

# LOKTRACER TLD.500

## TRACE GAS LEAK DETECTOR

Operating manual (as of: 07/2016)



# LOKTRACER TLD.500

## TRACE GAS LEAK DETECTOR

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# LOKTRACER TLD.500

## TRACE GAS LEAK DETECTOR

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# LOKTRACER TLD.500

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### 1. GENERAL INFORMATION

This operating manual describes the tracer gas leak detector LOKTRACER TLD.500 for people performing maintenance or installation work on refrigeration or air-conditioning systems and who have the corresponding skills and know-how.

Please read this operating manual with all due care and attention before using the device for the first time. It gives you all necessary information for safe, effective operation of the LOKTRACER TLD.500.

Please also comply with:

- Statutory regulations regarding the handling of refrigeration or air-conditioning systems
- Special instructions for the maintenance of refrigeration or air-conditioning systems possibly available in your company

Keep this operating manual with your LOKTRACER TLD.500 so that you can find the required information quickly when the need arises.

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#### 1.1 PROPER USE OF LOKTRACER TLD.500

LOKTRACER TLD.500 is rated for commercial use and serves for leakage detection in refrigeration and air-conditioning systems in conjunction with LOKTRACE gas which is a mixture consisting of 95% nitrogen and 5% hydrogen.

LOKTRACER TLD.500 may only be used by persons having the necessary skills and know-how for the maintenance or installation of refrigeration and air-conditioning systems.

VULKAN LOKRING Rohrverbindungen GmbH & Co. KG does not assume any liability for damage caused by the following:

- Use for any other than the purposes described in this operating manual
  - Changes to LOKTRACER TLD.500 made without the explicit approval of VULKAN LOKRING Rohrverbindungen GmbH & Co. KG
  - Damage to the device caused by external influences
  - Incorrect operation
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#### 1.2 EXPLANATION OF SYMBOLS



Risk of personal injury or damage to the device



Special information for using the device effectively

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## 2 FOR SAFE OPERATION



Please read through this operating manual with all due care and attention before using this device for the first time.

### General safety instructions:

Only use this device for the intended purpose stated in chapter 1.1 (see page 4).

This device has been developed solely for LOKTRACE gas. Other gases can cause damage to the refrigeration or air-conditioning system.

Pay special attention in particular to the right mixing ratio of 95% nitrogen to 5% hydrogen. Concentrations with a share of more than 5.7% hydrogen are explosive.

Never inhale LOKTRACE gas.

The LOKTRACE gas filling in the cylinder must be replaced at least once a year, as in the long term, hydrogen escapes even from steel cylinders.

Do not run a refrigeration or air-conditioning system filled with LOKTRACE gas. This could damage the system.

Wear safety goggles and safety gloves during the maintenance of refrigeration and air-conditioning systems. Any contact between refrigerant and your body can cause frostbite in these places because the refrigerant withdraws heat from your body.

Refrigerant vapours are heavier than air. Never inhale refrigerant vapours. They will displace the oxygen you need to breath.

Do not make any changes or alterations to this device.

Repairs may only be carried out by trained staff. Only original spare parts from VULKAN LOKRING may be used.

Check that the device is undamaged every time before you use the device.

Do not use the device if the device is damaged.

Following leak detection with LOKTRACE gas or possibly after carrying out repairs, always evacuate the refrigeration or air-conditioning system according to the manufacturer's instructions.

Never blow tobacco smoke onto the sensor head of the tracer gas leak detector to „check whether it works“. The tar residues in the smoke can settle on the sensor surface and reduce its sensitivity.

Do not hold the sensor head of the trace gas leak detector to the LOKTRACE gas cylinder valve and open the LOKTRACE gas cylinder valve to „check whether it works“. This could damage the sensor system.

The diffusion surface of the sensor head of the trace gas leak detector must always be kept clean and free of oil or grease. Do not spray it with any evaporating liquids or gases as this distorts the future display values and generates error messages.

Make sure that the sensor head of the trace gas leak detector never comes into contact with vapours and substances containing silicone.

Please also comply with these safety instructions:

- Statutory regulations regarding the handling of refrigeration or air-conditioning systems
- Special instructions for the maintenance of refrigeration or air-conditioning systems possibly available in your company

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### 3 YOUR LOKTRACER TLD.500

#### 3.1 SUPPLIED ACCESSORIES



- Earphone



- Operating manual on CD-ROM



- Mains adapter

The LOKTRACER TLD.500 has been carefully checked before shipment.

On receiving the delivery, please check that all the parts named above are present and not damaged in any way.

If any parts are missing or damaged, immediately inform the company responsible for the transport.

# LOKTRACER TLD.500

## TRACE GAS LEAK DETECTOR

### 3.2 CONTROLS



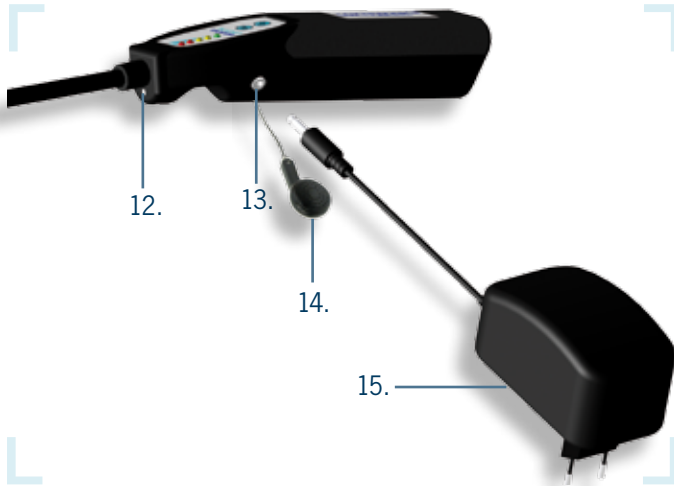
1. Operator film
2. Measuring sensor
3. Sensor head
4. Sensor safety cap



5. ON/OFF button
6. SET button
7. Green LED
8. Yellow LED 1
9. Yellow LED 2
10. Red LED 1
11. Red LED 2

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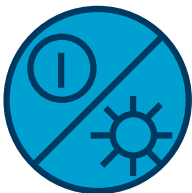
- 12. LED lamp
- 13. Earphone input
- 14. Earphone
- 15. Mains adapter

## 4 INITIAL COMMISSIONING AND DESCRIPTION OF FUNCTIONS



1. Before using the LOKTRACER TLD.500 for the first time it is necessary to charge the rechargeable batteries completely.
2. If the LOKTRACER TLD.500 has not been used for a longer period of time or if it has been exposed to highly contaminated, dirty air for a longer period of time, it is possible for deposits to settle on the gas sensor in the device. This can lead to the display of a non-existing gas concentration. Switching the device on frequently and letting it heat up cleans the sensor so that it returns to its original zero and is therefore completely ready for normal use. If this is not the case, carry out a test in uncontaminated outside air to check whether the air inside the room is polluted.
3. If the LOKTRACER TLD.500 has been stored below 0°C for a longer period of time, it must be switched on at least 10 minutes before use. Leak detection can then begin.

### 4.1 SWITCHING ON AND OFF



Switch the LOKTRACER TLD.500 on and off by pressing and holding the ON/OFF button (5).



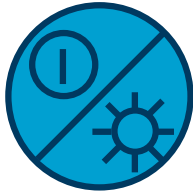
1. After switching on, the green LED (7) lights up. This is also followed by the initialisation phase. During this phase, the sensor heats up; the yellow LED 1 (8) and the yellow LED 2 (9) light up alternately for up to 90 seconds.
2. If the green LED (7) flashes after the heating-up phase, the TLD.500 has to be charged. Please see chapter 4.8 for details. In this case, you can continue to work with the device for approx. 15 minutes
3. The hydrogen concentration in the ambient air is automatically set to a leakage rate of 0 g p.a. when the LOKTRACER TLD.500 is switched on. You should therefore never switch the LOKTRACER TLD.500 on in a contaminated atmosphere.



# LOKTRACER TLD.500

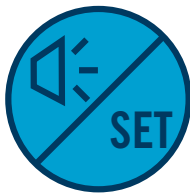
## TRACE GAS LEAK DETECTOR

### 4.2 SWITCHING THE LED LAMP ON AND OFF



With the LOKTRACER TLD.500 on, switch the LED lamp (12) on and off by pressing and holding the ON/OFF button (5) until you hear the beep.

### 4.3 SWITCHING THE ACOUSTIC SIGNAL ON AND OFF



With the LOKTRACER TLD.500 on, switch the acoustic signal on and off by pressing and holding the SET button (6) until you hear the beep.

### 4.4 LEAKAGE RATE DISPLAY

The extent of the leak is indicated among others by the speed of the acoustic signal.  
The extent of the leak is also indicated visually by the yellow and red LEDs.



LOKTRACER TLD.500 measures hydrogen concentrations in the ambient air. However, this operating manual states leakage rates for refrigerant in grams per year.

Meaning of the LEDs:

Yellow LED 1 (8) > 1 g p.a.

Yellow LED 2 (9) > 3 g p.a.

Red LED 1 (10) > 10 g p.a.

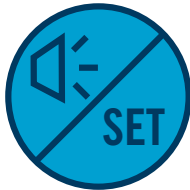
Red LED 2 (11) > 30 g p.a.

At a leakage rate of more than 30 g p.a., you will hear a continuous tone and the red LED 2 (11) lights up.

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### 4.5 MANUAL SUPPRESSION OF BACKGROUND CONCENTRATIONS



For large leaks, you can suppress a background concentration of up to 30 g p.a. The acoustic signal and LEDs are only set off when the hydrogen concentration increases. To do so, press and hold the SET button (6) until the green LED (7) flashes. The current hydrogen concentration will no longer trigger an acoustic alarm. The acoustic signal will only speed up and the LEDs go on when the hydrogen concentration increases, i.e. when you get closer to the actual leak.

### 4.6 AUTOMATIC SUPPRESSION OF BACKGROUND CONCENTRATIONS



The hydrogen concentration in the ambient air is automatically set to a leakage rate of 0 g p.a. when the LOKTRACER TLD.500 is switched on. You should therefore never switch the LOKTRACER TLD.500 on in a contaminated atmosphere.

If LOKTRACER TLD.500 is exposed to a hydrogen concentration corresponding to a refrigerant leakage rate of more than 30 g p.a. for longer than 3 seconds, this hydrogen concentration is automatically set to 0 g p.a.

This is indicated when the red LED 2 (11) flashes. The increasing acoustic signal and the LEDs are only set off when the hydrogen concentration increases. This helps you to get closer to a large leak.

You can cancel the automatic suppression of background concentrations by holding the LOKTRACER TLD.500 in an uncontaminated area for as long as it takes for the red LED 2 (11) to stop flashing.

### 4.7 USING THE EARPHONE



It is possible for the noise levels around the system being tested to make it difficult to hear the acoustic signal of LOKTRACER TLD.500. In this case, use the earphone (14) and connect it to the earphone input (13).

### 4.8 CHARGING OF THE RECHARGEABLE BATTERIES



The LOKTRACER TLD.500 can be used with the mains adapter (15) connected. In this case the rechargeable batteries are not charging. For charging of the rechargeable batteries the LOKTRACER TLD.500 has to be turned off.



Connect the mains adapter (15) to the earphone input (13). If the rechargeable batteries are completely discharged, the charging process can last up to 12 hours.

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### 5 TRACE GAS LEAK DETECTION

#### 5.1 FUNCTIONAL PRINCIPLE

Tracer gas leak detection has seen years of successful use on the industrial sector for checking the tightness of refrigeration and air-conditioning systems.

LOKTRACE gas is used for leak detection; this is a gas mixture consisting of 95% nitrogen and 5% hydrogen. The hydrogen share acts as tracer gas.

LOKTRACE gas is non-toxic, non-corrosive and not harmful to the environment. Thanks to its chemical properties, the gas spreads very quickly through the test device. Outside the system, LOKTRACE gas volatilises very quickly so that there will not be any persistent pollution of the ambient air around the test device.

The international standard ISO 10156 states that a mixture consisting of 95% nitrogen and 5% hydrogen is not inflammable. This also applies when it is released and mixes with air.

LOKTRACE gas is filled into the empty system at a pressure of approximately 5 bar. The tracer gas leak detector can be used to locate leakages.

Hydrogen molecules are the smallest particles occurring in nature and escape from even the tiniest leakages. Consequently, it is possible to detect tiny leakages so that the leak detector fulfils standards EN 35422 and EN 14624 which demand the detection of leakages of less than 5 g per year.

As hydrogen is lighter than air, the hydrogen molecules rise and the pipes can be easily checked from above.

The tracer gas leak detector reacts almost exclusively to hydrogen. It therefore has only very negligible cross sensitivities. As a result, this kind of leak detection is highly reliable.

As LOKTRACE gas is a natural gas, it can be filled into the empty system for leak detection and simply released into the environment after the detection procedure.

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#### 5.2 IMPELMENTATION



To optimise the response time of the LOKTRACER TLD.500, we recommend exposing the sensor to a small amount of LOKTRACE gas before each leak detection.



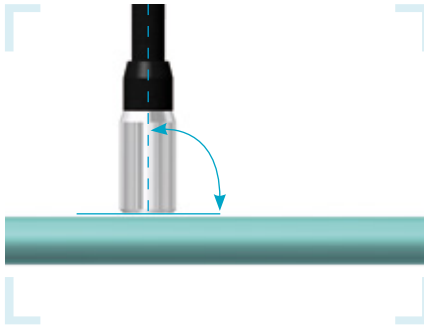
Never switch the refrigeration or air-conditioning system on during leak detection.



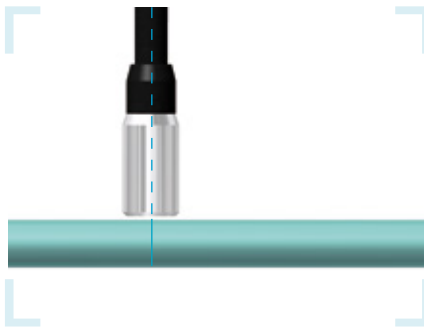
1. Every time before you begin with leak detection, make sure that the sensor safety cap (4) is not on the sensor head (3).
2. In the case of large leaks (rough leaks), the leakage site can frequently be found through the noise of the escaping gas. If you cannot find the leak without using the LOKTRACER TLD.500, please comply with the instructions for suppressing background concentrations of hydrogen in chapter 4.5. If this still is not sufficient, reduce the test pressure to 2 bar and blow compressed air through the area above the refrigeration or air-conditioning system to reduce the hydrogen concentration.
3. Following a large leak, there will be a high concentration of hydrogen in the air. Air the area well before the next leak detection.

# LOKTRACER TLD.500

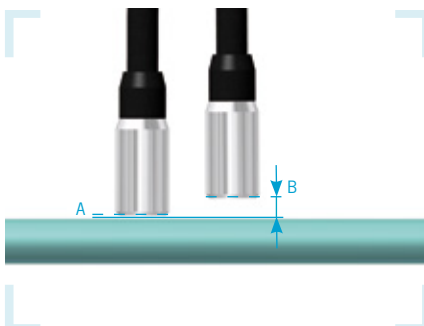
## TRACE GAS LEAK DETECTOR



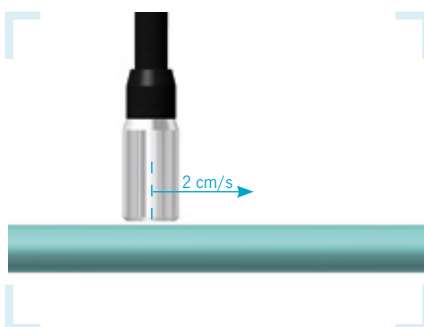
The sensor head (3) needs to be at right angles with the surface which needs to be checked.



The sensor head (3) needs to be centred to the surface which needs to be checked.



The optimal distance (A) between the sensor head (3) and the surface which needs to be checked is 1 mm. At spaces which are difficult to access the maximum distance (B) shall not be greater than 5 mm.

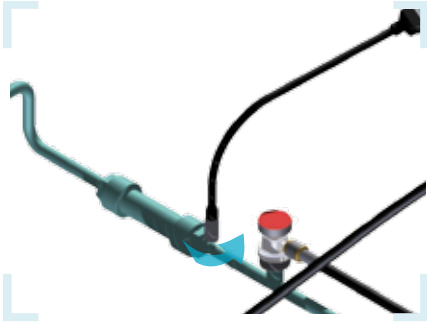


Move the sensor head slowly along the air-conditioning pipe (max. 2 cm per second).

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Screwed unions or other connection points must be „scanned“ slowly, i.e. move the sensor head (3) right around the complete connection point.



When the LOKTRACER TLD.500 indicates a leak, it is advisable to hold the sensor head (3) away from the leakage site for approx. 5 seconds. Then check whether the LOKTRACER TLD.500 indicates a leak at the same site again. Repeat this step up to three times. This verifies that there really is a leak at this site.

Pay special attention to whether the red LED 2 (11) is flashing. In this case, the background concentration has been automatically suppressed. Now hold the leak detector in an uncontaminated area for as long as it takes for the red LED 2 (11) to stop flashing.

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### 6 SERVICING THE LOKTRACER TLD.500

#### 6.1 CLEANING AND CARE

If necessary, clean the LOKTRACER TLD.500 with a clean cloth.  
Do not use any solvents or abrasive cleaning agents.

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#### 6.2 MAINTENANCE



It is necessary to arrange for annual inspections by the manufacturer, a service company or instructed staff. The inspection sticker adhered to the device housing shows when the last inspection was carried out and indicates the date of the next one.



The LOKTRACER TLD.500 must only be maintained by the manufacturer or by instructed staff in service companies.

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### 7 DISPOSAL

#### 7.1 DISPOSAL OF THE PACKAGING

Dispose of the packaging as waste paper.  
Dispose of plastic packaging as recycling waste.

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#### 7.2 DISPOSAL OF THE OLD DEVICE

On finally decommissioning the LOKTRACER TLD.500, take it to the next recycling centre.

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### 8 TROUBLESHOOTING

Troubleshooting	Cause	Recommendation
The green LED (7) flashes.	Rechargeable batteries are low.	Charge the rechargeable batteries.
The device will not switch on.	Rechargeable batteries are empty.	Charge the rechargeable batteries.
The yellow LED (2) flashes.	The sensor is defective.	Send in the device.
The device shows leaks for normal ambient air.	<ul style="list-style-type: none"><li>- The sensor is soiled.</li><li>- The ambient air is contaminated.</li></ul>	<ul style="list-style-type: none"><li>- Switch the LOKTRACER TLD.500 on and off several times to clean the sensor.</li><li>- Air the area well.</li></ul>

### 9 TECHNICAL DATA

Power supply	Rechargeable batteries
Time until ready	< 90 sec
Response time	1 to 2 sec
Tolerable operating temperature	-15°C to +50°C
Tolerable storage and transport temperature	-25°C to +50°C
Tolerable storage and transport humidity	20% to 80% rel. hum.
Power consumption	1.5 watt
Operating period	5 hours
Measuring sensor	320 mm
Dimensions (length x width x height)	480 x 44 x 28 mm
Weight	260 g

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### 10 ACCESSORIES

Article number	Article name	Description
L14003978	LOKplus SSC-TLD.500	Sensor safety cap (4)
L14003979	LOKplus EP-TLD.500	Earphone (14)
L17000082	LOKservice M-TLD.500	Maintenance LOKTRACER TLD.500

### 11 SHORT INSTRUCTIONS



It is very important that you read the detailed operating manual before starting the LOKTRACER TLD.500.

Switch LOKTRACER TLD.500 on by pressing the lower button in fresh air or in a gas-free environment. After switching on, at the end of a brief period you will hear a continuous tone, the five LEDs light up briefly and the yellow LEDs start to flash. The flashing indicates the sensor heating-up phase which lasts approx. 90 seconds.

After the heating-up phase, the yellow LEDs go off, the green LED lights up and indicates that the device is ready together with the acoustic signal that begins at the same time (ticking tone).

When the gas concentration increases, the acoustic signal gets louder.

From approx. 30 g p.a., you will hear a continuous tone and the 2nd red LED lights up.

Briefly press the upper push-button to switch the acoustic signal on and off.

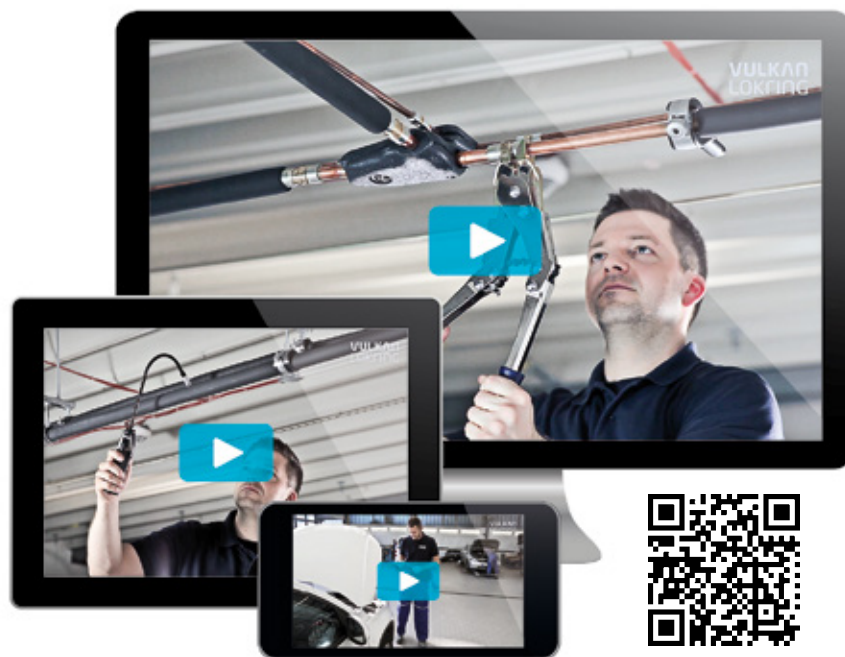
Press and hold the upper push-button to suppress background concentrations of up to 30 g p.a. The green LED flashes in this mode.

Press the lower push-button to switch the lighting on and off.

When both push-buttons are pressed on and off, you will hear a double signal tone as confirmation.







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