

#### A FEW PRACTICAL BENEFITS:

Acoustic and trace gas leak detection in only one device

High-resolution colour graphic display with touchscreen functions

**The only one of its kind in its class.** State-of-the-art smart function for even faster pinpoint leak detection (patent-protected)

Numerous preprogrammed common applications for quick access

All filters and parameters can be configured individually

Pipe detection mode

Complies with all guidelines governing according to VBG 121 (when used with original headphones) (VBG – trade association safety regulations)

Highly-sensitive, high-quality, robust precision microphone made in Germany

## LD6000 combi detector

### Leak detection and acoustic pipe location

**The only one of its kind in the world – and only at Trotec:**

**LD6000 combi detector with smart mode for quick and reliable pinpoint leak detection**



**Finally one software for basically all measuring devices:**

#### MultiMeasure Studio Professional

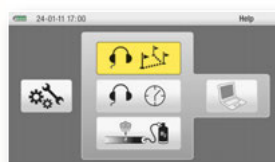
In addition to the ever growing number of fully compatible Trotec meters, this software is also suitable for the LD6000 semi-compatible combination detector – you can even benefit from this software for non-interface devices by enabling cross-device analysis and management of all measurement projects and customer data in a single application!

**Create professional measurement reports in next to no time!**

The unique report generating function of MultiMeasure Studio Professional already comes with completely formulated boilerplate texts for the fields of building diagnostics, moisture measurement, leak detection and thermography.

**More information can be found starting on catalogue page 48 ...**

- **Acoustic pinpoint leak detection**
- **Pipe detection**
- **Long-term measuring with logging function**
- **Trace gas detection**
- **All in only one device!**



*The LD6000 has been programmed to include a wide range of typical applications which can be accessed quickly and easily. It is also equipped with a variety of filter settings and additional parameters which can be adapted to suit the user's individual demands and requirements, which can be configured either via touch screen or by using the keys and buttons on the control panel.*

### The LD6000 cutting-edge leak detection device sets new standards in the field of leak detection ...

Whether you're planning on using it for routing pipes or for narrowing down the search for leaks or pinpointing their location, the highly-sophisticated LD6000 – which comes together with a high-quality microphone and new, cutting-edge electronic technology designed especially by us in order to fulfil the unique and special demands which state-of-the art acoustic leak detection puts on it – allows you to determine and process even the tiniest of leak sounds before displaying them on the easy-to-read, clear-cut display.

### LD6000 – the optimum solution for trade and industry and supply companies

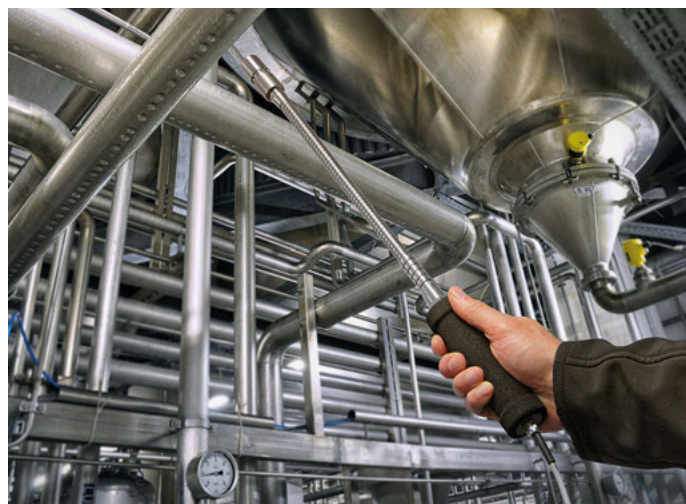
Users in industry are able to benefit from a state-of-the art measuring device which can be used universally to not only locate and pinpoint leaks and problem areas in sprawling and winding pipe networks, but also allow them to carry out effective and low cost inspections to determine if welded seams, valves, tanks, boilers, pressure lines and pump housings are leak proof or not.

The LD6000 provides supply companies with a whole host of application possibilities that allow them to carry out full and conclusive water loss analyses:

acoustic pinpoint detection with highly-sensitive ground microphones, trace gas leak detection on drinking water networks, line detection on metallic and non-metallic pipes and leak checks on seals and pipe connections.

A comprehensive program of accessories including a ground microphone and a contact and stick microphone ensure that the LD6000 is excellently suited for use as a quick, reliable and universal means of locating leaks not in many different areas in the field of industry but also in the trade sector.

**Whether it's for indoors or out. Or whether it's for industrial pipe or drinking water networks or for house installations. The easy-to-use LD6000 allows you to carry out quick and accurate – and therefore extremely reliable – leak detections, trace gas inspections and line routing projects using one and the same device!**



### The principle of acoustic leak detection

Water which escapes from high-pressure pipes at high speed causes friction which in turn can be picked up in the form of sound waves.

The pipes themselves start to oscillate. The sound that is generated is transmitted through the pipes and can be transformed into audible sound with a **body sound microphone** at a distant contact point (valve, hydrant, armature).

In addition the water leaking out through the crack or hole in the pipe generates sound which is carried through the ground to the surface. This sound can be picked up by a **geophone** and transformed into audible sound.

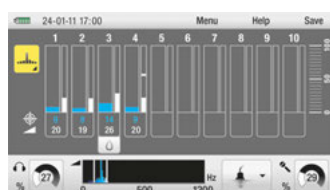
*The innovative, state-of-the-art LD6000 combi detector is suitable for a variety of different application and allows you to detect leaks using both the acoustic and trace gas method with only a single device:*

- 1 Acoustic pinpoint leak detection with geophone.
- 2 Detection and pipe laying, also for plastic pipes.
- 3 Acoustic body sound measurement.
- 4 Trace gas leak detection in drinking water systems.
- 5 Leak detection and leak tightness inspection of pipe systems in houses and industrial pipe networks.

### Overview of the functions:

#### Smart mode

**The state-of-the-art smart function is the only one of its kind in its class and has been filed for patent – the smarter way to find leaks.**



Complex algorithmic calculations carried out in the heart of the device which are based on factors like frequency, level and assessment provide you with a clear and precise view of what you want to see: the position of a potential leak which is shown by means of a bar indicator that displays the strongest signal where the leak is. Seeing is believing! And it doesn't get any easier than that!

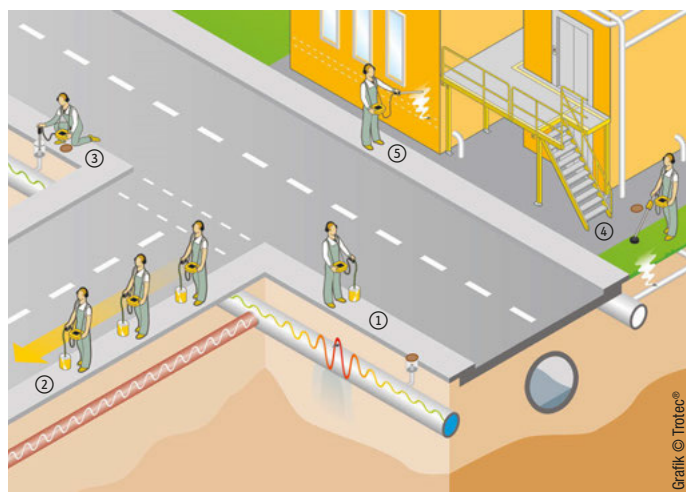
#### Leaks that can be seen and heard – additional acoustic modes

In addition to the smart mode, the LD6000 is also equipped with other acoustic modes which allow the user to carry out automatic or individual amplitude analyses of potential leaks.

#### Long-term measurements



In order to be able to pinpoint the leak exactly, an onboard sound logger can be activated to log measurements carried out over a period of up to 60 minutes, which can then be used to determine or rule out any leaks with the help of the recorded measurement curve.



#### Pipe detection mode

This mode is designed to allow you to locate pressure water lines made of synthetic material which are treated with ultrasound by the LD-PULS impulse generator.

*To find out more about using the LD6000 and LD-PULS for pipe detection go to page 81.*

#### Trace gas detection

Leak detection in pipe networks or house installations can be carried out quickly and reliably using trace gas in combination with hydrogen sensors.

*For more information on how to perform trace gas leak detection with the LD6000 go to page 80.*



Trotect

Temperature

Multi-function

Climate

Moisture

Data loggers

Software

Emission

Air Flow

Optical inspection

Leak detection

Tracing and detection

Planning and survey



Technical data	LD6000
Article no.	3.110.008.010
Operating mode	Acoustic leak detection (F&V, Smart, long-term measuring), pipe detection and trace gas leak detection
Measuring and device functions	Measuring modes for minimum level, averaged level, pulse wave measurements, simultaneous F&V analysis, logging function, automatic functions for setting filter frequencies and sensor sensitivity, memory preference for manual filter settings, sound level overmodulation protection, trace gas detection with concentration-dependent signal (optic and acoustic)
Controls	Either via touchscreen, keys or control dial
Amplification	120 dB low noise factor
Input impedance	1MΩ
Filter	Up to 256 can be configured individually (for stick sensor and ground microphone)
Frequency spectrum	0 - 4,000 Hz
Display	Colour LCD (automatic illumination), 480 x 272 pixels
Battery check	Via micro-controller
Output impedance	≤ 10 Ω
Power supply	4 x batteries type LR14 C 1.5 V
Operating time	up to 14 h in non-stop operation, up to 40 h in normal operation
Connections	Bayonet nut connector (microphone / sensor), 6.3 mm jack plug (headphones), USB
Protection class	IP54
Housing	Aluminium, powder-coated
Dimensions approx.	L 210 x W 160 x H 60 mm
Weight approx.	1,050 g

Technical data	LD6000 H2 hydrogen hand sensor
Article no.	3.110.008.011
Response sensitivity	1 ppm H <sub>2</sub>
Measuring range	10 ppm H <sub>2</sub> to 20,000 ppm H <sub>2</sub>
Resolution	1 ppm H <sub>2</sub>
Reaction time	0.5 s
Type	Hand sensor with flexible swan-neck (length 50 cm) and 160 cm connecting cable for LD6000

Technical data	LD6000 H2 hydrogen ground sensor incl. pump						
Article no.	3.110.008.020						
Response sensitivity	1 ppm H <sub>2</sub>						
Measuring range	10 ppm H <sub>2</sub> to 20,000 ppm H <sub>2</sub>						
Resolution	1 ppm H <sub>2</sub>						
Reaction time	0.5 s						
Pump module	<table> <tr> <td>Pump performance</td><td>1.5 litres/minute</td></tr> <tr> <td>Power supply</td><td>9 V block battery IEC 6LR61/6F22</td></tr> <tr> <td>Power input</td><td>approx. 45 mA</td></tr> </table>	Pump performance	1.5 litres/minute	Power supply	9 V block battery IEC 6LR61/6F22	Power input	approx. 45 mA
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Type  
Ground sensor with active pump, two-part rod (length approx. 1 m) and rubber collar as well as approx. 2 m long connecting cable for LD6000. Weight 1.1 kg.

## LD-PULS pulse wave generator



This impulse generator is excellently-suited for use with the LD6000 measuring device.

The pulse wave generator generates a periodically recurring pressure wave which, under favourable conditions, can spread out over a distance of 600 m and which can then be picked up acoustically from the pipe using the LD6000 along with the connected microphone.

This is why the LD6000 is equipped with a special pulse mode which allows the volume and the frequency of the pulse to be displayed as optimally as possible.

And which is also why non-metallic water pipes up to a depth of 2 metres can be detected quickly and accurately without having to block off or take the pipe out of service first.

This means that this method can be used to compile, complete or check plans and pipe layouts or networks.

### Standard scope of delivery:

- LD-PULS – pulse wave generator built into sturdy case with integrated rechargeable battery
- Separate power supply for LD-PULS

### Optionally available accessories:

- LD-PULS repair set containing an Allen key and 4 valves



Technical data	LD-PULS
Article no.	3.110.008.012
Minimum pressure	2 bar (29 psi) (minimum pressure of the service pipes)
Operating time	Approx. 12 hours
Pulse sequence	Approx. 60 per minute
Connection	1-inch GEKA high pressure coupling
Power supply	Internal battery (rechargeable) or 230 V AC
Weight	4.2 kg