KIESELMANN

FLUID PROCESS GROUP

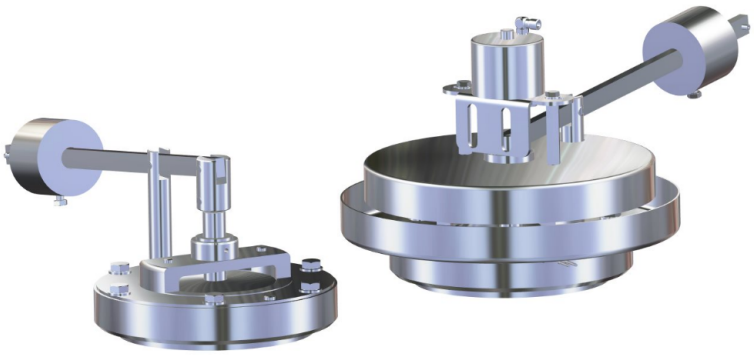
Translation of the original

Operating Instructions

Vacuum valve

Type 6164

weight-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 GmbH 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 GmbH - 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 GmbH 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 vakuum valve is used to prevent underpressure in tanks and vessels in plants of the food and drink industry, pharmaceutical and chemical industries as well as in biotechnology.

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

Functional impairment at low temperatures

Referring to the used sealing materials the vacuum valves are suitable for a minimum operating temperature at -10 °C.

➢ Low operating or ambient temperatures may applicable a impairment the function.

- Therefore, appropriate measures shall be taken for an operation at temperatures below +5°C to ensure a safe function of the valve.

⚠ CAUTION

Damage to the tank

The action of external force on the lever mechanism results in changes in the opening characteristics. This can result in damage to the tanks.

⚠ CAUTION

Malfunction due to contamination

Internal or external dirt may impair the function of the fitting or the safety equipment.

➢ Therefore the fitting must be operated in a way that protects it from external influences.

- The fitting must be cleaned internal and external at regular intervals.
- The fitting must be maintained at regular intervals.
- The fitting must be checked for its function at regular intervals.

⚠ CAUTION

Remove transport insurance before initial operation.

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

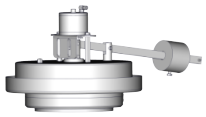
The function of the vacuum valve is to prevent impermissible pressure shortfalls (≤ 1 bar absolute pressure), in tanks and containers, which can result in damage. At underpressure, the valve opens to the atmosphere. The pressure in the tank is brought to the atmospheric pressure by the inflowing air. When the pressures become equal, the valve closes by the force of its weight without any external energy. The flow capacities referred to the relevant underpressure are shown in the capitel Characteristic curves.

In addition, the valve can be operated via a pneumatic actuator (see chapter Pneumatic actuator [▶ 12]). The position of the actuator can be retrieved via sensors which are mounted at a sensor mounting.

4.2 Commissioning, service and maintenance

4.2.1 Commissioning

4.2.1.1 Installation instructions



Fitting position

- The fitting is generally install vertical, as shown in the picture.

4.2.2 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.

4.2.3 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)

4.2.4 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.		

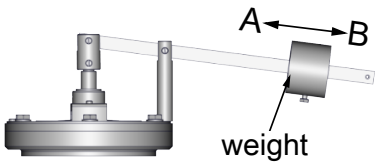
4.2.5 Cleaning

Cleaning

The optimum cleaning is carried out with the tank or pipe cleaning.

4.3 Pressure setting

The vacuum valve is set at the factory, by correspondingly positioning the weight, to an underpressure of 3 mbar. At this underpressure, the valve opens to the atmosphere.



NOTICE

If the position of the weight is changed towards direction (A), the closing function is not guaranteed any more.

If the position of the weight is changed towards direction (B), then the water column (Wc) increase on the maximum water column Wcmax.

Water column [WC] = Wassersäule [WS]

DN	50	65	80	100	125	150	200	250
						long lever / short lever		
Wc_{min} (mm)	30	30	30	30	30	30/30	30/30	30/30
Wc_{max} (mm)	150	50	200	150	240	320/120	125/100	370/80

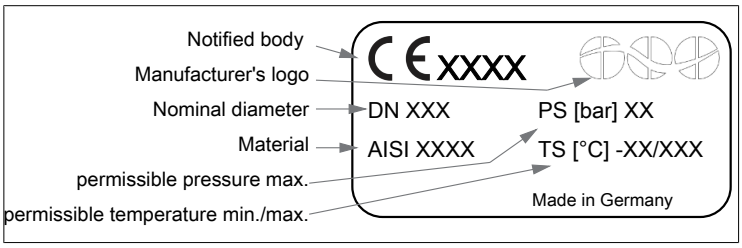
5 Technical data

5.1 Vacuum valve

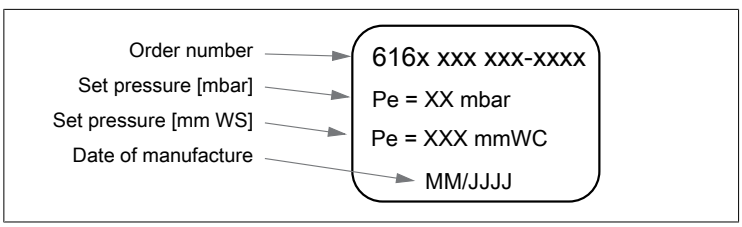
Model	Venting valve • weight-loaded • pneumatically liftable • optionally with heating element, temperature sensor, sensor mounting	
Valve size	DN 50; DN 65; DN 100 - DN 250	
Connection	• Flange connection • Flange with weld-on end end DIN EN 10357	
Operating pressure	DN 50 DN 65; DN 100 DN 125; DN 150 DN 200; DN 250	PN 16 PN 10 PN 16 PN 10
Set pressure	3 mbar (30 mmWS) (factory setting)	
Temperature range	Operating temperature: (medium dependent) Sterilization temperature: (SIP 30 min)	+0° to +100°C HNBR +100°C EPDM +140°C VMQ +90°C
Material: (in product contact)	stainless steel: Surface: Sealing material:	1.4301 / AISI 304 Ra < 0,8µm mat finish • EPDM • HNBR • VMQ

5.2 Identification

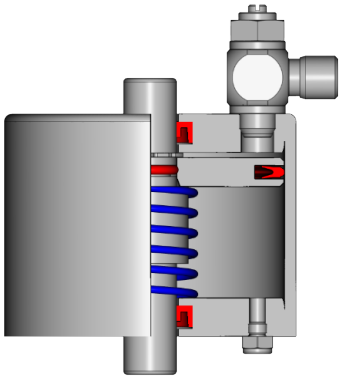
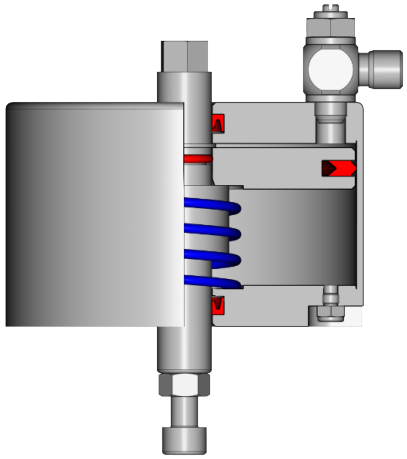
Identification 1
lasered



Identification 2
bonded



5.3 Pneumatic actuator

Type 76 **6162 076 900 – 032**		Type 104 **6162 104 900 – 032**	
			
Total height	85 mm	Total height	97 mm
Installation height	67 mm	Installation height	83 mm
Outside diameter	76 mm	Outside diameter	104 mm
Stroke	9 mm	Stroke	9 mm
Lifting force *)	1.844 N	Lifting force *)	3.822 N
weight	1,05 kg	weight	2,1 kg
*) at at control air pressure: 5 $bar_{(g)}$ Quality of control air ISO 8573-1:2010 quality class 3			

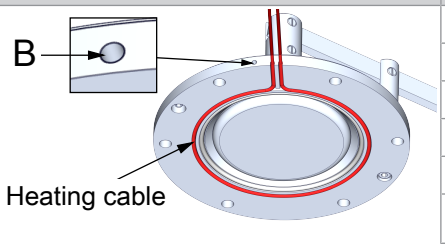
The selection of the actuator size can be made according to the following table:

Size	Control air	Actuator size at tank overpressure				
		0.5 bar	0.7 bar	1.0 bar	1.5 bar	2.0 bar
DN 50	5 bar	Ø 76	Ø 76	Ø 76	Ø 76	Ø 76
DN 65	5 bar	Ø 76	Ø 76	Ø 76	Ø 76	Ø 76
DN 80	5 bar	Ø 76	Ø 76	Ø 76	Ø 76	Ø 76
DN 100	5 bar	Ø 76	Ø 76	Ø 76	Ø 76	Ø 76
DN 125	5 bar	Ø 76	Ø 76	Ø 76	Ø 76	-
DN 150	5 bar	Ø 104	Ø 104	Ø 104	Ø 104	-
DN 200	5 bar	Ø 104	Ø 104	Ø 104	-	-
DN 250	5 bar	Ø 104	Ø 104	-	-	-

5.4 heating system

The heating of the vacuum valves via resistance heating cable with a defined heating zone, which run in an annular groove in the housing flange.

The heat tracing must be operated with a temperature control, so that exceeding the limit temperatures of the electric heating cables and the products to be heated is not exceeded. In the hole (B), a sensor (Ø5mm) can be used for temperature monitoring.

	Valve size	Usable cable length	Item number
	DN 50	-	-
	DN 65	382 mm	8615 483 038 – 000
	DN 80	482 mm	8615 483 048 – 000
	DN 100	525 mm	8615 483 052 – 000
	DN 125	622 mm	8615 483 062 – 000
	DN 150	738 mm	8615 483 073 – 000

	Valve size	Usable cable length	Item number
	DN 200	888 mm	8615 483 088 – 000
	DN 250	1.074 mm	8615 483 107 – 000
	-	1.100 mm	8615 483 110 – 000

6 Disassembly and assembly

6.1 Disassembly

NOTICE

All threaded joint have right-hand thread.

Dismantle pneumatic and electrical connections. Unscrew fittings for CIP,discharge and feed lines.

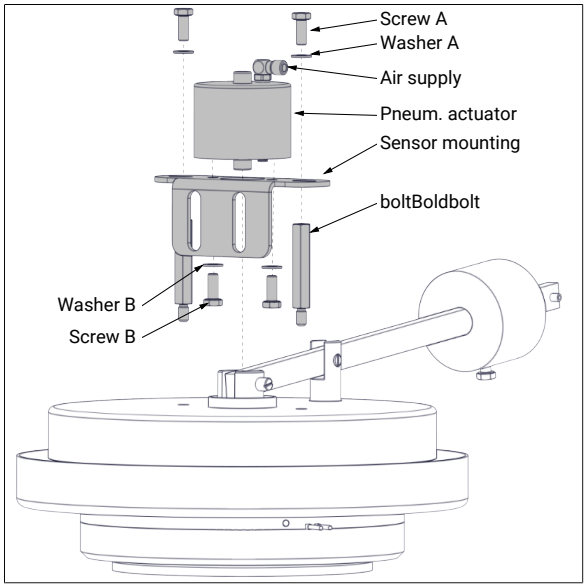
Pneumatic actuator

Unscrew the screws (A).

Remove the pneumatic actuator with bracket.

Unscrew the screws (B) and remove the bracket.

Unscrew the bolts.



splash guard

Unscrew the set screw.

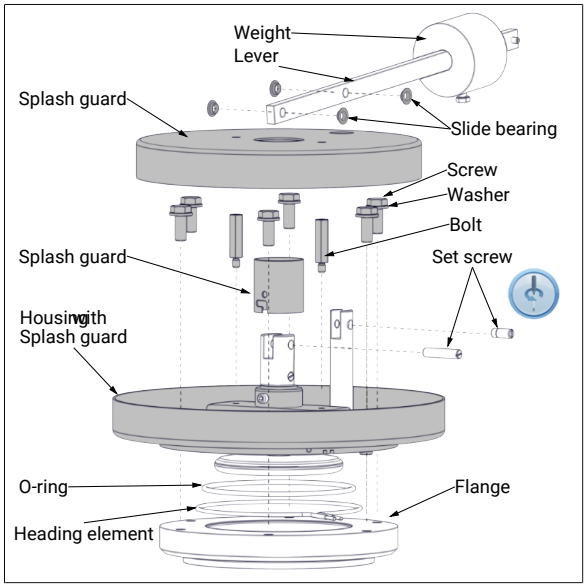
Remove the lever with the weight and the splash guard.

Unscrew the screws.

Remove the flange, O-ring and heating element.

Remove the inner splash guard.

Unscrew the bolts.



Basic valve

DN 65- DN 250

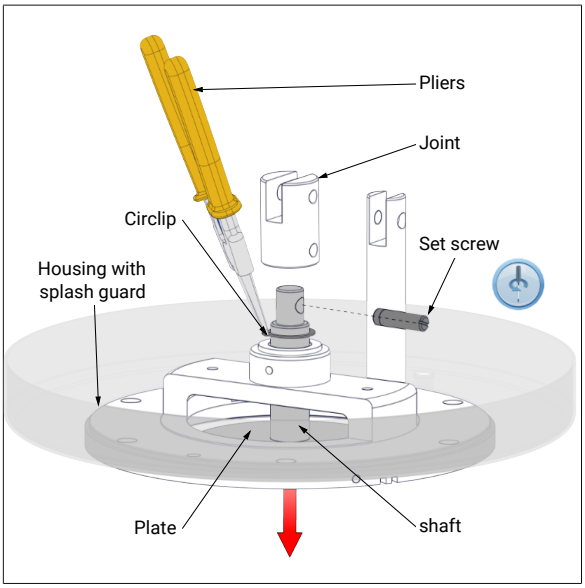
Unscrew set screw.

Remove the joint.

- DN50 - DN100

Remove circlip ring.

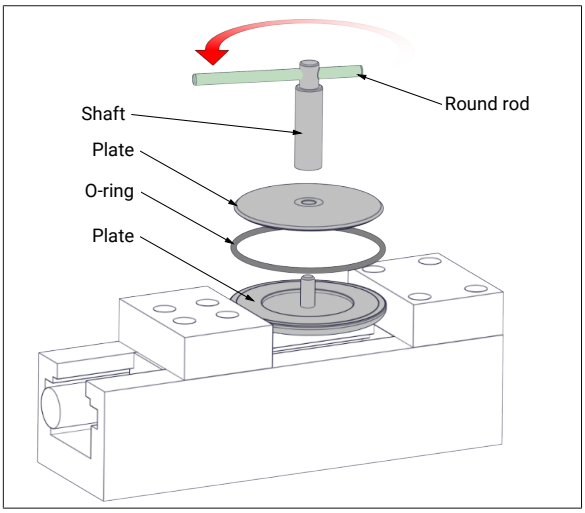
Remove downwards the shaft with plate A and plate B.



Tighten the plate B between soft jaws in a vice.

Unsrew with a fit round rod the shaft from the plate B.

Remove O-ring.



6.2 Assembly

- Thoroughly clean and slightly lubricate mounting areas and running surfaces.

  Assemble in reverse order.
- Check valve functions.

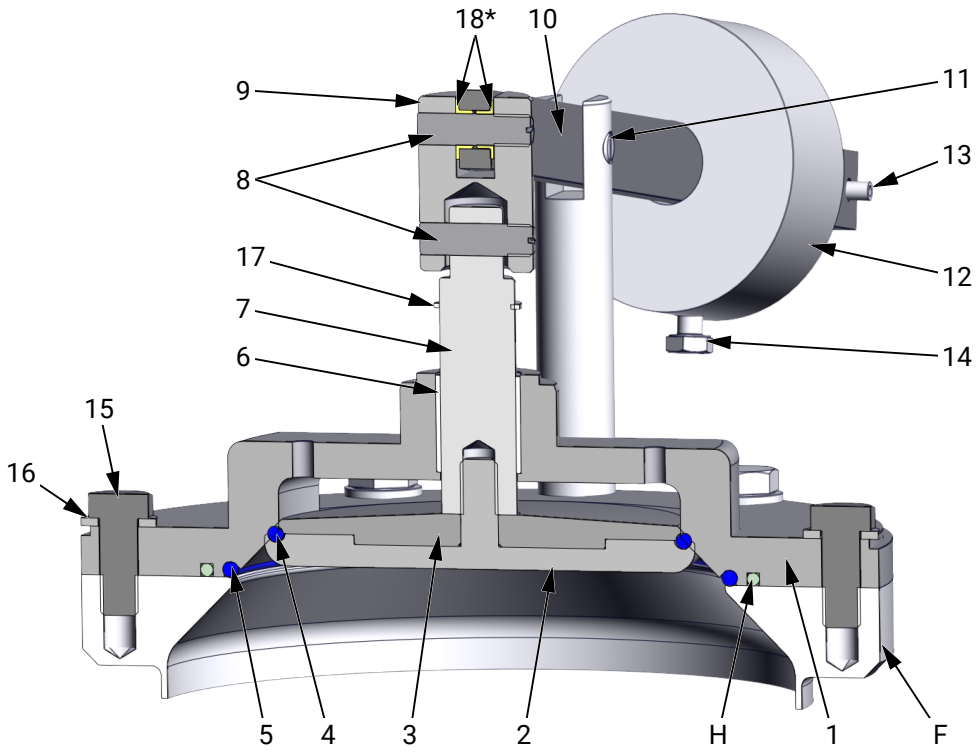
NOTICE

Thoroughly clean the plate and the shaft and secure the thread connection with removable screw retention.

7 Drawings and dimensions

7.1 Drawings

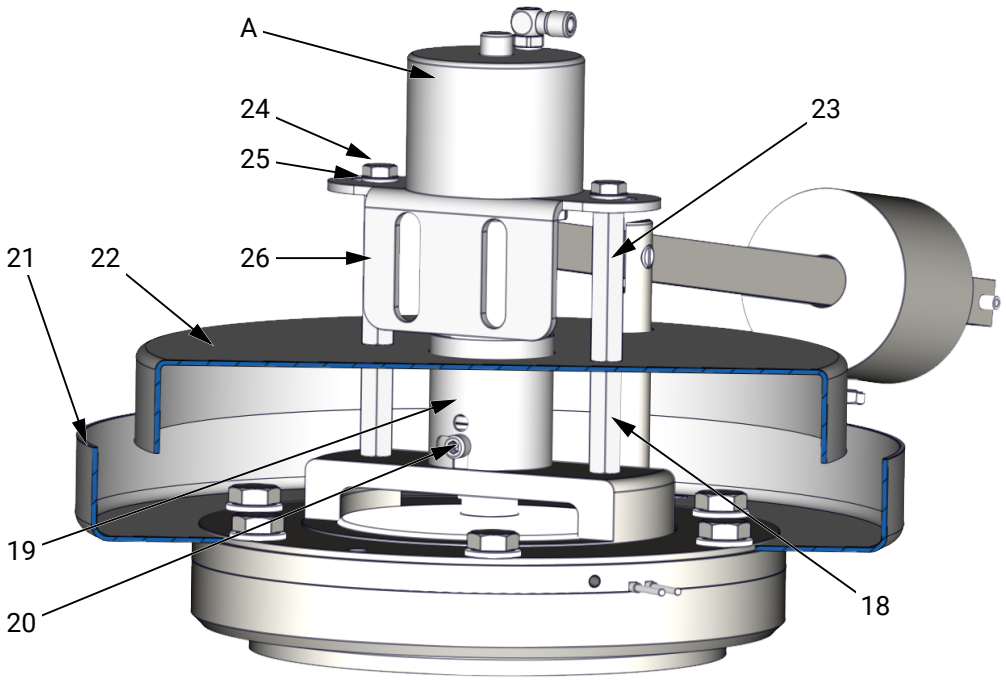
Vacuum valve - basic version



1	Housing	2	Plate
3	Plate	4	O-ring
5	O-ring	6	Slide bearing
7	Stem	8	Set screw
9	Joint	10	Lever
11	Set screw	12	Weight
13	Dowel pin	14	Screw
15	Screw	16	Washer
17	Locking ring	18*	Slide bearing
F	Flange	H	Heading element

*) ≥ DN 125

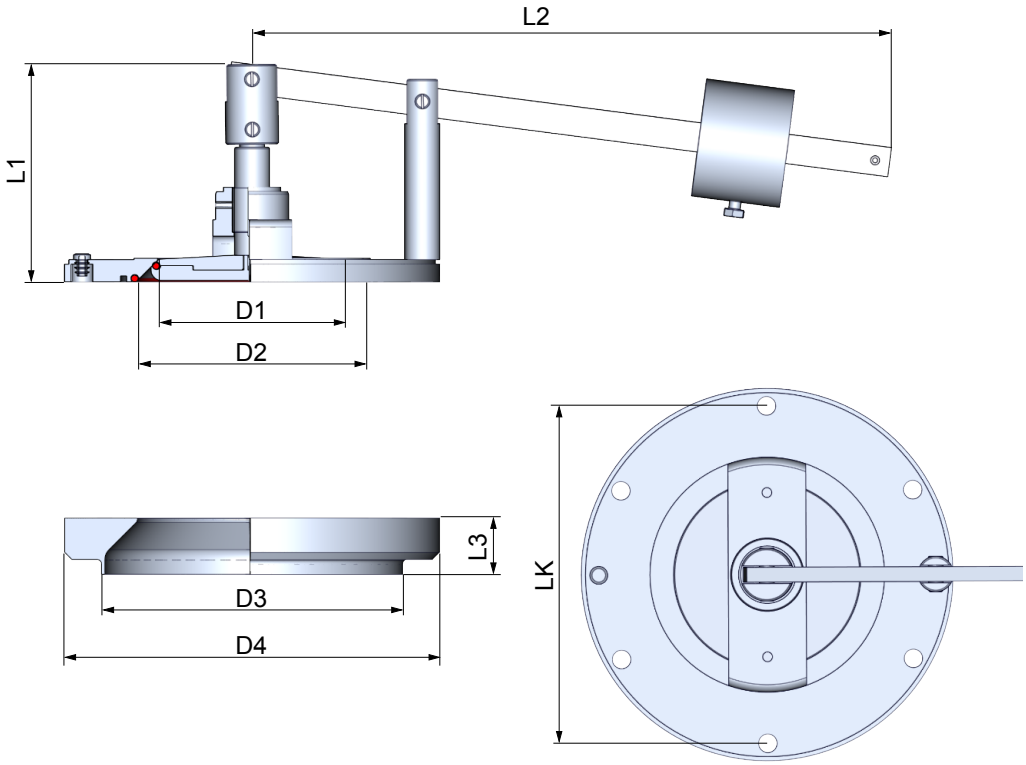
Version with pneumatic lifting device and splash guard



18	Bolt	19	Splash guard
20	Socket screw	21	Trip dray
22	Splash guard	23	Bolt
24	Screw	25	Washer
26	Sensor mounting	A	Actuator

7.2 Dimensions

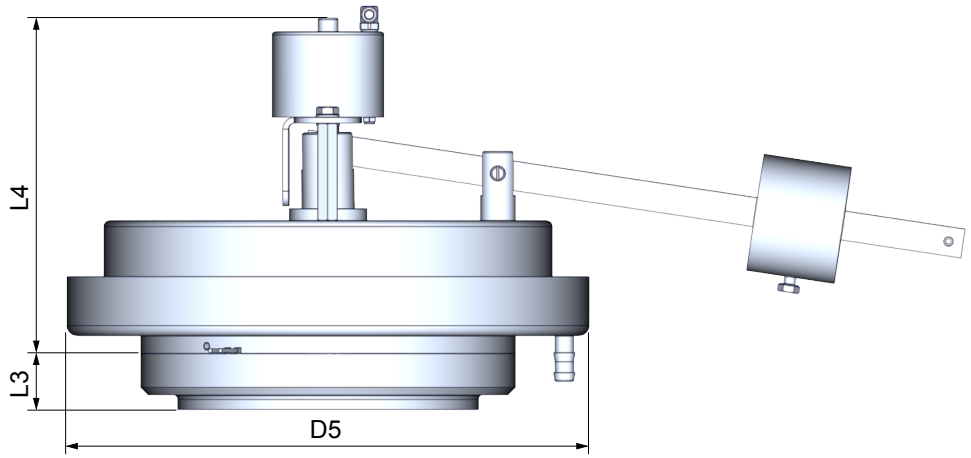
Vacuum valve - basic version



	Dimensions [mm]								
DN	**D1**	**D2**	**D3**	**D4**	**LK bolt circle**	**L1**	**L2**[1]	**L3**	**M**
50	55	74	85 x 2,0	129	115 [4 x M10]	112	229	26	150
65	68	91	104 x 2,0	154	130 [4 x M8]	126	235	29	165
80	84	112	129 x 2,0	204	160 [4 x M8]	129	334	34	?
100	104	131	154 x 2,0	204	180 [6 x M8]	130	334	30	180
125	128	155	204 x 2,0	254	230 [6 x M12]	150	433	38	200
150	152	180	254 x 2,0	304	260 [6 x M12]	149	433 / ?	39	210
200	204	243	304 x 2,0	326	300 [8 x M12]	201	426 / 673	40	275
250	252	298	354 x 2,0	406	355 [8 x M12]	219	481 / 673	54	335

1. L2 = short lever / long lever

Version with pneumatic lifting device and splash guard



	Dimensions [mm]		
DN	**D5**	**L3**	**L4**
50	196	26	198
65	230	29	214
80	279	34	219
100	279	30	217
125	354	38	235
150	366	39	260
200	412	40	311
250	481	54	333

8 Wearing parts

DN	Wear parts kit	O-ring (4)	O-ring (5)	Circlip (17)
	EPDM	EPDM	EPDM	1.4310 / AISI 301
50	6164 050 990-300	2304 050 050-054	2304 083 050-170	8084 015 100-030
65	6164 065 990-300	2304 065 050-054	2304 090 050-170	8084 020 120-031
80	-	-	-	-
100	6164 100 990-300	2304 100 050-054	2304 130 050-170	8084 020 120-031
125	6164 125 990-300	2304 125 050-054	2304 152 050-170	-
150	6164 150 990-300	2304 150 050-054	2304 183 050-170	-
200	6164 200 990-300	2304 200 050-054	2304 242 050-170	-
250	6164 250 990-300	2304 250 060-054	2304 300 050-054	8146 035 025-031

9 Characteristic curves

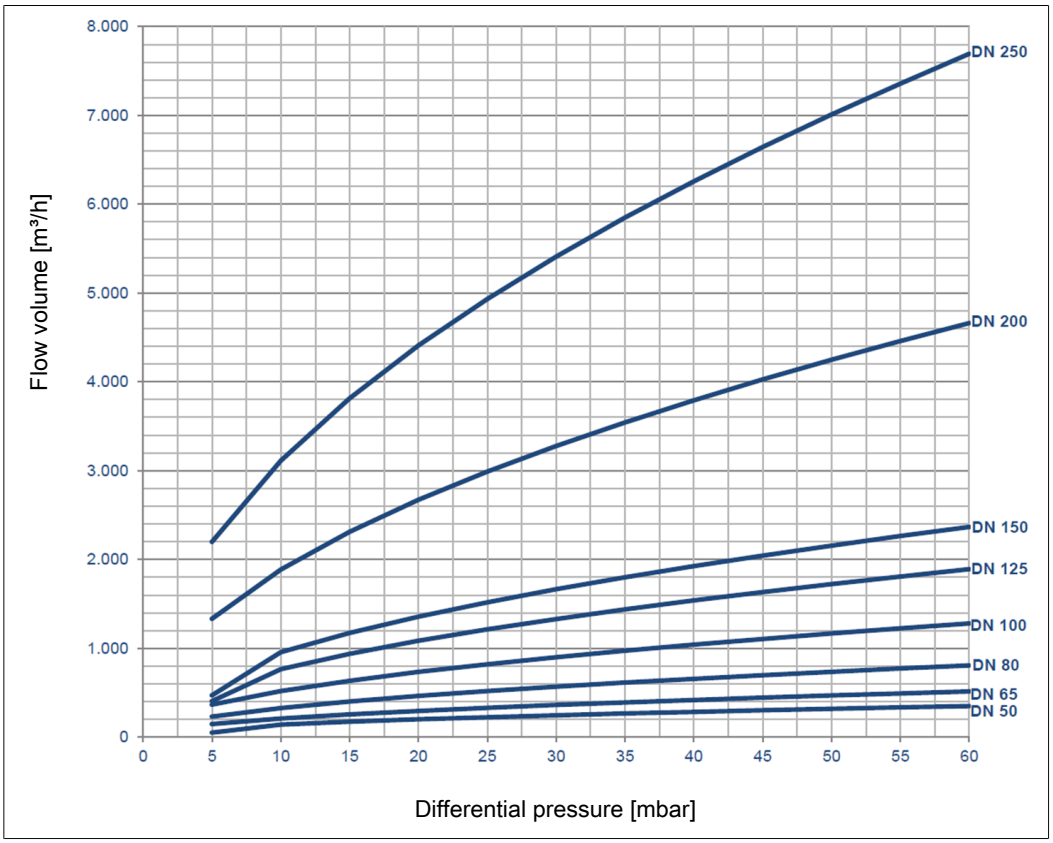
9.1 Performance chart

NOTICE

The flow capacities as well as the characteristic curves refer to the factory setting with a default set pressure of 3 mbar (30 mm WC). With this setting a steady flow characteristic will be achievable at a differential pressure of 5 mbar (50 mmWC). Changing the set pressure will affect the performance characteristics and the course of the characteristic curve.

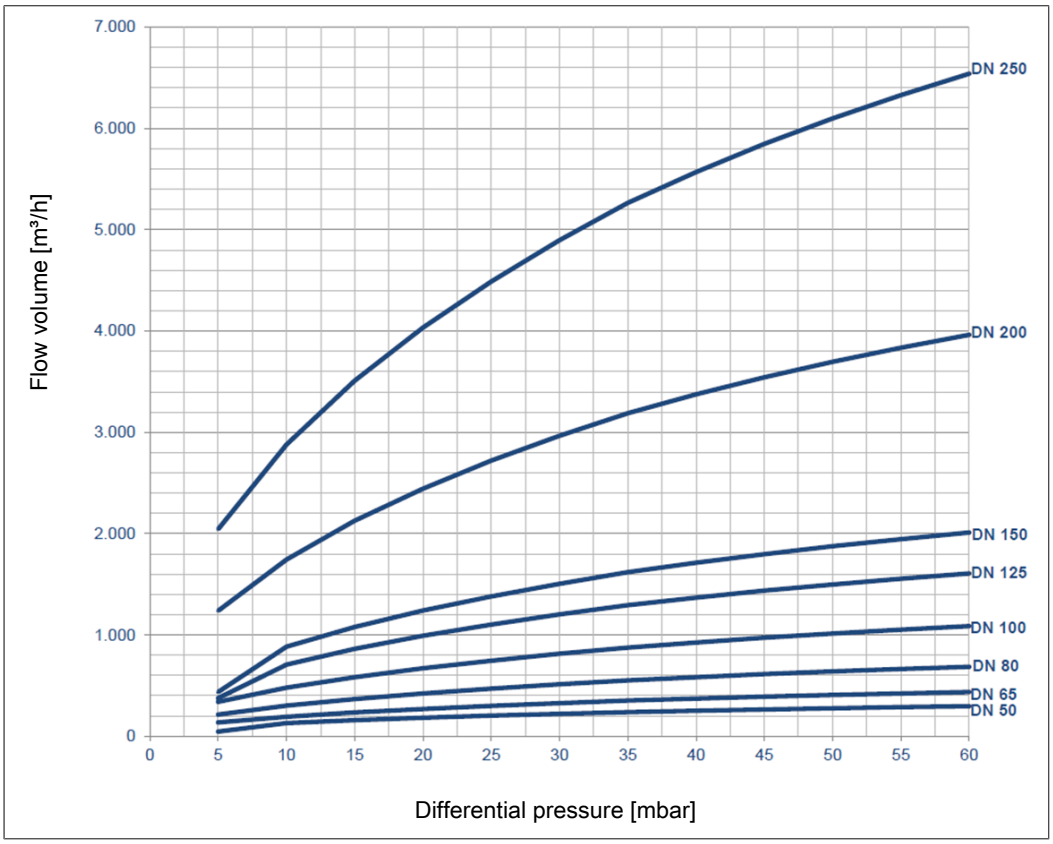
Flow characteristics for vacuum valves - basic version

Flow capacity								
Δ p	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250
mbar	m³/h	m³/h	m³/h	m³/h	m³/h	m³/h	m³/h	m³/h
Flow capacity								
5	50	147	230	366	405	470	1.332	2.199
10	141	208	326	517	765	957	1.866	3.112
15	173	255	400	634	937	1.173	2.311	3.815
20	200	295	462	733	1.083	1.356	2.671	4.409
25	224	330	517	820	1.212	1.517	2.990	4.934
30	245	361	567	899	1.329	1.664	3.278	5.140
35	265	391	613	972	1.437	1.799	3.544	5.849
40	284	418	656	1.041	1.538	1.925	3.792	6.258
45	301	444	696	1.105	1.633	2.043	4.026	6.644
50	318	468	735	1.166	1.723	2.156	4.248	7.010
55	334	492	771	1.224	1.808	2.263	4.459	7.359
60	349	514	806	1.279	1.890	2.366	4.662	7.694



Flow characteristics for vacuum valves with splash guard

Flow capacity								
Δ p	**DN 50**	**DN 65**	**DN 80**	**DN 100**	**DN 125**	**DN 150**	**DN 200**	**DN 250**
mbar	**m³/h**	**m³/h**	**m³/h**	**m³/h**	**m³/h**	**m³/h**	**m³/h**	**m³/h**
Flow capacity								
5	50	147	230	366	405	470	1.332	2.199
10	141	208	326	517	765	957	1.866	3.112
15	173	255	400	634	937	1.173	2.311	3.815
20	200	295	462	733	1.083	1.356	2.671	4.409
25	224	330	517	820	1.212	1.517	2.990	4.934
30	245	361	567	899	1.329	1.664	3.278	5.140
35	265	391	613	972	1.437	1.799	3.544	5.849
40	284	418	656	1.041	1.538	1.925	3.792	6.258
45	301	444	696	1.105	1.633	2.043	4.026	6.644
50	318	468	735	1.166	1.723	2.156	4.248	7.010
55	334	492	771	1.224	1.808	2.263	4.459	7.359
60	349	514	806	1.279	1.890	2.366	4.662	7.694



10 Appendix

10.1 Declaration of incorporation

CE

Declaration of incorporation

Translation of the original

Manufacturer / authorised representative:

KIESELMANN GmbH
Paul-Kieselmann-Str. 4-10
75438 Knittlingen
Germany

Authorised representative:
(for compiling technical documents)

Achim Kauselmann
(Documentation / Development)

KIESELMANN GmbH
Paul-Kieselmann-Str. 4-10
75438 Knittlingen
Germany

Product name	Function
pneum. Lift actuators	Stroke movement
pneum. Rotary actuators	Rotary movement
Ball valves	Media cutoff
Butterfly valves	Media cutoff
Single seat valves	Media cutoff
Flow control valves	Control of liquefied media
Throttle valve	Control of liquefied media
Overflow valve	Definition of fluid pressure
Double seat valve	Media separation
Bellow valves	Sampling of liquids
Sampling valves	Sampling of liquids
Two way valves	Media cutoff
Tankdome fitting	Prevention of overpressure and vacuum, Tank cleaning
Safety valve	Prevention of overpressure

The manufacturer hereby states that the above product is considered as an incomplete machine in the sense defined in the Directive 2006/42/EC on Machinery. The above product is exclusively intended to be installed into a machine or an incomplete machine. The said product does not yet conform to all the relevant requirements defined in the Directive on Machinery referred to above for this reason.

The specific technical documents listed in Appendix VII, Part B, have been prepared. The Authorized Agent empowered to compile technical documents may submit the relevant documents if such a request has been properly justified.

Commissioning of an incomplete machine must not only carried out if it has been determined that the respective machine into which the incomplete machine is to be installed conforms to the regulations set out in the Directive on Machinery referred to above.

The above product conforms to the requirements of the directives and harmonized standards specified below:

- Directive 2014/68/EU
- EN ISO 12100 Safety of machinery

Knittlingen, 21.09.2017

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