

# 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(e) x 6000 OpHrs x € 0.12/kWh  
 Annual electricity costs: **€ 180,000**

25% leakage cost: **27,000 €** per year!



## 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.

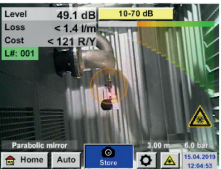

- Each “user” in the leakage search team can be assigned a role (e.g. leakage search, leakage repair, monitoring, checking for success)
- Access rights to individual or all projects can be assigned individually to each user
- The browser-based software ensures a common database in real time and paperless 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>	<b>Customer:</b>	<b>Auditor:</b>	
Company:	Acme	John Sample	
Address:	...	1 Sample St., 12345 Sampletown	
E-mail:	johnacme@sample.com	j.sample@acme.com	
Phone:	...	+49 1234 567890	
Logo:			
<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>		<b>Improvements:</b>	
Number of leaks:	141	Number remedied:	1
Total leakage amount:	718.126 ltr/min	Leakage amount saved:	3.468 ltr/min
Total costs per year:	4,048.49 €	Costs saved per year:	19.55 €
Total CO <sub>2</sub> per year:	11.91 tonnes	CO <sub>2</sub> saved per year:	0.06 tonnes

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

## Sensors:

## Accessories:



### Acoustic trumpet

Focuses the sound waves of small leaks, thereby amplifying the audible noise. The laser enables precise detection. Integrated laser distance measurement



### 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



### Parabolic mirror

For leak detection at great distances. Laser pointer and camera integrated



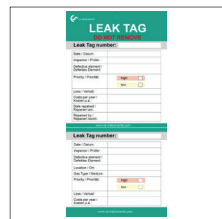
### Holster with shoulder strap

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



### Leak tags

As hardcopies for documentation on site



### Gooseneck

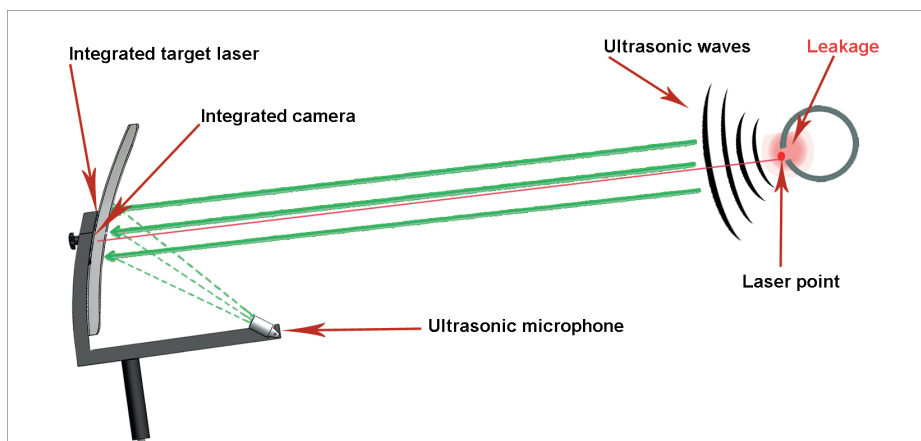
Enables pinpoint detection of the leak in places that are difficult to access. Background noise is faded out



### Ultrasonic tone generator

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

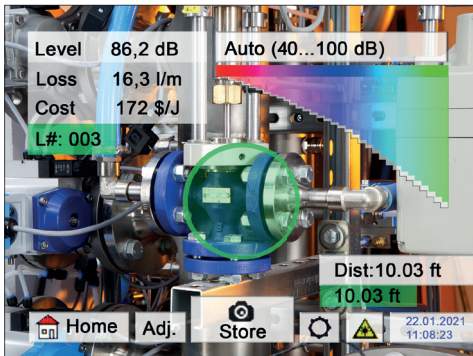
## Professional accessory – parabolic mirror



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.

## Easy documentation in the device directly on site



### Detect a leak

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.

**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

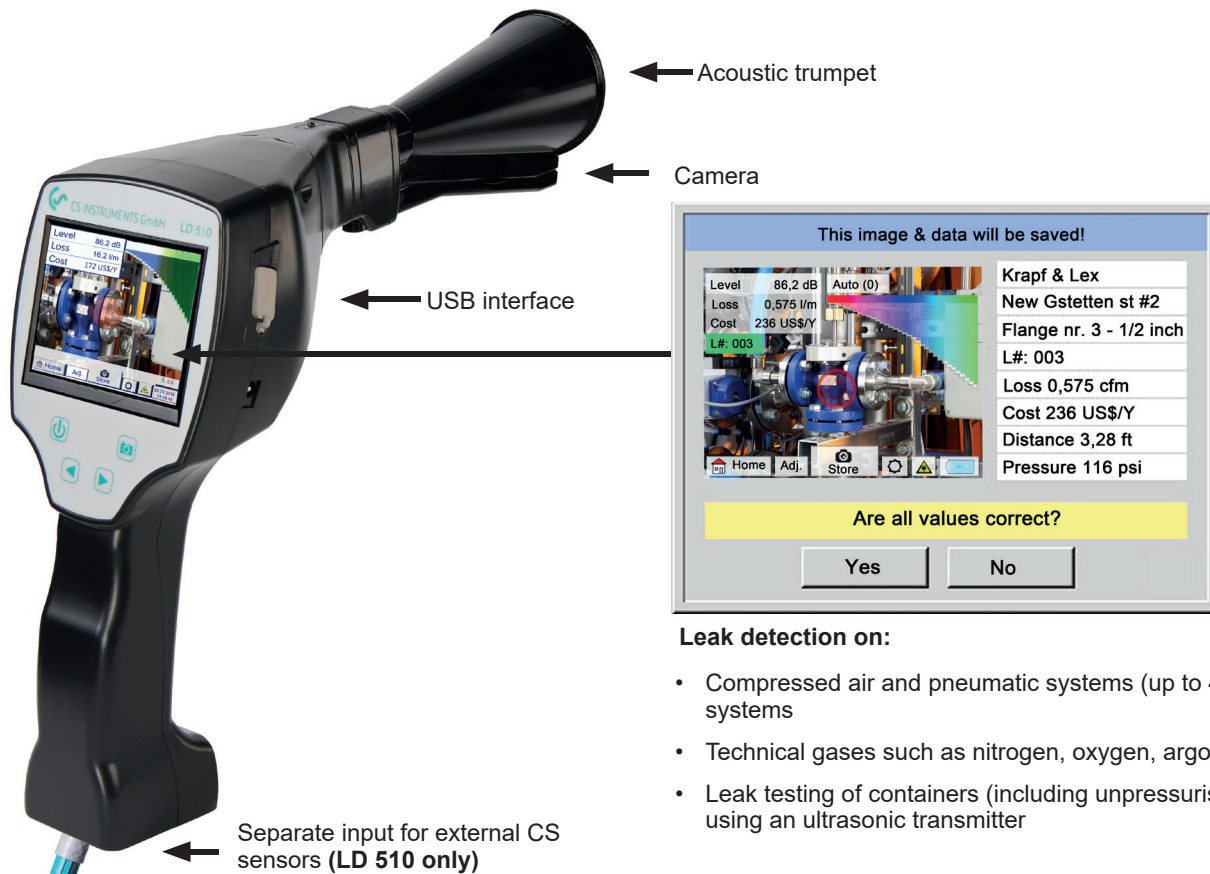
### Spare parts list in the device

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.

## The LD 500/510 in detail

The new leakage meters LD 500/LD 510 with integrated camera and leakage calculation are ideal measuring devices which help to easily find and document even the smallest leaks (0.1 l/min corresponds to approx. € 1 per year) even at great distances.

LD 510 is the world's first leakage meter with an additional freely assignable sensor input for all CS sensors. In addition to leakage measurement and detection, all necessary measurements relating to dew point, flow, pressure, temperature, ... can also be carried out.

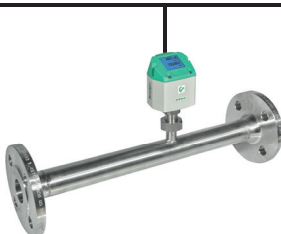


### Leak detection on:

- Compressed air and pneumatic systems (up to 40 bar) and vacuum systems
- Technical gases such as nitrogen, oxygen, argon, ...
- Leak testing of containers (including unpressurised containers) using an ultrasonic transmitter



Flow meter  
**VA 500**



Flow meter  
**VA 520**



Dew point sensor  
**FA 510**



Pressure sensor



Current/effective  
power meters

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>.



Transport case – LD 500/510



Transport case – Parabolic mirror

### 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, 4 h charging time
<b>Ambient temperature:</b>	0...+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

### 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



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:</b> Integrated laser distance measurement	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:</b> Integrated laser distance measurement	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

## Accessories



DESCRIPTION	ORDER NO.
Gooseneck for leak detection at sites which are difficult to access (length 600 mm)	0530 0105
Gooseneck for leak detection at sites which are difficult to access (length 1500 mm)	0530 0108



DESCRIPTION	ORDER NO.
Parabolic mirror for leak detection at long distances, incl. transport case	0530 0106



DESCRIPTION	ORDER NO.
Ultrasonic tone generator for leak testing	0554 0103



DESCRIPTION	ORDER NO.
500 leak tags for marking the leaks on site	0530 0107

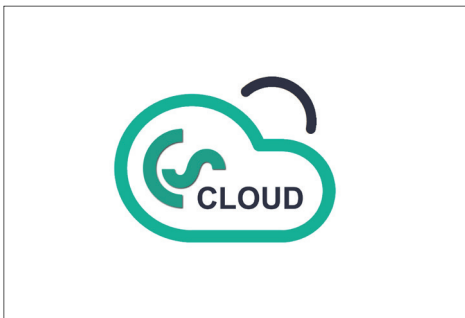
## Software



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: - Simple spare parts management - Histogram functions for documenting continuous improvement in accordance with ISO 50001 on the company or building level	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: - Common database of all users in real time. - Cross-location work in a team - Paperless documentation. - Unlimited number of guest logins (read-only rights) can be set up. Only available in combination with at least one CS Cloud (0554 0306) user licence.	0554 0305



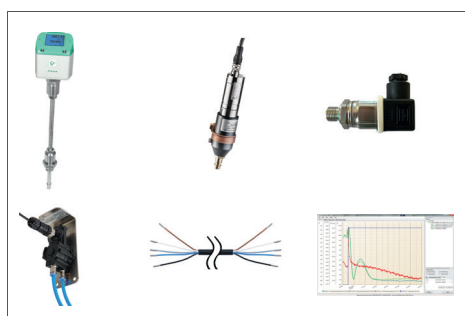
DESCRIPTION	ORDER NO.
<b>User licence – CS Cloud</b> 1 user / 12 months for CS Leak Reporter Cloud solution use.	0554 0306

## LD 500/510 calibration



DESCRIPTION	ORDER NO.
LD 500/LD 510 re-calibration	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