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Ultrasonic-
Steam Trap Control Device

SONAPHONE KRD

Operating Manual

(10/07)

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General safety instructions for the use of the SONAPHONE KRD

The SONAPHONE KRD corresponds to the state of the art and the safety-relevant rules. The manufacturer did everything to guarantee a safety working. The user have to ensure that the safe use is not impaired. The appliance is work-examined and was delivered in a safe to operate condition.

(1) It is only allowed to use or to connect the provided accessories with SONAPHONE KRD: the headphone, the ultrasonic probes, the temperature probes and the charger.

(2) It is only allowed to use the device by trained persons. Every user who works with the device has to read this user manual at first.

(3) To avoid a device defect the SONAPHONE KRD has to be protected against moisture.

(4) The device and all equipment can be cleaned with a damp cloth. Aggressive detergents can attack the plastic coating and can interfere with the mechanical stability of SONAPHONE KRD.

(5) The accumulator of the SONAPHONE KRD can be charged by the attached charger. The main voltage and the frequency have to be the same as given on the rating plate of the charger.

(6) It is not allowed to open the SONAPHONE KRD or the equipment or to do repairs on your own. Only the manufacturer is allowed to do repairs.

(7) The SONAPHONE KRD and the used probes are proper for a usage at a temperature range of 0...40°C. The permissible storage temperature range is about -10...50°C.

(8) Working with the device SONAPHONE KRD and the probes should be clearly visible. Never work with the probes in areas with non-insulated voltage-carrying parts or without intervisibility in unknown areas. If you locate ultrasonic signals on electrical installations, a sufficient safety distance need to be kept to avoid electrical flash-overs.

(9) Application and handling of structure-borne sound sensors have to be executed with sufficient carefulness so that nobody can get hurt by the cone point of the tip. Use the tubular for the probe on the shoulder-strap of the leather bag if you carry the probe or when it is not in use.

(10) Also use the leather bag with shoulder-strap if you climb stairs, a ladder, platforms and so on, to prevent an accident.

(11) The application of the SONAPHONE K~~RD~~ in strong electromagnetic fields should be avoided.

(12) The SONOTEC Ultraschallsensorik Halle GmbH gives no guaranty and also not for damages of a third party caused by misuse of the appliance.

Scope of delivery *)

testing device SONAPHONE K~~RD~~

Probes

- structure-borne sound sensors

Thermocouple probe

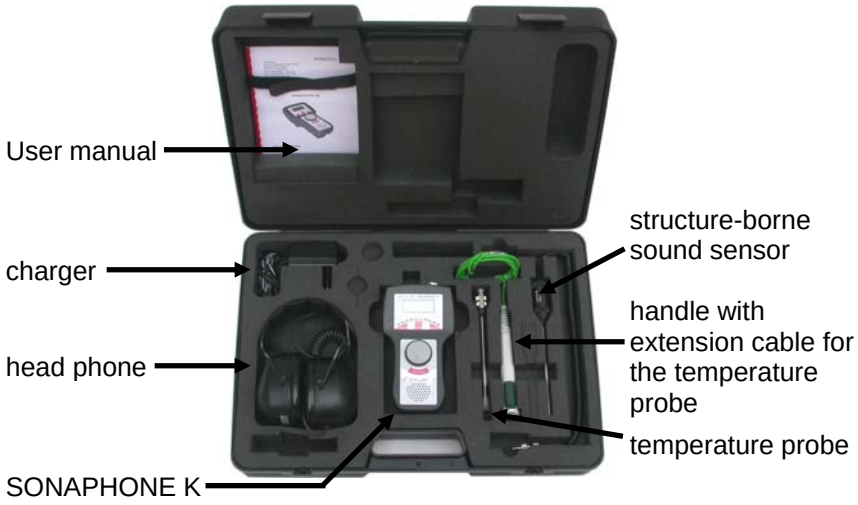
- NiCr-Ni temperature probe (temperature range: 0-800°C)

Accessories

- headphone, soundproofed
- charger
- leather bag
- handle with extension cable for the temperature probe
- transportation case
- operating manual

*) Please notice that the scope of delivery can vary appropriate to your order.

Overall view of the device and the accessories in the transport case



Functional description

At many flow processes of gases, liquids and solids in pipelines and on leakages, ultrasound arise from friction. These ultrasonic signals are received with the SONAPHONE KRD and the intensity gets audible with speaker or headphone. Simultaneously the level of the ultrasound will be displayed on a LCD or a LED-scale, respectively.

Ultrasound can arise out of a multitude of processes for example at leakages within compressed-air-, steam- and vacuum plants. The device is particularly suitable for

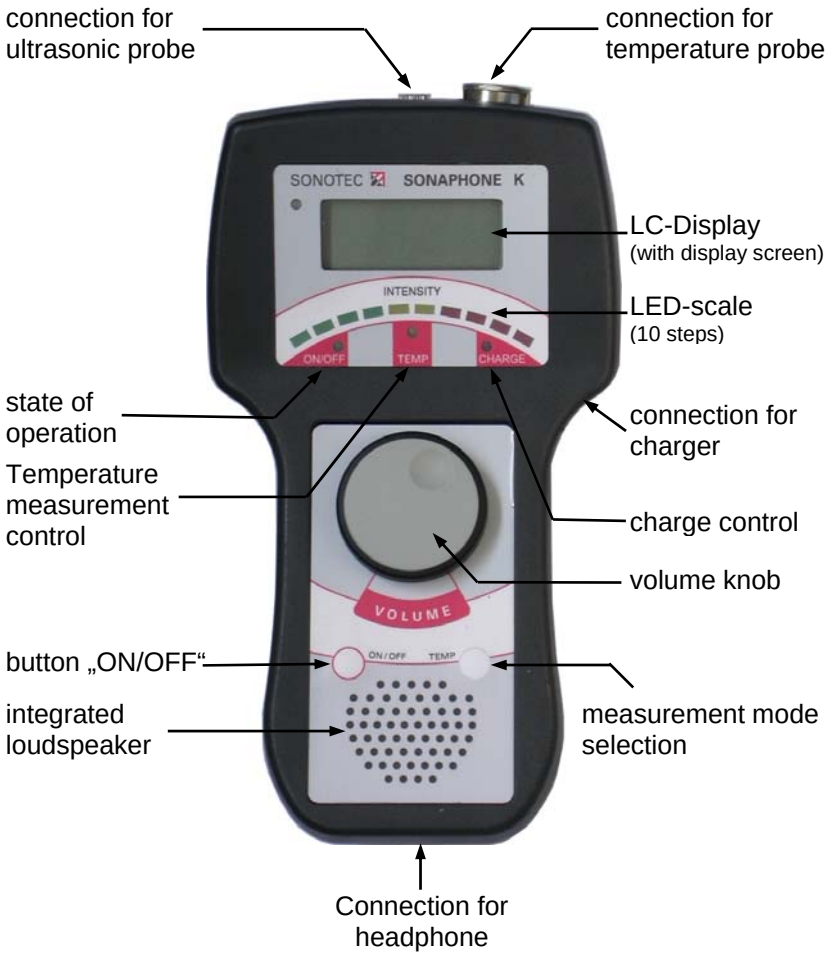
- steam traps
- leaking valves, gate valves, shutoffs, traps in line systems
- roller bearing defects
- cavity on pumps and compressors
- flash-overs and corona discharges on electrical installations

With the help of SONAPHONE KRD, faults can exactly get located and their size can get assessed.

By the use of a thermocouple type K it is possible to measure temperatures in an operative range of 0…800°C with an accuracy of ±2%. The thermocouple measurement is based on a comparative measuring procedure between the probe tip (hot junction) and the other hand of the thermocouple wire (cold junction). In our case the cold junction is the SONAPHONE K. Therefore it is necessary that the temperature of the SONAPHONE K corresponds to the surrounding temperature.

The checking device SONAPHONE K is a battery-supplied, mobile hand-held instrument. For the acquisition of the ultrasound, different probes can be used, which can be connected with a cable or directly to the checking device. For the temperature measurements a thermocouple temperature probe is available, which can be connected with a cable or directly to the testing device.

Connections, operating- and display elements of the SONAPHONE KRD and its functions



Starting up

For switching on or off the device the ON/OFF-button has to be pressed. After an operation time of 10 minutes the device switches off automatically. If the detection is not finished at this moment the SONAPHONE KRD has to be switched on again.

CAUTION!

To prevent hearing damages the volume knob has to be turned to minimum (left stop) before switching on the device. After switching on you can increase the volume until the leackage signal can be determined.

The usage of the structure-borne sound sensor

The usage of the structure-borne sound sensor allows to detect internal switch processes by noise level measurements at a steam trap. Therefore the probe has to be pressed onto the body of it. In a Ball float steam trap e.g. the SONAPHONE K detects internal ball movements, which allows to characterize internal functional expiries.

The usage of temperature probe

The temperature sensor supports this assessment by measuring relations between input, output and body temperature as a function of steam pressure.

The volume can be controlled through the VOLUME knob, where the position influences the intensity of the LED-scale.
Über die Taste MAX kann eine Maximalwerthaltung des Ultraschallpegels ein- bzw. abgeschaltet werden. Diese Funktion unterstützt die Suche nach der größten Ultraschallquelle.

Pressing the MAXTemp button the temperature measurement can be selected.storage of the maximum value of ultrasound signals can be turned on or off. This function allows the user to search for the maximum of the ultrasound source. When this function is active, the yellow LED is lightened.

When the surrounding light is not sufficient, the display screen lights on automatically.

Charging the batteries

If the operating time of the SONAPHONE KRD runs out, you have to recharge the internal batteries. This will be displayed by means of flashing from the green operating mode display. To start charging, you have to connect the plug of the charger (on the right side) with the SONAPHONE KRD. After that you have to plug in the charger. The red charging lamp lights up during charging. If the battery is completely discharged it can take 9 hours for recharging. When the charging is completed, the charging lamp goes off and the charger can be unplugged.

An overcharging protection in the device prevents a device damage caused by overcharging.

The stationary operation via the charger is also possible.

If the red LED sparkles during charging, the SONAPHONE KRD has a defect and has to be sent to the manufacturer for a check.

To improve the life of the batteries, they has to be recharged only when the batteries are completely discharged.

CAUTION!

For charging of the internal batterie only the provided charger is allowed to use.

Structure-borne sound sensor

The structure-borne sound sensors are used to prove ultrasound on solid bodies.

They have to be pressed onto the testing place by hand. Favourable points are those, where within the stream trap flow transitions are arising.

CAUTION!

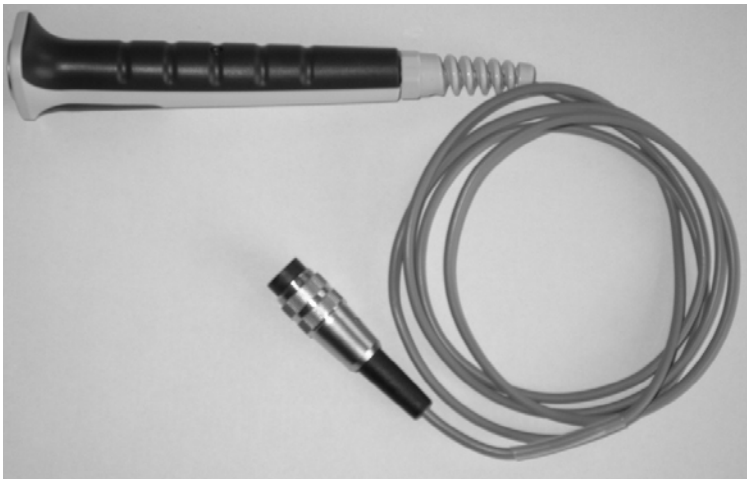
Using the body sound probe pay attention to the general safety instructions for the SONAPHONE K (9).

To aquire reproducible results, the pressure force and the direction have to be constant.

Temperature Probes

The SONAPHONE K allows to measure temperatures in a range of 0°C - 800°C. Therefore a NiCr-Ni thermocouple temperature probe is available, which was constructed particularly for measurements on rough surfaces.

The temperature sensor can be connected to the SONAPHONE K or by the handle with the extension cable.



For receiving good results it is the best to compare the temperatures from the input and the output with each other.

Trouble shooting

Not every trouble is a real defect of the device. You can safe money and time if you remove the cause of a defect yourself. The following hints should be helpfully:

Error	Possible reason	Remedy
device cannot be switched on	batteries are discharged	recharge batteries
no acoustic signal can be proved	volume control is low adjusted	adjust volume
	probe is not securely connected	connect the plug in full
	headphone is not securely connected	connect the plug in full
	device switched off automatically	switch on the device once more
	probe is defective	test with another probe
red charging-LED sparkles	defect of internal accumulators defect of charging circuit	send in the device SONAPHONE K for an inspection

Maintenance

The device SONAPHONE RDK, the probes and the accessories have a solid device construction. Nevertheless, they have to be protected against mechanical damages and heavy impact loads. It is only allowed to use solventless detergents.

The integrated batteries have a lifetime of maximally 1000 charging and discharging processes. For that reason they have to be completely discharged and afterwards recharged in regular intervals. You can discharge the accumulator for example by switching on the device SONAPHONE KRD. The device should be switched on until the green LED will begin to sparkle. Pay attention that the SONAPHONE KRD has an integrated Auto-Power-Off-function which switches off the device 10 minutes after switching on. After that you have to recharge it with the delivered charger until the red charging control light goes off (see section "Charging the batteries“).

Technical data (SONAPHONE KRD)

- operating frequency: about 40 kHz
- plugs: ultrasonic probes
  thermocouple probes
  headphone
  charging power pack
- display: digital on a LC-Display (0..140 scale steps) with backlight or on a LED-scale (10 steps)
- internal loudspeaker
- temperature measurement: thermocouple type K
  range: 0-800°C
- power supply: internal batteries or external charger
- operating time: about 10 hours with internal batteries
- charging time: maximum 9 hours
- dimensions: 190x110x85 mm
- weight: about 500g
- operating temperature: 0°C to + 40°C
- storage temperature: -10°C to + 50°C
- protection: IP 20
- CE conformity: EC directives and laws 89/336/EEC (electromagnetic compatibility)

Warranty

The SONOTEC Ultraschallsensorik Halle GmbH guarantees the SONAPHONE KRD and its accessories for a period of 12 months from the date of purchase. Within the warranty period SONOTEC Ultraschallsensorik Halle GmbH will repair all defects caused by faulty design, workmanship or materials for free. SONOTEC Ultraschallsensorik Halle GmbH will repair or replace the defect device or a part of it at their discretion within the warranty period. This guarantee shall not apply to the internal batteries or to damages caused through misuse, neglect, wear and tear and if the appliance has been dismantled or repaired by a person not authorized by SONOTEC. In addition this warranty does not cover lacks, which impair the value or the useability of the equipment only insignificant.

⇒ Delivery opportunities as well as technical changes are subject to change without notice.