



Steam Trap Testing Equipment
VAPOPHONE

VKP 10

EN
English

Original Installation &
Operating Manual

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Foreword

This Installation & Operating Manual will help you to use the following testing equipment correctly, safely and cost-efficiently:

VKP 10

This steam trap testing equipment is referred to below simply as equipment.

This Installation & Operating Manual is intended for all persons bringing this equipment into service, and operating, using, servicing, cleaning or disposing of the equipment. In particular, the Installation & Operating Manual is aimed at service technicians, trained specialist personnel, and qualified and authorised operating personnel.

Each of the above must have read and understood the content of this Installation & Operating Manual.

Following the instructions in the Installation & Operating Manual helps to avoid danger and increases the reliability and service life of the equipment. In addition to the instructions in this Installation & Operating Manual, compliance with the applicable binding rules on accident prevention in the country and location of use, and with the generally recognised technical regulations for safe and proper working, is essential.

Please also read and follow the instructions in the manufacturers' operating manuals for the data collector, particularly the safety notes.

Availability

Always keep this Installation & Operating Manual in the leather bag for the equipment. Make sure that the Installation & Operating Manual is available to the operator.

The Installation & Operating Manual is part of the equipment package. Hand over this Installation & Operating Manual if you sell or pass on the equipment to a third party.

Formatting features in the document

Different types of information in the Installation & Operating Manual are formatted in different ways.

This helps you to distinguish easily between the following types of information:

Normal text

Cross references

► Lists

► Bullet points in lists

➤ Action to be taken.



These tips contain additional information, e.g. about cost-efficient use of the equipment.

Security

Usage for the intended purpose

The steam trap testing equipment VKP 10 is used for testing steam traps. Do not use or operate the steam trap testing equipment VKP 10 in potentially explosive atmospheres.

Usage for the intended purpose also includes reading and adhering to all instructions in this manual, particularly the safety notes.

Use for the intended purpose also includes compliance with all the instructions given in the manufacturers' operating manuals for the data collector.

This applies in particular to the safety notes.

Any other use of the equipment shall be considered as improper use.

The following usages in particular shall be considered as improper use:

- The use of equipment in potentially explosive atmospheres without explosion protection
- The use of the equipment by untrained personnel

Basic safety notes

Risk of explosion

- Do not use the equipment in potentially explosive atmospheres.

Risk of serious injury

- Make sure that all equipment components are free of damage.
- There is a risk of electric shocks when performing measurements on live valves. Make sure that the valves to be tested are free of voltage.
- The valves to be tested are pressurised and hot. Only perform tests when the following conditions are satisfied:
- Avoid skin contact with the valve to be tested or other system parts.
- Wear suitable protective clothing during all measurements.
- Ensure that there is no escaping fluid around the valve to be tested.
- There is a risk of electric shocks when handling defective components.
- Never open the components of the equipment.
- Never use damaged components.
- Make sure that the cables used to charge the equipment are in perfect condition beforehand.

Information on property damages or malfunctions

- Sudden or strong changes in temperature can lead to condensate build-up in the equipment.
- Following temperature changes, leave the equipment switched off until the equipment temperature acclimatises to the ambient temperature.
 - Allow the device to dry out fully in the event of condensate build-up.
 - There is a risk of malfunctions and damage to electronic components due to static charges. Wear electrically insulating shoes when performing measurements.
- There is a risk of malfunctions and damage to electronic components due to incorrect handling. Never open the components of the equipment.
- Incorrect placement of the sound probe can lead to inaccurate measurement results. Only apply the sensor tip to a bare metallic surface.
- Performing measurements at various locations on a valve can lead to measurement errors. Always apply the sensor tip to the same measuring point. Apply the sensor tip vertically to the surface of the valve.

Personnel qualifications

Specialist personnel must be familiar with and have experience in the following areas:

- ▶ Locally applicable explosion & fire protection and occupational health & safety provisions
- ▶ Work on pressure equipment
- ▶ Working with hazardous (hot or pressurised) fluids
- ▶ All information in this Installation & Operating Manual and other applicable documentation
- ▶ Working with mobile end devices
- ▶ Analysing and interpreting steam trap test results

Protective clothing

The required protective clothing depends on the regulations at the place of work and the media used. Information on suitable protective clothing and PPE can be found in the safety data sheet of the fluid used.

The protective clothing basically consists of the following items:

- ▶ Safety helmet
- ▶ Safety boots
- ▶ Protective gloves
- ▶ Safety goggles

Ear protectors may also be necessary, depending on the noise level of the plant and the locally applicable regulations.

Eye protection may also be necessary, depending on the fluid used in the plant and the locally applicable regulations.

Formatting features for warnings in the document



DANGER

Instructions with the word DANGER warn of a dangerous situation that result in death or serious injury.



WARNING

Instructions with the word WARNING warn of a dangerous situation that may possibly result in death or serious injury.



CAUTION

Instructions with the word CAUTION warn of a situation that may result in minor or moderate injury.

Formatting features for warnings of property damages

Attention!

This information warns of a situation resulting in property damage.

Description

Product package and description of equipment

Scope of supply

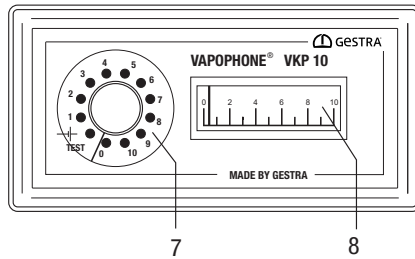
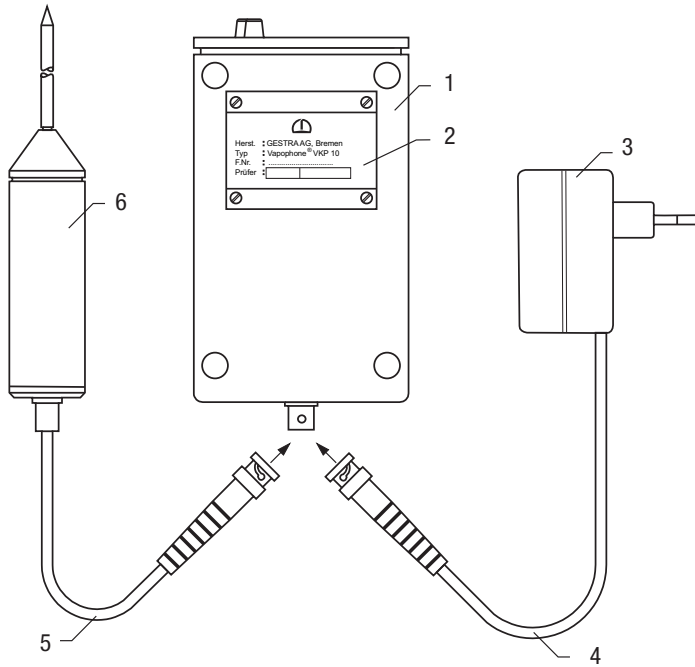
The equipment components are delivered in a leather bag. You must connect the components and charge the batteries prior to use.

The following components are included in delivery

- ▶ Display device
 - ▶ Storage battery (installed in the display device)
- ▶ Sound probe and cable
- ▶ Leather bag
- ▶ Battery charger and cable
- ▶ Operating manual

Equipment specification

VKP 10



No.	Designation or meaning
1	Display device
2	Name plate
3, 4	Battery charger and cable
5, 6	Sound probe and cable

No.	Designation or meaning
6	Sound probe
7	Rotary switch for sensitivity setting
8	Indicator

Task and function

Task

The testing equipment VKP 10 is used to test and analyse steam traps of all types.

The testing equipment consists of a display device and a sound probe.

Function

The testing equipment measures and analyses ultrasonic vibrations that occur when steam flows through functioning steam traps. The ultrasonic vibrations are transferred to the tip of the sensor by pressing the sound probe to the specified point of reference on the trap body. The ultrasonic vibrations are then converted into electric pulses and indicated by the display device. The test equipment VKP 10 signals only vibrations within 40 – 60 kHz, as these frequencies constitute the usual vibration range associated with flowing steam. The user evaluates the sensed ultrasonic vibrations as part of the comparison measurement carried out for reference.

Storing and transporting the equipment

- Install the equipment in the pipe.

Storing the equipment

- Store the equipment solely in the following conditions:
 - ▶ The equipment and all components must be protected against jolts and impacts.
 - ▶ Only store the device in enclosed areas.
 - ▶ Observe the conditions indicated in the technical data.
- Make sure that these conditions are constantly maintained throughout storage.
- Please contact the manufacturer if you wish to store the equipment in different conditions.

Transporting the equipment

- Maintain the same conditions during transport that were in place during storage.
- Observe the conditions indicated in the technical data during transport.
- Transport the equipment in the leather bag provided.
- Transport the equipment at the location of use in a way that protects it against falling and impacts.
- Observe the international rules on transporting Ni-Cd batteries when transporting the equipment.


Checking the equipment for damage

- Remove the equipment from the transport package.
- Inspect the equipment for transport damage.
- If you discover transport damage, please contact the manufacturer.

Operation

Bringing the display device into service

The device can be used for testing with and without the leather bag. If using the leather bag, open the locking strap on the base of the bag to open the cable outlet.

- Connect the cable of the sound probe 5 with the display device 1.
- Check the charge capacity of the battery.
 - Turn the rotary switch 7 to the  symbol.
 - If the indicating meter 8 shows a value less than "7", recharge the battery.

Measurement preparations

Charging batteries



DANGER

Do not use the testing equipment VKP 10 in potentially explosive atmospheres!

Risk of explosion due to sparks during charging!

Risk of explosion due to sparks during connection!

Attention!

Condensate can accumulate in the equipment when using it after sudden or strong changes in temperature. This can lead to malfunctions or damage.

- Following temperature changes, leave the equipment switched off until the equipment temperature acclimatises to the ambient temperature.
- Do not charge the equipment in this time.

Attention!

- Charge the equipment fully before every use.

Always charge the batteries before using the equipment for the first time. It takes around 5 hours to recharge a fully depleted battery.

- Connect the battery charger to the display device and the electricity mains.

Performing a measurement

Checking the steam trap

DANGER



Risk of electric shock when checking a live pipe.

- Take suitable measures before starting the check to ensure that no parts of the pipeline are carrying voltage.

You can do this by earthing the pipeline, for example.

- Make sure that the measuring point is free of paint or dirt.
- Make sure that you use the same measuring point as in previous measurements.
- Mark the measuring point on the steam trap if necessary.

Attention!

Incorrect placement of the sound probe can lead to inaccurate measurement results.

- Only apply the tip of the sound probe to a bare metallic surface.
 - Always apply the sensor tip to the same measuring point.
 - Apply the sensor tip vertically to the surface of the valve.
-

Performing measurements

Before checking steam traps, make sure that the measurement sensitivity of the VKP 10 has been selected in advance using the rotary switch 7. The switch position "10" indicates the highest level of sensitivity. Different steam trap types generate varying sound levels, even when the loss of steam and operating conditions are identical. We recommend the switch position "8" for GESTRA type-BK steam traps and position "7" for type-MK models.

Lightly press the sound probe against the surface of the steam trap. Always place the sound probe at the same location on the housing when testing steam traps of the same type. This makes it possible to compare the steam traps and determine any changes when repeating the tests.

Steam traps operating continuously, and discharging up to about 30 kg/hr of condensate from steam pressures lower than 20 bar will cause no or only a slight deflection of the indicating meter. Any steam loss is indicated by a proportional meter deflection. The relation between steam loss and meter deflection depends on the steam trap type and the used measuring point on the trap surface. Larger condensate flowrates and higher service pressures result in louder flow-generated noises, making it necessary to reduce the sensitivity setting. To obtain meaningful readings when using the VKP 10, log and use installation-specific survey data and empirical test values.

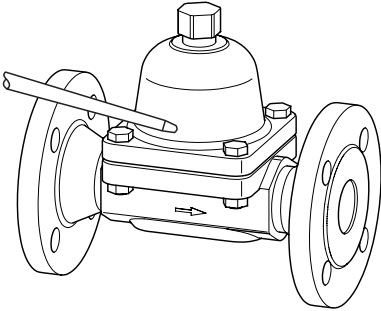
In practice, an exact quantification of the steam loss is usually only of minor importance. Normally, an approximate value that allows the detection of steam loss through steam traps at a tolerable effort will suffice.

When checking the steam traps, set the rotary switch to "7" or "8". A continuous indication between 6 and 8 on the meter scale indicates that the trap requires maintenance or replacement. This indicates steam losses of 1 to 4 kg/hr.

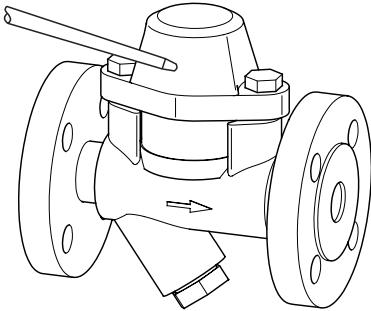
When checking thermal steam traps, position the sensor tip as follows:

- ▶ At the transition between the cover and the cover flange
- ▶ On the side of the cover

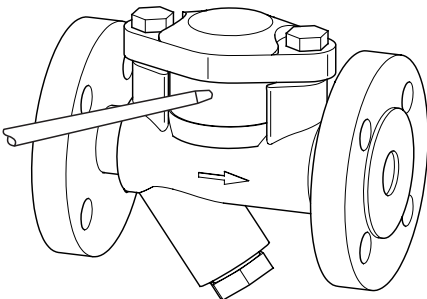
Examples of measuring points on thermal steam traps



Bimetallic steam trap type BK 15



Bimetallic steam trap type BK 45

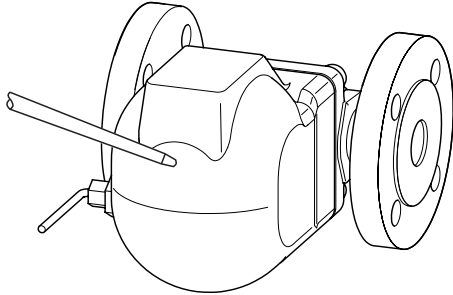


Thermostatic capsule steam trap type MK 45

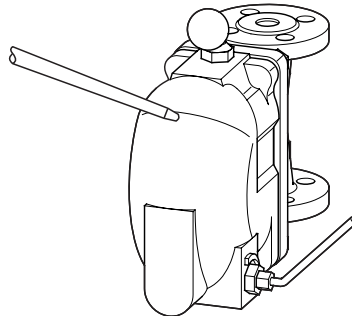
When checking ball-float steam traps, position the sensor tip as follows:

- ▶ At the highest point of the cover
- ▶ On the side of the cover

Examples of measuring points on ball-float steam traps



Ball-float steam trap type UNA 1, UNA 4



Ball-float steam trap type UNA 2

Position the sensor tip perpendicular to the measuring point.

Special information

Please take into account that ultrasonic sources like pumps or steam reducing stations in the proximity of the steam trap to be tested may falsify the result. In this case, steam loss may be indicated even though the traps operate correctly. This can be verified by scanning the adjacent pipelines. If the deflection remains unchanged or increases, this must be attributed to a foreign ultrasonic source. Switch off sound emitting plant components, if possible.

Intermittently operating steam traps cause recurrent meter deflections which may even reach the end of the scale. Thermostatic traps (with bimetallic control or membrane regulators) may operate within the specified pressure and flow-rate range either continuously or intermittently. In this case, steam loss can usually be excluded. A recurrent meter deflection here indicates that the steam trap is operating correctly.

Thermodynamically controlled steam traps always operate intermittently. Any steam loss rises with increasing lift frequency on this trap type. Only a constantly large meter deflection can clearly indicate steam loss.

Essentially the same considerations as mentioned for thermodynamic traps also apply in the case of steam traps with open floats. However, inherent steam loss definitely occurs on float-operated traps even when the trap operates intermittently.

Before performing the tests, use the technical plant data (service pressures, differential pressures, flowrates etc.) to at least estimate whether the trap flowrate lies within the testable range.

After operation

- Charge the equipment battery as described in the section "Measurement preparations".

Servicing the equipment

The equipment does not require any particular maintenance work.

Replacing the battery

Attention!

- The battery (9 V, NiCd) of the display device may only be replaced by the manufacturer!

The service life of the permanently installed battery is five to seven years with normal equipment use. If the battery is defective, please send the equipment to GESTRA, Bremen for the battery to be replaced.

Removing external dirt

Attention!

Risk of damage to the device due to fluid ingress.

- Make sure that no fluid can penetrate into the equipment.
- Only clean using damp cloths.

- Remove dirt from the equipment with clean water and a lint-free cloth.
- Remove stubborn dirt with a cleaning agent suitable for the material and a lint-free cloth.

Checking parts for damage

- Check that all equipment components are in perfect condition before and after use.
- Do not bring damaged components into service.
- Replace any damaged components.

Equipment maintenance and installing spare parts

Any defective components must be replaced.

No.	Designation	Stock code
1	Display device ¹⁾	
6	Sound probe ¹⁾	
5	Sound probe cable BNC 100	321509
3, 4	Battery charger 100-240 V AC, 50/60 Hz and cable	321510

¹⁾ We recommend having the display device and sound probe recalibrated by the manufacturer after no more than 2 years.

Taking out of service

Removing harmful substances



DANGER

For equipment used in contaminated areas, there is a risk of serious or fatal injury from harmful substances on the equipment.

- Only allow specialist personnel to perform work on contaminated equipment.
- Wear the protective clothing specified for the contaminated zone during all work.
- Make sure that the equipment is fully decontaminated before any work.
- Follow the instructions for handling the relevant harmful substances here.

Specialist personnel must have knowledge and experience in the following areas:

- ▶ The applicable local regulations for handling harmful substances
- ▶ Special regulations for handling the harmful substances present
- ▶ The use of the prescribed protective clothing

Attention!

Risk of environmental damage due to poisonous fluid residues.

- Prior to disposal, make sure the equipment is cleaned and free of any fluid residues.
- Dispose of all materials in accordance with the regulations at the location of use.

- Remove all residues from the equipment.
- Dispose of all residues in accordance with the regulations at the location of use.

Dismantling the equipment

- Charge the equipment if necessary.
- Store the equipment as described under "Storing the equipment".

Returning the equipment

You can return the equipment to your contractual partner.

- Register the return delivery with your contractual partner before returning the equipment.
- Make sure that all harmful substances are removed from the equipment.
- Send the completed and signed decontamination declaration with the equipment. The decontamination declaration must be attached to the packaging so that it is accessible from outside.
- Follow the instructions under "Transporting the equipment".
- Pack the equipment in its original packaging or in a suitable transport package.

The transport packaging must protect the equipment from damage in the same way as the original packaging.

Disposal of the equipment

The equipment and its components contain electronic parts that must be disposed of separately.

- Return the equipment in full to the manufacturer.

Technical data

Display device

Plastic housing with rotary switch and analogue display.

Battery compartment in housing.

One socket for connecting the sound probe.

Protection rating IP 41.

Maximum admissible operating temperature: 70 °C.

Minimum admissible operating temperature: 0 °C.

Power supply

Power is supplied by a 9 V NiCd battery or the battery charger.

Sound probe

The sound probe is supplied with power by the battery of the display device.

Battery charger

100-240 V AC, 50/60 Hz

Output 5.8 - 11.6 V

Weight

Leather bag with contents approx. 2 kg.

Dimensions

Leather bag: 200 mm / 190 mm / 90 mm

Display device: 90 mm / 45 mm / 160 mm
(width / height / depth)

Manufacturer's Declaration

You can find details on the conformity of the equipment in our Declaration of Conformity or Manufacturer's Declaration.

You can download the latest Declaration of Conformity or Manufacturer's Declaration at www.gestra.com or request it from the address below:

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Modifications to the equipment not approved by us will cause this Declaration to lose its validity.



You can find our authorised agents around the world at: www.gestra.com

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