

Operating instructions

Non-Slam Check Valve

type 8015

Item no. of operating instructions 320465, issue 04, 2021, 21 pages,
subject to technical modifications and typographical errors.



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1 Intended use

Type 8015 non-slam check valves are among the most efficient and economic ways to prevent backflow. Their function is based upon the valve principle; where a valve disc is pressed into the valve seat with a spring when in resting mode. The valve disc moves out of its seat in the direction of flow depending on its velocity until the valve is fully opened.

Any deviating operating conditions or areas of application are subject to manufacturer approval.



We will not assume any responsibility for product defects caused by improper operating conditions, war, violence, accidents, natural disasters or other circumstances.



Non-slam check valves cannot be used to control flow.

2 Safety instructions

2.1 General safety precautions

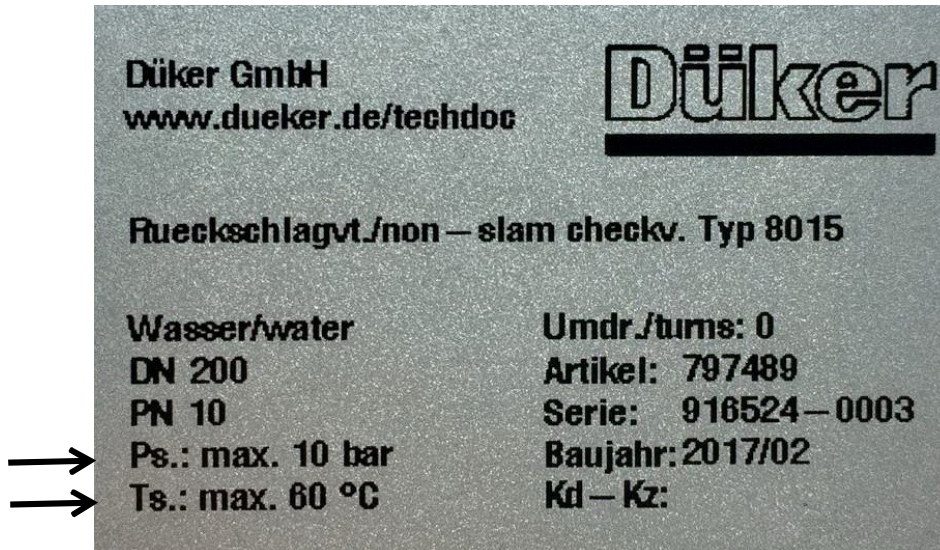
The same safety regulations apply for valves as for the pipeline system in which they are installed. These instructions only include additional safety instructions to be observed for valves.

2.2 Safety instructions for the operator

The operator of the valve must ensure that the valve is only used in accordance with the regulations. This is not the responsibility of the manufacturer. The valves must only be operated by properly qualified and trained staff. The operating manual and the corresponding safety instructions must be read and understood.



It is prohibited to use any valves with a nominal pressure ("Ps") and maximum admissible operating temperature ("Ts") insufficient for the operating conditions. The approved range of application is indicated on the valve.



There is a risk of injury while working on pipeline components within permissible operating temperatures in the temperature range less than 10° C and over 40 °C. This is why it is imperative to take the necessary protective measures in these cases.



Operating media must correspond with the specification of the valve. The manufacturer does not assume any liability for damage resulting from corrosion caused by aggressive media. Neglect of these regulations may result in imminent danger to life and health and may cause damage to the pipe system.

- The valve must be properly installed into the pipeline.
- Inside the pipeline, the usual flow velocity (e.g. according to EN 1074-1: 2.5 - 5 m/s for liquids) must not be exceeded during continuous operation.
- Operating conditions such as vibrations, water hammer, erosion, cavitation and large amounts of solid matter in the medium - especially of an abrasive nature – must be clarified with the manufacturer prior to commissioning.

2.3 Special risks



Ensure that the pipeline section is free of any pressure and danger prior to disassembly, maintenance and repair of the valve. The energy supply must be switched off.

3 Transport and storage



All valves must be carefully transported and stored.



The valves are fully enameled or rubberized. The coatings are shock sensitive and must be protected against impact stress.



The seals are light-sensitive: Unpackaged valves may only be exposed to bright daylight or UV light for a very short time. This is why the openings are sealed with protective caps. Valves must be stored in darkened rooms in their original package and with their protective caps.



In the event of storage over an extended period of time, the storage location should be protected against frost, kept cool, dark and free of dust or the valves must be packaged in order to fulfil these conditions.

The valve should be stored on a pallet or similar location and only transported with suitable tools such as wide straps to its designated point of installation. Do not use chains!

4 Pressure test of the pipeline section



DVGW (German Association for Gas and Water Applications) worksheet W 400-2 for the manufacture and inspection of water distribution systems is to be observed.

- Thoroughly flush all newly installed pipeline systems in order to remove all foreign matter.
- Valve opened: The test pressure must not exceed 1.5 x Ps.
- Valve closed: The test pressure must not exceed 1.1 x Ps.

5 Installation into the pipeline

5.1 General description



Only manufacturer's original spare parts may be installed. See section 11.2. for spare parts available.



The sealing surfaces of the flanges are made for counter flanges with smooth sealing surfaces, form B according to standard EN 1092-2. All other flange types are to be checked with the manufacturer. Flange gaskets comply with the German Federal Environment Agency Elastomer Guideline and the W 270 DVGW guideline for water. Preferably, flange gaskets with a steel core as in EN 1514-1 are to be used.

The non-slam check valve will be installed in the pipe in the flow direction which is indicated on the body with a cast-on arrow. There are two different installation positions. If the installation position is subject to subsequent adjustment, the corresponding springs can be found in the spare parts sets.



Installation position 1 with standard spring is suitable for both a vertical pipeline with an upward flow as well as for installation in a horizontal pipeline. Please note the flow direction arrow on the body. This version is marked through the installation position label (see image 5.1) on the valve.

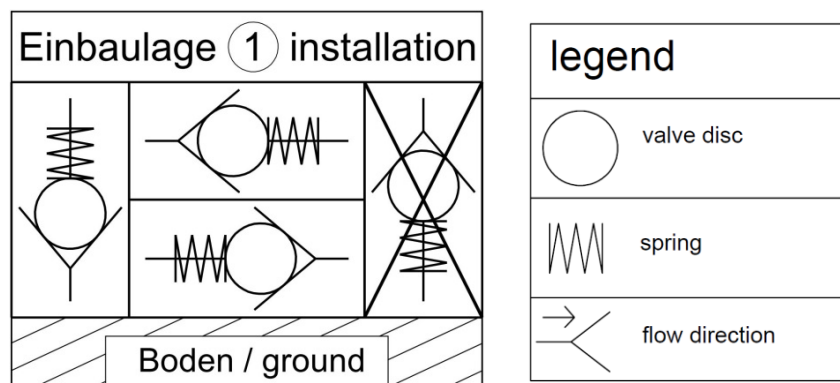


Image 5.1: Installation position 1



Installation position 2 is made explicitly for installation in a vertical pipeline with a downward flow. Please note the flow direction arrow on the body. This version is marked through the installation position label (see image 5.2) on the valve.

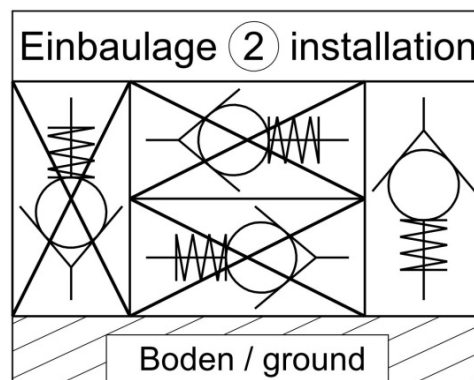
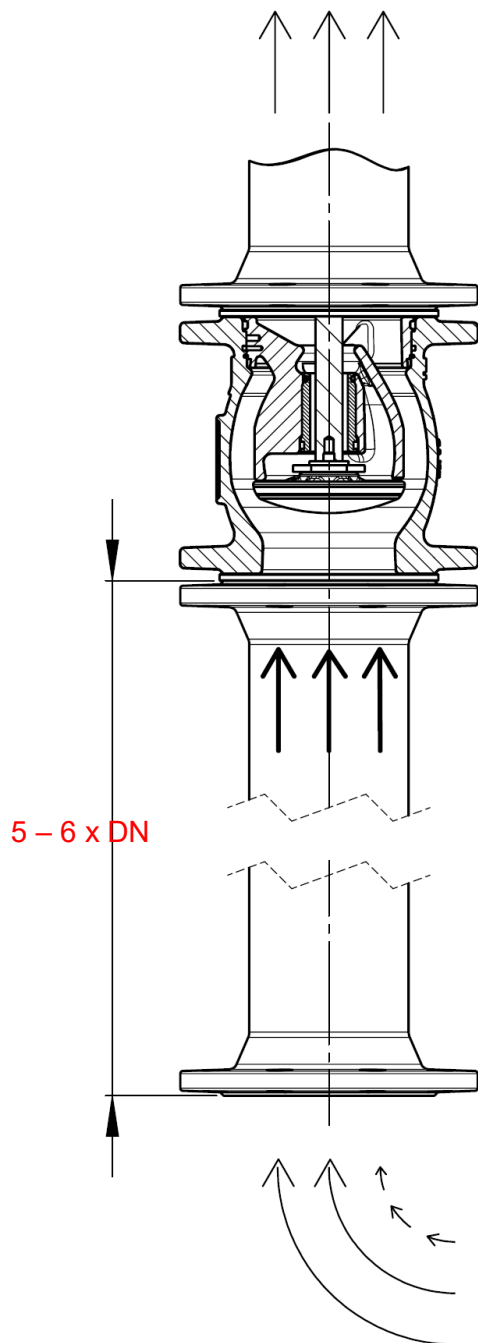


Image 5.2: Installation position 2


5.2 Positioning



The most favourable pressure loss coefficient is achieved at 1.5 to 2 m/s. It is therefore not advisable to permanently operate the non-slam check valve below 1.5 m/s since the valve will not reach the fully open position and lead to unfavourable flow conditions. With regard to the flow velocity, it is further recommended to design the non-slam check valve nominal size in accordance with the nominal size of the pump's pressure outlet.

We advise against positioning directly behind elbows, T-pieces, butterfly valves or directly behind the pump's pressure outlet since the resulting irregular inflow may cause vibrations and other negative impacts (loosening of the screw connections, spring fracture, increased wear and tear etc.). This is why we definitely recommend a flow-calming distance of at least 5-6 x DN for a homogeneous inflow.

5.3 Work steps

- Transport the valve to the point of installation in its protective packaging.
- The protective caps are to be removed from the pipe connections prior to installation.
- Check valve for transportation damage.
- Check coating for damage.
- Damaged valves must not be installed.
- The coating may be mended with a repair kit if needed.
- It must be ensured that nominal pressure and connecting dimensions of the valves meet the operating conditions. See labelling.
- Remove dirt and foreign matter from valves and pipelines before installation.
- A functional test must be carried out prior to installation. This is to be done by manually pressing the valve disc into the valve seat. As soon as the valve disc is released, the non-slam check valve must be automatically closed through the force of the spring. The test ought to be carried out in line with the intended installation position (horizontal or vertical).
- The installation direction must be observed. See flow direction arrow  on the body.
- The connections of the piping must be concentric, and the flanges plane parallel to the valve.
- The connecting screws must be evenly cross-tightened.
- When inserting the valve and the gaskets into a mounted pipe, the gap between the pipe ends must be large enough so that none of the connecting faces and gaskets are damaged. The gap should not be larger than absolutely necessary so as not to create any additional tension inside the pipe during installation.
- The valve is to be installed without tension.

6 Description

6.1 Function

The enamelled body with a flow-optimised contour serves as the basic body. The non-slam check valve can be installed into the pipeline through flange connections. The body insert, also enamelled, serves for bearing the movable parts and for the flow-optimised guidance of the medium through the body.

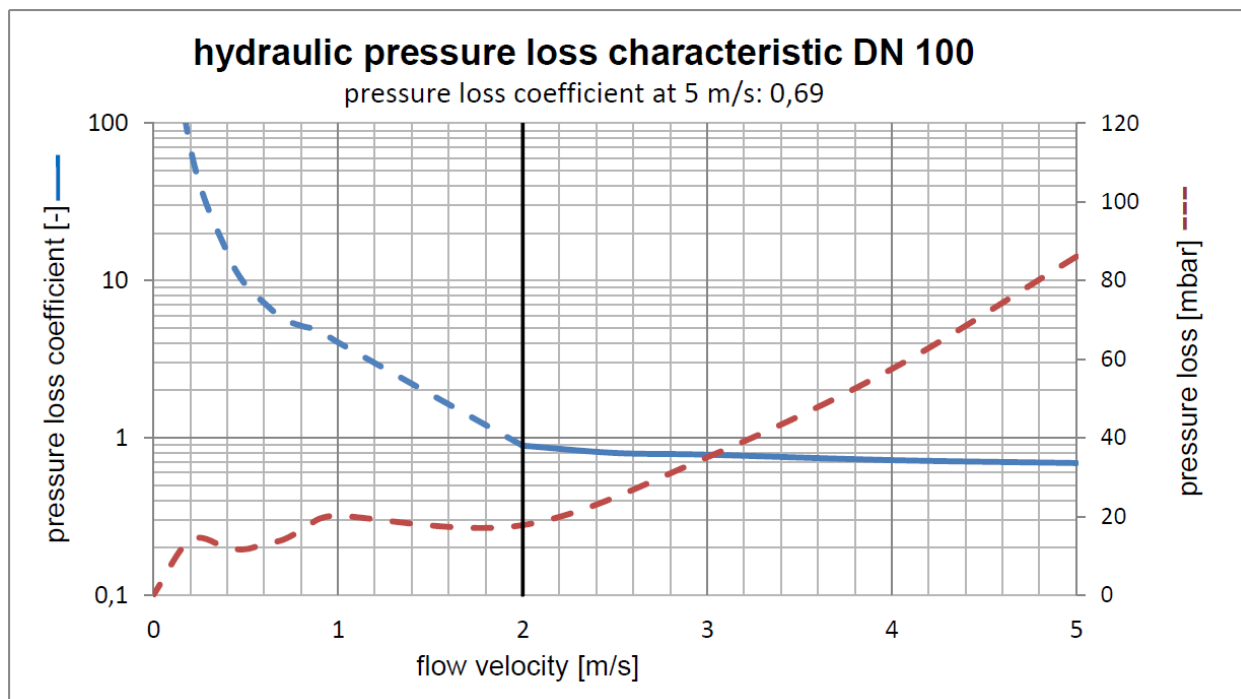
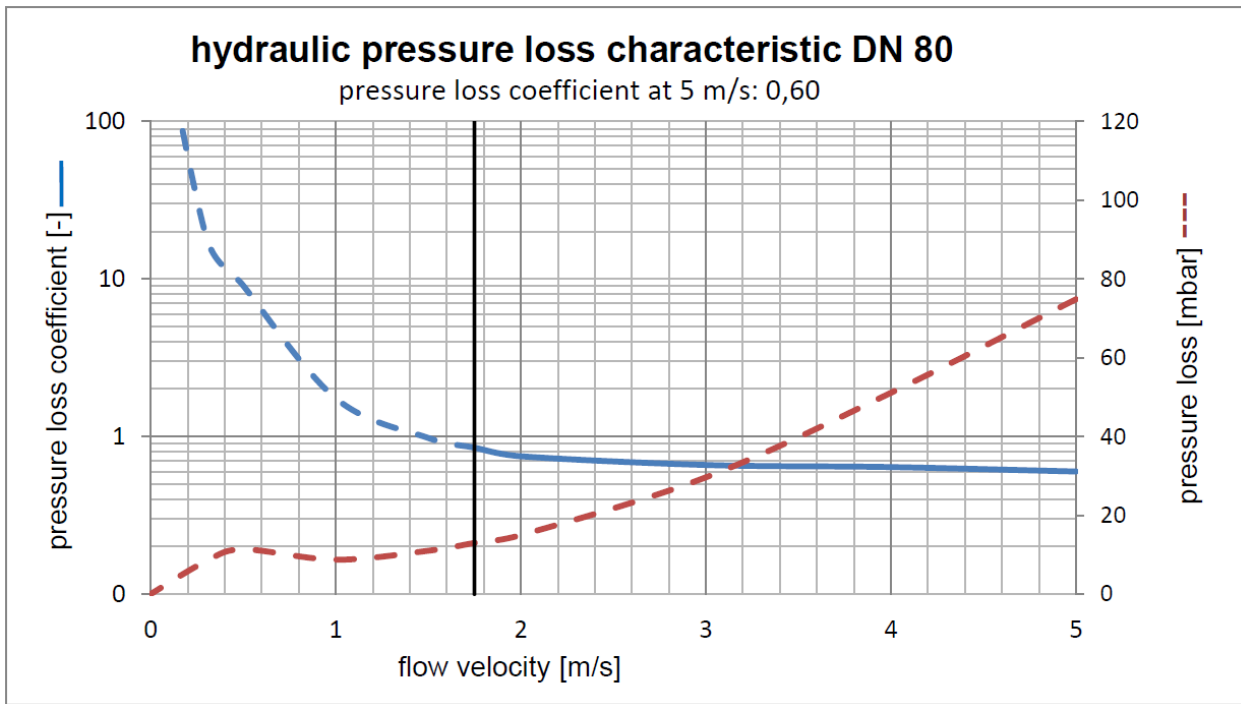
The valve disc is moved through the flow rate and the pressure spring. If the fluid is moving in the flow direction of the non-slam check valve, it opens as soon as the compressive force applied by the medium on the valve disc has overcome the spring force. The higher the stream velocity, the further the valve opens.

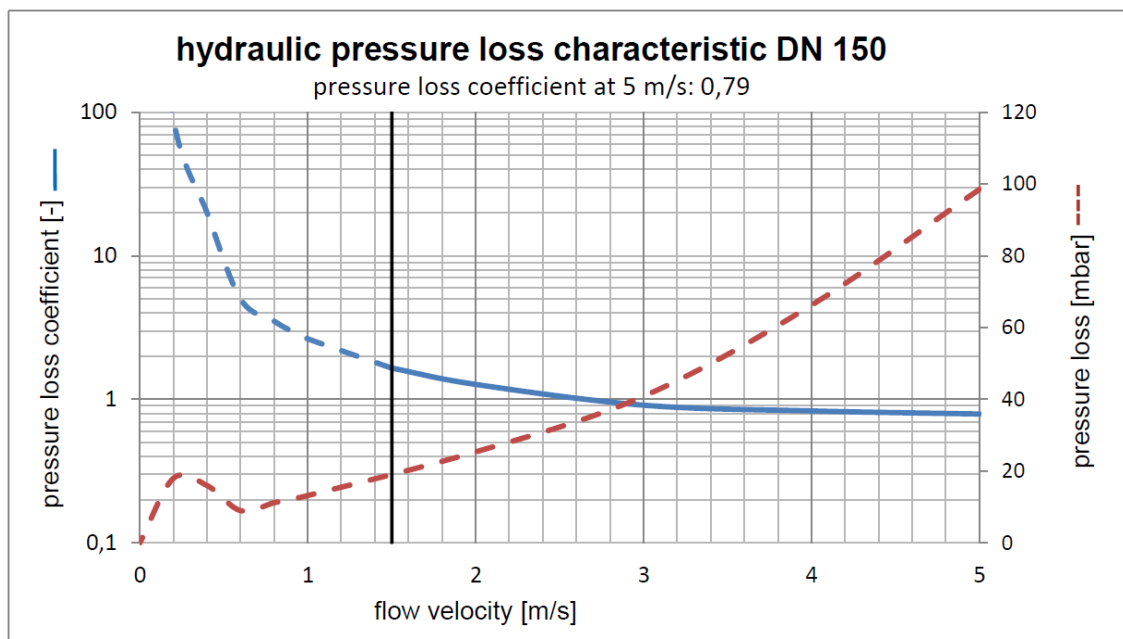
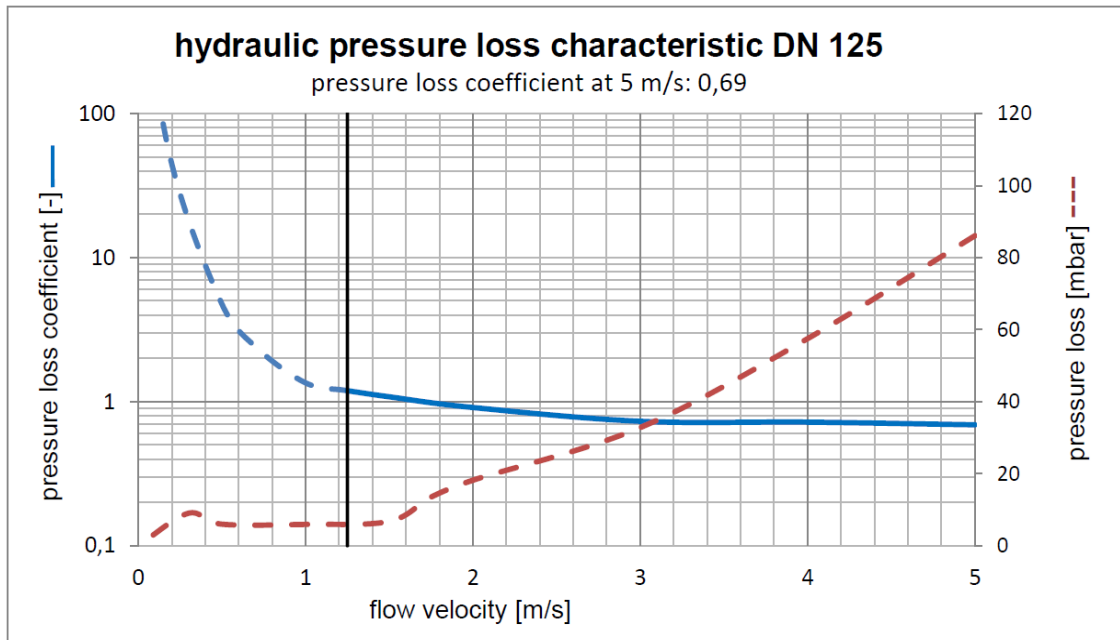
Once the flow is interrupted, backflow is prevented as quickly as possible through the restoring force of the spring. The spring moves the valve disc to the enamelled body seat and forms a seal by creating back pressure.

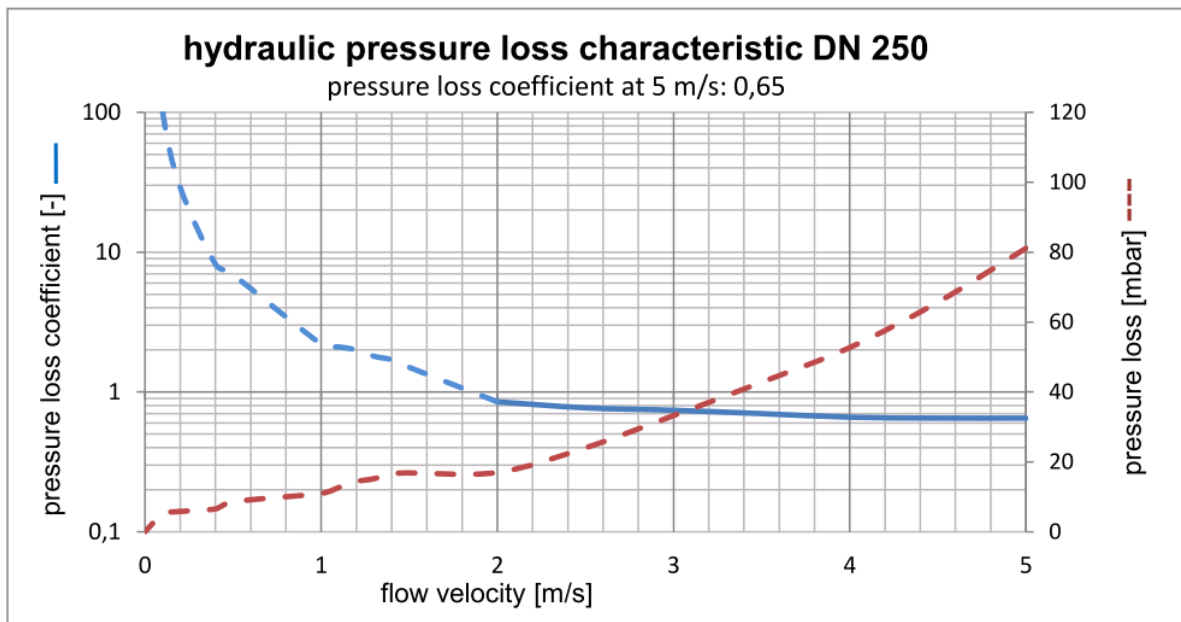
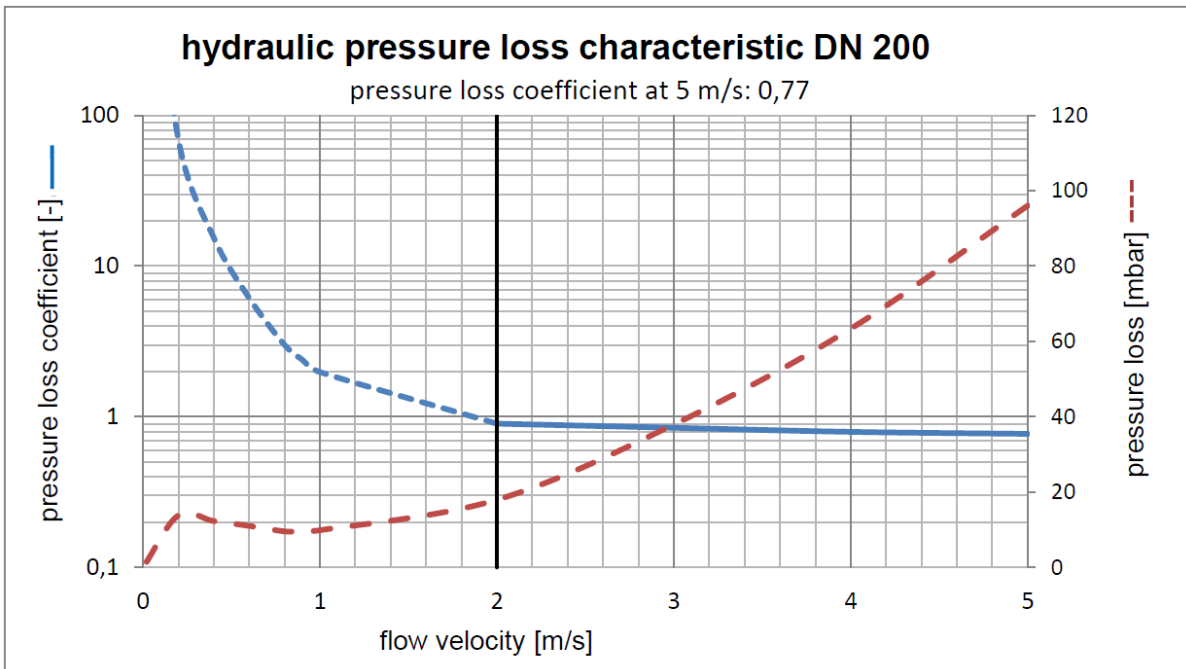
6.2 Technical characteristics

- Tightness starting with a back pressure of approx. 0.5 bar
- Leakage rate A according to EN 12266
- Full opening between 1.25 m/s and 2m/s depending on the nominal diameter
- Closing time under atmospheric conditions <0.1 s

6.3 Pressure loss characteristic curve

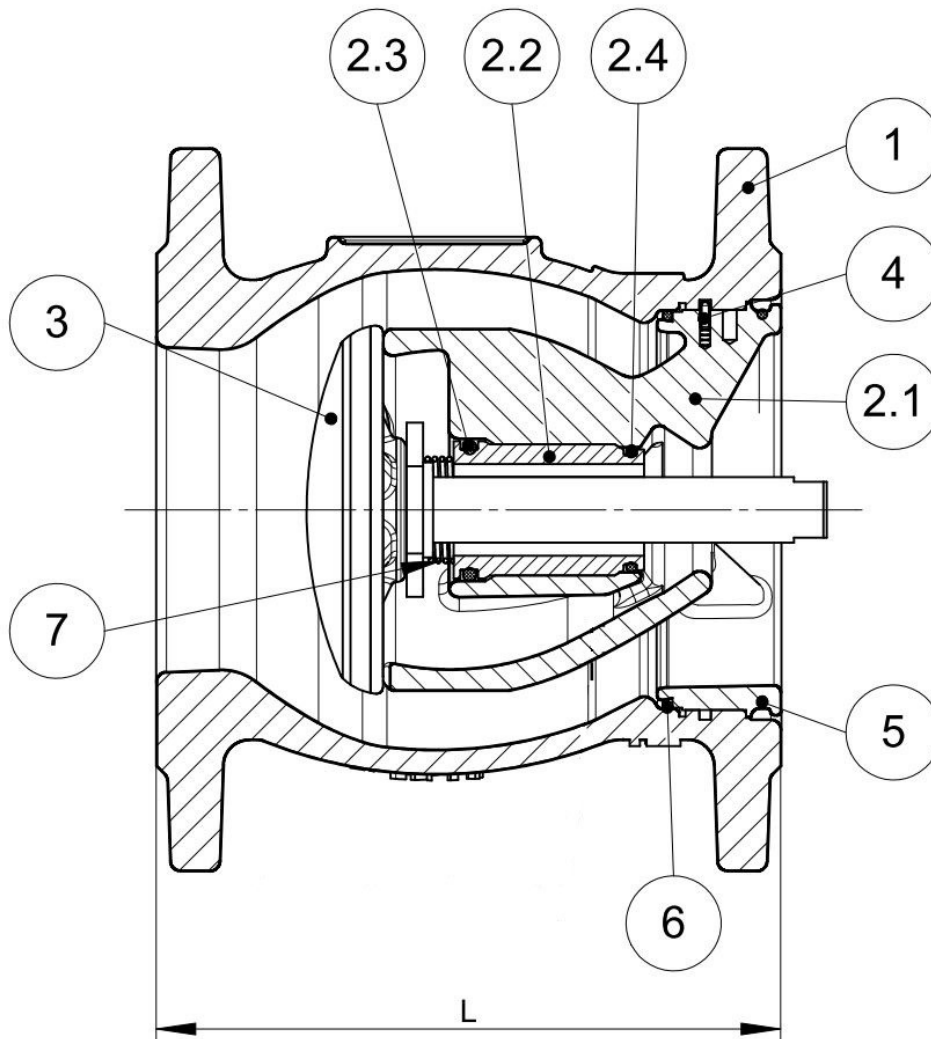






7 Drawings and parts list

7.1 Drawing



In DN 80, the body insert is equipped with an additional drilled drainage opening.

7.2 Parts list

Position	Designation	Material
1	Body	GJS 500-14
2	Body insert (set)	
2.1	Body insert	GJS 500-14
2.2	Guide bearing	Polymer
2.3	O-Ring A	EPDM/ NBR
2.4	O-Ring B	EPDM/ NBR
3	Valve disc complete	GJS 500-7/ EPDM/ 1.4057
4	Spring sleeve (DN 80 - 200) Spring and cylinder pin (DN 250, 300)	A2 / 1.4310 1.4310 / 1.4305
5	O-Ring C	EPDM/ NBR
6	O-Ring D	EPDM/ NBR
7	Spring H+V (horizontal and vertical upwards) / V (vertical downwards)	1.4310

DN	Face-to-face length L [mm]
80	180
100	190
125	200
150	210
200	230
250	250
300	270

8 Disassembly of the non-slam check valve



Depressurize pipeline

- Evenly loosen flange connection bolts at the outer circumference.
- Remove non-slam check valve from the pipeline.
- The body insert must be pushed out of the body. The required force F , which is between 3 and 5 kN (DN 80 - 200) and 17 to 25 kN (DN 250, 300) can be applied to the valve disc by tapping with a soft face hammer (DN 80 - 200), or by means of a press, a mounting tool. Please make sure to place a spacer onto the valve disc in order to prevent applying direct and punctual force when tapping. Make sure to hold the body insert tightly during disassembly in order to prevent damage to the coating while it is being pushed out of the body. The installed spring sleeves or cylinder pins (position 4, page 14) shear off during disassembly and must be replaced when re-installed. Spring sleeves or cylinder pins are included in all spare parts sets.

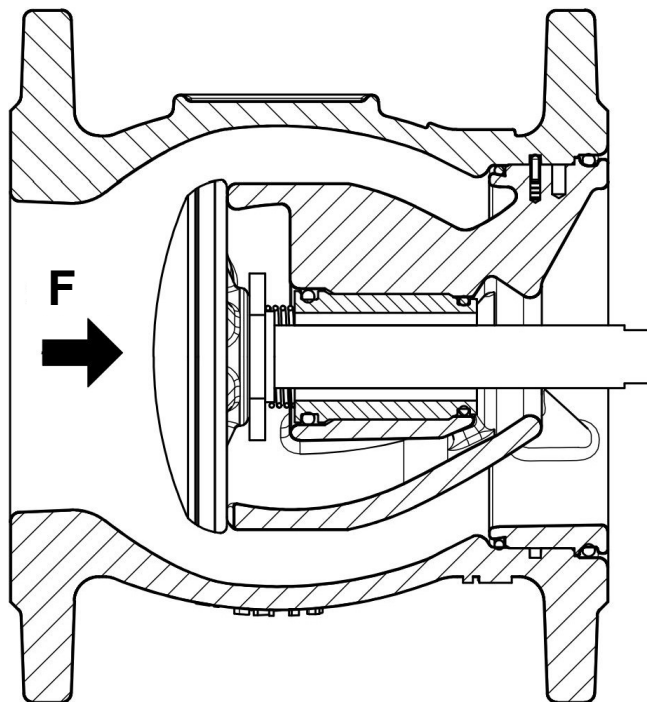


Image 8.1: Disassembly

9 Assembly of the non-slam check valve

- The valve disc connected with the guide rod (position 3, page 14) is placed into the body as a pre-assembled component (see image 9.1).
- Place the spring onto the guide rod.
- Place the lightly greased O-rings into the body insert.
- Plug in the spring sleeves (DN 80 - 200) or springs with cylinder pin (DN 250, 300) into each blind hole (3) of the body insert.
- Slide the body insert into the body until the spring sleeves or cylinder pins deadlock (see image 9.2).
- Push in the spring sleeves or cylinder pins with a suitable tool (screwdriver, thin metal sheet etc.) one by one into the blind holes so that the body insert can be pushed deeper into the body (see image 9.3).
- Slide in the body insert until the spring sleeves or cylinder pins snap into the peripheral groove. Try pulling the insert out to double-check if the parts are properly locked.
- Double check functioning of the valve as per page 9.

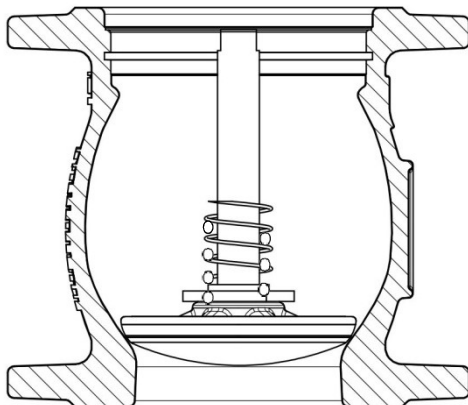


Image 9.1: installed valve disc

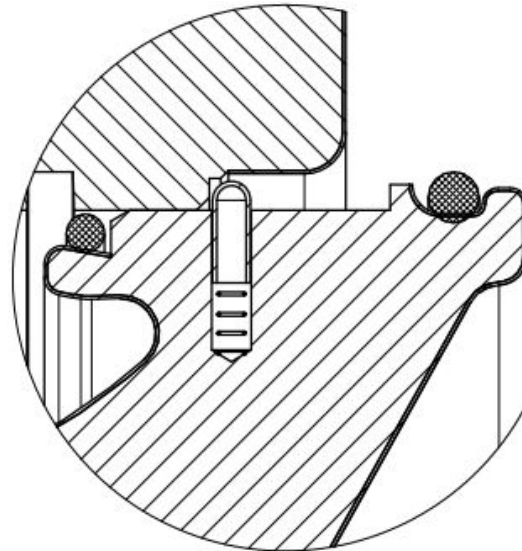


Image 9.2: inserted body insert

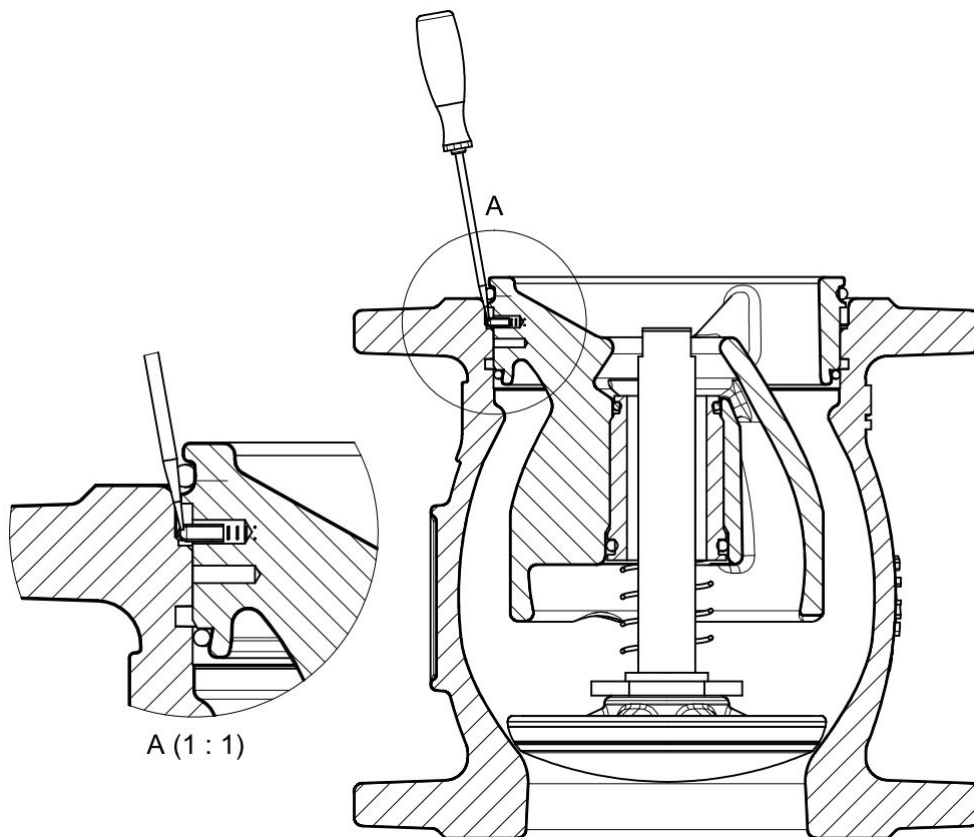


Image 9.3: Push in spring sleeves or cylinder pins

10 Malfunctions

Leakage of a connection to the pipeline:

- Retighten flange screws.
- If the leakage continues: Repairs needed.

Leakage in the valve disc area:

- Check rubber coating for defects.
- Check the seat area for defects/dirt.

Excessive noise level:

- Check spring for breakage.

Valve is jammed:

- Foreign objects ...
 - ... in the guide bearing area,
 - ... between body seat and valve disc,
 - ... between body insert and back of valve disc.



We would like to point out that Düker GmbH does not assume any liability for damages or disruption of operations resulting from non-observance of the operating manual.

11 Maintenance

11.1 Servicing

Regular maintenance work on non-slam check valves is not usually required. We do, however, refer to the DVGW worksheet W 400-3. Depending on the contents of the operation medium (iron, manganese, sand etc.) and the operating conditions, the maintenance intervals are to be adjusted.

11.2 Available spare parts

Spare parts are grouped in sets and are, as far as possible, delivered pre-assembled. Parts cannot be ordered individually. The following spare parts sets are available:

- | | |
|---|------------------------------|
| 1. Spare parts set "installation position replacement" | <i>Positions see page 14</i> |
| ✓ Spring for installation position 1 (see image 5.1) | Position 7 |
| ✓ Spring for installation position 2 (see image 5.2) | Position 7 |
| ✓ Installation position label (see image 5.1 + 5.2) | without position |
| ✓ Spring sleeves (DN 80 - 200), spring and cylinder pin (DN 250, 300) | Position 4 |
| ✓ O-rings | Position 5, 6 |

Order numbers:

DN 80	DN 100	DN 125	DN150	DN 200	DN 250	DN 300
312328	312326	312331	312327	309150	on request	on request

- | | |
|---|------------------------------|
| 2. Spare parts set "valve disc replacement PFA 10/16" | <i>Positions see page 14</i> |
| ✓ Valve disc PFA 10/16 including guide rod | Position 3 |
| ✓ Spring sleeves (DN 80 - 200), spring and cylinder pin (DN 250, 300) | Position 4 |
| ✓ O-rings | Position 5, 6 |

Order numbers:

DN 80	DN 100	DN 125	DN150	DN 200	DN 250	DN 300
312334	312332	312337	312333	309145	312335	312336

3. Spare parts set “valve disc replacement PFA 25/40” *Positions see page 14*

- ✓ Valve disc PFA 25/40 including guide rod Position 3
- ✓ Spring sleeves (DN 80 - 200), spring and cylinder pin (DN 250, 300) Position 4
- ✓ O-rings Position 5, 6

Order numbers:

DN 80	DN 100	DN 125	DN150	DN 200	DN 250	DN 300
312340	312338	312343	312339	309149	on request	on request

4. Spare parts set “bushing replacement” *Positions see page 14*

- ✓ Body insert Position 2
- ✓ Spring sleeves (DN 80 - 200), spring and cylinder pin (DN 250, 300) Position 4
- ✓ O-rings Position 5, 6

Order numbers:

DN 80	DN 100	DN 125	DN150	DN 200	DN 250	DN 300
312344	312348	312347	312349	309151	312345	312346



To ensure proper function and compliance with drinking water hygienic specifications, only original Düker spare parts are to be installed.

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