

Operating Instructions

Hydrotector H₂

Cable Leak Detector



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Important! It is imperative to read and observe all safety instructions prior to initial operation!

Technical Data

Traceable detection variation	from 1 ppm H ₂ in air
Tracing gas (nitrogen-hydrogen mixture)	the mixing ratio has to apply to internal regulations
Leak indication	acoustically and optically
Response time	approx. 3 s
Power supply	rechargeable NiCd batteries
Operating / Storage temperature	- 10 to + 45 °C / - 20 to + 50 °C
Time of use with both batteries fully charged	approx. 8 h
Recharging time of one battery	approx. 3 h
Charging temperature	+ 10 bis + 50 °C, optimal: ca. +20 °C
Battery charger	230 V 50-60 Hz, 12 W / opt. 10-30 V DC, 12 W
Dimensions of the case (W x L x H)	610 x 500 x 210 mm
Weight (probe unit and operating unit)	approx. 4,4 kg
Weight incl. accessories	approx. 12,4 kg

Ordering Data

Hydrotector H₂

incl. belt, battery charger 230 V 50-60 Hz, headphones
plunger, 2 NiCd-batteries, special case

Order-no. 057049.100

Accessories

Tracing gas filling kit

with single stage reducer and 5 m hose

Order-no. 057388.000

Battery charger 10 V - 30 V DC

Order-no. 072367.000

Spare parts

Suction filter for measurement and reference probe

Order-no. 057251.000

Union nut for measurement and reference probe

Order-no. 059422.000

Accumulator 6 V 900 mAh

Order-no. 072365.000

Washer D 8,4 A for height adjustment

Order-no. 004524.000

Threaded knob M8 x 25 for funnel

Order-no. 036634.000

Edge profile 1,05 m long

Order-no. 066018.000

Funnel

Order-no. 057282.000

Headphones

Order-no. 057917.000

Special case

Order-no. 072362.000

Plunger

Order-no. 065893.000

Belt

Order-no. 072368.000

General Information

These operating instructions should make it easier for you to become acquainted with the product. They contain important instructions to ensure safe, appropriate and cost-effective use of the equipment, to reduce repair costs and downtimes, as well as to raise the equipment's reliability and operational lifetime.

The operating instructions endorse the directives of national regulations for the prevention of accidents and the protection of the environment.

These operating instructions should always be available at the installation site.



These operating instructions shall be read and adopted by anyone assigned to work with/on the equipment, e.g. during

- **Operation to include setting-up, trouble-shooting in operational procedures, removal of production waste, maintenance, disposal of operating supplies.**
- **Maintenance, Inspection and Repair**

In addition to the operating instructions and the mandatory regulations for the prevention of accidents, applicable in the operator's country and at the place of use, the recognized technical regulations for safe and professional operation, shall also be observed.

Designated Use

The Hydrotector H₂ was developed to detect leaks in pressurized cables.

Proper intended use includes adherence to all prescribed operating, service and repair conditions.



**Important!
Use only tracing gas with a mixing ratio according to internal regulations!**

Any non-compliant use excludes the manufacturer from liability for any damages. The operator carries the risk!

Safety Instructions



Important!

It is imperative to read and observe all safety instructions prior to initial operation!

- Keep the operating instructions ready to hand!



Accident prevention!

- The unit should only be operated in technically-sound condition, for its designated use, with safety and risk awareness in mind, taking into account the operating instructions.
- Malfunctions deleteriously affecting safety in particular must be remedied immediately!
- The Hydrotector H₂ may only be serviced and operated by persons familiar with it who have been informed of the possible risks.
- Please observe road traffic safety rules when troubleshooting in the open.
- Do not modify the device in any way.



Accident prevention!

The applicable accident prevention rules and manufacturers information must be observed when using forming gas.

Forming gas is a compressed and highly inflammable gas mixture that is lighter than air and may accumulate in the ceiling area.

- It may explode on contact with oxidants.
- It displaces air and is suffocating in high concentrations.

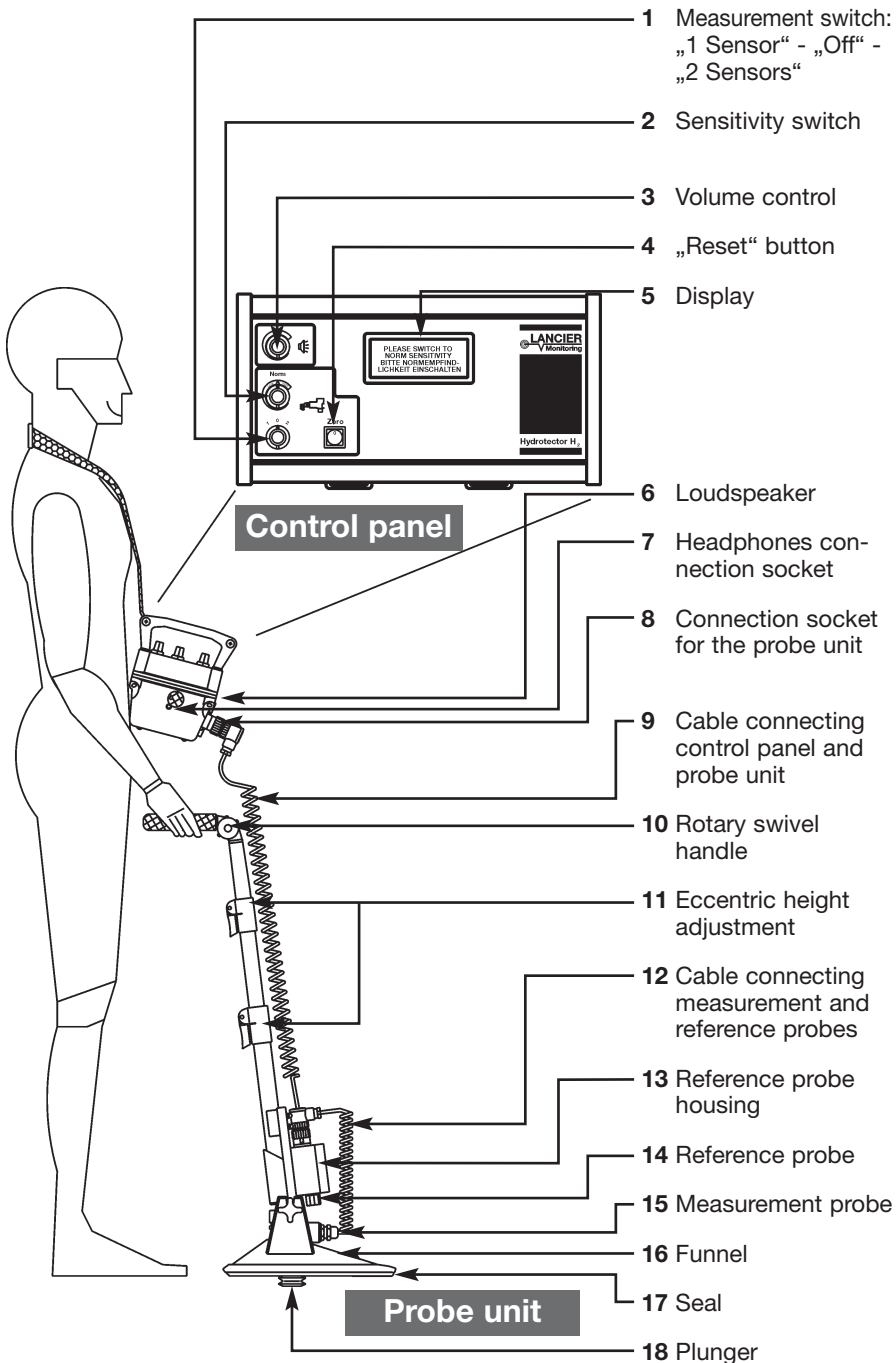
In the event of unintended gas leakage seal the leak if possible, leave the room, warn all persons in the vicinity and ensure ventilation.



Risk of damage to property!

- Do not submerge either the device or its probe in water.
 - Maintenance and repair work should only be performed by trained personnel!
 - Adhere to the deadlines prescribed, and/or those given in the Operating Instructions, for repetitive inspections / maintenance.
 - Check after maintenance and / or repair work that all screw connections undone during it are correctly seated and tightened.
 - Only use original LANCIER Monitoring replacement parts!
-

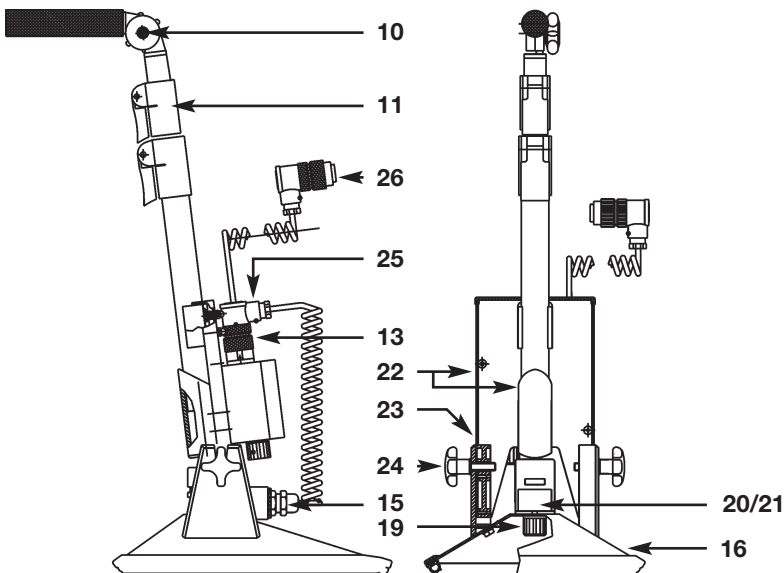
Controls



Initial Operation

Assembly

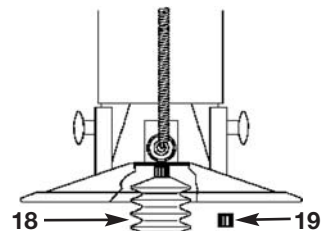
- Screw the measurement probe (15) to the funnel (16) using the union nut (19), ensuring that the probe notch (20) is aligned with the funnel rivet (21).
- Insert the telescopic rod with retaining unit (22) in the funnel holder frame (23) and tighten the threaded knobs (24).
- Connect the probe unit (25) plug and the reference probe housing socket (13).
- Connect the probe unit (26) plug and the control panel socket (8).
- Adjust the telescopic rod height using the eccentric adjustment (11) and the handle angle with the joint tightener (10) to suit your physique.



Assembly of the plunger

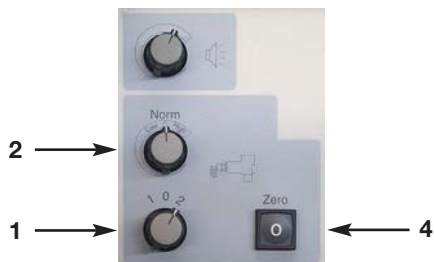
(only if needed, see the „Operation“ chapter, page 11)

- First undo the union nut (19).
- Screw the plunger (18) on in its stead.



Turning the device on

- Make sure, before turning it on, that all cable connections (9), (12) between probes and control panel are in place.
- To turn the Hydrotector H₂ on, turn the „Measurement“ switch (1) on the control panel to position „1“ or „2“.



Important!

Should other gasses that may influence matters have to be allowed for on the measurement route (e.g. road traffic exhaust gasses), turn the switch (1) to position „2“ to activate the reference probe as well. If no such gasses need be allowed for (little road traffic, open countryside, etc.) then it is best to activate only the measurement probe. This noticeably increases accumulator discharge time. Turn the switch (1) to position „1“ for the purpose.

- If the measurement probe (15) isn't connected up then the following error message will be displayed:

```
! PLEASE CONNECT !
! SENSOR          !
! BITTE SENSOR   !
! ANSCHLIESSEN  !
```

In such cases, turn the device off by turning the Measurement switch to position „0“. Connect the measurement probe (15) and turn the device on again as above.

- The device needs a warm-up period of about 3 minutes before it is ready for use.
- The following message is shown on the display for about 1 minute:

```
LANCIER MONITORING
  GmbH
D-48167 MÜNSTER
PLEASE WAIT
```

- and finally for a further 2 minutes:

```
HYDROTECTOR
ORDER NO:
057049.100
PLEASE WAIT
```




Important!

The device needs about three minutes before it is ready for use every time the switch is turned from position „1“ to „2“ or vice versa.

- Make sure that the Sensitivity switch (2) is in the „Norm“ position. If not, the following instruction will be displayed:

```

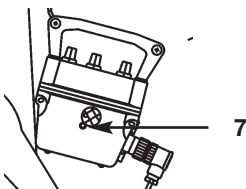
! PLEASE SWITCH TO !
! NORM SENSITIVITY !
  BITTE NORM EMPFIND-
  LICHKHEIT EINSCHALTEN
  
```

- After a total of three minutes the device is ready to use. It gives off a sound to signify that is now ready for use. This goes off about every 1.5 seconds. The device is now automatically reset. The following message is shown on the display:

```

>
MES REF
NORM SENSIT.
  
```

- If the ambient noise level is too high the headphones supplied can be connected to the socket (7) on the control panel. The loudspeaker on the control panel is then automatically switched off.



The Hydrotector H₂ is now ready for use.

Meaning of Reset (button „Zero“)

Resetting means measurement and reference probes are reset, i.e. measurement (**MES**) and reference (**REF**) signals revert to zero.

Should either or both of the probes permanently change its/their display, reset by simply pressing the „Zero“ button (4).

A Reset is only possible if at most 5 bars are shown in the available signal field.



Meaning of the signals

Measurement signal (MES)

The measurement signal (MES) shows the gas concentration measured by the measurement probe.

Reference signal (REF) (only if the reference probe is active)

The reference signal (REF) shows that probe's gas concentration measurement.

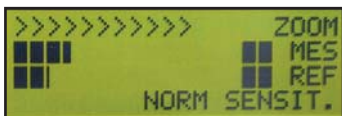
Zoom signal (ZOOM)

The Zoom signal (**ZOOM**) shows the measurement signal (**MES**) in zoomed format. The full length of the zoom signal scale is equal to one bar on the measurement signal scale.

The zoom signal arrow direction changes as follows:

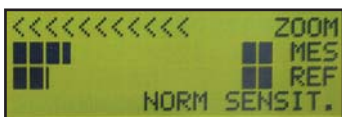
- > Climbing measurement signal
- < Falling measurement signal

Display examples:



ZOOM signal: climbing

MES signal: 2 units more than the **REF** signal



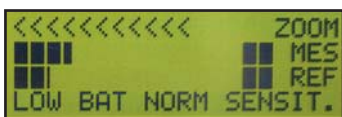
ZOOM signal: falling

MES signal: 2 units more than the **REF** signal

Apart from the measurement signal, the height of the impulse tone also changes:

- Higher measurement signal = higher tone
- Falling measurement signal = lower tone

Battery display (LOW BAT)



The battery displays (**LOW BAT**) if the accumulator capacity is exhausted. The remaining power is adequate for only 5 min.

The accumulator must either be replaced (see page 15) or charged using the charger (see page 15).

Set the sensitivity switch (2) to „Norm“ and then turn the device off. Change the accumulator and switch on again. After the warm-up phase the device is again ready for use.



Caution. Incorrect measurements may result if the accumulator is not changed in good time.

Operation

Leakage search on a buried telecommunications cable

Preparatory work



Important!

Use only tracing gas with a mixing ratio according to internal regulations!

- Determine the fault area using pneumatic measurements.
- Pump the forming gas toward the compressed air inlet at the nearest measurement point before the fault area.



Accident prevention!

The applicable accident prevention rules and manufacturers information must be observed when using forming gas.

Forming gas is a compressed and highly inflammable gas mixture that is lighter than air and may accumulate in the ceiling area.

- It may explode on contact with oxidants.
- It displaces air and is suffocating in high concentrations.

In the event of unintended gas leakage seal the leak if possible, leave the room, warn all persons in the vicinity and ensure ventilation.



Important: The supply pressure must be equal to, or greater than, the cable operating pressure!

- Open the next measurement point after the assumed fault location.
- Check 1-2 hours after beginning pumping that forming gas is flowing out of the opened measurement point.
- If no forming gas can be detected after 3 hours then all the gas pumped in is presumably flowing out of the cable leak.
- Close the measurement point.
- Determine the exact routing (e.g. with a cable detector).

Leak detection

- Adjust the device to your physique (see page 7).
- Connect the headphones to the headphone socket (7) if desired.
- Begin leak detection along the route determined beginning at the forming gas inlet point.
- Put the funnel (16) down on the ground along the route determined about every 50 centimetres for three seconds.

- If the weather is cold and/or wet and/or the terrain uneven use the plunger (18) (see page 7 for assembly instructions) and apply the funnel to the ground at shorter intervals (e.g. every 30 cm).
- The display will show any forming gas escaping from the soil after 1 to 3 seconds. The sound signal given out is simultaneously heightened in tone as well.
- The fault location is at the point at which the measurement value shown (MES) is highest.



Important! Where the surface is very dense the forming gas may not exit directly over the leak. Please therefore check a larger area when necessary. Extend the duration of measurement when the wind is very strong.

Leak detection using small quantities of forming gas

Should the measurement signal (MES) tend toward zero due to too low a gas concentration select „High“ with the sensitivity switch (2). This permits **two device sensitivity settings** to obtain a legible display.

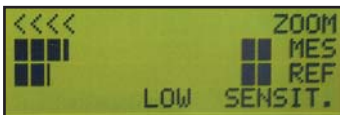
The display shows „HIGH SENSIT.“.



Leak detection using large quantities of forming gas

Should the measurement signal fill the entire scale due to excessively high gas concentration set the sensitivity switch (2) to „Low“. This permits lowering device sensitivity in **8 stages** to get a legible display

The display shows „LOW SENSIT.“.

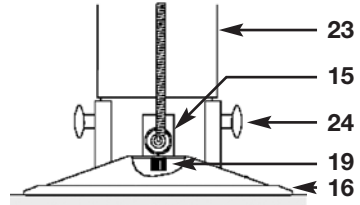


Leak detection in cable cellars or manholes

(exposed cable, cable vaults and at cable terminations)

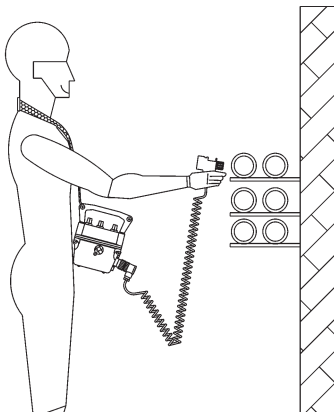
Preparatory work

- Turn the device off by turning the „Measurement“ switch (1) to „0“ . .
 - Undo the threaded knobs (24).
 - Pull the telescopic rod and retaining unit out of the funnel holder (23).
 - Remove the measurement probe (15) from the funnel (16).
 - Undo the union nut (19) in the funnel.
 - Extract the measurement probe (15) from above.
 - Screw the union nut (19) back on the probe.
 - Remove the plug of the cable connecting the control panel and the probe unit (9) on the control panel.
 - Remove the plug of the cable connecting measurement and reference probes (12) on the reference probe housing (13).
 - Connect the measurement probe (15) to the control panel with the connecting cable (12).
 - Turn the device on again by turning the „Measurement“ switch (1) to „1“.
- The device will be ready for use after a warm-up phase lasting about 3 minutes.



Leak detection

Move the vacuum filter of the measurement probe (15) about one to two centimetres above the surface to be checked.



Maintenance

Device maintenance

Regular maintenance



Important: The device must normally be serviced regularly every three months and after every use under very dusty conditions!

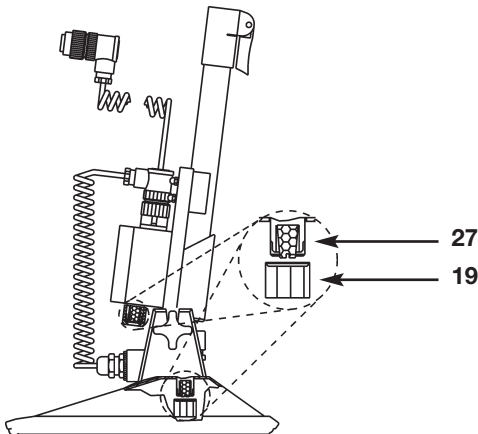
Clean and replace the probe vacuum filters

- First undo the union nut (19).
- Unscrew the measurement and reference probe vacuum filter (27) using a screwdriver.
- If necessary clean the vacuum filter (27) with compressed air (blowing from inside to out).



Important!
Always wear suitable protective goggles and equipment!

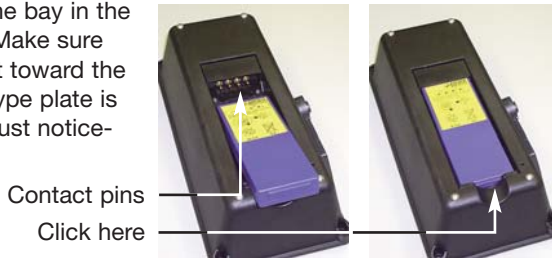
- Assemble the probe in the reverse order.



Accumulators

Use of accumulators

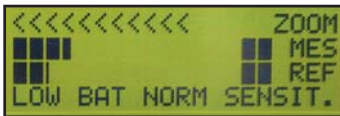
Insert the accumulator in the bay in the base of the control panel. Make sure accumulator contacts point toward the contact pins and that the type plate is visible. The accumulator must noticeably click into place.



If the Hydrotector H₂ cannot be turned on, check that the accumulator has been correctly installed.

Charging of accumulators

If „LOW BAT“ blinks in the display, charge the accumulator with the charger.



Charging time is about three hours (please refer to the separate Operating Instructions for the charger). The charger is equipped with overload protection.

To ensure the longest possible service life please note the following:

- Accumulators must not be stored in the charger just for brief periods.
- Charge them at room temperature (about 20 °C) if possible.
- Avoid keeping them anywhere where short-circuits might occur (e.g. tool kit, trouser pocket with keys, etc.).
- Remove them from the device if the latter is not to be used for a long period. Store them with contact protection covering in a dry place at room temperature.



Important!

Prevent accumulators from short-circuiting! Always use the contact protection cap when an accumulator is not in use.

Handling

- Do not throw accumulators into the fire or dip them in water.
- Do not dispose of old and/or defective accumulators as normal domestic waste.
- Adhere to environmental laws on battery disposal.
- Return old and/or defective accumulators to a municipal battery disposal point.



Ni-Cd



Cd



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EC Declaration of Conformity

We declare under our sole responsibility, that the product

Make: LANCIER Monitoring
Type: Hydrotector H₂

to which this declaration refers, meets the relevant health and safety requirements of the following EC directives:

2004/108/EG Electromagnetic compatibility

For proper implementation of the health and safety requirements named in the EC directives the following standard(s) and/or technical specification(s) have been consulted:

EN 61326-1 Electrical equipment for measurement, control and laboratory use - EMC requirements (class B)

Münster, 06.04.2011


Research and Development


Managing Director