KIESELMANN

FLUID PROCESS GROUP

Translation of the original

Operating Instructions

Small Valves

Small Valve: Type 5101

Aseptic Small Valve: Type 5102

Nominal size:	DN 8, DN 10, DN 15
Actuation:	Manual, pneumatic



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Table of Contents

1 General informations 4
1.1 Informations for your safety 4
1.2 Marking of security instructions 4
1.3 General designated use 4
1.4 Personnel 4
1.5 Modifications, spare parts, accessories 5
1.6 General instructions 5
2 Safety instructions 6
2.1 Intended use 6
2.2 General notes 6
2.3 General safety instructions 6
3 Delivery, transport and storage 7
3.1 Delivery 7
3.2 Transport 7
3.3 Storage 7
4 Specification 8
4.1 Modular system 8
4.2 Valve types 8
5 Function and operation 9
5.1 Description of function 9
5.2 Basic Position of Valve 9
5.3 Activation System and End Position Feedback 10
5.4 Pneumatic valve activation 10
6 Commissioning, service and maintenance 11
6.1 Commissioning 11
6.1.1 Installation Instructions 11
6.1.2 General welding guidelines 11
6.1.3 Use in EX area 11
6.2 Service 12
6.3 Cleaning 12
7 Technical data 13
8 Disassembly and assembly 14
8.1 Disassembly 14
8.1.1 Small Valve 15
8.1.2 Aseptic Small Valve 17
8.2 Assembly 19
9 Drawings and dimensions 20
9.1 Query Units 20
9.2 Drawings 21
9.3 Dimensions 24
10 Wearing parts 26
10.1 Spare parts list 26
11 Appendix 27
11.1 Declaration of incorporation 27

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

Small valves are used as manually or pneumatically controlled shut-off valves in the beverage and food industry, in pharmaceuticals, biotechnology and the chemicals 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

To avoid air leaking, only use pneumatic connection parts that have an O-ring seal facing the even surface.



⚠ 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.

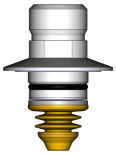
- To avoid damage to seals and bearings,
  - products up to DN 125 / OD 5 inch should be stored horizontally for maximum 6 months.
  - products larger than DN 125 / 5 inch, should be stored in the upright position with the actuator on top.
- Don't store any objects on the products.
- Protect the products 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 60% ±5%).
- Protect seals, bearings and plastic parts for UV light and ozone.

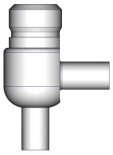
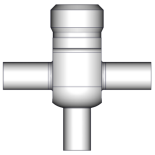
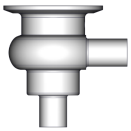
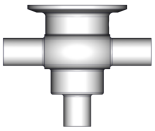
4 Specification

4.1 Modular system

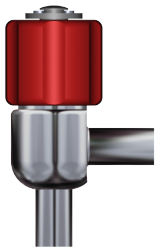
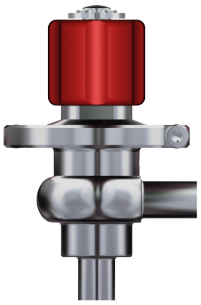
Activation and query systems			
		KI-Top control head	
			
Closing ring	Sensor holder	Hood: Stainless steel	Hood: Transparent

Drive	
	
Manual	Pneumatic

Closing unit	
	
Piston (PEEK, PTFE)	Bellows aseptic

Housing			
for piston		for bellows	
			
S - S	SS - S	S - S	SS - S

4.2 Valve types

Small valve		Aseptic small valve	
Manual	Pneumatic	Manual	Pneumatic
			

5 Function and operation

5.1 Description of function

Valve function:	– Shut off liquid media in pipelines. (see Fig. A and B)
Actuation:	• Pneumatic actuation by means of a lift drive (air/spring or air/air) • Manual actuation by means of a handwheel (open ↺ / close ↻)
Activation:	• Pneumatic via 3/2-way solenoid valves (See "Pneumatic Valve Activation")

Description of function - Lift actuator

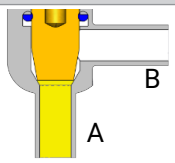
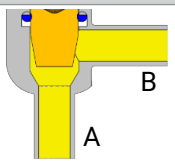
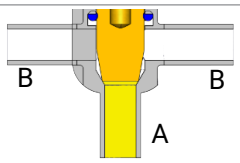
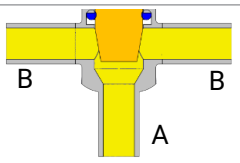
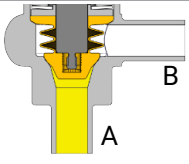
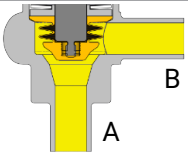
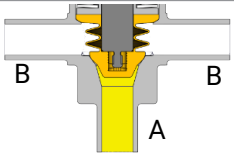
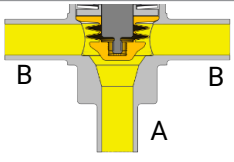
Normally closed (NC) Basic position: Valve close	
pneum. operated	→ opens the valve
undivided pneum. operated	→ spring force closes the valve

normal open (NO) Basic position: Valve open	
pneum. operated	→ valve “CLOSE“
undivided pneum. operated	→ spring force opens the valve

double acting (DA) Basic position: not defined[1]	
pneum. operated	→ opens the valve
undivided pneum. operated	→ valve “CLOSE“

1. The valve position is not defined in case of decrease of pressure in the compressed air line.

5.2 Basic Position of Valve

Basic positon: **Kind of actuation:**	**Valve closed** **Normally closed (NC)**	**Valve open** **Normally open (NO)**
Type: 5101 S-S Small valve	 Section A - B closed	 Section A - B opened
Type: 5101 SS-S Small valve	 Section A - B closed	 Section A - B opened
Type: 5102 S-S Angle valve	 Section A - B closed	 Section A - B opened
Type: 5102 SS-S Angle valve	 Section A - B closed	 Section A - B opened

5.3 Activation System and End Position Feedback



Feedback unit -optional-

Optionally, modular valve control head systems can be installed to the actuator for reading and actuating valve positions. The standard version is a closed system with SPS or ASI-bus switch-on electronics, and integrated 3/2-way solenoid valves. For tough operating conditions we recommend employing a high-grade steel cover.



Feedback unit with finger guard -optional-

For the acquisition of the valve positions over inductive initiators (Sensors), a feedback unit is mounted on the actuation. The enquiry takes place over the position of the piston rod.

5.4 Pneumatic valve activation

Valve functions	Pneum. activation Pneumatic activation via control head with solenoid valve (MV) Pneumatic activation via control head with solenoid valve (MV)	Pneum. activation Pneumatic activation via external solenoid valves (MV external)
Valve OPEN with compressed air Valve OPEN with compressed air	Control supply air P ➟ MV1➟ P1/LA	Control supply air ext. MV ➟ LA
Valve CLOSED by spring force Valve CLOSED by spring force	Ventilation LA/P1 ➟ MV1 ➟ R	Ventilation LA ➟ ext. MV

D = De-aeration

LA = Air connection

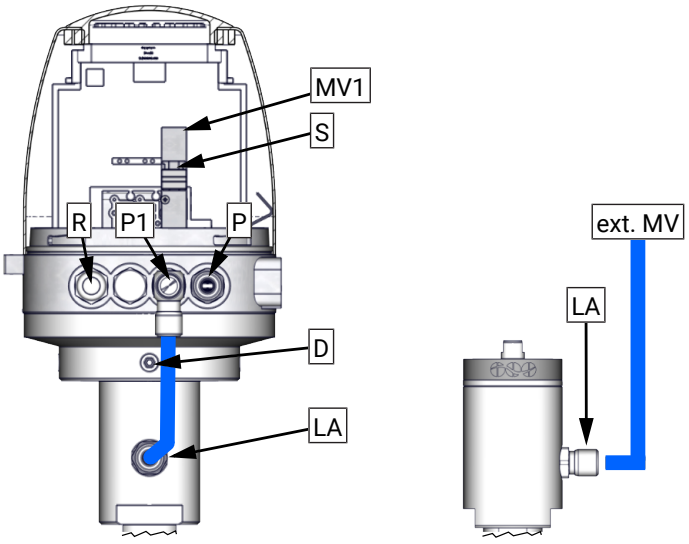
MV = Solenoid valve

P = Supply air connection

P1 = Control air

R = Ventilation silencer

S = Slide switch, manual actuation of the solenoid valve



6 Commissioning, service and maintenance

6.1 Commissioning

6.1.1 Installation Instructions

Installation Position

The valve must be installed so that the product can run out of the outlet spigot leaving no residue.

6.1.2 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.

6.1.3 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)

6.2 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; PTFE; 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.

6.3 Cleaning

Optimum cleaning is achieved with pipeline cleaning.

7 Technical data

Model:

Small Valve

Angle valve, T valve

- Manual actuation
- Pneumatic actuation

Valve size: DN 8; DN 10; DN 15

Connection type:

- *Weld-on end DIN EN 10357*

Nominal pressure:

Nominal width	Type 5101	Type 5102
DN 8	PN 10	PN 10
DN 10	PN 8	PN 10
DN 15	PN 6	PN 6

Temperature range:

Ambient temperature (air): *+4° to +45°C*

Operating temperature (depends on medium): *+2°C to +100°C*

Sterilisation temperature:

- Bellow (PTFE): 140 °C (SIP 20 min)
- Piston (PTFE; PEEK): 85 °C

Leak rate: *A (EN 12266-1)*

Control air: Control air pressure: 4.0 - 8.0 bar; Control air quality: *ISO 8573-1:2010 [3:(≤5 µm):4:4]*

Material (in contact with product):

Stainless steel: 1.4301 / AISI 304

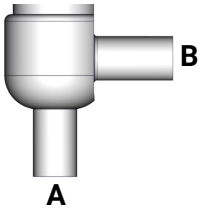
Surface: Ra < 0,8µm mat finish

Sealing material:

Piston: PTFE, PEEK

Bellow: PTFE

O-ring: EPDM, HNBR, FKM

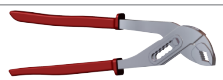


Nominal size	KV value [m³/h]		Closing pressure [bar]	Stroke [mm]
	A →B	B → A		
DN 8	0,4	0,5	10 / 10	2,0
DN 10	0,6	0,7	8 / 10	2,5
DN 15	0,8	0,9	6 / 6	2,5

8 Disassembly and assembly

8.1 Disassembly

Assembly Tools

T1		*Combination wrench-Set*	*SW 8 - SW 24*	-
T3		*Screwdriver Set*	*Size 2,5 - 10* *PH0,PH1*	-
T23		*Circlip pliers*	-	-
T24		*Water pump pliers*	-	-
T30		*Needle*	-	-
T31		*Round rod*	3 mm	-

NOTICE

All threaded joint have right-hand thread.

Unscrew and remove control air, steam resp. cleaning lines and electrical lines, complete feedback unit or control head.

8.1.1 Small Valve

Type 5101 Small Valve Manual

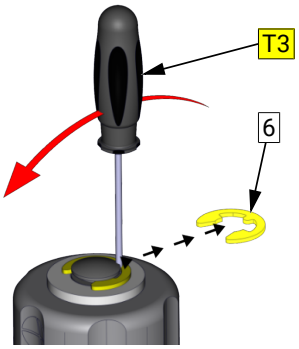


Fig. 1

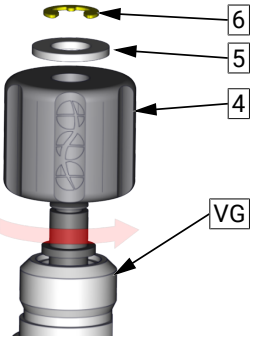


Fig. 2

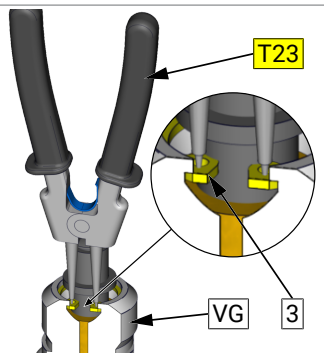


Fig. 3

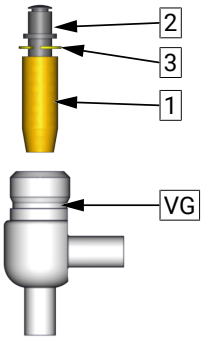


Fig. 4

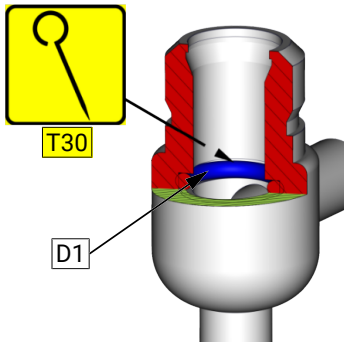


Fig. 5

Fig. 1

Use a screwdriver to remove the retaining ring (6) and washer (5).

Fig. 2

Unscrew the handwheel (4).

Fig. 3

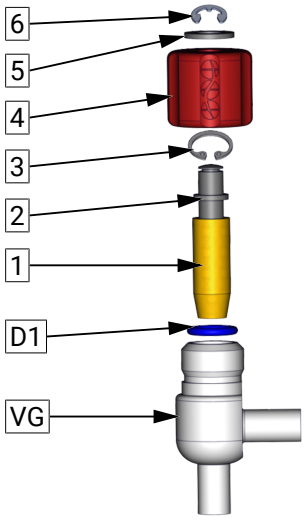
Remove retaining ring (3).

Fig. 4

Remove shaft (2) with piston (1) from the housing cover (4).

Fig. 5

Pierce the O-ring (D1) with a sharp tool and carefully remove it from the groove.



Type 5101 Small Valve Pneumatic

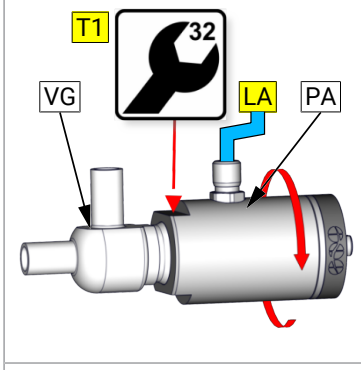


Fig. 1

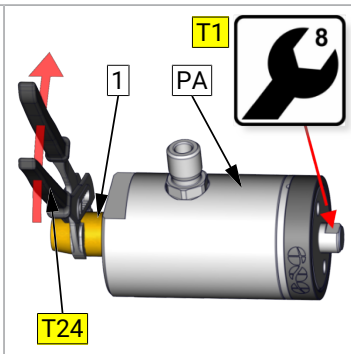


Fig. 2

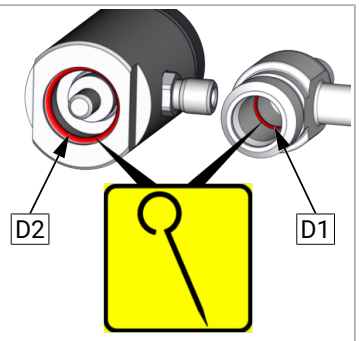


Fig. 3

Fig. 1

Connect the compressed air to (LA) and pressurise the lift drive (PA) with air. The valve opens.

Unscrew the valve core from the housing (VG).

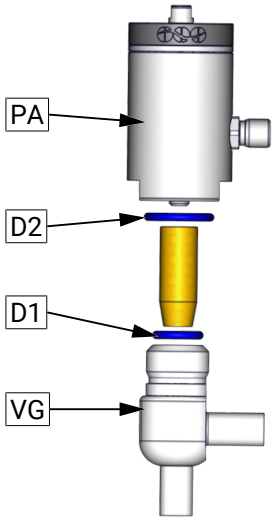
Disconnect the compressed air to (LA).

Fig. 2

Unscrew the piston (1). Use the wrench face for counter-torque.

Fig. 3

Pierce the O-rings (D1) and (D2) with a sharp tool and carefully remove them from the groove.



8.1.2 Aseptic Small Valve

Type 5102 Aseptic Small Valve Manual

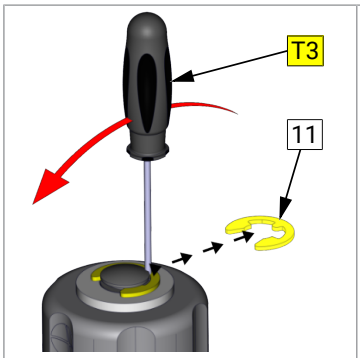


Fig. 1

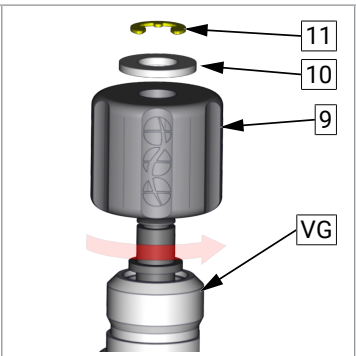


Fig. 2

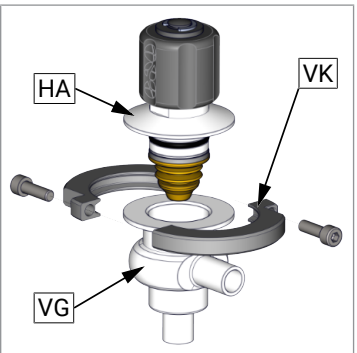


Fig. 3

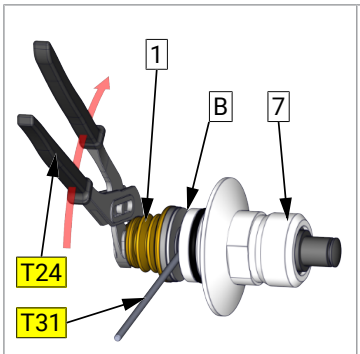


Fig. 4

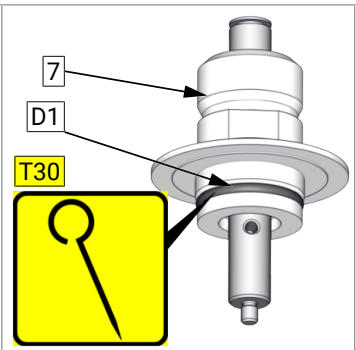


Fig. 5

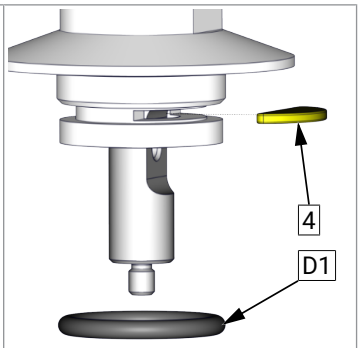


Fig. 6

Fig. 1

Use a screwdriver to remove the retaining ring (11) and washer (10).

Fig. 2

Unscrew the handwheel (9).

Fig. 3

Unscrew the locking clip (VK).

Remove the valve core from the housing.

Fig. 4

Unscrew the bellows (1). Use the round bar for counter-torque.

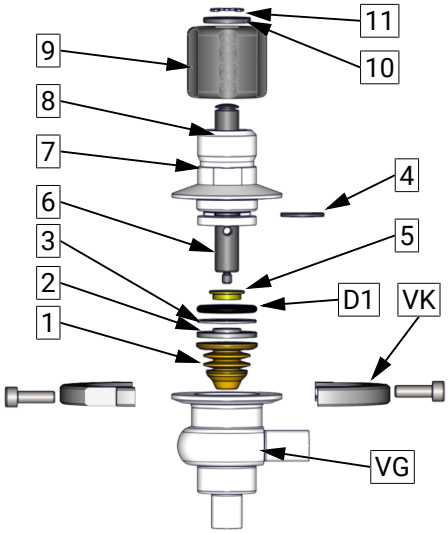
Remove the guide (2), cup spring (3) and slide bearing (5).

Fig. 5

Pierce the O-ring (D1) with a sharp tool and carefully remove it from the groove.

Fig. 6

Remove the anti-twist device (4).



Type 5102 Aseptic Small Valve Pneumatic

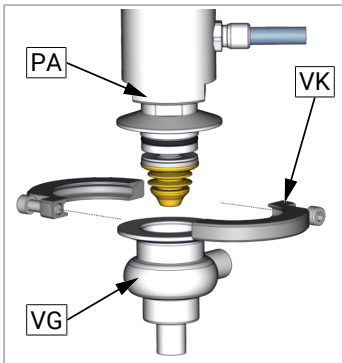


Fig. 1

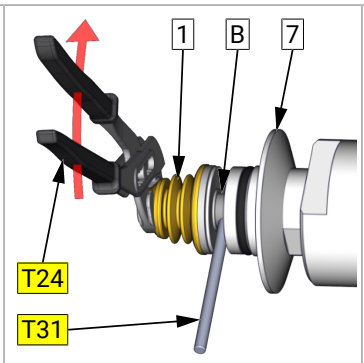


Fig. 2

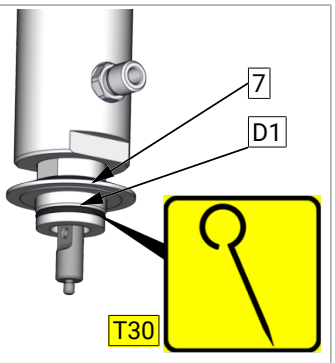


Fig. 3

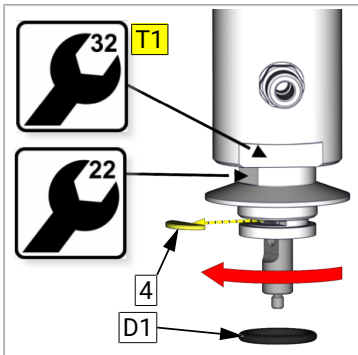


Fig. 4

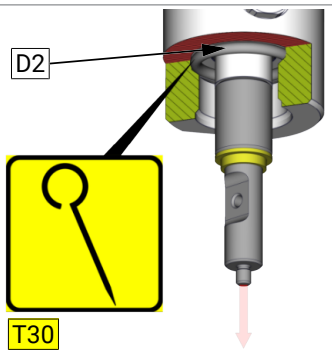


Fig. 5

Fig. 1

Connect the compressed air to (LA) and pressurise the lift drive with air. The valve opens.

Unscrew the locking clip (VK).

Remove the valve core.

Disconnect the compressed air.

Fig. 2

Unscrew the bellows (1).

Use the round bar for counter-torque.

Fig. 3

Pierce the O-ring (D1) with a sharp tool and carefully remove it from the groove.

Fig. 4

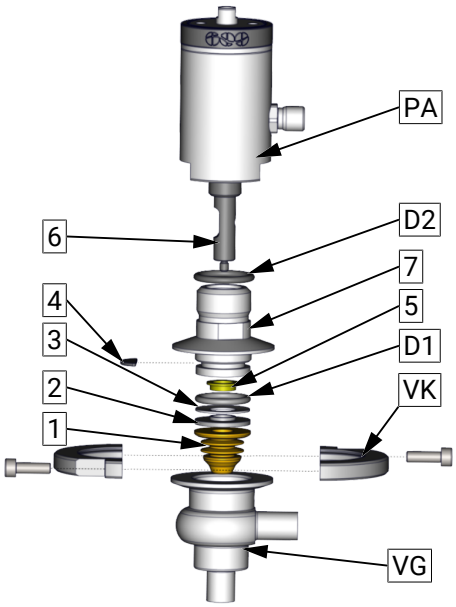
Remove the anti-twist device (4).

Unscrew the housing cover from the lift drive.

Fig. 5

Remove the slide bearing (5).

Pierce the O-ring (D2) with a sharp tool and carefully remove it from the groove.



8.2 Assembly



⚠ CAUTION

➢ The threaded connection (G1) on the piston/bellows and shaft is secured with screw locking. After unscrewing the piston/bellows, always replace it with a new one.

– Remove all adhesive residue on the threaded connection (G1) and degrease thoroughly. Secure the new piston/bellows during assembly with *Screw retention detachable (e.g. Loctite 243)*.



NOTICE

Leaks on the piston/bellows

To ensure the seal on the piston/bellows, the valve must be mounted in the opened state.

➢ Open manually actuated valves 2-3 revolutions before inserting them in the housing.

➢ Pressurise the pneumatic valves with air before installing them in the housing.

– Install the valve in the housing only after this has been done.

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



NOTICE

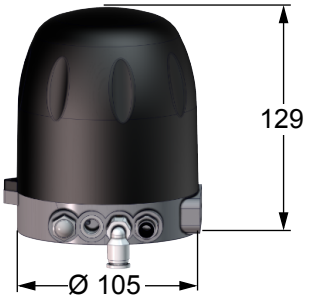
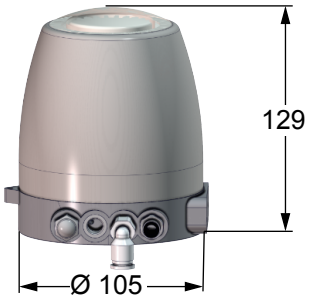
Alternately press and roll the O-rings into the groove with round body.

Performance test

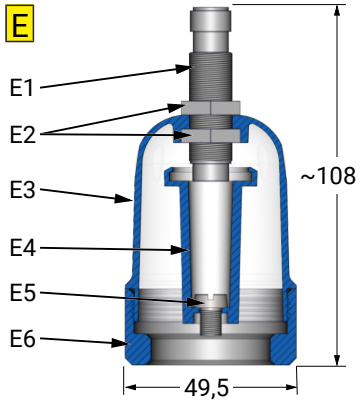
- Check the function according to the specified performance data in the operating state.

9 Drawings and dimensions

9.1 Query Units

Control head KI-TOP	
with plastic hood - transparent	**with stainless steel hood**
	

Adapter for control head KI-TOP	
• Adapter plate complete 6125072000-087	

End position feedback with contact protection (E)	
• E1 = Sensor • E2 = Locknut • E3 = Hood, transparent • E4 = Holder • E5 = Screw • E6 = Adapter	

9.2 Drawings

Small Valve Type 5101

- PEEK version

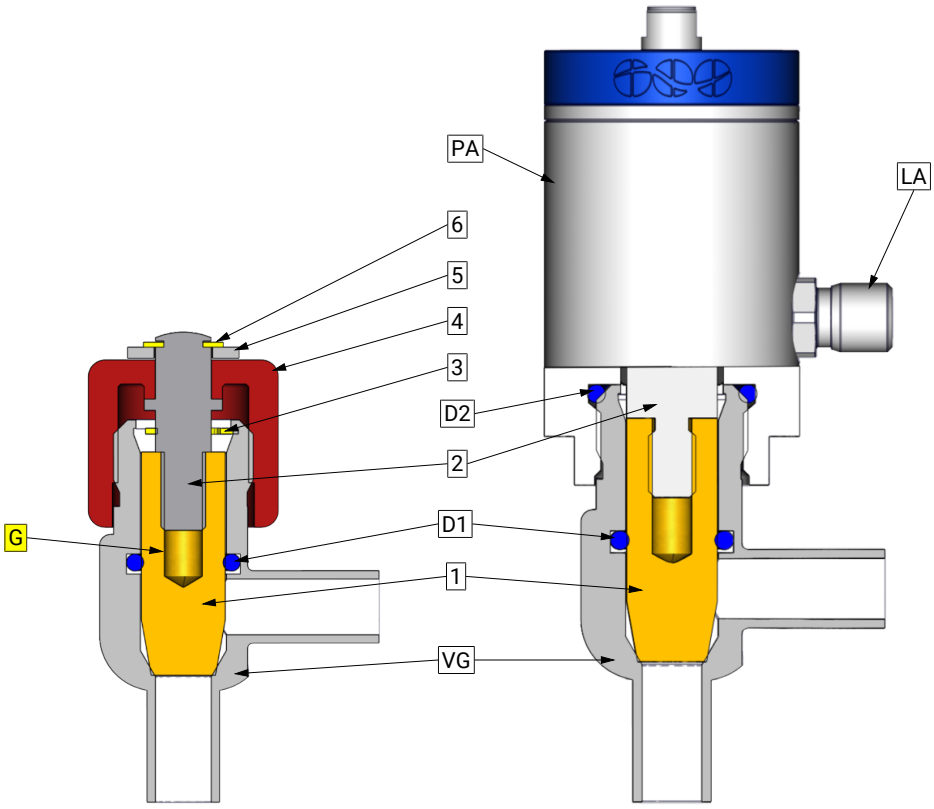


Fig. 1 5101_PEEK-piston

VG	Housing	D1	O-ring
1	Piston	2	Shaft
3	Retaining ring	4	Handwheel
5	Washer	6	Retaining ring
D2	O-ring	G	Screw locking
PA	Pneumatic lift drive	LA	Plug connection for air connection

Small Valve Type 5101

- PTFE version

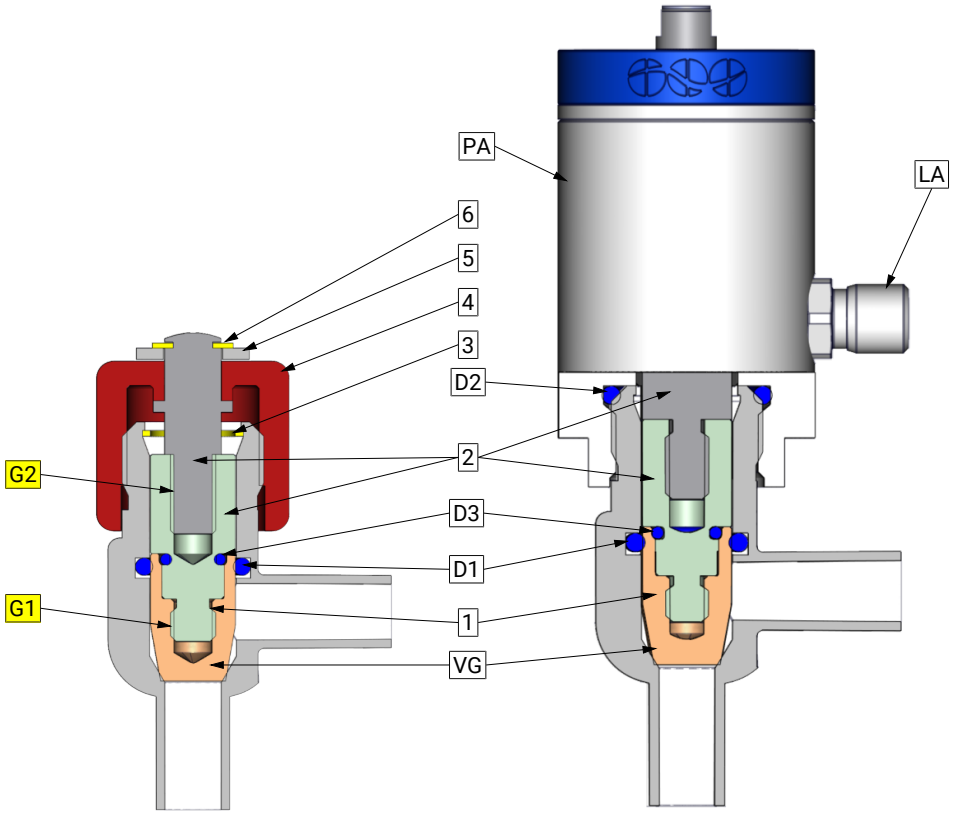


Fig. 2 5101_PTFE-piston

VG	Housing	D1	O-ring
1	Piston	2	Shaft
3	Retaining ring	4	Handwheel
5	Washer	6	Retaining ring
D2	O-ring	G1	Screw locking, releasable
PA	Pneumatic lift drive	LA	Plug connection for air connection
D3	O-ring	G2	Screw locking, high-strength

Aseptic Small Valve Type 5102

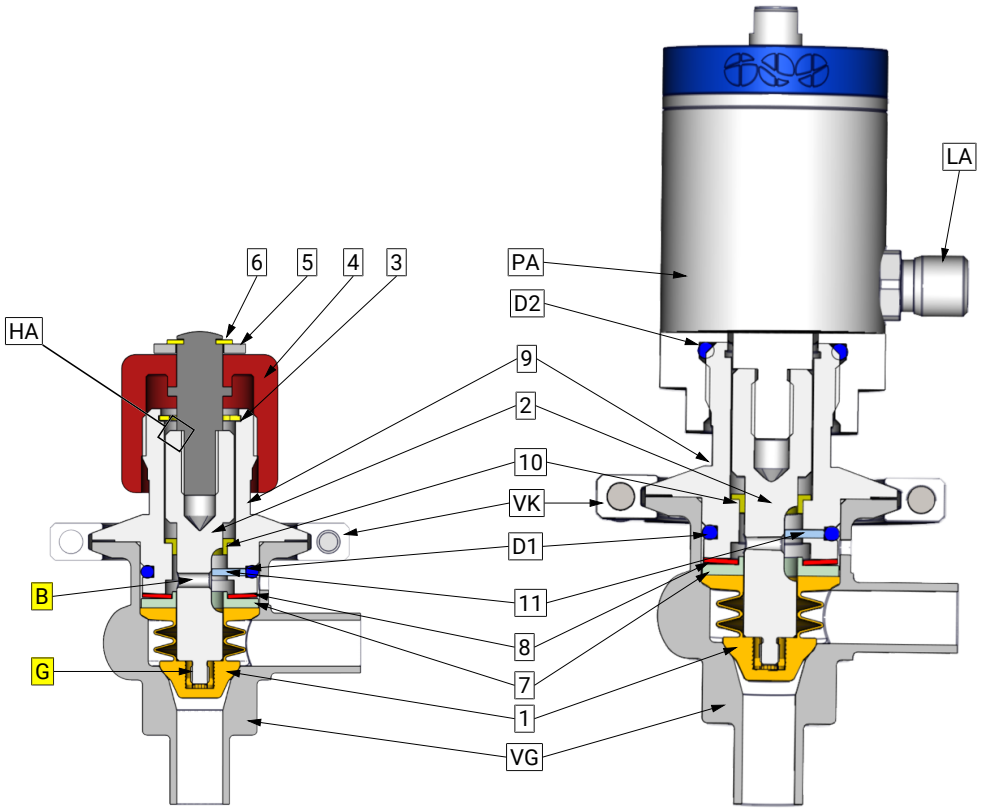


Fig. 3 5102_bellow

VG	Housing	D1	O-ring
1	Bellows	2	Shaft
3	Retaining ring	4	Handwheel
5	Washer	6	Retaining ring
7	Guide	8	Cup spring
9	Housing cover	B	Drill hole Ø 3 mm
G	Screw locking	VK	Locking clip complete
PA	Pneum. lift drive air op./spr. cl.	LA	Air connection
10	Sliding bearing	11	Washer for anti-twist device
HA	Manual drive	D2	O-ring

9.3 Dimensions

Kleinventil Typ 5101

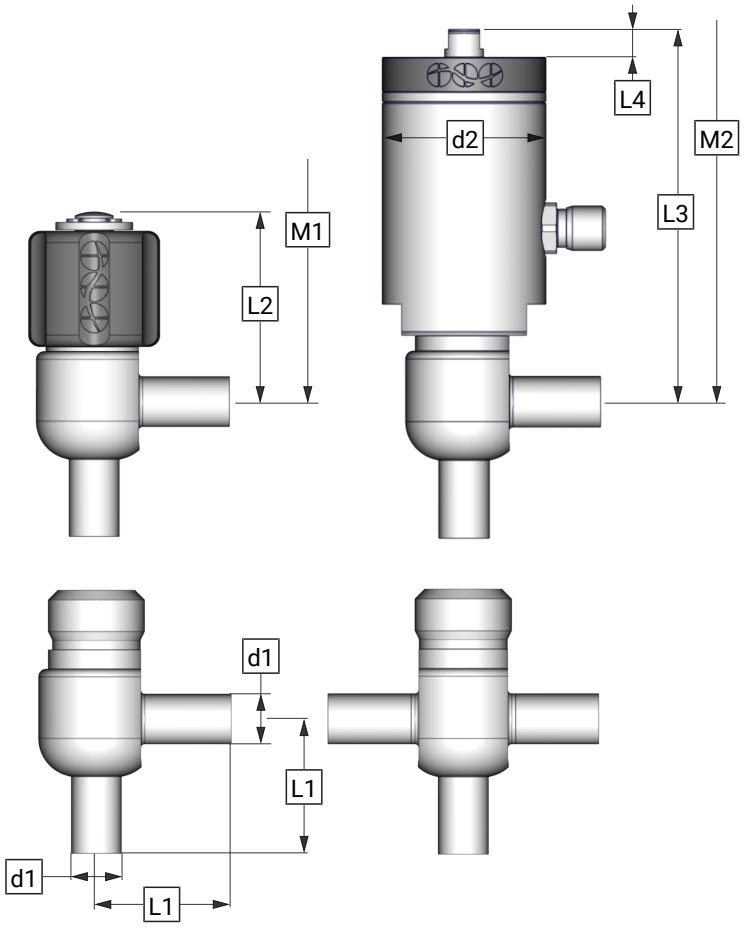


Fig. 4

	d1	d2	L1	L2	L3	L4	M1	M2
DN 8	10 x 1,0	42	35	~ 50	78,5	~ 7,2	~ 95	~ 141
DN 10	13 x 1,5	42	35	~ 50	78,5	~ 7,2	~ 95	~ 141
DN 15	19 x 1,5	42	31,5	~ 50	145	~ 7,2	-	~ 147

Aseptik - Kleinventil Typ 5102

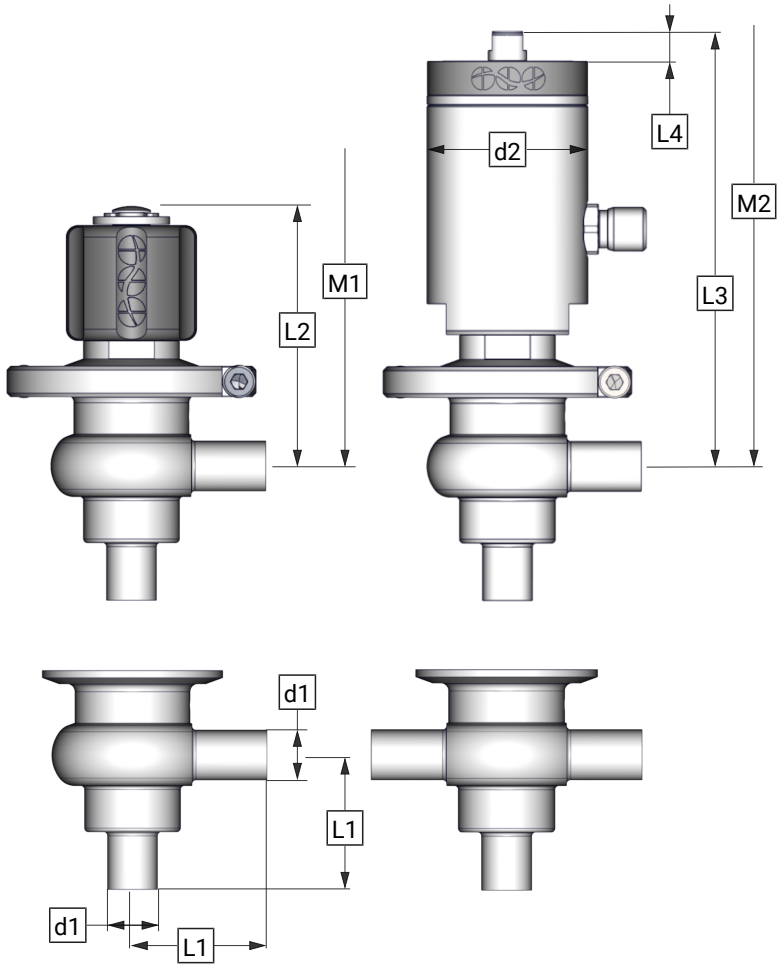


Fig. 5

	d1	d2	L1	L2	L3	L4	M1	M2
DN 8	10 x 1,0	42	35	67	113	~ 7,8	~ 102	~ 146,5
DN 10	13 x 1,5	42	35	68	114	~ 7,8	~ 103	~ 147,5
DN 15	19 x 1,5	42	33,5		128,5	~ 7,2		~ 180

10 Wearing parts

10.1 Spare parts list

5101 Small Valve

Item	Designation	Material	Qty.	Article number		
				DN 8	DN 10	DN 15
VG	Housing of angle valve	*AISI 316L*	1	5101 011 110-041	5101 011 120-041	5101 011 130-041
	Housing of T valve	*AISI 316L*		5101 011 111-041	5101 011 121-041	5101 011 131-041
PA	Pneum. lift drive air op./spr. cl.	-----	1			-
	Plug connection (LA)	Brass		5101 030 000-000		
	Plug connection (LA)	*AISI 304*		5101 030 000-100		
D1	O-ring	EPDM	1	2304 015 030-170		-
		HNBR		2304 015 030-171		
		FKM		2304 015 030-051		
D2	O-ring	NBR		2304 022 030-055		-
D3	O-ring	EPDM		2304 008 020-170		-
1	Piston	PEEK	1	5101 021 000-115		-
	Piston	PTFE		5101 021 002-114		
2	Shaft (piston PEEK)	*AISI 304*	1	6120 015 013-020		-
	Shaft (piston PTFE)			5101 021 003-020		
3	Retaining ring	*AISI 301*	1	6000 328 005-089		-
4	Handwheel	PA6-30GF	1	6000 328 005-089		-
5	Washer	*AISI 304*	1	8071 105 001-020		-
6	Retaining ring	*AISI 301*	1	8084 007 090-030		-

5102 Aseptic Small Valve

Item	Designation	Material	Qty.	Article number		
				DN 8	DN 10	DN 15
VG	Housing of angle valve	*AISI 316L*	1	5102 011 110-041	5102 011 120-041	5102 011 130-041
	Housing of T valve	*AISI 316L*		5102 011 111-041	5102 011 121-041	5102 011 131-041
VK	Locking clip			6125 027 000-020		-
PA	Pneum. lift drive air op./spr. cl.	-----	1			-
	Plug connection (LA)	Brass		5101 030 000-000		
	Plug connection (LA)	*AISI 304*		5101 030 000-100		
D1	O-ring	NBR	1	2304 017030-055		-
1	Bellows	PTFE	1	5102 020 000-187		-
2	Guide	*AISI 304*		5102 021 000-020		-
3	Cup spring	*AISI 304*		5102 022 000-020		-
4	Washer for anti-twist device	*AISI 316L*		5102 036 000-040		-
5	Sliding bearing	Iglidur	1	8050 010 003-156		-
6	Shaft	*AISI 304*	1	5102 037 000-020		-
7	Housing cover			5102 023 000-020		-
8	Retaining ring	*AISI 301*	1	6000 328 005-089		-
9	Handwheel	PA6-30GF	1	6000 328 005-089		-
10	Washer	*AISI 304*	1	8071 105 001-020		-
11	Retaining ring	*AISI 301*	1	8084 007 090-030		-

11 Appendix

11.1 Declaration of incorporation

Declaration of Incorporation

according to Directive 2006/42/EC of the European Parliament and the Council of 17 May 2006

Manufacturer:
KIESELMANN GmbH
Paul-Kieselmann-Str. 4-10
D-75438 Knittlingen

We declare that the following pressure equipment

Designation	Function
Pneumatic Linear actuator	pneumatically operation of valves
Pneumatic Quarter-turn actuator	pneumatically operation of valves
Butterfly Valve (pneumatically operated)	Separation of medium flow
Ball Valve (pneumatically operated)	Separation of medium flow
Single seat Valve (pneumatically operated)	Separation of medium flow
Changeover Valve (pneumatically operated)	Separation of medium flow
Double-Seat mixproof Valve (pneumatically operated)	Separation of medium flow
Control Valve (pneumatically operated)	Regulation of medium flow
Throttling Valve (pneumatically operated)	Regulation of medium flow
Tank Outlet Valve (pneumatically operated)	Separation of medium flow
Sampling Valve (pneumatically operated)	Separation of medium flow

complies with the definition of an „incomplete machine“ according to Article 2 of the European Machinery Directive 2006/42/EG, when fitted in or merged with other machines or incomplete machines which also comply with the provision of the Directive.

Applied harmonized standards:

Directive *2014/68/EU*
EN ISO 12100

Person responsible for documentation:

Achim Kauselmann
Documentation / Development
KIESELMANN GmbH

Knittlingen, 10.10.2020

i.V. Uwe Heisswolf
Head of Development

KIESELMANN
FLUID PROCESS GROUP

Notes

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