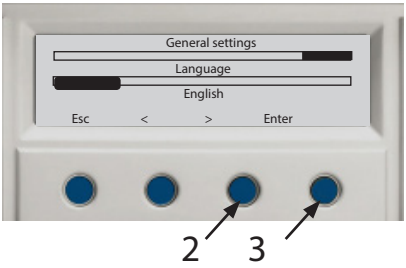


Select the main menu **General Settings** as described on page 18.




1. Press **Enter**.

2. Use < and > to choose between:
**Language**
**Change Password**
**Set Clock**
**Set Date**

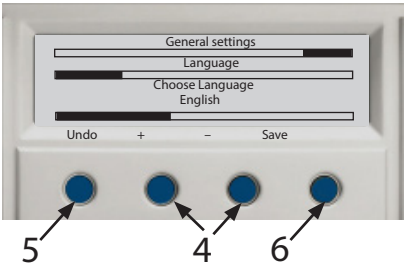



3. Press **Enter**. If **Enter Password** is displayed, this means that the setting function is protected by a password, see page 34.

4. Set the desired value using + and – or as described on the following page.

(5. Press Undo to delete the setting and revert to the previous value.)

6. Press Save to save the set value. The setting scale will flash to confirm the setting.




Revert to Detection Mode/Analysis Mode by pressing Esc twice.

EN

# Explanations

## Language
Select menu language.

## Change Password
The most critical parameters can be protected using a password so that the instrument settings cannot be changed by unauthorised users. **Note!** Factory default is no password.

When Enter Password is displayed: Type in the password (alpha/numeric characters) using + and –. Move forward to the next character using >. Press > twice after the last character. The display now shows Confirm New Password. To confirm, type in the password again and press > twice. The display then shows New Password Accepted.

If no password is required, only press > twice in response to Enter New Password on the display.

**Note!** When entering characters, go left to come directly to the digits and press right to reach the letters (i.e pressing left arrow at start scrolls around to the last character in the list). This function also works for timer settings.

## Set Clock
When Set Time is displayed: Type in the time using + and –. Move forward to the next character using >. Press > twice after the last character.

## Set Date
When Set Date is displayed: Set year using + and – buttons and press Enter. Select month using < and > and press Enter. Set day using + and – and press >.

# 8. Operating the Leak Detector



The detector operates in three modes.

- The leak detection mode (**Detection Mode**), mainly used for detecting and locating leaks but not quantifying them.

- The hydrogen analysis mode (**Analysis Mode**) measures the concentration of hydrogen.

- The **Combined Mode**, (default mode) which is a combination of Detection and Analysis mode.

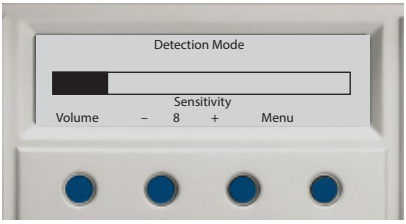
The Detection Mode operates continuously while the Analysis Mode determines the hydrogen concentration (and calculates a corresponding leak rate) in a step measurement.

**Detection Mode** gives no numbers. It therefore needs no actual calibration. The sensitivity of the sound signal and the moving bar on the display is set manually or automatically, see below.

When using the instrument in **Analysis Mode**, it must be calibrated as described on pages 21 and 34 in order to give correct figures.

## To detect leaks

If all you wish to do is to detect the presence of a leak, i.e. find out whether there is a leak or not, then use the **Detection Mode**. The definition of Leak/No Leak will then simply be "A leak is a leak when it can be detected by the detector, set to a specific sensitivity".




## To set up:

The operation in Detection Mode is not quantitative. No figures are given but the signal is still increasing and decreasing with gas concentration.

Therefore, there is no actual calibration to be done, but rather a setting of the sensitivity to a desired level.

A typical set-up procedure for the Detection Mode is:

• Set up a reference leak which corresponds to the smallest leak you wish to detect.

• Put the probe close to the reference leak and note approximately what reaction you get (no reaction, small, medium, high, full scale) within the first few seconds.

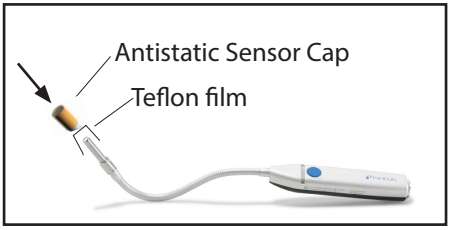
• Set the sensitivity. This can be done permanently under the menu **Detection Mode Settings** or temporarily as a **Direct Sensitivity Adjustment** on the display (unless you have set this function to OFF under the Detection Mode Settings menu. See pages 23 and 24).

**Note:** If the **Detection Mode** is used and the alarm function is required to be activated at a particular calibrated level, then the unit must be calibrated in accordance with the instructions on page 21 and 34. The reason for this is that the alarm is based on the **Analysis Mode** when the **Detection Mode** is displayed, due to inaccuracies in the **Detection Mode** signal.

## Water protection

The instrument is water-proof, but the sensor has to be protected if there is a risk of contact with water, which can pierce the filter and prevent the tracer gas from reaching the sensor.

Protect the sensor by placing a piece of teflon film over the filter. Fix it by mounting an Antistatic Sensor Cap and remove excessive film.



# To Locate Leaks



The Detection Mode is used to locate leaks. This mode is semi-quantitative, i.e. it gives an audio and visual signal which increases as a leak is approached (a higher gas concentration) and decreases as you move the probe away from the leak. It does not display figures.

In this mode of operation leaks can easily be detected using a sensitivity which can be pre-set (page 24). Leaks can be located very accurately, even when there are other leaks nearby.

If, for example, you are trying to locate a leak on a fuel tank and the tank has a major leak, then you will get an audio signal as soon as the probe is placed close to the tank. When the probe is moved around over the tank, the signal will increase as the probe approaches the leak. If the signal goes out of scale, simply reduce the sensitivity setting to bring the signal within the scale. Working with the sensitivity setting this way you will be able to locate multiple leaks that are in close proximity to each other.

**N.B.** Working inside a confined space such as, for example, a cabinet or a narrow passage on a combustion engine there is a risk that the background concentration accumulates to levels close to the upper detection limit of the detector. In such case it will not be possible to locate leaks as easily as in open spaces.

**Hint:** Do not expose the probe to more gas than is necessary, because it will slowly saturate with time. It is good practice to detect a leak, locate it, and immediately remove the probe to avoid saturation. The probe is not damaged by the exposure but it will recover more slowly. After excessive exposure it will be less sensitive for a short period of time.

EN

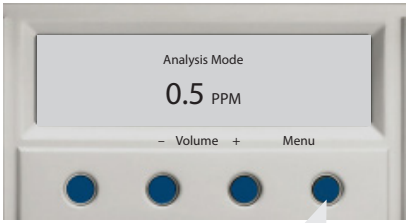
# To Quantify Leaks

The **Analysis Mode** is used for measuring the size of a leak (or the concentration of a gas sample).

To be able to do this measurement and obtain correct values, the instrument must first be calibrated using the calibration function. See the following page and page 21.

In the **Analysis Mode** the detector determines the gas concentration from the change, as the probe goes from being exposed to background to being exposed to a certain gas concentration. The detector does not continuously monitor the gas concentration but takes just one reading instead. Another suitable alternative name for this mode could be Sampling Mode. It is important to keep this in mind when using the detector in this mode.

In Analysis Mode the probe should be moved directly from a background situation to the test point. The size of the leak in PPM, or any other selected units*, is shown on the display. The probe can and should be removed from the measuring point as the measured value remains on the display.
The period during which the measured value is displayed can be adjusted in the **Analysis Mode Settings** menu. See page 25.




**Hint:** To switch between **Detection Mode** and **Analysis Mode** simply press the right hand button three times.

The **EXTRIMA** detector operates in the range 0 - 2000 ppm giving reasonable linearity between 0 and 500 ppm. To obtain greatest accuracy over this range, calibrate the detector at a concentration somewhere between 10 and 100 ppm. Generally accuracy is always best near the concentration at which it was calibrated.

*__Leak Rate Unit__ is selected in the **Analysis Mode Settings** menu, page 25.

# Leak Alarm Level

Leak Alarm Level is set in decimal or scientific format. The scientific format is explained by the following example:

$2.4 \times 10^{-2} = 0.024$
can be written:
2.4E–0.2 or 0.024

If entered incorrectly the previous value will be retained. Always check that the correct value is saved.

The unit used is the current **Leak Rate Unit**. See page 26.

# Calibration

The instrument can be calibrated using the integral calibration function, see page 20. After calibration the instrument will show the correct measured values on the display in **Analysis Mode**.

(The sensitivity settings made in Detection Mode are described on page 24.)

Calibration is a natural part of leak measurement and an important factor in Quality Assurance. It is easily achieved by using the integral calibration function described on page 21.

It is impossible to specify an exact requirement for the interval between calibrations because the applications for which the instrument is used can vary considerably.

If the detector is used, but is not subjected to gas for a lengthy period or exposed to very small gas concentrations (less than 10 ppm) with long intervals between exposure, there will be some oxidation of the sensor which reduces the sensitivity.

The oxidation is reduced when the instrument is subjected to large gas concentrations.

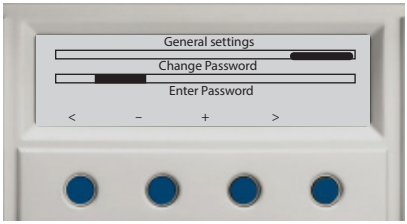
If the instrument is subjected to a very large gas concentration over a long period, a certain amount of insensitivity can occur directly afterwards. This saturation effect can make it difficult to detect very small leaks. Therefore, make a habit of removing the probe from the measuring point as soon as the measured value is displayed. This gives the detector an opportunity to recover. The measured value remains on the display for the period selected under **Min Presentation Time** in the **Analysis Mode Settings** menu, see page 26.

The calibration is saved in the probe even if it is disconnected. If another probe is connected it must be calibrated if this is not done earlier, if it has not been used for a while or if the reference is changed.

# Password

To prevent settings for measurements being changed inadvertently or by unauthorised persons, all critical settings can be protected with a password.

When the display shows Enter Password coupled with a flashing line, type in the desired password using the + and – , and press > twice after the last character.




If the display shows Wrong Password, press Enter and type in the correct password. Menus will be unlocked until you return to Detection Mode/Analysis Mode.

# Leak Rate Unit and Calibration Coefficient

EN

The **EXTRIMA** detector has no pre-defined leak rate units. The **Leak Rate Unit** is a text string defined by the user (default: PPM). The relation between the detector signal and the displayed number is set by the **Calibration Coefficient**.

The **Leak Rate Unit** is set in the **Analysis Mode** menu. Select PPM, cc/s, cc/min, SCCM, mbarl/s, $mm^3/s$, $mm^3/min$ Pa $m^3/s$ or Custom.

When you select Custom you can enter any unit as long as it contains a maximum of 12 characters. The unit can also be as a concentration, for example PPM or mg/ml-$H_2$.

Calibration can be performed against:
— a known leak flow,
or
— a known hydrogen concentration.

## Measuring Leak Flow

When measuring leak flow, calibrate the detector against a reference leak.

The reference leak should have a flow close to the chosen leak alarm limit. See also section **Selecting the reference**, page 36.

Set the Calibration Coefficient to the certified value of the reference leak. Set the Leak Rate Unit to the same unit as the Calibration Coefficient.

Example:
A reference leak is certified to 1.5 cc/min. Set **Calibration Coefficient** to 1.5 and **Leak Rate Unit** to cc/min.

## Measuring hydrogen concentration

When measuring hydrogen concentration the detector should be calibrated against a reference gas with a known concentration. The reference gas should be Hydrogen in Synthetic Air. (Hydrogen in Nitrogen can also be used, but the accuracy may be impaired.)

Set the Calibration Coefficient to the value of the known gas concentration. Set the Leak Rate Unit to the same unit as the Calibration Coefficient.

Example:
A reference gas contains 10 ppm Hydrogen in synthetic air. Set **Calibration Coefficient** to 10 and **Leak Rate Unit** to PPM.

**Note!** It is important that the unit for **Leak Rate Unit** is the same as for the used leak flow/concentration. If not — convert one of the values.

## Selecting the reference

Your reference should have a concentration or flow equal or close to what is to be measured.

Instrument specification is valid for concentrations ranging from 0.1 to 10 times the leak alarm level.

Example for reference gas:
**Leak Alarm Level** is set at 8 PPM.

A reference gas mix containing 8 ppm hydrogen in synthetic air will give best accuracy.

For greatest accuracy, reference gas should be within 50% of leak alarm level.

In this example it means 4 to 12 ppm Hydrogen.

Concentration of hydrogen should always be within 2 ppm to 400 ppm.

Example for reference leak:
**Leak Alarm Level** is set at 2.0E-4 atm.cc/s

A reference leak calibrated to 2.0E-4 cc/s will achieve the greatest degree of accuracy.

# Calibration messages

EN

Below is a list of the different messages that can be displayed during calibration.

| Message | Explanation | Remedy |
|---|---|---|
| Expose to background... | Prepare the probe for calibration by holding it in hydrogen free background. | |
| Gas detected | Gas signal is detected. | Normal operation, gas exposure can be interrupted. |
| Repeat calibration | Calibration was not within 10% of last stored value. | Wait 30 s and calibrate again. |
| Calibration OK | Calibration was within acceptable limit. | Press save to store calibration in memory. |
| No gas or unstable signal | No gas signal or no stable signal detected during calibration. | Check reference. Gas valve may be shut. Check that sensor is not clogged.<br>Background is higher than reference gas concentration Improve ventilation. |
| Sensitivity too low<br>for alarm level | Sensitivity of sensor is too low to guarantee correct response to a gas flow or concentration equal to the leak alarm level. The most likely reason is that sensor is too old. | Check reference. Gas valve may be shut. Check that sensor is not clogged.<br>Check setting of Leak Alarm Level. |
| High signal! Check reference! | Reference signal is abnormally high. | Check that reference gas mix is not replaced with tracer gas mix.<br>Check condition of reference.<br>Check that reference leak connections has no leaks. |

If calibration fails you can still use the instrument. Last valid calibration parameters will be used. You should, however, check that the instrument reacts to the reference.

# 9. Changing the probe

1. Switch off the detector

2. Disconnect the probe

3. Connect the new probe

4. Switch on the detector

5. While waiting for the instrument to stabilise, check that the green LED is flashing. Red LED indicates a fault in the cable or the hydrogen sensor inside the probe.

6. Perform calibration according to instruction on page 21 or set up as detailed on page 34, depending on whether the Analysis Mode or the Detection Mode is to be used.

7. Repeat calibration after one hour to achieve greatest accuracy.

# 10. Charging

• Instrument must not be charged inside hazardous area. Charger can cause ignition. Charge battery in safe area only!

• Do not use other chargers than the enclosed charger delivered with the **EXTRIMA**. Use of other charger may invalidate safety of instrument.

• When the battery voltage is too low, **EXTRIMA** is automatically switched off.

• **EXTRIMA** is automatically switched off and can not be started when the charger is connected.

On the main screens (Detection, Analysis and Combined Mode) a symbol in the upper right corner shows the battery charge status.

**LED indicators on charger**

- Green LED lights at mains contact
- Red LED flashes at short circuit or deep discharging
- Red LED lights during charging and is switched of at charge end

Extrima will operate for 7 hours on a fully charged battery.

It takes 8 hours to fully charge a run down battery.

One hour charging will give roughly one hour of operating time. This can be done when considered necessary, but it is important to regularly charge the battery fully.

Battery technology: 12V Litium Ion Rechargeable Cells.

# 11. Trouble-shooting

EN

The instrument contains no parts that can be repaired by the user and may only be dismantled by an authorised service technician. Opening or dismantling an instrument that is powered up can cause serious personal injury or danger to life. If repairs are carried out by a non-authorised person, the Ex-classification will not longer be valid.
If the measures described below do not result in a functioning instrument, send or hand in the instrument to an authorised service workshop for repair.

| **Fault symptom:** | **Action:** |
|---|---|
| • No sound in Detection, Analysis or Combined Mode. | • Press the + button repeatedly. |
| • No picture on display, no sound. | • Charge battery. |
| • No picture but sound when exposed to gas. | • Display setting may be wrong. Watch the display from the side at low angle and aim a lamp at the screen. Try to see the text so that you can enter the Display Settings menu and adjust contrast and brightness. If this doesn't help — send in instrument for replacement of display lamp. |
| • Red LED on charger flashes. | • See section 10. Charging. Disconnect charger and connect again. If the flashing don´t changes to fixed light within 10 min, send the instrument to authorised service workshop for repair. |
| • No signal when exposed to gas. | • Check sensor against reference leak. Change sensor if necessary. |
| **Error messages:** | |
| • Check Probe and Cable. Red LED flashes quickly. | • Check that the probe cable is properly connected to the probe and the instrument. If the fault persists, replace the probe/cable. |
| • Check Sensor. Voltage Error. | • Sensor defect or missing. |
| • Check Sensor. Temp Error. | • Sensor defect or missing. |
| • "Wait" on display. Green LED flashes slowly. | • The instrument is in a stabilization phase. Wait until "wait" disappears. |

# 12. Range and Default Settings of all Parameters



| Parameter | Range | Default |
|---|---|---|
| Contrast | 0 — 20 | 10 |
| Brightness | 0 — 19 | 19 |
| Screen Save Timeout | 0 — 60 min | 2 min |
| Sensitivity | 1 — 13 | 8 |
| Range Setting | Manual Range/Auto Range/ Dynamic Range | Manual Range |
| Direct sensitivity adjustment | ON/OFF | ON |
| Leak Alarm Indication | ON/OFF | ON |
| Lowest Frequency | 0 — 10 Hz | 1 Hz |
| Leak Alarm Level | 1.00E-37 – 1.00E+37 | 1.00E+01 = 10 |
| Leak Rate Unit | Several choices | “PPM” |
| Min Presentation Time | 1 — 120 s | 1 s |
| Leak Alarm Indications | LEDs only<br>Flashing backlight<br>Chopped audio signal<br>Backlight & Audio | Leds only |
| Language | English, German, French | English |
| Calibration Coefficient | 1.00E-37 – 1.00E+37 | 1.00E+01 = 10 |
| Calibration Time | Min Calibration Time – 30 s | 8 s |
| Min Calibration Time | 0 — 30 s | 5 s |
| Password | Max 12 characters | No password |
| Password protected calibration | ON/OFF | OFF |
| Clock | hh:mm:ss | - |
| Date | YY-MM-DD | - |
| Menu Mode | Several choices | Combined Mode |

# 13. Service Mode

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The detector is equipped with a service mode to help in trouble shooting and diagnostics.

**IMPORTANT!** The normal operator should not enter this mode.
The service mode menu option is therefore normally not shown in the menu system and most of the functions in the service mode are protected by a special password.

**IMPORTANT!** We strongly recommend that the service mode log in procedure is kept secret from all personnel not fully trained in the details of all functions of the detector.

## Logging in

Service Mode Log In Procedure

1. Switch power OFF.
2. Press the left button and hold. Then press start with the right button.

During warm up the display will show software versions and the serial numbers for the **EXTRIMA** and the Hand Probe PX57. Time and the inside temperature are also shown. All menu items, except showing the service mode display, are locked by a password.

The password can be obtained from INFICON. Simply send your request by email including the following information:

Subject: Service Mode Password
Name:
Job Title:
Name of Organisation:
Name of Division (if applicable):
Serial Number of Detector:

**e-mail:** reach.sweden@inficon.com

## Menu options

When instrument has been set to service mode there will be an extra menu item, **Service Settings**, on the display.

Choosing **Service Settings** will display the following options:

## Show Password

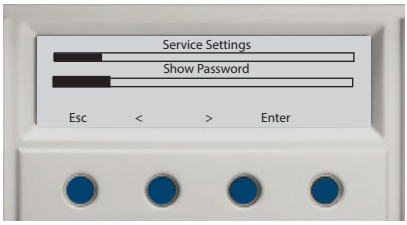
If you have "lost" your user password, you can retrieve it by choosing this menu option.

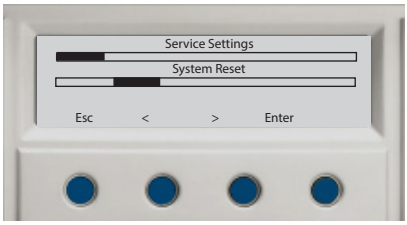
## System Reset

Choosing this option will reset all parameters to factory standard. See page 40 for factory default values.

You will be asked to confirm this choice once before system is reset.

Consider the work of resetting every parameter to suit your application before you perform a system reset.

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## Min Calibration Time

This parameter sets the lowest possible Calibration Time that can be set under the **Calibration** menu. Default is 5 s.

Min calibration time should be set to safeguard that the following two requirements are fulfilled:

1. The hydrogen from the reference leak or gas line must reach the sensor before end of calibration time.

2. The sensor must have time to reach its maximum signal before end of calibration time.

Setting Min Calibration Time too low will have the following effects:

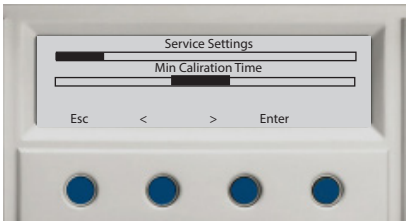
• Calibration will fail if Calibration Time is set too low.

• Calibration might pass but be incorrect.

Setting a high Min Calibration Time will have the following effects:

• Calibration takes longer time than necessary.

• Calibration gas consumption is higher than necessary.



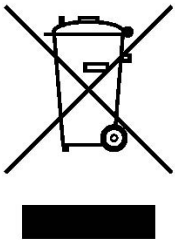

It is of course possible to set Min Calibration Time to 0 and anyway set the correct Calibration Time from under the Calibration Menu.

**IMPORTANT!** Correct calibration is an essential parameter in quality testing. We, therefore, recommend that careful consideration is paid to setting an appropriate Min Calibration Time. This will inhibit personnel, lacking detailed knowledge about calibration, from jeopardising quality by setting a to short Calibration Time.

# 14. Technical Specification



| | |
|---|---|
| **Power supply** | |
| AC Mains Voltage | 100 — 240 V 50/60 Hz |
| | |
| **Environment** | |
| Working temperature | -20°C — +50°C |
| Start up temperature | > 0°C |
| Humidity | 95% RH (non-condensing) |
| Storage temperature | 0°C — +60°C |
| Chemical | Jet-fuel and most common petroleum vapours |
| IP-Class | IP67, 30 min @1 m (IEC529) |
| | |
| **Dimension** | |
| Net Weight | 4 kg |
| Overall Dimensions | H x W x D 128 mm x 240 mm x 167 mm |
| | |
| **Application** | |
| Europe | Zone 0, 1 and 2 (mines and dust excluded) |
| US, Canada | Zone 0, 1 and 2 (mines and dust excluded)<br>US, Canada Class 1, Div 1, Groups A, B, C, D (Hydrogen, Jet-fuels, and other T3 gases) |
| | |
| **Sensitivity** | |
| Range in H2 Analysis Mode | 0.5 ppm — 0.2% H2 |
| **Sensitivity in Leak Detection** | |
| Mode with Hand Probe PX57 | 1 x 10-7 cc/s (when using 5% H2 tracer gas) |
| Repeatability | Typical ±10% of reading + 0.3 PPM |
| Linearity in H2 Analysis Mode (within 0.1 — 10 x calibration point) | Typical ±15% (within 0.5 — 100 ppm) |
| | |
| **Battery Capacity** | |
| Operating time | 7h (3h at -20°C) |
| Charging time | 7-8 h, flat to fully charged. Approx. 1h to 1h operating time |



## Disposal of product when taken out of service

According to EU legislation, this product must be recovered for separation of materials and may not be disposed of as unsorted municipal waste.

If you wish you can return this INFICON product to the manufacturer for recovery.

The manufacturer has the right to refuse taking back products that are inadequately packaged and thereby presents safety and/or health risks to the staff.

The manufacturer will not reimburse you for the shipping cost.

Shipping address:
INFICON AB
Wahlbecksgatan 25A
582 13 Linköping
Sweden

# 15. Accessories and Spare parts



**Complete Gas Injection Kit**
For easy Tracer Gas injection
Part No: 590-621

**Injection Pads**
Easy use throwaway accessories
for local injection of Tracer Gas.
Small (60 mm) x 10
Part No: 590-615
Large (150 mm) x 10
Part No: 590-616

**Injection Fix Kit**
Part No: 590-618

**Antistatic Sensor Caps** X 50
Part No: 590-270

**Water protective tape**
Part No: 591-038

**PX57-FLEX Hand Probe**
Flex. neck
Part No: 590-607

**PX57 Hand Probe**
Rigid neck
Part No: 590-606

**Sensor for PX57** Part No: 590-292

**Probe Tip Filter x 50** Part No: 591-234

**CX21 Probe cable**
3 m Part No: 590-260
5 m Part No: 590-265

**Battery charger** Part No: 591-656

**Shoulder strap** Part No: 591-687

**Reference Leaks**
Standard leaks for detector calibration and function check. For part no. see separate Data Sheet.

**Standard service EXTRIMA**
Part No: T.B.A.

INFICON AB, Box 76, SE-581 02 Linköping, Sweden
Phone: +46 (0) 13 35 59 00  Fax: +46 (0) 13 35 59 01
www.inficon.com  E-mail: reach.sweden@inficon.com

# CE Declaration of Conformity

**Manufacturer**

INFICON AB
P.O. Box 76
SE-581 02 Linköping
Sweden
Phone: +46 (0)13-355900
e-mail: reach.sweden@inficon.com

**Object of the declaration**

Extrima® Hydrogen Leak Detector (HWII) and Hand Probe PX57

**The objects of the declaration as described above are in conformity with the relevant Community Directives, namely:**

| | |
|---|---|
| ATEX | Equipment intended for use in potentially Explosive Atmospheres ( 2014/34/EU) |
| EMC | Electromagnetic Compatibility (2014/30/EU). |
| RoHS | Restriction of the use of certain Hazardous Substances in electronic equipment (2011/65/EU). |
| LVD | Electrical safety - Low Voltage (2014/35/EU) *. |

* Relevant only for battery charger (CE marked). Separate declaration provided on request

**Harmonized European standards which have been applied**

| Standard | Edition | Comment |
|---|---|---|
| EN 60079-0 | 2018 | Electrical apparatus for explosive gas atmospheres - Part 0: General requirements. |
| EN 60079-11 | 2012 | Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i". |
| EN 61000-6-1 | 2 | Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments. |
| EN 61000-6-3 | 2 | Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments. |
| EN80079-34 | 2020 | Application of Quality system for Ex Equipment Manufacturing. |

**Other standards which have been applied**

| | | |
|---|---|---|
| SS-EN 50581 | 2012 | Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances |

**Test institutes / notified bodies**

**EMC**
BK Services AB
Gotthardgatan 8
582 13 Linköping Sweden
Phone: +46 (0)13 21 26 50

**ATEX quality assurance**
RISE Research Institutes of Sweden
Box 857
50115 Borås, Sweden
Phone: +46 (0) 10 516 50 00
Notified body number 0402

**ATEX product certificate**
CSA Group Netherlands B.V.
Utrechseweg 310, 6812 AR, Arnhem,
Netherlands
Phone: +44 (0) 1244 670900
Notified body number 2813

**Report and Certificate reference numbers**

| No. | Issue | Subject |
|---|---|---|
| Sira 07ATEX2117X | 8 | EC type-examination certificate |
| TR_ADI070827EMC001 | - | EMC Test Report Extrima |
| SP07ATEX4125 | - | Production Quality Assurance Notification |

For INFICON AB, March 22, 2024

Fredrik Enquist, Development Manager

# UKCA Declaration of Conformity

**Manufacturer**

INFICON AB
P.O. Box 76
SE-581 02 Linköping
Sweden
Phone: +46 (0)13-355900
e-mail: reach.sweden@inficon.com

**Object of the declaration**

Extrima® Hydrogen Leak Detector (HWII) and Hand Probe PX57

**I declare that the objects of this declaration as described above are in conformity with the relevant UK legislation, namely:**

Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016.
Electromagnetic Compatibility Regulations 2016.
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012.
Electrical Equipment (Safety) Regulations 2016. *

* Relevant only for battery charger. Separate declaration provided on request

**Harmonized European standards which have been applied**

| Standard | Edition | Comment |
|---|---|---|
| EN 60079-0 | 2018 | Electrical apparatus for explosive gas atmospheres - Part 0: General requirements. |
| EN 60079-11 | 2012 | Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i". |
| EN 61000-6-1 | 2 | Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments. |
| EN 61000-6-3 | 2 | Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments. |
| EN80079-34 | 2020 | Application of Quality system for Ex Equipment Manufacturing. |

**Other standards which have been applied**

| | | |
|---|---|---|
| EN 50581 | 2012 | Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances |

**Test institutes / approved bodies**

**EMC**
BK Services AB
Gotthardgatan 8
582 13 Linköping
Sweden
Phone: +46 (0)13 21 26 50

**UKEX quality assurance**
SGS Baseefa Limited
Rockhead Business Park, Staden Lane
Buxton, Derbyshire. SK17 9RZ , UK
Phone: +44 (0) 1298 766600
Approved body number 1180

**UKEX product certificate**
CSA Group Testing UK Ltd
Unit 6 Hawarden Industrial Park
Hawarden, CH5 3US, UK.
Phone: +44 (0) 1244 670900
Approved body number 0518

**Report and Certificate reference numbers**

| No. | Issue | Subject |
|---|---|---|
| CSAE 21UKEX2586X | 0 | UK Type Examination Certificate |
| TR_ADI070827EMC001 | - | EMC Test Report Extrima |
| BASUKQAN7324 | - | UK Quality Assurance Notification |

For INFICON AB, March 22, 2024

Fredrik Enquist, Development Manager