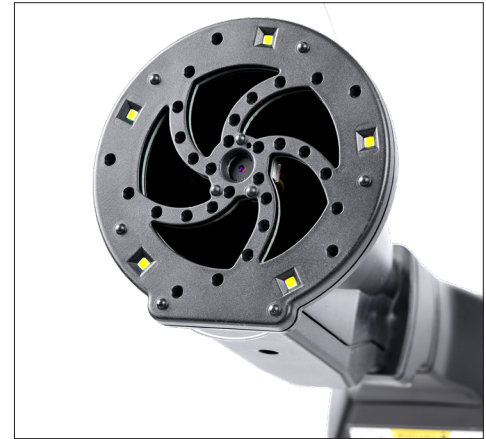





# UltraCam LD 500/510 – visualises the leaks directly in the image





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


- 


Enormous time saving compared to traditional leak detectors
- 


30 MEMS microphones create the image of the leaks
- 


Brightness sensor activates LEDs in dark surroundings
- 


Available as upgrade for LD 500/510
- 


**NEW:** Multi-user capable through cloud solution
- 

**NEW:** Unique laser distance measurement for automatic cost determination (e.g. 6' 11")
- 

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

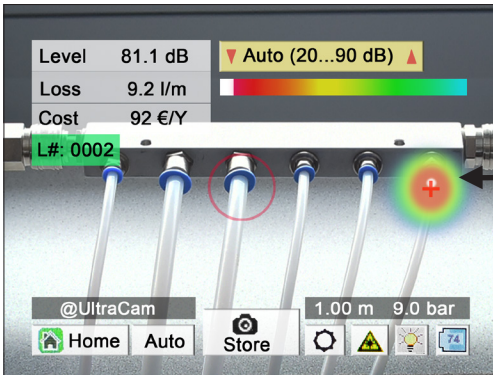
Photograph leaking parts
- 

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

Create a report in accordance with ISO 50001
- 

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

## Display and function in detail



The UltraCam LD 500/510 uses 30 MEMS microphones to calculate and visualise the ultrasound image. In addition, the device makes inaudible ultrasound audible

Advantage over the **traditional leak detectors**:

Visual representation of the leakage in the live image, even in noisy environments during production

To **determine the leakage rate**, the user aims the laser directly at the leakage. Leakage, laser and red circle must be on top of each other in the image. Then, the **leakage rate in l/min or cfm** and the **costs in €/year** are determined exactly. The distance is measured automatically.



DESCRIPTION	ORDER NO.
<b>Set UltraCam with leak detector LD 500:</b>	0601 0205
LD 500 leak detector with UltraCam, integrated camera, 30 ultrasonic microphones for visualisation of the leakage on the screen, incl. 100 leak tags	0560 0205
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>Set UltraCam with leak detector LD 510:</b>	0601 0206
LD 510 leak detector with UltraCam, integrated camera, 30 ultrasonic microphones for visualisation of the leakage on the screen, incl. 100 leak tags	0560 0206
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

Reporting software see page 137  
For further accessories, refer to pages 138-139

## LD 500/510 – Leak detector with camera – shows leakage rate in cfm and cost in \$



The LD 500 meets the requirements of class 1 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:

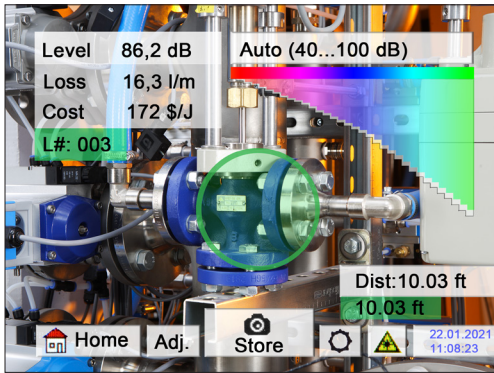
#### Sample calculation for a medium-sized company:

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.

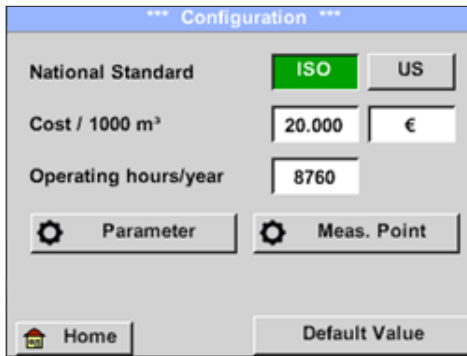


DESCRIPTION	ORDER NO.
<b>LD 500 set consisting of:</b>	0601 0105
LD 500 leak detector with acoustic trumpet and integrated camera, 100 leak tags for marking the leaks on site	0560 0105
<b>NEW:</b> Integrated laser distance measurement	Z554 5000
Transport case	0554 0106
Sound-proof headset	0554 0104
Focus 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

## 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 | €

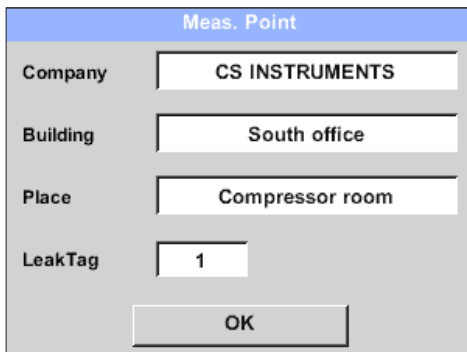
Operating hours/year: 8760

Parameter | Meas. Point

Home | 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

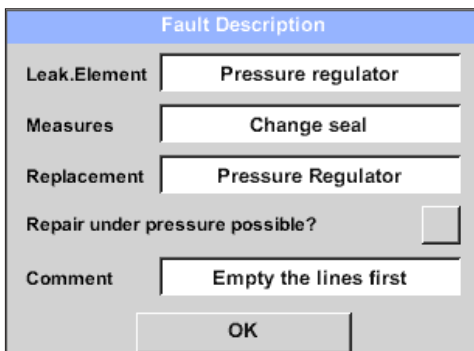
Place: Compressor room

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

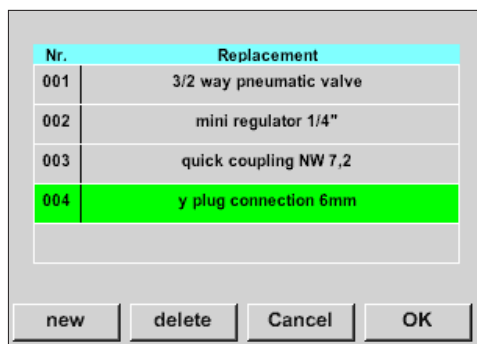
Repair under pressure possible?

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.


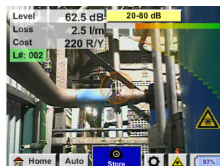
- Each “user” in the leakage search team can be assigned a role (e.g. leakage search, leakage repair, monitoring, checking for success)
- Access rights to individual or all projects can be assigned individually to each user
- The browser-based software ensures a common database in real time and paperless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

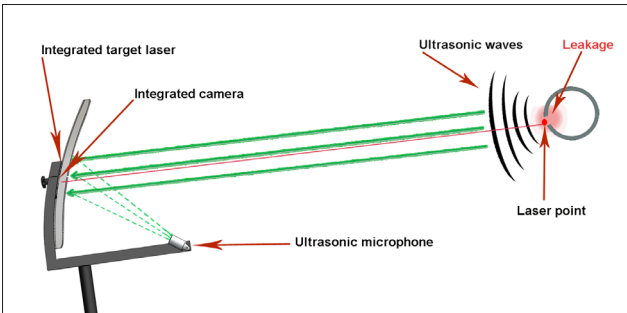
For the LD 500/510, enables ergonomic and safe work



### 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



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. - 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



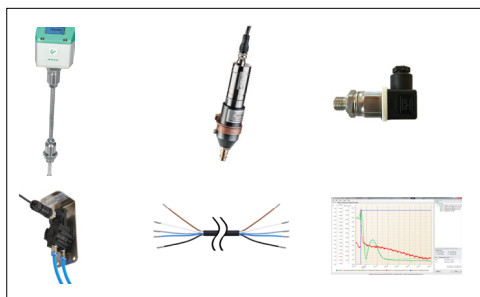
DESCRIPTION	ORDER NO.
<b>User licence – CS Cloud</b> 1 user / 12 months for CS Leak Reporter Cloud solution use.	0554 0306
Term extension - 1 user / 12 months for CS Leak Reporter Cloud solution use.	0554 0307

## LD 500/510 calibration



DESCRIPTION	ORDER NO.
LD 500/LD 510 re-calibration	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 (607 ft/s), probe length 220 mm(8,6 inch), incl. 16 ft connection cable	0695 1124
Standard pressure probe CS 16, 0...232 psi, ± 1% accuracy of f.s.	0694 1886
Differential pressure probe 23.2 psi diff.	0694 3561
Connection cable for pressure, temperature or external sensors on mobile instruments, 16 ft	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

Supply Pressure psig	Cost of Air Leaks and Open Lines											Atmosphere
	Orifice Diameter in Inches											
	1/64	1/32	1/16	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1	
	Leakage Rate in CFM at Supply Pressure											Cost/kWh
70	0.30	1.20	4.80	19.19	76.76	172.71	307.04	479.75	690.83	940.30	1228.15	\$0.120
SCF/Year	157,165	628,659	2,514,637	10,058,546	40,234,194	90,526,937	160,936,776	251,463,713	362,107,746	492,868,877	643,747,104	
kWh/Year	488	1,953	7,813	31,253	125,011	281,275	500,044	781,319	1,125,099	1,531,385	2,000,176	Hours/Day
Cost	\$59	\$234	\$938	\$3,750	\$15,001	\$33,753	\$60,005	\$93,758	\$135,012	\$183,766	\$240,021	24.0
80	0.34	1.34	5.36	21.46	85.82	193.10	343.29	536.39	772.40	1051.32	1373.15	Days/Week
SCF/Year	175,720	702,881	2,811,525	11,246,099	44,984,394	101,214,887	179,937,576	281,152,463	404,859,546	551,058,827	719,750,304	7
kWh/Year	546	2,184	8,736	34,943	139,770	314,483	559,081	873,564	1,257,932	1,712,186	2,236,324	Weeks/Year
Cost	\$66	\$262	\$1,048	\$4,193	\$16,772	\$37,738	\$67,090	\$104,828	\$150,952	\$205,462	\$268,359	52.0
90	0.37	1.48	5.93	23.72	94.88	213.49	379.54	593.03	853.96	1162.33	1518.15	hp / scfm
SCF/Year	194,276	77,103	3,108,412	12,433,649	49,734,594	111,902,837	198,983,376	310,841,213	447,611,346	609,248,777	795,753,504	0.25
kWh/Year	604	2,415	9,658	38,632	154,530	347,691	618,118	965,810	1,390,766	1,892,987	2,472,472	
Cost	\$72	\$290	\$1,159	\$4,636	\$18,544	\$41,723	\$74,174	\$115,897	\$166,892	\$227,158	\$296,697	
100	0.41	1.62	6.50	25.99	103.95	233.88	415.79	649.67	935.52	1273.35	1663.15	
SCF/Year	212,831	85,325	3,405,300	13,621,199	54,484,794	122,590,787	217,939,176	340,529,963	490,363,146	667,438,727	871,756,704	
kWh/Year	661	2,645	10,581	42,322	169,289	380,900	677,155	1,058,055	1,523,599	2,073,788	2,708,621	
Cost	\$79	\$317	\$1,270	\$5,079	\$20,315	\$45,708	\$81,259	\$126,967	\$182,832	\$248,855	\$325,034	
125	0.49	1.98	7.91	31.65	126.60	284.86	506.41	791.27	1139.43	1550.89	2025.65	
SCF/Year	259,220	1,036,880	4,147,518	16,590,074	66,360,294	149,310,662	265,441,176	414,751,838	597,242,646	812,913,601	1,061,764,704	
kWh/Year	805	3,222	12,887	51,547	206,187	463,921	824,748	1,288,669	1,855,683	2,525,790	3,298,991	
Cost	\$97	\$387	\$1,546	\$6,186	\$24,742	\$55,670	\$98,970	\$154,640	\$222,682	\$303,095	\$395,879	

### 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), 6h (with UltraCam), 4 h charging time
<b>Operating temperature:</b>	-41...+122°F
<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>	1.19 lbs (without UltraCam), 1.54 lbs (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