

**AGRICHEMA**  
SCHÜTTGUTTECHNIK



## Assembly Instruction

**SHOCK-BLOWER® SB-V**

**SIKOBETIC®-2 BB DN 100 110-240 V**

Our consignment No.: 170403  
Customer-No.: 100023  
Your purchase order: 1100122902/00010  
Project:

## Legal Notice

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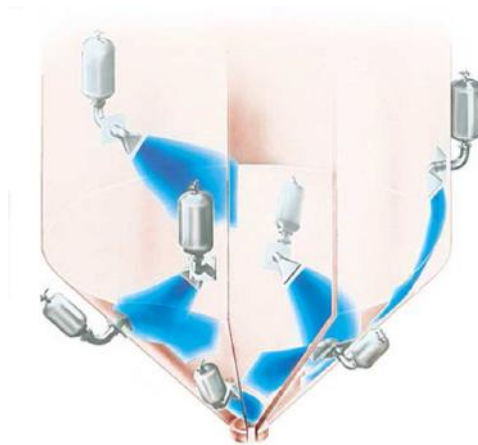
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# 1 General description

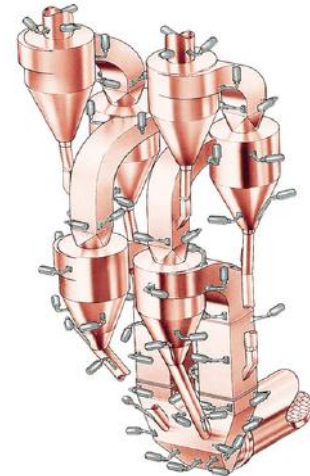
## 1.1 Function and mode of operation

SHOCK-BLOWER® air blast devices store highly compressed air (or inert gases) up to 10 bar, and, according to requirements, release it abruptly, in intervals of milliseconds.

Explosive air blows are systematically introduced into the separation plane between bulk material and wall via special nozzles. This "peels" the bulk material off the wall and moves it in direction of the outlet.



Blasts of air directed in the vicinity of the bulk solids



Deployed in high temperature areas

Illustration 1: Points of application

## 1.2 Unit identification

### 1.2.1 Rating plate

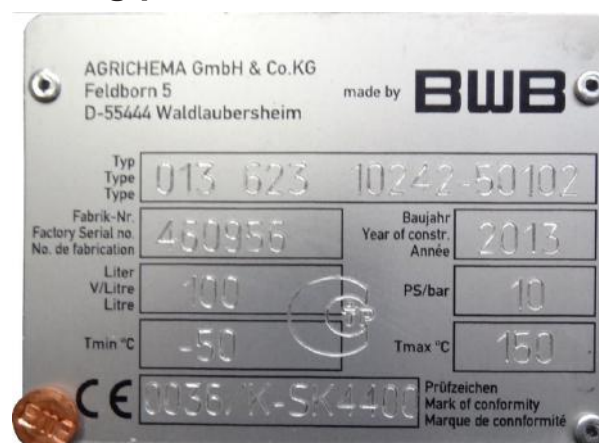


Illustration 2: Example rating plate

## 1.2.2 Adhesive label

Label on the device

The following label can be found on every device:



Illustration 3: Adhesive label SHOCK-BLOWER

## 2 Safety

### 2.1 Intended use

The use of this device is limited to the removal of flow obstructions and caking in bulk good systems, for example in:

- Bunkers and silos
- Stockpiles and star systems
- Transfer hoppers and chutes
- Filter systems and conduits
- Spray towers and cyclones
- Floating gas heat exchangers
- Clinker cooler inlets
- Travelling gate preheaters
- Slides

The devices are approved exclusively for use in trade and industry. Any other use is considered improper. For safety reasons, any technical modification or retrofit of the device is forbidden unless previously agreed by the manufacturer in writing. The manufacturer takes no liability for any damage resulting from such modification or retrofit.

### 2.2 Introduction to safety

Pay attention to the following safety notes, symbols and pictograms:



#### Type and source of danger

Will lead to immediate death or severe injuries if you do not pay attention to the safety note.

- a) Preventative measures.



#### Type and source of danger

Could lead to death or severe injuries if you do not pay attention to the safety note.

- a) Preventative measures.



#### Type and source of danger

Could lead to mild or moderate injuries if you do not pay attention to the safety note.

- a) Preventative measures.



#### Type and source of danger

- ✓ Could lead to material damage if you do not pay attention to the note.

- a) Preventative measures.

At the beginning of each chapter, a pictogram and accompanying text indicate the personnel qualifications required:



#### Personnel qualifications

Only the following personnel are permitted to perform the tasks detailed in this chapter:

List of approved personnel

## 2.3 General safety instructions

For your own safety, always adhere to the following basic requirements relating to handling this product:

- Read these operating instructions carefully, and store them in the immediate vicinity of the product, so that they are readily accessible.
- Ensure that you adhere to the stated maintenance and inspections intervals.
- Only operate the product when it is in perfect technical working order.

## 2.4 Special safety instructions



**WARNING**

### Noise by high sound levels

There is the risk of temporary partial loss of hearing (reversible after prolonged rest); with long-time exposure, irreversible hardness of hearing may occur.

- a) Wear hearing protection in the marked areas.

The devices store compressed air. Air blasts are expelled through the air outlets. All parts lying in the range of the air flow are blown away. Therefore never stay in the area around the air outlet!

The maximum permissible operating pressure (Pv) for the device is 10 bar.

Ensure that nobody is standing inside the bunkers, silos, heat exchangers, cyclones, and other parts of the device immediately before and during commissioning, and during operation.

Never disassemble, transport, or assembly the device when filled.

Never carry out welding work or heat treatment to pressure-carrying walls of the tank.

When installing exhaust systems, the management on site is responsible for selecting a statically admissible wall for breakthrough.

Close all inspection doors and manholes during operation and secure them against unauthorised opening. Attach respective warning signs at highly visible places.

De-pressurise all devices and protect them against unauthorised activation before opening viewing ports and manholes.

## 2.5 Operation in potentially explosive environments



### Dust explosion in potentially explosive environments

Failure to comply with the safety information causes explosions / deflagrations directly resulting in death or severe injury.

- a) Use inert gas (nitrogen) instead of compressed air in components where combustible and/or potentially explosive substances are conveyed (such as brown coal dust).
- b) In order to avoid dust explosions, observe the safety regulations of the material manufacturer. Never use gases that are enriched by or with oxygen.
- c) There is a general ban on smoking and the use of naked flames in connection with plant maintenance, start-up and operation. Always take the specified safety precautions when carrying out welding and soldering work.

## 2.6 The operator's responsibilities

The operator must observe the national regulations for commissioning and operating the equipment.

The operator is also responsible for instructing personnel on the handling of the product.

The operator shall also instruct its personnel on the protective devices supplied with the product and shall ensure that applicable safety and testing procedures are complied with.

## 2.7 Personnel qualifications

Qualification	Personnel
Operators	This person is a legal adult and has been trained by a qualified person. He or she is aware of all possible dangers that could result from improper use, and the qualified person has instructed him or her on all necessary protective equipment and safeguards.
Assembly/disassembly personnel	Specialist in the field of mechanics and electrical engineering
Maintenance personnel	Specialist in the field of mechanics and electrical engineering
Servicing personnel	Specialist in the field of mechanics and electrical engineering



## 3 Transport

### NOTICE

#### Please note:

Wear safety shoes when carrying out transports!

### 3.1 Delivery

The manufacturer thoroughly inspects all components before dispatch and packs them carefully, but damage during transport nevertheless cannot be excluded.

#### Receiving inspection

- Check the completeness of the delivery against the delivery note.
- Visually inspect the contents of the delivery for proper state.

#### Unpacking

- Remove the protective covers at the flanges/pipe connections.

#### In case of damage

- Immediately contact the last forwarding agent!
- Retain the packaging (for potential inspection by the forwarding agent or for return shipment).

#### Packaging for the return shipment

- If possible, use the original packaging and original packaging material.
- For any questions on return shipment, directly contact the manufacturer.

### 3.2 Transport to the place of installation

#### WARNING

#### Dropping parts

Risk of injury primarily to the lower extremities

- a) Wear the specified protective equipment.
- b) Remove uninvolved persons from the danger area.
- c) For transport, only use the transport eyelets provided for this purpose.
- d) Select the lifting capacity of the lifting equipment to match the weight of the product or assembly.

### 3.3 Storage

#### Storage conditions

- Temperature: - 10 °C to + 50 °C
- Protective covers at the flanges/pipe connections
- protected from moisture and condensate as well as dust-free

## 4 Overview of components

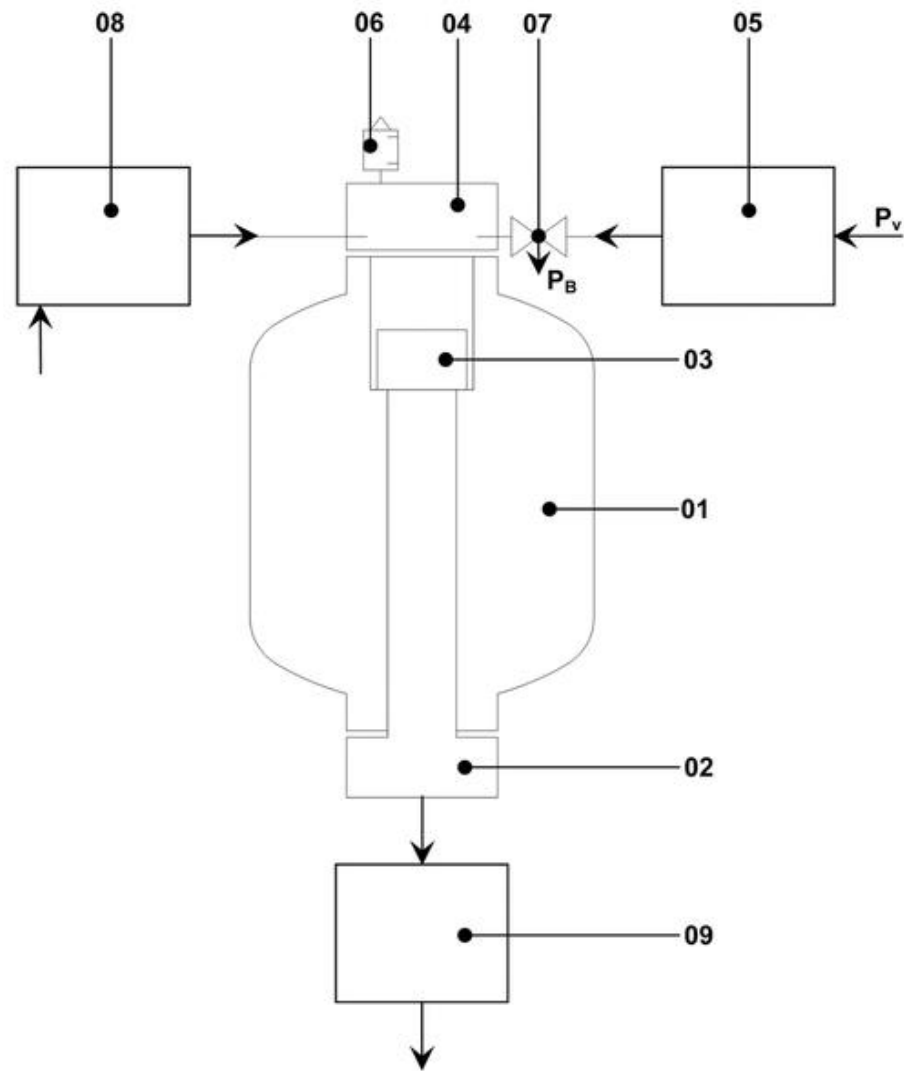


Illustration 4: Overview of components

01	Pressure tank	06	Silencer
02	Valve unit	07	Ball valve with ventilation bore
03	Piston	08	Control (optional)
04	Bonnet valve with control unit SIKOBETIC® / SIKOBETIC®-2 and solenoid valve.	09	Blow-out system
05	Maintenance unit / SIKOBETIC® (optional)		

All components are available in different versions.

The device consists of a pressure tank (01), the valve unit (02), the bonnet valve (04) and a piston (03).

The pressure tank (01) is provided in different dimensions for operating temperatures of max. +150°C and hot-dip galvanized inside and outside.

The valve unit (02) with valve seat and piston guide tube is arranged in the pressure tank (01) and is accessible for servicing from the outside after the bonnet valve (04) is unscrewed.

The bonnet valve (04) comprises the ball valve (07) with ventilation bore (P<sub>B</sub>), the silencer (06), the control unit SIKOBETIC®/SIKOBETIC®-2, and a solenoid valve.

## 5 Before commissioning

### 5.1 Installation of the device

#### NOTICE

The device is installed at the same time as the assembly of the blow-out system. When blow-out systems provided by the customer are used, the operating company is responsible for their proper functioning and safety.

The device is delivered ready for installation. Carry out the installation on site as follows:

- a) Prepare the installation of the supply lines, paying attention to cleanliness.
- b) Install the blow-out system.
- c) Remove the protective covers at the flanges/pipe connections.
- d) Mount the device on the purging system.
- e) Connect the electrical/pneumatic supply lines.
  - ⇒ Carry out a test run and record the results in a log.
- f) Check the safety function.
- g) Check the ball valve with forced venting.
- h) Check the manual release at the control cabinet.
- i) Instruct the operating personnel (instructed person).
- j) During initial operation, ensure that statutory provisions and regulations etc. are complied with



Illustration 5: Device with chain

#### ⚠ WARNING

#### Dropping of the device

There is the risk of fatal accidents.

- a) After assembly, additionally secure the device with an appropriate holding fixture (such as chain without tension).

## 5.2 Operating modes

**NOTICE****Note**

Blow-off of the device at insufficient operating pressure can be prevented by means of a pressure switch in the supply line. The pressure switch is set to the required minimum operating pressure and emits a signal if this pressure is not available.

**Cycle times**

*Pulse time T1 = 200 ms*

Cycle time T2 = >60 s

After blow-off, each device should be brought back to full operating pressure before it is blown off again, or until the next device within a group blows off.

*Pause time T3*

When several devices are combined in a group, it is possible, depending on the operating conditions, to provide for an appropriate pause time T3 after blow-off of the last device until restart.

**NOTICE****Note**

If the air blows are introduced for example in a silo with closed discharge opening, solidification of the material may occur. Ensure that the air-blow devices can only blow off when the discharge opening has been opened and the exhaust facility has been started. The respective locking measures must be carried out in the electrical control.

**NOTICE****Note**

The device is operated via the control or the manual auxiliary operation at the directional solenoid valve. The operation is described in separate instructions.

- The effect of the air blows is defined by the operating pressure in the pressure tanks and the pulse time.
- Observe the operating pressure recommended by the manufacturer for your application. With a recommended operating pressure between 6 and 8 bar, for example, ensure that the devices can fire only in the presence of an operating pressure of at least 6 bar.

**NOTICE****Note**

The devices attain their optimum efficiency when the size and number of the units and their respective operating conditions are taken into consideration in the control. Comply with the above information if the automatic pulse control specifically developed by the manufacturer is not comprised in the scope of your delivery.

## 5.3 Emergency

### In case of a power failure

- a) The pressure tank is still under pressure. Accordingly, you can only trip the device manually.
- b) When the pressure drops to  $\leq 4$  bar, the device remains operative but with insufficient performance.
- c) In case of failure of the entire system, the device remains operative as long as there is pressurised air with sufficient pressure and control signals.

### Malfunctions within the device

- a) When gasket and seals are defective, the device will not build up pressure. In this case, the pressure tank cannot retain the operating pressure.
- b) Mechanical defects may result in impaired functionality and even to failure of the device.
- c) In case of electrical defects, you will be able to operate the device only manually.

## 6 Operation

### 6.1 Activation / deactivation



#### Personnel qualification

Only the following personnel are permitted to perform the activities described in this chapter:

- Assembly-/disassembly personnel, maintenance personnel, service personnel

#### 6.1.1 Activation

##### NOTICE

##### Note

Ensure that the actual operating pressure does not exceed the allowed limit of 10 bar.

Carry out the following steps to switch the unit on:

- a) Set the 3/2-way main ball valve on the air service unit / SIWARTIC® in the position "CLOSED" and secure it against unauthorised opening by means of a padlock placed into the perforated disc.
- b) Remove all persons from the danger zone of components to which a device is attached.
- c) Ensure that all inspection doors and manholes, pokeholes and other openings of components to which a device is attached are closed.
- d) Ensure that all ball valves on the control units SIKOBETIC® are in the position "OPEN".
  - ⇒ You have activated the air supply.
- e) Ensure that the electric connection of all 3/2-way block valves has been established.
- f) Unlock the 3/2-way main ball valve on the air service unit / SIWARTIC® by turning it to the position "OPEN". Ensure that all ball valves (07) at the devices are in the position "OPEN".
- g) Test all devices one after the other by means of the electrical control.
  - ⇒ You have activated the air supply.
  - ⇒ You have switched on the device. During operation, both the 3/2-way main ball valve and the ball valve must remain in the position "OPEN".

#### 6.1.2 Switching off

##### Individual venting

- a) Close the corresponding ball valve downstream of the 3/2 way block valve.
  - ⇒ The corresponding device is automatically force-vented via the ventilation bore.
- b) Check whether the corresponding device is de-pressurised.
  - ⇒ You have vented the device.

##### Collective venting

- a) Lock the operating compressed air by turning the main ball valve at the maintenance unit WE / SIWARTIC® in position "CLOSED".
- b) Ensure that all downstream devices are de-pressurised.
- c) Place the main switch of the electric control system in position "OFF".
- d) Ensure that the devices are de-energized.

- e) Short-circuit the system and earth it.
- f) Secure the main switch and the main ball valve with a padlock against unintentional restart.
  - ⇒ You have vented and de-energized all devices.

## 6.2 Statuses of the device

### 6.2.1 Filling

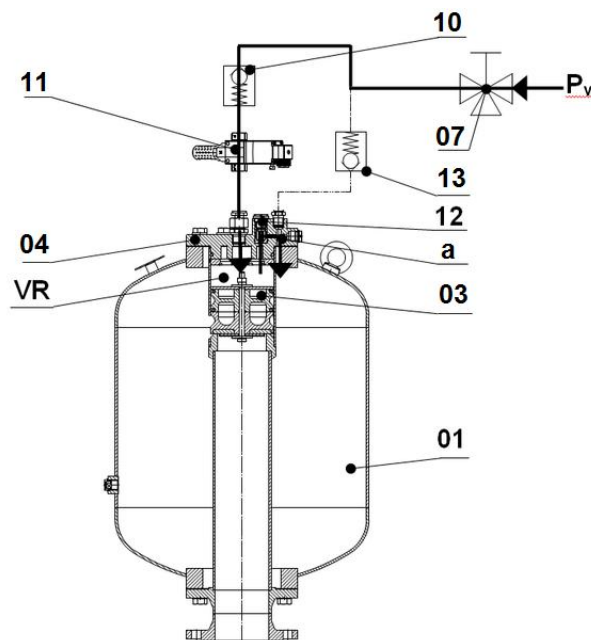


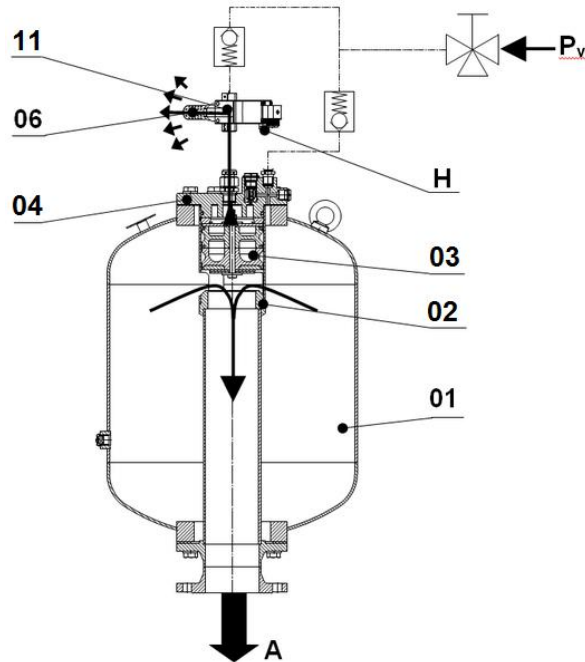
Illustration 6: Filling BB

In "idle position open" (P - A/B), the compressed air  $P_v$  flows through the ball valve (07), via the non-return valve (10) and the solenoid valve (11) into the piston ante-chamber (VR) and keeps the piston (03) reliably closed. Via the throttle bore (a) in the valve lid (04), the compressed air flows via the non-return valve (12) into the pressure tank (01). As soon as the pressure tank (01) has reached operating pressure, the device is ready for firing.

**Note:**

Through the non-return valve (13), the compressed air  $P_v$  cannot flow *into* the pressure tank (01) but *only out of* the pressure tank (01) (see "**Venting**" function).

## 6.2.2 Firing



*Illustration 7: Firing BB*

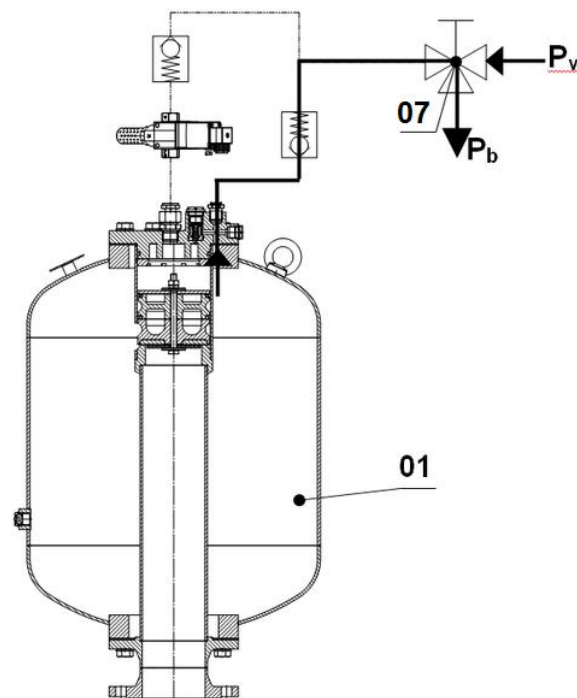
By electrical or mechanical switch-over of the solenoid valve (11) from "Rest position opened" to "Work position closed", the compressed air supply is interrupted. At the same time, the compressed air in the piston antechamber (VR) is abruptly ventilated via the block valve (11) through the ventilation damper (06). Now, the piston antechamber (VR) is depressurized.

Then, the overpressure in the pressure tank (01) acts on the projecting circular ring area. This instantly presses the piston (03) upwards, allowing the compressed air stored in the pressure tank (01) to expand abruptly through the apertures arranged along the circumference of the valve unit (02) in direction of the blow-out point "A".

The device is fired by actuating the solenoid valve (11) (auxiliary hand operation (H) is provided for inspection purposes).



### 6.2.3 Venting



*Illustration 8: Venting BB*

Proceed as follows to de-pressurize the compressed tank (01) before maintenance and in particular before disassembly:

To de-pressurize individual devices, close the ball valve (07) and vent the device by means of the ventilation bore (Pb).

To de-pressurize several devices of a system, vent the ball valve of the valve at the SIWARTIC® and de-pressurize it. During this process, the ball valve (07) at the device remains in the position "OPEN", as during "Filling".

## 6.3 Troubleshooting



### Personnel qualifications

Only the following personnel are permitted to perform the tasks detailed in this chapter:

- Operating personnel, assembling/dismantling personnel, maintenance personnel

Ensure that the equipment is switched off before performing any maintenance and repair works.

Ensure that the relevant device is unpressurised.

If the steps below do not rectify the problem, please contact the manufacturer.

Fault	Cause	Remedy
The required pressure does not build up in the pressure tank.	Pressure in the main pipeline too low	Increase pressure
	Valves closed	Open valves
	Solenoid valve not switching	Switch on the power, if necessary replace valve
Device doesn't trigger air blast.	Leakages	Replace seals
	Solenoid valve not switching	Inspect electrical control system, if necessary replace valve.
	Sound absorber in valve cover or solenoid valve dirty	Clean sound absorber, replace if necessary
	Valve unit in tank dirty	Check pulse duration T1, if necessary dismantle and clean device

## 7 Maintenance

### Personnel qualification

Only the following personnel are permitted to perform the activities in this chapter:

- Maintenance personnel, repair personnel

It is imperative that you comply with the specified cleaning and maintenance intervals to ensure the trouble-free operation of your device. The intervals relate to an operating time of approx. 2.200 operating hours / year. This corresponds to an operating time in 1-shift operation. Adapt the cleaning and maintenance intervals to a higher utilization if applicable.

### Maintenance I (every 2 weeks)

- Check the service unit for proper function, drain the condensate manually, and check the filter for fault-free state.
- Check the operating pressure at the pressure gauge; re-adjust it at the pressure controller if applicable.

### Maintenance II (every 4 weeks)

- Carry out a functional test by firing the device manually by means of the control cabinet.
- Check the pulse time T1 at the control cabinet.
- Check the pulse time T2 and pause time T3 at the electronic pulse control.

### Maintenance III (every 6 weeks and in case of heavy soiling)

- Clean the ventilation damper or replace it if applicable.
- Clean the warning signs.

### Maintenance IV (every 3 months)

During operation, the device is subject to vibrations. Thus, it is possible that screwed and clamped connections come loose.

- Check the device for loose screwed and clamped connections and tighten them if applicable.

### Maintenance V (every year)

The control limits of the pressure control system may change during operation.

- Check the pressure control systems for adherence to the control limits.
- Check the piston for wear at sealing and guide elements, replace these when applicable.
- Check the gaskets at the cover and replace them when applicable.

### After every maintenance

- After checking and replacing wear parts, check whether all safety equipment functions properly.
- Check that all executed work has been completed.
- Ensure that no tools were left in the device, and close the electrical control cabinets.

When all functions run properly, the device is handed over to the operator.

### Installation of spare and wear parts

We expressly point out that spare parts and accessories including standard parts not supplied by us have not been tested and approved by us. The installation and/or use of such products may negatively affect design properties of your device. The manufacturer does not assume liability for any damage caused by use of non-original parts and non-original accessories.

## 8 Servicing/repair

### 8.1 Disassembly/assembly

Disassembling the device



Remove the screws from the bonnet valve.



Remove the bonnet valve with the seal and the stop ring.



Remove the piston.

Replace worn parts and assemble everything in reverse order.

## 8.2 Device assembly

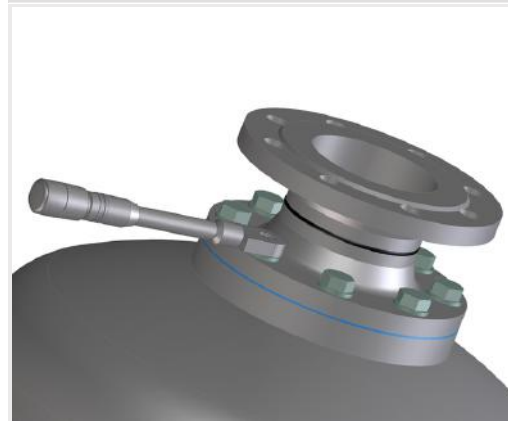
Assemble the device as follows:



Coat the flange ring with a metal-free solid lubricant before fitting the gasket.



Install the valve unit.



Tighten all eight hexagon head screws crosswise with a torque wrench. (See table).

To mount the lid fitting, turn the tank by 180°.

Torque table

DN	Thread	Torque
100	M16	210 Nm
150	M20	410 Nm



Valve unit inserted into the tank; view of the piston guide tube.

Note the distance between the piston guide tube and the tank. It must be the same all way round.



Inserting the piston in the piston guide tube

**Warning!** Do not damage the Glyd Rings® of the piston.

Insert the piston in the piston guide tube. The rubber-coated side of the piston is pointing downwards.



Insert the stop ring. Ensure that the grooves of the stop ring face the piston.



Coat the flange ring with a metal-free solid lubricant.

Next, place the seal.

	<p>Insert the O-ring into the groove of the bonnet valve.</p>
	<p>Attach the bonnet valve.</p>
	<p>Tighten the hexagon head screws cross-wise with a torque screw. (See table) Turn the tank by 180°.</p>

Torque table

DN	Thread	Torque
100	M16	210 Nm
150	M20	410 Nm

## 9 Technical data

### 9.1 Dimensional sheet

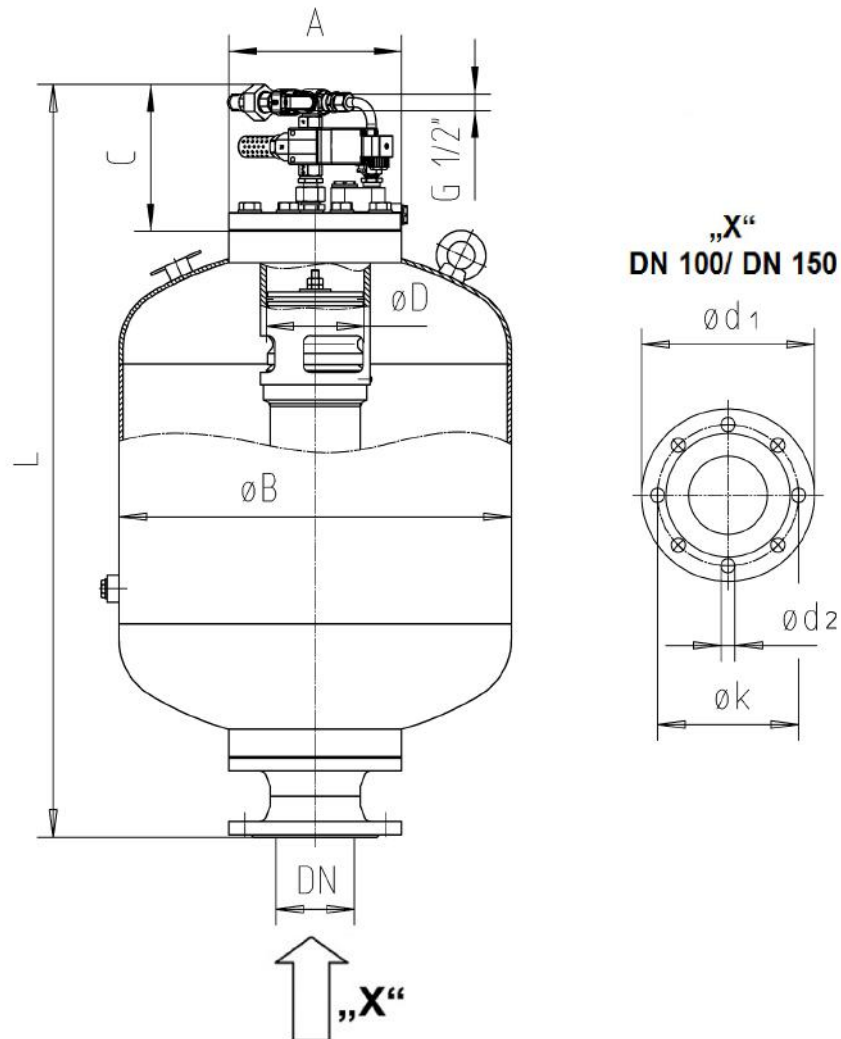


Illustration 9: Dimension sheet

Size	Exhaust-pipe DN	Piston-diameter ØD	Tank		Valve unit				
			ØB	L	A	C	Ød1	k	Ød2
BV (dm <sup>3</sup> )	DN	ØD	ØB	L	A	C	Ød1	k	Ød2
50	100	125	350	956	250	185	220	180	18
70	100	125	400	956	250	185	220	180	18
100	100	125	500	956	250	185	220	180	18
150	100	125	600	956	250	185	220	180	18
100	150	160	500	1017	285	240	285	240	22
200	150	160	500	1517	285	240	285	240	22
300	150	160	600	1517	285	240	285	240	22
500	150	160	800	1517	285	240	285	240	22

We reserve the right to change the devices with respect to the advancement of technology

Operating pressure: 4-10bar

Connecting cross – section nec. 1/2"



## 9.2 Data sheet

In rest position open, solenoid-actuated, internally pilot-controlled

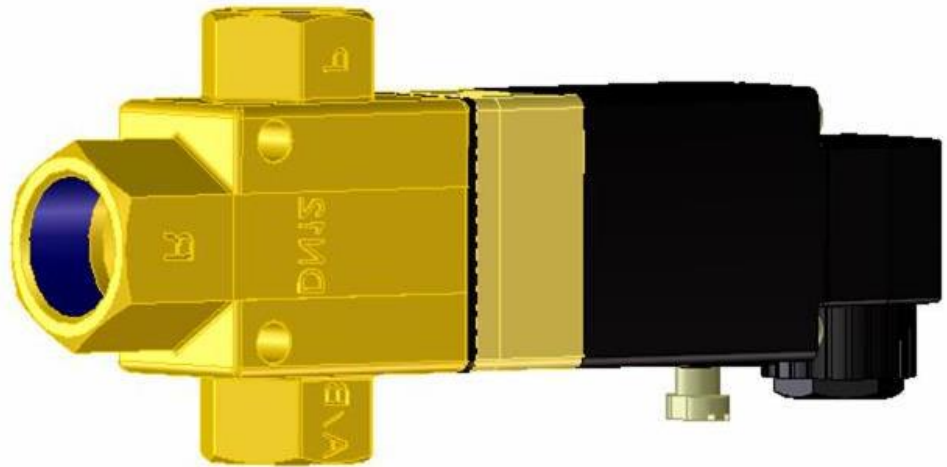


Illustration 10: Solenoid valve

DESIGN		Normally open
Seat valve:	Synthetic forming a seal on metal	
Housing material:	Brass	

### TECHNICAL SPECIFICATIONS

Solenoid:	Dimensioned for 1% ED
Power consumption:	AC 30 VA during start, 15 VA / 8W during operation
Voltage:	100 - 240 V; 50 - 60 Hz; 24 V / 48 V DC
Voltage tolerance:	± 10%
Ambient temperature:	max. +120°C (standard)
Flow medium:	Compressed air, inert gas Q <sub>N</sub> (P-A): 2800 l/min (A-R): 5000 l/min

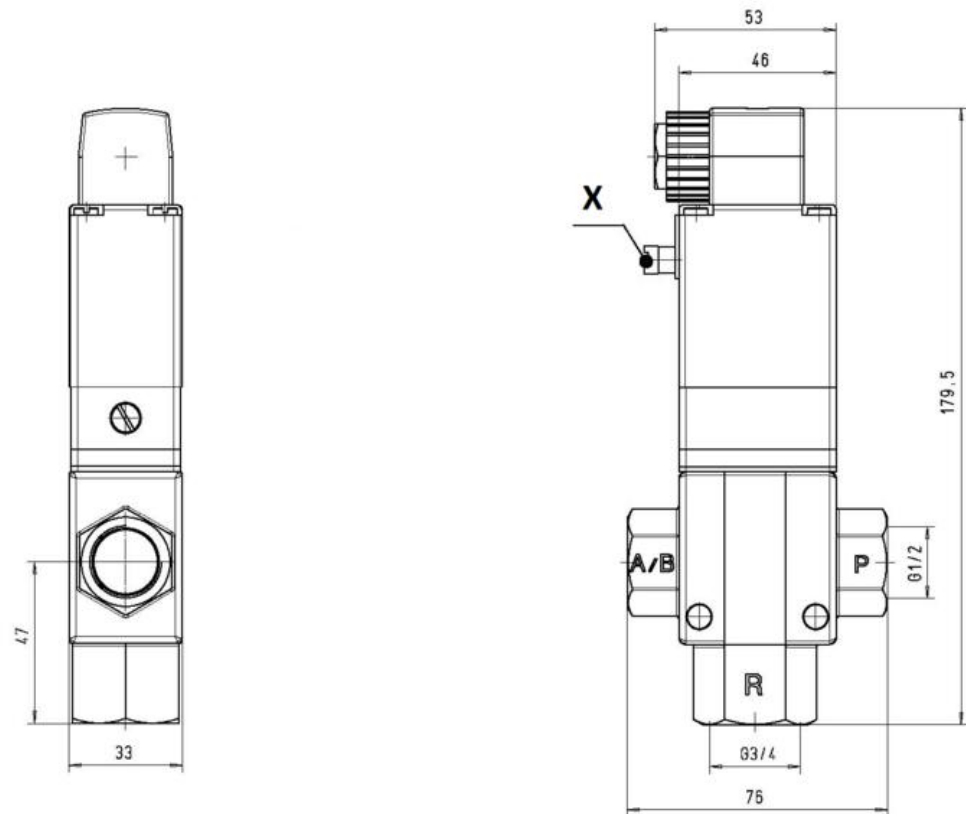


Illustration 11: cross section 2/3 way solenoid valve

#### Actuation

- Solenoid receives permanent electric command
- Spring return
- Non-latching auxiliary hand actuation (H)
- internally pilot-controlled
- **MODE OF OPERATION**

Solenoid current less:	P to A/B open, R closed
Solenoid energized:	P closed, A/B vented via R
Operating pressure range:	0.5 to 16 bar
Installation size	DN 12 for line installation Entry/exit G 1/2; Venting G 3/4

## 10 Spare parts

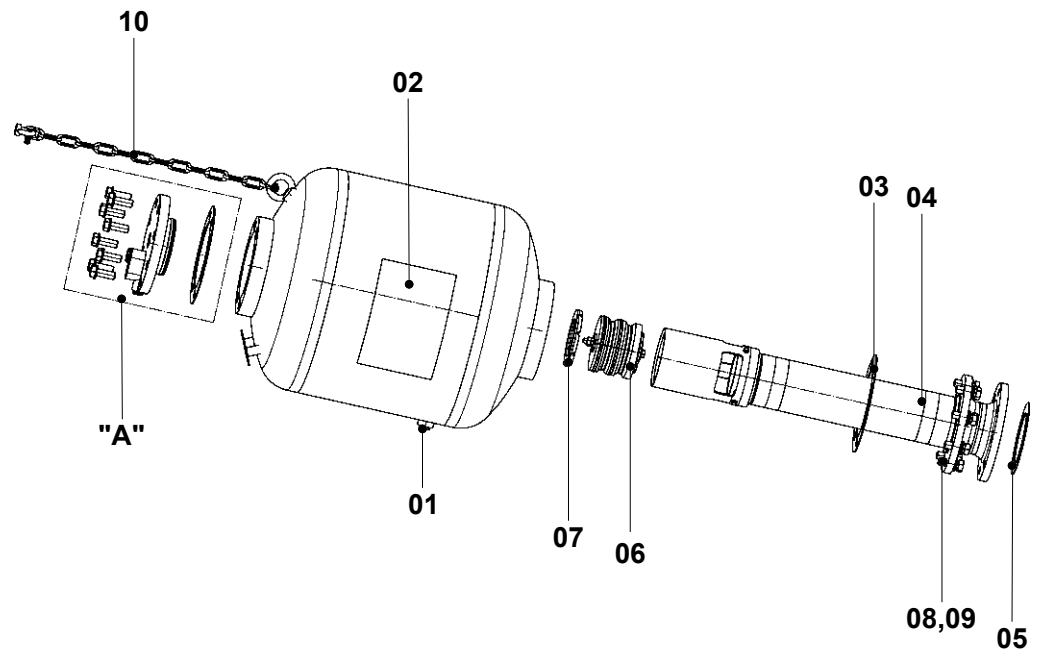


Illustration 12: SB-V DN 100 BB

Item	Part no:	Description	Pieces
		<b>SHOCK-BLOWER® SB-V, DN 100 compl.</b>	
01	02570-15002	Blind plug 1/2"	1
02	10191-81XXX	Sticker	1
03	02829-50002	Seal	1
04	12721-06210	Valve body	1
05	02828-50002	Flange seal	1
06	12829-06007	Piston 'H'	1
07	10235-06002	Stop ring	1
08	02151-02177	Washer	8
09	02115-16132	Hexagonal bolt	8
10	10268-02004	Fastening set	1
A		Cover, see next page	1

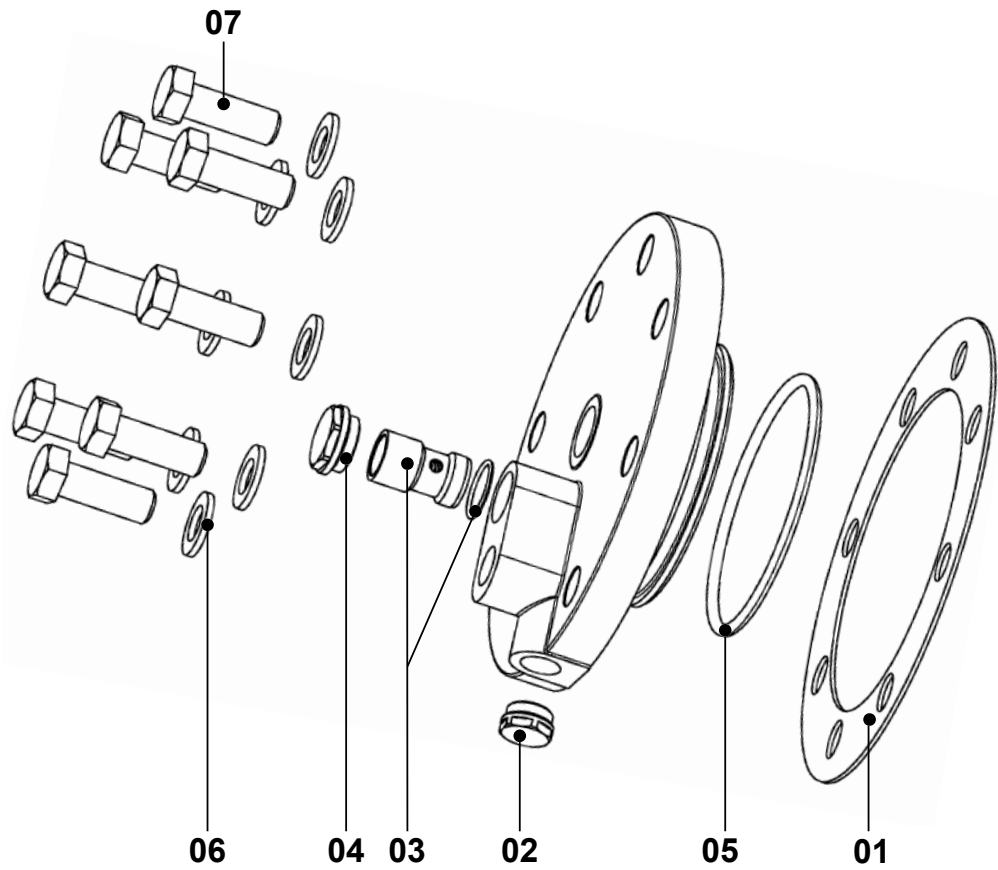


Illustration 13: Lidl BB DN 100

Item	Article-No.	Designation	Piece
	<b>22326-05220</b>	<b>Lid, compl.</b>	
01	02829-50002	Gasket	1
02	02570-15002	Sealing plug R 1/2"	1
03	13220-01024	Non-return valve with O-ring	1
04	02180-06011	Sealing plug	1
05	02811-31063	O-ring	1
06	02151-02177	U-washer	8
07	02115-16132	Hexagon screw	8

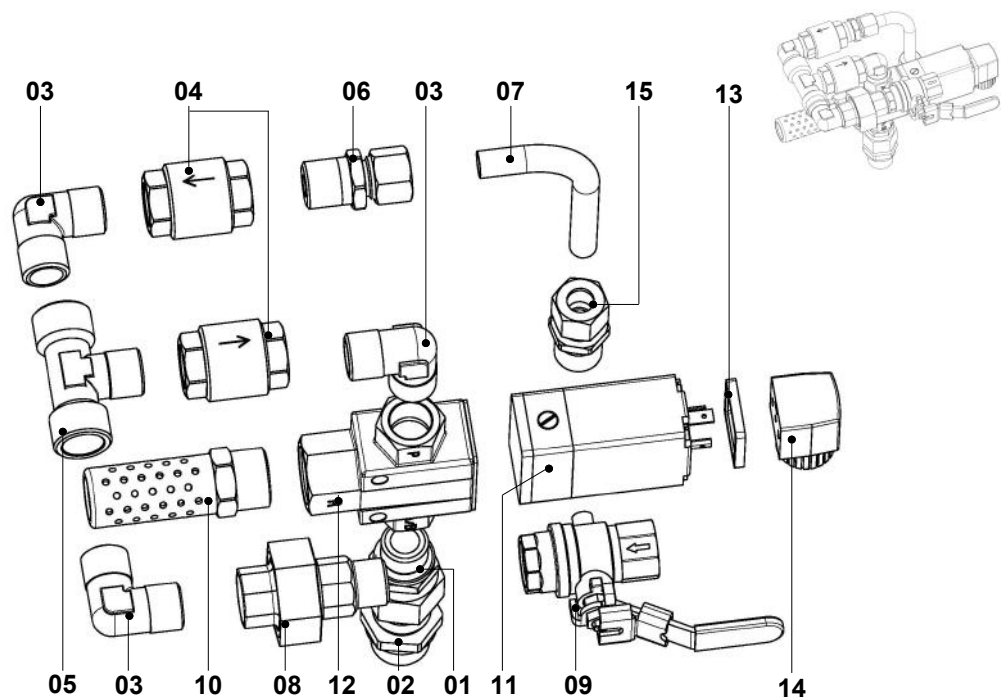


Illustration 14: 3/2-way valve BB with SIKOBETIC®-2

Item	Article-No.	Designation	Piece
	<b>10226-21015</b>	<b>3/2 way valve with SIKOBETIC®-2 BB, compl.</b>	
01	02517-01081	Straight screwed socket	1
02	02512-02072	Straight screwed socket	1
03	02536-02003	Angle	3
04	03220-01021	Non-return valve	2
05	02549-04003	T-piece	1
06	02512-02071	Straight screwed coupling	1
07	01114-02023	Pipe	1
08	02575-04002	Screw connection	1
09	03233-01031	Ball valve with vent hole	1
10	03228-04021	Silencer	1
	03256-01015	3/2 way valve BB 110-240; 50-60HZ, +120°C compl. (consist of Item 11 – 14)	1
11	08180-10014	Solenoid BB 110-240; 50-60HZ, +120°C	1
12	03256-02001	Valve body	1
13	03252-00015	Seal for Plug	1
14	03255-00005	Plug	1
15	02512-02081	Straight screwed coupling	1
	03256-00004	Seal kit, compl. in Item 11 + 12 (without pic.)	1

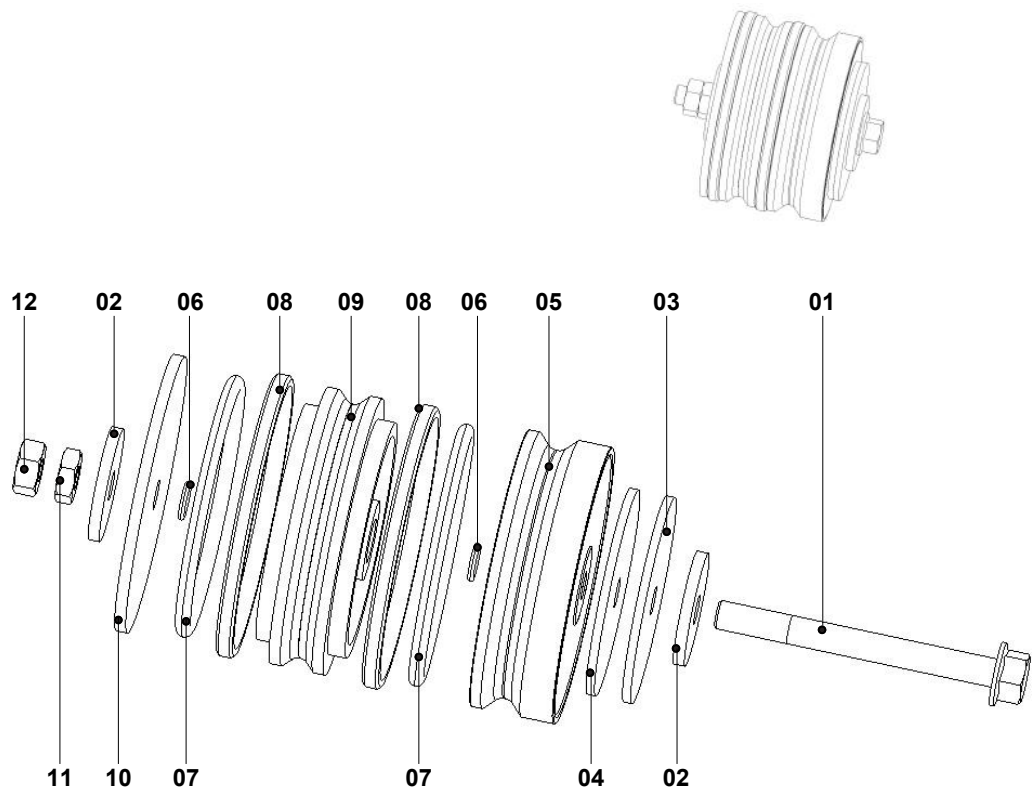


Illustration 15: Spare parts piston DN 100-2 "H"

Item	Artikel-No.	Description	Pcs.
	<b>12829-06007</b>	<b>Piston, compl.</b>	
01	02112-10263	Hexagonal screw	1
02	02156-10415	Steel disk	2
03	02155-11904	Heat – protection disk	1
04	02828-11912	Insulating disk	1
05	12840-06007	Piston disk	1
06	02811-19524	O-ring	2
07	02811-31063	O-ring	2
08	02812-02135	Turcon – Glyd - Ring	2
09	12850-06001	Mid piston disk	1
10	12542-06001	disk	1
11	02163-10017	Hexagonal nut thin type	1
12	02163-10007	Hexagonal nut	1

Installation instruction piston

NOTICE

**Risk of damage due to loose parts**

Damage to the device

- a) Replace the screw connections (Pos. A, B and C) each time you remove the piston

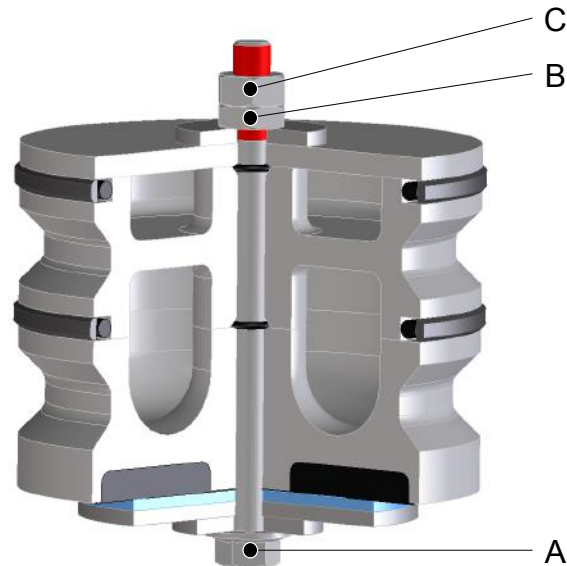


Illustration 16: Installation instruction piston

**Fastening the piston**

Bond both hexagonal nuts on screw (Pos. A) with Loctite 620, according manufacturer information.

Tighten the flat hexagon nut (Pos. B) with a torque wrench with socket wrench according to table.

Tighten the high hexagon nut (Pos. C) with a torque wrench with socket wrench according to table.

Tightening torque of screw connection of piston			
DN	Thread	Tightening torque Nm	
		Pos. B	Pos. C
40	M8	25	25
65	M8	25	25
100	M10	50	50
150	M12	80	80