

**Operating Instructions**  
**- Gas Analysis System -**  
**SAFE EthanTest**  
**(EN)**

[version 04/2022] [item no. 487002]



**Success for your business with quality products**

from **Esders** 

We thank you for choosing an *ESDERS GmbH* product.

You are always assured an outstanding, thoroughly tested device with products from our comprehensive range. Our devices comply with laws and regulations applicable in Germany and thus guarantee an extremely high standard of safety.

We also offer an annual service for all our devices.

These operating instructions will help you to start using the device quickly and effectively. Take a few minutes to read them through, so you can operate the device safely and are able to use all the functions.

You can contact our expert team at any time with any queries or suggestions you may have.

Best regards



***Esders GmbH***

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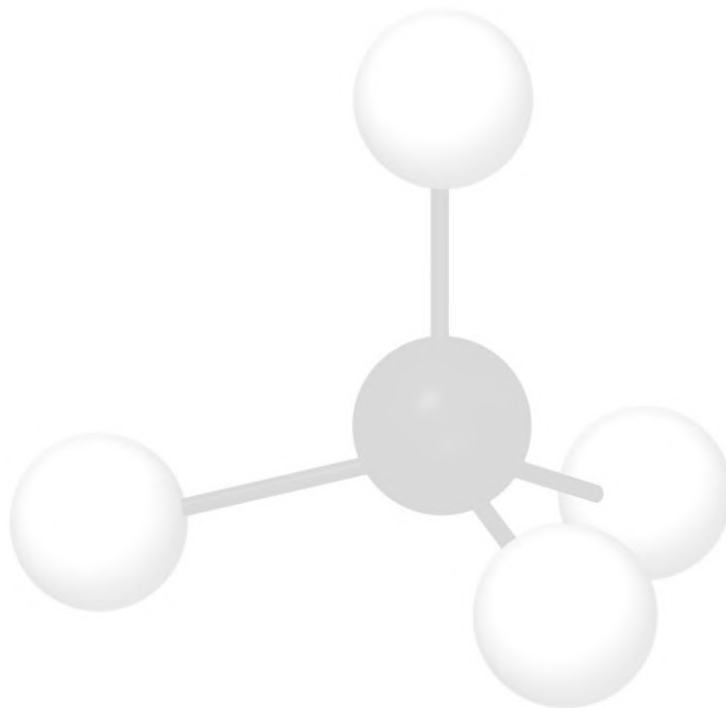
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**SAFE**





[ METHANE-MOLEKULE: CH<sub>4</sub> ]

## **1. SAFETY INSTRUCTIONS AND WARNINGS**

### **1.1. SAFETY ASPECTS**

To ensure maximum safety and prevent malfunction, you must follow the

**OPERATING INSTRUCTIONS CAREFULLY**

Using this device requires thorough knowledge of these operating instructions, which must be strictly adhered to.

References made to laws, directives and standards are based on the German legal system.

- The **SAFE EthanTest** must only be used for the purpose described here.
- Note this device can only be used within an ambient temperature range of -10°C to +45°C.
- Ensure the room is adequately ventilated when using a test gas to set the device.
- Ensure you keep within the specified measurement range limits.

### **1.2. MAINTENANCE**

Repair work on the device must only be carried out by **Esders GmbH's** authorised service. Only original Esders replacement parts must be used.

According to DIN 31051:

*Maintenance* = Servicing, inspection, repairs

*Servicing* = measures taken to retain a specified state

*Inspection* = measures taken to ascertain and evaluate the actual state

*Repairs* = measures taken to restore to the specified state

### **1.3. LIABILITY FOR USE OR DAMAGES**

Liability for function and use of the device is transferred to the owner or operator if the device has been serviced or repaired incorrectly by persons who are not part of Esders GmbH's authorised maintenance service. This also applies if the device is not used in the intended way.

## 1.4. SYMBOLS



### Information

This symbol indicates additional useful information and tips for use.



### Warning / Danger

This symbol indicates potential hazards or special circumstances which must be taken into consideration.

## 1.5. FIELD OF APPLICATION

The **Safe EthanTest** is designed for the reliable distinction of natural gas and biogas (marsh gas / fermentation gas). Natural gas contains methane and also, among other things, always a certain percentage of ethane (typical values are 0.3 to 8.0 vol.%). This gas is not contained in biogas.



Therefore, the distinction is based on the detection of ethane ( $C_2H_6$ ) in the gas. The concentration of ethane contained in natural gas also determines the minimum concentration of natural gas, whereby a reliable analysis can be performed. The higher the concentration of ethane, the smaller may be the natural gas concentration at which an analysis is still possible. If in doubt, only a comparative measurement with the distributed natural gas can provide information!

During a measurement with the **Safe EthanTest**, the concentration of both gases is measured and displayed. It is no additional gas measurement device or carrier gas (synthetic air) necessary. Through the integrated suction pump, the gas sample can be sucked directly over the corresponding probe from the sample hole.



The measurement result is a clear statement about whether it is pure biogas or natural gas. If the gas sample contains only methane, it can be ruled out a leak in the gas supply. But if ethane is also measured in the gas sample, this is a clear indicator of natural gas. So there is a leak in the gas supply.

Use the **Safe EthanTest** only with the associated suction hose and the appropriate probe, to avoid incorrect measurements. The flushing and suction time of the measurement instruments are adapted for these accessories!



The device is placed in a water-resistant case.

To ensure the protection IP 68, the following must be noted:

- The lid must be locked securely over both closing flaps.
- Sealing ring, tongue and groove of the lid and the box should be carefully checked for signs of damage.



**For damages which occur through non-observance with the above information, the company Esders GmbH is not liable. Warranty and liability conditions of Esders GmbH will not be enhanced by preceding instructions.**

### **Address:**

#### **Esders GmbH**

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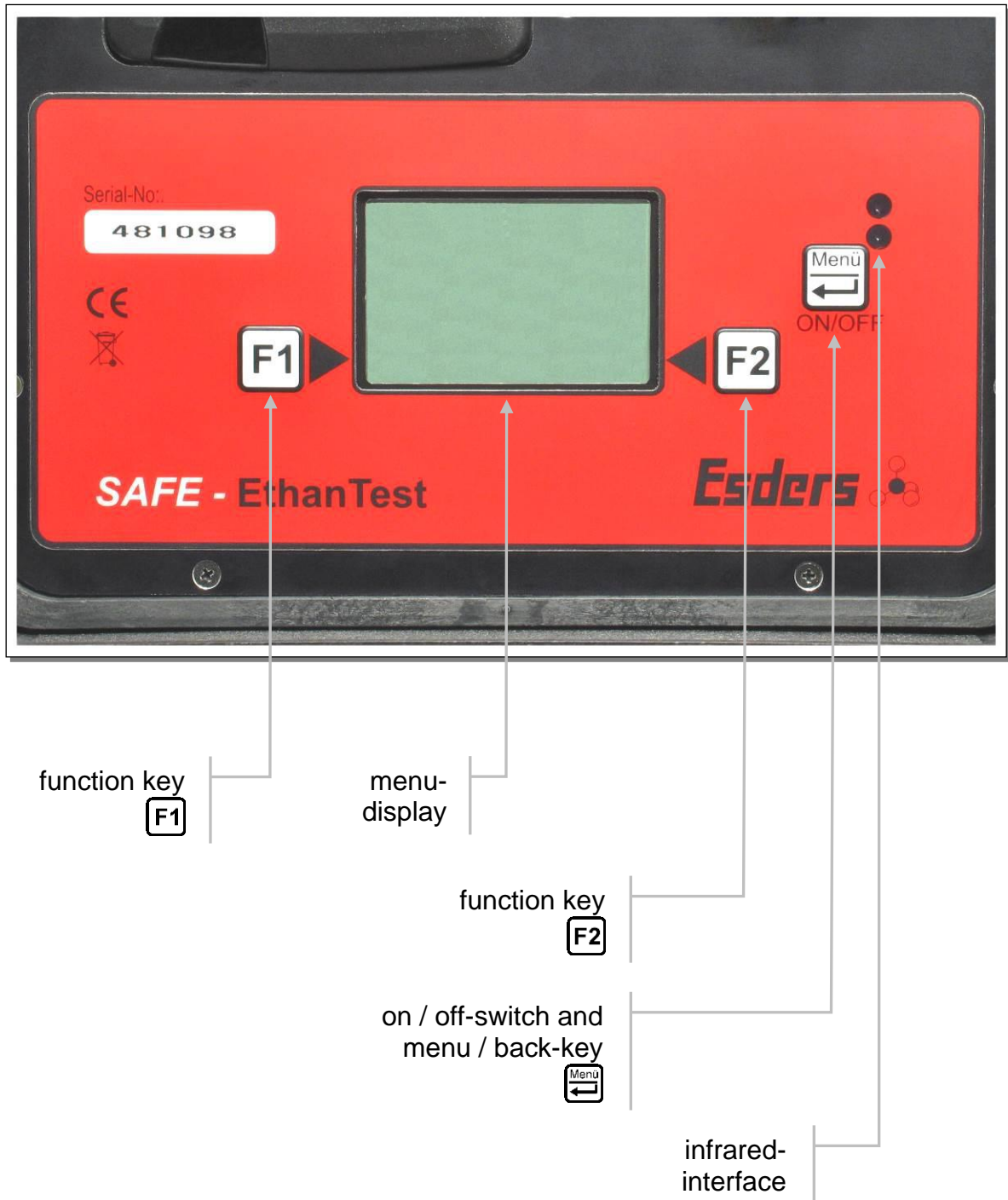
[www.esders.de](http://www.esders.de)  
[info@esders.de](mailto:info@esders.de)

## 2. ILLUSTRATION OF THE SAFE ETHANTEST

### 2.1. TOTAL VIEW



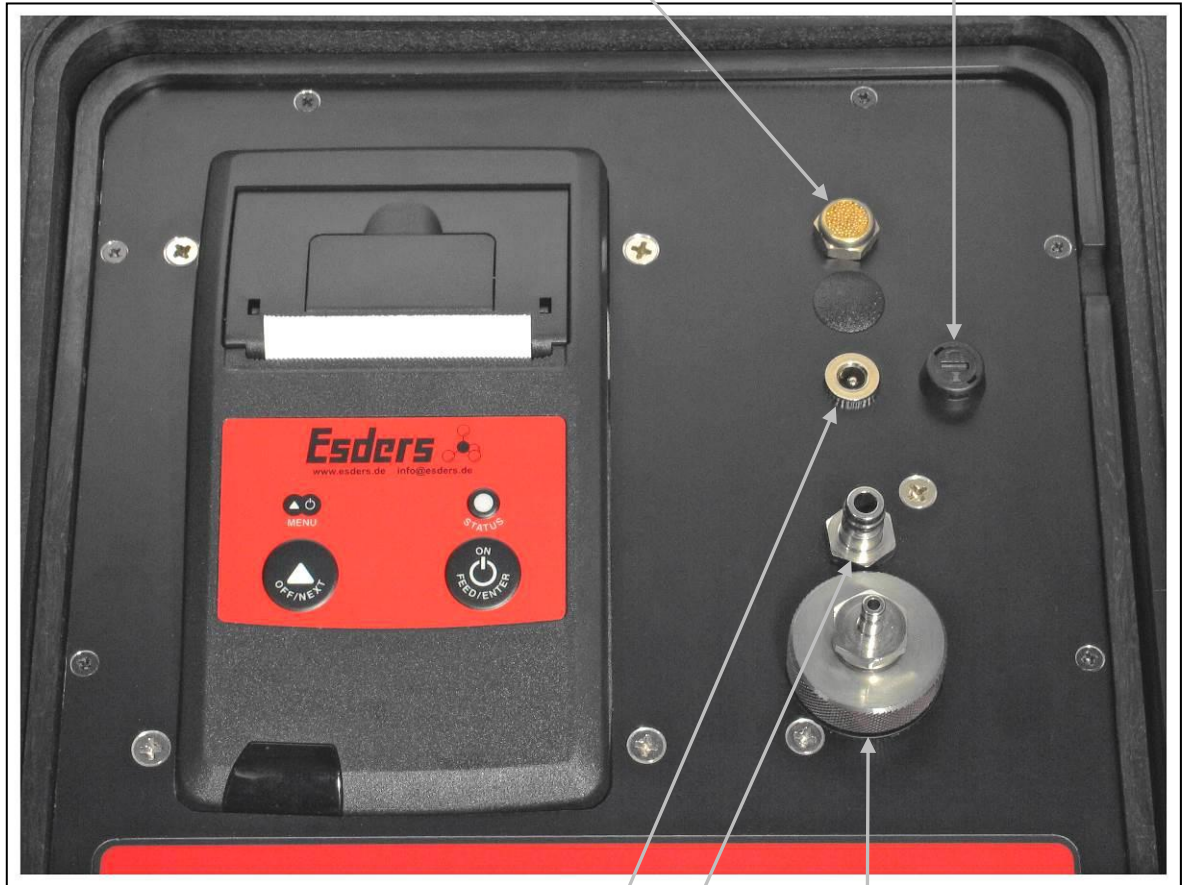
## 2.2. CONTROL PANEL



### 2.3. CONNECTIONS

suction hole for fresh air, with sintered filter

fuse holder for device fuse, 2A slow





charging socket 12V DC


connection socket for exhaust gas hose

gas connection for probe tube, with filter element

### **3. OPERATION OF THE SAFE ETHANTEST**


The operation of the **Safe EthanTest** is performed on the three keys **F1**, **F2** and . This low number of keys is achieved through the use of variable-assigned function keys. The functions are always adapted to the currently selected menu item. The function of the keys **F1** and **F2** is indicated in the bottom row of the display. This allows, for example, the selection of a submenu, out of the main menu. You can enter the submenu itself by pressing the  key. It serves among the selection also the confirmation of a command or the return into the previous menu.

#### **3.1. SWITCH ON / OFF**

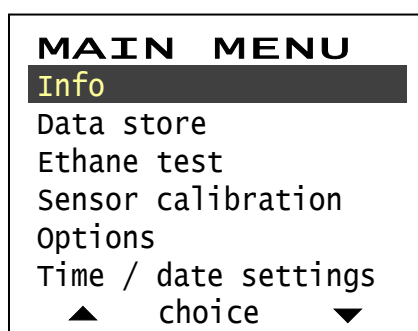
The device is turned on or off by pressing the  button.

Once the device has been switched on, a message indicating the next recommended date of servicing will briefly appear. The servicing is performed by Esders GmbH or other authorised organisation.


The separation column in the device is now warming up.

The **Safe EthanTest** can only be turned off from the main menu. Therefore the  key must be pressed about 3 seconds.

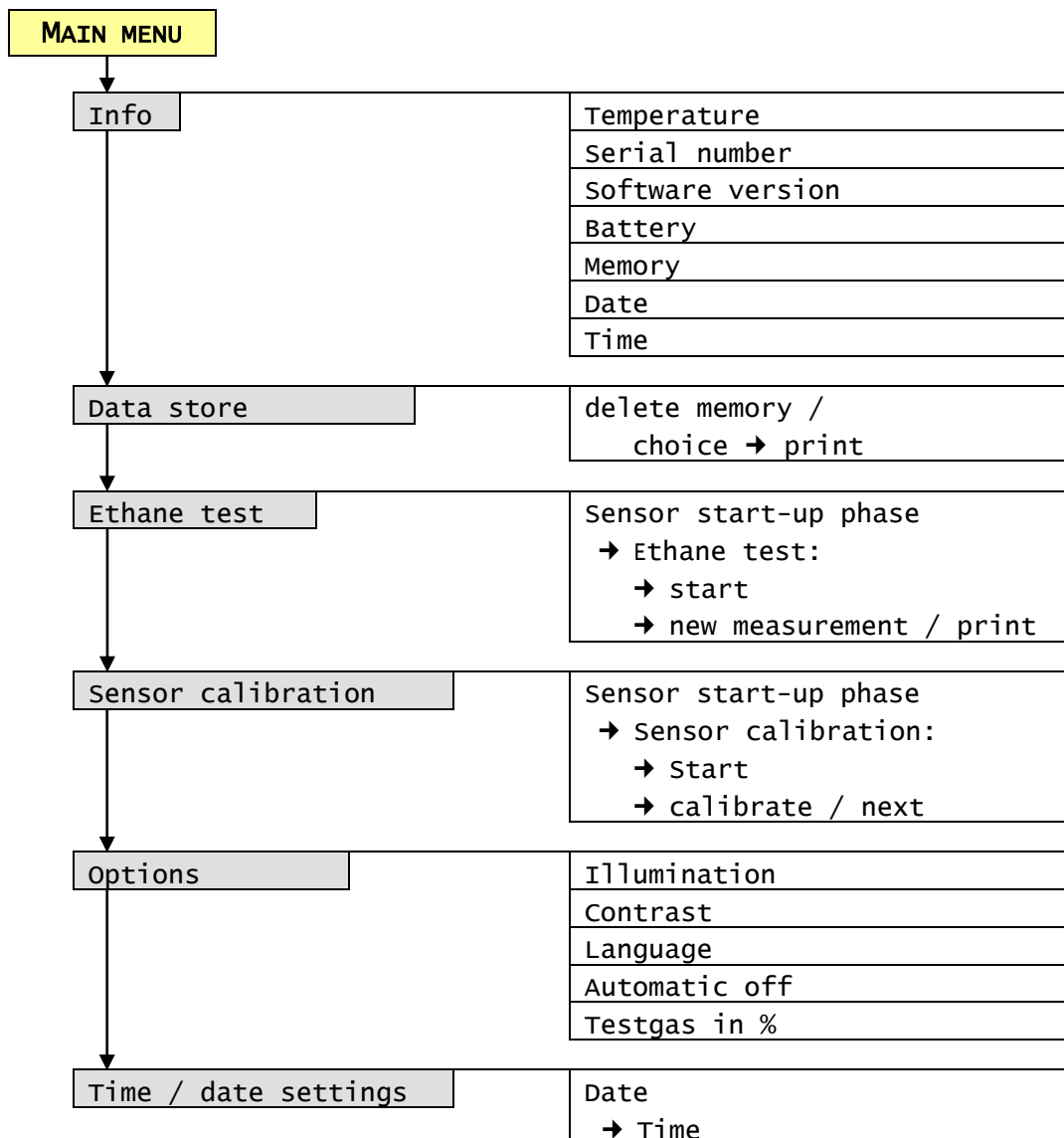
#### **3.2. MAIN MENU**



The individual menu items can be selected from the main menu. Select the menu item you require using the keys **F1** (▲) und **F2** (▼) to scroll up and down. The actual menu item currently selected is highlighted.

Use the  key to access the appropriate menu

### 3.3. MENU STRUCTURE




### 3.4. MENU – INFO

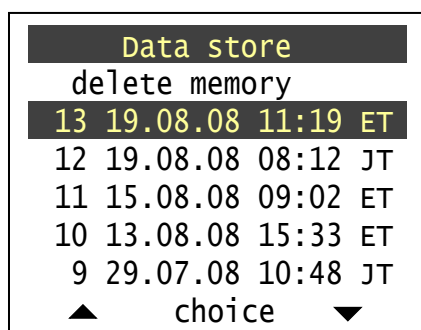
Info	
Temperat.:	40.6 °C
Serial no:	481086
SW-vers. :	48010906
Battery :	100.0%
Memory :	99.8%
Date :	19.08.08
Time :	15:00:00

In the „info-menu“ the following device informations will be displayed:

- Temperatur of the separation column,
- Serial number of the device,
- Software-version,
- Accu capacity,
- Free storage capacity,
- Date and
- Time of the device.

Use the  key to return to the main menu.


### 3.5. MENU – DATA STORE



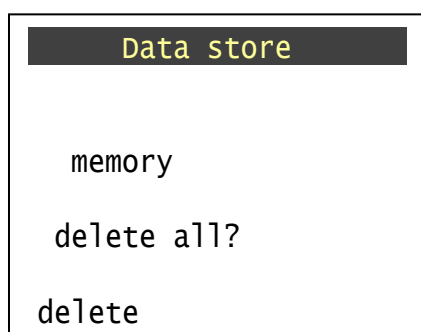
This menu can be used to display stored measurement readings and subsequently print them out.

The saved measurement readings are displayed chronologically by date and time, with the most recent reading being marked first. Each measurement is provided additionally with a serial number and an abbreviation for the type of measurement:

- ET = Ethane test
- JT = Sensor calibration (not printable)

The selection is made, as in the main menu by pressing . The measurement can then be printed out any number of times.


Use the  key to return to the main menu.



By selecting „delete memory“ the whole memory and therefore all measurements will be deleted.

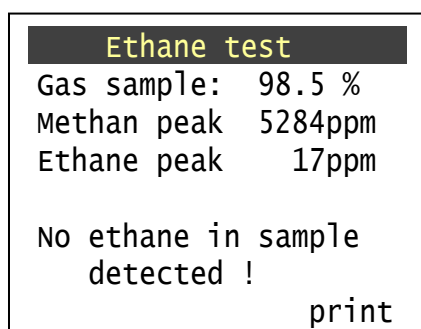
#### Attention!

It is **not** possible to delete messages individually.


This process can also be aborted by pressing .


Thereby you return to the main menu.

After selecting the desired measurement, for example the following screen for an ethane test, will appear:



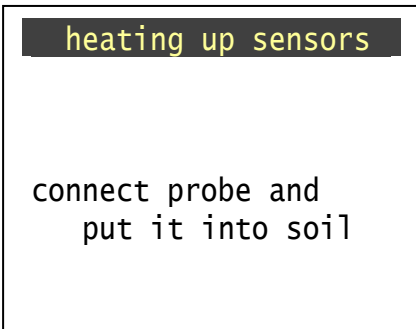
The values of the selected measurements are presented in the display.

The measurement can be printed out by pressing . For this purpose the printer must be turned on first with the key „ON (FEED / ENTER)“.

If the printer is still switched off you'll see „Printer not ready“ in the display. After turning on the printer, the measurement can be re-printed by pressing the key  (print).

Use the  key to return to the main menu.

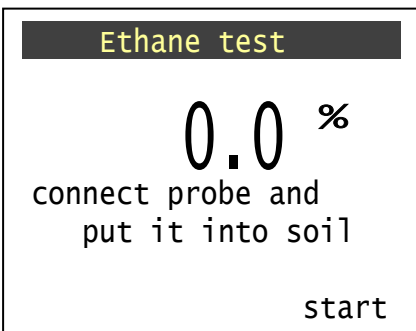
### 3.6. MENU – ETHANE TEST



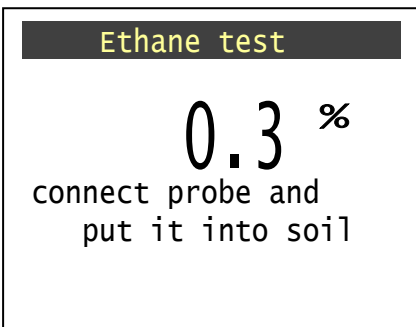
1. First, the menu item “Ethane Test” is selected. It starts the sensor start-up phase of the device.
2. Connect the measurement hose and the exhaust hose to the Safe EthanTest and put the probe into the soil.

exhaust gas hose for the disposal of "used" gas from the aspirated fresh air

gas connector fitting: at the other end of the tube the probe is attached



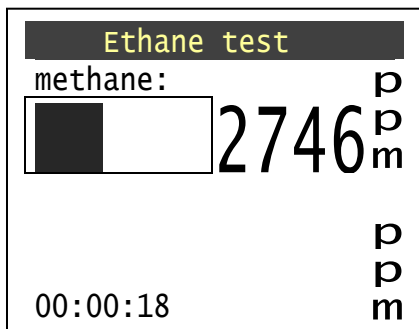
3. After the sensor start-up phase (about 30 sec) the device automatically switches to the “Ethane test” display. If the separation column has not yet reached its operating temperature, this phase can take longer.
4. The measurement starts by pressing the **F2** (start) key.



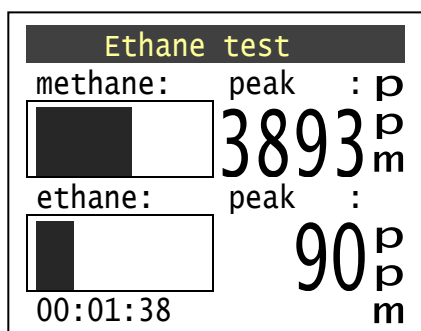
5. The current gas concentration in the sample is measured and displayed here. This determined the amount of gas, which is required for the measurement.

The user can exit the test up to this point by pressing the **Menu** key.





6. After the gas has sucked in the methane concentration is measured and shown in ppm (parts per million) on the display.

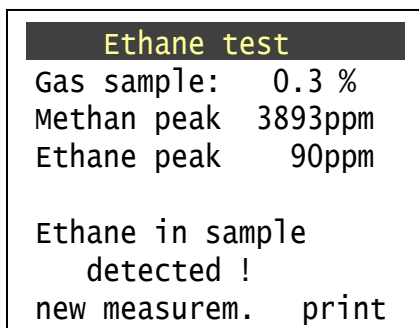


7. After about 50 seconds the measurement of the ethane concentration begins.

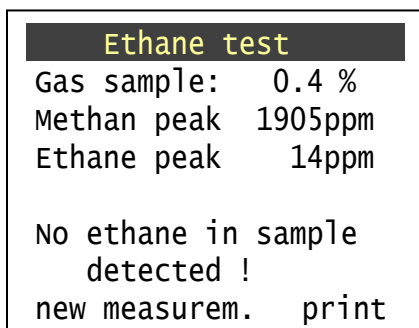
8. The respective maximum (methane peak and/or ethane peak) of the measurement is stored and displayed.

9. After one minute and 40 seconds the measurement is completed and the result will be displayed on the screen.

This can lead to the following results:



- "Ethane in sample detected !"  
 ⇒ Methane and ethane were detected in the sample. It is therefore natural gas!



- "No ethane in sample detected !"  
 ⇒ It was no ethane detected. This sample is therefore biogas!  
 ⇒ A small display of Ethane is still possible. This is due to the drift of the sensor.  
 ⇒ To evaluate therefore the ratio of ethane to methane is additionally used.

**Ethane test**

Gas sample: 0.3 %  
Methan peak 0ppm  
Ethane peak 0ppm

too small methane  
peak no results!  
new measurem. print

- "too small methane peak – no results !"
  - ⇒ The methane peak was too small. It must be drawn in a higher concentration of gas in order to ensure a reliable analysis.

10. A new measurement can be started with the **F1** (new measurement) key.

The results can be printed out by pressing the **F2** (print) key. The printer must be activated first by pressing the "ON (FEED / ENTER)" key.  
(see also section 5 "Printer")

11. The measurement result is always stored in the data memory and can be shown again later.

The return to the main menu can be done by pressing the **Menu** key.

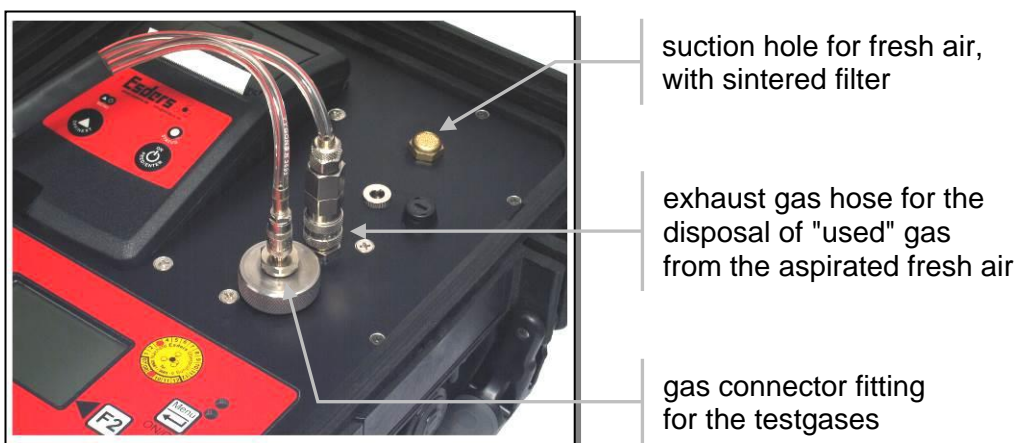
### 3.7. MENU – SENSOR CALIBRATION



The "Sensor calibration" menu item can be used to test or adjust the device. To check the sensitivity and to adjust the *semiconductor sensor*, a special testgas with 1 vol.-% methane and 50 ppm ethane in synthetic air is used.

The *thermal conductivity sensor* for measuring concentrations in a range of 0 to 100 Vol.-% can be adjusted with a different testgas. The concentration of this testgas can be chosen in the menu item "Testgas in %" in the "Options" menu and is between 85% and 100% methane.

For the adjustment of the sensors, the following two connectors of the **SAFE EthanTest** will be used, as shown in the figure below.



**heating up sensors**

Connect 1% methane with 50 ppm ethane

1. Choose the menu item „Sensor calibration“.
2. During the sensor start-up phase (about 60-120 sec) the test gas, containing 1 vol.% methane and 50 ppm ethane, can be connected via the gas connector fitting.
3. The exhaust gas hose is connected to the exhaust gas connector.

**Sensor calibration**

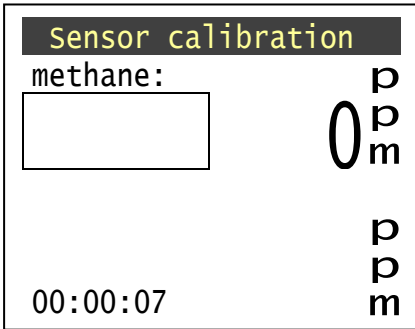
0.0 %

Connect 1% methane with 50 ppm ethane

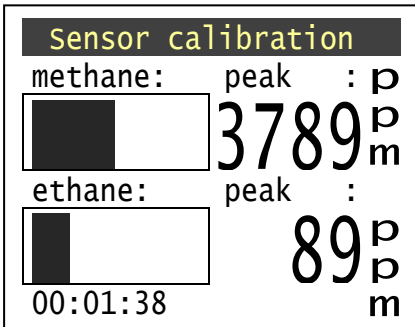
start

4. The test of the semiconductor sensor starts by pressing the **F2** key (start). The gas concentration is displayed on the screen.

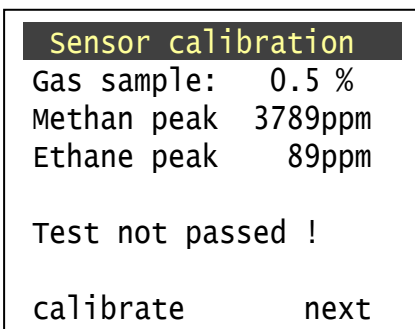
The user can exit the test up to this point by pressing the **Menu** key.



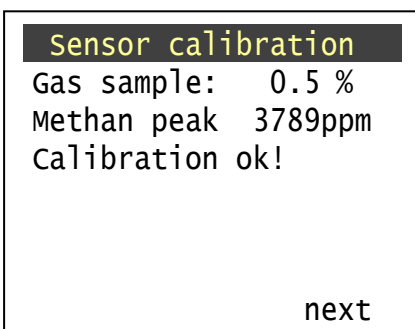
5. First, the methane flows through the separation column and the methane concentration is displayed.
6. Then after about 50 seconds the ethane concentration is measured and displayed.



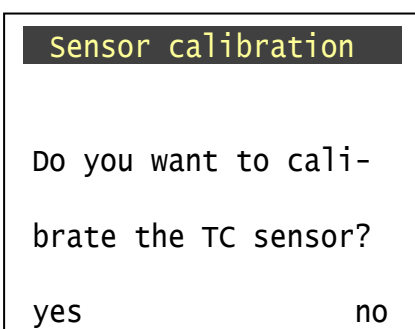
7. After about one minute and 40 seconds the measurement is completed. The respective maximum of methane and ethane is measured in ppm (parts per million).
  - > It will not be displayed fully test gas concentration, as only one part of the gas is used and pumped through the separation column.



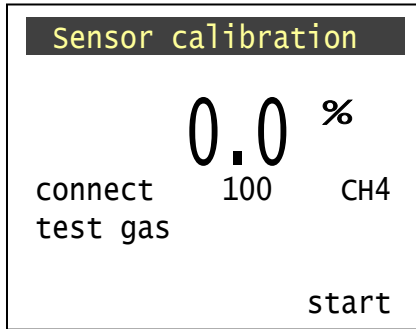
8. Then follows an overview of the concentration of the gas sample, the methane peak and ethane peak. And then the information whether the test passed or not is displayed on the screen.
9. If the test is not passed, you can repeat the test after pressing the **F2** key (next).



10. Or you can readjust the device with the key **F1** (calibrate). The message "Calibration ok!" then appears on the screen.
11. By pressing the **F2** (next) key the thermal conductivity sensor can then be tested. You get even in the subsequent menu, if you have passed the test and presses the "next" key.

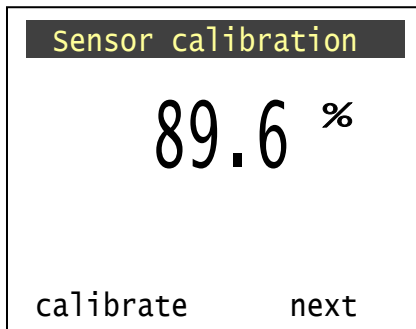


12. You can start the test of the thermal conductivity sensor by pressing the **F1** (yes) key.
  - If you want to cancel the test you can do this by pressing the **F2** (no) key.

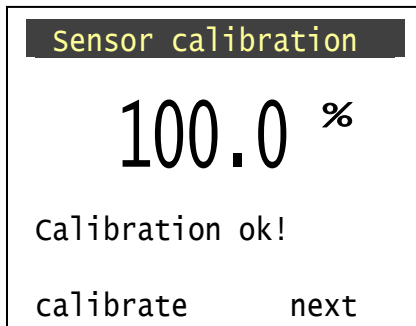


13. Test gas with a concentration between 85% and 100% methane (is specified in the "Settings" menu) can now be connected.

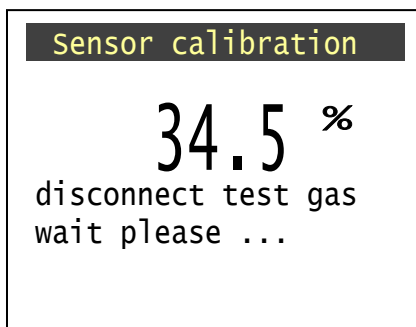
14. The measurement starts with the **[F2]** (start) key.



15. The concentration of the test gas is measured and displayed on the screen. The thermal conductivity sensor can be readjusted with the **[F1]** (calibrate) key, if the maximum is reached.



16. The successful adjustment will now be illustrated by the display „Calibration ok!“.



17. The test gas can now be removed. The device is still flushed once, and the indicated concentration drops to zero.

### 3.8. MENU – OPTIONS

Options	
Illumination:	30sec
Contrast :	10
Language :	english
Autom. off :	15min
Testgas in %:	100
change	choice ▼

The options menu enables the user to make various adjustments to the device. With the **F2** key (choice) the setting can be selected and with the **F1** key (change) the settings value can be changed.

The following 5 items can be changed in all:

#### 3.8.1. ILLUMINATION

- ⇒ off: Backlight remains off
- ⇒ on: Backlight is permanently on
- ⇒ Time specification: The light will automatically switch off after the specified period of inactivity.

The following times can be set:

5sec, 10sec, 30sec, 1min, 5min, 10min, 30min, 60min

#### 3.8.2. CONTRAST

This menu item can be used to adjust contrast on the screen. Use the **F1** key (change) to set contrast to the required level between 0-50 (5-steps).

#### 3.8.3. LANGUAGE

Other languages can be selected here in addition to the standard language of English, provided they have been implemented.

#### 3.8.4. AUTOMATIC OFF


Automatic device switch-off setting for when user is inactive.

- ⇒ no: The device will not switch off automatically.
- ⇒ 15min / 30min:

The device will switch off after the pre-set period of time if it is not being used.



### 3.8.5. TESTGAS IN %


The methane concentration of the test gas can be entered within the limits of 85 vol.-% to 100 vol.-%. The setting made here is considered in the adjustment of the thermal conductivity sensor, and therefore affects the accuracy of the device.

Use the  key to return to the main menu.

## 3.9. MENU – TIME / DATE SETTINGS

```
Time / date settings
Date      : 19.08.08
           ^
Time      : 16:10:11
+         position>
```

The device date and time can be set or changed in the “Time / date settings” menu. Press the  key (+) to increase the digit currently marked by a ‘^’. Use the  key (position>) to skip to the next digit.

Use the  key to return to the main menu.

## 4. USE OF THE SAFE ETHANTEST



With the **Safe EthanTest** can be determined whether ethane is contained in a gas sample. If this is the case, it's leaking natural gas. When only methane is found in the sample, it is biogas (fermentation gas).

### 4.1. PREPARATORY WORK


All work on pipes and tanks should only be performed taking into account the technical rules and by qualified personnel. Before using the **Safe EthanTest** the filter, the hose connections and the probe should be checked out for contamination or damage. If the gas sample is taken from a probe hole, it must be ensured that no water can be sucked in.




The **Safe EthanTest** should be used only with the associated suction hose and the corresponding probe. The flushing and suction time of the measurement instruments are adapted for these accessories!

### 4.2. ETHANE TEST

The main focus of the development was put on a safe analysis and a completely unproblematic use. The user doesn't need to mix a sample to a specific concentration or evaluate the test results. Also, the measurement uncertainty at low operating temperatures could be eliminated by heating and temperature control of the separation column.

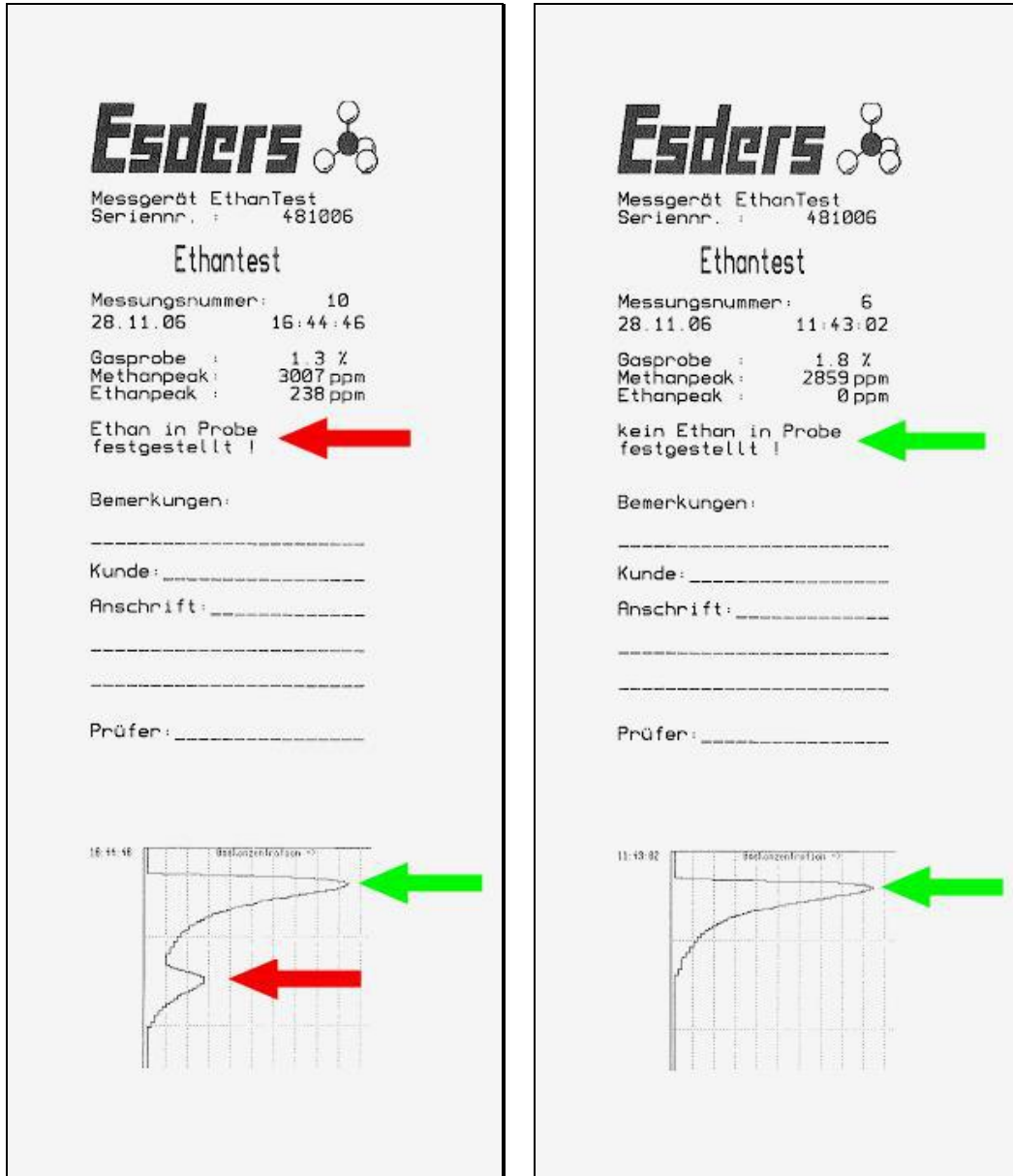
Operation plan for conducting a Ethane Test		
1.	Switch on the <b>Safe EthanTest</b> . (The separation column will be tepered and the system will be flowed).	
2.	Check device filter, probe and connecting hose for damage and contamination and replace if necessary.	
3.	<p>Connect the connecting hose to device and probe and insert probe into the probe hole.</p>  <p><u>Exhaust hole:</u> The aspirated test gas is diverted away from the fresh air port via an open hose.</p> <p><u>Gas connection:</u> The measurement probe is connected at the other end of the hose.</p>	



4.	The analysis can be started as soon as the separation column has reached its operating temperature.	<b>F2</b>
5.	The <b>Safe EthanTest</b> sucks in the gas sample and displays the concentration in vol. Depending on the gas concentration, a corresponding volume of gas is used for the analysis.	
6.	The gas sample passes through the separation column and the methane and if exists the ethane concentration will be displayed in ppm (parts per million).	
7.	<p>The result shows, in addition to the measured gas concentrations, if ethane is present in the sample or not. It can happen that in spite of a small display of ethane, no ethane is included in the sample.</p> <div data-bbox="587 855 1054 1169" style="border: 2px solid red; padding: 5px; margin: 10px auto; width: fit-content;">  <pre style="font-family: monospace; color: blue; margin: 0;"> Ethantest Gasprobe : 0.4 % Methanpeak: 3905ppm Ethanpeak : 14ppm  kein Ethan in Probe festgestellt ! neue Messung drucken                     </pre> </div> <p>This small display is due to the drift of the sensor, e.g. by moisture. The assessment is therefore determined also by the ratio of ethane to methane.</p>	
8.	The result log can be printed out too. In addition, the measurement will be stored in the memory and can be displayed as needed via the menu „data store“.	<b>F2</b>

### 4.3. APPRAISAL OF THE MEASUREMENT

As an printout you will normally receive one of these results:



A typical measurement of a sample containing natural gas (with ethane peak) is on the left side, and a measurement of a sample containing biogas (without ethane peak) is shown on the right side.



The gas sample is pressed with ambient air through the chromatographic separation column. For the passage through the column the different gases (methane: CH<sub>4</sub> / ethane: C<sub>2</sub>H<sub>6</sub>) require different lengths of time. This can be recognized at the various peaks.



If more than two peaks occur at the measurement, this indicates that the intake of ambient air is also loaded with gas. If gas is pressed with the intake ambient air into the gas chromatographic column again and again, an analysis is not possible!

In this case, the **Safe EthanTest** should be lifted or placed in an unpolluted environment (fresh air) during the analysis. With unpolluted ambient air, one peak with biogas and two peaks with natural gas are measured.

To increase the reliability of the device is not only the ethane content (if measured), but also assessed the ratio of the two gas concentrations (ethane to methane). Therefore, the readout „*no ethane in sample detected !*“ could be displayed even at low ethane concentration.

The following results are possible:

display readout	explanation
„too small methane peak – no results !“	The gas concentration of the aspirated sample is very small. A measurement is not possible.
„Ethane in sample detected !“	The device could measure <u>two</u> peaks and the concentration of ethane has met the minimum requirement for a positive appraisal.
„No ethane in sample detected !“	The device could measure only <u>one</u> peak or the concentration of ethane did not meet the minimum requirement for a positive appraisal.

The gas concentrations need for an analysis is highly dependent on the proportion of ethane in the natural gas. The higher the proportion of ethane, the lower can be the gas concentration for an analysis.



The gas concentration of the aspirated sample is measured with a *thermal conductivity sensor* and displayed on the screen. Is the measured concentration below 0.2% by volume the indication „gas concentration too low for analysis“ appears. The analysis is still performed. If the analysis with the much more sensitive semiconductor sensor results a too small concentration of methane, too, this is indicated via the display „too small methane peak – no results !“



In the assessment of gases in the soil, it must also be assumed that there is, in rare cases, both natural gas and biogas in an area. Therefore, it is recommended to analyze gas samples from two different places.

#### 4.4. **SENSOR CALIBRATION**

The two sensors used in the **Safe EthanTest** should be regularly checked for their sensitivity and accuracy.

To set the device to the desired value calibrate it by using the menu „Sensor calibration“ according to the instructions in section 3.7.

The sensitivity checks and the adjustment of the sensors should be documented.

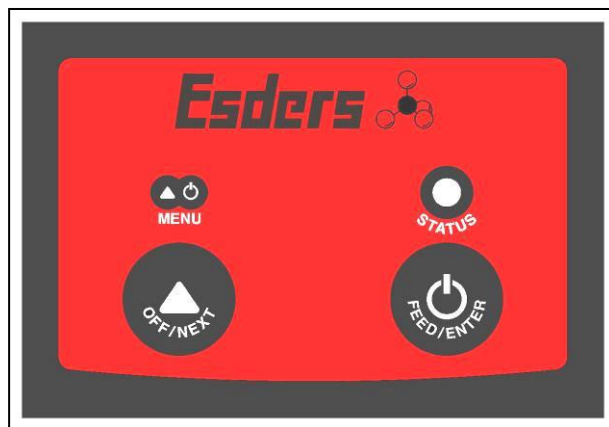
## **5. PRINTER**

the integrated printer of the **Safe EthanTest** is a thermal printer with 58 mm wide roll paper.



The print head needs to be protected from dust and dirt particles to prevent damage. Although the SAFE EthanTest is designed, from the housing and equipment, for the construction operation, it is necessary to ensure that no dirt gets into the paper output slot.

### **5.1. HANDLING**



(Printer control panel)

The printer is operated with two buttons:

"ON (FEED / ENTER)": The printer is supplied with power by the electronics of the SAFE-ethane test. Press the "ON" button briefly to turn on the printer. When operable, the printer status LED blinks green. If no paper is present, the status LED flashes red.

The printer turns itself off automatically after a few minutes.

If the printer is already on, this button (FEED) is also for paper feeding.

"OFF / NEXT": This button must be pressed for about 3 seconds to turn off the printer.

## 5.2. INSERTING THE THERMAL PAPER

The printout of the measurements is performed on a *thermal paper for printer* (Item No. 265082) with 58 mm width and an outer diameter of about 31 mm.

Inserting and replacing of the paper is performed as follows:

- First, lift the small opener on top of the printer.
- The lid will disengage and spring open a little.
- Open the paper tray lid as far back as it will go.
- Insert the roll of paper as shown in the diagram.
- The glossier side must face forwards.
- Then pull the paper slightly forward, so a piece sticks out and close the lid again.
- The lid will click back into place.
- The paper can now be neatly torn off along the serrated edge.



## 5.3. PRINTING PROTOCOLS

- ⇒ The printer must be switched on by pressing the "ON" button. The status light will flash green.
- ⇒ Now the printing process can be started from the menu by pressing the button **F2**.
- ⇒ A printout can also be done via the menu «*data store*». Here, the desired measurement is first selected and then printed out by pressing **F2**.
- ⇒ The status line shows «*printing*» and the printout starts.
- ⇒ If the printing has completed successfully the device shows «*printout complete*» an.

## **6. BATTERY**

The **Safe EthanTest** is powered by an internal lead acid battery. This battery type has no so-called memory effect who decreases the performance over time.

To charge the device, an internal battery charger is used. It enables the unproblematic charging of the batteries out of every operating condition. The battery is then loaded from the current capacity on its 100% capacity. For this purpose, the 230 V / 12 V power supply, or alternatively the 12 V car adapter by Esders GmbH will be connected to the charging socket of the device (see accessories).



The maximum charge time for an unloaded device is approximately 16 hours. Even after this time, the device can remain connected even further on the charging dock, since the charging electronics prevents overcharging and automatically switches to conservation charging.

The device can also be used during charging. This allows a continuous operation!



### **Warning!**

The device should never be discharged too deeply. Thus the battery can be destroyed. The device also consumes a small amount of power when switched off (real time clock). Without voltage the clock does not work anymore must be reset in the settings (or with the PC).

When the device is not used for some time, the battery should still be recharged regularly (~ every 30 days).



Depending on use the capacity of the battery may decrease after about 2 to 3 years. The replacement of a battery with too low capacity can be made by the Esders GmbH. Appropriately, this should be done within the annual service.

## **7. MAINTENANCE AND REPAIR**

The **Safe EthanTest** is a very low-maintenance, safe measurement device. With the sensors used for measuring gas and temperature, it can occur influence of the accuracy through long-term drifts or mechanical stress.



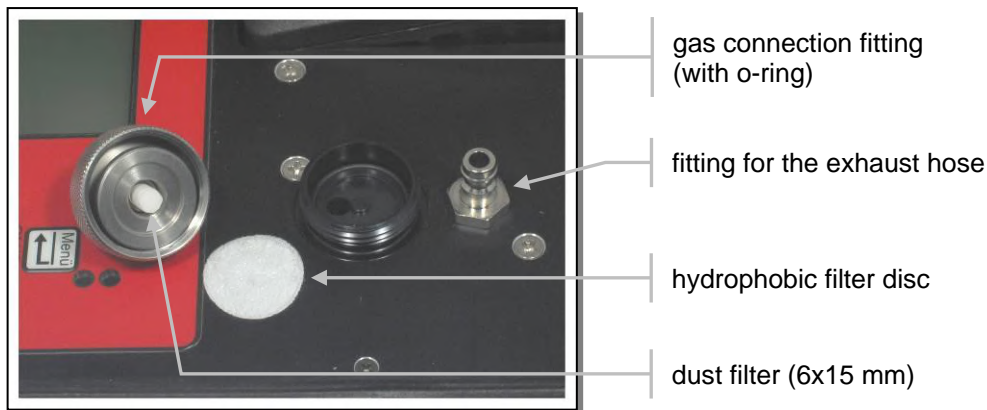
We recommend to check the accuracy regularly and if necessary cause a readjustment.

Because the devices are used for evaluation of gases, they should be subjected a complete maintenance by the manufacturer or an authorized service facility once a year.

### **7.1. FILTER CHANGE**

The **Safe EthanTest** has two filters in the gas connection fitting. By turning left this this connection will be unscrewed.

Here is an effective dust filter to protect the pump and the sensors, which has to be checked before starting work and as needed. Especially in dry environments may incur a larger amount of fine dust. The dust filter should not be turned over and reused in this way, because dust can be sucked into the device.



In addition, located at the gas connection fitting / device input, a hydrophobic filter disc, which forms, when properly mounted on, a secure water barrier. If water comes up to this point the filter disc avoid the infiltration into the device.



Water will only be kept out if the knurled screw is firmly tightened (by hand).

If water or a large amount of dust is present in the filter, ensure water or dust is prevented from getting into the device when the filter is removed. This is why the device should be placed upside down and dust and moisture removed before taking the filter out.





A damp filter (water-repellent filter disc) can be dried so it is fit for further use if it is not contaminated. Use tweezers to replace the filter. Ensure you do not damage it when doing so.

When inserting the filter, place carefully into the device as it can be easily damaged. Do not use sharp instruments. The glossy, structured side with the supporting tissue should face downwards and the plain side upwards.

## 7.2. USE AND STORAGE

If the device is stored for a long time or not used, the battery must still be regularly loaded (see Chapter 6, „Battery“).

The storage temperature should be between 0°C and +50°C.

## 7.3. LOCATION AND TYPE OF FUSE

The device has a fuse with a value of 2A slow, which can be exchanged. The fuse is located in the fuse holder on the front panel.

If the device can not be turned on, check the fuse and replace it if necessary.

## 7.4. SERVICING ADDRESS

Esders GmbH service workshop and mobile service are at your disposal for repairs and servicing of all **SAFE EthanTest** devices.

### **Esders GmbH**

Hammer-Tannen-Str. 26-30  
D - 49740 Haselünne

tel.: 05961-9565-0  
fax: 05961-9565-15

[www.esders.de](http://www.esders.de)  
[info@esders.de](mailto:info@esders.de)

## **8. ACCESSORIES**

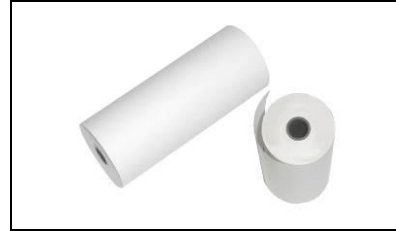
### **8.1. WEARING PARTS**

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#### **Paper for 58 mm IR Thermal Printer**

Item no. 265082

- Paper roll 11 m in length



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#### **Filter Set SIGI EX / DAVID / SAFE**

Item no. 271112

- 10 hydrophobic 1µm filter discs



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#### **25x dust filter 8 x 15 mm**

Item no. 271111

- Dust filter for the bell probe of the SAFE EthanTest



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#### **25x dust filter 6 x 15 mm**

Item no. 271113

- Dust filter for the gas connection fitting of the SAFE EthanTest



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#### **O-ring 10 x 2,5 mm**

Item no. 235058

- Sealing ring for the bell probe of the SAFE EthanTest



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#### **O-ring 22 x 1,5 mm**

Item no. 485022

- Sealing ring in the gas connection fitting of the SAFE EthanTest



## 8.2. OTHER ACCESSORIES

### Testing Device PED basis 35 l/h (for 1 vol.% methane, 50 ppm ethane)

Item no. 331020

- For limiting pressure and flow rate to regulate in-feed of test gas
- Flow regulator for connecting directly to pressure gas cylinders
- With pressure gauge



### Test Gas Cylinder (1 vol.% methane and 50 ppm ethane)

Item no. 372003

- Contents 1 Litre
- Pressure 12 bar



### Bell probe "SAFE" height 25 cm

Item no. 232092

- Bell probe for the SAFE EthanTest
- Grip and bell screwable



### SAFE EthanTest probe hose

Item no. 481003

- Connection hose for the bell probe
- With additionally exhaust hose



### 230 V Power Supply Unit

Item no. 202002

- For recharging the SAFE EthanTest in the power socket
- Supplies 12 V DC / 1 100 mA



### Car Charger Lead for 12 V socket

Item no. 202003

- For recharging the SAFE EthanTest in cars
- Length: 1.8 metres
- Supplies 12 V DC / 1 100 mA



## **9. TROUBLESHOOTING**

<b>Problem</b>	<b>Possible cause</b>	<b>Solution</b>
Device is not charged	Fuse in the device defect	Replace defect fuse!
Device is not charged (car charger leads)	<ul style="list-style-type: none"> <li>- Defective fuse in the charger</li> <li>- Charging contacts contaminated</li> </ul>	<ul style="list-style-type: none"> <li>- Replace fuse</li> <li>- Clean contacts (do not use any sharp instruments when doing so)</li> <li>- Send device to Esders Service Department</li> </ul>
SAFE EthanTest does not respond when key is pressed		Check fuse on the device!
Low pump power	Filter damp or dusty and blocked	Replace or dry filter (DO NOT turn filter over)
Gas alarm with low readings	SAFE EthanTest sucking in negative pressure through disconnected hose, or sensor hose quick-release coupling is closed as the sensor has not been connected	Ensure intake can flow unhindered
Gas reading during test gas exposure too low	Sensor drift due to inhibitor such as H <sub>2</sub> S (substance which reduces sensitivity temporarily)	Expose device to test gas several times. If reading increases each time exposed to test gas, adjustment often not necessary.
"	Sensor sensitivity permanently reduced due to sensor toxin	Re-adjust device
More than 2 peaks appear in the printout	Exhaust hose is not connected and / or device sucks in ambient air polluted by gas during the analysis	Connect probe and exhaust hose properly and / or put device directly after the start of the analysis in an unpolluted environment

## **10. TECHNICAL DATA**

<b>Dimensions:</b>	350 x 300 x 150 mm
<b>Weight:</b>	approx. 5,600 g
<b>Display:</b>	illuminated LCD graphic display with 128 x 64 pixel
<b>Power supply:</b>	lead acid battery 6 volts 7.2 Ah
<b>Charging time:</b>	max. ~16 hours until fully charged
<b>Operating time:</b>	> 15 hours (Depending on ambient temperature and the number of directly consecutive measurements. Because the separation column is heated up to operating temperature before start of measurement, it can be done about 50-100 measurements, depending on application)
<b>Ambient temperature:</b>	- when operating: -10°C to +45°C - when in storage: 0°C to +50°C
<b>Memory:</b>	4 MB internal memory for up to 4,000 measurements
<b>PC-Interface:</b>	Infrared-Interface
<b>Protection category:</b>	IP 68 (with closed device)
<b>Service life:</b>	12 month warranty

### **Sensors:**

<u>Operating principle:</u>	<u>Measurement Range:</u>	<u>Resolution:</u>	<u>Gas type:</u>
Semiconductor (SC)	0 bis 10,000 ppm	→ 1 ppm	methane (CH <sub>4</sub> ) and ethane (C <sub>2</sub> H <sub>6</sub> )
Thermal conductivity (TC)	0 bis 100 Vol.%	→ 0.1 Vol.%	natural gas

**Analysis range:** from about 1,000 ppm to 100 vol.% natural gas  
(depending on the concentration of ethane in the gas)

**Technical specifications subject to change!**

## **11. WARRANTY CONDITIONS**

We thank you for choosing the **SAFE EthanTest**. All devices are carefully checked by our technicians before they leave our production facilities.

We offer a 12-month warranty on all our devices if they are used as intended.

Our liability is limited to repairs or adjustment of the device, which should be returned to the factory for such purposes.

Consumables such as filter or thermal paper are expressly excluded from this warranty. Likewise, damage to the gas sensor caused by improper handling of the device is also excluded.

If a malfunction is brought about by incorrect handling or by abnormal operating conditions, repairs are carried out at a charge.

In such cases, you will be informed of the expected cost before repairs are started.