Bunging device

BOMB2

Instruction manual

Reference: BOMB2_NOT_FR

Version A

34-36 Avenue Roger Hennequin
78197 Trappes cedex - France
Phone: + 33 (0)1 30 16 15 00
Fax: +33 (0)1 30 16 15 01
Home page: http://www.servinox.com

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1 GENERAL PRESENTATION

1.1. Manufacturer

SERVINOX is a specialist in process equipment for the brewing, food processing, cosmetics and chemical industries.

Expertise in process equipment:
In areas such as tank protection, sampling, gas injection into liquids, pipe scraping or cleaning with patented products.

SERVINOX is ***ISO 9001: 2015*** certified and offers products that comply 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 manufacturer's sanitary standard

We are an active member of ***EHEDG France*** (European Hygienic Engineering and Design Group).

1.2. Instruction manual

To ensure the integrity of the equipment and the safety of people, it is necessary to read the information in this manual before installing and using the equipment.

Depending on the installation and the medium, specific guidelines and regulations apply, and must be complied with.

In addition to the instructions in this manual, the general occupational safety and protection regulations must be observed. Environmental protection regulations must also be complied with.

1.3. *Functional description*

The bunging device allows to visualise the release of carbon dioxide from a fermentation process.

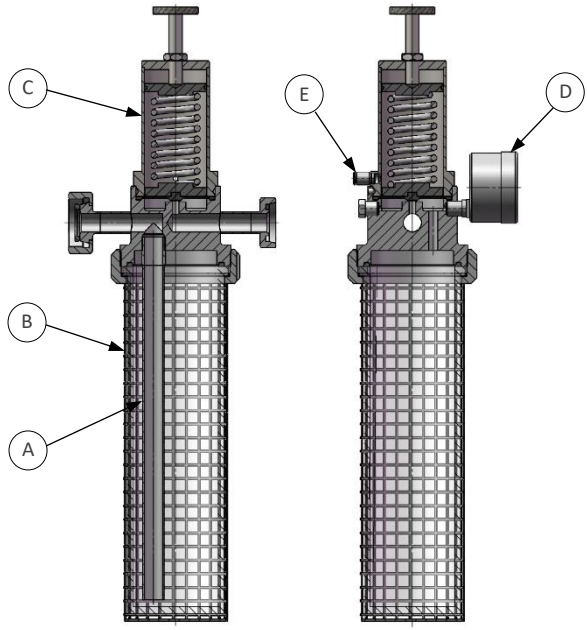
Its hygienic design makes it suitable for all food applications, especially in the brewing industry for use in fermentation tanks. The bunging device, fitted at man height at the base of the tank, is connected to the rest of the installation (fermentation tank, CIP plant, recovery line and CO2 pressure control).

The bunging device is a vessel in accordance with Article 4, Paragraph 3 of the European Directive 2014/68/EU and not subject to CE marking.

This bunging device must be used on a circuit carrying clear or viscous liquid products of group 2.

Presentation of the equipment

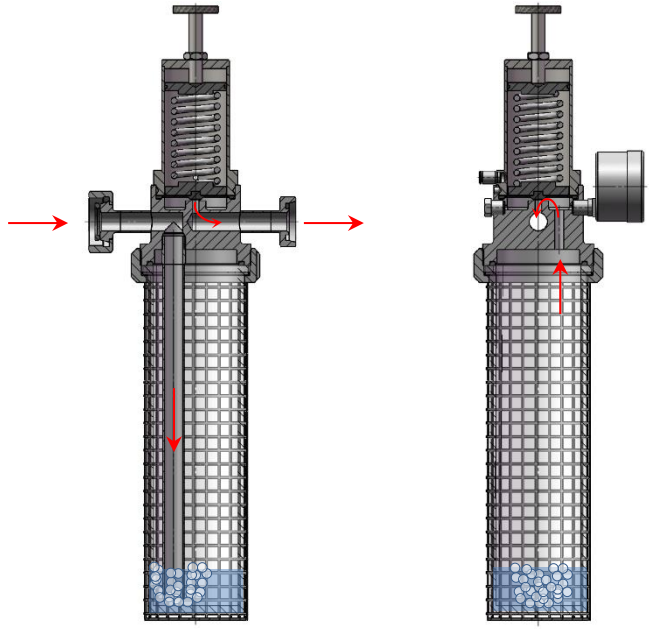
The bunging device allows a volume of water to be stored at the bottom of the container to visualise the fermentation in the tank through the release of carbon dioxide while maintaining the required pressure in the tank.



The equipment includes the following items:

- A body with lateral inlet/outlet and a dip tube (Item A) which sends the gas to the bottom of the container filled with water.
- A container with a protective grid (Item B).
- An adjustment chamber with spring and knurled screw (Item C) to adjust the pressure in the tank.
- A pressure gauge (Item D) on the front or rear to display the fermentation pressure in the tank.
- A pneumatic fitting to control the bunging device with the spring decompressed (Item E).

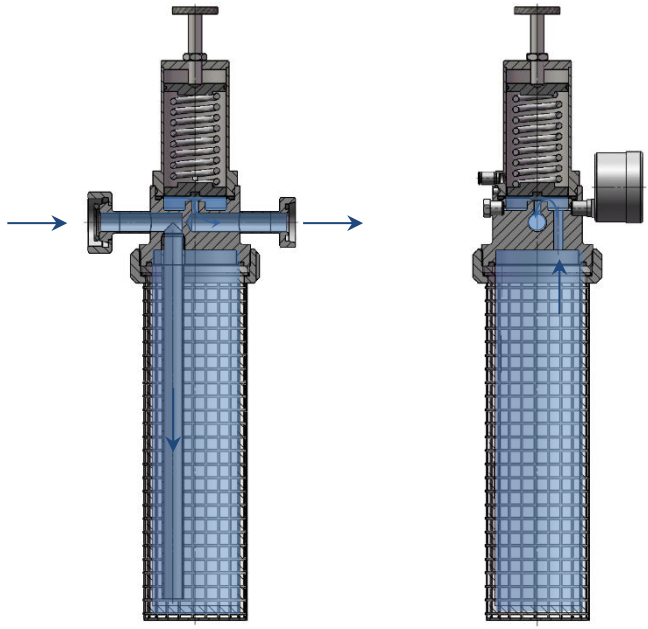
Operation during the fermentation phase



During the fermentation phase in the tank:

- The gas from the tank is collected in the bunging device through the dip tube.
- The gas is washed of impurities before escaping through the outlet to the pressure control and gas recovery system.
- Prior to this phase, the bunging device must be filled with water and the set pressure must be adjusted.

Operation during the cleaning phase



During the cleaning phase:

- The CIP liquid fills the bunging device container completely through the dip tube.
- Set the pressure of the bunging device slightly below that of the CIP system to allow the valve to open and the liquid to flow through.
- At the end of this phase, the rinsing water trapped in the container will serve as a control liquid for the fermentation in the production tank.

1.4. Marking

If the user encounters difficulties that cannot be resolved with the information in these operating instructions, the user should seek additional information from the manufacturer or, if applicable, the distributor of the equipment.

It is imperative to mention the SERVINOX order and/or the serial number/manufacturing order beginning with SVX for any particular request (spare parts, etc.).

2 SAFETY INSTRUCTIONS

The technical manual contains basic instructions that must be complied with. It is therefore essential to read it before installation and commissioning.

2.1. Indications and symbols

The following pictograms will help to draw your attention to important points concerning the safety of people and the integrity of the equipment:

SYMBOL	DEFINITION
	Direct hazard to people
	Possible damage to the product or its environment
	Lock-out is mandatory
	Minimum staffing requirements for certain operations. (The number of characters in the pictogram indicates this minimum number).
	Minimum technical capacity level. (the red number indicates the minimum level required).

Some operations require specific technical skills and authorisations, such as corrective maintenance work or work on electrical equipment.

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

	OPERATOR PROFILE	SPECIFICATIONS
Level 1	**End user** with no technical knowledge.	**Default level** if the capacity pictogram is not present. Allows only **routine use and maintenance**.
Level 2	Experienced **professional**.	Trained and **experienced**. **Knows the equipment and technologies** used.
Level 3	**Manufacturer's staff** / product expert	**Work reserved for the manufacturer of** the documented equipment.

2.2. Operator safety

Installation, inspection, maintenance and replacement operations must be carried out:

- By qualified personnel.
- By following the recommendations and instructions given in this manual.
- By integrating the provisions for work safety, the installer's own procedures and means, and the legal requirements for the prevention of accidents, particularly with regard to electrical installations.

Failure to comply with the safety instructions may result in the loss of all claims for damages.

2.3. Intended use

Proper use

Check with the certification documents whether the equipment has been selected for the intended use.

Contrary use

The equipment must not be used contrary to its intended purpose. The manufacturer cannot be held responsible for any use contrary to the above.

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

PARAMETER	LIMITS
Maximum permissible pressure	3 bar
Minimum/maximum temperature	+1°C / +120°C

This bunging device must be used on a circuit carrying clear or viscous liquid products of group 2.

This equipment has undergone a hydraulic strength test.

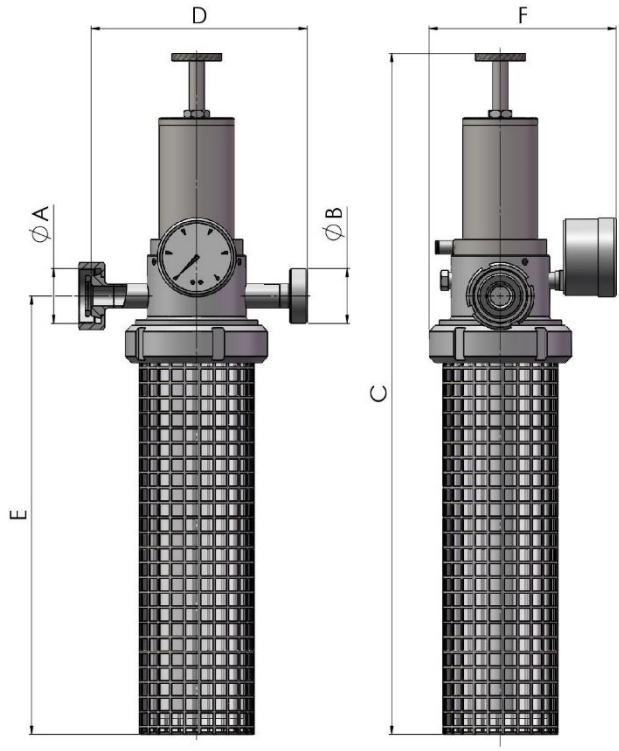
3 TECHNICAL FEATURES

3.1. Features

FEATURES	SERVINOX OFFER
Materials	*PARTS IN CONTACT WITH THE PRODUCT AND OTHER METAL PARTS*: Stainless steel 1.4404 (316L) CONTAINER: Borosilicate (Pyrex) *SEALS IN CONTACT WITH THE PRODUCT*: EPDM
Operating temperature	MIN.: +1°C MAX.: +120°C
Performance	Gas: 30 Nm3/h at 1 bar Liquid: 1.2 m3/h at 3 Bar

It is imperative to know the maximum gas (CO2) and liquid (CIP) pressure levels in the vessel to define the maximum permissible pressure in the vessel according to the phases of use.

3.2. Dimensions



SIZES	15	20	25
A (Female)	DIN15	DIN20	DIN25
B (Male)	DIN15	DIN20	DIN25
C (Maximum)	554	554	554
D	173	173	173
E	352	352	352
F	150	150	150

4 COMMISSIONING

4.1. Transport/ Receipt/ Handling

On receipt, check:

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

If the equipment is damaged, it should not be mounted on the installation. Contact the manufacturer, or if applicable, your distributor.

4.2. Storage

If the equipment is not installed immediately after delivery, it should be ***stored according to good practices***.

It should be stored in its original packaging, in a covered area, protected from dirt, rain, snow, insects and impacts.

The safe storage temperature is between 5°C and 40°C, with a relative air humidity < 50 %.

If the equipment is stored at sub-zero temperatures, the resistance of the materials to cold (e.g. membrane and seals) should be taken into account.

If the storage period is longer than one year, the membrane and seals must be replaced before commissioning

4.3. Installation

General

Before using the equipment, the user must visually check its apparent good condition:

- ***absence of corrosion.***
- ***no packaging residue.***
- ***no breakage of the borosilicate tube.***

If the fluid is noxious, flammable, toxic, etc., equip the installation with discharge piping, leading to a safe place.

However, it is recommended to check the compatibility of these products with the seals and materials before use.

The equipment should only be installed on a locked out and inert installation (no pressure and risk of fluid transfer)

At the outlet, it is advisable to collect the excess CO2 pressure via a collector (it is normal for the appliance to be noisy at the height of fermentation if the CO2 is not collected).

- The correct operation of the safety devices must be ensured in accordance with their specific instructions.
- This equipment is intended for use in a frost-free room.

Operators

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

Personnel must be equipped with personal protective equipment against the risks associated with the exhaust or contact with the fluid (burns, noise, splashes, etc.)

Valve connection

- The bunging device must be installed vertically.
- The bunging device must be carefully positioned, taking into account the risks related to the release of the fluid (burns, noise, projections, etc.)
- Do not deliberately block the exhaust port.
- The connection pipes must feature the same inner and outer diameter as the bunging device.
- When attaching the bunging device, care must be taken to ensure that the fittings are not submitted to stress.

5 OPERATION

5.1. Adjustment

Adjustment is reserved for the manufacturer of the documented equipment.

Please contact SERVINOX or, if applicable, your distributor

5.2. Functional check

After installation before using the bunging device or carrying out maintenance operations:

- Check that the bunging device opens to the required set pressure.

5.3. Precautions

Check the compatibility of your products with the bunging device before use.

The use of CIP fluids or high temperatures in the equipment may present a risk of burns to the bunging device contacts.

5.4. Tank overflow in the bunging device

<u>If the tank overflows into the bunging device</u>:

STOP PRODUCTION, it is essential to clean the inside of the bunging device. If the bunging device is blocked, it no longer protects the installation against the risk of overpressure.

RISK OF DESTRUCTION OF THE TANK!

6 SERVICING AND MAINTENANCE

6.1. General

The equipment requires maintenance to ensure that it functions properly.

Inspections should be carried out at regular intervals. An initial inspection interval of 6 months should be complied with.

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

For the proper maintenance and warranty of the equipment, SERVINOX provides spare parts. Specify the production number and the product reference for all orders.

We have sets of wear parts (membrane, etc.) in stock and recommend that you keep a few sets in stock for quick repair.

You can contact SERVINOX for advice on the maintenance of the equipment.

Maintenance precaution

<u>Comply the following points before any repair work:</u>

- Lockout the installation comprising the equipment.
- The fluid must be cooled to room temperature.
- Depressurise the system.
- The system must be drained of all fluids.
- Ventilate the pipe system, if the fluid is corrosive and aggressive.

Operators

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

Staff must wear gloves, safety hats and safety shoes.

6.2. Inspections and servicing

Mandatory periodic maintenance:

Every 2 months during 6 months after commissioning

- Check that the fittings are tight.
- Check the borosilicate tube for cracks.
- Check the system for deformation.

Every 6 months and during commissioning:

- Visually check the condition of the seals.
- Check that there is no dirt or debris inside the bunging device.
- Check that the fittings are tight.
- Check the borosilicate tube for cracks.
- Check the system for deformation.
- Check the appearance of the welds.

Every year:

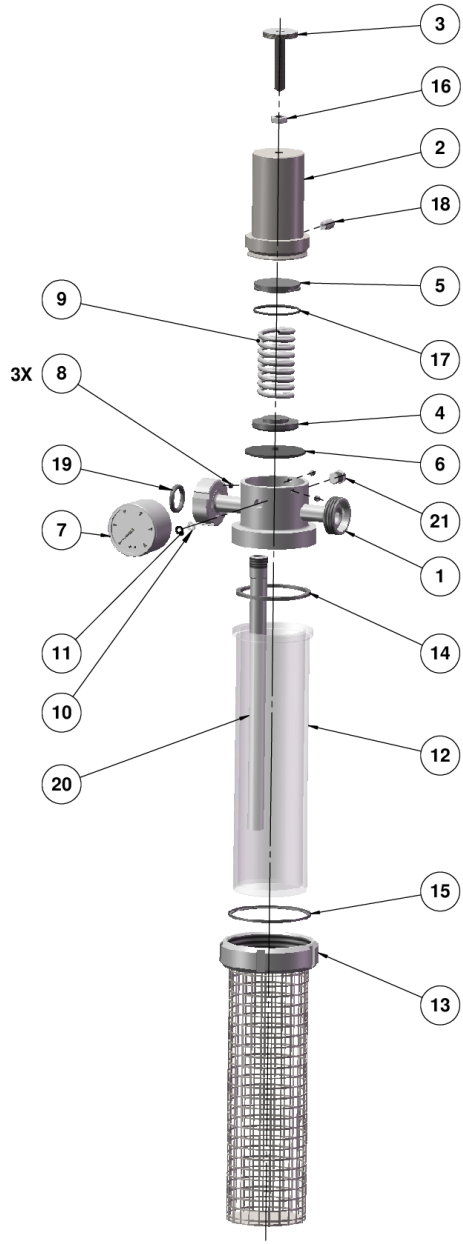
- Replace the membrane.
- Replace the connection seals.

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

We recommend that all maintenance and control operations carried out on the installation be recorded in a table of this type:

Date	Company	Name of the operator	Signature
PREVENTIVE MAINTENANCE			
Operations		**Other, Remarks**	
PERFORMANCE AND CONDITION CHECKS			
Operations		**Other, Remarks**	

Exploded view of the bunging



device

Parts list

REF.	DESCRIPTION	QUANTITY
1	Body	1
2	Upper chamber	1
3	Adjusting screw	1
4	Lower spring guide	1
5	Upper spring guide	1
6	Membrane	1
7	Pressure gauge	1
8	Headless set screw with cone point	3
9	Spring	1
10	Bülte ring	1
11	Seal	1
12	Vial	1
13	Protective grid	1
14	Square seal	1
15	Set ring	1
16	Retaining nut	1
17	Guide seal	1
18	Pneumatic fitting	1
19	Connection seal	1
20	Dip tube	1
21	Male plug	1

Dismantling the bunging device

The following instructions should be followed for the removal of the bunging device:

1) Place the entire system on a workbench.

2) Unscrew the retaining nut (Item 16) and then the adjusting screw to relieve the spring (Item 9).

3) Unscrew the screws (Item 8) using an Allen key.

4) Remove the upper chamber (Item 2) with the upper guide mounted on top (Item 5), the retaining nut (Item 16) and the adjusting screw (Item 3).

5) Remove the spring (Item 9), the lower spring guide (Item 4) and the membrane (Item 6).

6) Unscrew the protective grid nut (Item 13) and remove the grid with its set ring (Item 15) and the Container (Item 12).

Be careful when handling the container during dismantling of the bunging device so as not to accidentally damage it.

7) Remove the seal (Item 14).

If the pressure gauge is removed, proceed as follows:

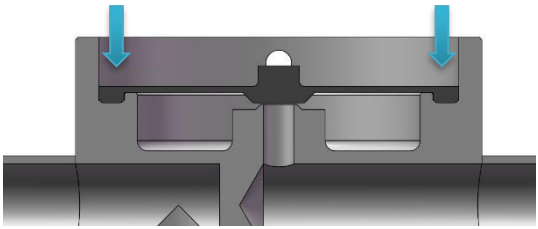
1) Unscrew the pressure gauge (Item 7).

2) Remove the seal (Item 11) with the Bülte ring (Item 10) from the bottom of the body (Item 1).

Reassembling the bunging device

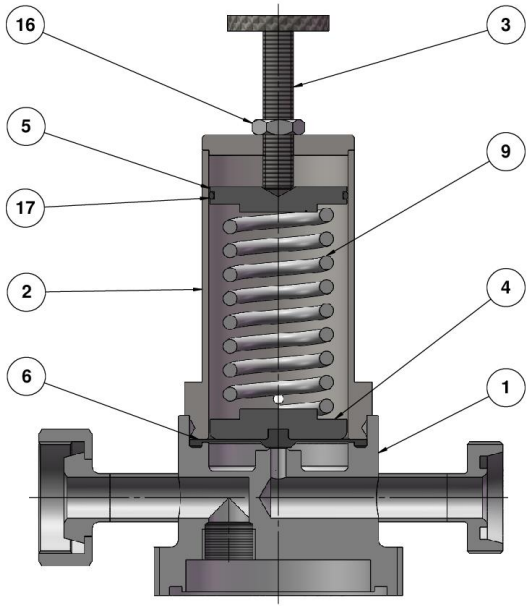
The following instructions should be followed when reassembling the bunging device:

1) Position the membrane (Item 6) at the bottom of the body (Item 1) making sure that the edge of the membrane is firmly seated in its groove.

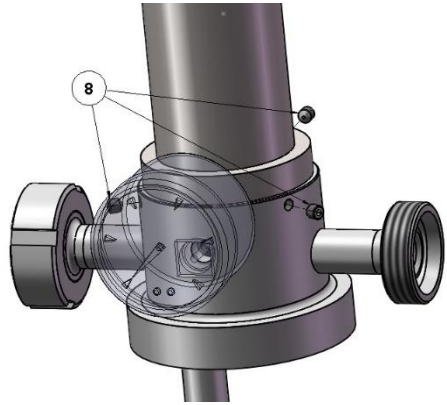


2) Fit the lower spring guide (Item 4) on the nipple of the membrane (Item 6) and the spring (Item 9).

3) Insert over the top chamber (Item 2) with the upper spring guide (Item 5) and its seal (Item 17) and the adjusting screw (Item 3) and its retaining nut (Item 16).



4) Tighten the screws (Item 8) on the body (Item 1) using an Allen key.



Before screwing in the screws (Item 8), make sure that the upper chamber (Item 2) is pushed in properly in the body (Item 1) so that the chamber is almost in contact with the body.

5) Insert the seal (Item 14).

6) Place the set ring (Item 15) in the nut of the protective grid (Item 13).

7) Insert the container (Item 12) in the protective grid (Item 13).

Be careful when handling the container during assembly of the bunging device so as not to accidentally damage it.

8) Insert the assembly along the dip tube (Item 20) facing the seal (Item 14).

9) Screw the protective grid nut (Item 13) on the body (Item 1).

10) Insert the connection seal (Item 19) and mount the equipment on the line.

11) Calibrate the bunging device with the adjusting screw (Item 3).

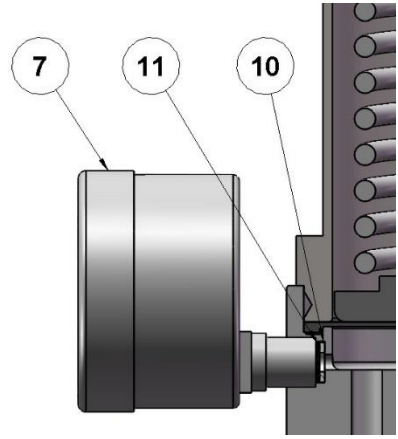
If the pressure gauge is fitted, proceed as follows:

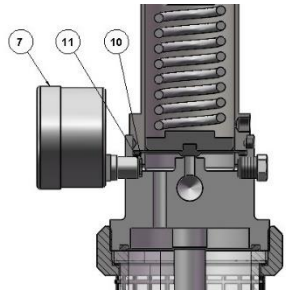
1) Place the Bülte ring (Item 10) at the bottom of the body (Item 1), then fit the seal (Item 11).

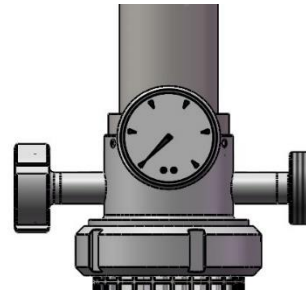
2) Screw on the pressure gauge (Item 7) covered with a Teflon strip on the thread in the body (Item 1)

The pressure gauge (Item 7) can be mounted at the front or at 180° as required.

Make sure the pressure gauge is correctly oriented when screwing it in to facilitate reading.







7 DIAGNOSTIC ASSISTANCE

The following table is a diagnostic aid providing assistance to repair malfunctions.

INCIDENT	POSSIBLE CAUSE	SOLUTION
No gas flow through the bunging device	- Membrane is torn or seized - Inlet and/or outlet is obstructed	> Replace the membrane with a new one > Check that there are no objects blocking the seat hole or the passage holes
No pressure indication on the pressure gauge	- Faulty pressure gauge or pressure setting problem	>Replace the pressure gauge or adjust the pressure with the knurled screw
No CIP flow through the bunging device	- The bunging device does not open - Inlet and/or outlet is obstructed	> Check that the set pressure is lower than the CIP pressure > Check that there are no objects blocking the seat hole or the passage holes
Fluid overflow from the tank into the bunging device	- Tank overflow	> Drain and lock-out the tank and clean the inside of the bunging device

8 GUARANTEE

Unless otherwise stated on the offer, the ***equipment is guaranteed for 12 months from the date of delivery***.

Parts found to be defective further to survey in our factory will be replaced at our expense.

Any equipment components (wear parts, seals, etc.) must be replaced with original SERVINOX parts

The guarantee does not cover damage resulting from:

- incorrect assembly, inappropriate or abusive use,
- accident or improper installation,
- modification of the equipment,
- leakage due to the passage of impurities will not be taken into account,
- Mandatory maintenance not carried out.

The warranty offered on our products covers the free repair of returned parts that have been proven to have become unusable prematurely, due to a manufacturing or material defect.

We are not liable for any compensation or other obligations of this nature.

The equipment was checked before leaving the factory.

This equipment is certified to have been inspected and approved for sale

34-36 Avenue Roger Hennequin
78197 Trappes cedex - France
Phone: + 33 (0)1 30 16 15 00
Fax: +33 (0)1 30 16 15 01
Home page: http://www.servinox.com