



# KIESELMANN

FLUID PROCESS GROUP

Translation of the original

## Operating Instructions

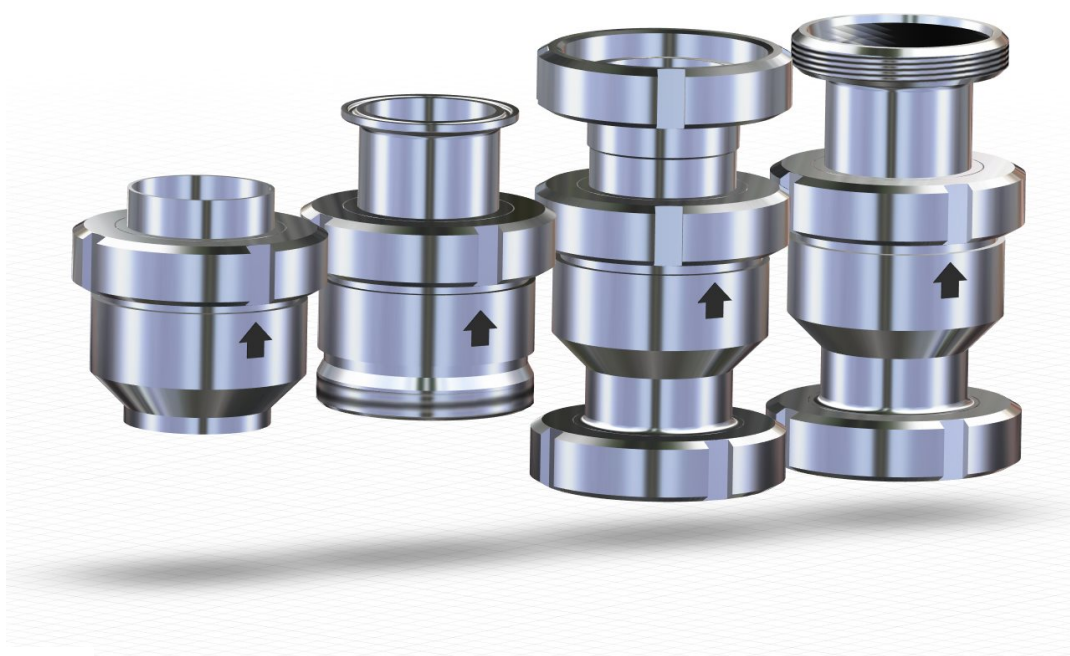
### Non-return valve

Type 5091

DN10 - DN100



OD 1" - 4"

spring loaded



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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.

- Medias 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 Specification

### 4.1 Valve types

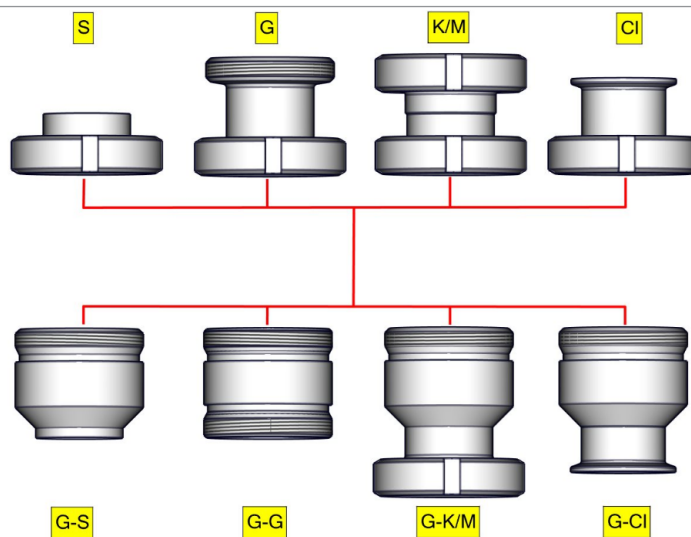
#### check valve O-ring - design

##### Couplings with connections

- S-K/M = welded end- taper nut
- G-K/M = male - taper nut
- K/M-K/M = taper nut - taper nut
- Cl-K/M = clamp- taper nut

##### Valve housings with connections

- G-S = male - welded coupling
- G-G = male - male
- G-K/M = male - taper nut
- G-Cl = male - clamp



Valve size		seals			
DN	Inch	EPDM	HNBR	FKM	Silicone
010 = DN 10	-	x	x	-	-
015 = DN 15	-	x	x	-	x
020 = DN 20	-	x	x	-	-
025 = DN 25	026 = OD 1"	x	x	x	-
032 = DN 32	-	x	x	x	-
040 = DN 40	038 = OD 1 1/2"	x	x	x	x
050 = DN 50	051 = OD 2"	x	x	x	x
065 = DN 65	064 = OD 2 1/2"	x	x	x	-
080 = DN 80	076 = OD 3"	x	x	x	-
100 = DN 100	101 = OD 4"	x	x	x	-

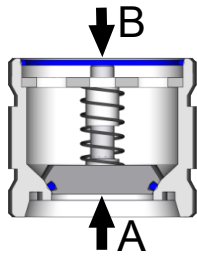
DN = nominal diameter = z.B. 5091 050 000-041

OD = outside diameter= z.B. 5091 051 000-041



## 5 Function and operation

### 5.1 Description of function



The valve opens against spring power with flow pressure > x,xx bar in flow direction "A" (see Table 6.1.1 [▶ 11]). The valve closes added by spring power with flow pressure > x,xx bar in flow direction "B".



#### NOTICE

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

### 5.2 Commissioning, service and maintenance

#### 5.2.1 Commissioning

##### 5.2.1.1 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.

##### 5.2.1.2 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.

##### 5.2.1.3 Use in EX area

For valves or plants/installations that are operated in the ATEX area, sufficient bonding (grounding) must be ensured. (see e.g. ATEX Directives EC; UKSI 696:2019-Schedule 25)

### 5.2.2 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.			

### 5.2.3 Cleaning

Optimum cleaning is achieved with pipeline cleaning.

## 6 Technical data

### 6.1 Check valves Type 5091

Model	Non-return valve	
	Design: Sealing = O-ring	
Size	DIN: DN10 - DN100	
	Inch: OD1 - OD4	
Connection type	Weld-on end DIN EN 10357	
	Male part DIN11851	
	Liner / nut DIN 11851	
	Clamp	
Temperature range	Ambient temperature:	+4° to +45°C
	(air)	
	Operating temperature:	+0° to +95°C
	(depends on medium)	
	Sterilisation temperature:	HNBR +110°C
Pressure nominal (bar)	(SIP 30 min)	EPDM +120°C
		FKM +95°C
		Silicone +110°C
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 e-polished
	Sealing material:	EPDM (FDA)
		HNBR (FDA)
		FKM (FDA)
		Silicone (FDA)



#### 6.1.1 Opening pressure, closing pressure and KV values

	Nominal diameter DN / OD										
	DIN Inch	10 -	15 -	20 -	25 1	32 -	40 1½	50 2	65 2½	80 3	100 4"
Opening pressure: [bar(g)]	DIN	0.50	0.40	0.20	0.10	0.10	0.15	0.15	0.15	0.15	0.10
	Inch	0.50	0.40	0.20	0.10	-	0.15	0.15	0.15	0.15	0.10
Closing pressure [bar(g)]	DIN	0.10	0.10	0.10	0.05	0.05	0.10	0.10	0.10	0.10	0.10
	Inch	0.10	0.10	0.10	0.05	-	0.10	0.10	0.10	0.10	0.05
KV-value (m³/h):	DIN	1	3.5	4.5	18	28	36	60	104	150	230
	Inch	-	-	-	13	-	33	54	87	119	220

measured in installation position and flow direction from bottom to top

## 7 Disassembly and assembly

### 7.1 Disassembly

T11		Hinged hook wrench	DN25 - DN100 90/155 V2A	8028025100-020
T30		Needle	-	-



#### NOTICE

All screw connections have right-handed threads.

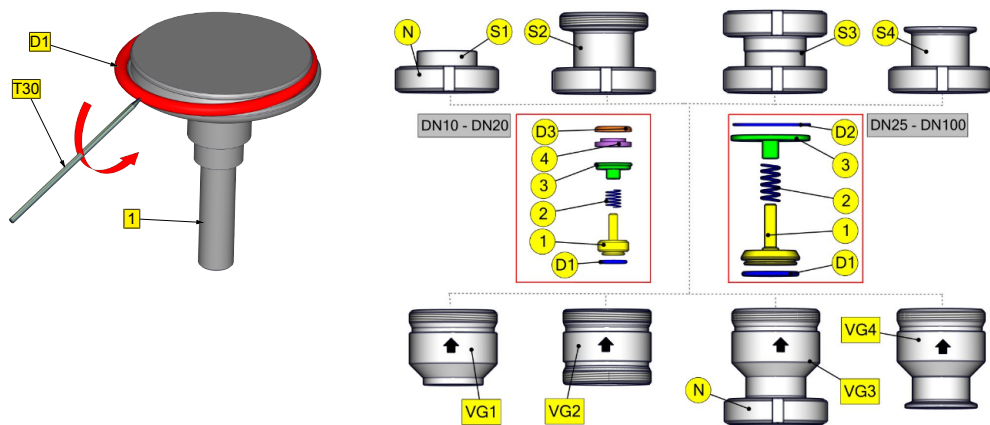
#### Disassembly

- Unscrew the nuts (N) on both sides and remove the valve from the pipe system.
- Dismount the inner parts from housing (VG).
- Remove O-ring (D1).



#### NOTICE

- Puncture the O-ring with a needle and remove them carefully from the groove of piston.
- Remove O-ring (D2) and (D3).



1	Plate	S1	Socket S-K/M
2	Spring	S2	Socket G - K/M
3	guidance	S3	Socket K/M - K/M
4	Adapter (DN10-DN20)	S4	Socket CI - K/M
D1	O-ring	VG1	Housing G-S
D2	O-ring	VG2	Housing G-G
D3	Seal (DN10-DN20)	VG3	Housing G-K/M
N	Slotted nut	VG4	Housing G-CI

S = welded end; G = male; K/M = cone/nut; CI = clamp

## 7.2 Assembly



### INFORMATION

- For the installation and removal is axially a minimum space requirement necessary (measure X).
  - Alternately press and roll the O-ring (D1) into the groove with round body.
- 
- 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.

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### Performance test

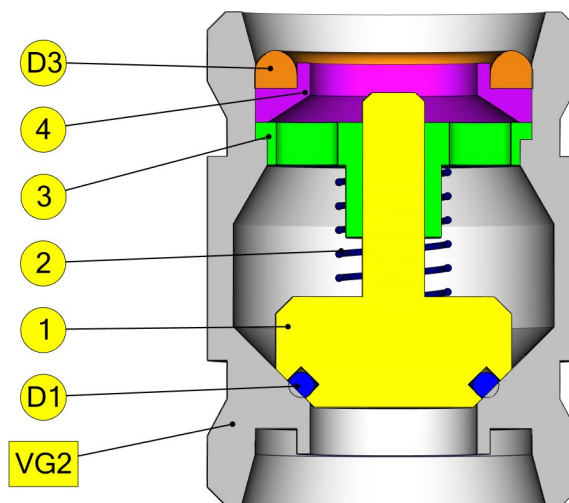
- Check the function according to the specified performance data in the operating state.

## 8 Drawings and dimensions

### 8.1 Drawings

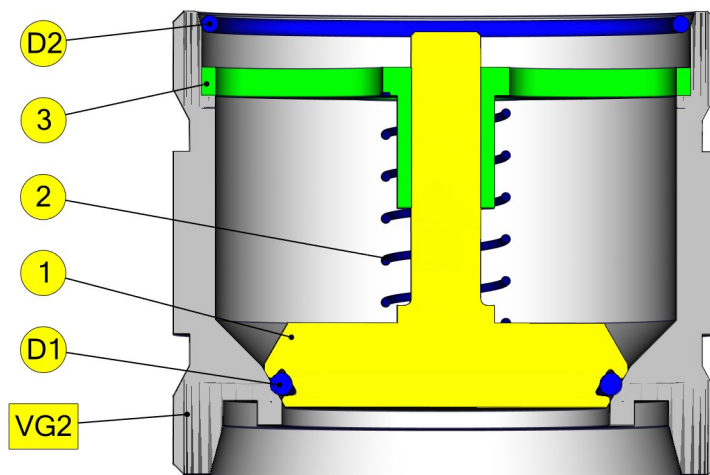
#### DN10 - DN20

- 1 = Plate
- 2 = Spring
- 3 = Guidance
- 4 = Receiver
- D1 = O-ring
- D2 = -
- D3 = Seal
- VG2 = Housing

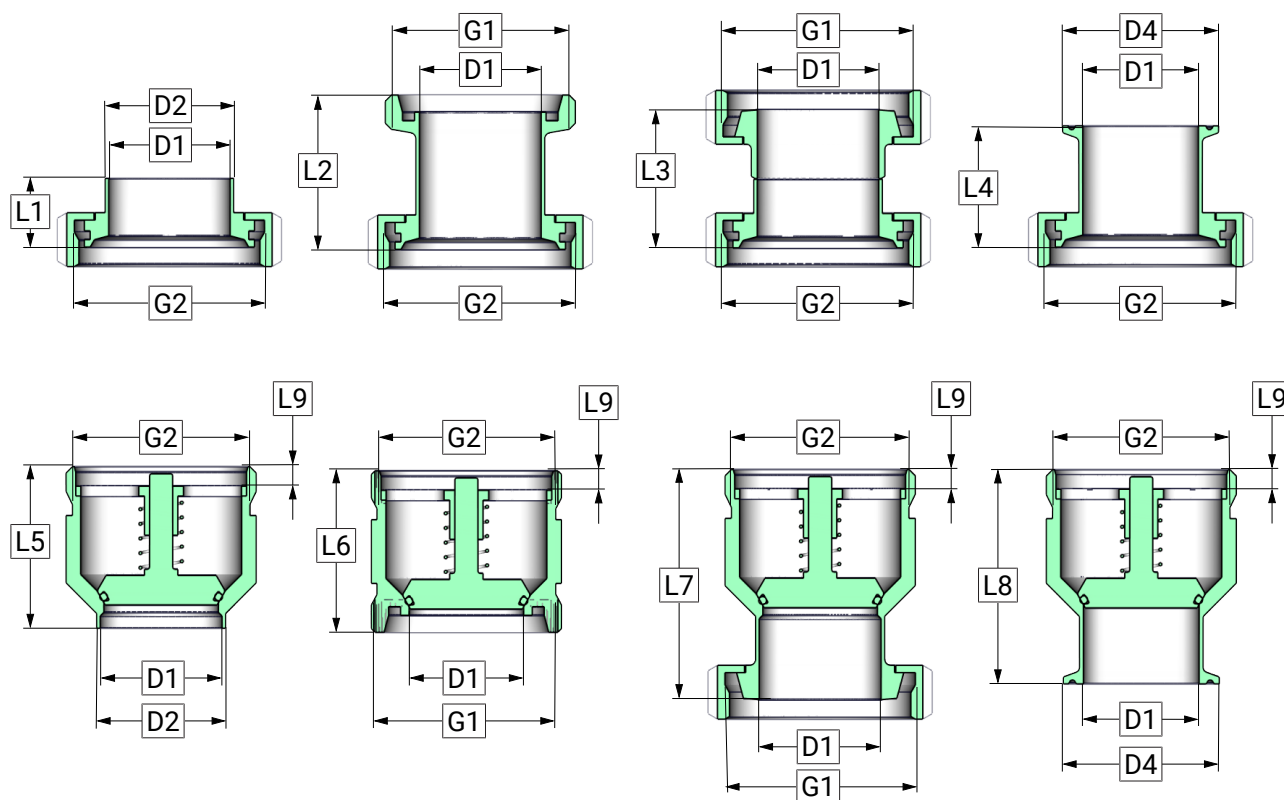


#### DN25 - DN100

- 1 = Plate
- 2 = Spring
- 3 = Guidance
- D1 = O-ring
- D2 = O-ring
- VG2 = Housing



### 8.2 Dimensions



DN	D1	D2	D3	D4	G1	G2	L1	L2	L3	L4	L5	L6	L7	L8	L9
10	10	13	10	34	Rd28x1/8	Rd28x1/8	17	38	34	42	41	45	58	59	4
15	16	19	16	34	Rd34x1/8	Rd34x1/8	17	38	34	42	49	50	66	70	4
20	20	23	20	34	Rd44x1/6	Rd44x1/6	18	42	36	43	52	58	70	69.5	6
25	26	29	25.5	50.5	Rd52x1/6	Rd52x1/6	22	51	44	43.5	48	50	70	69.5	7
32	32	35	30	50.5	Rd58x1/6	Rd58x1/6	25	57	50	46.5	50	51	75	71.5	7
40	38	41	36	50.5	Rd65x1/6	Rd65x1/6	26	59	52	47.5	58	59	84	79.5	7
50	50	53	47	64	Rd78x1/6	Rd78x1/6	28	63	56	49.5	66	66	94	87.5	8
65	66	70	64	91	Rd95x1/6	Rd110x1/4	40	80	72	68	73	75	105	104	12
80	81	85	77	106	Rd110x1/4	Rd120x1/4	45	90	82	72	87	88	124	115	15
100	100	104	100	119	Rd130x1/4	Rd160x1/4	50	104	94	78	107	117	151	135	9

OD	D1	D2	D3	D4	G1	G2	L1	L2	L3	L4	L5	L6	L7	L8	L9
1"	22.1	25.4	22.1	50.5	Rd52x1/6	Rd52x1/6	20	-	-	-	49	52	-	70.5	7
1½"	34.8	38.1	34.8	50.5	Rd65x1/6	Rd65x1/6	26	-	-	47.5	58	59	-	79.5	7
2"	47.5	50.8	47.5	64	Rd78x1/6	Rd78x1/6	28	-	-	49.5	66	66	-	87.5	8
2½"	60.2	63.5	60.2	77.5	Rd95x1/6	Rd110x1/4	40	-	-	68	73	78	-	101	12
3"	72.9	76.2	72.9	91	Rd110x1/4	Rd120x1/4	45	-	-	-	-	92	-	-	15
4"	97.6	101.6	97.6	119	Rd130x1/4	Rd160x1/4	50	-	-	-	-	117	-	-	9

## 9 Wearing parts

### 9.1 Wear parts kit

#### Wear parts kit EPDM O-ring - design

DN	Wear parts kit EPDM 2, D1, D2 / D3	Pos. D1 O-ring	Pos. D2 / D3 <sup>1</sup> O-ring / seal	Pos. 2 Spring
10 / -	5099 010 000-060	2304 009 025-170	2004 010 000-054	8150 115 030-031
15 / -	5099 015 000-060	2304 012 030-170	2004 015 000-054	8150 117 070-031
20 / -	5099 020 000-060	2304 014 030-170	2004 020 000-054	8150 117 070-031
25 / 1"	5099 025 029-054	2304 020 030-170	2304 035 030-170	8150 117 060-031
32 / -	5099 032 029-054	2304 024 035-170	2304 042 030-170	8150 117 060-031
40 / 1½"	5099 040 029-054	2304 028 035-170	2304 046 030-170	8150 181 000-031
50 / 2"	5099 050 029-054	2304 041 035-170	2304 060 030-170	8150 182 000-031
65 / 2½"	5099 065 029-054	2304 057 035-170	2304 085 035-159	8150 209 000-031
80 / 3"	5099 080 029-054	2304 069 035-170	2304 100 040-159	8150 236 000-031
100 / 4"	5099 100 029-054	2304 088 035-170	2304 117 035-159	8150 236 000-031

#### Wear parts set HNBR O-ring - design

DN	Wear parts kit HNBR 2, D1, D2 / D3	Pos. D1 O-ring	Pos. D2 / D3 <sup>1</sup> O-ring / seal	Pos. 2 Spring
10 / -	5099 010 000-050	2304 009 025-055	2004 010 000-050	8150 115 030-031
15 / -	5099 015 000-050	2304 012 030-055	2004 015 000-050	8150 117 070-031
20 / -	5099 020 000-050	2304 014 030-050	2004 020 000-050	8150 117 070-031
25 / 1"	5099 025 029-050	2304 020 030-050	2304 035 030-050	8150 117 060-031
32 / -	5099 032 029-050	2304 024 035-050	2304 041 035-050	8150 117 060-031
40 / 1½"	5099 040 029-050	2304 028 035-050	2304 047 025-157	8150 181 000-031
50 / 2"	5099 050 029-050	2304 041 035-050	2304 060 030-050	8150 182 000-031
65 / 2½"	5099 065 029-050	2304 057 035-050	2304 085 035-050	8150 209 000-031
80 / 3"	5099 080 029-050	2304 069 035-050	2304 100 040-050	8150 236 000-031
100 / 4"	5099 100 029-050	2304 088 035-050	2304 118 054-050	8150 236 000-031

<sup>1</sup> (D2) O-ring = DN 25 - DN 100  
(D3) seal = DN10 - DN 20



**Wear parts kit FKM O-ring - design**

DN	Wear parts kit FKM 2, D1, D2 / D3	Pos. D1 O-ring	Pos. D2 / D3 <sup>2</sup> O-ring / seal	Pos. 2 Spring
10 / -	5099 010 000-051	2304 009 025-051	2008 010 000-051	8150 115 030-031
15 / -	5099 015 000-051	2304 012 030-051	2008 015 000-051	8150 117 070-031
20 / -	5099 020 000-051	2304 014 030-051	2004 020 000-051	8150 117 070-031
25 / 1"	5099 025 029-051	2304 020 030-051	2304 035 030-051	8150 117 060-031
32 / -	5099 032 029-051	2304 024 035-051	2304 041 035-051	8150 117 060-031
40 / 1½"	5099 040 029-051	2304 028 035-051	2304 047 035-178	8150 181 000-031
50 / 2"	5099 050 029-051	2304 041 035-051	2304 062 030-051	8150 182 000-031
65 / 2½"	5099 065 029-051	2304 057 035-051	2304 085 035-051	8150 209 000-031
80 / 3"	5099 080 029-051	2304 069 035-051	2304 100 040-051	8150 236 000-031
100 / 4"	5099 100 029-051	2304 088 035-051	2304 118 045-051	8150 236 000-031

**Wear parts kit SILIKON O-ring - design**

DN	Wear parts kit SILICONE 2, D1, D2 / D3	Pos. D1 O-ring	Pos. D2 / D3 <sup>2</sup> O-ring / seal	Pos. 2 Spring
10 / -	-	-	-	-
15 / -	-	2304 012 030-052	2007 015 000-052	8150 117 070-031
20 / -	-	-	-	-
25 / 1"	-	-	-	-
32 / -	-	-	-	-
40 / 1½"	-	-	-	-
50 / 2"	-	2304 041 035-052	2304 060 035-052	8150 182 000-031
65 / 2½"	-	2304 054 035-052	2304 085 035-052	8150 209 000-031
80 / 3"	-	-	-	-
100 / 4"	-	-	-	-

<sup>2</sup> (D2) O-ring = DN 25 - DN 100  
(D3) seal = DN10 - DN 20