

# LD 500/510 – Leak detector with camera - Shows leakage rate in l/min and cost in €



The LD 500 meets the requirements of class I instruments for the "Standard Test Method for Leaks Using Ultrasonic" (ASTM Int. – E1002-05)



## NEW:

Multi-user capable through cloud solution



## NEW:

Unique laser distance measurement for automatic cost determination



Find out your leakage rate (l/min or cfm) and potential savings (€/year). Currency can be set as required



Find the smallest leaks at large distances



## NEW:

Automatic sensor detection



Auto level: Automatically adapts the sensitivity to the environment and reliably eliminates ambient noise



Photograph leaking parts



Paperless documentation.

Enter everything into the device on site: Define the leakage location as well as the remedial measures and spare parts required



Transmit the leakage data via USB to your desktop software



Create a report in accordance with ISO 50001



9 hours of continuous operation possible



Fatigue-free work – ergonomic, one-hand operation – low weight

## FINDING LEAKS PAYS OFF:

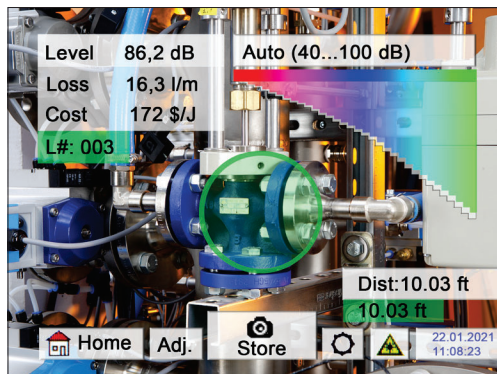
### Sample calculation for a medium-sized company:

Approx. 25% of compressed air is lost due to leaks  
 Installed compressor capacity 150 kW(el) x 6000 OpHrs x € 0.24 /kWh  
 Annual electricity costs: **€ 216.000**

**25% leakage cost: 54.000 € per year!**



## Display and function in detail



### Search for leaks

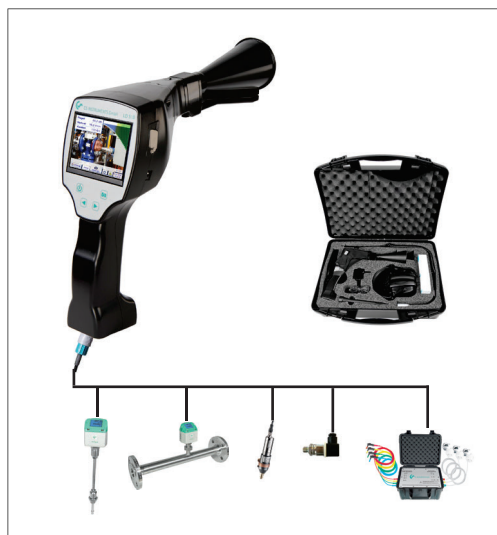
The ultrasound, which is inaudible to the human ear, is made audible via headphones. Loud ambient noises are faded out.

The device indicates the leakage rate in (l/min or cfm) and the savings potential in (€ /year) on the display. Currency can be set as required. This data is saved together with the photo.

With the LD 500/510, the smallest leaks, even over long distances (0.1 l/min corresponds to approx. 1 € p.a.) can also be tracked and documented.

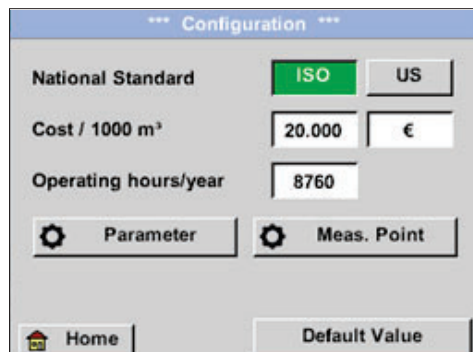


DESCRIPTION	ORDER NO.
<b>LD 500 set consisting of:</b>	0601 0105
LD 500 leak detector with acoustic trumpet and integrated camera, 100 leak tags for marking the leaks on site	0560 0105
<b>NEW: Integrated laser distance measurement</b>	Z554 5000
Transport case	0554 0106
Sound-proof headset	0554 0104
Focus tube with focus tip	0530 0104
AC adapter plug	0554 0009
Spiral cable for connecting the ultrasonic sensor, length 2m (extended)	020001402
Holster with shoulder strap for LD 500/510	020001795



DESCRIPTION	ORDER NO.
<b>LD 510 set consisting of:</b>	0601 0106
LD 510 leak detector incl. acoustic trumpet, with integrated camera and additional input for external sensors, 100 leak tags for marking the leaks on site	0560 0106
<b>NEW: Integrated laser distance measurement</b>	Z554 5000
Transport case	0554 0106
Sound-proof headset	0554 0104
Focus tube with focus tip	0530 0104
AC adapter plug	0554 0009
Spiral cable for connecting the ultrasonic sensor, length 2m (extended)	020001402
Holster with shoulder strap for LD 500/510	020001795

## Easy documentation in the LD 500 / UltraCam LD 500 directly on site



\*\*\* Configuration \*\*\*

National Standard: **ISO** (selected) | US

Cost / 1000 m<sup>3</sup>: **20.000** | €

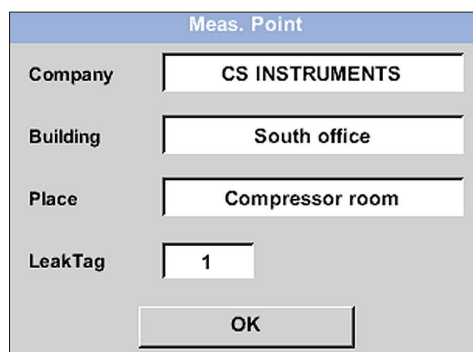
Operating hours/year: **8760**

Parameter (gear icon) | Meas. Point (gear icon)

Home (house icon) | Default Value

### Entering the compressed air costs in the unit

Depending on the electricity costs, the costs per 1000 m<sup>3</sup> (or per 1000 cf) can be freely entered in any currency



Meas. Point

Company: **CS INSTRUMENTS**

Building: **South office**

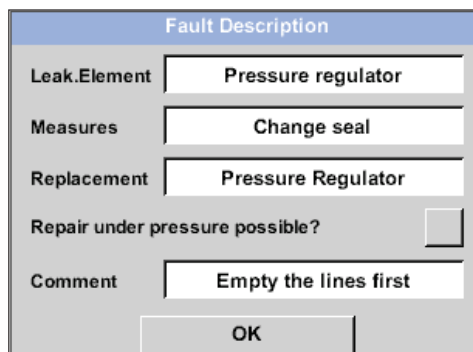
Place: **Compressor room**

LeakTag: **1**

OK

### Define the location

The location of each leak can be stored:  
Company / building / location



Fault Description

Leak.Element: **Pressure regulator**

Measures: **Change seal**

Replacement: **Pressure Regulator**

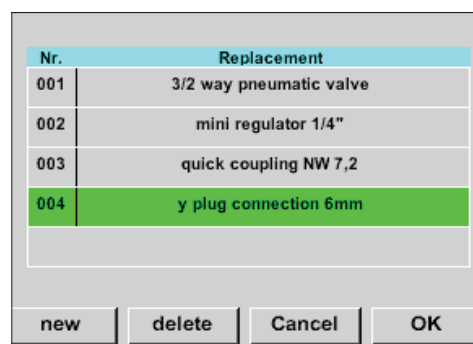
Repair under pressure possible? ☐

Comment: **Empty the lines first**

OK

### Remedy the leak

Efficiency and clarity also for elimination of leaks. Definition of the necessary spare parts and maintenance work already on site.



Nr.	Replacement
001	3/2 way pneumatic valve
002	mini regulator 1/4"
003	quick coupling NW 7,2
004	y plug connection 6mm

new | delete | Cancel | OK

### Spare parts list in the device

The software can be used to transfer a custom spare parts list to the device. The device offers an intelligent search function with auto-complete feature. The list with the required spare parts can be exported from the CS Leak Reporter software.

Use the reporting software to quickly and efficiently produce an ISO 50001 report



## CS Leak Reporter – cloud solution




Ideal for leak detection service providers and for companies/ major corporations with multiple locations.

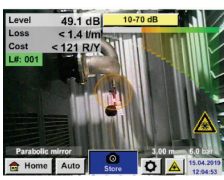
- Each “user” in the leakage search team can be assigned a role (e.g. leakage search, leakage repair, monitoring, checking for success)
- Access rights to individual or all projects can be assigned individually to each user
- The browser-based software ensures a common database in real time and paperless documentation



## CS Leak Reporter – PC solution

Creates detailed ISO 50001 reports. Provides an illustrated overview of the leaks found and their savings potential. Measures for elimination, including status display, can be defined for every leak – license for two computers

Leakage Report	Start: 15/04/2019	End: 25/04/2019	Duration: 10 day(s)
<b>Contact details:</b> Company: Acme Address: ... E-mail: johnacme@sample.com Phone: ... Logo: 			
<b>Customer:</b> Acme 1 Sample St., 12345 Sampletown j.sample@acme.com +49 1234 567890 			
<b>Auditor:</b> John Sample 1 Sample St., 12345 Sampletown j.sample@acme.com +49 1234 567890 			
<b>Project master data:</b> Import date: CO <sub>2</sub> emissions: 0.527 kg/kWh Cost calculation basis: Energy costs (70%) Specific output: 0.12 kWh/m <sup>3</sup> Compressed air costs: 21.6 €/1000 m <sup>3</sup> Electricity price: 0.18 €/kWh Operating hours per year: 4350 h			
<b>Results:</b> Number of leaks: 141 Total leakage amount: 718.126 ltr/min Total costs per year: 4,048.49 € Total CO <sub>2</sub> per year: 11.91 tonnes			
<b>Improvements:</b> Number remedied: 1 Leakage amount saved: 3.468 ltr/min Costs saved per year: 19.55 € CO <sub>2</sub> saved per year: 0.06 tonnes			

	<b>Leak tag:</b> 1	<b>Building – location:</b> COMPRESSOR ROOM 1 <b>Date and time:</b> 15/04/2019 12:06:03 <b>Leakage rate:</b> < 1.395 ltr/min <b>Costs per year:</b> < 7.86 € <b>Total CO<sub>2</sub> per year:</b> 0.02 tonnes <b>Priority:</b> Low <b>Comment:</b> Replace ball valve	<b>Repair under pressure possible?</b> - No <b>Error:</b> Ball valve defective <b>Spare part:</b> 1/2" ball valve <b>Action:</b> Replace <b>Note:</b> - <b>Status:</b> Open <b>Remedied on:</b> - <b>Remedied by:</b> -
	<b>Leak tag:</b> 2	<b>Building – location:</b> COMPRESSOR ROOM 1 <b>Date and time:</b> 15/04/2019 12:08:19 <b>Leakage rate:</b> 2.519 ltr/min <b>Costs per year:</b> 14.2 € <b>Total CO<sub>2</sub> per year:</b> 0.04 tonnes <b>Priority:</b> High <b>Comment:</b> Reestablish flange seal	<b>Repair under pressure possible?</b> - No <b>Error:</b> Flange leaking <b>Spare part:</b> DN 100 flange seal <b>Action:</b> Reestablish seal <b>Note:</b> - <b>Status:</b> Done <b>Remedied on:</b> 16/04/2019 <b>Remedied by:</b> AM

## Accessories included in the set:



### Headset

The noise-proof headset enables leak detection even in an extremely loud environment. The ambient noise is faded out, and the leakage (inaudible ultrasonic sound) is transformed into an audible signal



### Holster with shoulder strap

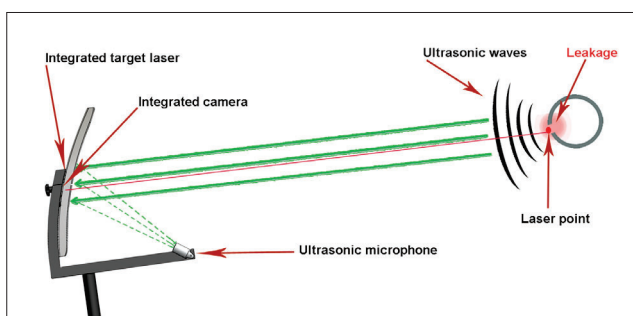
For the LD 500/510, enables ergonomic and safe work



### Focus tube with focus tip

For pinpoint detection of the smallest leaks in confined spaces

## Professional accessory – parabolic mirror



By focusing the ultrasonic waves in the parabolic mirror, even the smallest leaks of 0.8 l/min (approx. € 8 p.a.) can be located with pinpoint precision ( $\pm 15$  cm) at a distance of up to 10 to 15 m.

The shape of the parabolic mirror ensures that only ultrasonic waves of the targeted leak are evaluated. Background noise is reduced to a minimum.

## Accessories



### DESCRIPTION

Gooseneck for leak detection at sites which are difficult to access (length 600 mm)

### ORDER NO.

0530 0105

Gooseneck for leak detection at sites which are difficult to access (length 1500 mm)

0530 0108

Gooseneck High Sensitivity for leak detection on vacuum systems and for leak testing (length: 600 mm)

0530 0110



### DESCRIPTION

Parabolic mirror with laser distance measurement for leak detection in long distances, incl. transport case

### ORDER NO.

0530 0206

Parabolic mirror for leak detection at long distances, incl. transport case

0530 0106



### DESCRIPTION

Ultrasonic tone generator for leak testing. A handy ultrasonic tone generator is available for detecting leaks in systems that are not under pressure. The transmitter is positioned so that the sound can enter the pipe system. The ultrasonic signal penetrates the smallest openings, which can then be detected with the LD 500

### ORDER NO.

0554 0103

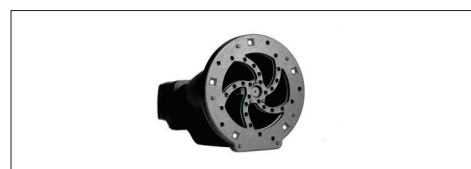


### DESCRIPTION

500 leak tags for marking the leaks on site

### ORDER NO.

0530 0107



### DESCRIPTION

UltraCam – funnel with integrated camera, 30 ultrasonic microphones for visualisation of leakages – for retrofitting to existing LD 500 / LD 510

### ORDER NO.

Z554 5500



## Software



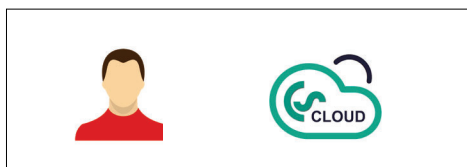
DESCRIPTION	ORDER NO.
<b>CS Leak Reporter V2</b> Creates detailed ISO 50001 reports. Provides an illustrated overview of the leaks found and their savings potential. Measures for elimination, including status display, can be defined for every leak – license for two computers  New functions: <ul style="list-style-type: none"> <li>- Simple spare parts management</li> <li>- Histogram functions for documenting continuous improvement in accordance with ISO 50001 on the company or building level</li> </ul>	0554 0205



DESCRIPTION	ORDER NO.
CS Leak Reporter V2 – additional licence for one computer	Z554 0205CS

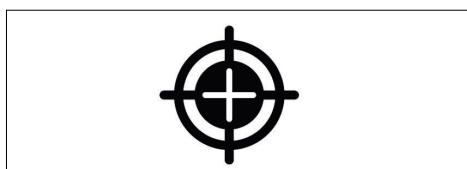


DESCRIPTION	ORDER NO.
<b>CS Leak Reporter – cloud solution</b> Basic package: Browser-based access to the CS Cloud. Advantages: <ul style="list-style-type: none"> <li>- Common database of all users in real time.</li> <li>- Cross-location work in a team</li> <li>- Paperless documentation.</li> <li>- Unlimited number of guest logins (read-only rights) can be set up.</li> </ul> Only available in combination with at least one CS Cloud (0554 0306) user licence.	0554 0305



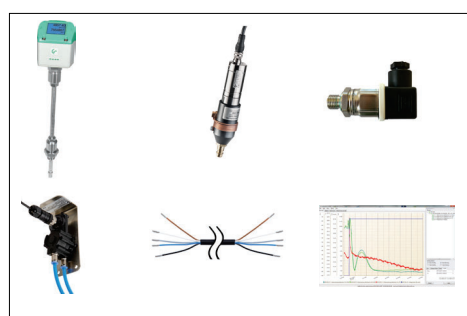
DESCRIPTION	ORDER NO.
<b>User licence – CS Cloud</b> 1 user / 12 months for CS Leak Reporter Cloud solution use.	0554 0306
Term extension - 1 user / 12 months for CS Leak Reporter Cloud solution use.	0554 0307

## LD 500/510 calibration



DESCRIPTION	ORDER NO.
LD 500/LD 510 re-calibration / UltraCam LD 500/510	0560 3333

## Additional sensors / accessories for connection to LD 510



DESCRIPTION	ORDER NO.
FA 510 dew point sensor for mobile devices, -80...+20 °Ctd incl. mobile measuring chamber, 5 m connection cable and perforated protection cap	0699 1510
VA 500 flow probe, max. version (185 m/s), probe length 220 mm, incl. 5 m connection cable	0695 1124
Standard pressure probe CS 16, 0...16 bar, ± 1% accuracy of f.s.	0694 1886
Differential pressure probe 1.6 bar diff.	0694 3561
Connection cable for pressure, temperature or external sensors on mobile instruments, 5 m	0553 0501
CS Basic – data evaluation in graphic and table form – readout of the measured data via USB or Ethernet. License for two workstations	0554 8040

## Calculation

Costs per year						
Pressure	Size of leak – diameter (mm)					
	0.5 mm	1.0 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
3 bar	€ 90	€ 361	€ 812	€ 1,444	€ 2,256	€ 3,248
4 bar	€ 113	€ 451	€ 1,015	€ 1,805	€ 2,820	€ 4,061
5 bar	€ 135	€ 541	€ 1,218	€ 2,166	€ 3,384	€ 4,873
6 bar	€ 158	€ 632	€ 1,421	€ 2,527	€ 3,948	€ 5,685
7 bar	€ 180	€ 722	€ 1,624	€ 2,888	€ 4,512	€ 6,497
8 bar	€ 203	€ 812	€ 1,827	€ 3,248	€ 5,076	€ 7,309

Table: Leakage costs in one year with 24-hour operation 365 days per year calculated with compressed air costs of 1.9 ct/Nm<sup>3</sup>.

### TECHNICAL DATA OF THE LD 500 / LD 510

<b>Operating frequency:</b>	40 kHz ± 2 kHz
<b>Connections:</b>	3.5 mm stereo jack for headset, power supply socket for connecting an external charger
<b>Laser:</b>	Wavelength: 630...660 nm Output power: < 1 mW (laser class 2)
<b>Display:</b>	3.5" touch screen
<b>Interface:</b>	USB interface
<b>Data logger:</b>	16 GB SD memory card (100 million values)
<b>Power supply:</b>	Internal rechargeable Li-Ion batteries, approx. 9 h continuous operation (without UltraCam), 6 h continuous operation (with UltraCam) 4 h charging time
<b>Operating temperature:</b>	-5...+50 °C
<b>EMC:</b>	DIN EN 61326
<b>Auto level:</b>	Automatically adapts the sensitivity to the environment and reliably eliminates ambient noise
<b>Sensitivity:</b>	min: 0.1 l/min at 6 bar, 5 m distance, approx. € 1/year of compressed air costs
<b>Weight without headset:</b>	540 grams (without UltraCam), 698 grams (with UltraCam)

### TECHNICAL DATA OF EXTERNAL SENSOR INPUT (LD 510 ONLY)

<b>Measuring range:</b>	See external CS sensors
<b>Accuracy:</b>	See external CS sensors
<b>Power supply:</b>	Output voltage: 24 VDC ± 10% Output current: 120 mA in continuous operation