



**USER**  

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**GUIDE**

LKS  
1000  
**V2+**  
**IR**



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# PACK LKS1000 V2+IR



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# WHAT IS A LEAKSHOOTER®?

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LEAKSHOOTER® LKS1000 V2+ IR is a portable ultrasonic detection camera that helps **locate, hear, view, measure and record leaks which emit ultrasounds**. It can also estimate the leak flow and the leak cost with **the dedicated K cost estimator function**.

LEAKSHOOTER® LKS1000 V2+ IR, is also a portable thermal infrared camera that helps locate abnormal temperature problems of an installation (overheating or else).

Main industrial applications are:

- ✓ Compressed air leak detection
- ✓ Compressed process gases leak detection
- ✓ Vacuum leak detection
- ✓ Steam trap or valve condition listening
- ✓ High voltage capacitive default detection (corona, arcing, tracking...)
- ✓ Tightness checking and seal integrity test (with ultrasonic emitter)

- ✓ Thermal analysis (With embedded 160x120 pixels infrared Camera) for Electrical, Mechanical, Process, Building inspection.

## HOW TO WORK WITH LEAKSHOOTER®?

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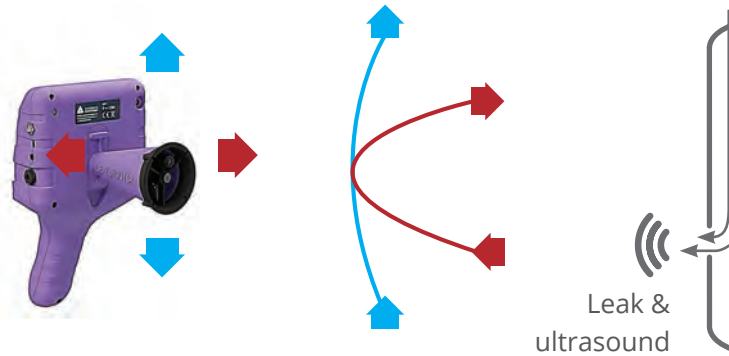
LEAKSHOOTER® LKS1000 has been designed to display in real time the fusion of images of the scene being scanned and the detected ultrasounds coming from a leak (ultrasound received = white or colored dynamic target).

Depending on the leak size (intensity of ultrasonic waves received around 40 kHz) and on the settled sensitivity (GAIN), the dynamic target will be big or small (white).

Of course if you want to know the leak severity, please click on the K function button. The target will then have a severity color (LEAKSCORE from 0 to 100 is made for a 1 meter distance detection).



LEAKSHOOTER® **LKS1000** is equipped with a special MAX RMS value function which thanks to the target, shows you if you are close to the leak (simple round target) or in front of the leak (round target + cross in its center).



The method consists of scanning the scene, conscientiously. From far to close location. Do not forget to decrease GAIN slowly to avoid saturation.

Start with the maximum of sensitivity (GAIN=106 dB, settled when the device is switched ON).

Sweep the scene for example from left to right and from top to bottom, with the aim of going in front of the leak and thus activating the special MAX value, which will remain frozen a few seconds (bold vertical line in the bargraph).

If you still have the white target with cross, everywhere,

it is because you are in a saturated zone. Look on the ground with LEAKSHOOTER®, slightly decrease the GAIN to be in the green part of the bargraph and scan again in such a way as to find a direction in which to go.

Thus, go back to the area to find this special MAX value (align RMS real time and MAX). You will see a cross in the center of the dynamic target. You are in front of the leak.



# DETAIL OF A LEAKSHOOTER®

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# DETAIL OF A LEAKSHOOTER®



# DETAIL OF KEYBOARD

With LEAKSHOOTER® LKS1000 V2+ IR Keyboard



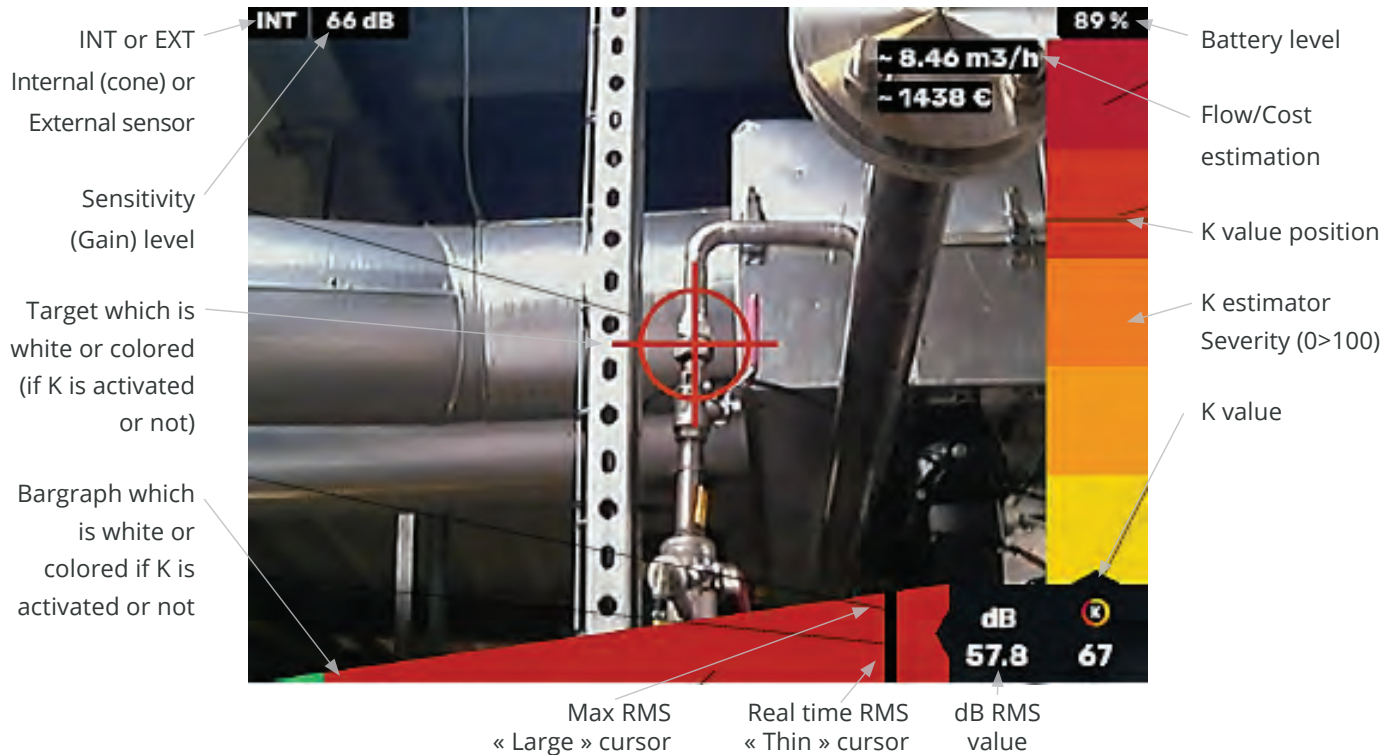
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# DETAIL OF SCREEN



# BATTERY CHARGING

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LEAKSHOOTER® LKS1000 V2+ IR has an internal NiMH (Nickel Metal Hybrid) battery pack technology (6x 1,2V-2600 mAh). To charge this battery pack, please only do it with the delivered charger DC 12V-1,5A.

We recommend if you do not use the LEAKSHOOTER® during a long period, to charge it fully (100%) before to leave it on stock. Maximum recommended charging time is about 2H30. We recommend to not leave your device unattended.



**Please be careful not to charge several times (connect - disconnect - connect...) within a few hours. It could disturb the automatic ending charge detection.**

Feeling some heat at the end of the charging process is normal.

**Note:** Please charge and discharge 1 times completely before to have correct % values of battery state on screen. Autonomy is about 5 hours.

# ON/OFF

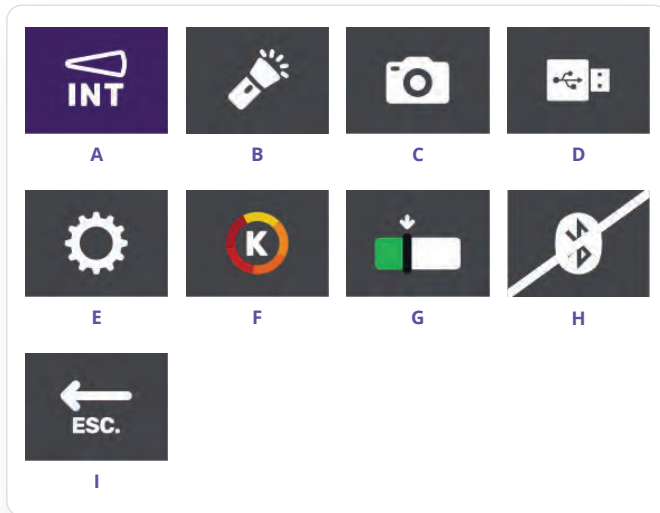
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- Switching ON:  
Briefly press the button , LEAKSHOOTER® starts 5 seconds after initialization.
- Switching OFF:  
Press for a longer time (> 3 seconds) the button , LEAKSHOOTER® goes to switch OFF.





# MAIN MENU (VIA OK BUTTON)

---



- A. INT (cone) or EXT (flexible or contact) sensor
- B. LED light activation
- C. Memory with leakage photos
- D. USB LINK activation
- E. General settings
- F. K (Severity and Estimator of leak flow/cost) settings
- G. Limit of green/white part of bargraph adjustment
- H. Bluetooth activation
- I. Escape icon



- A. It confirms the used sensor between cone (INT) or flexible/contact (EXT).**
- When you connect an external sensor, it is automatically detected as EXT (same when removing it).
- B. To help you to have a better light to take a picture in a dark situation.**
- C. To be able to review stored leakage photos (READ or CANCEL).**
- You can navigate with **+** or **-** buttons and escape with **OK**.
- To cancel a photo, click on the PHOTO button .
- D. To download photos to PC or to update device.**
- Connect your device (ON) to PC with USB cable, activate USB LINK and wait with WINDOWS function.
- Copy / Paste / Delete your photos. Before disconnecting, be sure to eject USB with WINDOWS function.
- E. To set clock/date, luminosity (5 per default), Auto off, frequency mixing (42 kHz per default).**
- F. K (Severity and Estimator of leak flow/cost) settings.**
- If you need a flow/cost estimation, please fulfill h/Y compressor use and Nm<sup>3</sup> cost. To do that, click on the icon and go to the virtual keyboard with . Choose your number and valid it with the virtual keyboard Enter button.
- G. Limit of green/white part of bargraph adjustment.**
- Select this icon and add +0,5 or +1 or +1,5 dB to your cursor with **+** or **-** button, to make it more closed to white part than green part of bargraph when you do not have ultrasounds. It will help for small leak detection (target will be more reactive to small ultrasounds). Valid value with **OK**.
- H. Bluetooth activation**
- Select this icon and put your headphones or your speaker in pairing mode. Wait some seconds and it' will be OK.
- I. Escape icon to go back to measure mode.**



# K, HOW IT WORKS?

Only for industrial compressed air (5 to 8 Bar (72 to 116 Psi)).

On screen, target will go from white (standard mode) to K colored value.

Of course, you can switch OFF/ON this K function with **K** button.



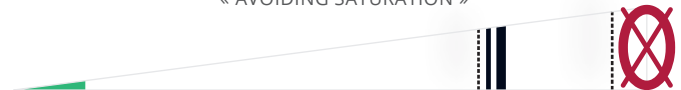
# K, CONDITION OF USE

Only for industrial compressed air (5 to 8 Bar (72 to 116 Psi)).



**1,0m**  
40 in.

« AVOIDING SATURATION »



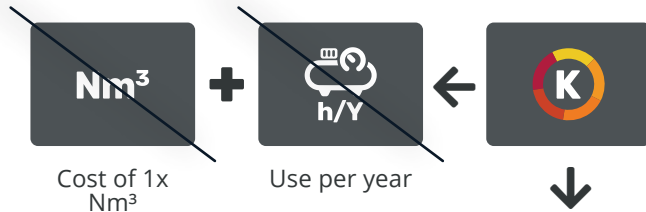
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# K, WITHOUT SETTINGS

IF IN K MENU, SETTINGS ARE = « 0 »



LEAKSCORE NUMBER:

0 to 100, from very small to very big leakage

5 colored levels:

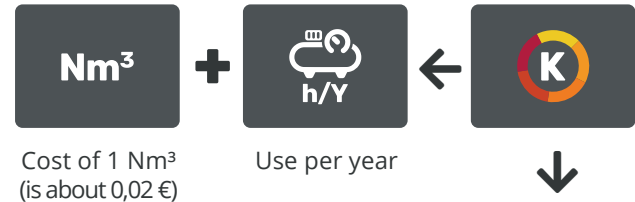
- 0-20 ;
- 20-40 ;
- 40-60 ;
- 60-80 ;
- 80-100

(for about :

- 0.2 m<sup>3</sup>/h;
- 0.6 m<sup>3</sup>/h;
- 3.5 m<sup>3</sup>/h;
- 14.5 m<sup>3</sup>/h;
- 31.7 m<sup>3</sup>/h)

# K, WITH SETTINGS

IF IN K MENU, SETTINGS ARE BOTH  
DIFFERENT THAN « 0 »



LEAKSCORE NUMBER:

0 to 100, from very small to very big leakage

5 colored levels:

- 0-20 ;
- 20-40 ;
- 40-60 ;
- 60-80 ;
- 80-100

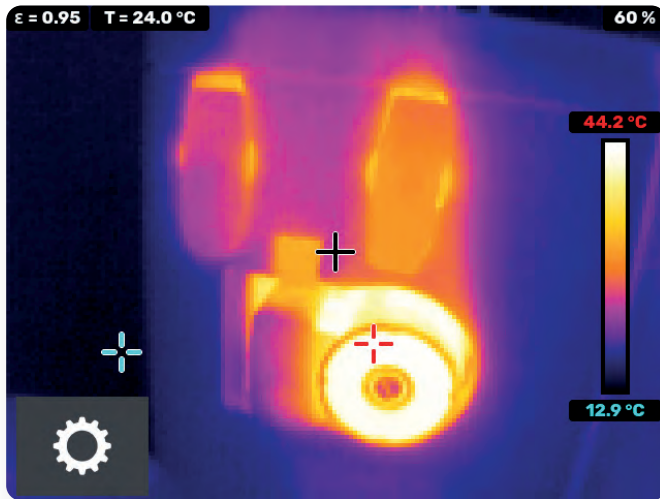
+ Flow m<sup>3</sup>/h





+ Cost/year estimations



# THERMAL CAMERA HOW IT WORKS?

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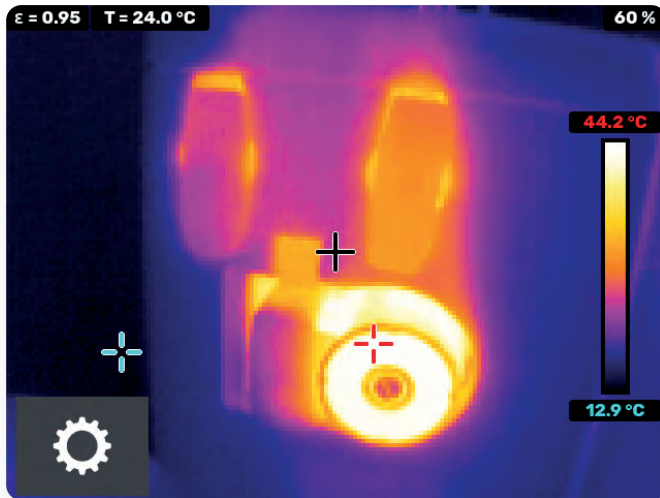


- (-10°C to +200°C (per default) or -10°C to +400°C range) with AUTOSCALING thermal imaging Mode
- You can see 3 cursors: 1x black centered with T° value in left-top corner of the screen, 1x red AUTO Max, 1x blue AUTO Min
- Emissivity  $\epsilon$  can be adjusted with  and  buttons
- Photo can be taken with with 1x click, twice on the PHOTO button  and a name validated with Enter button on the virtual keyboard
-  to go back in ultrasonic measurement mode





# MAIN ICONS USED IN LEAKSHOOTER®



Settings



Color palette : Iron - Rainbow - B&W



Unit: °C - °F



Scale: -10°C > +200°C (±3°C)  
or -10°C > +400°C (±10°C)



Memory: To access to photo in memory



Escape: Return to thermal measurement  
mode



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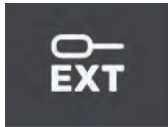
BLUETOOTH setting  
(Headphones or speaker pairing)



AUTO OFF setting



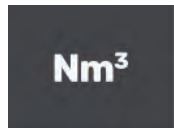
White LED light ON/OFF



Internal or external  
probes



Your use of compressed air / year  
(8.760 h/year for 24h/24h use)



Your Nm<sup>3</sup> compressed air cost  
(for example 0.02 €).  
Use # for special non standard money.



Frequency mixer setting  
(42 kHz per default)



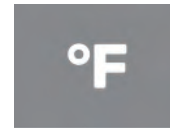
Clock & date settings



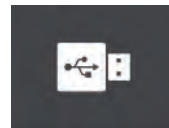
Memory to access to stored photos  
(Visible+IR), 1 directory for leaks,  
1 directory for STRAPSHOOTER®



K settings



T° unit  
for  
thermal  
camera



USB link



# ACCESSORIES LEAKSHOOTER® DETAIL

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- Flexible 400mm
- Flexible 1500mm
- Contact probe
- 12V external battery
- Bluetooth headphones
- Bluetooth speaker
- Holster
- Ultrasonic dome



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# LKS 1000 V2+ IR

## USER

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## GUIDE

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SYNERGYS TECHNOLOGIES has been established in 1996 in France, to offer innovative and professional solutions for preventive and predictive maintenance.

SYNERGYS TECHNOLOGIES is the inventor of the ultrasonic visualization concept with the LEAKSHOOTER®, the thermal contour concept with the TSHOOTER® and of the MCP (Machine Condition Picture) concept with the VSHOOTER®.

We are present worldwide with professional and trained distributors.



**SYNERGYS**  
TECHNOLOGIES

LEAKSHOOTER®,  
VSHOOTER® & TSHOOTER®  
a SYNERGYS TECHNOLOGIES innovation.

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