



KIESELMANN

FLUID PROCESS GROUP

Translation of the original

Operating instruction

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	ATEX - Guidelines	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 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

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








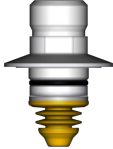
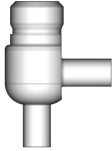
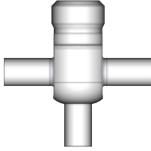
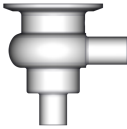
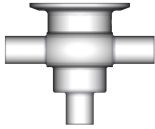
Recommendation for longer storage

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

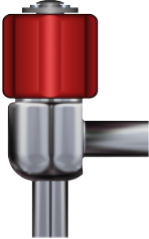

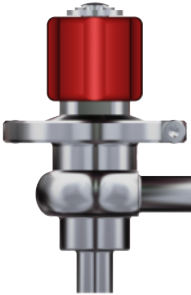

- To avoid damage to seals and bearings,
 - products up to DN 125 / OD 5 inch should be stored horizontally for maximum 6 months.
 - products larger than DN 125 / 5 inch, should be stored in the upright position with the actuator on top.
- Don't store any objects on the products.
- Protect the products 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 70% ±5%).
- Protect seals, bearings and plastic parts for UV light and ozone.

4 Specification

4.1 Modular system

Activation and query systems			
 Closing ring	 Sensor holder	KI-Top control head	
		 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:	<ul style="list-style-type: none"> • Pneumatic actuation by means of a lift drive (air/spring or air/air) • Manual actuation by means of a handwheel (open ☺ / close ☻)
Activation:	<ul style="list-style-type: none"> • Pneumatic via 3/2-way solenoid valves (See "Pneumatic Valve Activation")

Description of function - Lift actuator

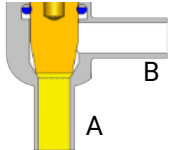
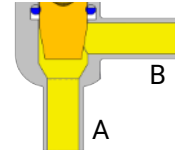
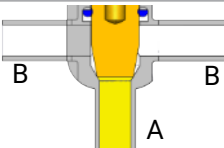
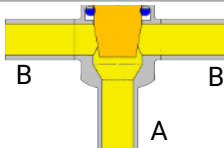
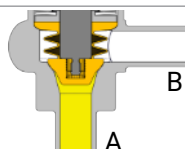
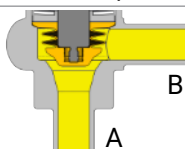
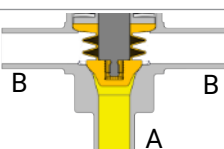
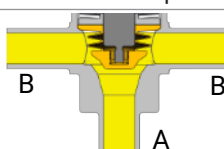
Normally closed (NC) Basic position: Valve close	
pneum. operated	→ opens the valve
undivided pneum. operated	→ spring force closes the valve

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 position: 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.



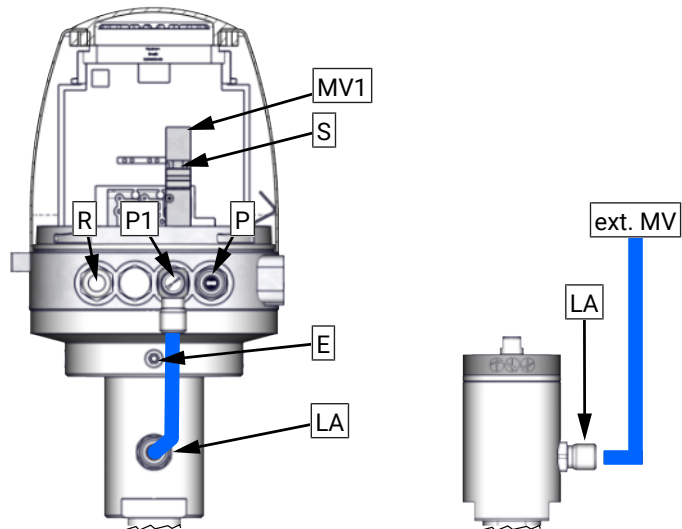
Feedback unit with finger guard -optional-

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

- E = Ventilation
- 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 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).

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

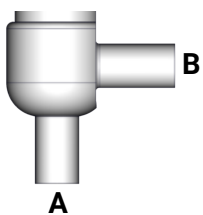
	EPDM; HNBR; NBR; FKM; k-flex	-	Klüber Paraliq GTE703*
	Silicone	-	Klüber Sintheso pro AA2*
	Thread	-	Interflon Food*
*) It is only permitted to use approved lubricants, if the respective fitting is used for the production of food or drink. Please observe the relevant safety data sheets of the manufacturers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

6.3 Cleaning

Optimum cleaning is achieved with pipeline cleaning.

7 Technical data

Model	Small valve	
	Angle valve, T valve	
	<ul style="list-style-type: none"> • Manual actuation • Pneumatic actuation 	
Size	DN 8	
	DN 10	
	DN 15	
Connection type	<ul style="list-style-type: none"> • weld-on end DIN EN 10357 	
Nominal pressure	DN 8 = PN 10	
	DN 10 = PN 8	
	DN 15 = PN 6	
Temperature range	Ambient temperature:	+4° to +45°C
	(Air)	
	Operating temperature:	+0° to +95°C
	(depends on medium)	
Leakage rate	Sterilisation temperature:	120 °C
	(SIP 30 min)	
Control air	Control air pressure:	Control air quality:
	4.0 - 8.0 bar	ISO 8573-1 : 2001 quality class 3
Material (in contact with product)	Stainless steel:	1.4301 / AISI 304
	Surface:	Ra < 0.8µm matt
	Sealing material:	<ul style="list-style-type: none"> • EPDM • HNBR • FKM



Nominal size	Flow coefficient [m³/h]		Closing pressure	Stroke
	A → B	B → A		
DN 8	0.4	0.5	10	2.0
DN 10	0.6	0.7	8	2.5
DN 15	-	-	-	-

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

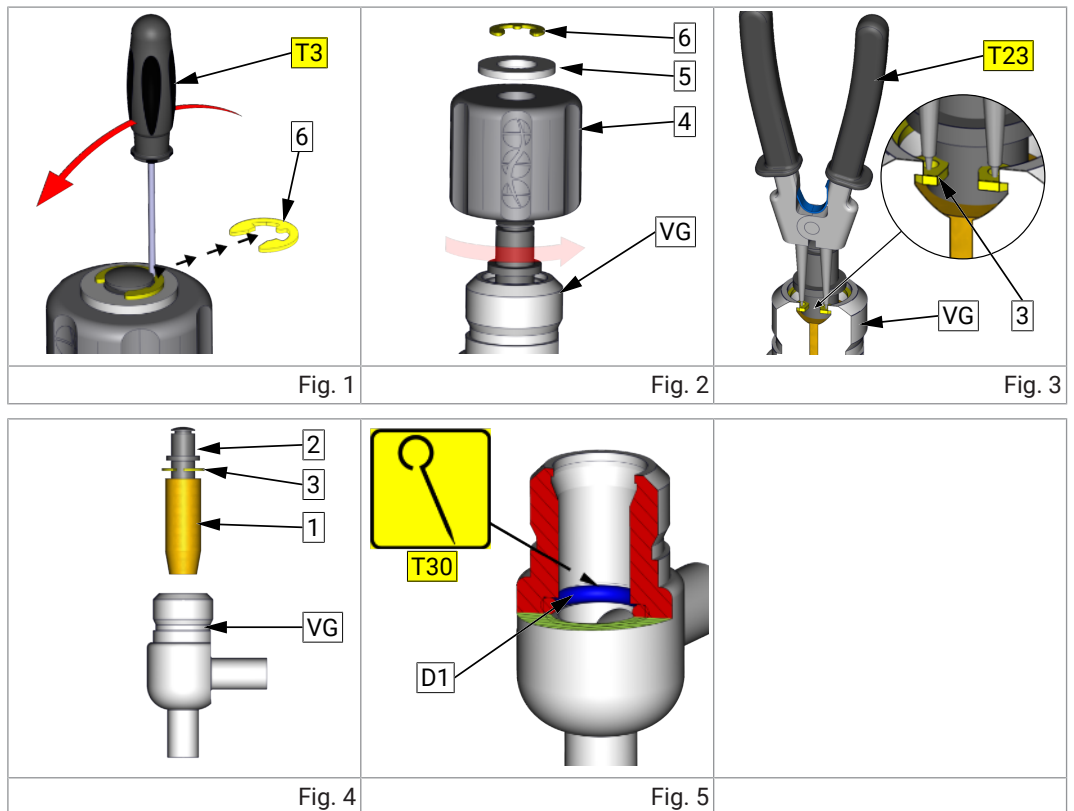


Fig. 1

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

Fig. 2

Unscrew the handwheel (4).

Fig. 3

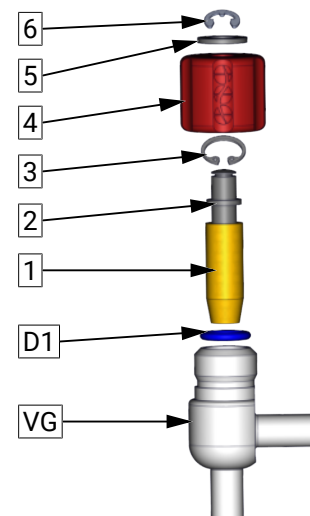
Remove retaining ring (3).

Fig. 4

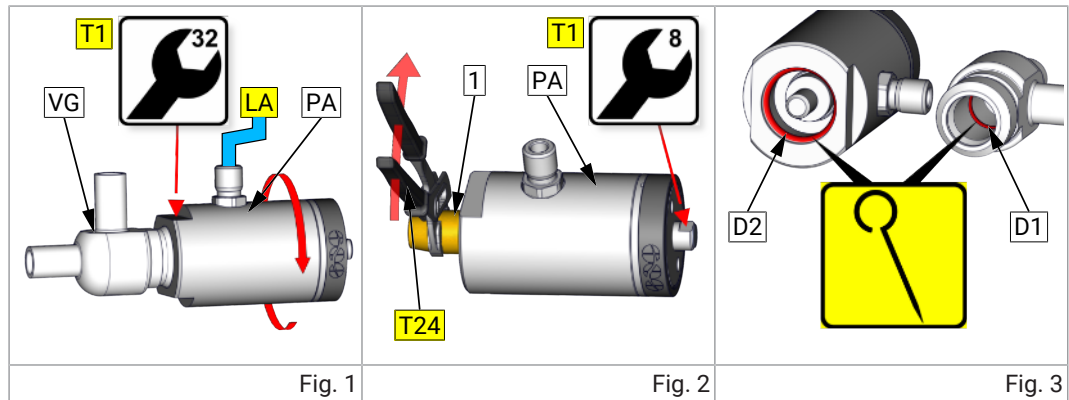
Remove shaft (2) with piston (1) from the housing cover (4).

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**

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).

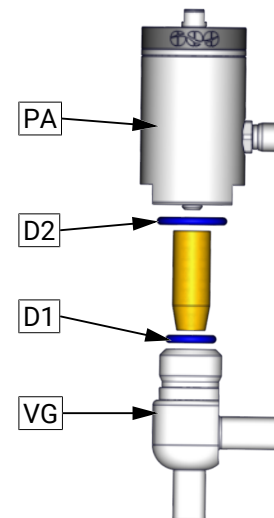
Disconnect the compressed air to (LA).

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

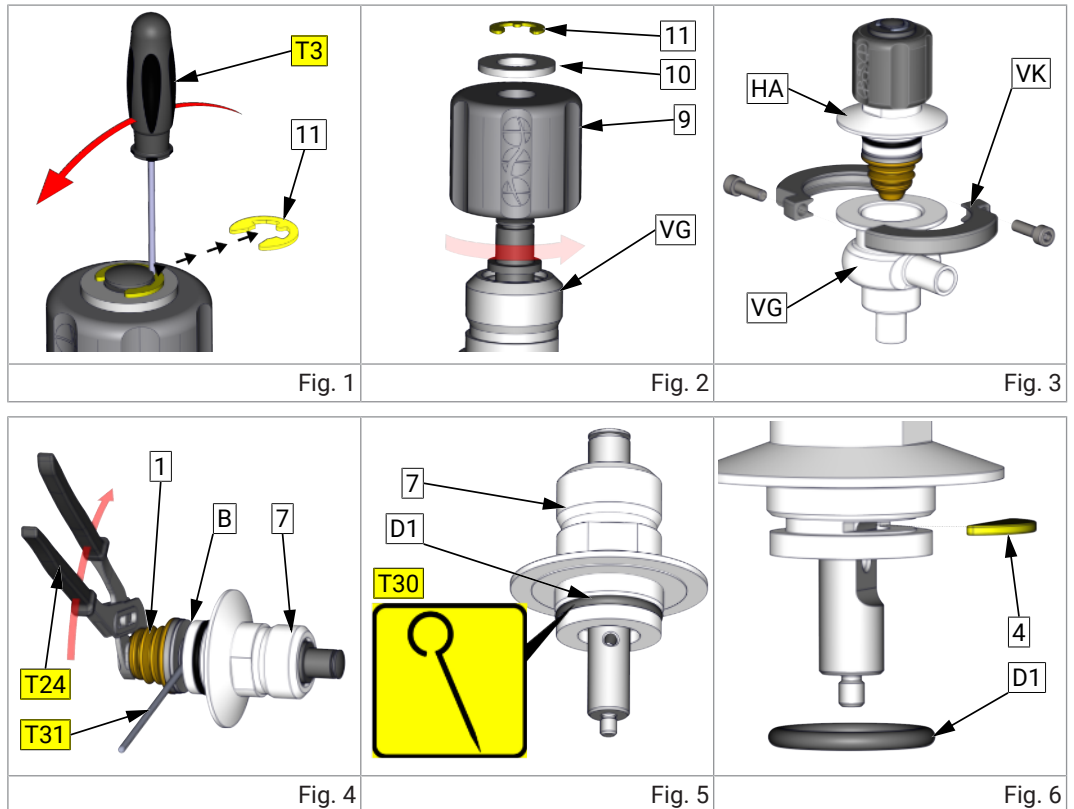


Fig. 1

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.

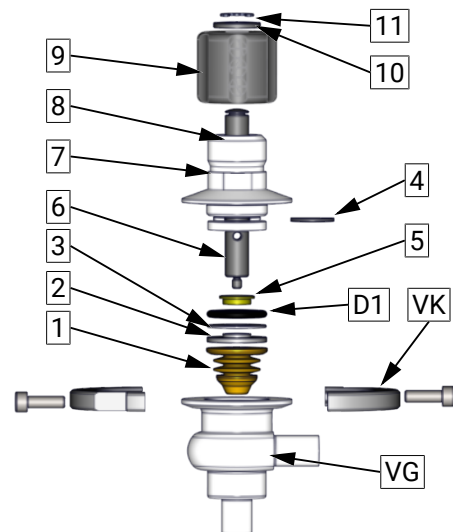
Remove the guide (2), cup spring (3) and slide bearing (5).

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

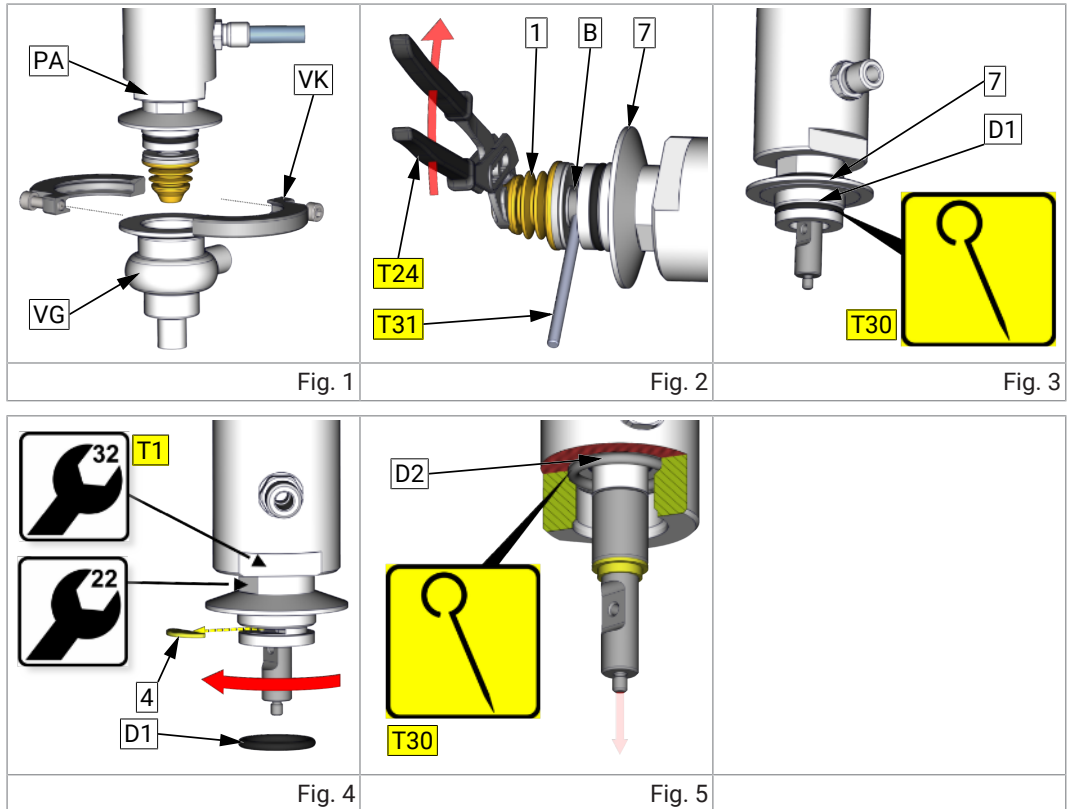


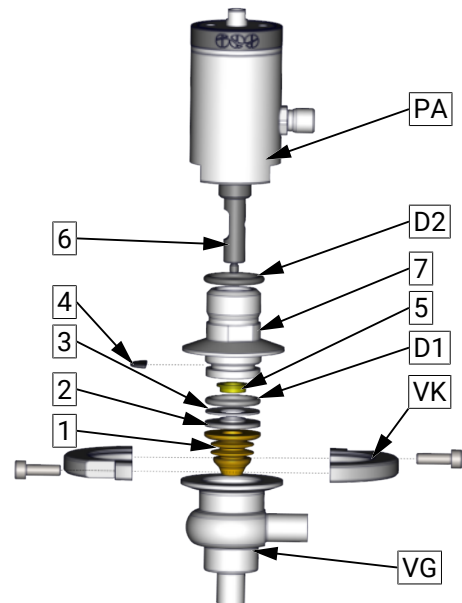
Fig. 1
 Connect the compressed air to (LA) and pressurise the lift drive with air. The valve opens.
 Unscrew the locking clip (VK).
 Remove the valve core.
 Disconnect the compressed air.

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

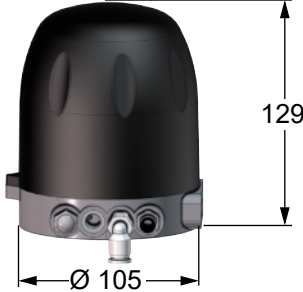


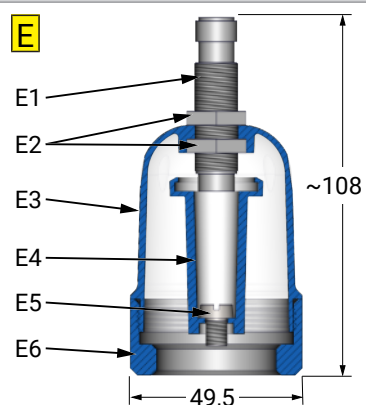
Alternately press and roll the O-rings into the groove with round body.

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 <ul style="list-style-type: none"> • Adapter plate complete 6125072000-087 	
End position feedback with contact protection (E) <ul style="list-style-type: none"> • E1 = Sensor • E2 = Locknut • E3 = Hood, transparent • E4 = Holder • E5 = Screw • E6 = Adapter 	

9.2 Drawings

Small Valve Type 5101

- PEEK version

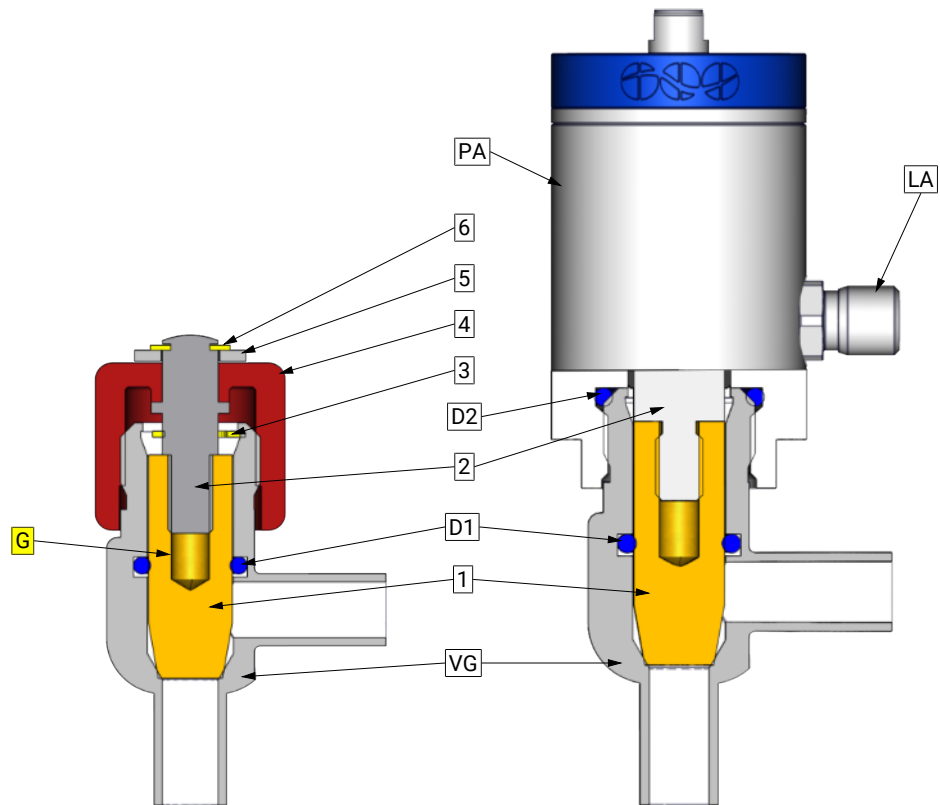


Illustration 15101_Naming

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

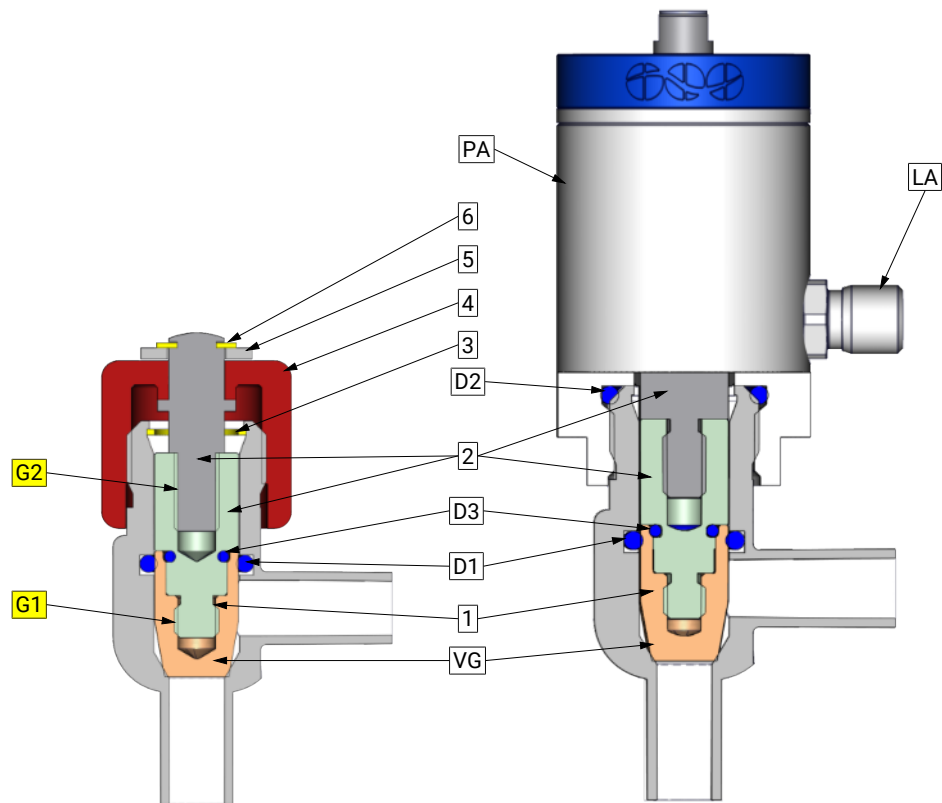


Illustration 25101-PTFE piston

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

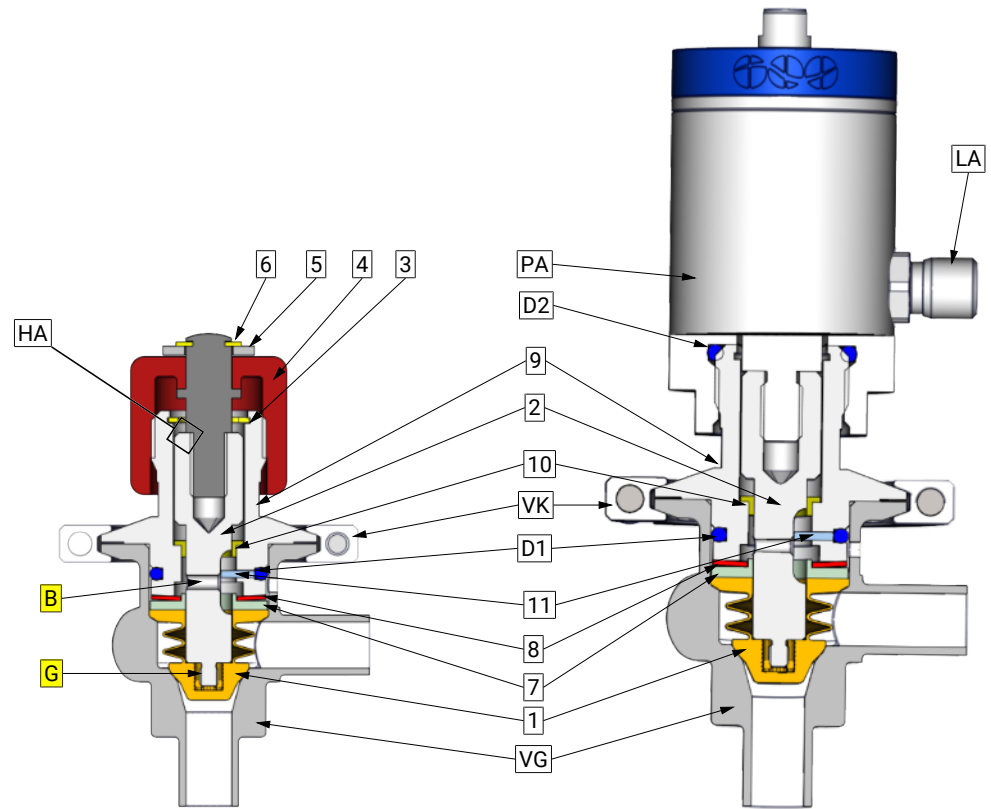


Illustration 35102_Naming

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 (NC)	LA	Air connection
10	Slide bearing	11	Washer for anti-twist device
HA	Manual drive	D2	O-ring

9.3 Dimensions

Small Valve Type 5101

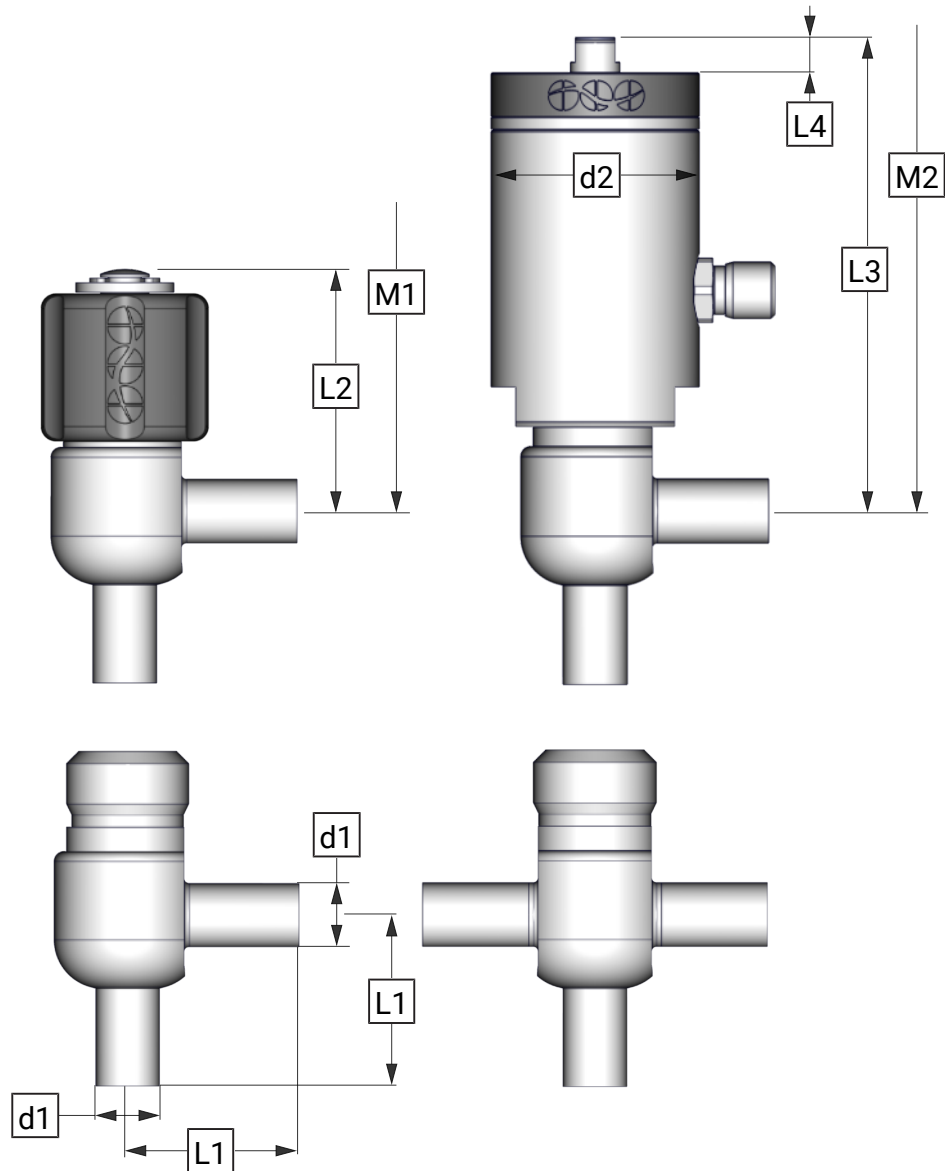


Illustration 4

	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	-	-	-	-	-	-	-	-

Aseptic Small Valve Type 5102

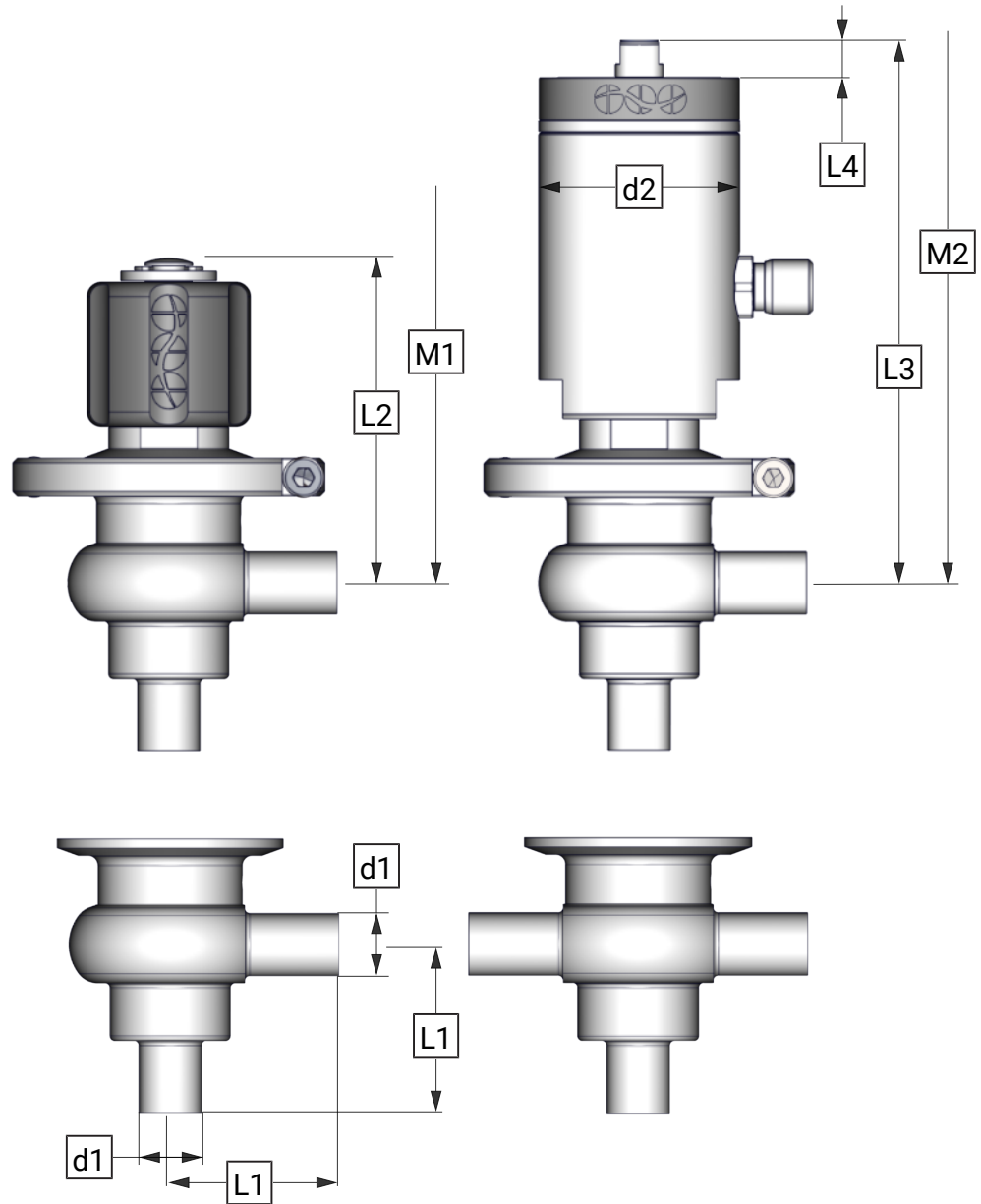


Illustration 5

	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	-	-	-	-	-	-	-	-

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 (NC)	----	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 (NC)	----	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	Slide 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

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

<u>Product name</u>	<u>Function</u>
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.

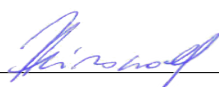
The specific technical documents listed in Appendix VII, Part B, have been prepared. The Authorized Agent empowered to compile technical documents may submit the relevant documents if such a request has been properly justified.

Commissioning of an incomplete machine must not only be 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
- DIN EN ISO 12100 Safety of machinery

Knittlingen, 21.09.2017


i.V. Uwe Heisswolf
Head of Development


KIESELMANN
FLUID PROCESS GROUP