Pressure valve

Weight-operated

BOT

Instructions

Reference: BOT_NOT_EN

Version K

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1 INTRODUCTION

1.1. The manufacturer

SERVINOX is a specialist, making process equipment for the brewing, food, cosmetic and chemical industries.

Skill and knowledge about process equipment:
In areas such as the protection of tanks, sampling, injection of gas in liquids, scouring or cleaning pipes with patented products.

SERVINOX is certified ***ISO 9001: 2015*** and makes products complying with the following applicable standards and directives:

- Pressure Equipment Directive ***(PED) 2014/68/EU***
- European Directive concerning Devices for Use in Explosive Atmospheres ***(ATEX) 2014/34/EC***
- Hygienic standard for manufacturers US 3A

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

1.2. Instructions

To ensure the integrity of the device and the safety of people, you should be aware of the information contained in these instructions before installing and using the device.

Depending on the installation and the fluid, the specific directives and regulations apply, and should be complied with.

In addition to these instructions, the general instructions for safety at work and protection should be applied. The regulations concerning the protection of the environment must also be followed.

1.3. About the equipment

The "BOT" safety valve is a safety device intended to protect tanks from the risk of overpressure. Weight-operated calibration offers excellent reliability over time.

Safety accessory belonging to category IV of European Directive 2014/68/EU.

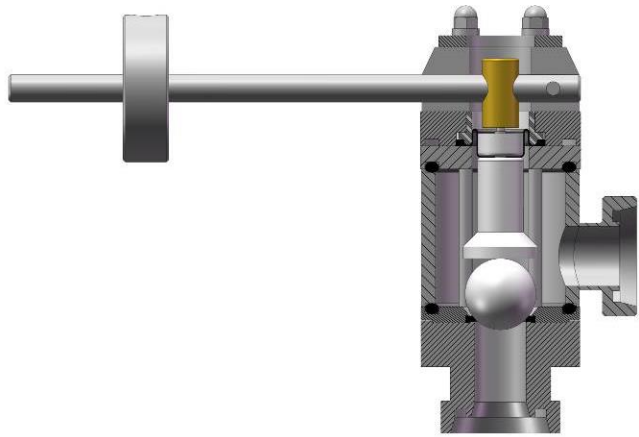
This valve should be used on a circuit conveying gaseous fluids (excluding steam) of group 2.

How it works

This safety valve is intended to protect a tank or a production line containing gaseous fluids of group 2 (excluding steam) against overpressure.

A stainless-steel calibrated weight on the lever provides the calibrated pressure (Pdo = Opening pressure). In case of overpressure, the ball allows the fluid to evacuate towards a secondary system or directly into the ambient atmosphere.

The sealing is provided by a stainless-steel or arnite ball (depending on the maximum temperature of your process) and contact with a lip seal.



Cross-section of the BOT valve – Type 2

1.4. Signs

If you have difficulties these instructions cannot resolve, you should ask for further information from the manufacturer or from the equipment distributor.

It is essential to mention the SERVINOX order and/or the batch number, beginning with SVX, for all special requests (spare parts, etc).

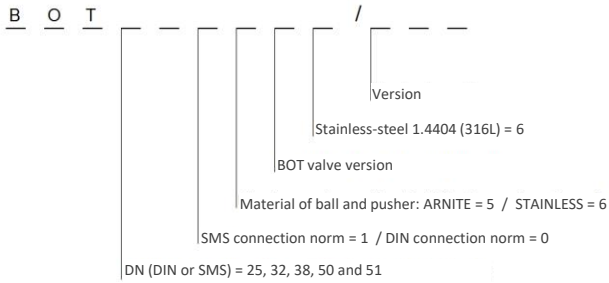
The safety valve has a label on the recovery chamber

SERVINOX FRANCE Phone: +33 (0)1.30.16.15.00 www.servinox.com CE 0851	**Reference:** XXXXXXXXXX **Serial N°: SVXXXXXXX** **Assembly N°: X** **Year: 2021** **Pdo/Set pressure : X bar** ***Fluid group 2 (gas except steam)*** **TS : +1°C to +XXX°C** **Kdr : 0,1** **Gasket material : XXXX**

For Atex version

SERVINOX FRANCE Phone: +33 (0)1.30.16.15.00 www.servinox.com CE Ex ATEX 2014/34/UE : **II 2GD c T120°C (T4)**	**Reference: XXXXXXXXXX** **Serial N°: SVXXXXXXX** **Assembly N°: X** **Year: 2021** **Pdo/Set pressure : X bar** **TS: +1°C to +XXX°C** **Gasket material : XXXX**

Codification of the reference



BOT valve version

Code	Profil
1	without collected exhaust
2	collected exhaust
3	side connection + without collected exhaust
4	side connection + collected exhaust
5	flange connection + without collected exhaust
6	flange connection + collected exhaust

2 SAFETY INSTRUCTIONS

This technical manual contains basic instructions that should be followed. It is therefore essential to read it before installation and commissioning.

2.1. Indications and symbols

The following pictograms are designed to draw your attention to important points relating to the safety of people and the integrity of the device:

SYMBOL	DEFINITION
	Direct danger for people
	Possible damage to the product or its environment
	Compulsory instruction
	Minimum number required for certain operations. (The number of characters in the pictogram indicates the minimum number of persons).
	Minimum technical skill level. (The number in red indicates the minimum level required).

Some jobs require special technical skills and qualifications, such as for maintenance repairs or work on electrical equipment.

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

	WORKER'S PROFILE	QUALIFICATIONS
Level 1	**End user** with no technical knowledge	**Default level** if the skill pictogram is not present. Permits only **ordinary use and routine maintenance**.
Level 2	**Experienced professional**	**Trained and experienced - knowing the equipment and the technologies used**.
Level 3	**The manufacturer's personnel** / expert of the product	**Work reserved for the manufacturer** of the documented device.

2.2. Safety of workers

Installation, test, adjustment, maintenance and replacement should be performed:

- By qualified persons
- Following the recommendations and guidelines given in these instructions
- Complying with the arrangements for safety at work, procedures and resources of the fitter, and the legal notifications for the prevention of accidents, especially those concerning electrical installations.

Not following these safety instructions can result in the loss of all right to claim damages.

2.3. Intended use

Correct utilisation

In the certification documents, check that the device chosen is right for its intended use.

This equipment is a safety device designed to protect device under pressure and/or installations against exceeding the admissible limits with regard to pressure.

Incorrect utilisation

The device must not be used for any other purpose other than its intended use. The manufacturer cannot be held responsible in case of incorrect utilisation.

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

PARAMETER	LIMITS
Maximum admissible pressure (PS)	The maximum allowable pressure is indicated into the EC declaration of conformity and the EC mark of the BOT valve.
Temperature - MINIMUM/MAXIMUM	+1 / +165 °C (Seal made of silicone or VITON) or +1 / +120 °C (Seal made of EPDM) or +1 / +80 °C (Ball and pusher ARNITE) or +1 / +165 °C (Ball and pusher STAINLESS)

This device has undergone a hydraulic strength test.

2.4. Breakdown of the risks

Loads due to the exterior weather

- The presence of weather (wind, snow, etc) can create risks for the functions of the valve and will no longer act as a safety device.
- This equipment is designed for use in a place or protected area that can be heated if necessary.

Forces and moments of reaction provoked by the supports, fixings and pipes

- No stress static, dynamic or thermic should be applied / transferred to the valve.
- Earthquakes can create risks for the functions of the valve. A burst diaphragm can help to cope with this risk.
- Not following the above rules can endanger the functioning of the valve.

Corrosion of the seals by the product

- The seals are made of EPDM, VITON or Silicone; these materials are compatible with food requirements. A certificate of conformity FDA compliant with CFR 21 PART 177.2600 Dry foods (A-D) of the seal is supplied with the EC file.
- The material of the seal is to be decided according to the fluids in contact with it and the conditions of use (particularly the temperature); the user must check the compatibility of the seal with the fluids conveyed.
- In case of corrosion of the seals there is no risk of overpressure. You should plan all the resources necessary for recovering the products that may exhaust if these pose a risk for the persons around and for the walls and accessories attached to the equipment.

Fatigue of the materials

- This safety device is intended to only function exceptionally.
- Inspections should be carried out in order to visually check for the absence of fatigue cracking or premature wear. (See chapter "Servicing and maintenance").

Functioning of the valve

- When the safety valve opens, very loud noises may be heard.
- In case of servicing at high fluid temperatures, these high temperatures may be transmitted to the surface of the body: risk of burns.

3 TECHNICAL SPECIFICATIONS

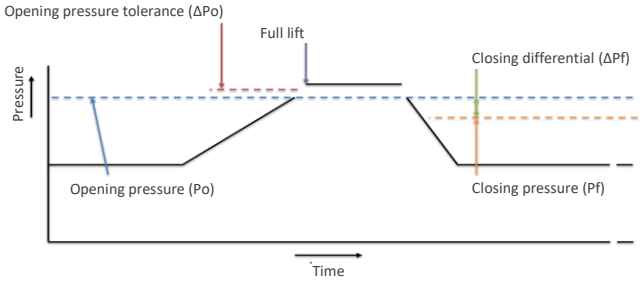
3.1. Specifications

SPECIFICATIONS	SERVINOX PROPOSAL
Connections	Male, female, clamp, flange
Pdo (Calibration or Opening pressure)	From 0.5 to 6 bar
Kd (coefficient of rate)	0.1
Service temperature	Depending on the material of the ball +1°C to 80°C (arnite). +1°C to 165°C (stainless). Depending on the seal gaskets +1°C to 120°C (EPDM). +1°C to 165°C (VITON, Silicone)
Materials: • Part in contact with the product • Other parts • Seals	 Stainless-steel 1.4404 and/or 1.4409 (316L), Arnite Stainless-steel 1.4404 (316L), 1.4307 (304L). Nickel-plated brass EPDM, VITON, Silicone

This valve should be used on a circuit conveying gaseous fluids (excluding steam) of group 2.

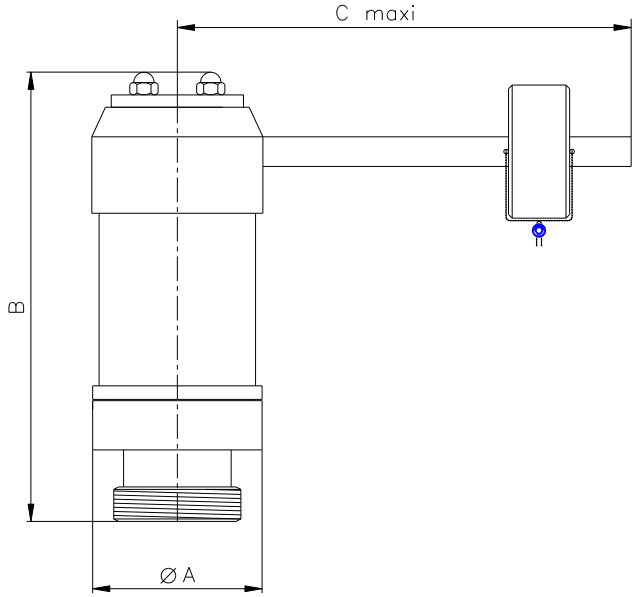
Functional tolerances

CRITERIA	TOLERANCE
Opening pressure:	
From 0.5 to 5 bar	±0.15 bar
From 5 to 6 bar	±3%



3.2. Standard dimensions

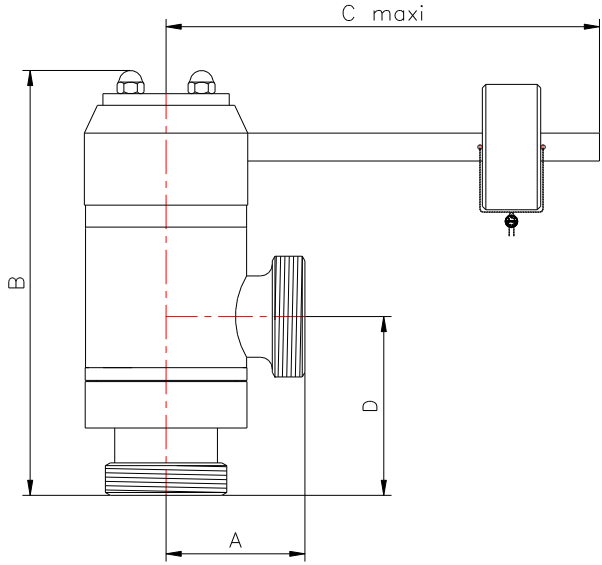
Model straight connection and uncollected exhaust (type1)



	SIZE OF CONNECTION (STANDARD DIN)			
SIZES	**DN25**	**DN32**	**DN40**	**DN50**
A	69	69	88	88
B	183	183	203	203
C	453	453	462	462

	SIZE OF CONNECTION (STANDARD SMS)		
SIZES	**DN25**	**DN38**	**DN51**
A	65	88	88
B	183	203	203
C	453	465	465

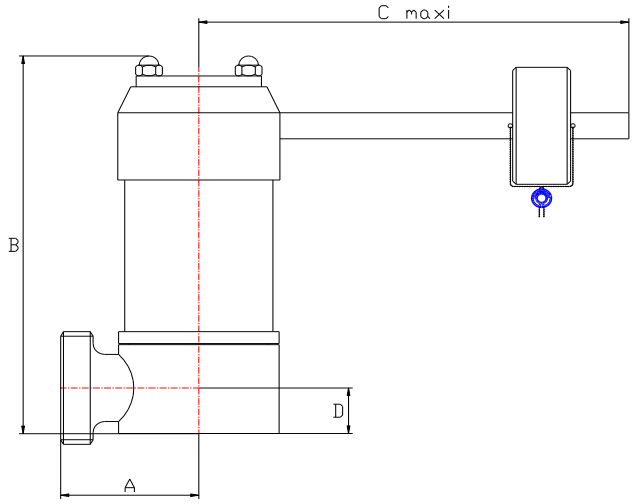
Model straight connection and collected exhaust (type 2)



	SIZE OF CONNECTION (STANDARD DIN)			
SIZES	**DN25**	**DN32**	**DN40**	**DN50**
A	60	60	99	99
B	183	183	203	203
C	453	453	465	465
D	77	77	85	85

	SIZE OF CONNECTION (STANDARD SMS)		
SIZES	**DN25**	**DN38**	**DN51**
A	63	77	77
B	183	203	203
C	453	465	465
D	77	85	85

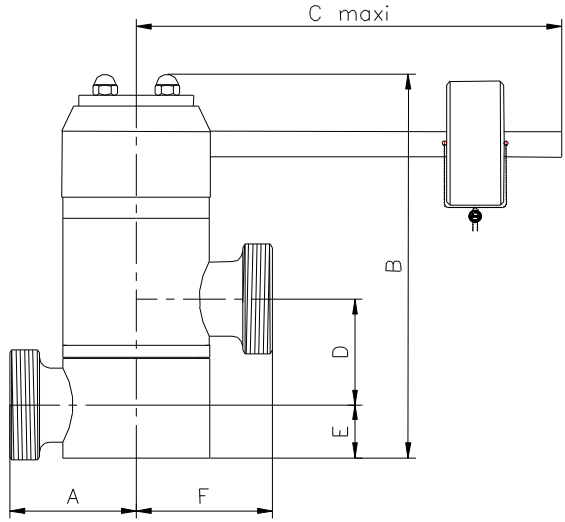
Model side connection and uncollected exhaust (type 3)



	SIZE OF CONNECTION (STANDARD DIN)			
SIZES	**DN25**	**DN32**	**DN40**	**DN50**
A	60	60	71	71
B	175	175	202	202
C	453	453	465	465
D	21	21	25	25

	SIZE OF CONNECTION (STANDARD SMS)		
SIZES	**DN25**	**DN38**	**DN51**
A	63	77	77
B	175	202	202
C	453	465	465
D	21	25	25

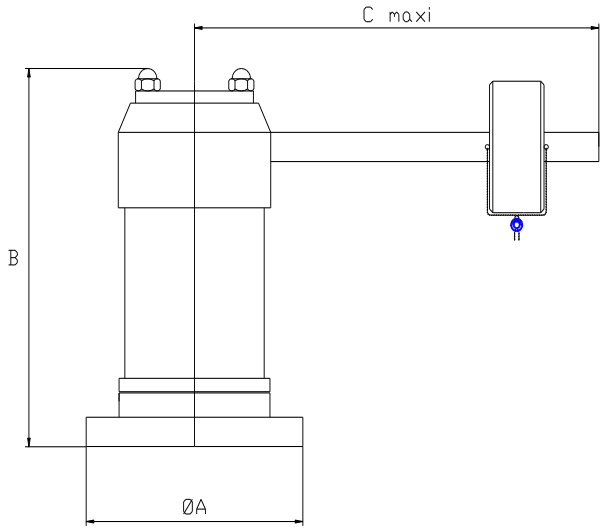
Model side connection and collected exhaust (type 4).



	SIZE OF CONNECTION (STANDARD DIN)			
SIZES	**DN25**	**DN32**	**DN40**	**DN50**
A	60	60	99	99
B	175	175	202	202
C	453	453	465	465
D	48	48	59	59
E	21	21	25	25
F	60	60	99	99

	SIZE OF CONNECTION (STANDARD SMS)		
SIZES	**DN25**	**DN38**	**DN51**
A	63	77	77
B	175	202	202
C	453	465	465
D	48	59	59
E	21	25	25
F	63	77	77

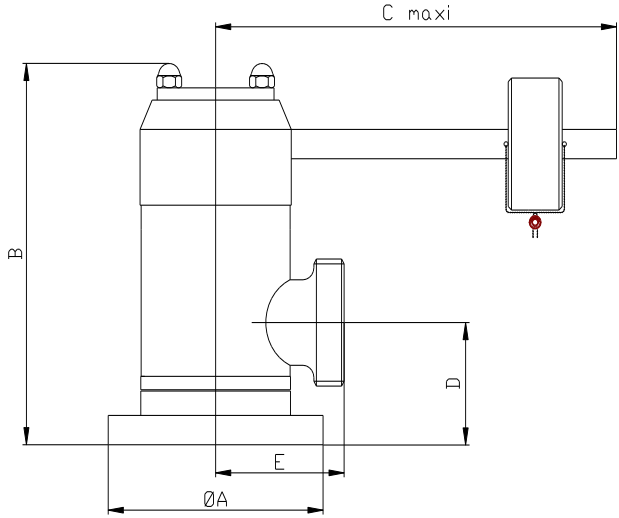
Model straight flange connection and uncollected exhaust (type 5).



	SIZE OF CONNECTION (STANDARD DIN)		
SIZES	**DN25**	**DN40**	
A	100	120	
B	155	170	
C	453	465	

	SIZE OF CONNECTION (STANDARD SMS)		
SIZES	**DN25**	**DN38**	
A	100	120	
B	155	170	
C	453	465	

Model straight flange connection and collected exhaust (type 6).

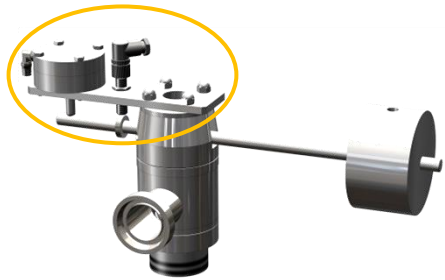


	SIZE OF CONNECTION (STANDARD DIN)		
SIZES	**DN25**	**DN40**	
A	100	120	
B	155	170	
C	453	465	
D	50	52	
E	60	99	

	SIZE OF CONNECTION (STANDARD SMS)		
SIZES	**DN25**	**DN38**	
A	100	120	
B	155	170	
C	453	465	
D	50	52	
E	63	77	

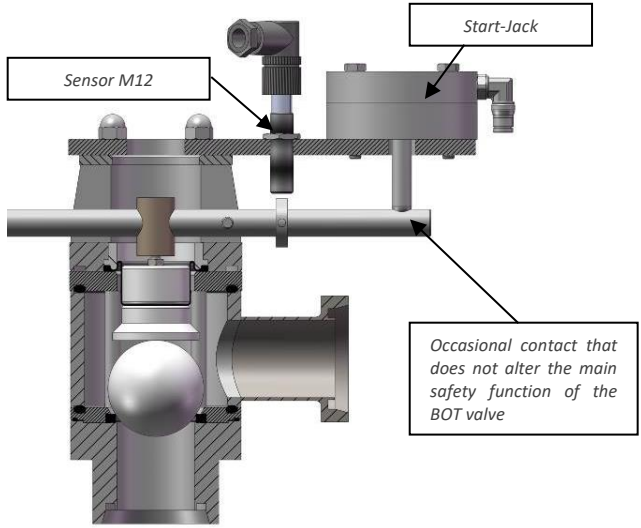
3.3. Option

Starting-cylinder with/without detection



The starting-cylinder (simple pneumatic effect) allows the opening of the valve in Cleaning Phase. To do this, actuation of the cylinder acts on the lever lift leaving the ball to rise freely allowing a leak of the Cleaning Liquid.

The starting-cylinder must only be actuated if the equipment protected by the valve has been brought to atmospheric pressure (0 bar relative).



The starting-cylinder can be accompanied optionally, by an inductive sensor to inform a controlled system or notify the rise of the valve lever.

CAUTION: the lever rising indicates the opening of the BOT valve (exhaust of overpressure from the protected equipment).

4 COMMISSIONING

4.1. Transport/ Reception/ Handling

When transporting, protect against all external danger (knocks, blows, vibration, etc)

Upon receipt, check:

- that ***the package is in good condition***
- that the device ***is delivered as ordered***
- that the device ***has not been damaged***

If the device is damaged, it must not be fitted on the installation. Contact the manufacturer or your distributor.

4.2. Storage

If the device is not fitted immediately after delivery, it should be stored ***carefully***.

It should be stored in its original packaging, in a covered area, with protection against dirt, rain, snow, insects and away from shock.

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

If the device is stored at negative temperatures, the resistance of the materials to cold should be taken into account (e.g.: the seals).

If storage is for longer than one year, the seals need to be replaced before commissioning

4.3. Warning before installation

- It is strictly forbidden to modify the calibration and lighten the weight to make it slide.

- It is strictly forbidden to change the intended use (safety device and not a regulating device).

- It is very important to comply with the standards with regard to the assemblies and their dimensions.

- It is very important to use the correct screws supplied with the equipment.
If you replace the nuts and bolts, they must be suitable for the essential safety requirements of the PED 2014/68/EU (particularly the conditions of elongation and bending by minimum shock) and, if the user changes the specifications of the screws from those supplied with the equipment, carry out an evaluation of conformity as regards the conditions of use, test and exceptions.

- The evacuation duct is dimensioned so that when draining, the back-pressure never exceeds 0.5 bar.
(CAUTION: in this case add the counter-pressure to the calibration of the valve for calculating the pressure in the tank).

4.4. Installation

General

Before any utilisation of the equipment, the user must visually verify good condition: absence of corrosion, bits of packaging.

If the fluid is harmful, inflammable, toxic, etc, fit the installation with discharge pipes going into a safe place.

Also, you are advised to check the compatibility of these products with the seals and materials before using them.

The equipment must only be fitted when the installation is out of service and inert (absence of pressure and risk of transfer of fluid)

The workers

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

The personnel must be fitted with equipment of personal protection against risks of the exhaust or contact with the fluid (burns, noise, projections, etc)

Connecting the valve

- The valve should be installed vertically and plumb.
- The valve should be positioned carefully taking into account the risks from the exhaust of the fluid (burns, noise, projections, etc).
- Do not voluntarily obstruct the exhaust orifice.
- The connection tubes must have interior and exterior diameters identical to the valve.
- When fixing the valve, you should be careful not to exert stress on its connections.
- Verify that the lever operates well and check that the opening of the valve is correct.

Fitting the optional starting-cylinder

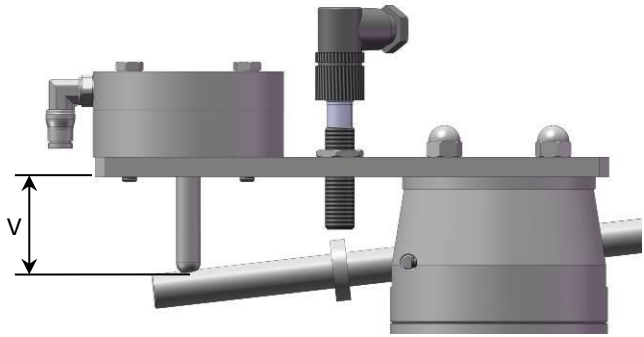
The connection is made with a flexible pneumatic pipe Ø6 mm on the bracket connector of the starting-cylinder (simple pneumatic effect).

The minimum pneumatic pressure should be 1 bar, up to 4 bar maximum.

Reminder: the starting-cylinder must only be actuated if the equipment protected by the valve has been brought to atmospheric pressure (0 bar relative).

When opening the cylinder, the lever it must have the size "V" between the lever and the lower face of the support plate (Ref.10):

- 25 mm for the valve DN25
- 40 mm for the valve DN40

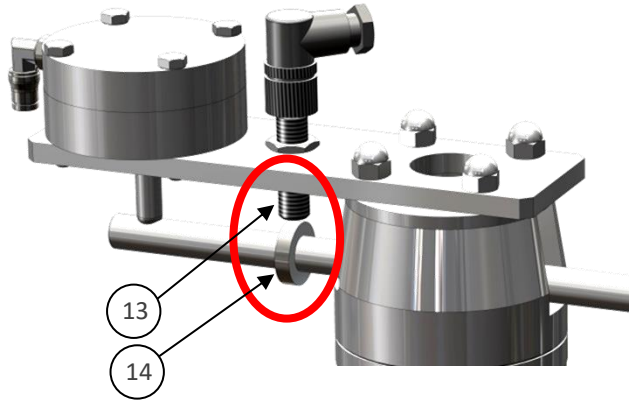


Fitting the detection option

Connect the inductive sensor M12 and its female connector according to the technical documentation below.

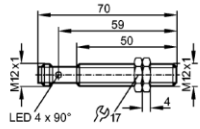
Check for correct adjustment of the sensor.

There must be no contact between the detection washer (Ref.14) and the inductive sensor (Ref.13). The inductive sensor must not hinder the closing of the BOT valve.



IFT216

IFK3004BBPKG/M/V4A/US-104-DPS



Made in Germany

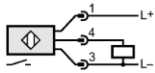
Product characteristics		
Inductive sensor		
Metal thread M12 x 1		
Connector		
Increased sensing range		
Gold-plated contacts		
Sensing range 4 mm; [f] flush mountable		
Electrical data		
Electrical design		DC PNP
Operating voltage	[V]	10...36 DC
Current consumption	[mA]	< 10
Protection class		II
Reverse polarity protection		yes
Outputs		
Output function		normally open
Voltage drop	[V]	< 2.5
Current rating	[mA]	100
Short-circuit protection		pulsed
Overload protection		yes
Switching frequency	[Hz]	700
Range		
Sensing range	[mm]	4
Operating distance	[mm]	0...3.25
Accuracy / deviations		
Correction factors		mild steel = 1 / stainless steel approx. 0.7 / brass approx. 0.5 / Al approx. 0.5 / Cu approx. 0.4
Hysteresis	[% of Sr]	1...15
Environment		
Ambient temperature	[°C]	0...100
Protection		IP 68 / IP 69K
Tests / approvals		
EMC		EN 61000-4-2 ESD: 4 kV CD / 8 kV AD EN 61000-4-3 HF radiated: 10 V/m EN 61000-4-4 Burst: 2 kV EN 61000-4-5 Surge: 0.5 kV EN 61000-4-6 HF conducted: 10 V EN 55011: class B
MTTF	[Years]	1628
Mechanical data		

IFT216

IFK3004BBPKG/M/V4A/US-104-DPS

Mounting		flush mountable
Housing materials		stainless steel (316L); active face: PEEK (polyether ether ketone)
Weight	[kg]	0.03
Displays / operating elements		
Output status indication	LED	yellow (4 x 90°)
Electrical connection		
Connection		M12 connector; Gold-plated contacts

Wiring



Accessories		
Accessories (included)		2 lock nuts
Remarks		
Pack quantity	[piece]	1

5 USE

5.1. Warning before commissioning

It is strictly forbidden to:

- Limit the travel of the weight lever on opening and/or on closing

- Prevent by any means whatsoever the opening and/or the closing of the weight lever.

5.2. Functional checks

After installation, before using the valve or maintenance work:

- Check that the lever rises freely.

5.3. Overflow of tank into the valve

In case of overflow of the tank into the valve:

HALT PRODUCTION, it is essential to clean the interior of the valve. Flooding of the valve no longer protects the installation from the risk of overpressure.

RISK OF DESTRUCTION OF THE TANK!

5.4. Adjustment

Adjustments are reserved for the manufacturer of the documented device.

Contact SERVINOX or your distributor.

6 SERVICING AND MAINTENANCE

6.1. General

The equipment requires maintenance to make sure it functions correctly.

An inspection must be carried out at regular intervals. There should be an initial inspection interval of six months.

Certain properties of fluids (corrosive, aggressive, abrasive, residues, viscosity, etc) and certain environmental conditions (climate, pollution, etc) may require a reduction of these inspection intervals.

SERVINOX supplies the spare parts for proper maintenance and the warranty on the equipment. Specify the production number and the product reference for all orders.

We keep a store of sachets of wear parts (seals, etc) and we recommend that you keep a few sachets in stock for quick jobs.

You can contact SERVINOX for all advice about maintenance of the device.

The valve should be recalibrated as often as necessary and in all cases if there is a doubt or statutory obligation in the country where it is being used.

SERVINOX insists on recalibrating the valves on its premises. No weight change or modification of the weight is allowed other than by SERVINOX.

Maintenance precautions

<u>Do the following before any work:</u>

- Stop the equipment or the process protected by the BOT valve
- Depressurise the system
- The installation must be empty
- The fluid should be cooled to ambient temperature
- Aerate the system of pipes, if the fluid is corrosive and aggressive

The workers

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

The personnel must be fitted with gloves, helmet, and safety shoes.

6.2. Inspections and servicing

Required periodic maintenance:

Every 2 months for 6 months after commissioning

- Check that the lever rises freely
- The tightness of the assemblies
- No obstruction of the outlet of the valve
- Absence of cracking or deformation of the valve

Every 6 months and on commissioning:

- Internal cleaning of equipment
- Visual verification of the condition of the seals
- Absence of impurities or residue inside the valve
- The tightness of the assemblies
- Absence of cracking or deformation of the valve
- Check that the lever rises freely

Every year:

- Change all the seals and diaphragm of the BOT valve
- Change the connection seals.

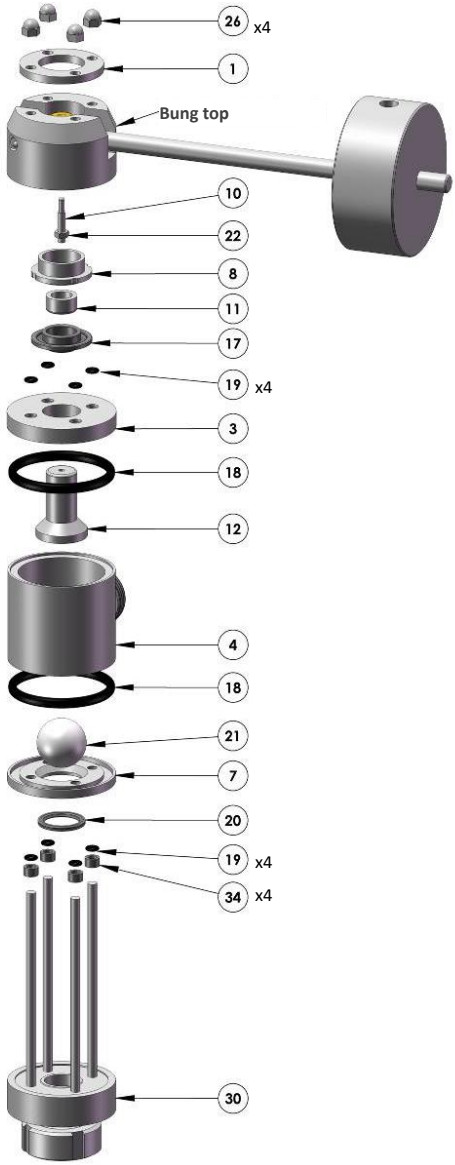
You are advised to check the compatibility of your products with the seals and materials before using them

We advise you to enter all the maintenance and test operations carried out on the installation in a form of this type:

Date	Company	Name of the worker	Signature
PREVENTIVE MAINTENANCE			
Operations		**Other, Comments**	
CHECKS ON CORRECT FUNCTIONING AND GOOD CONDITION			
Operations		**Other, Comments**	

6.3. Maintenance operations

BOT valve with collected exhaust (DN25: Type 2, 4 and 6).



Dismantling the valve DN25 with collected exhaust

<u>BEFORE DISMANTLING</u>:

- Note the orientation of the outlet from the recovery chamber (Ref.4) and the bung top lever

- Note the calibration value (Pdo = Opening pressure) of the valve

To dismantle the safety valve, proceed as follows:

1) Unscrew the cap nuts (Ref.26).
2) Withdraw the support plate of the starting-cylinder with/without detection.
3) Remove the upper plate (Ref.1).
4) Withdraw the bung top and the diaphragm press (Ref.8).

Do not remove the lever + calibrated weight assembly from the bung top

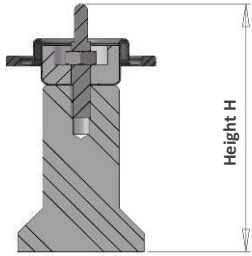
5) Remove the components along the 4 rods in the following order:
    - The back-plate (Ref.3) with the assembly [pusher (Ref.12)/ diaphragm (Ref.17)/ piston (Ref.11)/ needle (Ref.10)/ locknut (Ref.22)/ 4 seals (Ref.19)]
    - The upper seal (Ref.18).
    - The recovery chamber (Ref.4).
    - The ball (Ref.21).
    - The lower seal (Ref.18).
    - The seal plate (Ref.7).
    - The 4 seals (Ref.19) and the 4 spacers (Ref.34).
    - The valve seal (Ref.20).

6) To remove the diaphragm (Ref.17), proceed as follows:

MANDATORY OPERATION:

With a calliper, measure the height H of the needle (Ref.10) on the pusher (Ref.12).

In case of voluntary or involuntary dismantling of the diaphragm (Ref.17) without knowing the height H of the assembly pusher/piston/diaphragm/needle, stop the maintenance work and contact SERVINOX for repairs to the BOT valve.



- Unscrew the locknut (Ref.22) and the needle (Ref.10).
- Withdraw the diaphragm (Ref.17) on the piston (Ref.11).

Refitting the valve DN25 with collected exhaust

Refitting is done after cleaning all the parts; taking care to avoid the introduction of impurities which could damage the seals.

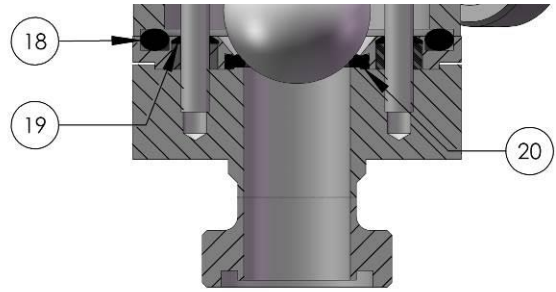
Apply food-standard silicone lubricant in spray on the seals (Ref.18, Ref.19 and Ref.20) before fitting

To refit the safety valve, proceed as follows:

1) Drill a hole of Ø5mm in the centre of the diaphragm (Ref.17).
2) Introduce the pusher (Ref.12) into the back-plate (Ref.3).
3) Position the piston (Ref.11) in the diaphragm (Ref.17) (canvas side opposite the pusher) and assemble them on the pusher (Ref.12) with the needle (Ref.10) and the locknut (Ref.12).

Keep to the measurement H noted when dismantling the diaphragm (Ref.17)

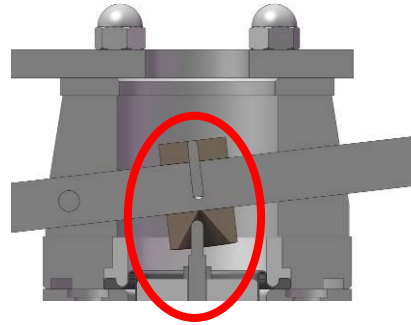
4) Fit the 4 seals (Ref.19) then the 4 spacers (Ref.34) in the seal plate (Ref.7).
5) Fit the valve seal (Ref.20) on the seal plate (Ref.7).



6) Fit the seal plate (Ref.7) along the 4 rods then the ball (Ref.21) and the lower seal (Ref.18).
7) Fit the recovery chamber (Ref.4) and direct the exhaust outlet according to the position noted before dismantling.
8) Fit the upper seal (Ref.18).
9) Position the back-plate (Ref.3) along the 4 rods with the assembly [pusher (Ref.12)/ diaphragm (Ref.17)/ piston (Ref.11)/ needle (Ref.10)/ locknut (Ref.22)]
10) Replace the 4 seals (Ref.19) into the back-plate (Ref.3).

11) Assemble the diaphragm press (Ref.8) on the bung top; then fit the assembly on the rods and the upper plate (Ref.1). Make sure you keep to the orientation of the bung top lever as noted when dismantling.

Be careful when fitting: the needle pivot (Ref.9) must be centred on the needle (Ref.10)



12) Position the upper plate (Ref.1); then the support plate of the starting-cylinder with/without detection.

13) Compress the assembly vertically and tighten the 4 cap nuts (Ref.26) up to total crushing of the components.

<u>AFTER REFITTING</u>:

1) Check that the lever rises freely

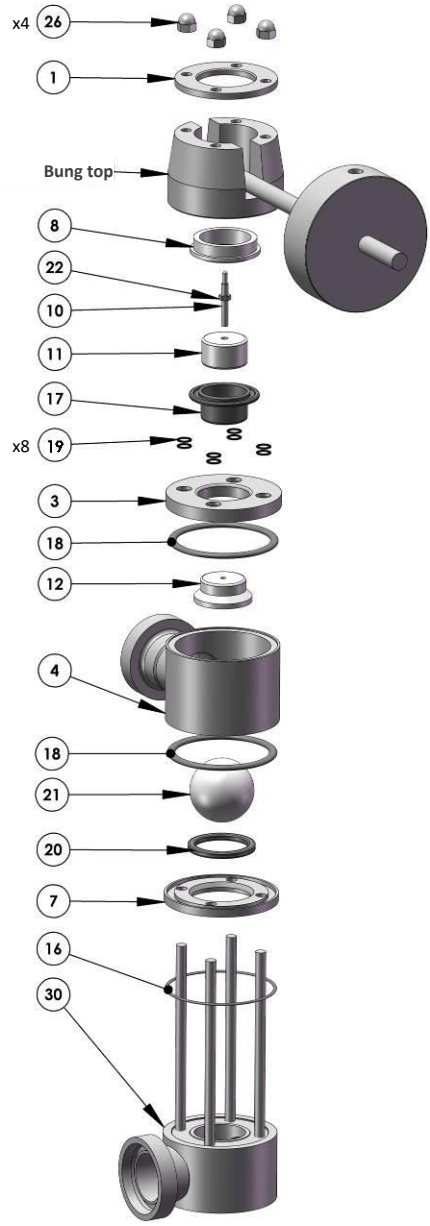
2) Starting-cylinder option with/without detection option:

- Check that the inductive sensor is not in contact with the detection washer anywhere along the travel of the lever.
- Check that the piston of the starting-cylinder is centred in the punching on the lever.

3) Check the calibration value (Pdo = Opening pressure) of the valve

4) Fit the valve on the tank and connect up all the electrical and pneumatic power options, if necessary. Check for correct functioning.

BOT valve with collected exhaust (DN40: Type 2, 4 and 6).



Dismantling the valve DN40 with collected exhaust

<u>BEFORE DISMANTLING</u>:

- Note the orientation of the outlet from the recovery chamber (Ref.4) and the bung top lever

- Note the calibration value (Pdo = Opening pressure) of the valve inscribed on the EC sign

To dismantle the safety valve, proceed as follows:

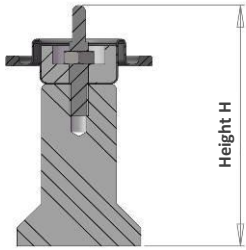
1) Unscrew the cap nuts (Ref.26).
2) Withdraw the support plate of the starting-cylinder with/without detection.
3) Remove the upper plate (Ref.1).
4) Withdraw the bung top ***(do not remove the lever + calibrated weight assembly)*** and the diaphragm press (Ref.8).
5) Remove the components along the 4 rods in the following order:
    - The back-plate (Ref.3) with the assembly [pusher (Ref.12)/ diaphragm (Ref.17)/ piston (Ref.11)/ needle (Ref.10)/ locknut (Ref.22)]
    - The 8 seals (Ref.19) in the back-plate (Ref.3).
    - The upper seal (Ref.18).
    - The recovery chamber (Ref.4).
    - The ball (Ref.21).
    - The lower seal (Ref.18).
    - The seal plate (Ref.7).
    - The seal (Ref.16).
    - The valve seal (Ref.20).

6) To remove the diaphragm (Ref.17) proceed as follows:

<u>MANDATORY OPERATION</u>:

With a calliper, measure the height H of the needle (Ref.10) on the pusher (Ref.12).

In case of voluntary or involuntary dismantling of the diaphragm (Ref.17) without knowing the height H of the assembly pusher/piston/diaphragm/needle, stop the maintenance work and contact SERVINOX for repairs to the BOT valve.



- Unscrew the locknut (Ref.22) and the needle (Ref.10).
- Withdraw the diaphragm (Ref.17) on the piston (Ref.11).

Refitting the valve DN40 with collected exhaust

Refitting is done after cleaning all the parts; taking care to avoid the introduction of impurities which could damage the seals.

Apply food-standard silicone lubricant in spray on the seals (Ref.16, Ref.18 and Ref.20) before fitting

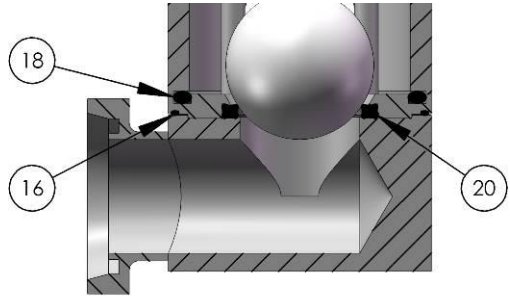
To refit the safety valve, proceed as follows:

1) Drill a hole of Ø5mm in the centre of the diaphragm (Ref.17).

2) Position the piston (Ref.11) in the diaphragm (Ref.17) (canvas side opposite the pusher) and assemble them on the pusher (Ref.12) with the needle (Ref.10) and the locknut (Ref.12).

Keep to the measurement H noted when dismantling the diaphragm (Ref.17)

3) Position the pusher (Ref.12) on the back-plate (Ref.3).



4) Fit the seal (Ref.16) on the seal plate (Ref.7).

5) Fit the valve seal (Ref.20) on the seal plate (Ref.7).

6) Fit the seal plate (Ref.7) along the 4 rods then the ball (Ref.21) and the lower seal (Ref.18).

7) Fit the recovery chamber (Ref.4) and direct the exhaust outlet according to the position noted before dismantling.

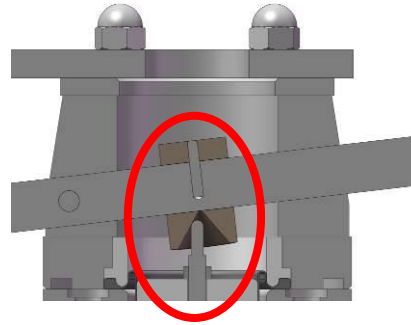
8) Fit the upper seal (Ref.18).

9) Position the back-plate (Ref.3) along the 4 rods with the assembly [pusher (Ref.12)/ diaphragm (Ref.17)/ piston (Ref.11)/ needle (Ref.10)/ locknut (Ref.22)]

10) Position the 8 seals (Ref.19) in the back-plate (Ref.3).

11) Assemble the diaphragm press (Ref.8) on the bung top; then fit the assembly on the rods and the upper plate (Ref.1). Make sure you keep to the orientation of the bung top lever as noted when dismantling.

Be careful when fitting: the needle pivot (Ref.9) must be centred on the needle (Ref.10)



12) Position the upper plate (Ref.1); then the support plate of the starting-cylinder with/without detection.

13) Compress the assembly vertically and tighten the 4 cap nuts (Ref.26) up to total crushing of the components.

<u>AFTER REFITTING</u>:

1) Check that the lever rises freely

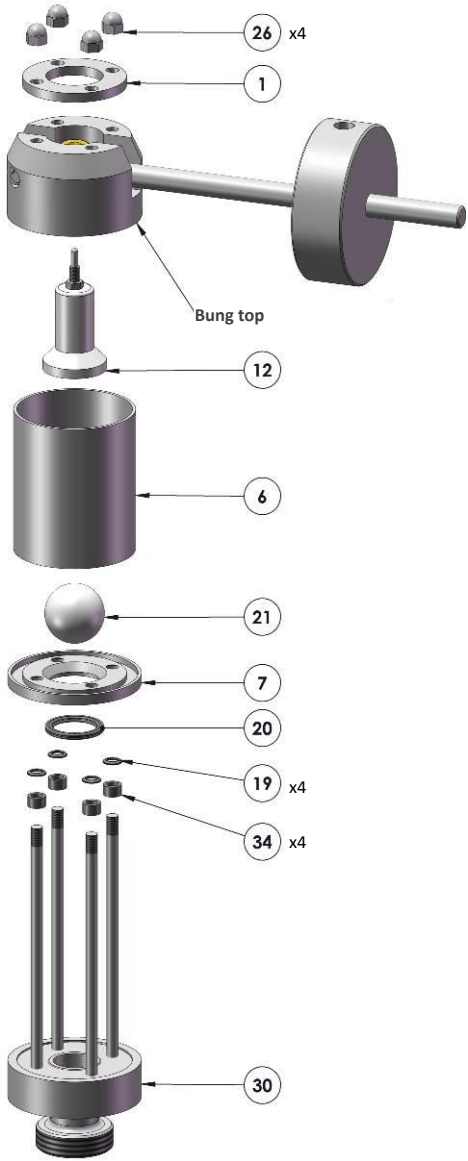
2) Starting-cylinder option with/without detection option:

- Check that the inductive sensor is not in contact with the detection washer anywhere along the travel of the lever.
- Check that the piston of the starting-cylinder is centred in the punching on the lever.

3) Check the calibration value (Pdo = Opening pressure) of the valve

4) Fit the valve on the tank and connect up all the electrical and pneumatic power options, if necessary. Check for correct functioning.

BOT valve without collected exhaust (DN25: Type 1, 3 and 5).



Dismantling the valve DN25 without collector

<u>BEFORE DISMANTLING</u>:

- Verify the absence of pressure inside the tank and that the tank is out of service to prevent its use

- Disconnect all the electrical and pneumatic supplies on the options of the valve if any.

- Note the calibration value (Pdo = Opening pressure) of the valve

To dismantle the safety valve, proceed as follows:

1) Unscrew the cap nuts (Ref.26).
2) Withdraw the support plate of the starting-cylinder with/without detection.
3) Remove the upper plate (Ref.1).
4) Withdraw the bung top, ***do not remove the lever + calibrated weight assembly***
5) Remove along the 4 rods and in the following order of components:

Do not remove the needle with its locknut on the pusher (Ref.12).

In case of voluntary or involuntary dismantling of the pusher/locknut/needle assembly, stop the maintenance work and contact SERVINOX for repairs to the BOT valve.

- The tube (Ref.6).
- The ball (Ref.21).
- The seal plate (Ref.7).
- The 4 seals (Ref.19), 4 spacers (Ref.34) and the valve seal (Ref.20) on the seal plate (Ref.7).

Refitting the valve DN25 without collector

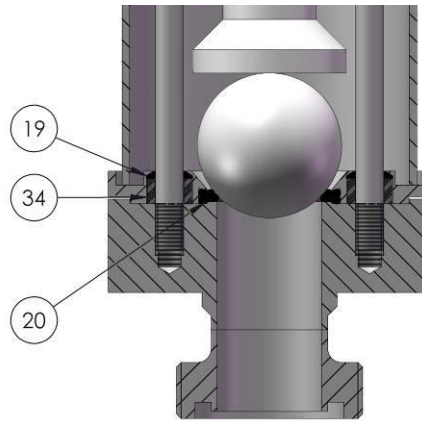
Refitting is done after cleaning all the parts; taking care to avoid the introduction of impurities which could damage the seals.

Apply food-standard silicone lubricant in spray on the seals (Ref.19 and Ref.20) before fitting.

To refit the safety valve, proceed as follows:

1) Fit the 4 seals (Ref.19) then the 4 spacers (Ref.34) in the seal plate (Ref.7).

2) Fit the valve seal (Ref.20) on the seal plate (Ref.7).

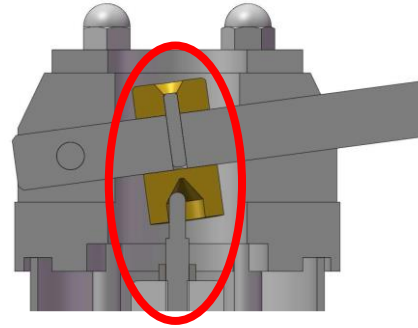


3) Fit the seal plate (Ref.7) along the 4 rods then the ball (Ref.21).

4) Fit the tube (Ref.4) with the hole downwards

5) Position and maintain the pusher (Ref.12) on the ball (Ref.21), and fit the bung top along the 4 rods.

Be careful when fitting: the needle pivot (Ref.9) must be centred on the needle (Ref.10)



6) Position the upper plate (Ref.1); then the support plate of the starting-cylinder with/without detection.

7) Compress the assembly vertically and tighten the 4 cap nuts (Ref.26) up to total crushing of the components.

<u>AFTER REFITTING</u>:

1) Check that the lever rises freely

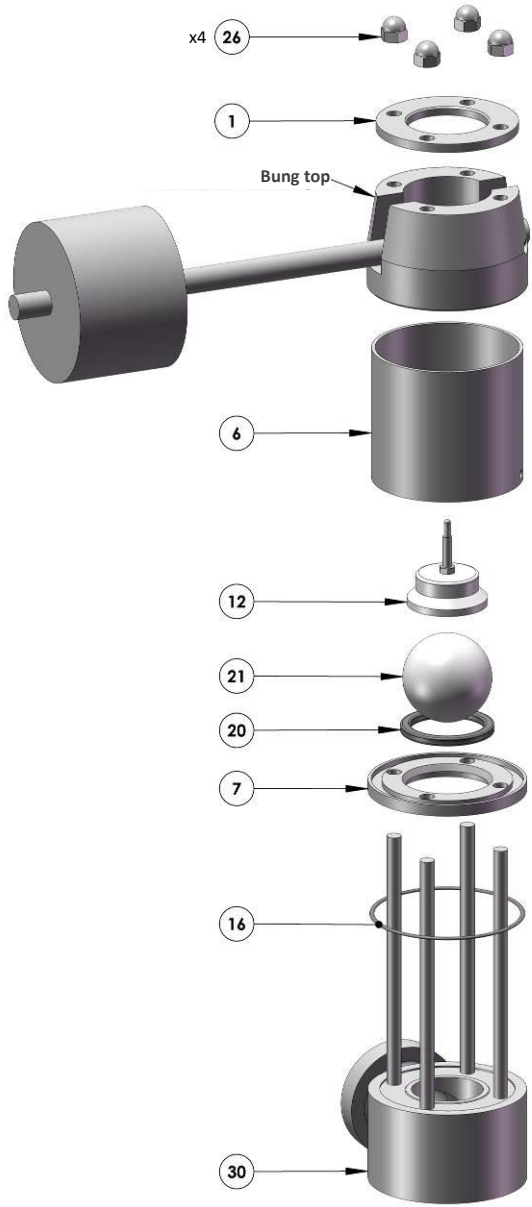
2) Starting-cylinder option with/without detection option:

- Check that the inductive sensor is not in contact with the detection washer anywhere along the travel of the lever.
- Check that the piston of the starting-cylinder is centred in the punching on the lever.

3) Check the calibration value (Pdo = Opening pressure) of the valve

4) Fit the valve on the tank and connect up all the electrical and pneumatic power options, if necessary. Check for correct functioning.

BOT valve without collected exhaust (DN40: Type 1, 3 and 5).



Dismantling the valve DN40 without collector

BEFORE DISMANTLING:

- Verify the absence of pressure inside the tank and that the tank is out of service to prevent its use

- Disconnect all the electrical and pneumatic supplies on the options of the valve if any.

- Note the calibration value (Pdo = Opening pressure) of the valve

To dismantle the safety valve, proceed as follows:

1) Unscrew the cap nuts (Ref.26).
2) Withdraw the support plate of the starting-cylinder with/without detection.
3) Remove the upper plate (Ref.1).
4) Withdraw the bung top, ***do not remove the lever + calibrated weight assembly.***
5) Remove the components along the 4 rods in the following order:

Do not remove the needle with its locknut on the pusher (Ref.12).

In case of voluntary or involuntary dismantling of the pusher/locknut/needle assembly, stop the maintenance work and contact SERVINOX for repairs to the BOT valve.

- The tube (Ref.6).
- The ball (Ref.21).
- The seal plate (Ref.7).
- The seal (Ref.16) and the valve seal (Ref.20) on the seal plate (Ref.7).

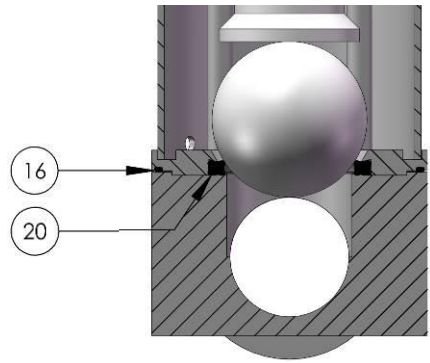
Refitting the valve DN40 without collector

Refitting is done after cleaning all the parts; taking care to avoid the introduction of impurities which could damage the seals.

Apply food-standard silicone lubricant in spray on the seals (Ref.19 and Ref.20) before fitting.

To refit the safety valve, proceed as follows:

1) Fit the valve seal (Ref.20) and the seal (Ref.16) on the seal plate (Ref.7).

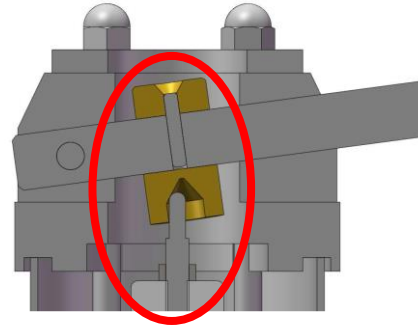


2) Fit the seal plate (Ref.7) along the 4 rods then the ball (Ref.21).

3) Fit the tube (Ref.4) with the hole downwards

4) Position and maintain the pusher (Ref.12) on the ball (Ref.21), and fit the bung top along the 4 rods.

Be careful when fitting: the needle pivot (Ref.9) must be centred on the needle (Ref.10)



5) Position the upper plate (Ref.1); then the support plate of the starting-cylinder with/without detection.

6) Compress the assembly vertically and tighten the 4 cap nuts (Ref.26) up to total crushing of the components.

<u>AFTER REFITTING</u>:

1) Check that the lever rises freely

2) Starting-cylinder option with/without detection option:

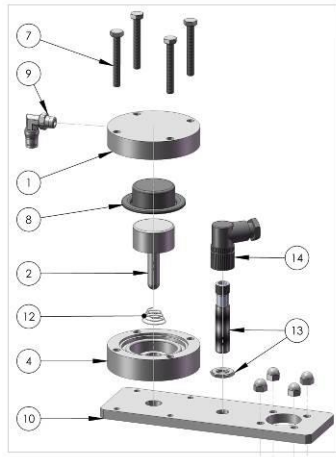
- Check that the inductive sensor is not in contact with the detection washer anywhere along the travel of the lever.
- Check that the piston of the starting-cylinder is centred in the punching on the lever.

3) Check the calibration value (Pdo = Opening pressure) of the valve

4) Fit the valve on the tank and connect up all the electrical and pneumatic power options, if necessary. Check for correct functioning.

Starting-cylinder option

BEFORE DISMANTLING:
- Disconnect the pneumatic supply in the starting-cylinder and disconnect the inductive sensor if any.



To dismantle the starting-cylinder, proceed as follows:

1) Loosen the screws (Ref.7) and remove the body upper (Ref.1).
2) Replace the diaphragm (Ref.8).
3) Fit the body upper (Ref.4).
4) Tighten the screw (Ref.7).

Connect the pneumatic supply in the starting-cylinder and connect the inductive sensor if any.

Check for correct functioning of the cylinder:
- Absence of pneumatic leak at the service pressure
- Outlet of the piston (Ref.2) of 25mm (DN25) or 40mm (DN40).

7 DIAGNOSTIC AID

The table below is a diagnostic aid. It is intended to help you remedy simple functional problems.

PROBLEM	POSSIBLE CAUSE	REMEDY
The BOT valve does not start	- Sealing broken and the calibrated weight modified	> Stop the tank and immediately contact SERVINOX to recalibrate the valve.
	- Overflow of fluid in the valve	> Empty and stop the tank then clean the interior of the valve
Premature start of the BOT valve	- Sealing broken and the calibrated weight modified	> Stop the tank and immediately contact SERVINOX to recalibrate the valve.
	- Valve seal worn	> Replace the seal of the valve/ball.
	- Starting-cylinder active	> Check the control of the starting-cylinder
No detection of opening valve	- Sensor incorrectly connected	> Check the sensor connection and the electrical continuity.
	- Electrical fault (cable cut, sensor defective, etc).	> Replace the inductive sensor M12.
	- Poor adjustment of the detector	> Check the proximity of the detector washer on the lever of the valve.
The starting-cylinder does not start.	- Absence of compressed air	> Check the compressed air supply of the actuator.
	- Fault of control over the actuator	> Check the control of the starting-cylinder
	- Cylinder diaphragm worn	> Replace the diaphragm.

8 WARRANTY

Unless otherwise stated in the proposal, ***the device is guaranteed 12 months as from the date of delivery***.

After an examination in our factory, the parts considered as defective will be replaced at our expense.

All replacement of the device's components (wear parts, seal, etc) must be replaced by SERVINOX original parts

The warranty does not cover damage due to:

- Poor fitting, inappropriate or abusive utilisation
- An accident or incorrect installation
- Modification of the equipment
- Leaks following the passage of impurities will not be taken into account
- Required maintenance not performed

The warranty on our products covers the free repair of parts returned when proved that they have become unusable prematurely, following a manufacturing or material fault.

We are not bound to any compensation or any other obligation of this kind.

This equipment has been inspected before leaving the factory.

This equipment has been certified as having been inspected and authorised for sale

Notes

Notes

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