Automatic cleaning valve

XCHE

Instruction manual

Reference: XCHE_NOT_EN

Version A

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1 GENERAL PRESENTATION

1.1. The manufacturer

SERVINOX is a specialist producer of process equipment, designed for the brewing, food, cosmetics and chemicals sectors.

Process equipment expertise:
In fields such as tank protection, sampling, gas injection in liquids, pigging systems or cleaning with patented products.

SERVINOX is certified ***ISO 9001:2008*** and proposes products in compliance with the following applicable standards and directives:

- Pressure Equipment Directive ***(PED) 2014/68/EU***
- European Directive on equipment installed in potentially explosive atmospheres ***(ATEX) 2014/34/EC***
- US 3A manufacturers sanitary standard

We are an active member of the ***EHEDG France*** association (sanitary standard for European manufacturers).

1.2. Instruction manual

In order to guarantee the integrity of the equipment and the safety of persons, familiarization is necessary with the information contained in this manual before the installation and use of the equipment.

Depending on the installation and on the liquid concerned, precise directives and regulations are applicable. These must be complied with.

In addition to the instructions in this instruction manual, the general instructions for workplace safety and protection must be applied. The regulations on environmental protection must also be complied with.

1.3. Markings

If the user encounters difficulties for which these service instructions do not provide resolution, please request additional information from the manufacturer or, as the case may be, from the equipment distributor.

The tank dome adapter has an engraved number:

- This number begins with a trigram: SVX
- Followed by the batch identification numbers

If the user encounters difficulties for which these service instructions do not provide resolution, please request additional information from the manufacturer or, as the case may be, from the equipment distributor.

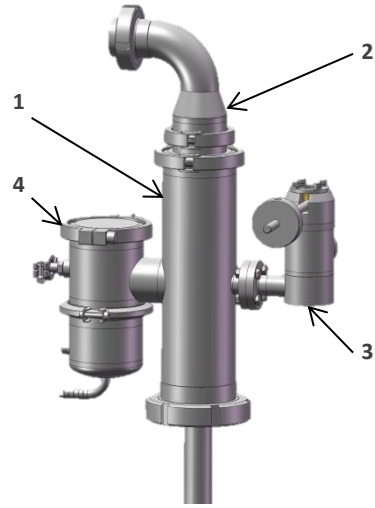
The SERVINOX order number must be indicated for any specific request.

1.4. Equipment presentation

The XCHE is an assembly that offers pressure and vacuum protection to tanks, the cleaning of tanks, their pressurization, and the recovery of fermentation gases, via a single tap on the tank and a single vertical pipe descending from the top of the tank.

Of hygienic design, it is suited to all types of food applications, in particular in the brewing industry for equipping fermentation tanks.

Pressurized recipient under category II of the European directive 2014/68/EC, module A. This automatic cleaning valve must be used on a circuit carrying group 2 clear or viscous liquid products.



The automatic cleaning valve is equipped with:

1) XCHE body (item 1), connected to the top of the tank.

2) CHE pipe assembly (item 2), enabling pressurization of the tank (including with washing ball immersed), recovery of gases (including with washing ball immersed), and cleaning of the tank with a single vertical pipe descending from the top of the tank.

3) An SHP or BOT pressure relief valve (item 3) to enable gas to escape during filling, pressurization, or in the event of cold thermal shock during tank cleaning (see corresponding manual).

4) A BOG E vacuum break valve (item 4) for letting air into the tank when emptying or in the event of hot/cold thermal shock during cleaning.

2 SAFETY INSTRUCTIONS

The technical manual contains basic instructions that must be complied with. The manual must therefore be read thoroughly before assembly and commissioning.

2.1. Signs and symbols

The following pictograms are designed to draw your attention to the important points concerning safety for persons and the integrity of the equipment:

SYMBOL	DEFINITION
	Direct danger for persons
	Possible damage to the product or its environment
	Useful information or instructions for use
	Minimum number of persons required for certain operations (the number of persons depicted in the pictogram indicates this minimum number)
	Minimum technical capability level (the figure in red indicates the minimum requisite level)

Certain operations require technical capabilities and specific clearances, such as curative maintenance work or work on electrical equipment.

Three levels specify the technical capability required (knowledge of the equipment concerned, experience, training, etc.):

	OPERATIVE PROFILE	DETAILS
Level 1	**End-user** with no technical knowledge.	**Default level** if there is no capability pictogram. Exclusively authorizes **everyday usage and servicing operations**.
Level 2	Experienced **professional**.	Trained and **experienced**. **Knows the equipment and the technologies** used.
Level 3	**Manufacturer personnel** / product expert	**Work restricted to the manufacturer** of the documented equipment.

2.2. Safety of operatives

The installation, inspection, settings, servicing and replacement operations must be conducted:

1. By qualified personnel
2. According to the recommendations and instructions contained in this manual
3. Taking account of provisions to guarantee workplace safety, the installer's specific procedures and facilities, and legal requirements with regard to accident prevention

Failure to comply with the safety instructions may lead to the loss of any right to claims for damages.

2.3. Intended use

Compliant use

Check with the aid of the certification documents that the equipment selected is designed for the intended use.

The equipment must not be used beyond the following operating limits:

PARAMETER	LIMITS
MAX. pressure	8 bar for sizes 1 and 2 4 bar for size 3
MIN/MAX. temperature	+1° / +120°C

Non-compliant use

The equipment must not be used for anything other than its intended use. The manufacturer shall be discharged of all liability in the event of non-compliant use.

3 TECHNICAL CHARACTERISTICS

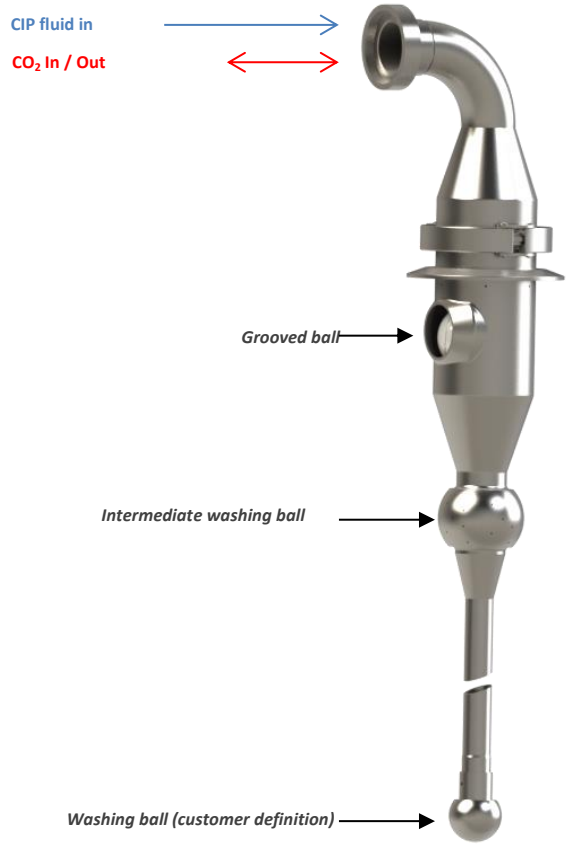
3.1. Characteristics

Piping accessory corresponding to paragraph 3.3 of European directive 2014/68/EC.

CHARACTERISTICS	SERVINOX SOLUTION
Materials	*PARTS IN CONTACT WITH THE PRODUCT*: AISI 316L stainless steel *OTHER METALLIC PARTS*: AISI 316L stainless steel *FLOATING BALL*: Polypropylene (PP) *GASKETS IN CONTACT WITH THE PRODUCT*: EPDM or NBR or FKM/FPM or VQM
Sizes / Service pressure (liquid and gas)	Size 1: 8 bar Size 2: 8 bar Size 3: 5 bar
Service temperature	MIN.: +1°C MAX.: +120°C

Equipment view

CHE pipe assembly:

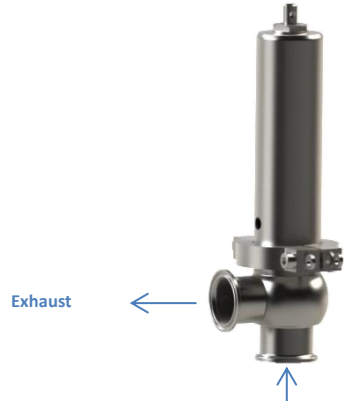


The automatic cleaning valve is composed of a body in which a floating ball enables communication, with no load loss, between the tank and the gas inlet and exhaust duct.

When the cleaning liquid is injected, the floating ball blocks the gas connection: the liquid is then directed toward the washing balls.

The grooved ball enables the seating of the valve to be cleaned during the washing operation.

SHP or BOT pressure relief valve:



The SHP or BOT safety valves are ***entirely autonomous devices*** requiring no external controller for their operation. They are safety accessories corresponding to ***category IV of European directive 2014/68/EU*** with CE marking.

The valve is designed to protect the tank against overpressurization:

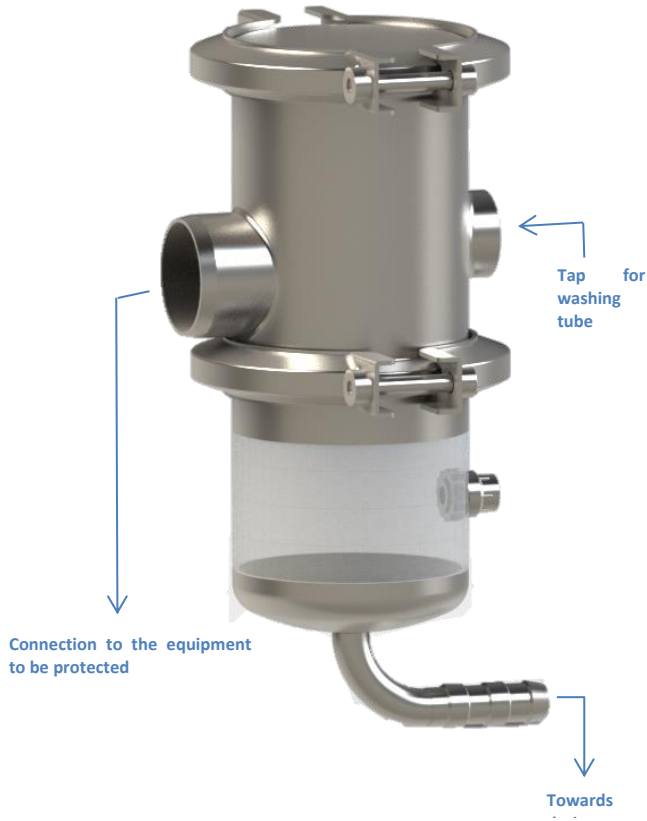
- gas and vapor for the SHP valve
- gas only for the BOT valve

Valve calibration technology:

- Spring for the SHP valve
- Weight for the BOT valve

BOT pressure valve:

BOG E vacuum break valve



This vacuum break valve is designed to provide the tank with vacuum protection during CIP washing and the draining of liquid.

4 COMMISSIONING

4.1. Transport / Reception / Handling

Upon reception, check:

- that ***the packaging is in good condition;***
- that the ***delivered equipment matches the order;***
- that the equipment ***has not been damaged.***

If the automatic cleaning valve is damaged, it must not be mounted on the installation. Contact the manufacturer or your distributor, as the case may be.

4.2. Storage

If the equipment is not being installed immediately upon delivery, it should be ***stored according to the rules of best practice***.

It must be stored in its original packaging, in a covered location, with protection against dirt, rain, snow, and insects, and sheltered from shocks and vibrations.

The temperature for risk-free storage is between 5°C and 40°C, with a relative humidity of <50%.

If the equipment is stored at temperatures below zero, the resistance of the materials to cold conditions (e.g., the gaskets) should be taken into account.

If the storage period is longer than one year, the gaskets must be replaced before commissioning.

4.3. Installation

General

Before using the equipment, the user must carry out a visual check that it is in good apparent condition: no corrosion, no packaging residues.

If the fluid is harmful, inflammable, toxic, etc., fit the installation with evacuation piping leading to a safe place.

It is recommended, however, to check the compatibility of these products with the gaskets and materials before use.

The equipment must only be installed in a confined and inert installation (no pressurization or risk of fluid transfer).

- Ensure that the safety components are handled correctly, in accordance with the specific instruction manuals.
- The equipment must be installed on a vertical axis.

Operatives

The work described below must be carried out by qualified and experienced personnel.

The personnel must be equipped with gloves, hardhats, and safety footwear.

5 OPERATIONS

Check the compatibility of your products with the XCHE tank dome adapter before use.

5.1. Settings

Adjusting settings is restricted to the manufacturer of the documented equipment.

Please contact SERVINOX or your distributor, as the case may be.

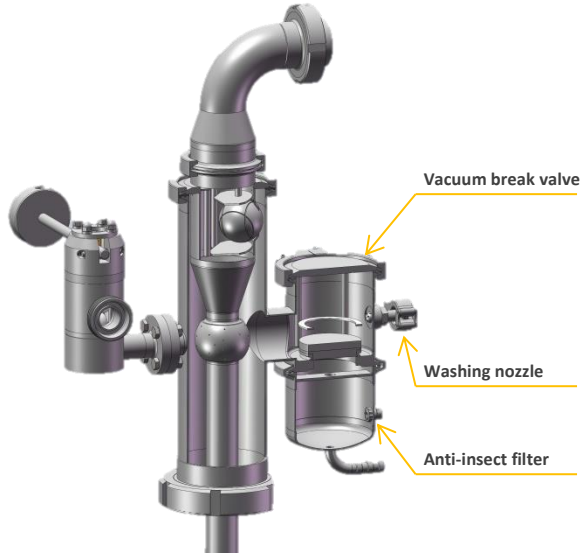
5.2. Operation of the SHP or BOT valve

The safety valve is an entirely autonomous safety device, requiring no controller in order to function.

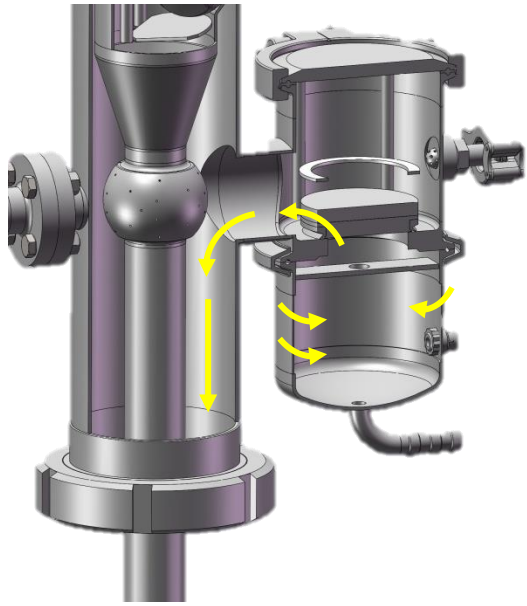
Refer to the SHPCE_NOT or BOT_NOT manual for any additional information.

5.3. Operation of the vacuum break valve

The vacuum break valve is an entirely autonomous safety device, requiring no controller in order to function.

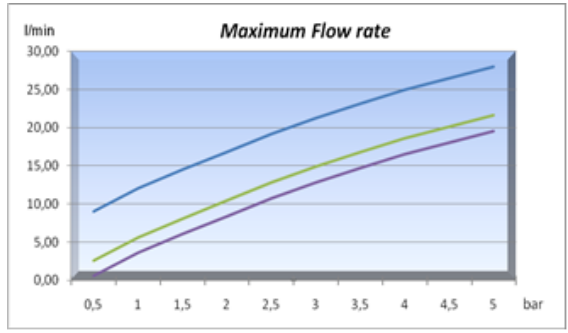


During the liquid draw-off phase in the tank, the vacuum break valve admits air into to the tank as soon as the internal vacuum of the tank is equal to the calibration setpoint value of the valve.



Attention: do not block the anti-insect valve on the drip collector.
⇨ Risk of tank blockage

5.4. Liquid flow rate - "vacuum break" washing nozzle



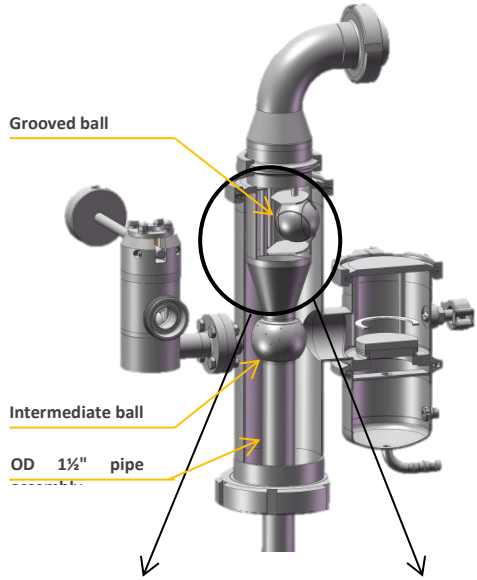
XCHE Size 1 and 2 ➔ Diaphragm Ø4mm

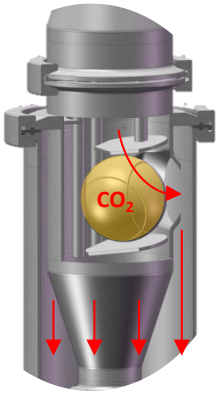
XCHE Size 3 ➔ Diaphragm Ø3.2mm

5.5. CHE pipe assembly operation

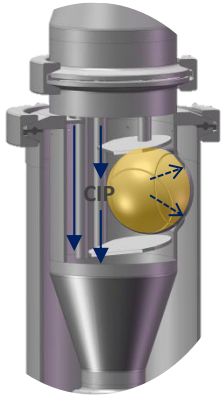
The CHE pipe assembly is composed of:

- 1 x OD 1½" tube for supplying a CIP washing ball
- 1 fixed intermediate washing ball for cleaning the pressure valve inlet, the vacuum break valve inlet and the inside of the tank dome adapter
- 1 mobile autonomous grooved ball for:
    - directing the CO_2 supply directly into the tank dome adapter during the fermentation phase
    - or, directing the washing liquid to the intermediate ball and the tank washing ball during the CIP cycle.





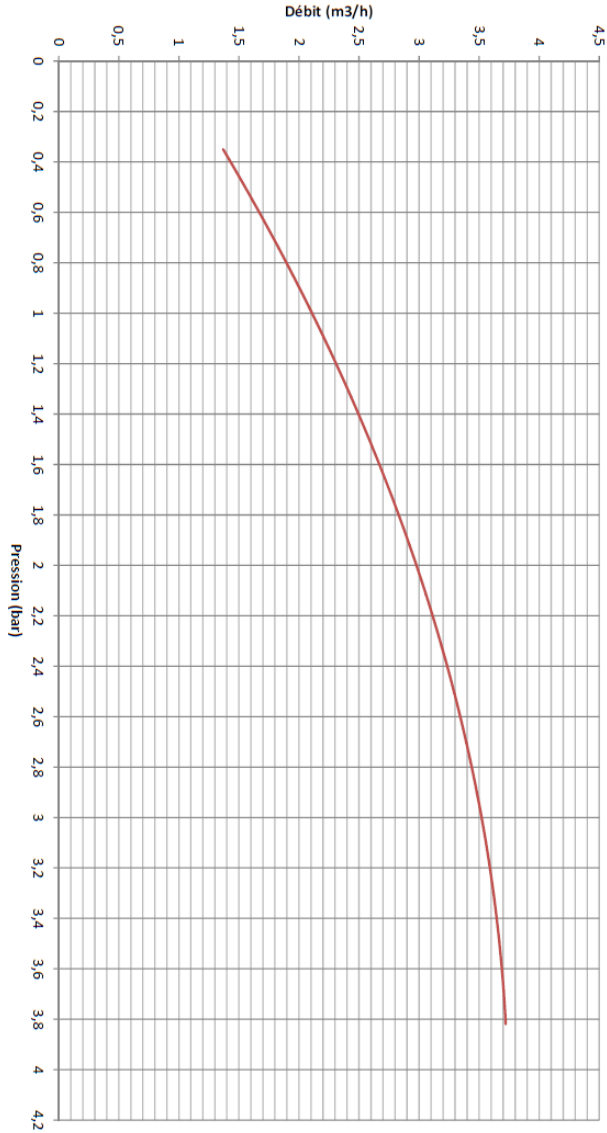
Ball in fermentation position



Ball in washing/CIP position

5.6. *Liquid flow rate - CHE pipe assembly*

The flow rate/pressure curve below corresponds to the liquid consumption of the intermediate washing ball + leaks from the grooved ball on its seating.


Débit (m3/h)
0
0,5
1
1,5
2
2,5
3
3,5
4
4,5
Pression (bar)
0
0,2
0,4
0,6
0,8
1
1,2
1,4
1,6
1,8
2
2,2
2,4
2,6
2,8
3
3,2
3,4
3,6
3,8
4
4,2

5.7. Risk analysis

DANGER / RISK			
	Hot fluid	**Very hot surfaces**	**Caustic fluid**
DAMAGE	Burns	Burns	Burns
PREVENTION			
	Appropriate clothing, goggles, gloves	Appropriate gloves	Appropriate gloves, goggles, mask

Forces and stresses generated by supporting elements

- It is very important to use the appropriate fastenings supplied with the equipment.
- In the event of replacing the fastenings, the replacements must be in compliance with the essential safety requirements of PED 2014/68/EC (in particular, the minimum elongation and impact resistance conditions), and be subject, if the operator changes the characteristics of the screw fastenings compared to those delivered with the equipment, to a compliance evaluation with regard to service, test and exceptional conditions.
- The tightening of the fastenings provided must be uniform around the periphery (tightening in star configuration) and in compliance with the recommended value (see maintenance paragraph).

Corrosion caused to the gaskets by the product

- The quality of the gasket is to be determined according to the fluids in contact with it, the tightening torque and the conditions of service.
- The standard gaskets are made of EPDM, the general characteristics of which are:
  - Excellent resistance to water and to aqueous solutions in general.
  - Good resistance to cold.
  - Fairly good mechanical behavior.
- In the event of gasket corrosion, there is no risk of overpressurization. All necessary precautions should be taken to recover any products that might escape, if these products are likely to constitute a risk for people in the vicinity or for the bulkheads and the accessories connected to the equipment.

Fatigue

- Inspections must be carried out in order to check visually the absence of any of fatigue cracks or premature wear and tear.

6 SERVICING AND MAINTENANCE

6.1. General

The equipment requires servicing in order to guarantee its correct operation.

Inspections must be carried out at regular intervals. An initial inspection interval of 6 months must be observed.

Certain fluid properties (corrosive, caustic, abrasive, residues, viscosity, etc.) and certain environmental conditions (climate, pollution, etc.) may necessitate shorter inspection intervals.

For good maintenance and for the purposes of the equipment warranty, SERVINOX supplies the spare parts. State the manufacturing number and product reference for each order.

We can provide you with packs of wearing parts (gaskets, etc.), and we recommend that you keep several packs in stock for rapid intervention.

You can contact SERVINOX for any advice about equipment maintenance.

Maintenance precautions

<u>Observe the following points before any intervention:</u>

- Confine the installation in which the assembly is located
- Depressurize the system
- The installation must have been drained
- The fluid must be cooled to ambient temperature
- Duct network ventilated if fluid is corrosive and caustic

Operatives

The work described below must be carried out by qualified and experienced personnel.

The personnel must be equipped with gloves, hardhats, and safety footwear.

6.2. Inspection and servicing

Pressure relief valve

For the servicing and maintenance of the equipment, refer to the following manuals:

- Pressure relief valve: **SHPCE_NOT_FR** or **BOT_NOT_FR**, depending on the configuration of the XCHE equipment.

XCHE tank dome adapter

Mandatory periodic servicing:

Every 2 months during the 6 months after its commissioning, then every 6 months

- Check that the assembly fastenings are properly tightened
- Check for the absence of any cracks and deformations in the system
- Check for pneumatic and liquid leaks

Every 6 months and on commissioning:

- Check for the absence of any impurities or debris inside the tank dome adapters
- Check the appearance of the welds

Every 2 years:

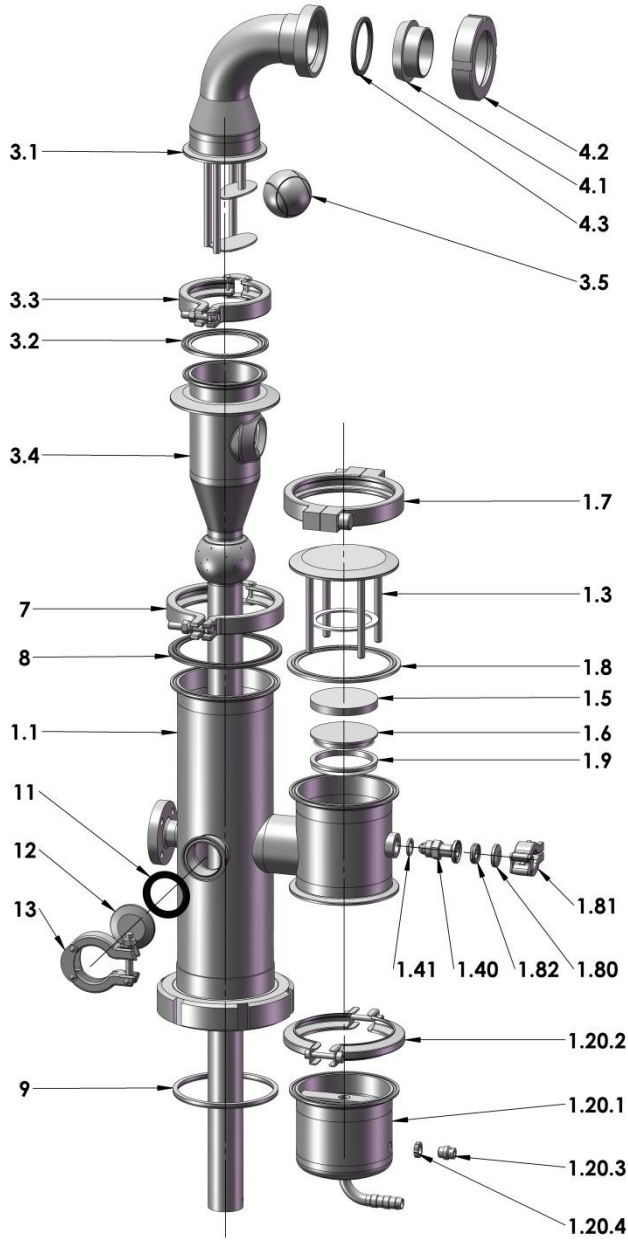
- Change all installation gaskets

It is recommended to check the compatibility of your products with the gaskets and materials before use

We recommend consigning all servicing and inspection operations carried out on the installation to a table of this type:

Date	Company	Operative name	Signature
PREVENTIVE MAINTENANCE			
Operations		**Other information, Comments**	
INSPECTIONS OF GOOD OPERATION AND GOOD CONDITION			
Operations		**Other information, Comments**	

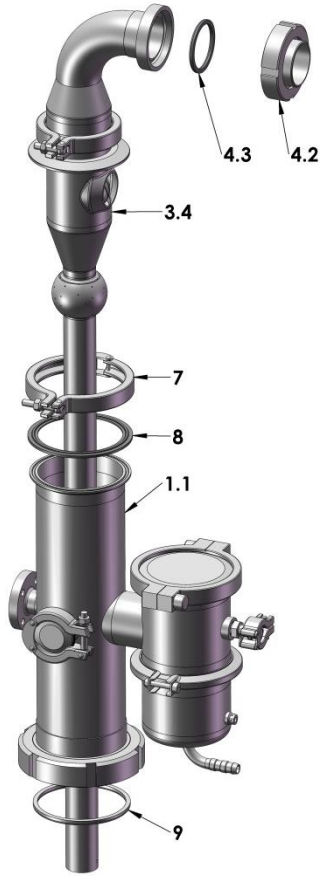
6.3. Exploded view



6.4. Parts list

ITEM	DESIGNATION	QUANTITY
1.1	BOG E valve body	1
1.3	BOG E valve cover	1
1.5	Weight	1
1.6	Vacuum relief valve -8mbar	1
1.7	HP clamping ring	1
1.8	Clamp gasket	1
1.9	V-ring gasket	1
1.20.1	Drip collector with anti-insect filter	1
1.20.2	Clamping ring	1
1.20.3	Stuffing box	1
1.20.4	Stuffing box counterpiece	1
1.40	Washing nozzle	1
1.41	Flat gasket	1
1.80	Clamp cover	1
1.81	Clamp gasket	1
1.82	Clamping ring	1
3.1	Washing / CO_2 inlet	1
3.2	Clamp gasket	1
3.3	Clamping ring	1
3.4	CHE body (cleaning valve)	1
3.5	Grooved ball	1
4.1	Sleeve	1
4.2	Nut	1
4.3	Gasket	1
7	Clamping ring	1
8	Clamp gasket	1
9	Tank gasket	1
11	Clamp gasket	1
12	Clamp cover	1
13	Clamping ring	1
14	Clamp cover	1
15	Clamp gasket	1
16	Clamping ring	1

6.5. Maintenance operations



Disassembling the CHE valve + body

5) Disconnect the piping at the CHE inlet and remove the gasket (item 4.3).

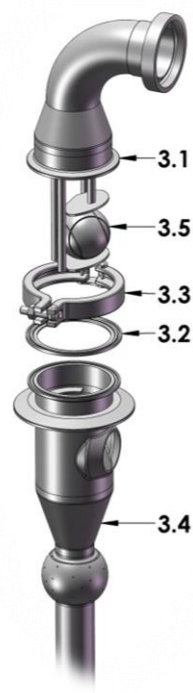
6) Remove the clamping ring (item 7).

7) Remove the cleaning valve (item 3.4) and remove the clamp gasket (item 8).

8) Disconnect the washing nozzle supply on the vacuum break valve.

9) Disconnect the body (item 1.1) from the tank, and remove the gasket (item 9).

Disassembling the CHE valve



10) Remove the clamping ring (item 3.3).

11) Remove the CHE inlet pipe (item 3.1) with its ball (item 3.5).

12) Remove the clamp gasket (item 3.2).

13) Carry out a visual inspection (internal/external) of the components (item 3.4) and (item 3.1).

Reassembling the CHE valve

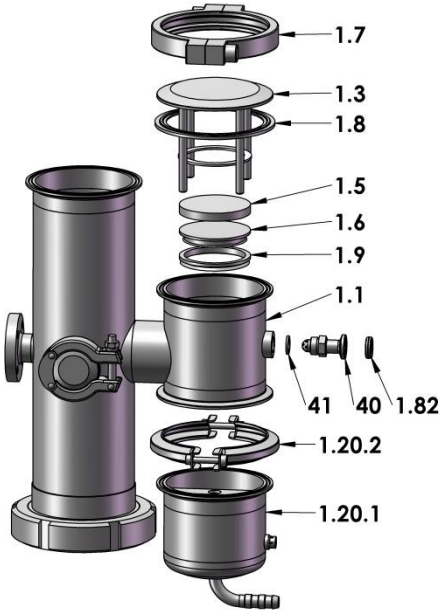
14) Replace the gasket (item 3.2).

15) Check the condition of the grooved ball (item 3.5); replace if necessary.

16) Replace the gasket (item 3.2) on the CHE (item 3.4).

17) Place the grooved ball (item 3.5) in the CHE inlet (item 3.1), then fit the assembly in the CHE (item 3.4) using the clamping ring.

Disassembling the vacuum break valve



18) Remove the clamping ring (item 1.20.2) and remove the drip collector with insect filter (item 1.20.1).

19) Check the cleanliness of the drip collector with insect filter (item 1.20.1): no holes in the perforated grille must be blocked; clean if required.

20) Remove the clamping ring (item 1.7) then remove the cover (item 1.3).

21) Remove the clamp gasket (item 1.8) then extract the weight (item 1.5), and the stainless steel valve (item 1.6) with its gasket (item 1.9).

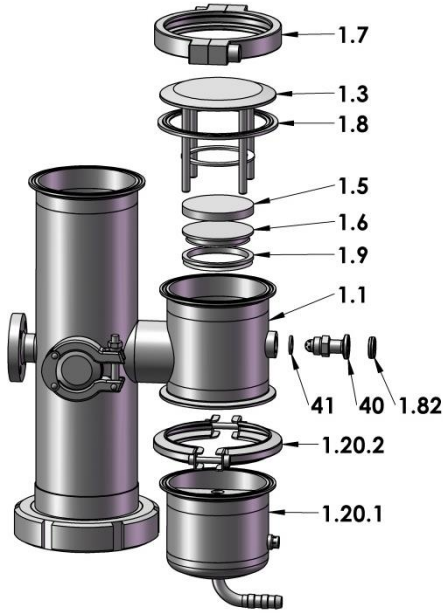
22) Remove the gasket (item 1.9) from the valve (item 1.6).

23) Remove the clamp gasket (item 1.82).

24) Unscrew the washing nozzle (item 40) and remove the gasket (item 41).

25) Check the internal cleanliness of the body of the vacuum break valve (item 1.1).

Reassembling the vacuum break valve



26) Replace the gaskets (item 1.8), (item 1.9), (item 41) and (item 1.82).

27) Place and center in the body of the vacuum break valve (item 1.1) the valve (item 1.6) with its V-ring gasket (item 1.9) + weight (item 1.5).

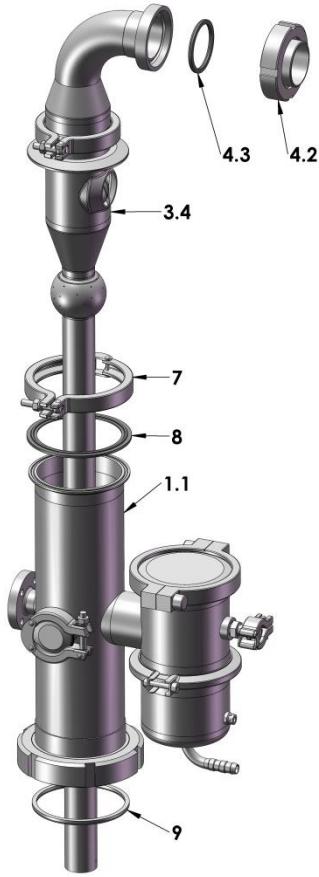
28) Replace the cover (item 1.3) with its gasket (item 1.8) and the clamping ring (item 1.7).

29) Push the valve (item 1.6) upwards from the bottom of the body (item 1.1) in order to check the rising of the valve (item 1.6).

30) Replace the flat gasket (item 41) then screw in the washing nozzle (item 40).

31) Replace the gasket (item 1.82) on the washing nozzle (item 40).

32) Position the drip collector (item 1.20.1) and fit it beneath the body (item 1.1) with the clamping ring (item 1.20.2).



Refitting the CHE pipe assembly + body

33) Replace the gaskets (item 9), (item 8) and (item 4.3).

34) Replace the tank gasket (item 9).

35) Assemble the body (item 1.1) on the tank.

36) Assemble the CHE pipe assembly (item 3.4) on the body (item 1.1) with the clamp gasket (item 3) and the clamping ring (item 7).

37) Connect the CHE inlet to the CO_2/CIP supply with the gasket (item 4.3).

38) Connect the washing nozzle of the vacuum break valve.

7 WARRANTY

Unless stated otherwise in the proposal, the ***equipment is guaranteed for 12 months from the delivery date***.

Parts recognized as defective following an expert appraisal in our factory shall be replaced at our expense.

Equipment components (wearing parts, gaskets, etc.) must be replaced with SERVINOX original parts.

The warranty does not cover damage resulting from:

- improper installation, inappropriate use or misuse;
- accidents resulting from non-compliant installation;
- modifications to the equipment;
- leaks resulting from the passage of impurities that have not been taken into account;
- failure to carry out mandatory servicing.

The warranty offered on our products covers free repair of the parts returned for which it could be proved that they have become prematurely unusable on account of a manufacturing or material fault.

We have no obligation to provide compensation, or any other obligation of this nature.

The equipment has been subject to inspection before leaving the factory.

solutions
engineered for you
dprozesse: Proces
ösungen fluid
für Ihre dise
de solu
vendung adaptada
indu

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