

SC SAMPLE COOLERS

INSTALLATION AND MAINTENANCE INSTRUCTIONS



SC32 / SC132
SC32B / SC132B
SC32F / SC132F
SC332 / SC432 / SC532

GENERAL INFORMATION

- These instructions must be carefully read before performing any work involving VALSTEAM ADCA products. Failure to observe these instructions may result in hazardous situations.
- These instructions describe the entire life cycle of the product. Keep them in a location that is accessible to every user and make these instructions available to every new owner of the product.
- Current regional and plant safety regulations must be considered and followed during installation, operation, and maintenance work.
- The images shown in these instructions are for illustration purposes only.
- For problems that cannot be solved with the help of these instructions, please contact VALSTEAM ADCA or its representative.

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We reserve the right to change the design and material of this product without notice.

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1. SAFETY INFORMATION

1.1. Explanation of symbols



DANGER

Hazardous situations which, if not avoided by applying the correct preventive measures, will result in fatal or serious injury and/or considerable property damage.



WARNING

Hazardous situations which, if not avoided by applying the correct preventive measures, could result in fatal or serious injury and/or considerable property damage.



CAUTION

Hazardous situations which, if not avoided by applying the correct preventive measures, could result in moderately severe or minor injury.



NOTICE

Situations which, if not avoided, can result in property damage or product malfunction.



NOTE

Indicates additional informations, tips, and recommendations.

1.2. Intended use

Refer to the markings on the device, such as nameplate and laser markings, Information Sheet (IS), and these Installation and Maintenance Instructions (IMI) to check that the product was designed for the intended use and meets the specifications used for sizing and selection. This includes checking application, material suitability, process medium, pressure, and temperature as well as their respective limiting values.

VALSTEAM ADCA does not assume any responsibility for damage resulting from inappropriate use of the product, damage caused by external stresses, or any other external factors. Correct installation of the product is the full responsibility of the contractor.

Inappropriate use of the product is any use other than the one described in this chapter. Inappropriate use also includes:

- Use of spare parts that are not genuine;
- Performance of maintenance work not described in these instructions;
- Use outside the limits defined by the accessories connected to the product.
- Unauthorized modifications to the product.

If the product is to be used for an application or with a fluid other than the one it was designed for, contact VALSTEAM ADCA.

1.3. Qualification of personnel

Handling, installation, operation, and maintenance work must be carried out by fully trained and qualified personnel, capable of judging the work which they are assigned to perform and recognizing potentially hazardous situations. They should be trained to properly use this product according to these Installation and Maintenance Instructions.

Where a formal “Permits to Work” system is implemented in the plant it must be complied with.

1.4. Personal protective equipment

Personal protective equipment should always be worn during work in order to protect against hazards posed by e.g. the process medium, dangerous temperatures, noise, falling or projected objects, and working at height. This equipment includes a helmet, safety glasses, safety harness, protective clothes, safety shoes, hearing protection, etc.

NOTE

Always assess whether you or others in your vicinity require any protective equipment. When in doubt check with the plant’s health & safety responsible personnel for details on required protective equipment.

1.5. The system

The complete system should be assessed as well as every action (e.g. closing of shut-off valves, disconnection of the power supply) to ensure this will not bring additional risk to personnel or property.

Dangerous actions that can result in a hazardous situation include isolation of protective devices such as safety valves, vents, vacuum relief valves, disconnection of electric safety devices, sensors, and alarms.

1.6. ATEX

If the product is in the scope of the ATEX 2014/34/EU directive and as such bears the Ex marking, consult its specific Additional Instructions for use in Potentially Explosive Areas (IMI EX). In such cases, handling, installation, operation, and maintenance work must only be performed by personnel qualified and authorized to work in potentially explosive areas.

1.7. General safety notes



DANGER

RISK OF BURSTING OR IMPLOSION IN PRESSURE EQUIPMENT

Valves, ancillaries, and pipelines are pressure equipment. Working outside their operating limits, improper opening, malfunction, or system operation failure may result in component bursting or implosion.

- Observe the maximum and minimum operating limits of the product and check if they are within those of the system in which it is being installed. If not, ensure a safety device is included in the system to prevent operation outside those limits. Check the product Information Sheet (IS).
- In case the malfunction of any equipment installed on the system or a system operation failure may result in a dangerous overpressure, overtemperature, or vacuum condition, ensure a safety device is included in the system to prevent such situation.
- Before starting any work on the product, depressurize it and cool or heat it to ambient temperature. This also applies to the line in which it is fitted.
- Drain the process medium from the product and all the relevant plant sections.



WARNING

RISK OF BURNS

Depending on the operating conditions, products, and pipelines may get very hot or cold and cause burn injuries.

- Do not touch the product while it is hot or cold, allowing it firstly to cool down or heat up.
- Wear protective clothing and safety gloves during working operations.
- Thermally insulate tubes and products as a preventive measure.



WARNING

RISK OF INJURY CAUSED BY FLUID ATTACK ON PRODUCT MATERIALS

The product must only be used with mediums that do not attack the materials of the product (body, gaskets, seals). Otherwise, leaks may occur, and hot and/or hazardous fluid can escape.

- Do not use the product with mediums other than the ones it was designed for. Check section 1.2 - Intended Use.
- Prevent medium contamination.

RISK OF INJURY CAUSED BY UNDER TIGHTENED PRODUCT OR ITS COMPONENTS

Excessively low tightening torques may cause medium to escape and/or components to be projected at high speed which may result in a hazardous situation depending on the medium, chemical properties, and/or its operating conditions.

- Do not loosen any screws while the equipment is pressurized.
- Observe the specified tightening torques on these Installation and Maintenance Instructions. If the relevant torque value is not mentioned contact VALSTEAM ADCA.

RISK OF HEARING LOSS

Depending on the operating conditions, the product may generate loud noises.

- Wear hearing protection when in the vicinity of the product.

RISK OF INJURY AS A RESULT OF ILLEGIBLE INFORMATION

Important information written in the product nameplate, markings, and warning signs may wear over time or become illegible due to e.g. dirt accumulation, resulting in hazardous situations and personal injury or property damage.

- Keep nameplates, markings, and warning signs in a legible state, replacing them when illegible, missing, or damaged.



CAUTION

RISK OF INJURY DUE TO RESIDUAL PROCESS MEDIUM

Direct contact with a dangerous process medium may lead to personal injury, e.g. smoke inhalation and chemical burns.

- Drain the process medium from the product and all the relevant plant sections.
- Wear protective clothing, safety gloves, mask, and eye protection.



CAUTION

RISK OF INJURY DUE TO IMPROPER HANDLING

Manual handling (e.g. lifting, carrying, pushing, pulling) of large and/or heavy products may result in personal injury.

- Assess the risk associated with the handling task.
- Use adequate handling methods and appropriate auxiliary handling equipment.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO EXCESSIVELY HIGH TIGHTENING TORQUES

High tightening torques may lead to premature wearing of product components.

- Observe the specified tightening torques on these Installation and Maintenance Instructions. If the relevant torque value is not mentioned contact VALSTEAM ADCA.

2. PRODUCT INFORMATION

The ADCA SC series of sample coolers are designed to cool samples of boiler water, feedwater, condensate and steam. Sample coolers prevent steam flashing-off from hot pressurized liquid samples, which besides being dangerous may also result in an incorrect sample. The sample is affected because the re-evaporation of water will change the density of the sample which will show a higher conductivity and thus falsifying the result and triggering unnecessary consequent actions (e.g. increase amount of boiler blowdowns).

The units are provided with a pre-drilled mounting bracket for wall mounting.

2.1. Principle of operation

The cooling liquid (generally demineralized cold water) flows in the shell counter-current to the hot fluid to be cooled which flows inside a coiled tube.

The cooling water inlet valve (3) is open to allow the cooling media to flow across the sample cooler (1). The sample inlet valve (2) is a needle valve which is used to throttle amount of hot fluid to be cooled until the desired temperature is reached and can be read off the thermometer (7). At this point a water sample is drawn from the sample outlet for chemical analysis.

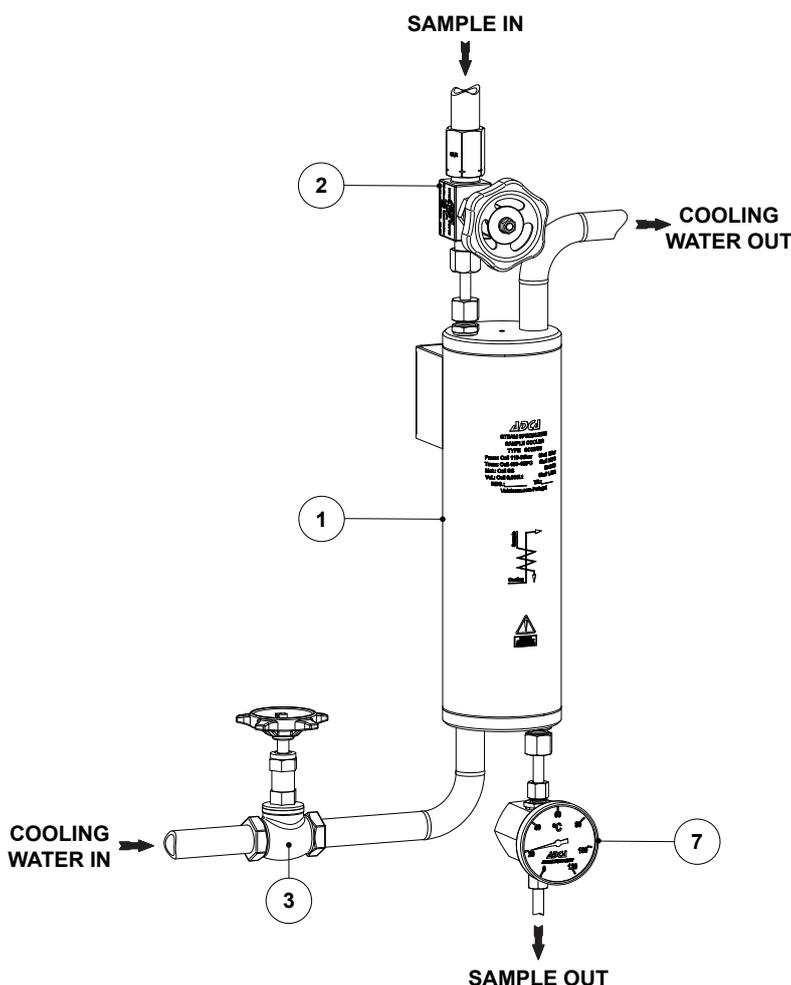


Fig. 1

2.2. Certification

This product has been specifically designed for use with liquids and gases which are in Group 2 of the European PED – 2014/68/EU Pressure Equipment Directive and it complies with its requirements.



NOTE

If the product falls within the category SEP it must not be CE marked, unless other directives are applicable.

This product is not in the scope of the ATEX 2014/34/EU directive as it does not have its potential ignition source. Personnel responsible for the plant installation must assess the risks caused by static electricity and take the necessary precautionary measures to prevent static charge. These measures include e.g. connection of the product to the equipotential bonding system.

2.3. Product identification

The following items are indicated on the product nameplate or directly on its body:

- Manufacturer
- Product model (e.g. SC32/SS)
- Max. operating temperature (e.g. Tmax: Coil 450 °C | Shell 120 °C)
- Max. operating pressure (e.g. Pmax: Coil 90 bar | Shell 20 bar)
- Flow direction (indicated by arrows for both cooling media and sample)
- Volume (e.g. Vol: Coil 0,085 L | Shell 1,48 L)
- Serial number and year of manufacturing (e.g. Reg.:17483/19)
- CE Marking (when applicable – see section 2.2 – Certification)
- EX Marking (when applicable e.g. EX h IIB T6...T3 Gb – see section 2.2 – Certification)

2.4. Technical data

For technical data including dimensions, materials, limiting conditions and versions refer to the product's respective Information Sheet (IS).

3. TRANSPORT, STORAGE, AND PACKAGING



WARNING

RISK DUE TO FALLING LOADS

Loads may tip or fall over resulting in damage to property, serious injury, or death.

- Use suitable equipment when moving or lifting suspended loads.
- Make sure no one is standing below the suspended load.



CAUTION

RISK OF INJURY DUE TO IMPROPER HANDLING

Manual handling (e.g. lifting, carrying, pushing, pulling) of large and/or heavy products may result in personal injury such as back injury.

- Assess the risk associated with the handling task.
- Use adequate handling methods and appropriate auxiliary handling equipment.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO IMPROPER STORAGE

- Do not remove any packaging or protective covers until immediately before installation at the site.
- Store the product in a solid base in a dry, cool, and dust-free environment.
- Until its installation, protect it from the weather, dirt, corrosive atmospheres, and other harmful influences.

RISK OF PRODUCT DAMAGE DUE TO LONG-TERM STORAGE

Some product components may deteriorate with time (e.g. valve packings, seals).

- Do not store the product for more than 12 months.
- If for any reason the product must be stored for longer periods contact VALSTEAM ADCA.

Products are individually wrapped in plastic film, thermo shrinkable plastic, and/or stored in a cardboard box as they leave VALSTEAM ADCA. Avoid removing packaging and any protective cover until immediately before installing the product at the site.



NOTE

If the transport packaging has any shipping damage contact VALSTEAM ADCA or its representative.

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NOTE

If the corrosion protection (paint and other surface coatings) of the product is damaged during transport or other handling procedures repair it immediately.

4. INSTALLATION

Before performing any installation work, refer to section 1 – Safety information.



WARNING

RISK OF INJURY DUE TO INSUFFICIENT SUPPORT DURING INSTALLATION

Insufficient support of the product during installation may cause it to fall and cause personal injury.

- Ensure the product is safely held in place during installation.
- Wear protective safety shoes.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO STRESS

The product is not intended to withstand external stresses that may be induced by the system to which it is being connected.

- Make sure that the connected pipe does not subject the body to any stress (forces or torques) during installation and operation.
- Do not use the product as an elevation point.

4.1. Preparation for installation

Before installation, make sure the following conditions are met:

- The installation area has easy access and the product is to be installed in a position where operation and maintenance work can be performed safely.
- The product will be installed with proper support and free of any stresses that can be induced by the system due to e.g. pipe expansions. The necessary precautions are recommended during system design.
- The pipeline where the product will be installed is designed in such a way that it takes into account the weight of the product. The pipeline may require support on both sides next to the product, particularly if its size and weight are considerable and especially if vibrations are to be expected in the system.
- The product is not damaged.
- Make sure all the necessary materials and tools are readily available during installation work.
- Referring to this Installation and Maintenance Instructions (IMI), Information Sheet (IS), and nameplate, check that the product is suitable for the intended installation: temperature, medium, pressure, temperature, etc. – see section 1.2 – Intended use.

- Check that there are no foreign bodies inside the pipelines and ancillaries, flushing may be necessary. These should be thoroughly cleaned.
- Check any mounted pressure gauges or thermometers and make sure they function properly.
- Ensure the available cooling water is clean and softened.



NOTE

Assembly Drawings (AD) with assembly details and parts lists are available on request.

4.2. Installation procedure

1. Remove plastic film and other packaging, as well as the protective covers that are placed on flanges or connection ends. Make sure the sample cooler is free from foreign matter.
2. The sample cooler must be mounted vertically with the sample inlet connection on the top, and with the housing fixed using the pre-drilled mounting brackets.
3. A sample inlet valve (2), such as an ADCA NV400H needle valve, should be installed upstream of the sample cooler and a thermometer (7) on the outlet. The valve is used for the purpose of throttling the amount of hot fluid to be cooled until the desired temperature is reached and can be read off the thermometer (7).
4. A cooling water inlet valve (3), such as an ADCA GV32, should be fitted upstream of the cooling media inlet connection for the purpose of isolating flow when the sample cooler is not in use.
5. Pipe the cooling water outlet connection to an open drain.



NOTE

In order to avoid a possible air lock at the top of the sample cooler, ensure that the thread of the tube or accessory which threads in the water outlet connection does not protrude inside and into the body. The above is not relevant for models SC32F, SC132F, SC32B and SC132B as the outlet water connection is at the bottom.

6. Take care with jointing materials and sealing compounds to ensure that none may be permitted to block or enter the sample cooler causing malfunction or blocking. In case of flanged connections use appropriate flange gaskets.



DANGER

RISK OF BURSTING OF THE SAMPLE COOLER SHELL

Obstruction (total or partial) of the cooling water outlet side can lead to damage or even bursting of the sample cooler shell.

- Installation of an isolating valve downstream of the cooling water may lead to improper operation of the unit and result in a hazardous situation.
- Ensure there is no obstruction at the cooling water side to ensure there is no flow restriction that could otherwise lead to vaporization of the cooling water and consequently an overpressure/temperature condition on the shell side.

5. START-UP

Before performing the start-up procedure, refer to section 1 – Safety Information.

The start-up procedure must be followed every time the product is put back into service.

5.1. Preparation for start-up

Before starting up, make sure the following conditions are met:

- All works on the system have been completed.
- All the necessary safety devices have been installed.
- When required, warning notices are used to alert others that the system is starting up.
- The product is correctly installed – see section 4 – Installation.
- Referring to these Installation and Maintenance Instructions (IMI), Information Sheet (IS), and nameplate, check that the product is suitable for the intended installation: temperature, medium, pressure, temperature, etc. – see section 1.2 – Intended use.
- A safety check was performed by qualified personnel. Checking for leaks, structural damage and integrity of system components.

! NOTICE

RISK OF PRODUCT DAMAGE DUE TO CONTAMINATION

The plant operator is responsible for cleaning the pipelines in the plant as well as keeping the product well-maintained. At start-up, the presence of small particles in the medium (dirt, scale, weld splatters, etc.) may damage the product or cause malfunction.

- Flush pipelines before start-up.
- Clean protection varnishes from pipes and flanges, leftover paint, graphite, grease, etc.

5.2. Start-up procedure

1. Open shut-off valves slowly, until normal operating conditions are achieved. This will prevent sudden surges of pressure that can damage the product.
2. Depending on the medium this will also avoid thermal shocks by bringing the product slowly up to temperature.
3. Check for any leaks.

i NOTE

24 hours after system start-up, it is recommended to check the pipe connection for leaks and retighten when necessary. Clean strainers/filters to avoid blocking.

6. OPERATION

Before operating the product refer to section 1 – Safety Information.

Immediately after completing the start-up procedure, the product is ready for operation.

! WARNING

RISK OF BURNS DUE TO HOT SAMPLE DISCHARGE

Sample side pipework may get very hot and cause burn injuries if touched.

- Do not touch the sample side pipework while it is hot, allowing it firstly to cool down once operation has finished.
- Always close the sample inlet valve before closing the cooling water valve.

WARNING

RISK OF VAPORIZATION OF COOLING WATER

Cooling water may evaporate in case of insufficient flow.

- Before opening the sample inlet valve ensure that the cooling water valve is fully open and full flow can be seen at the cooling water outlet.

6.1. Operation procedure

1. Open the cooling water inlet valve (3) and ensure that there is full flow running across the sample cooler shell which can be seen then discharging from the cooling water outlet.
2. Gradually open the sample inlet valve (2) and regulate flow until achieving a cooled sample at about 25 to 30 °C. If a thermometer (7) is fitted, this can be used to determine sample temperature.
3. Allow the sample to run for approximately 10 seconds before collecting with an adequate cup or flask.
4. After sample collection, close the sample inlet valve (2) first and then the cooling water inlet valve (3) but only after a small period of time in order to condense or cool the remaining media inside the coil.

7. SHUTDOWN

Before performing the shutdown procedure, refer to section 1 – Safety information.

7.1. Shutdown procedure

1. Switch off the system and secure it so it cannot be turned on by unauthorized personnel.
2. Fully close the upstream shut-off valves.
3. Make sure the pipeline and the sample cooler are not under pressure and are at a safe temperature.
4. If the sample cooler is to be removed from the pipeline – see section 3 - Transport, storage, and packaging.

8. PARTS LIST

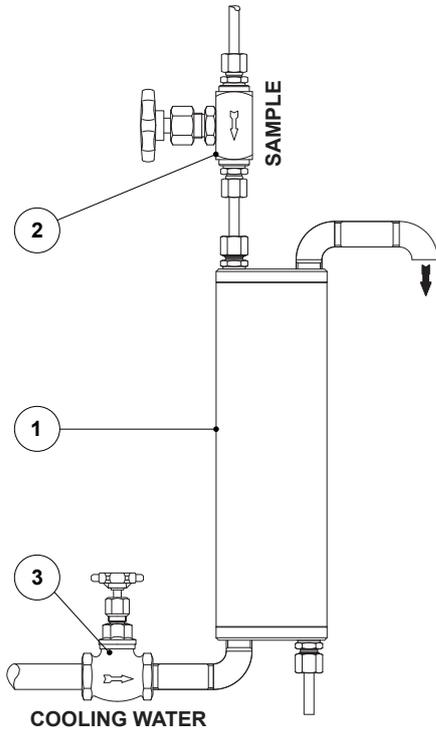


Fig. 2 - SC32 and SC132

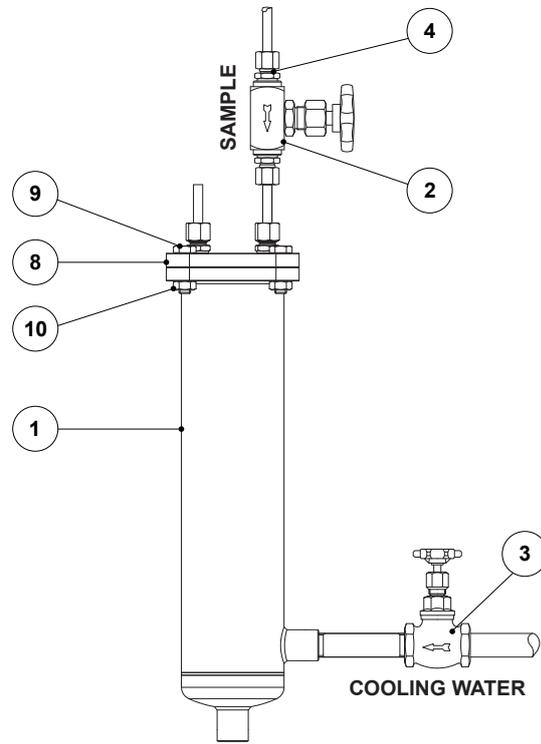


Fig. 3 - SC32B and SC132B

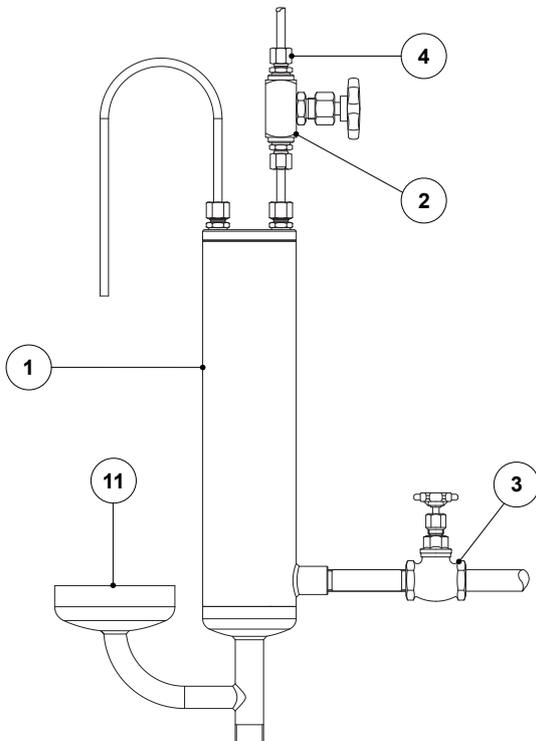


Fig. 4 - SC32F and SC132F

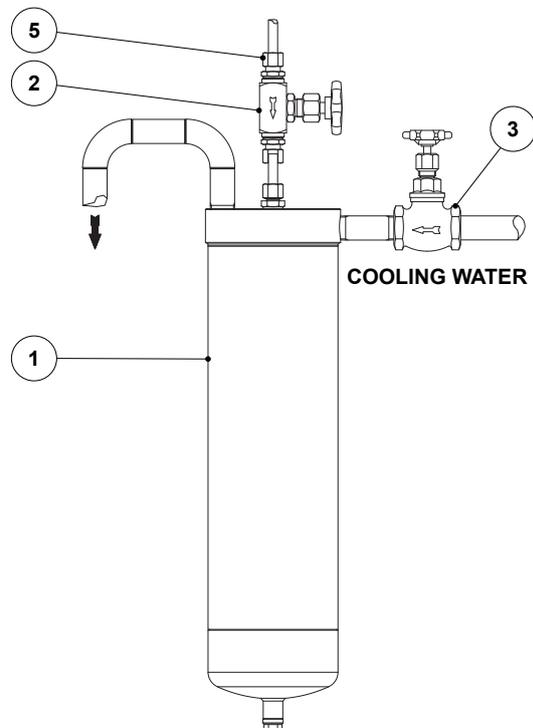


Fig. 5 - SC332, SC432 and SC532

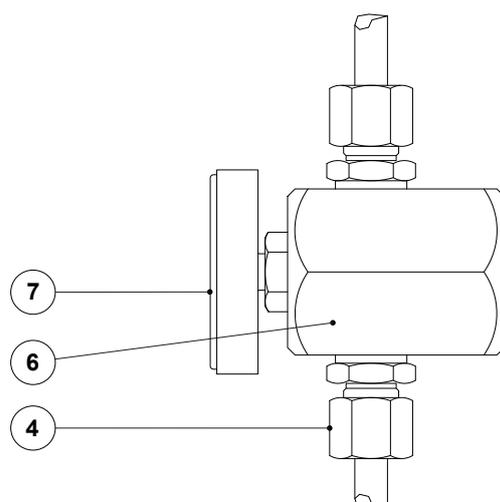


Fig. 6 - Thermometer and connector

POS. N°	DESIGNATION
1	Sample cooler
2	Sample inlet valve
3	Cooling water inlet valve
4	Compression fittings (x2) 1/4" x 8 mm
5	Compression fittings (x2) 3/8" x 10 mm
6	Thermometer connector
7	Bimetallic thermometer
8	Cover
9	Bolts
10	Nuts
11	Funnel

9. MAINTENANCE

Before performing a maintenance procedure, refer to section 1 – Safety information.

Sample coolers do not require maintenance and have no spare parts. It is recommended to examine the unit at regular intervals and it may be recommended by local authorities according to specific or general pipe and/or vessel assembly procedures.

Cleaning/flushing may be necessary in case of sporadic use.

In case of bolted models such as the SC32B or SC132B, which can be opened for inspection, please contact Valsteam ADCA or its representative for information concerning spare parts and tightening torques.

10. DISPOSAL

Once the product has reached the end of its working life, it should be sent for disposal in accordance with the prevailing national and local regulations.

Before disposal make sure that the product is clean and free from fluid residues.

During its disposal, pay special attention to rubbers, resins, and polymer components (PVC, PTFE, PP, PVDF, FKM, NBR, etc.).

Do not dispose of components and hazardous substances together with household waste.

11. RETURNING PRODUCTS

Information regarding hazards and precautionary measures to be considered due to contaminating fluids and residues or mechanical damage that may represent a health, safety, or environmental risk, must be provided in writing when returning products to VALSTEAM ADCA.



WARNING

RISK DUE TO THE PRESENCE OF HAZARDOUS RESIDUES ON RETURNED PRODUCTS

Contaminated fluids and residues may represent an environmental risk, or risk to VALSTEAM ADCA personnel.

- Information regarding any hazards or precautionary measures to be considered must be provided in writing when returning products to VALSTEAM ADCA.
- Health and Safety information sheets relating to any substances identified as hazardous or potentially hazardous must be provided outside the packaging.
- Use Hazmat labels on the packaging.

IMPORTANT NOTE

Total or partial disregard of these Installation and Maintenance Instructions involves loss of any right to warranty.

The extent and warranty period are specified in the “General sales conditions”.