

Sample Conditioning System - HCDT (SCS - HCDT)

SCS - HCDT

Operating Instructions

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en



Read this manual carefully before installing and using the device.
BARTEC BENKE GmbH will not accept any liability for damage caused by failure to observe the manual or the safety instructions.

We have checked this manual to ensure that it is complete and that the facts in it are correct. Nevertheless, differences due to technical developments cannot be precluded, which means we cannot guarantee that it entirely corresponds to the product. The operating manual does not constitute any obligation or assured performance on the part of BARTEC BENKE GmbH.

When translated into other languages, the German version of the manual must be regarded as definitive.

Should you have any queries, please contact the address below:

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1 General information

Amongst other things, this section contains information on this operating manual, the symbols used, liability restrictions and contact persons in customer service.


1.1 Information on the operating manual

This operating manual provides important information on handling the sample conditioning system SCS - HCDT. Adherence to all safety and operating instructions given is the prerequisite for work safety.

-  Furthermore, the locally applicable accident prevention regulations and general safety instructions for the area of application of the SCS - HCDT must be observed.
-  Read the operating manual prior to beginning any work! It is a component part of the product and must be stored in the immediate vicinity of the SCS - HCDT and must be accessible for operating personnel at all times.

If the SCS - HCDT is handed over to a third party, the operating manual must also be handed over.

For the purposes of clarity, the figures in this operating manual are not necessarily illustrated to scale and may deviate slightly from the actual SCS - HCDT model.

NOTICE	
	<p>This operating manual describes all assemblies/ components that can be installed in a SCS - HCDT.</p> <p>You can read about the configuration of your SCS - HCDT in your customer folder.</p>

In addition to the operating manual, all other documents contained in the customer folder are applicable.




Observe the safety instructions listed there! An overview can be found in the table of contents in the customer folder.

1.2 Explanation of symbols

Warnings

Warnings are indicated in this operating manual by symbols. The warnings are introduced with signal words indicating the degree of danger at hand.

Observe the instructions under all circumstances and work with care to avoid accidents, injuries to personnel and damage to property.

DANGER	
	... indicates an immediate hazard which, if not avoided, will result in serious injury or death.
WARNING	
	... indicates a possible hazard which, if not avoided, could result in serious injury or death.
CAUTION	
	... indicates a possible hazard which, if not avoided, could result in minor injuries.
NOTICE	
... indicates a possible hazard which, if not avoided, could result in damage to equipment or property.	

Symbols used in this manual and on components

The safety warnings on the components are also highlighted with warning symbols. The following section explains the warning symbols used on the components and in the operating manual.



Warning about a danger area



Warning about poisonous substances



Warning about flammable substances



Warning about potentially explosive atmospheres



Warning about electrical current



Warning about potential hand injuries



Warning about hot surfaces



Warning about automatic start-up
(used with certain devices only)





Warning about low temperature/frost
(used with certain devices only)




Warning of laser beam
(used with certain devices only)

Examples of special warnings

DANGER	
	<p>Danger of death due to electrical current!</p> <p>... indicates life-threatening situations due to electrical current. Failure to observe the safety instructions could result in serious injuries or death.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ The work to be performed may only be carried out by an electrician.
WARNING	
	<p>Risk of death due to unavailable explosion protection!</p> <p>... indicates life-threatening situations in potentially explosive atmospheres. Failure to observe the safety instructions could result in serious injuries or death.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Work may only be performed by a specialist for potentially explosive atmospheres.

Tips and recommendations

NOTICE	
	... indicates useful tips and recommendations as well as information for efficient and trouble-free operation.

1.3 Duties of the operator

The SCS - HCDT is used in commercial applications and the operator is consequently subject to the statutory obligations for occupational safety. The applicable national standards and laws must be observed.

In addition to the work safety instructions in this operating manual, the safety, accident prevention and environmental protection regulations applicable in the area of application of the SCS - HCDT must be observed.

In addition to this, the operator is responsible for ensuring that the SCS - HCDT is always in a technically perfect working condition. Therefore the following applies:

- The operator must ensure that all maintenance intervals specified in this operating manual are adhered to.
- The operator must have all safety equipment inspected regularly to ensure it is fully functional and complete.

The operator must make the necessary safety equipment available to personnel.

1.4 Limitation of liability

All specifications and instructions in this operating manual have been compiled under due consideration of the applicable norms and regulations and the latest technological standards as well as our many years of experience and expertise.

The manufacturer assumes no liability for damage due to the following:


- Failure to observe the instructions in the operating manual
- Improper use
- Deployment of untrained personnel
- Structural modifications made without prior consent
- Technical modifications
- Use of non-approved replacement parts

The actual scope of delivery of special models can differ from the explanations and diagrams used in this manual if additional options are ordered or due to the latest technical changes.

Otherwise, the obligations agreed upon in the delivery contract, the general terms and conditions and the delivery terms of the manufacturer apply, as well as any legal regulations valid at the time the contract was concluded.



1.5 Copyright

The operating manual is to be treated confidentially. It is intended exclusively for personnel engaged to work with the SCS - HCDT. Making the operating manual available to third parties is not permitted without the manufacturer's written consent.



NOTICE	
	The information, texts, diagrams, images and other illustrations of the contents are copyright protected and subject to commercial protective rights. Every instance of misuse may result in prosecution.

Reproductions of any type - including excerpts - as well as the application and/or imparting of the content is prohibited without a written statement from the manufacturer. Infringements will be met with a claim for compensatory damages. The right to make further claims is reserved.

1.6 Replacement parts

WARNING	
	<p>Risk of injury due to incorrect replacement parts!</p> <p>Incorrect or defective replacement parts can result in damage, faults or total failures as well as impairments to safety.</p> <p>FOR THIS REASON:</p> <p> Only use spare parts from BARTEC BENKE.</p>

Obtain replacement parts from authorized dealers or directly from BARTEC BENKE. For the address, see *Section 1.7 "Customer service" on page 7*.

WARNING	
	<p>No explosion protection when using false replacement parts!</p> <p>Some optionally used replacement parts have been modified by BARTEC BENKE for a specific purpose. The use of non-modified original replacement parts from the respective manufacturer can lead to the loss of explosion protection.</p> <p>FOR THIS REASON:</p> <p> Only use spare parts from BARTEC BENKE.</p>

The replacement parts list can be found in the customer folder.

An extraction of the replacement parts list you can find in the following table. The replacement parts mentioned here are needed for typical maintenance work.

Description	Type	Specification	Order number
Element fine filter	VF01	15µm	413502
Element, seal coalescer filter	VF02	0,1µm	413593
Orifice	RN01	0,5mm	409726
Magnet valve	QM23	24V	445364
Magnet valve	QM23	230V	419683

NOTICE	
	<p>Contaminated components or assemblies that are to be repaired or serviced by BARTEC BENKE may only be sent together with a completed decontamination declaration! If this is not provided, a repair/maintenance cannot be processed.</p> <p>Templates can be found in the customer folder or they can be requested from BARTEC BENKE (see <i>Section 1.7 "Customer service" on page 7</i>).</p>

1.7 Customer service

Should you require any technical information, our customer service department will be happy to help you.

You can find information on the responsible contact partner at any time by telephone, fax, e-mail or on the Internet.

Furthermore, our employees are always eager to receive any new information and experiences arising from use and which could be valuable for the improvement of our products and services.

Service address

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2 Safety

This section provides an overview of all important safety aspects for optimal protection of personnel as well as safe and trouble-free operation.

Failure to observe the operating and safety instructions in this manual can result in considerable dangers.


This chapter describes all the safety and warning signs in line with the risk assessment. The measures for avoiding the respective dangers are described in detail in this chapter. The following chapter will only present the safety and warning signs in shortened form.

Example of shortened safety or warning message

DANGER	
	<p>Danger of death due to electrical current!</p> <p>Touching voltage-conducting parts poses an immediate life-threatening hazard. Damage to the insulation or to individual components can cause fatal injury.</p> <p>☞ Avoidance measures see chapter 2 "Safety".</p>

2.1 Intended use

The SCS - HCDT is designed exclusively for the preparation of gaseous fossil and regenerating energy sources and/or petrochemical products (hereafter referred to as *product*). The introduction of liquid media is not permissible. It is solely intended for use at a fixed location and for operation in hazardous areas at risk of explosion in Zone 1.


NOTICE	
	<p>The SCS - HCDT may only be used for conditioning natural gas!</p>

Do not make any modifications to the SCS - HCDT. Only use spare parts from BARTEC BENKE. Otherwise additional hazard may arise for which the safety fittings cannot provide sufficient protection.

2.1.1 Improper use

The following uses of the device are prohibited:

- Do not use any products with an oxygen content. The maximum content of hydrogen is 2 % and that of oxygen 0.001 mol%. You can find more detailed information on the product specifications in the customer folder.
- Purging with steam. High temperatures and pressures damage the components of the SCS - HCDT.

WARNING	
	<p>Danger due to improper use!</p> <p>Every instance of improper use or usage for purposes other than that for which the SCS - HCDT is expressly intended can result in dangerous situations.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Only use the SCS - HCDT for its intended application.☞ Adhere strictly to all specifications and instructions in this operating manual.

Claims of any type for damages that result from improper use are excluded.


The operator bears sole liability for all damage resulting from improper use.

2.2 Dangers and risks


The following section names residual risks that have been established in a risk analysis.

- ☞ Adhere to the safety instructions and observe the warnings in the following sections of this operating manual to reduce health risks and avoid dangerous situations.


Electrical current

DANGER	
	<p>Danger of death due to electrical current!</p> <p>Touching voltage-conducting parts poses an immediate life-threatening hazard. Damage to the insulation or to individual components can cause fatal injury.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ If the insulation is damaged, immediately disconnect the power supply and have the damage repaired. ☞ Have work on the electrical systems performed only by electricians. ☞ For all work on the electrical systems, switch off the voltage and test that the circuit is voltage-free. ☞ Prior to any maintenance, cleaning and repair work, switch off the power supply and secure it against being switched back on again. ☞ Do not bypass or disable any fuses. When exchanging fuses, observe the correct amperage. ☞ Keep moisture away from voltage-conducting parts. This could otherwise result in a short-circuit.


Pressurized gases

WARNING	
	<p>Danger of injury from gases under pressure!</p> <p>Lines are under overpressure even when switched off. In the case of defective or leaky lines, escaping gases could cause serious injuries.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Before performing any work, switch off the supply lines and depressurize them. ☞ Wear suitable protective goggles and gloves.


Hot operating materials

WARNING	
	<p>Danger of burns due to hot operating materials!</p> <p>Operating materials can reach high temperatures during operation and cause burns upon contact.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Before handling operating materials, check whether they are hot. Allow them to cool down if necessary.


Hot surfaces

WARNING	
	<p>Danger of burns due to hot surfaces!</p> <p>Contact with hot components can cause burns.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Always wear protective clothing and gloves during all work in the vicinity of hot components.☞ Check that all components have cooled to ambient temperature before beginning any work.





Cold operating materials











WARNING	
	<p>Danger of burns due to cold operating materials!</p> <p>Operating materials can reach low temperatures during operation and cause burns upon contact.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Before handling operating materials, check whether they are cold. Allow them to warm up if necessary.

Cold surfaces





WARNING	
	<p>Danger of burns due to cold surfaces!</p> <p>Contact with cold components can cause burns.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Always wear protective clothing and gloves during all work in the vicinity of cold components.☞ Check that all components have warmed up to ambient temperature before beginning any work.

Transporting the SCS - HCDT




CAUTION	
	<p>Damage due to improper transport!</p> <p>Improper transport can result in considerable material damage.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">  When unloading the packaged items during delivery or during in-house transport, exercise caution and observe the symbols and instructions on the packaging.  If provided, only use the intended suspension points.  Remove the packaging only immediately prior to assembly.

WARNING	
	<p>Danger of death due to suspended loads!</p> <p>When loads are being lifted, falling or uncontrollably swinging components pose a danger to life and limb.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">  Never step beneath suspended loads.  Observe the specifications regarding the provided suspension points.  Do not suspend by protruding machine parts or by the eyebolts of attached components.  Make sure suspension equipment is attached securely.  Only use approved lifting devices and lifting accessories with sufficient load-bearing capacity.  Do not use cracked or chafed cables or belts.  Do not attach cables and belts to sharp edges or corners and do not knot or twist.  Only move loads under supervision.  Set down the load before exiting the workplace.


Dirt and objects left lying around

CAUTION	
	<p>Danger of tripping due to dirt and objects left lying around!</p> <p>Dirt deposits and objects left lying around constitute slipping and stumbling hazards and can cause injuries.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">  Always maintain a clean and orderly work area.  Remove objects that are no longer required.  Draw attention to stumbling hazards with yellow and black marking tape.


Handling packaging materials

CAUTION	
	<p>Environmental damage due to incorrect disposal!</p> <p>Packaging materials are valuable raw materials and can in many cases be reused or expediently processed and recycled.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">  Dispose of packaging materials in an environmentally sound manner.  Observe the locally applicable disposal regulations. Have a specialist company handle the disposal if needed.


Incorrect installation and commissioning

WARNING	
	<p>Danger due to incorrect installation and commissioning!</p> <p>Installation and commissioning must be conducted by trained specialist personnel who have adequate experience. Errors in installation and commissioning can lead to life-threatening situations or considerable material damage.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Have installation and preparations for commissioning conducted solely by specialists for potentially explosive atmospheres or by qualified electricians. ☞ If the location of the device is to be changed later, consult the manufacturer. ☞ Do not install or relocate the device yourself. ☞ Before starting work, ensure there is adequate space for the work. ☞ Use caution when handling open, sharp-edged components. ☞ Assemble the components professionally. Comply with the specified screw-tightening torques. ☞ Secure components so that they cannot fall down or tip over.


Improper operation

WARNING	
	<p>Danger of injury due to improper operation!</p> <p>Improper operation can lead to serious personal injury and material damage.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ All operating steps are to be conducted in accordance with the instructions contained in this operating manual. ☞ Before starting work, make sure that all safety equipment is installed and working properly. ☞ Never disable safety equipment during operation.

Improperly performed maintenance


WARNING	
	<p>Danger of injury due to improperly performed maintenance work!</p> <p>Improper maintenance can lead to serious personal injury and material damage.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Before starting work, ensure there is adequate space for the work.☞ If components were removed, make sure they are remounted correctly, reinstall all fastening elements and observe the specified screw tightening torques.


Incorrect dismantling work

WARNING	
	<p>Danger of injury due to incorrect dismantling work!</p> <p>Stored residual energy, components with sharp edges, points and corners on the SCS - HCDT or on the required tools can cause injuries.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Before starting work, ensure there is adequate space for the work.☞ Use caution when handling open, sharp-edged components.☞ Dismantle the components in a professional manner. Remember that some components may be very heavy. Use lifting gear if necessary.☞ Secure components so that they cannot fall down or tip over.☞ Should you have any questions, contact the manufacturer.


2.2.1 Safety for explosion protection

Petrochemical products


WARNING	
	<p>Danger of explosions due to impermissible petrochemical products!</p> <p>The explosion protection has been exclusively designed for the safety technology characteristics of the petrochemical products specified in the order documentation.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Before switching on and during SCS - HCDT, make sure that the supply lines and all other petrochemical product-conveying parts only contain the permitted product (for example by thorough rinsing and bleeding). ☞ Make sure that the product properties correspond with the given specifications.

WARNING	
	<p>Danger of explosions due to escaping petrochemical products!</p> <p>Petrochemical products can leak. Escaped gas forms an explosive atmosphere when mixed with air.</p> <ul style="list-style-type: none"> ☞ Prevent the escape of petrochemical product. ☞ Do not use open flames or ignition sources. ☞ Do not use any tools which cause sparks. ☞ Additionally used devices and all electrical connections within the danger area must be protected against explosions in accordance with ATEX. ☞ Written permission (hot work permit) must be obtained for all work with flames or hot materials. ☞ Make a fire extinguisher available. ☞ Halt work at once in the event of fire. Initiate fire-fighting and, if appropriate, leave the danger zone until the all clear signal is given.


Vent and drain

WARNING	
	<p>Danger of explosions due to uncontrolled chemical reactions!</p> <p>Supplied or discharged products other than the petrochemical product can explode.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Make sure that the vent/drain system and other lines only convey the petrochemical product and its exhaust gases.


Technical modifications

WARNING	
	<p>Danger of explosions due to technical modifications!</p> <p>Every unauthorized modification endangers the safety of the SCS - HCDT and can result in the failure of the explosion protection and accidents.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Do not make any technical modifications to the SCS - HCDT without prior written consent from the manufacturer.☞ Only use spare parts from BARTEC BENKE.

Exceeding the limit values

WARNING	
	<p>Danger of explosions if exceeding the limit values!</p> <p>Loss of explosion protection.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Never exceed the defined limit values!


Open terminal box


WARNING	
	<p>Danger of explosion due to open terminal box!</p> <p>Loss of explosion protection.</p> <ul style="list-style-type: none">☞ Check that all seals are flawless.☞ Keep the lid of the connection box closed with all fastening bolts during normal operation.☞ Close holes not required for cable entries with Ex-certified sealing plugs.


Ignition sources of operating material outside the SCS - HCDT


WARNING	
	<p>Danger of explosion due to open ignition sources of operating material outside the SCS - HCDT!</p> <p>Operating materials operated in intrinsically safe circuits can cause explosions if they are not connected according to the manufacturer's specifications.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ The total of all capacities and inductivities of this operating equipment must lie below the threshold values specified in the standards and regulations applicable to explosion protection and in the manufacturer's specifications.

Electrostatic discharge

WARNING	
	<p>Danger of explosions due to electrostatic discharge!</p> <p>Non-metallic components, manual controls made from plastic and insulation from a size of 20 cm² can become charged electrostatically by friction or particle flows.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Always clean plastic areas with a damp cloth. ☞ Avoid air flows that can carry or swirl up dust. ☞ Clean the components/assemblies of the SCS - HCDT and surroundings regularly.

WARNING	
	<p>Danger of explosions due to electrostatic discharge!</p> <p>Non-metallic stickers from a size of 80 cm² can become charged electrostatically by friction.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Always clean BARTEC BENKE stickers with a damp cloth.

WARNING	
	<p>Danger of explosions due to electrostatic discharge!</p> <p>Painting the SCS - HCDT increases the risk of electrostatic discharge even on metallic surfaces.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ SCS - HCDT Do not paint, cover or coat.

WARNING	
	<p>Danger of explosions due to electric discharge!</p> <p>Different voltage potentials of contact surfaces can lead to electric discharge.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Only operate the control of the SCS - HCDT with an intact ground connection.☞ Remove corrosion at the potential connection and potential joins.

2.3 Hazardous substances


The notices given here only provide a general overview of the potential dangers that could arise from substances that are prepared in the SCS - HCDT. For the precise material-specific requirements for personal protective equipment, safety notices at the workplace, cleaning and disposal, please refer to the data sheet pertaining to the material in use.

In addition to the hazardous substances used in the system, other substances requiring further safety measures may also be in use at the location of the SCS - HCDT. It is the responsibility of the operator to ensure compliance with the pertinent regulations and legislation (for example the Ordinance on Hazardous Substances).

Highly flammable substances



Substance marking
"Flammable"

WARNING	
	<p>Danger of fire due to highly flammable materials!</p> <p>Highly flammable gases can start fires which can cause severe or fatal injuries.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Do not use open flames or ignition sources.☞ Make a fire extinguisher available.☞ In the event of fire, immediately stop work, initiate fire-fighting and, if appropriate, leave the danger zone until the all clear signal is given.

Toxic substances



Substance marking
"Toxic"

WARNING**Danger of injury from toxic substances!**

Swallowing, inhaling or contact with skin or eyes can lead to serious, permanent health damage or death.

FOR THIS REASON:

- ☞ Avoid direct contact.
- ☞ Do not inhale gases or vapors.
- ☞ If unknown concentrations or concentrations above the limit values for the particular substance are present in the air, wear suitable respiratory protection.
- ☞ Wear suitable protective gloves, protective clothing and eye protection during work.
- ☞ In the event of an accident, consult a doctor at once.
- ☞ Do not consume or store any food, drink or tobacco in the work area.
- ☞ Observe the notes in the safety data sheet.

Environmentally hazardous substances



Substance marking
"Hazardous to water"

NOTICE**Environmentally hazardous substances!**

Hazardous substances escaping during a malfunction are hazardous to the environment.

FOR THIS REASON:


- ☞ Prevent them from entering bodies of water, the sewerage system or the ground, and/or install the SCS - HCDT in a ground that is leak-proof against the hazardous substances occurring in the system.
- ☞ Use suitable resistant materials for the collecting tray or sealing.
- ☞ Dispose of residues and waste product professionally.
- ☞ If pollutant substances are released, take immediate measures to limit the damage.

2.4 Explosion protection

The SCS - HCDT is intended for use in potentially explosive atmospheres. It is an explosion-proof device assembled from electrical and mechanical components. The combination of this assembly does not lead to additional ignition hazards. The types of protection or explosion protection markings of the individual components can be found in the device view and device layout in the customer folder.

The particular application conditions, including the restrictions from the ignition hazard assessment and the maximum permissible limit values or parameters can be found in the technical data of the SCS - HCDT in the customer folder.





Warnings indicate residual hazards. These can be found in the signage plan.

NOTICE	
	The device layout with the explosion-proof components as well as the technical data and signage plan can be found in the customer folder under Manufacturer Data Record Book .

2.4.1 Label

The marking of the SCS - HCDT is provided according to ATEX Directive 2014/34/EU and standard DIN EN 80079-36 "Non-electrical equipment for explosive atmospheres" (see **Technical data** in the customer folder).

2.5 Safety equipment

WARNING	
	<p>Danger of death due to non-functioning safety equipment!</p> <p>Safety is only guaranteed if the safety equipment is intact.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">  Before starting work, check whether the safety equipment is correctly installed and fully functional.  Never disable safety equipment.  Make sure that safety equipment is not misadjusted or locked and always accessible.

NOTICE	
	<p>Regularly check the function of the safety equipment</p>

For the safety of devices, various measures have been applied, which ensure that no device-related ignition source becomes an effective ignition source at your application site. The associated device protection level (EPL) of the device must correspond to the local potentially explosive atmosphere.

In case of electrical devices, the different protection measures are described in the explosion marking. The following chapters describe examples of operating equipment for the SCS - HCDT.

There is no detailed explosion marking for non-electrical devices. A device protection level (EPL) and a temperature class is assigned to the operating equipment within the ignition source analysis.

All operating equipment of the SCS - HCDT, which was subject to an ignition source analysis according to IEC/EN 80079-36, can be found in the **device layout** drawing in the customer folder.

All measures that were applied in the ignition source analysis have been implemented when manufacturing the SCS - HCDT as well as in the associated documentation.

You can find the assignment of the operating equipment in the flow chart in the customer folder (e.g. **QM23**).

2.5.1 IP protective housing

The SCS - HCDT is accommodated in an IP protective housing in order to protect the device against dirt contamination and electrostatic discharges. The housing does not provide protection against explosive atmospheres. Therefore only devices/components that do not have any effective ignition source may be installed in this housing.

An opened door without supervision is not permissible. External electrostatic effects can ignite an explosive atmosphere.

Special measures for maintenance during operation see *chapter 5 "Maintenance"* on page 47.



Figure 2.1: Example with double-bit lock

The IP protective housing is provided with two locks in order to prevent opening by unauthorized persons.

- ☞ Close the housing door slowly.
- ☞ **Never slam the housing door shut, as the casement fastener of the lock can ignite an explosive atmosphere upon impact.**

2.5.2 Potential equalization

All metallic housing parts and the components in the SCS housing including the pipework are grounded with the IP protective housing or via the potential equalization rail by design. The housing must be connected to the local potential equalization.

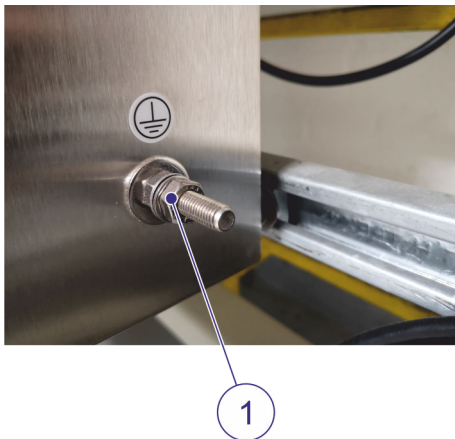


Figure 2.2: Example with grounding connection

The figure shows a customer grounding connection using an M8 bolt (1).

2.5.3 Shutoff valve (manually operated)

The shutoff valve is used for manually disconnecting the gas flow to the SCS - HCDT.

2.5.4 Mass flow restriction

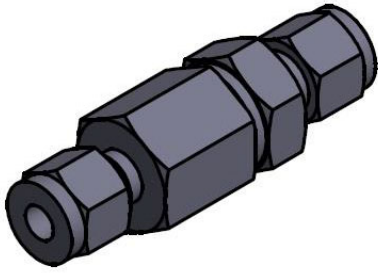



Figure 2.3: Orifice

The mass flow restriction (orifice) serves to reduce mass flow rates for exclusive use with gaseous products (in accordance with the technical regulations of the DVGW G488 - A).

NOTICE	
	<p>The use of this orifice is only permissible in conjunction with a safety valve designed by BARTEC BENKE.</p>

2.5.5 Electrically activated shutoff device

In the event of a fault, a shutoff is ensured by the electromagnetically actuated shutoff valve **QM23**. **This valve must be actuated at the customer!**

- ☞ Ensure via a suitable control here that the shutoff device **QM23** can only be released after rectifying the cause of the fault.

2.5.6 Proportional overflow valve

In the event of an impermissible pressure rise in the medium pressure range (pressure regulator failure, leakages losses due to gas zero consumption), the overflow valve **FI01** ensures the pressure protection in conjunction with the mass flow restriction **RN01**.

The device protection of the hydrocarbon dew point sensor **BQ11** is also ensured in this way.

The overflow valve **FL02** also serves in conjunction with the mass flow restriction **RN01** for device protection of customer analytics connected downstream as well as compliance with the MOP applicable in the pressure range.

2.5.7 Manometer with limit contact

The limit contact manometers **BP01** and **BP02** can be used to record impermissible pressure rises.

The signal evaluation must be realized at the customer!

2.5.8 Pressure transmitter

The pressure transmitter **BP11** can be used via the analog outputs of the Hygrophil F 5673 to record impermissible pressure rises.

The signal evaluation must be realized at the customer!

2.5.9 Signs and safety warnings

The signs and safety warnings on the SCS - HCDT and in the system surroundings are part of the safety equipment. They are described in *Chapter 2.6 “Signs” on page 26*.

- In accordance with the maintenance plan (see *page 52*), their presence and legibility should be checked regularly.
- Replace them if damaged or missing.

2.6 Signs

The following safety instructions and signs giving orders must be attached directly on the individual components/assemblies. They must be attached in the position in which they are delivered and must be clearly legible.


WARNING	
	<p>Danger of injury resulting from illegible symbols!</p> <p>Over the course of time, stickers and signs can become dirty or otherwise unrecognizable.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Always maintain safety, warning, and operating notices in a legible condition. ☞ Replace damaged signs or stickers immediately.


Replacements can be ordered from the manufacturer. For the address to order from, see *Section 1.7 “Customer service” on page 7*.



All warning signs, pictograms and command signs that can be used are described below. The relevant use depends on the customer-specific design of the SCS - HCDT.

You can find the detailed customer-specific signage plan in the customer folder.




2.6.1 Warning signs and warning symbols



DANGER	
	<p>Danger of death due to electrical current!</p> <p>Touching the non intrinsically safe, voltage-conducting parts can cause potentially fatal current to flow.</p> <p>FOR THIS REASON: Do not open the housing if non intrinsically safe electrical circuits are live.</p>

DANGER	
	<p>Danger of death due to electrical current!</p> <p>Touching the non-intrinsically safe, voltage-conducting parts can cause potentially fatal current to flow.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Do not open the box if non-intrinsically safe circuits are live!




	 WARNING
	<p>Danger of explosions due to electrostatic discharge!</p> <p>Cleaning plastic surfaces with a dry cloth can result in electrostatic discharge (ESD). The sparks can ignite potentially explosive atmospheres.</p> <p>FOR THIS REASON: Observe the operating instructions! Always clean signs and plastic surfaces with a moist cloth.</p>



86-en

WARNING	
	<p>Danger of explosions due to electrostatic discharge!</p> <p>Cleaning plastic surfaces with a dry cloth can result in electrostatic discharge (ESD). Any sparks could ignite a potentially explosive atmosphere.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">  Observe the operating manual.  Only clean signs and plastic surfaces with a damp cloth.



	 WARNING
	<p>Danger of explosion due to electrostatic discharge (ESD)!</p> <p>FOR THIS REASON: Observe the operating instructions! Always clean signs and plastic surfaces with a moist cloth.</p>



87-en

WARNING	
	<p>Danger of explosions due to electrostatic discharge (ESD)!</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">  Observe the operating manual.  Only clean signs and plastic surfaces with a damp cloth.




	 WARNING
	<p>Danger of injury from gases or liquids under pressure!</p> <p>Lines in the interior are still under pressure even if the device is switched off. In the case of defective or leaky lines, escaping liquids or gases could cause serious injuries.</p> <p>FOR THIS REASON: Depressurise the pipes before performing any work, wear protective goggles and protective gloves.</p>


88-en


WARNING	
	<p>Risk of injury due to liquids or gases under overpressure!</p> <p>Lines are under overpressure even when switched off. In the case of defective or leaky lines, escaping liquids or gases can cause serious injuries.</p> <ul style="list-style-type: none">  Depressurise the pipes before performing any work, wear protective goggles and protective gloves.


	 WARNING
	<p>Danger due to nitrogen!</p> <p>The system contains pressurized nitrogen gas. Working on lines that carry nitrogen can lead to injury or suffocation.</p> <p>FOR THIS REASON: Close and depressurize the nitrogen lines. Ensure adequate ventilation of the working area. Wear protective goggles!</p>


101-en

WARNING	
	<p>Danger due to nitrogen!</p> <p>The system contains pressurized nitrogen gas. Working on lines that carry nitrogen can lead to injury or suffocation.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">  Close and relax the nitrogen pipes. Ventilate working area sufficiently.  Wear safety goggles.

	⚠ WARNING
	<p>Danger of explosions due to electrostatic discharge (ESD)!</p> <p>Touching plastic or operating manual controls made of plastic (e.g. pressure regulators) may ignite an existing explosive atmosphere!</p> <p>FOR THIS REASON: Only open the housing outside of an explosive atmosphere! For explosion free measurement, use e.g. a gas warning device!</p>

WARNING	
	<p>Danger of explosions due to electrostatic discharge (ESD)!</p> <p>Touching plastic or operating manual controls made of plastic (e.g. pressure regulators) may ignite an existing explosive atmosphere!</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Only open the housing outside of an explosive atmosphere! ☞ For explosion free measurement, use e.g. a gas warning device!

⚠ CAUTION

<p>Danger due to incorrectly set pressures and flow rates!</p> <p>Safe operation of the analyzer can no longer be ensured.</p> <p>FOR THIS REASON: Set pressures and flow rates according to technical data in the operating instructions.</p>

CAUTION	
	<p>Hazard due to incorrectly set pressures and flow rates!</p> <p>Safe operation of the analyzer can no longer be ensured.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Set pressures and flow rates according to technical data in the operating instructions or in the customer folder.



Warning about electrical current.



Warning about low temperature / frost.



Warning about hot surface.

2.6.2 Mandatory signs



This command sign indicates that suitable gloves must be worn (see *page 33*).



This sign indicates that suitable safety goggles must be worn (see *page 33*).



This sign indicates that suitable ear protection must be worn (see *page 33*).

2.7 Safety measures at the installation location

Workspace conditions

- ☞ Ensure that the working area is adequately ventilated.
- ☞ Observe the emission limits. Install an exhaust-air cleaning system if necessary.
- ☞ Do not direct suctioned-off air back into the work room.
- ☞ Install washing facilities and eye baths in the workplace.
- ☞ Install a solvent-proof floor.
- ☞ **Creeping vapors can constitute an ignition source.** Seal the room properly to ensure that gases or vapors which could contain ignition sources cannot enter the room.
- ☞ Install equipment for detecting and reporting gas hazards.
- ☞ Install emergency-off equipment in easily accessible locations.

Containers and hoses

- ☞ Label containers and hoses clearly.
- ☞ Only conduct work on containers and hoses when they have been thoroughly rinsed and rendered inert.
- ☞ Protect the SCS - HCDT from impermissible external warming.
- ☞ Regularly inspect for leaks.


Vent/drain system

Liquids must not be introduced via the vent drain system.

2.8 Personnel requirements

All personnel who may work in potentially explosive atmospheres or on refrigeration systems must be sufficiently trained and familiar with the device, system or component/components. This training must include instruction on the device properties, hazardous substances and environmental conditions that relate to the requirements for explosion protection.

2.8.1 Qualifications

WARNING	
	<p>Danger of injury due to inadequate qualifications!</p> <p>Improper handling can lead to considerable personal injury and material damage.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Have all tasks performed only by qualified personnel.

The operating manual refers to the following qualifications for various task areas:

Instructed person

An instructed person has been instructed by the operator on the assigned tasks and on the potential dangers in case of improper behavior.

Trained specialist

Trained specialists have specialist training, knowledge and experience and are aware of the relevant regulations, meaning that they can perform assigned tasks and detect and avoid any possible dangers.

Electrician

Electricians have specialist training, knowledge and experience and are aware of the relevant standards and regulations, meaning that they can perform work on **electrical systems** and detect and avoid any possible dangers.

Electricians are trained for the special locations in which they work and are aware of the relevant standards and regulations.

They are also familiar with all standards and regulations relevant to explosion protection, in particular, but not limited to, all sections of IEC 60079 [**Explosive atmosphere**].

Specialist for potentially explosive atmospheres

Specialists for potentially explosive atmospheres have specialist training, knowledge and experience and are aware of the relevant standards and regulations, meaning that they can perform work on **systems or components in potentially explosive atmospheres** and detect and avoid any possible dangers.

The specialists have knowledge of the various ignition protection types, installation procedures and area partitions in rooms where potential explosions can arise and has certification for experience of knowledge in this area.

These specialists are aware of the rules and regulations applicable to their duties and for explosion protection, in particular, but not solely the ATEX guideline 2014/34/EU and all parts of IEC 60079 [**Explosive atmosphere**].

Specialist for refrigeration and air conditioning technology

Based on their technical training, theoretical knowledge of physical principles, the circulation process of refrigerants, the main components of a refrigeration or air conditioning system, the types of heat transfer and connection technology, specialist personnel are able to carry out work on the refrigerant circuit and recognize and avoid potential hazards independent. In addition, the expert who performs an activity must have a valid certificate according to Directive EU 2015-2067 Article 3.


2.8.2 General requirements

Completed instruction must be logged and confirmed by the persons responsible for instruction and by the persons receiving instruction.

Employees must be persons who can be expected to perform their work reliably. Persons whose reactions are impaired, e.g. by drugs, alcohol or medication, are not permitted.

When selecting employees, observe the age and occupation-specific regulations applicable at the location of deployment.

2.8.3 Unauthorized persons

WARNING	
	<p>Hazard for unauthorized persons!</p> <p>Unauthorized persons who do not fulfill the requirements described here are not aware of the hazards posed in the work area.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Keep unauthorized persons out of the work area. ☞ In case of doubt, address these persons and instruct them to leave the work area. ☞ Interrupt work as long as unauthorized persons are within the work area.

2.8.4 Instruction

The operator must provide instruction to personnel before they are hired, and at least once a year after that. Log the performance of instruction to make it easier to monitor.

Below is an example of an instruction log:

Date	Name	Type of instruction	Instruction provided by	Signature
		First safety instruction for _____		
		Annual safety instruction for _____		

2.9 Personal protective equipment

Wearing personal protective equipment while working is required in order to minimize health hazards.

- ☞ Always wear the protective equipment required for the corresponding tasks.
- ☞ Follow the instructions posted in the work area regarding personal protective equipment.

Always wear



Protective work clothing

The following minimum requirements must always be met when performing work:

- Anti-static
- Fire-retardant
- Tight-fitting and closed

No rings, necklaces or other jewelry.



Safety boots

The following minimum requirements must always be met when performing work:

- Category S3 and closed
- Anti-static
- Fire-retardant

Wear for special work



When you are performing special tasks, special personal protective equipment is required. This equipment is referred to specifically in the individual chapters of this operating manual. These special items of safety equipment are described below:

Respiratory protection, filter devices

Protect against hazardous gases, vapors, dusts and similar materials and media.

If a permissible limit value is exceeded by a factor of 100, self-contained respiratory protection apparatus must be used.

Respiratory protection may only be used when there is an oxygen content of at least 17% in the air.

Safety goggles

Protect the eyes from flying objects and sprayed liquids.

Note: Some system operators make the wearing of safety goggles mandatory in general.



**Protective gloves (hazardous materials)**

Protect hands against contact with hazardous toxic substances. The glove material must be sufficiently durable and impermeable to the substance in use. Gloves made of fabric or leather are not suitable.

- Before using, check for holes or leaks.
- Clean before removal.

**Safety gloves (hot surfaces)**

Protect hands against contact with hot surfaces.

3 Design and function

This chapter provides an overview of the functional groups/components and the possible setup of a SCS - HCDT.

3.1 Overview of possible functional groups in an SCS

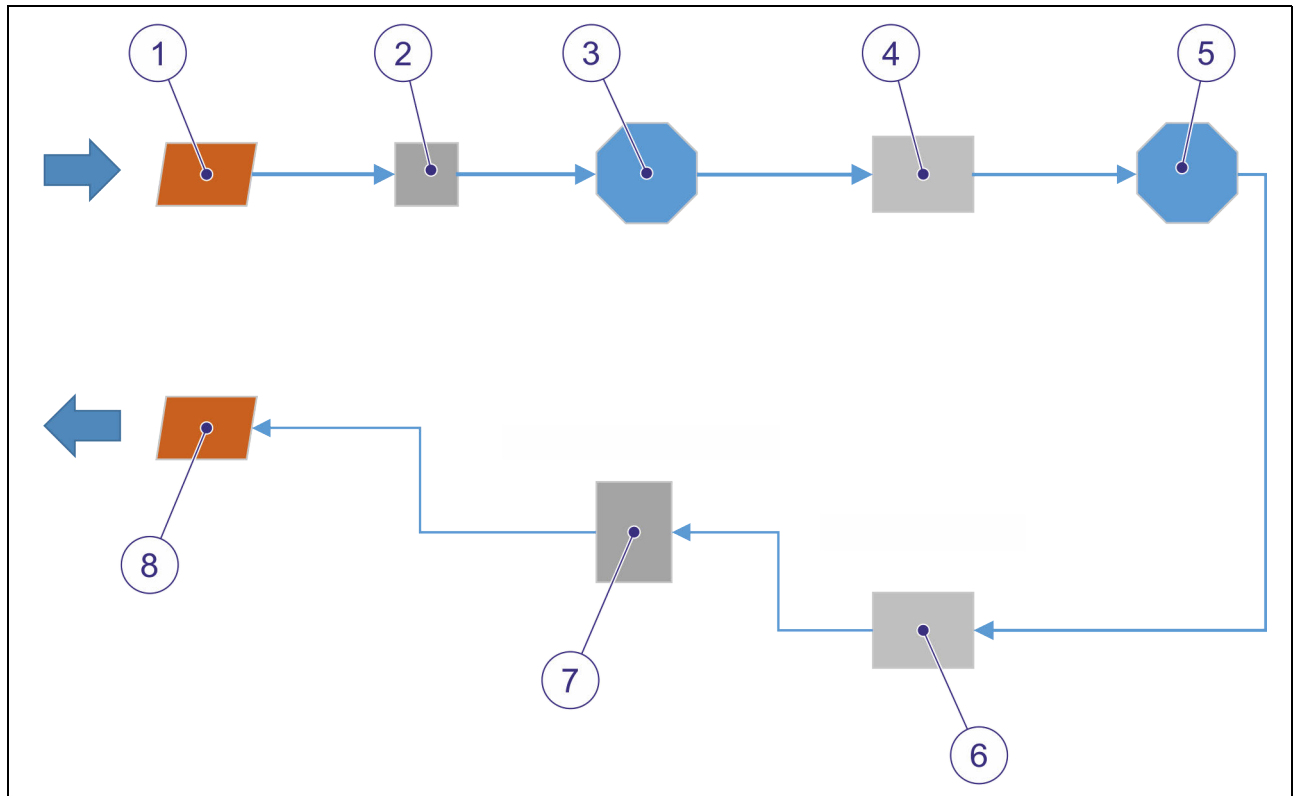


Figure 3.1: SCS - HCDT overview (example)

- | | |
|---------------------------------------|---------------------------------------|
| ① Shutoff (flow control) | ⑤ HCDT measurement |
| ② Filter | ⑥ 2 pressure stage (pressure control) |
| ③ DT measurement | ⑦ Flow control |
| ④ 1 pressure stage (pressure control) | ⑧ Shutoff (flow control) |

3.2 Brief description

The SCS - HCDT is designed to condition gaseous media for determining the hydrogen and hydrocarbon dew point in conjunction with the gas composition analyzer Hygrophil F.

The SCS - HCDT consists of various functional groups, which are custom designed and assembled for the relevant analysis task. The combination of individual components/assemblies does not result in any additional ignition hazards. The SCS - HCDT is suitable for operation in Zone 1. More precise information on the SCS - HCDT can be found in the relevant customer folder.

3.3 Description of functional groups

All functional groups with the corresponding components that can be installed in a SCS - HCDT are described below.

Pressure regulation

For the analysis, it may be necessary to set gas pressures or adjust them to the changing conditions during operation. The relevant pressures can be increased or reduced and serve the following different purposes:

- Pumping gases
- Protecting components/assemblies and external system parts
- Adjustment to process conditions

The pressure is controlled via a pressure regulator or reducer.

Pressure measurement

It may be necessary to measure gas pressures for the analysis. Pressures can be displayed locally or recorded electronically for further processing in the software via a transmitter.

The pressure measurement serves the following purposes:

- Setting and monitoring the pressures using a manometer
- Recording and displaying the pressures in the software using a pressure transducer.


The manometers can also be equipped with electrical contacts in order to record limit values. These can be evaluated as simple electrical operating equipment according to IEC/EN 60079-11. You can find the intrinsically safe characteristics in the circuit diagram and in the technical data of the customer folder.

The measured values are transmitted via an intrinsically safe data cable.

Flow control


It may be necessary to control or shut off gas flows for the analysis. The flow control serves the following purposes:

- Controlling the gas flows
- Shutting off individual gas flows
- Protecting individual components or functional groups

NOTICE	
	<p>Open or close the manually operated valves always slowly so as to avoid pressure surges, which could damage the pipe system and the components of the SCS.</p> <p>Operate the ball valves always slowly in order to prevent ignition sources due to impacting against the limit stops.</p>

The flow control is realized by valves with different types of actuation, shut-off valves, non-return valves, overpressure and bleed valves.

A suitable pre-fuse must be used for a power supply to solenoid valves. The electrical characteristics can be found in the customer folder. The maximum permissible characteristics must not be exceeded to comply with the explosion protection.

NOTICE	
	<p>The orifice is a safety-relevant component and must NEVER be removed!</p> <p>See also <i>Section 2.5.4 "Mass flow restriction" on page 25</i></p>

Flow rate measurement

It may be necessary to measure the gas flow rates for the analysis. Flow rates can be displayed locally or recorded electronically for further processing in the software via a transmitter.

The flow rate measurement serves the following purposes:

- Setting and monitoring the flow rates using a flow meter
- Recording the flow rates via a transmitter
- Displaying the flow rates via an inspection glass

Temperature control

It may be necessary to control the temperatures of the gases and/or components for the analysis. The relevant temperatures can be increased or reduced for different purposes.

The temperature control serves the following purposes:

- Temperature control of gases
- Regulating the temperature of housing structures or measuring cells

The heating can be realized directly via an electrical heating or Peltier element or indirectly via a heat exchanger or housing heater. The cooling can be carried out directly via a Peltier element or indirectly via a heat exchanger.

Housing heating systems consist of a temperature regulator and an electrical resistance heater, which are approved for use in an explosive atmosphere.

The maximum permissible pre-fuse and the residual-current devices to be used for the gas housing system must always be installed by the operator. The design data can be found in the customer folder. **The explosion protection is only ensured if the protection elements are installed accordingly!**

In the case of a Peltier cooler, the Peltier element is connected to the hot side with large aluminum body and to the cold side with a metal bolt. The cooling object is mounted on this metal bolt.

Temperature measurement

It may be necessary to measure the temperatures of gases and/or components for the analysis. Temperatures can be displayed locally or recorded electronically for further processing in the software via a transmitter.

The temperature measurement serves the following purposes:

- Setting and monitoring temperatures
- Recording the temperatures via a transmitter
- Displaying the temperatures via a dial thermometer

Filters

It is necessary to separate gas flows from impurities for the analysis. The impurities can be present in liquid, gaseous or solid form, depending on the gas.

The following components can be used:

- Solid filters for separating solids from gases

Fill level measurement

For safe operation, it may be necessary to record filling levels in containers or tanks.

The recording can be performed via electrical limit value switches, which are to prevent the container from overflowing for instance.

Functional components such as pumps or valves can be controlled via the filling level measurement.

Sample withdrawal assembly

It may be necessary for the analysis to be able to extract samples at a suitable point in order to perform reference analyses in a laboratory.

Quick-release couplings are available for manual sample extraction or for extracting samples for laboratory analyses. You can find more information in the customer folder.

The sample withdrawal assembly serves to validate the analyzer and ensure product quality.

Housing


The SCS - HCDT is accommodated in an IP protective housing and ensures an even temperature control.


The housing is a safety device. You can find more information in the customer folder.

3.4 Intrinsically safe signals

The cable data, particularly the maximum permissible cable lengths, as well as other information can be found in the circuit diagram of the customer folder. The technical data on the intrinsic safety as well as reference to the intrinsic safety validation, which can also be made available to you on request, can also be found in the technical data.

4 Commissioning

NOTICE	
	<p>Environmentally hazardous substances!</p> <p>Hazardous substances, which could leak out as the result of a fault during improperly performed installation, can enter the earth.</p> <p>☞ Avoidance measures see <i>chapter 2 Safety</i>.</p>

NOTICE	
	<p>BARTEC BENKE recommends that commissioning is performed by employees of the manufacturer and having operating and maintenance personnel trained by the manufacturer.</p>

4.1 Requirements for the installation location

Environmental conditions

The SCS - HCDT is only to be used for use at a fixed location. The following ambient conditions must be met:

Environment	Condition
Temperature range	5 to 40 °C Others on request
Relative humidity, non-corrosive	5 to 100 % at 25 °C

If installing on open ground, a suitable cover for protection against the weather must be installed by the operator. The lightning protection must be provided by the operator.

Offshore installation or installation close to the coast is not permissible.

Sufficient load bearing capacity and vertical alignment must be ensured if mounting on a wall. Consult the technical data in the customer folder for the weight.

Atypical vibrations and shocks must be avoided near the SCS - HCDT. The installation site must be even on a rack when installing the SCS - HCDT. The distance between SCS - HCDT and supply lines or components that cause strong mechanical vibrations in the pipe system (e.g. pumps) should be as great as possible.

Notes on hazardous substances

- ☞ Ensure that the working area is adequately ventilated.
- ☞ Observe the emission limits. If necessary, install an exhaust air treatment system.
- ☞ Do not return the extracted air to the work area.
- ☞ Provide washing facilities and eye baths in the workplace.
- ☞ Creeping vapors can constitute an ignition source. Seal the room properly to ensure that gases or vapors which could contain ignition sources cannot enter the room.
- ☞ Install equipment for detecting and reporting gas hazards.

4.2 Safety


Personnel

Commissioning is only to be performed by specialists for potentially explosive atmospheres.


Personal protective equipment

Wear the basic protective equipment in line with **chapter 2 “Safety”** and the following additional protective equipment:


- Safety goggles
- Protective gloves
- Hearing protection if necessary

NOTICE	
	If other safety equipment is required for certain tasks, this will be mentioned in the warnings in this chapter.


Pressurized gases

WARNING	
	<p>Danger of injury from gases under pressure!</p> <p>Lines are under overpressure even when switched off. In the case of defective or leaky lines, escaping gases could cause serious injuries.</p> <p>☞ Avoidance measures see chapter 2 “Safety”.</p>


Hazardous substances

WARNING	
	<p>Danger of injury from toxic substances!</p> <p>Swallowing, inhaling or contact with skin or eyes can lead to serious, permanent health damage or death.</p> <p>☞ Avoidance measures see chapter 2 “Safety”.</p>


Hot operating materials

WARNING	
	<p>Danger of burns due to hot operating materials!</p> <p>Operating materials can reach high temperatures during operation and cause burns upon contact.</p> <p>☞ Avoidance measures see <i>chapter 2 "Safety"</i>.</p>


Hot surfaces

WARNING	
	<p>Danger of burns due to hot surfaces!</p> <p>Contact with hot components can cause burns.</p> <p>☞ Avoidance measures see <i>chapter 2 "Safety"</i>.</p>

Cold operating materials

WARNING	
	<p>Danger of burns due to cold operating materials!</p> <p>Operating materials can reach low temperatures during operation and cause burns upon contact.</p> <p>☞ Avoidance measures see <i>chapter 2 "Safety"</i>.</p>

Cold surfaces

WARNING	
	<p>Danger of burns due to cold surfaces!</p> <p>Contact with cold components can cause burns.</p> <p>☞ Avoidance measures see <i>chapter 2 "Safety"</i>.</p>

4.3 Installation and preparation for commissioning

- ☞ Connect the potential equalization (M8 bolt external on the IP protective housing) to the local potential equalization system.
- ☞ Connect the power supply and signal cables corresponding to the enclosed circuit diagrams.

Personnel

Installation and commissioning may only be performed by specialists for potentially explosive atmospheres.

Special tools required


Electrician's equipment

Tightening torques

The following tightening torques of the connection terminals must be complied with:

Cross section	Tightening torque
1 to 2.5 mm ²	0.4 to 0.6 Nm
4 mm ²	0.5 to 1 Nm
6 mm ²	0.8 to 1.6 Nm

Electrical current

DANGER	
	<p>Danger of death due to electrical current!</p> <p>Touching voltage-conducting parts poses an immediate life-threatening hazard. Damage to the insulation or to individual components can cause fatal injury.</p> <p>☞ Avoidance measures see chapter 2 "Safety".</p>

4.4 Commissioning the SCS - HCDT

The customer-specific commissioning of the SCS - HCDT is described in the customer folder. The figure below shows a typical setup for the SCS - HCDT.

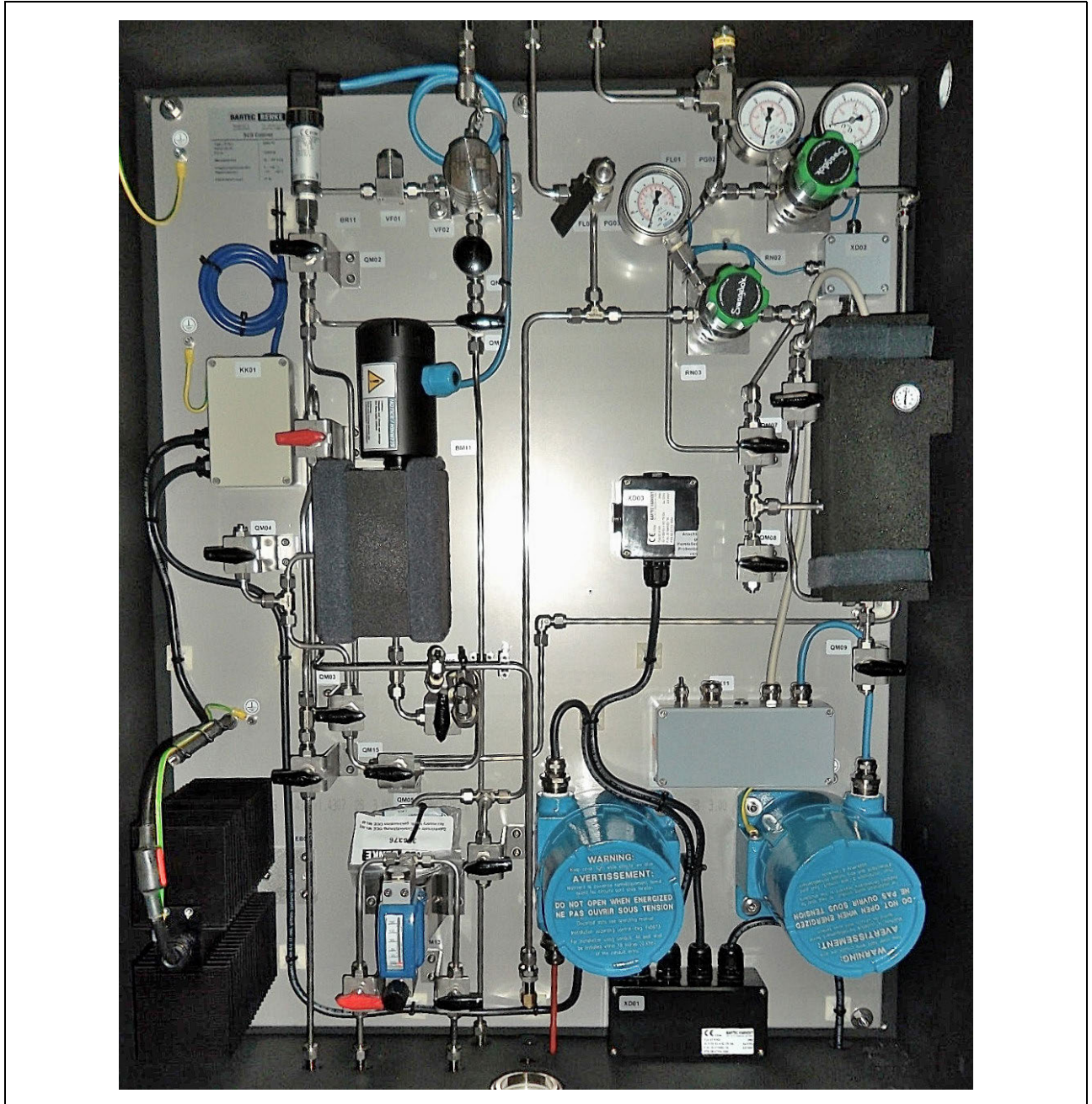


Figure 4.1: SCS - HCDT setup (example)

4.5 Commissioning the trace moisture analyzer

See operating manual of the relevant trace moisture analyzer.

4.6 Monitoring and operation

Monitoring

- ☞ After 2 hours of operation, check all connections for leaks and perform a general visual inspection.

Supplying with product:

- ☞ Check the settings of the pressure regulator.
Adjust the pressure regulator if necessary.
- ☞ Check the settings of the flow meter.
Adjust the flow meter if necessary.
- ☞ If necessary, continue adjusting the pressure regulator and flow meter settings until the target values are reached.

Operation

- ☞ Check the settings of the SCS - HCDT regularly and correct, if necessary.

5 Maintenance


Regular maintenance must be carried out in order to ensure optimal and fault-free operation. The following section describes the general maintenance work and the safety measures to be observed.

5.1 Safety

Personnel

The maintenance work described here may only be performed by **specialists for potentially explosive atmospheres** or **by employees of the manufacturer**.


Work on the electrical systems may only be performed by electricians.

NOTICE	
	BARTEC BENKE recommends that operating and maintenance staff be trained by the manufacturer



Personal protective equipment


Wear the basic protective equipment specified in *chapter 2 "Safety"* and the following additional protective equipment:

- Safety goggles
- Protective gloves
- Hearing protection if necessary
- Respiratory protection if necessary


NOTICE	
	If other protective equipment must be worn for certain tasks, this is stated in the warnings in this chapter.


Fundamental principles

WARNING	
	<p>Danger of injury due to improperly performed maintenance work!</p> <p>Improper maintenance can lead to serious personal injury and material damage.</p> <p> Preventive measures see <i>chapter 2 "Safety"</i>.</p>


NOTICE	
	Observe the regulations for assembling screw pipe connections. See the manufacturer's documentation for each component.

Replacement parts


WARNING	
	<p>Risk of injury due to incorrect replacement parts!</p> <p>Incorrect or defective replacement parts can result in damage, faults or total failures as well as impairments to safety.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Only use spare parts from BARTEC BENKE. ☞ See <i>chapter 2 Safety</i> “Intended use”.

NOTICE	
	<p>Contaminated components or assemblies to be repaired or serviced by BARTEC BENKE must always be sent together with a completed decontamination declaration! If this is not provided, repair/maintenance cannot be carried out.</p> <p>Templates can be found in the customer folder or they can be requested from BARTEC BENKE (see Section 1.7 “Customer Service” on page 7).</p>


Pressurized gases







WARNING	
	<p>Danger of injury from pressurized gases!</p> <p>Lines are pressurized even when switched off. In the case of defective or leaky lines, escaping gases could cause serious injuries.</p> <ul style="list-style-type: none"> ☞ Before performing any work, shut off and depressurize the supply lines. ☞ Wear suitable safety goggles, protective gloves and, if applicable, breathing apparatus.







Electrical current

DANGER	
	<p>Danger of death due to electrical current!</p> <p>Touching voltage-conducting parts poses an immediate life-threatening hazard. Damage to the insulation or to individual components can cause fatal injury.</p> <ul style="list-style-type: none"> ☞ Avoidance measures see chapter 2 “Safety”.

Securing against being switched on again

DANGER	
	<p>Danger of death due to unauthorized restarting!</p> <p>During work in danger areas, there is the danger that the power supply can be switched on without authorisation. This poses a life-threatening hazard for the persons in the danger area.</p> <ul style="list-style-type: none"> ☞ Avoidance measures see <i>chapter 2 “Safety”</i>.




Hazardous substances	<p style="text-align: center;">WARNING</p> <div style="display: flex; align-items: center;">  <div> <p>Danger of injury from toxic substances!</p> <p>Swallowing, inhaling or contact with skin or eyes can lead to serious, permanent health damage or death.</p> <p>☞ Avoidance measures see chapter 2 "Safety".</p> </div> </div>
Hot operating materials	<p style="text-align: center;">WARNING</p> <div style="display: flex; align-items: center;">  <div> <p>Danger of burns due to hot operating materials!</p> <p>Operating materials can reach high temperatures during operation and cause burns upon contact.</p> <p>☞ Avoidance measures see chapter 2 "Safety".</p> </div> </div>
Hot surfaces	<p style="text-align: center;">WARNING</p> <div style="display: flex; align-items: center;">  <div> <p>Danger of burns due to hot surfaces!</p> <p>Contact with hot components can cause burns.</p> <p>☞ Avoidance measures see chapter 2 "Safety".</p> </div> </div>
Cold operating materials	<p style="text-align: center;">WARNING</p> <div style="display: flex; align-items: center;">  <div> <p>Danger of burns due to cold operating materials!</p> <p>Operating materials can reach low temperatures during operation and cause burns upon contact.</p> <p>☞ Preventive measures see chapter 2 "Safety".</p> </div> </div>
Cold surfaces	<p style="text-align: center;">WARNING</p> <div style="display: flex; align-items: center;">  <div> <p>Danger of burns due to cold surfaces!</p> <p>Contact with cold components can cause burns.</p> <p>☞ Preventive measures see chapter 2 "Safety".</p> </div> </div>
Electrostatic discharge	<p style="text-align: center;">WARNING</p> <div style="display: flex; align-items: center;">  <div> <p>Danger of explosions due to electrostatic discharge!</p> <p>Non-metallic components, manual controls made from plastic and insulation from a size of 20 cm² within the IP protective housing can become charged electrostatically by friction or particle flows.</p> <p>FOR THIS REASON:</p> <p>☞ Always keep the housing door closed. External electrostatic effects can ignite an explosive atmosphere.</p> <p>☞ Clean the components with a damp cloth only.</p> </div> </div>

WARNING	
	<p>Danger of explosions due to electrostatic discharge!</p> <p>Non-metallic stickers from a size of 80 cm² can become electrostatically charged by friction.</p> <p>FOR THIS REASON:</p> <p> Preventive measures see <i>chapter 2 "Safety"</i>.</p>
WARNING	
	<p>Danger of explosions due to electrostatic discharge!</p> <p>Painting the SCS - HCDT increases the risk of electrostatic discharge even on metallic surfaces.</p> <p>FOR THIS REASON:</p> <p> Preventive measures see <i>chapter 2 "Safety"</i>.</p>
WARNING	
	<p>Danger of explosions due to electric discharge!</p> <p>Different voltage potentials of contact surfaces can lead to electric discharge.</p> <p>FOR THIS REASON:</p> <p> Preventive measures see <i>chapter 2 "Safety"</i>.</p>

5.2 Maintenance plan

The maintenance plan provides an overview of the most important maintenance work. The sections below describe the maintenance work in detail. If increased wear is detected at regular inspections, shorten the required maintenance intervals according to the actual degree of observed wear.











If you have questions on maintenance tasks and intervals, contact us at our service address (see *chapter 1.7 "Customer service" on page 7*).


WARNING	
	<p>Risk of injury due to incorrect replacement parts!</p> <p>Incorrect or defective replacement parts can result in damage, faults or total failures as well as impairments to safety.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">  Only use spare parts from BARTEC BENKE.  See <i>chapter 2.1 "Intended use" on page 9</i>.

Interval	Maintenance task	To be performed by
Daily	General visual inspection (see <i>page 52</i>)	Authorized specialist for potentially explosive atmospheres and working on high-pressure equipment
Monthly or as required	Checking condensate drain for condensate (see <i>page 55</i>)	
Every 6 months	Checking the safety equipment (see <i>page 57</i>)	
	Cleaning or replacing filters (see <i>page 58</i>)	
	Functional check of overflow valves (see <i>page 59</i>)	
Annually	Checking that all screw pipe connections are securely fitted	
	Checking that all electrical terminals are firmly seated	
Every 2 years or if defective	Replacing solenoid valve (emergency shut-off) (see <i>page 63</i>)	
	Replacing orifice (see <i>page 65</i>)	

5.3 Preparing for maintenance work

Before carrying out maintenance work, please observe the following points to prepare for the maintenance work:

-  Provide spare parts or consumables (e.g. filters).
-  Prepare the suitable tools.
-  Prepare collecting vessels or binding agents, cleaning materials etc.
-  Stop the downstream analyzer from measuring, if required, or switch it into a safe state.
-  Disconnect the auxiliary supply or sample supply from the SCS - HCDT.
-  Disconnect the electrical supply (if required).
-  Relieve the pressurized areas of the SCS - HCDT.
-  Flush the entire SCS - HCDT with inert gas.
-  Allow the heated/hot parts of the SCS - HCDT to cool down.
-  Only open the door of the IP protective housing for maintenance purposes. **A door left open without supervision is not permissible. External electrostatic effects can ignite an explosive atmosphere.**


NOTICE	
	<p>Always use the appropriate tools during the maintenance work described.</p> <p>Dispose of all sealing materials and use new ones.</p>

5.4 General visual inspection

The visual inspection is one of the first opportunities to detect and remedy a malfunction in the SCS - HCDT. The visual inspection should be carried out regularly at short time intervals. The inspection can be performed while the SCS - HCDT is in operation.

The following items should be inspected for problem-free operation:


Inspection item	Reaction
Target/actual pressures	Adjust pressures
Target/actual flow rates	Adjust flow rates

WARNING	
	<p>Danger of explosion due to incorrectly set pressures and flow rates!</p> <p>Safe operation of the SCS - HCDT can no longer be ensured. Explosion protection is no longer ensured.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Set pressures and flow rates according to the technical data on the sign of the relevant component or flow diagram.

Not only the operating parameters but also the condition of safety markings on the SCS - HCDT must be checked during the visual inspection. Warning signs and labels are an integral part of the safety markings for the SCS - HCDT.

The signage and positioning of the warnings signs and labels on the SCS - HCDT must be checked in the same way as overflow or overpressure valves. They must be present and clearly legible.

- ☞ Check whether the earthing is properly connected.
If not, connect it to the potential equalization rail.

WARNING	
	<p>Risk of injury due to damaged safety equipment!</p> <p>For missing, damaged or unusable safety equipment, a risk of injury exists due to missing warnings and the danger of explosion protection loss.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ If safety equipment is missing, damaged or not functional, switch off the SCS - HCDT immediately. ☞ Only start the SCS - HCDT again once all safety equipment has been restored to full working order.

5.4.1 IP protective housing

The maintenance must be carried out regularly corresponding to application and ambient conditions, but at least once a year, and documented accordingly.

Type and scope of work to be carried out:

- ☞ Check the hinges of the doors for ease of opening/closing and spray them with a suitable, water-free lubricant.
- ☞ Check the lock for ease of operability.
Spray all moving lock parts with a suitable, water-free lubricant.
- ☞ Replace the seals **inside** the contact edges in case of damage. In case of damage to the seal **outside** the contact edges, an adequate sealing effect is usually still present.
- ☞ To prevent damage due to temperature induced freezing of the seals, normal media such as talcum, Vaseline or waxes can be used. Check all components and surfaces for external damage.

5.5 Checking condensate drain for condensate


To ensure a problem-free flow of the sample (gas), it must be tested at regular intervals as to whether any condensate has formed in it. A condensate drain is provided for this purpose.

Personal protective equipment

Wear the basic protective equipment specified in *chapter 2 "Safety"* and the following additional protective equipment:

- Safety goggles
- Protective gloves (hazardous substances)

Preparation

WARNING	
	<p>Danger of explosions due to escaping petrochemical products!</p> <p>Petrochemical products can leak. Escaped gas forms an explosive atmosphere when mixed with air.</p> <p>☞ Preventive measures see <i>chapter 2 "Safety"</i>.</p>

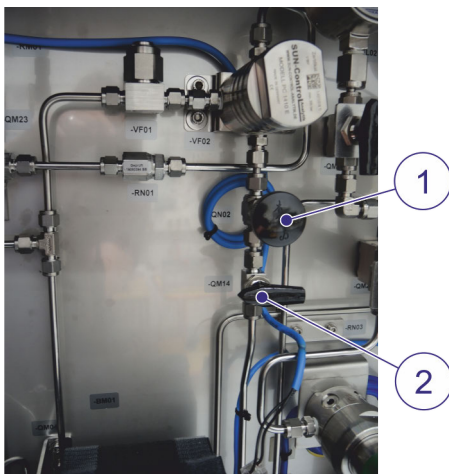


Figure 5.1: Ball valve and needle valve

- ☞ Close the needle valve **QN02 (1)** and the ball valve **QM14 (2)** which are connected with the condensate drain.

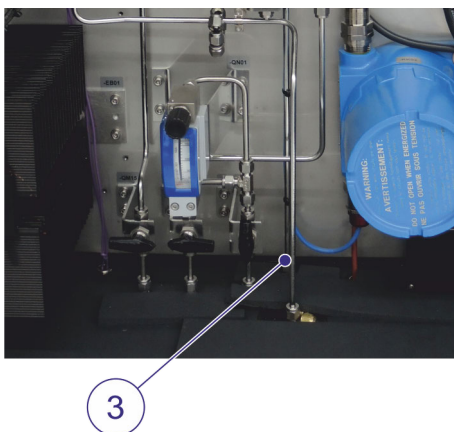



Figure 5.2: Condensate drainpipe

The condensate drain is located beneath the housing on the pipes **(3)**.

Checking the condensate drain

CAUTION	
	<p>Risk of injury due to sudden escaping of condensate!</p> <p>Due to the residual pressure in the pipes, gas and condensate can escape and cause injuries to hands and eyes.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none">☞ Wear protective goggles and protective gloves.

- ☞ **Carefully** release the blind cap on the condensate drain **(3)**.
- ☞ Place a collection container under the condensate drain.
- ☞ Open the needle valve **(1)** briefly and then close it again.
- ☞ Carefully open the ball valve **(2)** and catch any condensate using the collection container.
- ☞ Close the ball valve again.
- ☞ Repeat this procedure until no more condensate emerges.

Restarting operation

- ☞ Once you have completed all the maintenance work, carry out the steps described in *Chapter 5.11 "Measures after maintenance"* on page 66.

5.6 Checking the safety equipment

The external safety markings can be checked while the device is in operation.

 Check the safety equipment using the following table.

Inspection table

Safety equipment	Target condition
Warning signs	Present, easy to read
Stickers	Present, easy to read
Measuring unit enclosure	<ul style="list-style-type: none"> ■ Door locked ■ No damage to housing, seals or installations ■ No open drill holes
Junction box "Ex e /Ex i" junction box	<ul style="list-style-type: none"> ■ No damage to housing or seals ■ No open drill holes or screw connections ■ Lid sealed tight (Phillips screw)
Ground	<ul style="list-style-type: none"> ■ Connected ■ No corrosion ■ Firmly seated <p><i>See also in Section 2.5.2 "Potential equalization" on page 24</i></p>
Breather glands	clear, remove any impurities

5.7 Cleaning or replacing filters

Filters must be cleaned or replaced at regular intervals in order to ensure a smooth flow of the sample.

Personal protective equipment

Wear the basic protective equipment specified in *chapter 2 “Safety”* and the following additional protective equipment:

- Safety goggles
- Protective gloves (hazardous substances)

Preparation

☞ Depressurize the SCS - HCDT.

The component-specific maintenance activities can be found in the *Maintenance schedule in the customer folder*.

Cleaning/replacing the filters

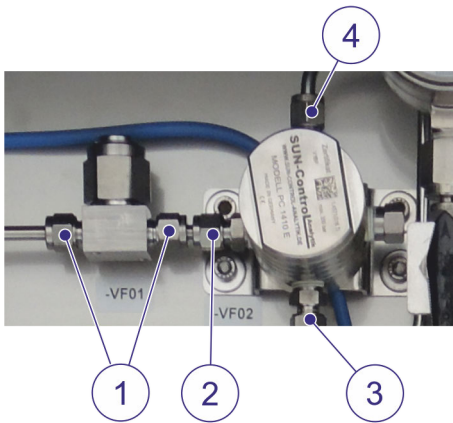


Figure 5.3: Filter

☞ For the filter *VF01*, you can first clean the filter insert and the seal by unscrewing the upper part.

After cleaning, reinsert the filter insert and the seal correctly and screw the upper part tight again.

If heavily soiled, do not have these cleaned but instead replace the entire filter.

☞ Proceed as follows:

- Release the Swagelok fittings **(1)** to remove the filter *VF01*.
- Place the new filter in position and retighten the Swagelok fittings **(1)**.

☞ With the filter *VF02* (*particulate and coalescence filter*), you can likewise first clean/replace the filter insert and the seal. Observe the operating manual of the filter when performing maintenance activities (*see customer folder*).

☞ **If heavily soiled, do not have the filter insert and/or the seals cleaned but instead replace the entire filter.**

☞ Proceed as follows:

- Release the Swagelok fittings **(2) - (4)** to remove the filter *VF02*.
- Place the new filter in position and retighten the Swagelok fittings **(2) - (4)**.

Restarting operation

☞ Pressurize the SCS - HCDT again by slowly reopening the previously closed valve behind the filter.

When doing this, watch for leaks and eliminate any found.

☞ Once you have completed all the maintenance work, carry out the steps described in *Chapter 5.11 “Measures after maintenance”* on page 66.

5.8 Functional check of overflow valves

The function of the overflow valves must be checked at regular intervals.

Personal protective equipment

Wear the basic protective equipment specified in *chapter 2 “Safety”* and the following additional protective equipment:

- Safety goggles
- Protective gloves (hazardous substances)

Preparation

- ☞ Have a pressurized gas cylinder with inert gas available.

Checking the overflow valve *FL01*

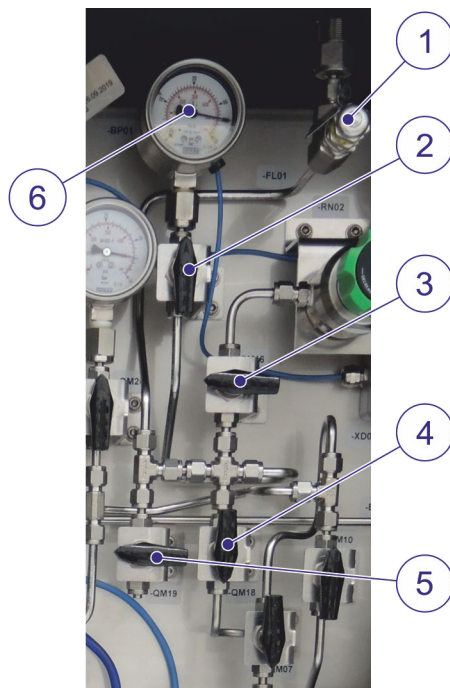


Figure 5.4: Checking overflow valve 1

Proceed as follows to check the function of the overflow valve *FL01* (1):

- (1) Leave the ball valve *QM17* (2) open.
- (2) Close the ball valves *QM16* (3) and *QM18* (4).
- (3) Connect the pressurized gas cylinder with inert gas to the connection of the ball valve *QM19* (5).
- (4) Set a pressure of 40 barg on the fitting of the pressurized gas cylinder.
- (5) Carefully open the ball valve *QM19* (5) briefly and then close it again.
- (6) Check the indicator on the pressure gauge *BP01* (6):
 - If the pressure gauge shows a pressure between 32 and 38 bar, the overflow valve is functioning flawlessly.
 - If the pressure gauge shows a pressure > 38 bar, repeat steps 4 to 6 with a pressure of 45 barg on the fitting of the pressurized gas cylinder. If the value is still > 38 bar, the overflow valve is probably jammed or defective. **Replace it promptly (see page 61).**
 - If the pressure gauge shows a pressure < 32 bar, the overflow valve does not close properly or has a leak. **Replace it promptly (see page 61).**
- (7) Open the ball valves *QM16* (3) and *QM18* (4) again.
- (8) Leave the ball valve *QM19* (5) closed.
- (9) Close the pressurized gas cylinder and disconnect it from the ball valve connection.

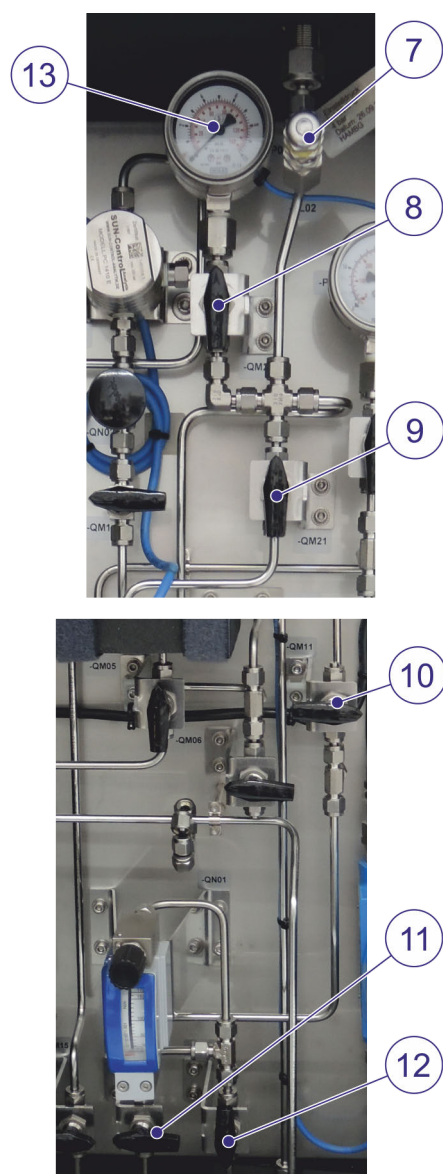
Checking the overflow valve *FL02*

Figure 5.5: Checking overflow valve 2

Proceed as follows to check the function of the overflow valve *FL02* (7):

- (1) Leave the ball valve *QM22* (8) open.
- (2) Close the ball valves *QM21* (9), *QM12* (12) and *QM13* (11).
- (3) Connect the pressurized gas cylinder with inert gas to the connection of the ball valve *QM11* (10).
- (4) Set a pressure of 6 barg on the fitting of the pressurized gas cylinder.
- (5) Carefully open the ball valve *QM11* (10) briefly and then close it again.
- (6) Check the indicator on the pressure gauge *BP02* (13):
 - If the pressure gauge shows a pressure between 3 and 5 bar, the overflow valve is functioning flawlessly.
 - If the pressure gauge shows a pressure > 5 bar, repeat steps 4 to 6 with 7 barg on the fitting of the pressurized gas cylinder. If the value is still > 5 bar, the overflow valve is probably jammed or defective.
Replace it promptly (see page 61).
 - If the pressure gauge shows a pressure < 3 bar, the overflow valve does not close properly or has a leak.
Replace it promptly (see page 61).
- (7) Open the ball valves *QM21* (9), *QM12* (12) and *QM13* (11) again.
- (8) Leave the ball valve *QM11* (10) closed.

5.8.1 Replacing overflow valves

Preparation

- ☞ Depressurize the overpressure lines (*G* and *F* in the flow diagram) of the overflow valve and make sure that no gas can flow back out of the downstream pipelines.
- ☞ Close the ball valves *QM01* (sample inlet) and *QM15* (validation).
- ☞ Depressurize the SCS - HCDT.
- ☞ Close the ball valves *QM12* and *QM13* (sample return flow).
- ☞ Disconnect the power supply of the SCS - HCDT.

Replacing overflow valve *FL01*

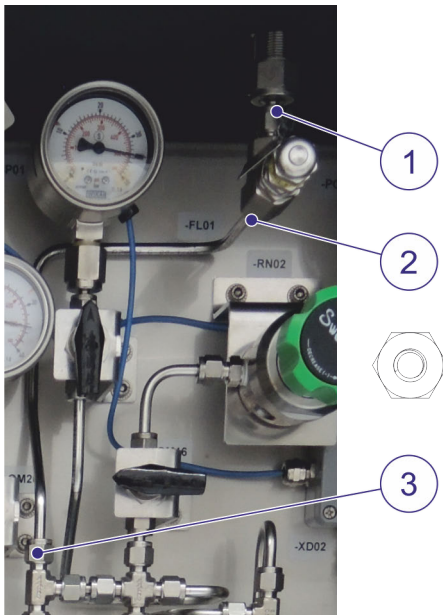


Figure 5.6: Replacing overflow valve 1

- ☞ Release the Swagelok fitting **(1)**.
- ☞ Release the Swagelok fitting **(3)**, to remove the overflow valve *FL01* with the pipes. Remove the pipes from the overflow valve by removing the Swagelok fitting **(2)**.
- ☞ Connect the new overflow valve to the pipes and retighten the Swagelok fittings **(1)** to **(3)**.

Replacing overflow valve FL02

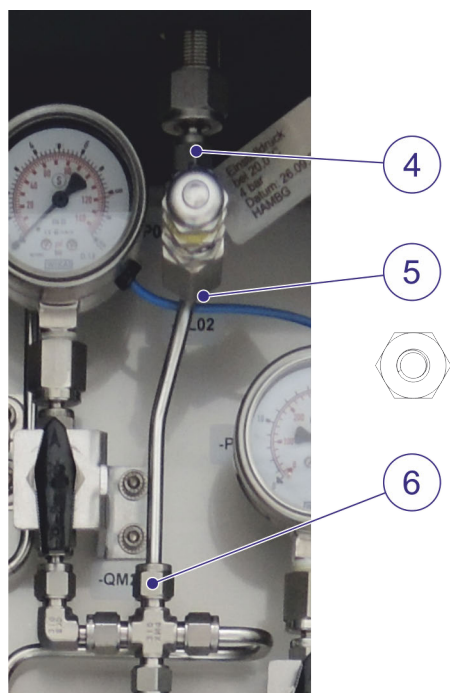


Figure 5.7: Replacing overflow valve 2

- ☞ Release the Swagelok fitting **(4)**.
- ☞ Release the Swagelok fitting **(6)**, to remove the overflow valve FL02 with the pipes.
Remove the pipes from the overflow valve by removing the Swagelok fitting **(5)**.
- ☞ Connect the new overflow valve to the pipes and retighten the Swagelok fittings **(4)** to **(6)**.

Restarting operation

- ☞ Switch the power supply on again.
- ☞ Pressurize the SCS - HCDT again by slowly opening the valves you previously closed (QM12, QM13, QM15, QM01)
When doing this, watch for leaks and eliminate any found.
- ☞ Pressurize the overpressure lines again.
- ☞ Once you have completed all the maintenance work, carry out the steps described in Chapter 5.11 "Measures after maintenance" on page 66.

5.9 Replacing the solenoid valve (emergency shut-off)

To ensure the safety of the SCS - HCDT and problem-free flow of the sample, the solenoid valve for the emergency shut-off must be replaced at regular intervals.

Personal protective equipment

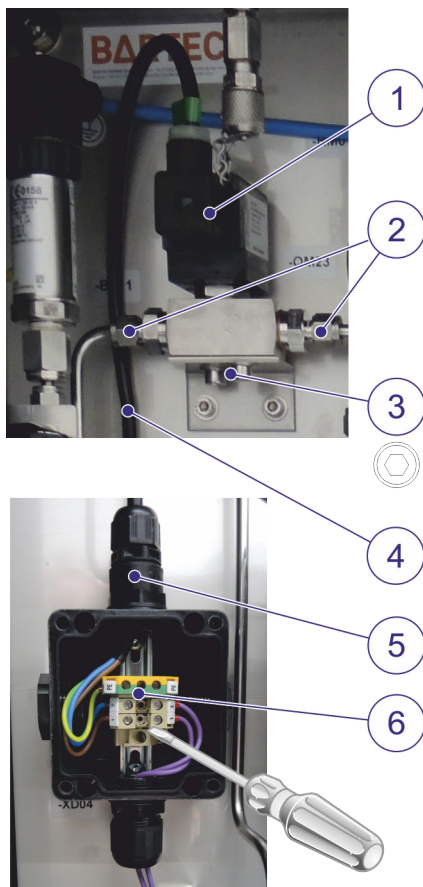
Wear the basic protective equipment specified in *chapter 2 "Safety"* and the following additional protective equipment:

- Safety goggles
- Protective gloves (hazardous substances)

Preparation

- ☞ Depressurize the SCS - HCDT and open the valve behind or in front of the solenoid valve so that any residual pressure can escape.

Removing the solenoid valve

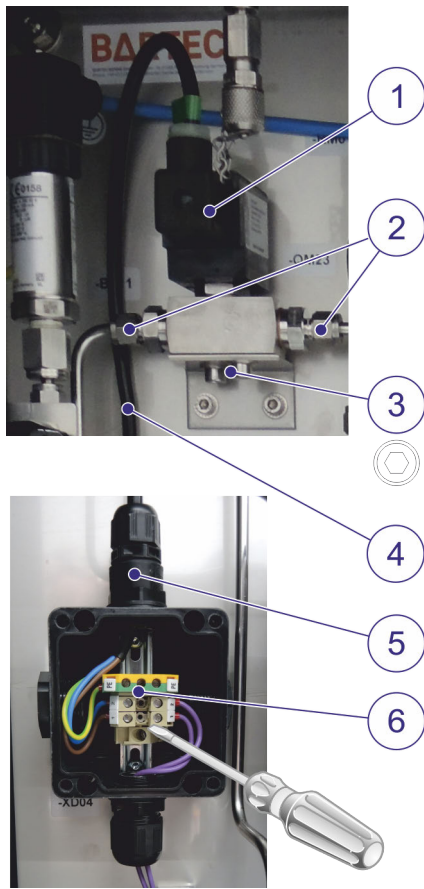


- ☞ Release the Swagelok fittings (2) of the solenoid valve (1) of the emergency shut-off.
- ☞ Remove the screws (3) from the holder.
- ☞ Remove the cable ties of the cable (4).
- ☞ Release the cable gland on the junction box (5).
- ☞ Detach the terminals (6) of the three wires of the cable.
- ☞ Carefully pull out the cable.
- ☞ Remove the solenoid valve.

You can now also replace the orifice by performing the following steps.

Figure 5.8: Solenoid valve

Installing the solenoid valve



- ☞ Install the solenoid valve back in by placing it on the holder.
- ☞ Tighten the screws (3) only loosely.
- ☞ Connect the Swagelok fitting (2) and tighten it again.
- ☞ Tighten the screws (3) of the holder.
- ☞ Guide the cable (4) into the junction box (5).
- ☞ Tighten the cable gland on the junction box.
- ☞ Connect the three wires of the cable with the terminals (6) according to the connection diagram.
- ☞ Bind the cable with cable ties.

Figure 5.9: Solenoid valve

Restarting operation

- ☞ Pressurize the SCS - HCDT again by slowly reopening the previously closed valve behind or in front of the solenoid valve.
When doing this, watch for leaks and eliminate any found.
- ☞ Once you have completed all the maintenance work, carry out the steps described in Chapter 5.11 "Measures after maintenance" on page 66.

5.10 Replacing the orifice

To ensure the safety of the SCS - HCDT and problem-free flow of the sample, the orifice must be replaced at regular intervals.

Personal protective equipment

Wear the basic protective equipment specified in *chapter 2 “Safety”* and the following additional protective equipment:

- Safety goggles
- Protective gloves (hazardous substances)

Preparation

- ☞ Depressurize the SCS - HCDT and open the valve behind or in front of the orifice so that any residual pressure can escape.

Replacing the orifice

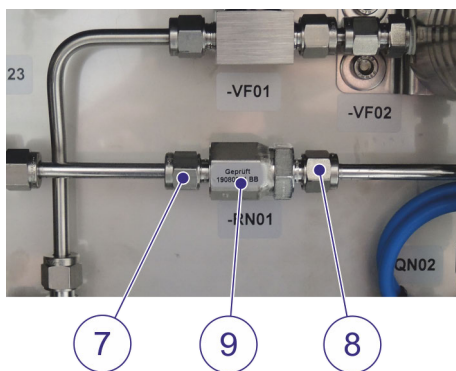


Figure 5.10: Orifice

- ☞ Release the Swagelok fittings (7) and (8) of the orifice (9).
- ☞ Remove the orifice and install a new one.
- ☞ Connect the Swagelok fittings (7) and (8) of the orifice (9).

Restarting operation

- ☞ Pressurize the SCS - HCDT again by slowly reopening the previously closed valve behind or in front of the orifice.
When doing this, watch for leaks and eliminate any found.
- ☞ Once you have completed all the maintenance work, carry out the steps described in *Chapter 5.11 “Measures after maintenance”* on page 66.

5.11 Measures after maintenance

After completing the maintenance work and before switching on, carry out the following steps:

- ☞ Check that all screw connections that had been loosened are tight again.
- ☞ Make sure that all previously removed protective devices and covers have been properly reinstalled.
- ☞ Make sure that all tools, materials and other equipment that were used have been removed from the work area.
- ☞ Clean the work area and remove any escaped materials such as liquids, processing materials or similar.
- ☞ Make sure that all protective devices on the system are functioning flawlessly.
- ☞ Put the SCS - HCDT back into operation.
- ☞ After 2 hours of operation, check all connections for leaks and perform a general visual inspection.

5.12 Decommissioning

5.12.1 Taking the SCS - HCDT out of service

Before a planned decommissioning, the system should be flushed with a flushing medium, if available.

- ☞ Close the sample inlet valve.
- ☞ If valves are available for relieving the pressure in the SCS - HCDT, open these to depressurize the SCS - HCDT.
- ☞ Switch off any heater that might be present.

6 Dismantling

At the end of its service life, the SCS - HCDT must be dismantled and disposed of in an environmentally friendly manner.

6.1 Safety

Personnel


- Dismantling is only to be performed by specialists for potentially explosive atmospheres.
- Have work on the electrical system performed only by electricians.


Personal protective equipment

Wear the basic protective equipment in line with **chapter 2 “Safety”** and the following additional protective equipment:

- Safety gloves if necessary
- Safety goggles

Fundamental principles

WARNING	
	<p>Danger of injury due to incorrect dismantling work!</p> <p>Stored residual energy, components with sharp edges, points and corners in and around the SCS - HCDT or on the required tools can cause injuries.</p> <p>☞ Avoidance measures see chapter 2 “Safety”.</p>

DANGER	
	<p>Danger of lethally toxic substances!</p> <p>Leaks can cause toxic substances to accumulate on the inside, which can cause serious or fatal injury if inhaled.</p> <p>☞ Avoidance measures see chapter 2 “Safety”.</p>


6.2 Preparing for dismantling

- ☞ Clean the SCS - HCDT prior to disposal.
- ☞ Empty product-conveying components and rinse them with inert gas (e.g. nitrogen).
- ☞ Switch off the SCS - HCDT and connected analyzer and ensure they cannot be restarted.
- ☞ Discharge the remaining residual energies.
- ☞ Remove operating media, auxiliary media and any remaining processing materials in an environmentally friendly manner.

6.3 Disconnecting electrical connections

- This work should only be performed by a qualified electrician.
- Special tools required:
- Electrician's equipment

Electrical current

DANGER	
	<p>Danger of death due to electrical current!</p> <p>Touching voltage-conducting parts poses an immediate life-threatening hazard. Damage to the insulation or to individual components can cause fatal injury.</p> <p>☞ Avoidance measures see chapter 2 "Safety".</p>

Disconnecting electrical connections

- ☞ Disconnect the SCS - HCDT completely from the mains.
- ☞ Make sure the SCS - HCDT cannot be switched back on.
- ☞ Open the junction box.
- ☞ Disconnect all cables and pull them out of the junction box.
- ☞ Unscrew the potential matching cable from the rack.
- ☞ Close the junction box.

6.4 Disconnecting pipe connections

Personnel


This work should only be conducted by a specialist for potentially explosive atmospheres.

Personal protective equipment

Wear the basic protective equipment in line with **chapter 2 "Safety"** and the following additional protective equipment:

- Safety goggles
- Protective gloves

Hazardous substances


WARNING	
	<p>Danger of injury from toxic substances!</p> <p>Swallowing, inhaling or contact with skin or eyes can lead to serious, permanent health damage or death.</p> <p>☞ Avoidance measures see <i>chapter 2 "Safety"</i>.</p>

Disconnecting pipe connections

- ☞ Check that the pressure has been fully released.
- ☞ Collect any escaping substance residues separately.
- ☞ Disconnect the pipe connections in accordance with the installation plan in the customer folder.

6.5 Removing fastenings


- ☞ Remove the fastening screws from the base.
- ☞ Undo the SCS - HCDT from the base.

WARNING	
	<p>Danger of injury due to SCS - HCDT tipping over!</p> <p>Due to the high center of gravity, the SCS - HCDT could tip over if transported incorrectly, which can lead to severe injuries and material damage.</p> <p>FOR THIS REASON:</p> <p>☞ SCS - HCDT Secure against tipping over and use a suitable means of transport.</p>

6.6 Disposal

Disassemble the SCS - HCDT in accordance with the applicable work safety and environmental protection guidelines. Recycle the dismantled components:


- ☞ Scrap metals.
- ☞ Send plastic elements for recycling.
- ☞ Dispose of the other components according to their material composition.

CAUTION	
	<p>Environmental damage due to incorrect disposal.</p> <p>Improper disposal damages the environment.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Have electric scrap, electronic components, lubricants and other auxiliary media disposed of only by authorized specialist companies. They are subject to the rules on special waste treatment.

Your local authorities or specialist disposal companies can provide you with information on environmentally friendly disposal.

Hazardous substances

Sort the hazardous materials according to their properties and have them disposed of professionally.

CAUTION	
	<p>Environmental hazard.</p> <p>Improper disposal of hazardous substances poses a threat to both health and the environment.</p> <p>FOR THIS REASON:</p> <ul style="list-style-type: none"> ☞ Observe local laws and regulations regarding the disposal of hazardous materials.

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