



KIESELMANN

FLUID PROCESS GROUP

Translation of the original

Operating Instructions

Non-return valve

Type 5093

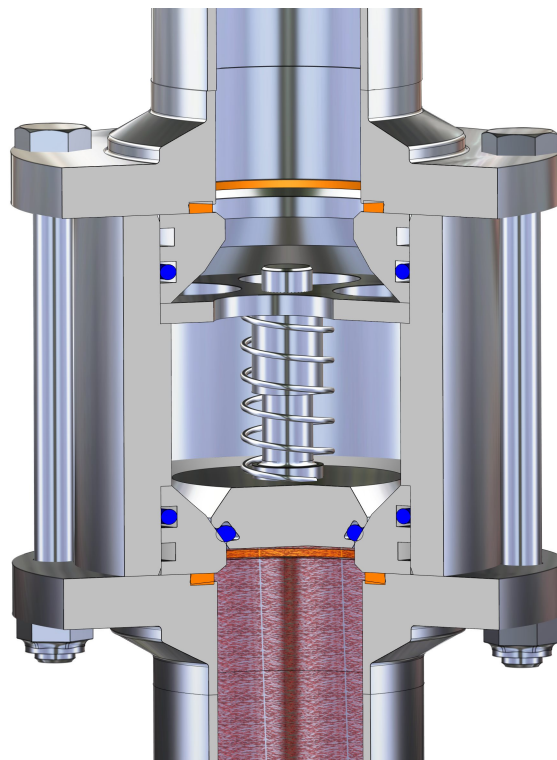
EPDM: Type 5093xxx000-xxx

HNBR: Type 5093xxx700-xxx

FKM: Type 5093xxx140-xxx

O-ring - Model

Intermediate flange with welding ends



KIESELMANN GmbH

Paul-Kieselmann-Str. 4-10
D - 75438 Knittlingen

 +49(0) 7043 371-0 •  +49(0) 7043 371-125
www.kieselmann.de • info@kieselmann.de

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1 General informations

1.1 Informations for your safety

We are pleased that you have decided for a high-class KIESELMANN product. With correct application and adequate maintenance, our products provide long time and reliable operation.






Before installation and initiation, please carefully read this instruction manual and the security advices contained in it. This guarantees reliable and safe operation of this product and your plant respectively. Please note that an incorrect application of the process components may lead to great material damages and personal injury.

In case of damages caused by non observance of this instruction manual, incorrect initiation, handling or external interference, guarantee and warranty will lapse!

Our products are produced, mounted and tested with high diligence. However, if there is still a reason for complaint, we will naturally try to give you entire satisfaction within the scope of our warranty. We will be at your disposal also after expiration of the warranty. In addition, you will also find all necessary instructions and spare part data for maintenance in this instruction manual. If you don't want to carry out the maintenance by yourself, our KIESELMANN - service team will naturally be at your disposal.

1.2 Marking of security instructions

Hints are available in the chapter "safety instructions" or directly before the respective operation instruction. The hints are highlighted with a danger symbol and a signal word. Texts beside these symbols have to be read and adhered to by all means. Please continue with the text and with the handling at the valve only afterwards.

Symbol	Signal word	Meaning
	DANGER	Imminent danger which will result severe personal injury or death.
	WARNING	Imminent danger which may result severe personal injury or death.
	CAUTION	Dangerous situation which may cause slight personal injury or material damages.
	NOTICE	An harmful situation which may result in damages of the product itself or of adjacent vicinity.
	INFORMATION	Marks application hints and other information which is particularly useful.

1.3 General designated use

The fitting is designed exclusively for the purposes described below. Using the fitting for purposes other than those mentioned is considered contrary to its designated use. KIESELMANN cannot be held liable for any damage resulting from such use. The risk of such misuse lies entirely with the user. The prerequisite for the reliable and safe operation of the fitting is proper transportation and storage as well as competent installation and assembly. Operating the fitting within the limits of its designated use also involves observing the operating, inspection and maintenance instructions.

1.4 Personnel

Personnel entrusted with the operation and maintenance of the tank safety system must have the suitable qualification to carry out their tasks. They must be informed about possible dangers and must understand and observe the safety instructions given in the relevant manual. Only allow qualified personnel to make electrical connections.

1.5 Modifications, spare parts, accessories

Unauthorized modifications, additions or conversions which affect the safety of the fitting are not permitted. Safety devices must not be bypassed, removed or made inactive. Only use original spare parts and accessories recommended by the manufacturer.

1.6 General instructions

The user is obliged to operate the fitting only when it is in good working order. In addition to the instructions given in the operating manual, please observe the relevant accident prevention regulations, generally accepted safety regulations, regulations effective in the country of installation, working and safety instructions effective in the user's plant.

2 Safety instructions

2.1 Intended use

This type of non-return valve is used as an independent non-return stop valve for liquid and gas media in systems used in the food and drinks industry, the pharmaceutical industry and the biotechnology industry.

2.2 General notes



NOTICE - observe the operating instructions

To avoid danger and damage, the fitting must be used in accordance with the safety instructions and technical data contained in the operating instructions.



NOTICE

All data are in line with the current state of development. Subject to change as a result of technical progress.

2.3 General safety instructions



⚠ WARNING

Risk of injury by outflowing medium

Dismantling the valve or valve assemblies from the plant can cause injuries.

- Media flowing through the leakage drain outlet are to be drained off without splashing into a discharge arrangement.
- Carry the disassembling only if when the plant has been rendered pressure-less and free of liquid and gas.



⚠ WARNING

ATEX - Guidelines

If the valve or the plant is operated in a potentially explosive atmosphere, the valid ATEX directive of the EC and the installation instructions in this operating manual must be observed.



⚠ CAUTION

Before starting the system, the entire pipeline system must be thoroughly cleaned.



⚠ CAUTION

Steps should be taken to ensure that no external forces are exerted on the fitting.

3 Delivery, transport and storage

3.1 Delivery

- Immediately after receipt check the delivery for completeness and transport damages.
- Remove the packaging from the product.
- Retain packaging material, or expose of according to local regulations.

3.2 Transport



CAUTION

Risk of injury and damage to the product

During the transport the generally acknowledged rules of technology, the national accident prevention regulations and company internal work and safety regulations must be observed.

3.3 Storage



NOTICE

Damage to the product due to improper storage!

Observe storage instructions
avoid a prolonged storage



INFORMATION

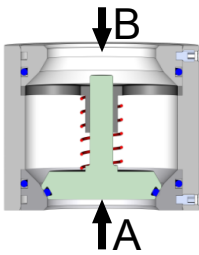
Recommendation for longer storage

We recommend regularly checking the product and the prevailing storage conditions during long storage times.

- To avoid damage to seals and bearings,
 - products up to DN 125 / OD 5 inch should be stored horizontally for maximum 6 months.
 - products larger than DN 125 / 5 inch, should be stored in the upright position with the actuator on top.
- Don't store any objects on the products.
- Protect the products for wetness, dust and dirt.
- The product should be stored in a dry and well ventilated room at a constant temperature (optimal indoor temperature: 25 C ±5; indoor humidity data 70% ±5%).
- Protect seals, bearings and plastic parts for UV light and ozone.

4 Function and operation

4.1 Description of function



The valve open against spring power with flow pressure > x,xx bar in flow direction "A" (see Tab. 5.1.1 [► 10]). The valve close added by spring power with flow pressure > 0,1 bar in flow direction "B".



NOTICE

A pressure from minimum 0,8 bar is necessary for a leakproof shut off in flow direction "B".

4.2 Commissioning, service and maintenance

4.2.1 Commissioning

4.2.1.1 Installation instructions

Fitting position

Non return valve be installed preferably vertically, with the flow direction from bottom to top.

Other mounting positions are possible, but the function of the valve must always be checked in the operating state.



NOTICE

The flow direction is generally in the direction A.

If installed horizontally, some minor residual liquids will remain in the housing.

4.2.1.2 General welding guidelines

Sealing elements integrated in weld components must generally be removed prior to welding. To prevent damage, welding should be undertaken by certified personnel (EN ISO 9606-1). Use the TIG (Tungsten Inert Gas) welding process.



CAUTION

Damage and injuries due to high temperature supply

To avoid a distortion of the components, all welding parts must be welded to stress-relieved.

Allow all components to cool before assembling.



NOTICE

Damage due to impurities

Impurities can cause damage to the seals and seals area.

Clean inside areas prior to assembly.

4.2.1.3 ATEX - Guidelines

For valves or plants/installations that are operated in the ATEX area, sufficient bonding (grounding) must be ensured (see valid ATEX Guidelines EG).

4.2.2 Service



RECOMMENDATION

Replacement of seals

To achieve optimal maintenance cycles, the following points must be observed!

- When replacement of seals, all product-contacting seals should be replaced.
- Only original spare parts may be installed.

Maintenance interval

The maintenance intervals depend on the operating conditions "temperature, temperature-intervals, medium, cleaning medium, pressure and opening frequency". We recommend replacing the seals 1-year cycle. The user, however should establish appropriate maintenance intervals according to the condition of the seals.

Lubricant recommendation

	EPDM; HNBR; NBR; FKM; k-flex	-	Klüber Paraliq GTE703*
	Silicone	-	Klüber Sintheso pro AA2*
	Thread	-	Interflon Food*
*) It is only permitted to use approved lubricants, if the respective fitting is used for the production of food or drink. Please observe the relevant safety data sheets of the manufacturers of lubricants.			

4.2.3 Cleaning

Optimum cleaning is achieved with pipeline cleaning.

5 Technical data

5.1 Non-Return Valve Type 5093

Model	Non-return valve Intermediate flange connection with weld end Design: Sealing = O-ring	
Size	DIN: DN25 - DN150 Inch: OD1 - OD4	
Connection type	Intermediate flange connection with weld end	
Temperature range	Ambient temperature: +4° to +45°C (air) Operating temperature: +0° to +95°C (depends on medium) Sterilisation temperature: HNBR +110°C (SIP 30 min) EPDM +120°C FKM +95°C	
Pressure nominal (bar)	DN25 - DN65 = PN 16 OD 1" - OD 2½" = PN 16 DN80 - DN150 = PN 10 OD 3" - OD 4" = PN 10	
Leakage rate	A (EN 12266-1)	
Material (in contact with product)	Stainless steel: 1.4301 / AISI 304 1.4404 / AISI 316L Surface: Ra ≤ 0,8µm-polished Sealing material: HNBR EPDM FKM k-flex	

5.1.1 Opening pressure, closing pressure and KV values




	Nominal diameter DN / OD									
	DIN Inch	25 1	32 -	40 1½	50 2	65 2½	80 3	100 4"	125 -	150 -
Opening pressure: [bar(g)]	DIN	0.10	0.10	0.15	0.15	0.15	0.15	0.10	0.10	0.10
	Inch	0.10	-	0.15	0.15	0.15	0.15	0.10	-	-
Closing pressure [bar(g)]	DIN	0.05	0.05	0.10	0.10	0.10	0.10	0.10	0.10	0.10
	Inch	0.05	-	0.10	0.10	0.10	0.10	0.05	-	-
KV-value (m³/h):	DIN	18	28	36	60	104	150	230	350	450
	Inch	13	-	33	54	87	119	220	-	-

measured in installation position and flow direction from bottom to top

6 Disassembly and assembly

6.1 Disassembly

Mounting tools

T1		Combination wrench-Set	SW 8 - SW 24	-
T2		Allen key - Set	1.5 - 10	-
T30		Needle	-	-



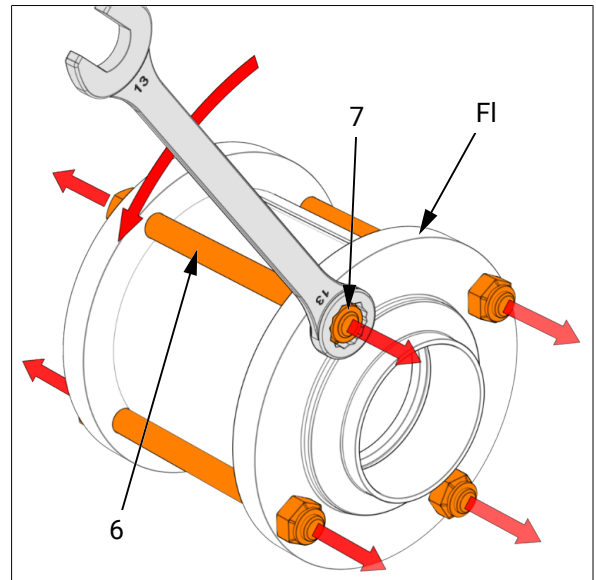
NOTICE

All screw connections have right-handed threads.

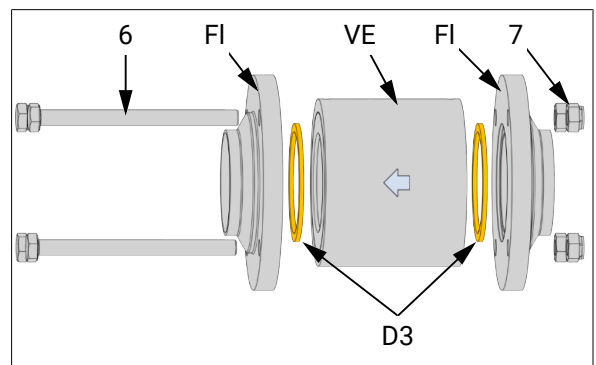
Replacement wear parts

DN 25 - DN 100 / OD 1 Inch - OD 4 Inch

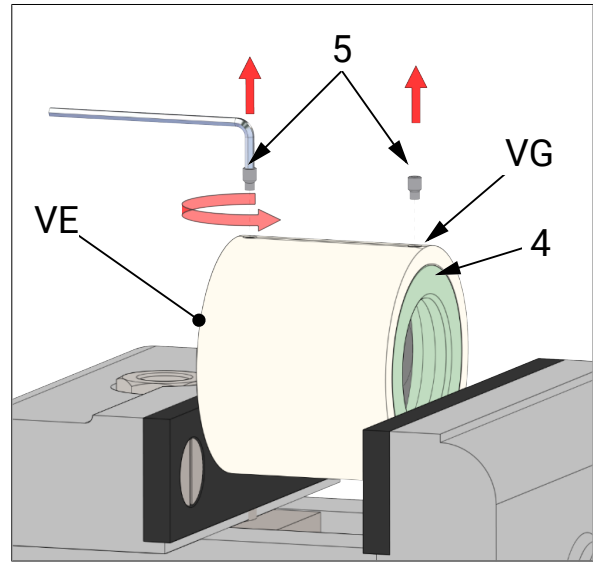
- Unscrew nuts (7).
- Remove axial the screws / threaded bolt (6).
- Remove flanges (FI).



- Dismount the valve insert (VE).
- Remove seals (D3).



- Tighten on the face side the valve insert (VE) between soft jaws in a vice.
- Unscrew the headless pin (5).

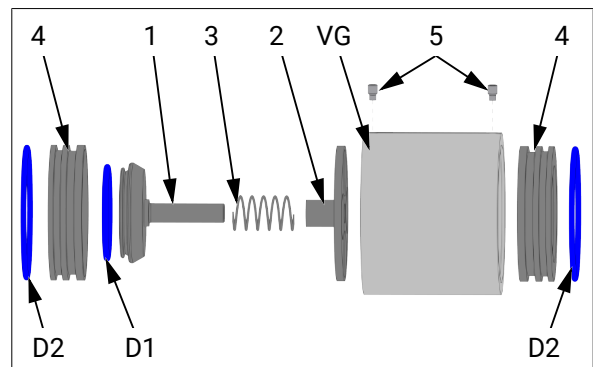


NOTICE

Spring tension

The tightly seats (4) rest at the vise jaws due to the spring tension. Open the vise, thereby the spring (3) is relaxed.

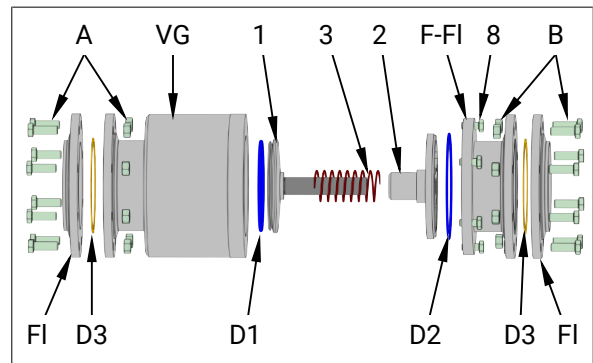
- Dismount the inner parts from housing (VG).
- Remove the O-rings (D1) and (D2).



Replacement wear parts

DN125 - DN150

- Unscrew the screw joints (A) and (B).
- Remove the check valve.
- Remove seals (D3).
- Unscrew the screws (8). Thereby the spring (3) is almost completely relaxed.
- Dismount the inner parts from housing (VG).
- Remove the O-rings (D1) and (D2).

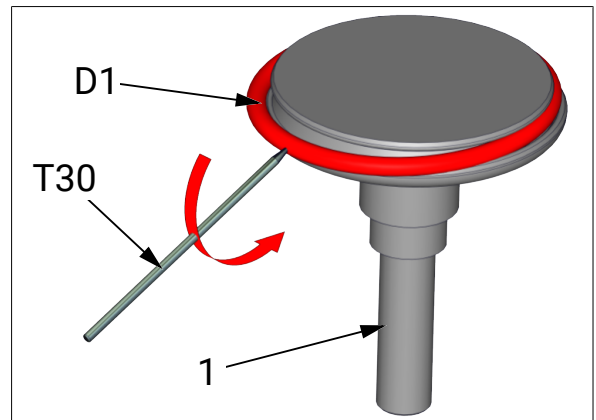


Replacement valve plate seal (D1)



NOTICE

- Puncture the O-rings with a needle and remove them carefully from the groove.
- Remove O-ring (D1) out of the valve disc (1).



6.2 Assembly

- Before installation, thoroughly clean and slightly lubricate mounting areas and running surfaces.
- Assemble in reverse order.



NOTICE

Alternately press and roll the O-rings into the groove with round body.

Performance test

- Check the function according to the specified performance data in the operating state.

7 Drawings and dimensions

7.1 Drawings

1. Piston plate
2. guidance
3. Spring
4. Tightly seats
5. Headless pin
6. Screw / threaded bolt
7. Hexagon nut
8. Screw

A = Screw joint

FI = Flange

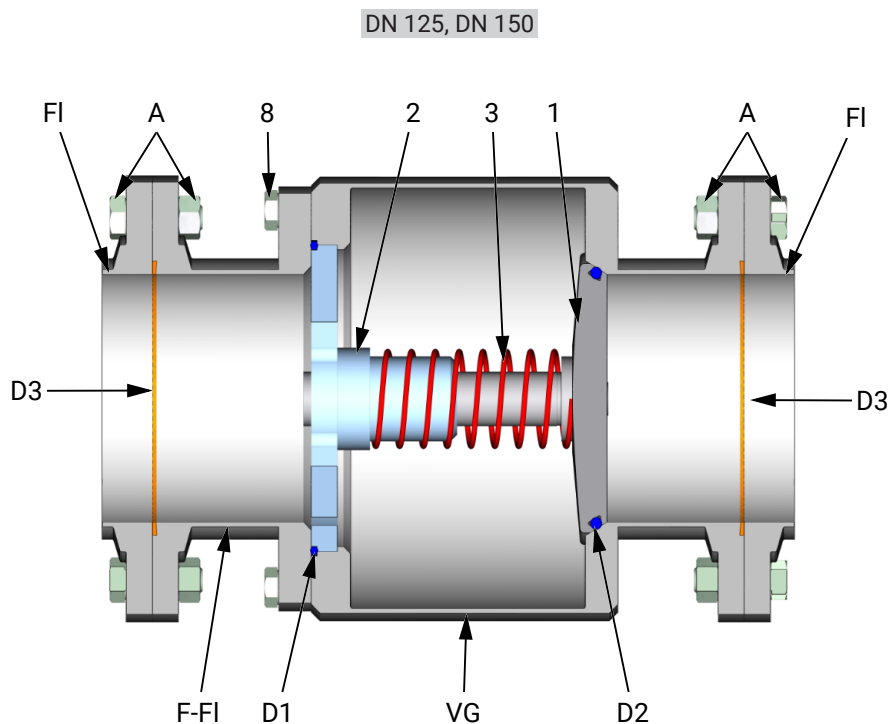
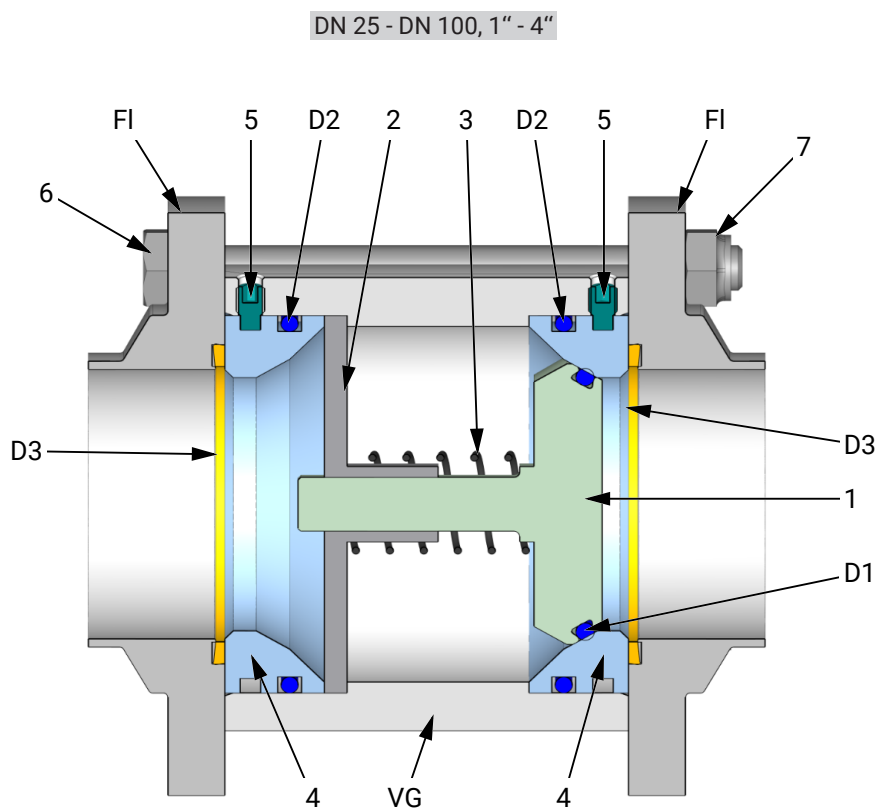
F-FI = Flange - flange coupling

VG = Valve housing

D1 = O-ring

D2 = O-rings

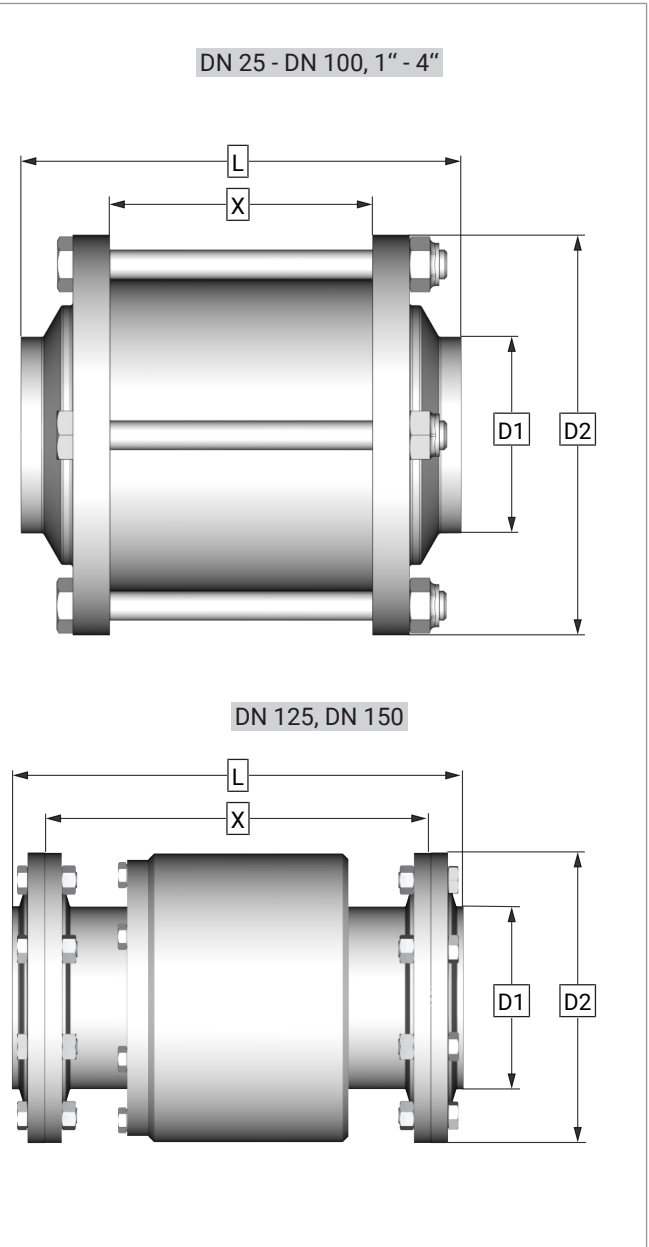
D3 = Seals



7.2 Dimensions

DN	D1	D2	L	X
25	29x1.5	80	104	56
32	35x1.5	86	104	56
40	41x1.5	92	113	65
50	53x1.5	108	119	71
65	70x2	130	127	79
80	85x2	146	144	96
100	104x2	166	159	111
125	129x2	205	318	272
150	154x2	240	327	281

OD	D1	D2	L	X
1 Inch	25,4x1,65	80	104	56
1½ Inch	38,1x1,65	92	113	65
2 Inch	50,8x1,65	108	119	71
2½ Inch	63,5x1,65	130	127	79
3 Inch	76.2x2.00	146	144	96
4 Inch	101.6x2.00	166	159	111
5 Inch	-			
6 Inch	-			



8 Wearing parts

8.1 Wear parts kit

Wear parts set (WPS) EPDM O-ring - Model

- for Check valves 5093 xxx 000-xxx

	WPS	Pos. 3	Pos. D1	Pos. D2	Pos. D3
DIN Inch	EPDM	Spring 1.4310/AISI301	O-ring EPDM	O-ring EPDM	Seal k-flex
25 1"	5095 025 029-054 5095 026 029-054	8150117060-031	2304020030-170	2304031035-159	2353035026-114 2353032024-114
32 1¼"	5095 032 029-054 -	8150117060-031	2304024035-170	2304041035-159	2353041032-114 -
40 1½"	5095 040 029-054 5095 038 029-054	8150181000-031	2304028035-170	2304047035-159	2353047038-114 2353044036-114
50 2"	5095 050 029-054 5095 051 029-054	8150182000-031	2304041035-170	2304062035-159	2353059050-114 2353057049-114
65 2½"	5095 065 029-054 5095 064 029-054	8150209000-031	2304057035-170	2304085040-170	2353076066-114 2353071061-114
80 3"	5095 080 029-054 5095 076 029-054	8150236000-031	2304069035-170	2304100040-159	2353090081-114 2353083073-114
100 4"	5095 100 029-054 5095 101 029-054	8150236000-031	2304088035-170	2304118045-170	2353109100-114 2353107099-114
125 5"	5095 125 029-054 -	8150263119-031	2304113053-084	2304146035-054	2353136125-114
150 6"	5095 150 029-054 -	8150263119-031	2304136053-069	2304175050-054	2353161150-114

Wear parts set (WPS) HNBR O-ring - Model

for Check valves 5093 xxx 700-xxx

	WPS	Pos. 3	Pos. D1	Pos. D2	Pos. D3
DIN Inch	HNBR	Spring 1.4310/AISI301	O-ring HNBR	O-ring HNBR	Seal k-flex
25 1"	5095 025 029-050 5095 026 029-050	8150117060-031	2304020030-050	2304031035-050	2353035026-114 2353032024-114
32 -	5095 032 029-050 -	8150117060-031	2304024035-050	2304041035-050	2353041032-114 -
40 1½"	5095 040 029-050 5095 038 029-050	8150181000-031	2304028035-050	2304047035-157	2353047038-114 2353044036-114
50 2"	5095 050 029-050 5095 051 029-050	8150182000-031	2304041035-050	2304062035-050	2353059050-114 2353057049-114
65 2½"	5095 065 029-050 5095 064 029-050	8150209000-031	2304057035-050	2304085040-050	2353076066-114 2353071061-114
80 3"	5095 080 029-050 5095 076 029-050	8150236000-031	2304069035-050	2304100040-050	2353090081-114 2353083073-114
100 4"	5095 100 029-050 5095 101 029-050	8150236000-031	2304088035-050	2304118045-050	2353109100-114 2353107099-114
125 5"	- -				
150 6"	- -				

Wear parts kit (WPS) FKM O-ring - Model

for Check valves 5093 xxx 140-xxx

	WPS	Pos. 3	Pos. D1	Pos. D2	Pos. D3
DIN Inch	FKM	Spring 1.4310/AISI301	O-ring FKM	O-ring FKM	Seal k-flex
25 1"	5095 025 000-051 5095 026 000-051	8150117060-031	2304020030-051	2304031035-051	2353035026-114 2353032024-114
32 -	5095 032 000-051 -	8150117060-031	2304024035-051	2304041035-051	2353041032-114 -
40 1½"	5095 040 000-051 5095 038 000-051	8150181000-031	2304028035-051	2304047035-051	2353047038-114 2353044036-114
50 2"	5095 050 000-051 5095 051 000-051	8150182000-031	2304041035-051	2304062035-051	2353059050-114 2353057049-114
65 2½"	5095 065 000-051 5095 064 000-051	8150209000-031	2304057035-051	2304085040-051	2353076066-114 2353071061-114
80 3"	5095 080 000-051 5095 076 000-051	8150236000-031	2304069035-051	2304100040-051	2353090081-114 2353083073-114
100 4"	5095 100 000-051 5095 101 000-051	8150236000-031	2304088035-051	2304118045-051	2353109100-114 2353107099-114
125 5"	- -				
150 6"	- -				