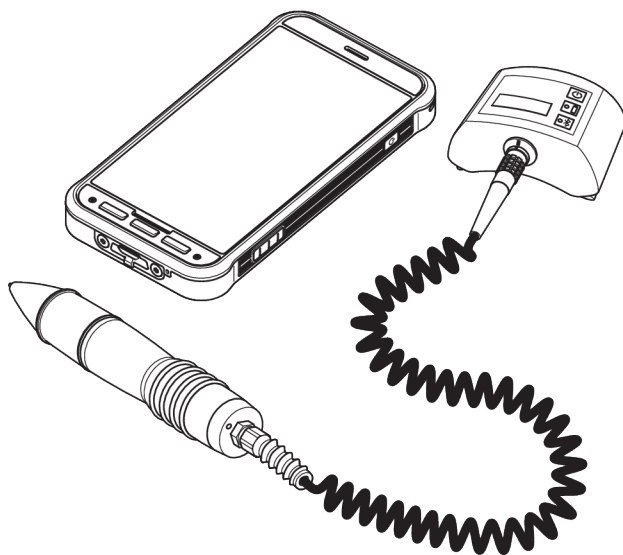




Steam Trap Testing Equipment

VKP 42 Ex

VKP 42

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Foreword

This installation & operating manual will help you use the steam trap test equipment safely and efficiently for its intended purpose.

VKP 42 Ex

VKP 42

This test equipment for steam traps will be called equipment in this document.

This installation & operating manual is intended for anyone commissioning, using, operating, servicing, cleaning or disposing of this equipment and, in particular, for professional after-sales service technicians, qualified personnel and authorised and trained staff.

All of these persons must read and understand the content of this installation & operating manual.

Following the instructions given in this installation & operating manual helps avoiding danger and increases the reliability and service life of the equipment. Please note that in addition to the instructions given in this installation & operating manual you must also observe all locally applicable rules and regulations concerning the prevention of accidents as well as approved safety guidelines for good professional practice.

Please also read and follow the instructions in the manufacturers' installation & operating manual for the data collector, especially the safety notes.

Availability

Always keep this Installation & Operating Manual in the transport case 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

Certain text elements of this installation & operating manual feature a specific typographic design. You can easily distinguish the following text elements:

Standard text

Cross-reference

- ▶ Listing
 - ▶ Sub-items in listings
- Steps for action.



Here you will find additional useful information and tips serving to assist you in using the equipment to its fullest potential.

Safety

Use for the intended purpose

The VKP 42 steam trap testing equipment is used for testing steam traps for loss of steam and banking up of condensate. Do not use or operate the VKP 42 steam trap testing equipment in potentially explosive atmospheres.

The VKP 42 Ex steam trap testing equipment is used in areas at risk of gas explosion for testing steam traps for loss of steam and banking up of condensate.

Correct use includes compliance with the instructions given in this installation & operating manual, in particular obedience to all safety instructions.

Use for the intended purpose also includes compliance with the data collector installation & operating manual, particularly the safety notes.

Any other use of the equipment is considered to be improper and is not allowed.

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

- ▶ Using equipment without Ex protection in a potentially explosive atmosphere
- ▶ Use of the equipment by untrained personnel

Basic safety notes

Explosion hazard

- Use the equipment in areas at risk of gas explosion only under the following conditions:
 - In areas at risk of gas explosion, only use equipment type VKP 42 Ex with VKPS 40 Ex measuring transducer, VKPC 40plus Ex Com box and VKPN 42 Ex Smart-Ex 02 *** DZ1 data collector.
 - Make sure that all components of the equipment are undamaged.
 - Never connect or disconnect components of the equipment in potentially explosive atmospheres.
 - Never open components of the equipment in potentially explosive atmospheres.
 - Do not charge batteries of individual components of the equipment in potentially explosive atmospheres.
- Risk of explosion if the pipeline to be tested is carrying voltage.
Before starting the test make sure that no part of the pipeline is carrying voltage. You can achieve this e.g. by earthing the pipeline.
- There is a risk of explosion if the wrong USB charging cable is used. Charging with the wrong USB charging cable can damage equipment components or batteries. If this happens, explosion protection is no longer effective. Only charge the VKPC 40plus Ex Com box outside the potentially explosive atmosphere using the supplied VKPA 40plus USB charging cable.
- Risk of explosion due to spark-over.
Do not use any items in the explosion-risk area that could generate sparks. Do not use the supplied file!
- Pay attention to the safety notes for the VKPN 42 Ex data collector type Smart-Ex 02 *** DZ1. You will find these in the equipment certificate provided.

Risk of severe injuries

- Risk of deadly electric shocks if a test is performed on live steam traps!
Make sure that the traps to be tested are not live.
- The trap to be tested is hot and under pressure.
Before carrying out any tests make sure that the following requirements are met:
 - Make sure there is no skin contact with the trap to be tested or other parts of the installation.
 - Always wear protective gear when performing the tests.
 - Make sure that there are no fluid leaks at the area of the trap to be tested.
- Risk of deadly electric shocks if defective components are used!
 - Never open the components of the equipment.
 - Never use any defective or damaged components.
 - Before recharging the equipment make sure that the used cables are in good working condition.

Information on property damage or malfunctions

- ▶ Condensation may have formed in the equipment in the event of sudden or drastic temperature changes.
 - ▶ After temperature changes leave the equipment switched off until the temperature of the equipment reaches ambient temperature.
 - ▶ Allow any condensation on the equipment to dry out completely.
- ▶ Static charges may cause damage to electronic components and/or lead to malfunctions. Wear electrically insulated shoes when performing tests.
- ▶ Improper handling may cause damage to electronic components and/or lead to malfunctions. Never open the components of the equipment.
- ▶ If the measuring probe does not touch the trap firmly at the right position and angle the readings may be incorrect. Make sure the sensor tip of the measuring probe touches only a bare metallic surface.
- ▶ If the tests are performed on different points on a steam trap the readings may be faulty. Make sure the sensor tip touches always the same test point. Make sure the sensor tip is perpendicular to the surface of the steam trap when it touches the test point.
- ▶ The telephone function of the data collector can be impaired. Observe regulations governing wireless technology at the place of use.

Qualification of personnel

A qualified person must be acquainted with and experienced in the following:

- ▶ The pertinent on-site rules and regulations for preventing fire and explosions as well as industrial safety regulations
- ▶ Working on pressure equipment
- ▶ Working with dangerous (hot or pressurized) fluids
- ▶ Observing all notes and instructions in this installation & operating manual and the applicable documents
- ▶ Working with portable instruments
- ▶ Working with personal computers (PCs)
- ▶ Working with menu-driven software
- ▶ Analysing and interpreting steam trap test results

Protective gear

The required protective gear depends on the types of fluid used and the regulations on site. For more information on suitable protective clothing and safety gear refer to the safety data sheet of the fluid in question.

Protective gear comprises the following items:

- ▶ protective helmet
- ▶ work boots
- ▶ protective gloves

Depending on local rules and regulations and the noise level generated by the plant some form of ear protection must be worn.

Depending on local rules and regulations and the fluid used in the plant some form of eye protection must be worn.

Typographic features of warning notes



DANGER

Notes with the heading DANGER warn against imminent dangerous situations that can lead to death or serious injuries.



WARNING

Notes with the heading WARNING warn against possibly dangerous situations that could lead to death or serious injuries.



CAUTION

Notes with the heading CAUTION warn against dangerous situations that could lead to minor or moderate injuries.

Formatting features for warnings of property damage

Attention!

This information warns of a situation leading to property damage.

Description

Scope of supply and equipment specification

Scope of supply

The equipment components are supplied individually in a transport case. Before use, you must connect the components and charge the batteries outside the potentially explosive atmosphere.

Delivery includes the following items:

- Transport case
- Strap for securing the Com box
- Data collector VKPN 42 Smart-Ex 02 *** Rugged or VKPN 42 Ex Smart-Ex 02 *** DZ1 with accessories (see manufacturer's installation & operating manual):
 - Charger with adapters for UK, EU, US and AU sockets
 - Screwdriver
 - USB cable
- Measuring transducer VKPS 40 Ex with connecting cable
- Com box VKPC 40plus or VKPC 40plus Ex
- USB charging cable VKPA 40plus for Com box VKPC 40plus or VKPC 40plus Ex
- Power supply unit for Com box
- Four power supply unit adapters for various mains sockets
- Adjustable mirror
- Identification signs for valves (optional)
- Diagnostic app TRAP *test* VKP local (to download) or portal (web app)

Do NOT use the supplied file and the adjustable mirror in explosion-risk areas! The file and the mirror are provided with an appropriate warning note.

For VKP 42 Ex equipment, the following components are intended for use in areas at risk of gas explosion and are identified on the respective name plates:

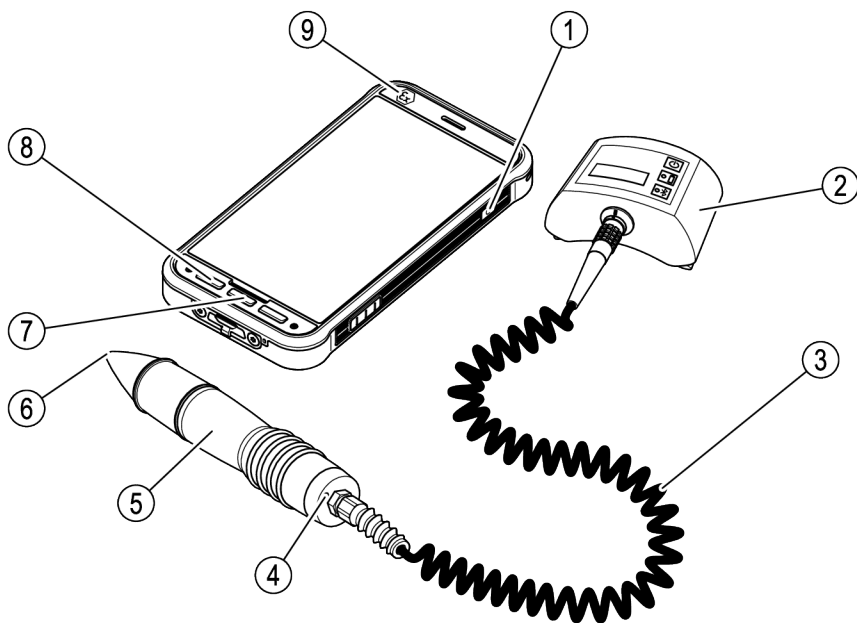
- Data collector VKPN 42 Ex Smart-Ex 02 *** DZ1
- Com box VKPC 40plus Ex
- Measuring transducer VKPS 40 Ex

Accessories

- Standby bag (optional, suitable for areas at risk of gas explosion).

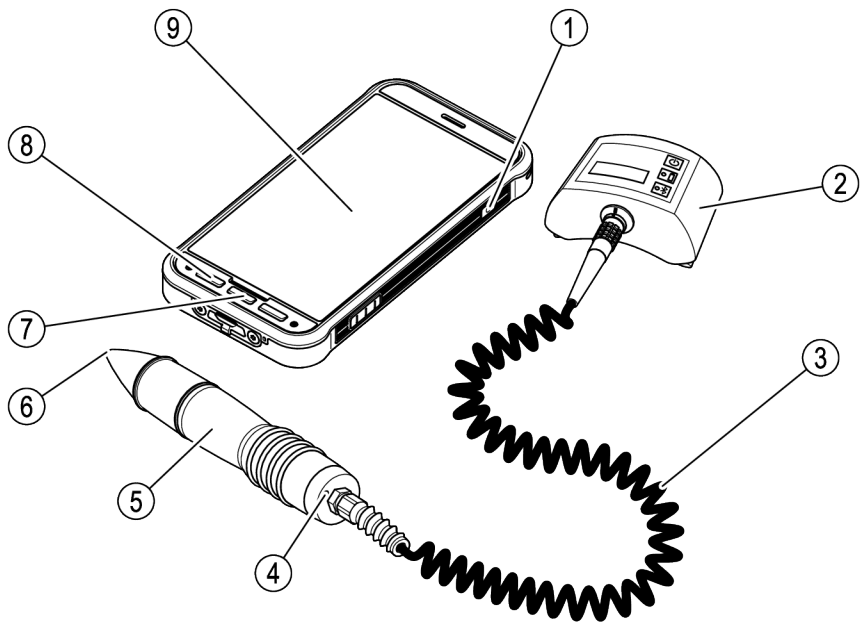
Equipment specification

VKP 42 Ex



Item no.	Name / specification
1	On/Off key (see operating manual for the data collector)
2	Com Box type VKPC 40plus Ex
3	Connecting cable to connect the measuring probe with the Com Box (firmly attached to the measuring probe)
4	Red LED (illuminated during a test)
5	Measuring transducer (=probe) type VKPS 40Ex

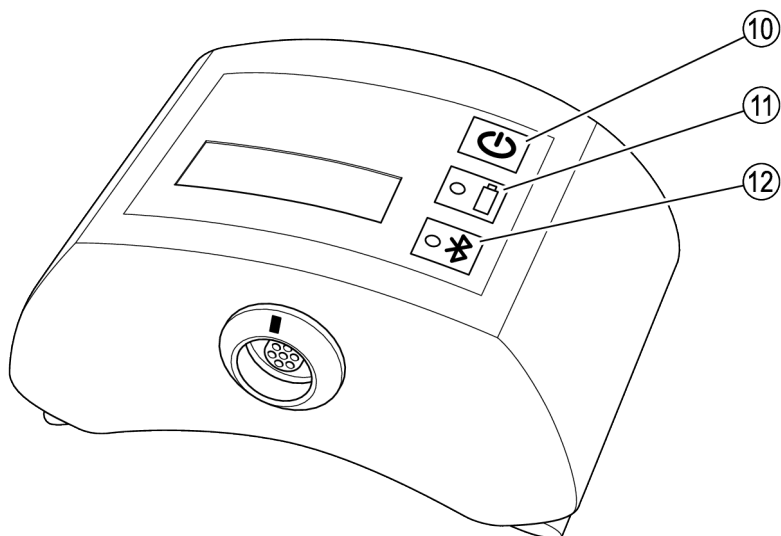
No.	Designation or meaning
6	Sensor tip
7	"Home" button (see data collector installation & operating manual)
8	"Back" button (see data collector installation & operating manual)
9	Data collector VKPN 42 Ex Smart-Ex 02 *** DZ1 (see manufacturer's installation & operating manual)



Item no.	Name / specification
1	On/Off key (see operating manual for the data collector)
2	Com-Box type VKPC 40plus
3	Connecting cable to connect the measuring probe with the Com Box (firmly attached to the measuring probe)
4	Red LED (illuminated during a test)
5	Measuring transducer (=probe) type VKPS 40Ex

No.	Designation or meaning
6	Sensor tip
7	“Home” button (see data collector installation & operating manual)
8	“Back” button (see data collector installation & operating manual)
9	Data collector VKPN 42 Smart-Ex 02 *** Rugged (see manufacturer’s installation & operating manual)

Indicators and adjustors on the Com box



Item no.	Description
10	ON/OFF button
11	Charge indicator - LED illuminated green: the battery of the Com Box is charged. The Com Box is not connected to the mains power. - LED pulsing green: the Com Box is connected to the mains power and the battery is being charged. - LED illuminated amber: the charge of the battery of the Com Box is low. Please recharge the battery at the next opportunity. - LED illuminated red: the charge of the battery of the Com Box is too low. Recharge the battery. If the LED is not illuminated the storage battery of the Com Box is charged. Disconnect the Com Box from the mains power.
12	Status indicator for Bluetooth connection - LED illuminated blue: Bluetooth connection established to the data collector. - LED pulsing blue: the Bluetooth connection to the data collector is being established or data are being transferred. There is no Bluetooth connection to the data collector if the LED is not illuminated.

Name plate

Name plates are affixed to the individual components:

- ▶ Data collector:
 - ▶ Equipment name plate on rear
 - ▶ The explosion-proof equipment (VKP 42 Ex) also has the ATEX test number on the name plate.
- ▶ Com box: Name plate on rear behind the carry strap
- ▶ USB charging cable for Com box: Inscribed on housing
- ▶ Measuring transducer: Inscribed on housing

The name plates contain the following indications:

- ▶ Manufacturer
- ▶ Type designation
- ▶ Serial number
- ▶ Admissible range of service temperature

Traceability

The VKP 42 Ex is subject to the traceability rules of Directive 2014/34/EU.

For this reason, the name plates of the testing equipment (complete testing equipment, data collector, Com box and measuring transducer) contain serial numbers.

The serial numbers can be found on the following name plates:

- ▶ Complete testing equipment: Name plate on transport case
- ▶ Data collector VKPN 42 Ex: Equipment name plate on rear
- ▶ Com box VKPC 40 Plus Ex: Name plate on rear
- ▶ Measuring transducer VKPS 40 Ex: Inscribed on housing

When purchasing the testing equipment or individual components, the customer data is linked to the relevant serial numbers, which ensures traceability. If the testing equipment or individual components are resold or passed on, the vendor is responsible for ensuring that traceability is maintained. To do this, the vendor must archive the new owner's data together with the serial numbers

of the testing equipment/components, and share this data with GESTRA if so requested.

Alternatively, the vendor can also transfer this data directly to GESTRA. In this case GESTRA, as the manufacturer, takes on responsibility for the relevant data.

ATEX-/IECEx Directive

VKP 42 Ex equipment is approved for use in potentially explosive atmospheres. You can find more detailed information on the data collector VKPN 42 Ex Smart-Ex 02 *** DZ1 in the data collector installation & operating manual.

The following components are approved for use in potentially explosive atmospheres:

- ▶ Data collector VKPN 42 Ex Smart-Ex 02 *** DZ1 with Ex classification
- ▶ Measuring transducer VKPS 40 Ex with Ex classification
- ▶ Com box VKPC 40plus Ex with Ex classification
- ▶ Standby bag (optional) with Ex classification

Do NOT use the supplied file and the adjustable mirror in explosion-risk areas! The file and the mirror are provided with an appropriate warning note.

Data collector VKPN 42 Ex Smart-Ex 02 *** DZ1 has the following classification:
II 2G Ex ib op is IIC T4 Gb IP64
II 2D Ex ib op is IIIC T120°C Db
EPS 19 ATEX 1 068 X
IECEx EPS 19.0031X

For more information on the markings on the data collector see the operating manual for the data collector.

Com box VKPC 40plus Ex has the following classification:

VKPC 40plus Ex
II 2G Ex ib IIC T4 Gb
BVS 15 ATEX E002
Ex ib IIC T4 Gb
IECEX BVS 18.0048

Only VKPS 40 Ex measuring transducers with the classification Ex ib IIC T4 Gb may be connected to the VKPC 40plus Ex Com box.

Components may only be connected and disconnected outside the potentially explosive atmosphere.

Measuring transducer VKPS 40 Ex has the following classification:

VKPS 40Ex
Ex ib IIC T4 Gb

Additional information for use in the USA and Canada

Classification for hazardous locations:

Class I Zone 1 AEx ib IIC Gb T4
Class I, Division 2 Groups A-D, T4

This device contains:

- ▶ FCC ID: T9J-RN42
- ▶ IC: 6514A-RN42

This device complies with Part 15 of the FCC Rules and with Industry Canada license exempt RSS standard(s).

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le

brouillage est susceptible d'en compromettre le fonctionnement.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or Television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between the equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/TV technician for help.

Task and function

Purpose

The VKP 42 testing equipment is used for testing steam traps for loss of steam and banking up of condensate.

The VKP 42 Ex testing equipment is used in areas at risk of gas explosion for testing steam traps for loss of steam and banking up of condensate.

To use the VKP 42, you will need the supplied app to analyse the test data. Further information can be found in the operating instructions for this app.

You can start the test via the test objects, or create a test object in the data collector during the test:

- Create test objects in the app and retrieve them using the "Test jobs/Perform test" button on the data collector.
- Quick check: The test object is created during this rapid test.
- With the TRAPtest VKP portal app, you can create, edit or exchange test projects using the "Create test objects" button.

During the test procedure the surface temperature of the tested steam trap is also measured, which makes it possible to detect waterlogged steam traps. In order to do so you have to enter the service pressure upstream of the test object. The boiling point associated with this service pressure is then compared with the temperature reading. If the measured temperature is below 40 % of the boiling point, the steam trap is waterlogged and banking up condensate.

If the test results are affected by noise produced by other components of the plant you can perform a foreign noise measurement. This will help you to test and evaluate the influence of foreign noise on the test results.

Function

When fluid is flowing through steam traps, this produces ultrasonic vibrations. When the sensor tip is in position, these vibrations are picked up by the measuring transducer. At the same time, the temperature at the measuring point is measured by a thermocouple in the measuring transducer.

The measuring transducer converts the readings into digital signals. These signals are transferred to the Com box by the permanently attached cable. The Com box transfers the readings to the data collector via Bluetooth. The readings are then graphically displayed on the data collector and stored there.

Synchronisation of the data collector with the analysis app differs depending on which version of the VKP 42 you have:

- Via the supplied USB cable (only outside the potentially explosive atmosphere)
- Wirelessly via Wi-Fi
- Wirelessly via mobile data

The test results are analysed on the basis of noise limit values. These values were established through tests by the manufacturer.

The steam trap does not lose any steam if the following conditions are simultaneously met:

- One reading is below the threshold, and
- the temperature reading is above 40 % of the set point

The steam trap also does not lose any steam if the following conditions are simultaneously met:

- The reading is above the threshold, and
- the noise limit value is not reached across an average of all readings in this test, and
- the temperature reading is above 40 % of the set point

If this is not the case, either extraneous noise has influenced the readings or the steam trap is faulty. To determine whether extraneous noise is responsible, you can measure this with the testing equipment. In this case, the data collector menu will prompt you to do this after the test.

Steam traps with thermodynamic regulator are assessed based on the limit frequency of operations.



If you have not entered the working pressure, the test merely checks whether the temperature is above 40 °C. In this case, banking up of condensate is not indicated.

Storing and transporting the equipment

- Use only the supplied hard case for storing the equipment.
- When not in use, charge the data collector and Com box at least every six months (see "Recharging the batteries" on page 13).

Storing the equipment

- Please observe the following items when storing the equipment:
- Protect the equipment and all components against hard shocks and impacts.
- Store the equipment only indoors.
- The requirements specified under "Technical Data" on page 29 must be observed.
- Make sure that all these requirements are always met when storing the equipment.
- Please contact the manufacturer if you cannot comply with the recommended storage conditions.

Transporting the equipment

- Meet the requirements for storage also when transporting the equipment.
- For transport, comply with the conditions in the technical data on page 29.
- Outside potentially explosive atmospheres, only transport the equipment in the supplied transport case.
- When transporting the equipment to the location of use, make sure it is secured against falling and impacts.
- In potentially explosive atmospheres, only transport the equipment connected and in the optional standby bag with Ex classification.
- When transporting the equipment observe international regulations for the transport of lithium-ion batteries.

Operation

Preparing tests

Recharging the batteries



DANGER

Sparks generated when charging the equipment can cause an explosion.

- Recharge the batteries of the Com box and the data collector only outside the explosion-risk area.



DANGER

Risk of explosion if a wrong USB power cable ("charger") is used!

- Use only the supplied USB power cable ("charger") for recharging the battery of the Com Box type VKPC 40plus Ex

If another USB power cable ("charger") is used parts of the Com Box may be damaged. In this case the equipment is no longer explosion proof.

The correct USB power cable ("charger") and the connection for the USB power cable ("charger") on the Com Box are marked with the stock code number 393081 of the USB power cable ("charger").

Attention!

If the equipment is used after sudden and/or drastic temperature changes condensation may form in the equipment. This can lead to malfunctions or damage.

- After temperature changes leave the equipment switched off until the temperature of the equipment reaches ambient temperature.
- Do not recharge the equipment during this time.

Attention!

If the equipment is not fully charged, data may be lost.

- Always fully charge all components of the equipment outside of the potentially explosive atmosphere before use.
- Immediately charge the equipment outside the potentially explosive atmosphere if the charge indicator on the data collector display is in the red zone.

If the battery charge is too low the COM Box will switch off automatically. If it is then switched on again without prior recharging the battery may be exhausted completely. The battery may be damaged and data may be lost.

- To avoid this allow the battery to charge for at least 30 minutes before switching the COM box on again.

Before using the equipment for the first time, you must charge the batteries in the Com box and the data collector outside the potentially explosive atmosphere.



If the temperature of the battery is too high or too low the charging process of the data collector and the Com Box is stopped automatically to prevent the batteries from overloading.

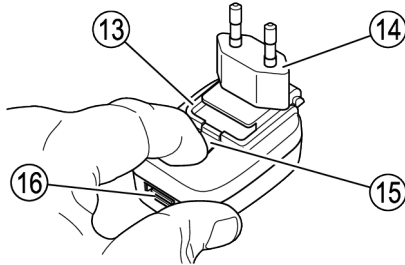
The max. temperature is 35 °C (95 °F), the min. temperature 0 °C (32 °F).

The charging process will continue automatically as soon as the temperature of the battery is again within the admissible temperature limits.

- Charge the data collector battery outside of the potentially explosive atmosphere as described in the data collector installation & operating manual.

To connect the Com box to mains electricity with different mains sockets, you can connect various adapters to the power supply unit. Proceed as follows to change the adapter:

- Press the catch (15) on the adapter.
- Disconnect the adapter (14) from the power supply unit (13).
- Push the required adapter onto the power supply unit until it clicks into place.
- Make sure that the USB connector is securely inserted in the USB port (16).



The drawing shows the power supply unit for the Com Box (stock code number 393226). The power supply unit (stock code number 393080) can also be used.



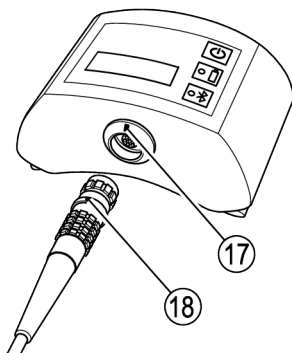
DANGER

Sparks generated when charging the equipment can cause an explosion.

- Recharge the batteries of the Com box and the data collector only outside the explosion-risk area.

To charge the battery of the Com Box proceed as follows:

- Unplug the connecting cable of the measuring probe from the jack (17) in the Com Box.
- Align the marking on the plug of the USB power cable ("charger") (18) with the marking on the jack (17).
- Insert the plug into the jack until it hits a stop.
- Connect the USB power cable ("charger") with the power supply unit to the power supply.



Connecting components

- Take the equipment out of the transport packaging.
- Check the equipment for transport damage.
- Contact the manufacturer if you detect any kind of shipping damage.



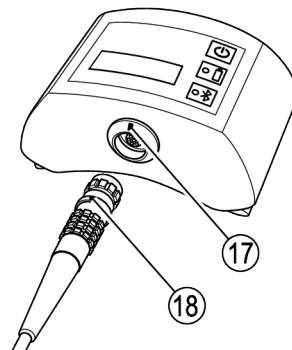
DANGER

Sparks generated when connecting the equipment can cause an explosion.

- Connect the Com box and the measuring probe always outside the explosion-risk area!

To connect the Com box with the data collector proceed as follows:

- Align the marking on the plug (18) with the marking on the jack (17).
- Insert the plug into the jack until it hits a stop.



The back of the Com box is provided with belt straps. If you do not want to carry the Com box during the test procedure you can attach it to your belt or to the supplied strap.

Switching on the equipment

Attention!

If the equipment is used after sudden and/or drastic temperature changes condensation may form in the equipment. This can lead to malfunctions or damage.

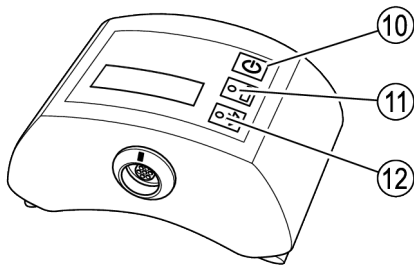
- After temperature changes leave the equipment switched off until the temperature of the equipment reaches ambient temperature.
- Do not recharge the equipment during this time.

- To switch the Com Box on press the ON/OFF button (10).

The LEDs (11, 12) on the Com Box light up briefly.

- To switch the Com Box off press the ON/OFF button (10) and hold it down for three seconds.

The measuring probe is switched on as soon as it is connected to the Com Box and the Com Box is switched on.



- To switch on the data collector press the On/Off button.

Setting up the data collector

Before starting a test, you must enter the following basic settings:

- Set the menu language
- Enable Bluetooth
- To do this, proceed as described in the data collector Installation & Operating Manual.

Using the VKP 42 app

- To start the VKP 42 app, tap the relevant icon on the display of the data collector.

The main menu is displayed.

The name of the program is shown in the title bar. To the right of this is a button for opening submenus.

- Tap the button to open submenus.
- To change the unit in the TRAPtest VKP portal app, tap "Units: SI/IMP".



This function is only available in the TRAPtest VKP portal app.

- To see information about the manufacturer of the program, tap "Imprint".
- To see information on the licence agreement, tap "EULA".



In the TRAPtest VKP portal app, this information is shown automatically when you launch the app.

- To see a list of abbreviations used, tap "Abbreviations".
- To pair the data collector with a Com box via Bluetooth, tap "Bluetooth".

For more information on pairing, see page 17.

The status of the data collector's Bluetooth connection is shown below the title bar. Next to this, you will see the battery charge indicator. The charge status of the Com box ("VKPC") is only displayed if you have paired the Com box with the data collector.

Below this you will find buttons for using the program. The "Data Transfer" button is only

enabled if the data collector is connected to the data analysis app.

- To view the list of test objects, tap the "Test jobs" or "Perform test" button.
- To manage test objects in the TRAPtest VKP portal app, tap the "Create test objects" button.



In this menu, you can create, edit or exchange test objects.

- To start a rapid test, tap the "Quick Check" button.
- To transfer data to the analysis app, tap the "Data Transfer" button.
- To view information on the program, tap the "Info" button.
- To exit the program, click the "Exit" button.

You will be prompted to confirm that

- you wish to exit the program.

The VKP 42 app closes.

You will find information on using functions in the sections below.

Establishing a Bluetooth connection

Proceed as follows to pair a data collector and the Com box for data transfer via Bluetooth:

- Switch on the data collector.
- Make sure that Bluetooth transmission is enabled on the data collector.
- Launch the VKP 42 app.
- Switch on the Com box.
- Tap the "Menu" button.
- Select the "Bluetooth" submenu.

The "Pair VKPC" submenu opens.

- To find Bluetooth sources within receiving range, tap "Start Bluetooth scan".

"Finding VKPC..." appears on the display. The data collector searches for Bluetooth sources within receiving range.

When the search is over, Com boxes are displayed with their name and serial number. The name of the Com box is always "VKPxyz". The serial number

"xyz" is the same as that shown on the name plate of the Com box.

- To pair the data collector with the desired Com box, tap the relevant Com box entry.



You can only produce a data connection between the Com box and one data collector.

- Tap "Continue".

You will be asked to enter a password. The Com box password is either "1234" or "0000".

- Enter the password as described in the data collector Installation & Operating Manual.

The two devices are paired. "Connected VKP" and the Com box type and serial number appear on the display. The charge status of the Com box is displayed.

If an error occurs during pairing, the message "Pairing error!" is displayed.

- In this case, repeat the pairing process for the two devices.

Using the app to analyse the test data



You can find information on using the data analysis app in the supplied operating instructions.

Performing tests

- Launch the VKP 42 app.

The main menu is displayed. You will find information on the main menu on page 16.

- To start a test, tap the “Test jobs” or “Perform test” button.

To find out how to test a steam trap, see page 18.

- To perform a rapid test, tap the “Quick Check” button.

To find out how to perform a rapid test, see page 24.

- To switch the Com Box on briefly press the ON/OFF button.

For information on the indicating facilities of the Com Box see page 16.

The measuring probe is switched on as soon as it is connected to the Com Box and the Com Box is switched on.

For a test, the following information is required:

- Operation
- Plant
- Plant section
- Place of installation
- Location
- Type
- Manufacturer
- Installation description
- Working pressure (required for measuring the banking up of condensate)

Checking steam trap



DANGER

Risk of explosion if the pipeline to be tested is carrying voltage.

- Before starting the test make sure that no part of the pipeline is carrying voltage.

You can achieve this e.g. by earthing the pipeline.



DANGER

Risk of explosion due to spark-over.

- Do not use any items in the explosion-risk area that could generate sparks.
 - Do not use the supplied file!
-
- In the VKP 42 app, select a steam trap as the test object.
 - Make sure that there is no paint or dirt on the measuring point.
 - Make sure that you use the same measuring point as for previous tests.
 - If necessary, mark the measuring point on the steam trap.

You can use the identification signs to ensure the test object has the same details as the data collector.

Attention!

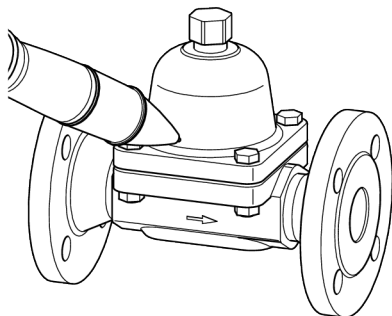
If the measuring probe does not touch the trap firmly at the right position and angle the readings may be incorrect.

- Make sure the sensor tip of the measuring probe touches only a bare metallic surface.
- Make sure the sensor tip touches always the same test point.
- Make sure the sensor tip is perpendicular to the surface of the steam trap when it touches the test point.

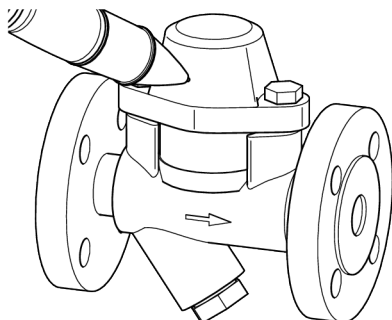
For thermal steam traps, you must apply the sensor tip in one of the following positions:

- Where the cover meets the flange
- On the side of the cover

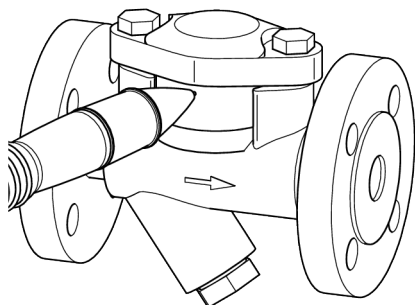
Example points of application for thermal steam traps



Bimetallic steam trap BK 15



Bimetallic steam trap BK 45

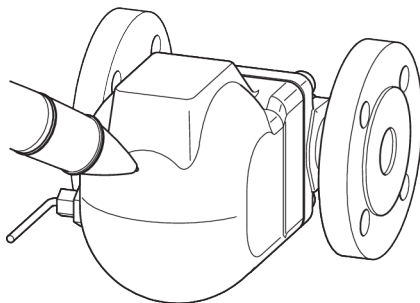


Steam trap with thermostatic capsule MK 45

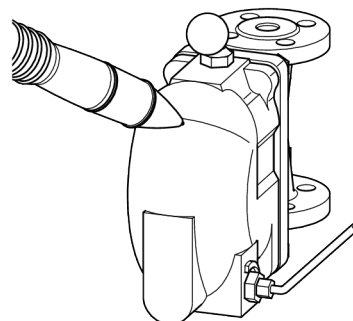
For ball-float steam traps, you must apply the sensor tip in one of the following positions:

- The highest point of the cover
- On the side of the cover

Example points of application for ball-float steam traps



Ball-float steam traps UNA 1 and UNA 4



Ball-float steam trap UNA 2

- Position the sensor tip perpendicular onto the test point.
- Press down the sensor tip until it hits a stop.

The test begins as soon as you push the sensor tip into the measuring transducer and the LED on the transducer lights up.

The blue LED on the Com box flashes while data is being transferred from the Com box to the data collector. The message "Testing" is shown on the data collector display.

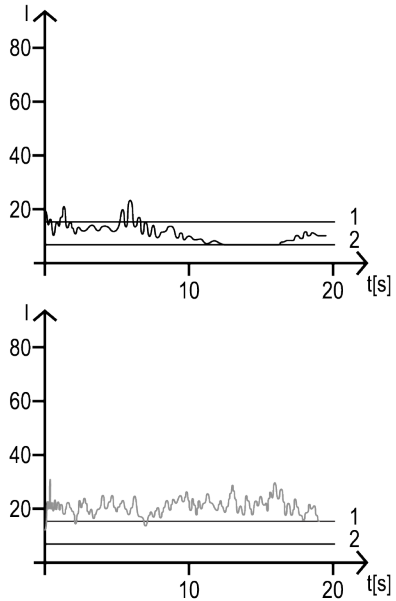
If the noise reading reaches the threshold value within 10 seconds, the test is automatically terminated after 10 seconds.

Otherwise, the test is automatically terminated after 20 seconds.

When the test has finished, the test result is shown graphically and in writing.

The diagrams below show two test results as examples.

- The upper diagram shows the display for a correctly functioning steam trap.
- The lower diagram shows the display for a faulty steam trap.



Item no.	Abbreviation	Description
1	LV	Limit sound value (LV)
2	TV	Threshold value

The following test results are possible:

Message	Description
Steam trap O.K.	The test object is in good working condition and not leaking steam.
Defective	The test object is faulty. Authorize qualified personnel to replace the faulty steam with a new one.
FN (foreign noise)	The test object is affected by foreign noise. Consequently, the test results are distorted. Perform a foreign noise measurement (see page 24).
BC (banking-up of condensate)	The test object may be waterlogged. (This option is only available if the required operating pressure of the test object was entered in the system.) Authorize qualified personnel to check the plant parameters and the steam trap settings.
Cold	The temperature of the test object is below 40 °C. Check the condition of the installation. Repeat the test when the test object is operating.
Check	The mean value of the measured sound exceeds the limit sound value. In addition one of the following conditions exists: ● The temperature of the test object is below 40 °C. ● The specified operating pressure of the test object does not match the measured temperature. ● The place of installation "Heat Exchanger" was selected. Authorize qualified personnel to check the plant parameters and the settings of the test object.
Comment	There is a comment on the test object. Read the comment.

If faults occur during the test procedure one of the following messages will be indicated:

Message	Description
Abort!	The test was stopped by touching the "Back" button. Repeat the test.
Error!	An error occurred during the data transfer from the Com Box. Check the Bluetooth connection shown on the display. Check the connecting cable of the measuring probe. Repeat the test. Should this error occur again have all equipment components tested by the manufacturer.
Check sum!	A check sum error occurred during the data transfer from the Com Box. Check the Bluetooth connection shown on the display. Check the connecting cable of the measuring probe. Repeat the test. Should this error occur again have all equipment components tested by the manufacturer.
Tip without contact	During the test the sensor tip was lifted off and lost contact with the test object. As a result the test was interrupted. Press the sensor tip firmly onto the test object. Continue the test.
Timeout!	Timeout occurred during the data transfer from the Com Box. Check the Bluetooth connection shown on the display. Check the connecting cable of the measuring probe. Repeat the test. Should this error occur again have all equipment components tested by the manufacturer.
...awaiting VKPS data	The sensor tip does not have contact with the test object. Testing has not yet started. To start the test firmly press the sensor tip onto the test object.

- To repeat the test touch the "Repeat" button.
- To save the test result in the data collector touch the "Save" button.

A green check mark indicates that the respective steam trap has been tested.

- To return to the main menu without saving the test results touch the "Back" button.

Entering comments

If a steam trap has not been checked yet you can enter and save a comment on the test object.

The available comments are explained in the following table. Most comments allow checking the test objects.

Comment	Meaning
Test object removed	The test object is not installed in the system.
Test object not in operation	The test object is not in operation.
Wrong name	The name of the test object does not match the available test object. Change the test object and the operating data.
Faulty gasket	The test object has a faulty gasket. Replace the gasket.
Incorrectly installed	The test object is not installed correctly. Install the test object correctly.
Cold test object	The fluid in the test object is cold. Check the settings of the system and the test object.
Not accessible	The test cannot be performed due to lack of space. Install the test object differently.
Wrong type	The type of test object differs from the one stored in the database. Change the details in the database. You can also change the information on the type during the test.
Test object insulated	The measuring point on the test object is insulated and not accessible. Remove the insulation from the measuring point.
Stop valve faulty	A stop valve to the test object is faulty. Replace the stop valve.
Stop valve closed	A stop valve to the test object is closed. Open the stop valve.
Test object OK	The test object is functioning without an inadmissible loss of steam. There is no banking up of condensate. You may perform a test.
Test object faulty	There is an inadmissible loss of steam from the test object.
Comment	Comment freely. Enter any comment you wish.

- To enter a comment touch the respective entry.
- To test a steam trap with a faulty seal touch the "Save" button.
- To test a steam trap of the wrong type select the respective trap type stated in the list.
- Then touch the "Yes" button.

Measuring foreign noise (FN)

The ultrasonic test can be affected by foreign noises. If the mean value of the measured noise exceeds the preset noise limit, the message "Foreign noise test" pops up on the display.

In this case proceed as follows:

- Measure the sound intensity at various points upstream and downstream of the test object.
- Compare the measured sound intensity with the mean value of test result.

If the measured sound intensity is below the mean value, the test was not impaired by foreign noise.

- In this case select the item "Foreign noise NO" in the menu.

For more information on the test results see table Test Results in Chapter "Performing Tests".

- To save the test result in the data collector touch the "Save" button.
- Observe the notes on the test results given in the table.

If, however, the measured sound intensity is above the mean value, the test was impaired by the foreign noise.

- In this case select the item "Foreign noise YES" in the menu.

For more information on the test results see table 'Test Results' in Chapter "Performing Tests".

- To save the test result in the data collector touch the "Save" button.
- Observe the notes on the test results given in the table.

Performing a quick check

In the "Quick Check" menu, you can perform tests without creating a test object beforehand. This is useful when valves have been modified or new ones fitted.

You can repeat a rapid test as often as necessary. This is a good idea when troubleshooting, for instance.

The results of a rapid test can also be saved.

- Launch the VKP 42 app.
- Tap the "Quick Check" button.

Buttons appear for the possible test locations "Steam tracer", "Steam line" and "Heat exchanger".

- Tap the appropriate button for the desired test location.

Buttons appear for the various types of steam trap. The following types are possible:

- Bimetallic
- Membrane (capsule)
- Ball-float
- Inverted bucket
- Thermodynamic

- Tap the appropriate button for the type.

The "Working Pressure" menu is shown.

- Tap the entry for the required working pressure.
- If you do not wish to enter a saturated steam temperature, tap "Bar ??? (pressure unknown)".

The working pressure is saved. This working pressure is displayed the next time you perform a rapid test.

- Perform the test as described on page 18.
- To save the test result, tap "Save".

The storage number is shown on the display. This will help you find the test results more easily later on.

- Make a note of the storage number.

With the rapid test, you can record a new test object or one with different properties. In this case, additional information is required for creating the test object. If you document this information during

the test, this will ensure more efficient entry of the test object in the data analysis app.

- If necessary, make a note of any other information required for creating a test object.
- Tap “Continue” to end the rapid test and return to the main menu.

Analysing tests

You can analyse the tests using the data analysis app. You can find further information in the operating instructions supplied with this app.

- To remove any persistent residues use a cleaning agent that is suitable for the material and carefully wipe the equipment with a clean, lint-free cloth.

Checking the component parts for damage

- Be sure that all components are in good working condition before and after using them.
- Do not use damaged or defective components.
- Replace any damaged or defective component.

After operation

Switching the equipment off

- To exit the VKP 42 app, tap “Exit” in the main menu.
- To switch the data collector off press and hold down the ON/OFF button on the data collector for three seconds.
- To switch the Com box off press the ON/OFF button and hold it down for three seconds.
- Charge the batteries of all components as described on page 13.

Maintaining the equipment

The equipment does not require any particular maintenance.

Removing external dirt deposits

Attention!

If fluids penetrate the equipment it may get damaged.

- Make sure that fluids cannot get into the equipment.
 - Use only a slightly moistened cloth to clean the equipment.
-
- To remove dirt deposits rinse the equipment with fresh water and wipe it with a clean, lint-free cloth.

Servicing the equipment and installing spare parts

Any defective component must be replaced with a new one.

Designation	Stock code	
	VKP 42	VKP 42 Ex
Data collector with TRAPtest VKP local diagnostic app	393440	393439
Data collector with TRAPtest VKP portal diagnostic app	393552	393551
Com box	321469	321472
Power supply unit for Com box (power supply unit, adapter)	321473	
USB charging cable VKPA 40plus for Com box	321474	
Measuring transducer VKPS 40Ex	321447	
USB cable	393510	
Charger with UK, EU, US and AU adapters	393511	
Torx T8 screwdriver	393512	

Troubleshooting

Problem	Cause	Remedy
The Com Box cannot be switched on.	The battery of the Com Box is flat.	Recharge the battery of the Com Box only outside the explosion-risk area.
	The battery of the Com Box is defective.	Return the Com Box to the manufacturer to get a new one.
The data collector cannot be switched on.	The battery of the data collector is flat.	Recharge the battery of the data collector only outside the explosion-risk area.
	The battery of the data collector is defective.	Return the data collector to the manufacturer to get a new one.
There is no Bluetooth connection between the Com Box and the data collector. The blue LED on the Com Box is not illuminated. The display states "Pairing error".	The Bluetooth connection (pairing) has been interrupted or could not be established.	Establish a Bluetooth connection by pairing the Com Box with the data collector.
	The Bluetooth transfer on the data collector has been deactivated.	Activate the Bluetooth transfer on the data collector as described in the operating manual issued by the manufacturer.

Problem	Cause	Remedy
The LED on the measuring probe is not illuminated.	The measuring probe was not positioned correctly onto the trap.	Put the measuring probe vertically onto the test object. Press down the sensor tip until it hits a stop.
	The LED is defective.	Return the measuring probe to the manufacturer to get a new one.
The data collector did not receive the test results.	The connection is interrupted because the permissible range has been exceeded.	Reduce the distance between the data collector and the Com Box. Establish a Bluetooth connection between the Com Box and the data collector. Repeat the test.
The data collector did not receive the test results. Error "13" is indicated.	The equipment is defective or has a malfunction.	Return the Com Box and measuring probe to the manufacturer for inspection. If a component is faulty get a new one from the manufacturer.
It is hard or impossible to press the sensor tip inwards.	The sensor tip is bent.	Return the measuring probe to the manufacturer to get a new one.
The LED on the USB power cable ("charger") is illuminated red.	A fault occurred during charging.	Detach the USB power cable ("charger") from the Com Box and the power supply. Repeat the charging process.

- If faults occur that are not listed above or cannot be corrected, please contact our Technical Service or authorized agency in your country.

Putting the equipment out of operation

Removing the equipment

- Switch off the data collector and Com box.
- Remove the measuring transducer connecting cable from the Com box socket outside of the potentially explosive atmosphere.
- If necessary, charge the data collector and Com box outside of the potentially explosive atmosphere.
- Store the equipment as described on page 13.

Disposing of the equipment

The equipment is made from the following materials:

Component	Material
Data collector	See data collector installation & operating manual
Measuring transducer body	3.7035
Com box housing	ABS (acrylonitrile butadiene styrene)
Identification signs	1.4301
Transport case	Aluminium/plywood/TCN film/foam/cardboard

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

- Send the equipment with all components back to the manufacturer.

Technical data

Dimensions and weights

Component	VKP 42		VKP 42 Ex	
	Dimensions (H × W × D) [mm]	Weight [kg]	Dimensions (H × W × D) [mm]	Weight [kg]
Transport case, without contents	173 × 450 × 340	4,900	173 × 450 × 340	4,900
Transport case, complete, with contents		approx. 6,500		approx. 7,250
Data collector	163 × 82 × 22	380	163 × 82 × 22	380
Com box	83.0 × 96.0 × 32.0	160	83.0 × 96.0 × 32.0	approx. 560
Measuring transducer (diameter × length)	36 × 210	440	36 × 210	440

Ambient conditions

Operational environment	Indoor and outdoor use, not for wet locations
Max. altitude	2000 m
Pollution degree	2
Degree of ingress protection	Suitable for use in industrial environments

Pressure & temperature ratings

Components	Service temperature [°C]	Storage temperature [°C]	Air humidity
Data collector ¹	-20 to +60	-10 to +50	0–95 % (not condensing)
Com Box ¹	-10 to +50		
Hand-held measuring probe (measuring transducer)	-10 to +60		
USB charging cable	-10 to +35		

1 Charging temperature: 0 to +35 °C

Min. upstream pressure for temperature measurement	1.1 bar
Max. differential pressure	20 bar

Electrical data

Charger, power supply unit

Supply voltage	100–240 V AC
Frequency	50/60 Hz
Current rating	0.3/1.0 A
Power rating	10 W
Protection Class	II (with protective insulation)
Overvoltage category	II

Data collector, hand-held measuring probe (measuring transducer), Com Box, USB charging cable

Supply voltage	5 V DC
Protection Class	III (SELV)
Overvoltage category	I

Data collector battery

Type	Rechargeable lithium ion secondary battery, removable
Voltage	3.7 V
Capacity	4400 mAh/16.3 Wh
Battery life	approx. 8 h

Com Box battery

Type	Rechargeable lithium ion secondary battery, non removable
Voltage	3.7 V
Capacity	1250 mAh/4.7 Wh
Battery life	approx. 8 h

Bluetooth

Bluetooth class	Class 2
Maximum output power	2.5 mW
Frequency range	2.402 GHz – 2.480 GHz
Bluetooth range	8 m

Declaration of Conformity – Standards and Directives

You can find details on the conformity of the equipment and the applicable standards and directives in the Declaration of Conformity and the relevant certificates.

You can download the latest Declaration of Conformity at www.gestra.com. You can request the relevant certificates by writing to the following address:

GESTRA GmbH

Münchener Straße 77

28215 Bremen

Germany

Phone +49 421 3503-0

Fax +49 421 3503-393

e-mail info@de.gestra.com

Web www.gestra.com

Modifications to the equipment not approved by us will invalidate the Declaration of Conformity and the certificates.



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

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