OPERATING INSTRUCTIONS

Original instructions

Aseptic Valves

GEA VESTA® bellow valve type H_A
Sizes DN10 to ISO 33,7

GEA Tuchenhagen GmbH
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1 General Information

1.1 Information on the Document

The present Operating Instructions are part of the user information for the product. The Operating Instructions contain all the information you need to transport, install, commission, operate and carry out maintenance for the product.

1.1.1 Binding Character of These Operating Instructions

These Operating Instructions contain the manufacturer's instructions to the operator of the product and to all persons who work on or use the product regarding the procedures to follow.

Carefully read these Operating Instructions before starting any work on or using the product. Your personal safety and the safety of the product can only be ensured if you act as described in the Operating Instructions.

Store the Operating Instructions in such a way that they are accessible to the operator and the operating staff during the entire life cycle of the product. When the location is changed or the product is sold make sure you also provide the Operating Instructions.

1.1.2 Notes on the Illustrations

The illustrations in these Operating Instructions show the product in a simplified form. The actual design of the product can differ from the illustration. For detailed views and dimensions of the product please refer to the design documents.

1.1.3 Symbols and Highlighting

In these Operating Instructions, important information is highlighted by symbols or special formatting. The following examples illustrate the most important types of highlighting.

Danger

Warning: Fatal Injuries

Failure to observe the warning can result in serious damage to health, or even death.

► The arrow identifies a precautionary measure you have to take to avoid the hazard.

Warning: Explosions

Failure to observe the warning can result in severe explosions.

► The arrow identifies a precautionary measure you have to take to avoid the hazard.

Warning!

Warning: Serious Injuries

Failure to observe the warning can result in serious damage to health.

► The arrow identifies a precautionary measure you have to take to avoid the hazard.

Caution!

Warning: Injuries

Failure to observe the warning can result in minor or moderate damage to health.

► The arrow identifies a precautionary measure you have to take to avoid the hazard.

Notice

Warning: Damage to Property

Failure to observe the warning can result in serious damage to the component or in the vicinity of the component.

► The arrow identifies a precautionary measure you have to take to avoid the hazard.

Carry out the following steps: = Start of a set of instructions.

1. First step in a sequence of operations.
2. Second step in a sequence of operations.

   → Result of the previous operation.

→ The operation is complete, the goal has been achieved.

Hint!

Further useful information.

1.2 Manufacturer address

GEA Tuchenhagen GmbH
Am Industriepark 2-10
21514 Büchen

1.3 Contact

Tel.:+49 4155 49-0
Fax:+49 4155 49-2035

flowcomponents@gea.com
www.gea.com

1.4 EU Declaration of Conformity in accordance with the EC Machinery Directive 2006/42/EC

EU Declaration of conformity within the meaning of the EC machine directive 2006/42/EC

Manufacturer: **GEA Tuchenhagen GmbH**
Am Industriepark 2-10
21514 Büchen, Germany

Hereby, we declare that the machine designated in the following

Designation:	Valve with actuator
Type:	VESTA® H_A, H_A/I, H_A/T

by virtue of its design and construction and in the versions placed on the market by us, complies with the essential health and safety requirements of the following directive:

Relevant EC directives:	2006/42/EC	EC Machinery Directive
Applicable harmonized standards, in particular:	EN ISO 12100: 2010	

Remarks:

- In the event of a modification to the machine that was not agreed with us, this declaration loses its validity
- Furthermore, we declare that the specific technical documentation for this machine has been drawn up in accordance with Annex VII, Part A, and undertake to forward this documentation by means of data medium upon justified request by the national authorities

Person authorised for compilation and handover of technical documentation:

GEA Tuchenhagen GmbH
CE Documentation Officer
Am Industriepark 2-10
21514 Büchen, Germany

Büchen, 19 September 2023

Tatjana Fischer
Managing Director

pp. Stephan Dirks
Head of Engineering

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GEA INTERNAL

1.5 EU Declaration of Conformity in accordance with the EC Machinery Directive 2006/42/EC

Manufacturer:	GEA Tuchenhagen GmbH Am Industriepark 2-10 21514 Büchen, Germany

We hereby declare that the machine named below

Designation:	Valve with actuator
Type:	H_A, H_A/I, H_A/T

due to its design and construction as well as in the versions sold by us, meet the basic safety and health requirements of the following guideline:

Relevant EC directives:	2006/42/EC	EC Machinery Directive
Applicable harmonized standards, in particular:	DIN EN ISO 12100	

Remarks:	This declaration will become invalid if any alterations are made to the machine which have not been agreed with us. We also declare that the relevant technical documentation for this machine has been prepared in accordance with Annex VII, Part A, and agree to submit the documentation on justified request of national authorities on a data carrier.

Person authorised for compilation and handover of technical documentation:	GEA Tuchenhagen GmbH CE Documentation Officer Am Industriepark 2-10 21514 Büchen, Germany

Büchen, 19 September 2023

Tatjana Fischer Managing Director	i.V. Stephan Dirks Head of Engineering

2 Safety

2.1 Intended use

Shut-off valves of type H_A are stroke valves and are used for controlled opening and closing pipe sections.

Pressure hammers and excessive control air pressures can destroy the bellows. Therefore, the control air pressure should not exceed the maximum values according to the technical data.

The medium should preferably flow in the opening direction of the bellows to avoid pipe hammers when the valve is opened or closed. Should this not be possible due to technical reasons related to the plant or process, the valve must be depressurized, whenever possible.

Hint!

The manufacturer will not accept any liability for damage resulting from any use of the valve which is not in accordance with the designated use of the valve. The risk is borne solely by the operating company.

2.1.1 Requirements for operation

The prerequisite for reliable and safe operation of the component is proper transportation and storage as well as professional installation and assembly. Operating the unit within the limits of its designated use also involves adhering to the operating, inspection and maintenance instructions.

2.1.2 Pressure equipment directive

The component is a piece of pressure equipment (without safety function) in the sense of the pressure equipment directive 2014/68/EU. Classified according to Annex II in category 1.

According to the scope of directive 2014/34/EC, article 1, paragraph 2, f, the exception of the directive applies, due to conformity with the machine directive 2006/42/EU.

The nominal diameters smaller than DN 25 are subject to article 4, paragraph 3 of the Pressure Equipment Directive which specifies sound engineering practice.

Nominal diameters ≥ IPS 4“; DN 125 valid for the fluid group II.

In the event of any deviations, GEA Tuchenhagen GmbH will supply a specific Declaration of Conformity.

2.1.3 Use in potentially explosive atmospheres (ATEX)

In areas with an explosive atmosphere, only valves suitable for use in such areas may be used.

Refer to and observe the additional instruction manual “Hygienic valves ATEX models”. For details regarding the marking of valves for use in potentially explosive areas also refer to the additional instruction manual “Hygienic valves ATEX models”.

If these valves are used in areas with a potentially explosive atmosphere, you must absolutely comply with the requirements of directive 2014/34/EC with respect to all ignition hazards.

2.1.4 Improper operating conditions

The operational safety of the component can not be guaranteed under improper operating conditions. Therefore avoid improper operating conditions.

The operation of the component is not permitted if:

- Persons or objects are in the danger zone.
- Safety devices are not working or were removed.
- Malfunctions have been detected on the component.
- Damage to the component has been detected.
- Maintenance intervals have been exceeded.

2.2 Operator’s Duty of Care

The operating company of the component has a special responsibility for the proper and safe handling of the component within their company. Only use the component when it is in perfect operating condition in order to prevent danger to persons and property.

This operating manual contains information that you and your employees need for safe operation over the life of the component. Be sure to read these Operating Instructions carefully and ensure that the measures described here are observed.

The operator's duty of care includes planning the necessary safety measures and monitoring that these measures are observed. The following principles apply:

- Only qualified personnel may work on the component.
- The operating company must authorize personnel to carry out the relevant tasks.
- Order and cleanliness must be maintained at the work stations and in the entire area surrounding the component.
- Personnel must wear suitable work clothing and personal protective equipment. As the operating company must ensure that work clothing and personal protective equipment are used.
- Inform personnel regarding any properties of the product which might pose a health risk and the preventative measures to be taken.
- Have a qualified first-aid representative on call during the operation. This person must be able to initiate any necessary first-aid measures in case of an emergency.
- Clearly define procedures, competences and responsibilities for those working in the area of the component. Everybody must know what to do in case of an emergency. Instruct the staff in this respect at regular intervals.
- The signs on the component must always be complete and easy to read. Check, clean and replace the signs as necessary at regular intervals.

- Observe the Technical Data specified and the limits of use!

Hint!

Carry out regular checks. This way you can ensure that these measures are actually observed.

2.3 Subsequent changes

No technical modifications should ever be made to this component. Otherwise you will have to undergo a new conformity process in accordance with the EC Machinery Directive on your own.

In general, only original spare parts supplied by GEA Tuchenhagen GmbH should be fitted. This ensures that the component is always operating properly and efficiently.

2.4 General safety instructions and dangers

The component is safe to operate. It was built according to state-of-the-art science and technology.

Nevertheless, dangers can arise from the component, if:

- the component is not used as intended
- the component is used improperly
- the component is operated under impermissible conditions

2.4.1 Principles for safe operation

Dangerous situations during operation can be avoided by safety-conscious and proactive behaviour of the staff.

To ensure safe operation of the valve the following principles apply:

- The Operating Instructions must be kept ready to hand at the valve's place of use. They must be complete and in clearly legible form.
- Only use the valve for its intended use.
- The valve must be functional and in good working order. Check the condition of the valve before starting work and at regular intervals.
- Wear tight-fitting work clothing for all work on the valve.
- Ensure that nobody can get hurt on the parts of the valve.
- Immediately report any faults or noticeable changes on the valve to the person responsible.
- Never touch the pipes and the valve when these components are hot! Avoid opening the valve unless the process plants have been emptied and depressurised.
- Observe the accident prevention regulations and all local regulations.

2.4.2 Environmental Protection

Harm to the environment can be avoided by safety-conscious and proactive behaviour of the staff.

For environmental protection the following principles apply:

- Substances harmful to the environment must not be discharged into the ground or the sewage system.
- Always observe the pertinent regulations relating to waste avoidance, disposal and utilization.
- Substances harmful to the environment must be collected and stored in suitable containers. Clearly mark the containers.
- Dispose of lubricants as hazardous waste.

2.4.3 Electrical Equipment

For all work on electrical equipment, the following principles apply:

- Access to electrical equipment should only be allowed to qualified electricians. Always keep unattended switch cabinets locked.
- Modifications of the control system can affect the safe and reliable operation. Modifications are only permitted with the express permission of the manufacturer.
- After completion of all work, check that the protective devices are fully functional.

2.5 Supplementary Regulations

In addition to the instructions in this documentation the following also has to be observed:

- pertinent accident prevention regulations,
- generally accepted safety rules,
- national regulations applicable in the country of use,
- work and safety instructions applicable in the facility,
- installation and operating regulations for use in potentially explosive areas.

2.6 Qualification of personnel

This section provides information on how the personnel working on the component must be trained.

Operating and maintenance personnel must

- have the necessary qualification to carry out their tasks,
- be instructed with regard to possible dangers,
- know and observe the safety instructions given in the documentation.

Only allow qualified electricians to carry out work on the electrical equipment or have a qualified electrician supervise the work.

Only allow specially trained personnel to carry out work on an explosion-protected system. When working on explosion-protected equipment observe the standards DIN EN 60079-14 for gases and DIN EN 50281-1-2 for dusts.

The following minimum qualifications are required:

- Training as a specialist for working independently on the component.
- Adequate instruction to work on the component under the supervision and guidance of a trained specialist

Each employee must meet the following requirements to work on the component:

- Personal suitability for the respective task.
- Sufficient professional qualification for the respective task.
- Received instruction about the functionality of the component.
- Received instruction about operating sequences on the component.
- Familiar with the safety devices and their function.
- Familiar with these Operating Instructions, especially with the safety instructions and the information which is relevant for the task on hand.
- Familiar with the basic regulations with regard to occupational health and safety and accident prevention.

When working with the component, a distinction is made between the following user groups:

User groups	
Staff	**Qualifications**
Operating personnel	Adequate instruction and sound knowledge in the following areas: • Functionality of the component • Operating sequences on the pump • What to do in case of an emergency • Lines of authority and responsibilities with respect to the task
Maintenance personnel	Appropriate training and a sound knowledge of the structure and functionality of the component. Sound knowledge in the following areas: • Mechanical equipment • Electrical equipment • Pneumatic system Authorization with regard to safety engineering standards to carry out the following tasks: • Setting devices into operation • Earthing of devices • Marking of devices The relevant certificates of qualification must be submitted before work can be carried out on ATEX certified machines.

2.7 Safety equipment

2.7.1 Signs

Hazardous locations on the component are marked by warning labels, prohibition signs and mandatory signs.

The signs and instructions on the component must always be legible. Any illegible signs must be replaced immediately.

Signs on the component	
Sign	**Meaning**
	Explosion-hazarded zones warning

2.8 Residual dangers

Dangerous situations can be avoided by safety-conscious and proactive behaviour of the personnel and by wearing personal protective equipment.

Residual dangers on the valve and measures		
Danger	**Cause**	**Measure**
Danger to life	Inadvertent switch-on of the valve	Effectively disconnect all components, effectively prevent switch-on.
	Electric power	Observe the following safety rules: 1. Isolate from the power supply. 2. Take appropriate measures to prevent switch on. 3. Test absence of voltage. 4. Earthing and short-circuiting. 5. Cover or safeguard any adjacent live parts.
	Spring tension in the actuator	For large valves: Danger to life caused by the pressurised spring in the actuator. Do not open the actuator, rather return it to GEA Tuchenhagen for proper disposal.
Risk of injury	Danger presented by moving or sharp-edged parts	The operator must exercise caution and prudence. For all work: • Wear suitable work clothing. • Never operate the machine if the cover panels are not correctly fitted. • Never open the cover panels during the operation. • Never reach into openings. As a precautionary measure, wear personal protective equipment in the vicinity of the valve: • Protective gloves • Safety shoes

Residual dangers on the valve and measures		
Danger	**Cause**	**Measure**
	Danger due to escaping media at the leakage hole	• Effectively disconnect all components. • Effectively prevent switching on. • Pipes must be depressurised.
Environmental damage	Operating materials with properties which are harmful to the environment	For all work: • Collect lubricants in suitable collecting vessels. • Dispose of lubricants in accordance with the pertinent regulations.

2.9 Danger zones

Please observe the following notes:

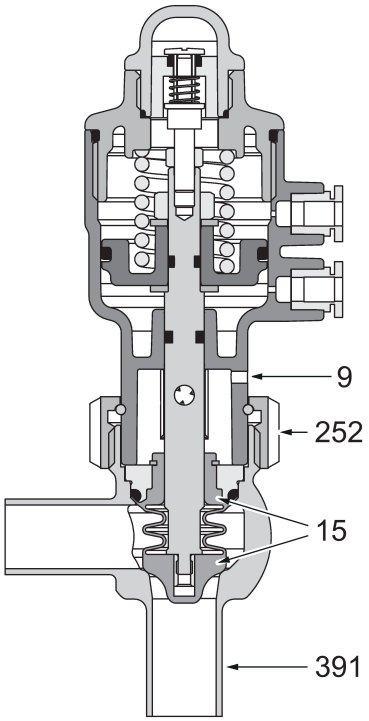

Fig.1: Danger zone at the valve

- In the event of malfunctions, shut down the valve (disconnect from the power and air supply) and secure it against being used.
- On a spring-closing valve there is danger of injury when the cap nut (252) is opened, as the released spring pretension will suddenly lift the actuator. Therefore, release the spring tension before undoing the cap nut (252) by supplying the actuator with compressed air.
- Before starting any maintenance, servicing or repair work, disconnect the valve from the power supply and secure it against inadvertently being switched back on again.
- Only allow a qualified electrician to carry out any work on the electrical power supply.
- Check the electrical equipment of the valve at regular intervals. Immediately remedy loose connections and molten cables.
- If work on live parts cannot be avoided, call in a second person, who can operate the main switch in case of an emergency.
- The housing sockets (391) have very sharp edges. When transporting and installing the valve be sure to wear suitable protective gloves.
- During production, increased temperatures may occur on the housing (391).
- In the event of damage to the bellows, medium can escape from the leakage hole (9).

3 Description

3.1 Design

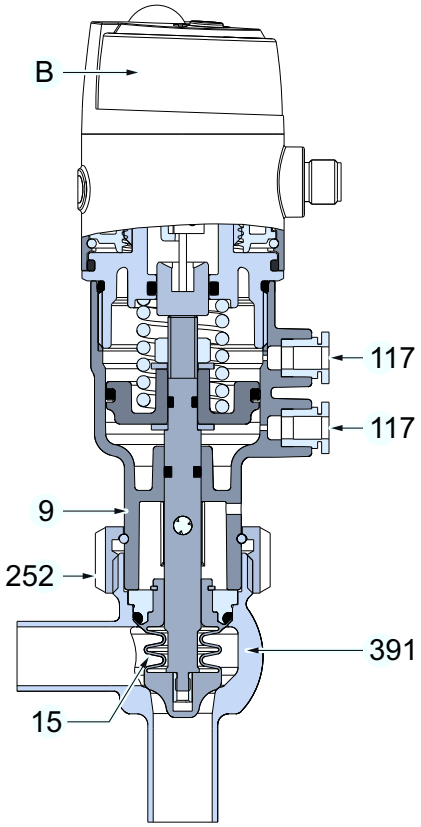

Fig.2: Valve with pneumatic drive and control top

Design	
No.	**Designation**
B	Control top
9	Lantern
15	Bellows
117	Air connection
252	Cap nut (safety device)
391	Valve housing

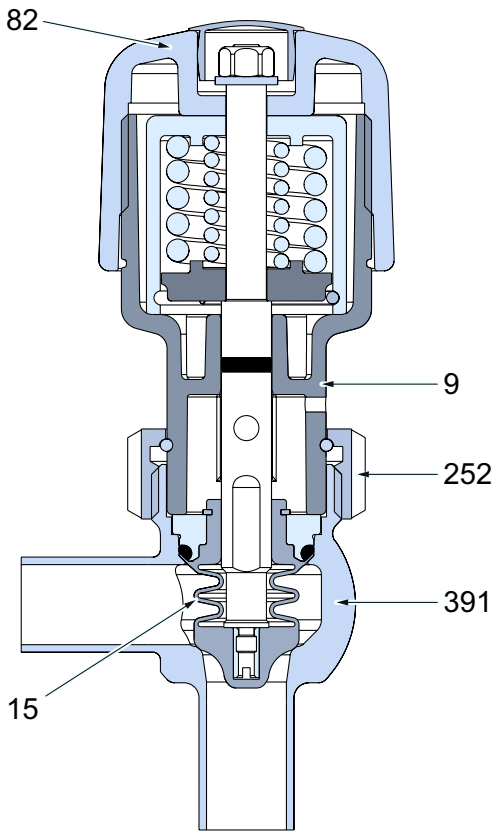

Fig.3: Valve with manual drive

Design	
No.	**Designation**
9	Lantern
15	Bellows
82	Handwheel
252	Cap nut (safety device)
391	Valve housing

3.2 Functional description

3.2.1 Closing direction NC

Closing direction: from top to bottom

Resting position: spring closing

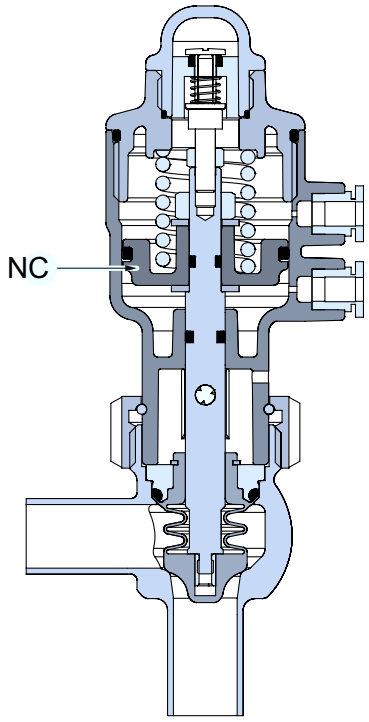

Fig.4: Resting position (NC). Valve with mechanical position indicator

3.2.2 Distinguishing feature of spring-to-close actuator (NC)

Valve is closed in the non-actuated position.

Identification on the T.VIS control top once the installation (SET-UP) has been completed:

- Permanent light (1) green: valve in non-actuated position
- Permanent light (1) yellow: valve in end position (actuated position)

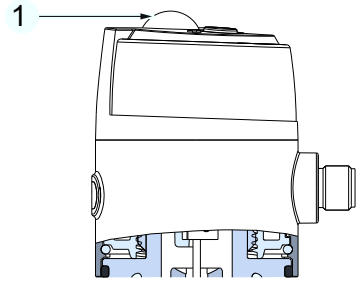

Fig.5: Permanent light on the control top T.VIS

3.2.3 Closing direction NO

Closing direction: from the bottom to the top

Resting position: spring opening

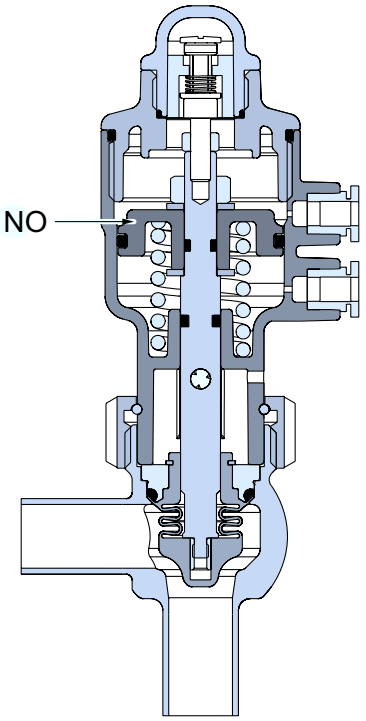

Fig.6: Resting position (NO), valve with mechanical position indicator

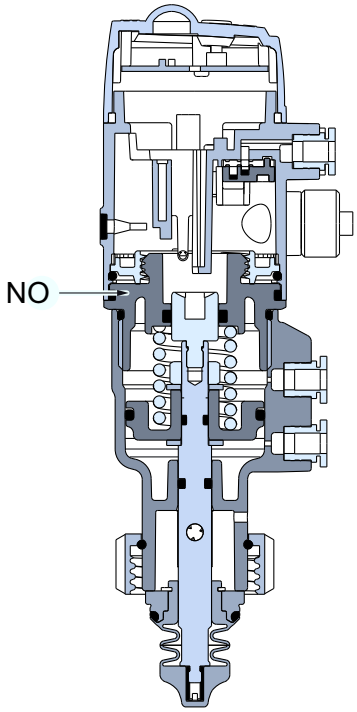

Fig.7: Valve with control top

3.2.4 Distinguishing feature of spring-opening actuator (NO)

The valve is open in the non-actuated position.

Identification on the T.VIS control top once the installation (SET-UP) has been completed:

- Green steady light (1): valve in non-actuated position
- Yellow steady light (1): valve in end position (actuated position)

4 Transport and storage

4.1 Storage conditions

The valves, valve inserts or spare parts should be stored in a dry place, free of vibrations and dust, and protected from light. To avoid damage, leave the components in their original packaging if possible.

If, during transport or storage, the valve is going to be exposed to temperatures ≤ 0°C, it must be dried beforehand and suitable measures must be taken to protect it from damage.

Hint!

We recommend that the valve should be stored at a temperature of ≥ 5 °C for a period of 24 hours prior to any handling (disassembling the housings / activation of actuators) so that any ice crystals formed by condensation water can melt.

4.2 Transport

For transport, the following principles apply:

- Only use suitable hoist and slings for transporting the package units/valves.
- Observe the pictograms on the package.
- Handle valves with care to avoid damage caused by impact or careless loading and unloading. The outside synthetic materials are susceptible to breaking.
- Control tops must be protected from animal and vegetable fats.
- Only allow qualified staff to transport the valve.
- Movable parts must be properly secured.
- Under no circumstances should anyone stand under a suspended load.
- Take care when transporting the valve. Do not grip sensitive parts of the unit to lift or push the unit or to support yourself. Avoid jerky movements when putting down the unit.

4.2.1 Scope of supply

After taking delivery of the component, check if

- the details on the type plate correspond to the data in the order and delivery documents,
- the equipment is complete and all components are in good order.

5 Technical data

5.1 Type plate

The type plate clearly identifies the valve.

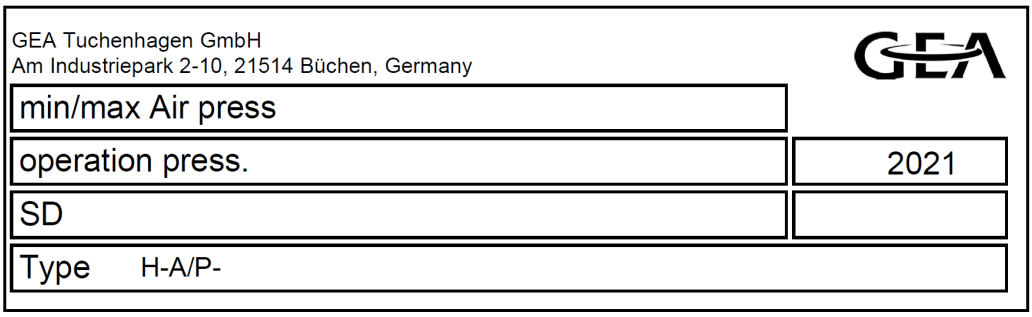

Fig.8

The type plate provides the following key data:

Key data of the valve	
Control air pressure bar/psi	minimum 5.0/72; maximum 6.0/87
Product pressure bar/psi	10.0/145
Serial	Serial number
Mat.	Material number
Type	Shut-off valve H_A

5.2 Technical data

Refer to the following tables for the key technical data of the valve:

Technical data: Valve	
Designation	**Description**
Size	DN 10 to DN 32 0.5" OD to 1" OD ISO 13,5 to ISO 33,7
Material of product contact parts	Stainless steel 1.4435, PTFE TFM1705
Fitting position	Any position, if valve and pipe system can drain properly

Technical data: Ambient temperatures	
Designation	**Description**
- Valve	0 to +60 °C, standard < 0 °C: Use control air with low dew point. Protect valve rods against freezing. < −15 °C: no solenoid valves in the control top > +50 °C: no solenoid valves in the control top
- Initiator	-20 to +80 °C
- Control top type T.VIS M-15, A-15	-20 to +50 °C
- Control top type T.VIS P-15	0 to +60 °C
Product temperature and operating temperature	0 to +135 °C short-term +150°C, maximum for 30 minutes

Technical data: Compressed air supply	
Designation	**Description**
Air hose	
- metric	Material PE-LD outside Ø 6 mm Inside Ø 4 mm
- Inch	Material PA outside-Ø 6.35 mm Inside Ø 4.3 mm
Product pressure	10 bar (145 psi) standard
Control air pressure	Actuator NC: 6 bar, max 8 bar Actuator NO: 5 bar Actuator LL: 3 bar
Control air	acc. to ISO 8573-1:2010
- Solid particle content:	Quality class 6 Particle size maximum 5 mm Particle density maximum 5 mg/m^3
- Water content:	Quality class 4, maximum dew point +3 °C If the unit is used at higher altitudes or at low ambient temperatures, an accordingly lower dew point is required.
- Oil content:	Quality class 3, preferably oil free maximum 1 mg oil in 1m^3 air

Note: Compressed air support when using valves with NC actuator not permitted.

5.3 Resistance of the sealing materials

The resistance of sealing materials depends on the type and temperature of the medium conveyed. The exposure time can adversely affect the service life of the seals. The sealing materials meet the requirements of the respective directives for the food industry and the pharmaceutical industry. See material certificates for more information.

Resistance:

- + = good resistance
- o = reduced resistance
- – = no resistance

Seal resistance PTFE		
Medium	**Temperature**	**Sealing material (general operation temperature)**
		PTFE TFM1705
Alkalis up to 3%	up to 80 °C (176°F)	+
Alkalis up to 5%	up to 40 °C (104°F)	+
Alkalis up to 5%	up to 80 °C (176° F)	+
Alkalis more than 5%		+
Inorganic acids up to 3%	up to 80 °C (176°F)	+
Inorganic acids up to 5%	up to 80 °C (176°F)	+
Inorganic acids up to 5%	up to 100 °C (212°F)	+
Water	up to 80 °C (176°F)	+
Steam	up to 135 °C (275° F)	+
Steam, approx. 30 min	up to 150 °C (320°F)	+
Fuels/hydrocarbons		+
Product with a fat content of max. 35%		+
Product with a fat content of more than 35%		+
Oils		+

5.4 Pipe ends - General table of measurements

The following information refers to pipe ends. More measurements can be found in the measurement tables in .

Hint!

The valves are also available in larger nominal sizes, see the operating instructions "GEA VESTA(R) shut-off valves type H_A XL".

Dimensions for tubes in DN				
Metric DN	**Outside diameter**	**Wall thickness**	**Inside diameter**	**Outside diameter according to DIN 11866 series A**
10	13	1.5	10	x
15	19	1.5	16	x
20	23	1.5	20	x
25	29	1.5	26	x
32	35	1.5	32	x

Dimensions for tubes in inch OD				
Inch OD	**Outside diameter**	**Wall thickness**	**Inside diameter**	**Outside diameter acc. to DIN 11866 series C**
0.5"	12.7	1.65	9.4	x
0.75"	19.05	1.65	15.75	x
1"	25.4	1.65	22.1	x

Dimensions for tubes in ISO				
ISO	**Outside diameter**	**Wall thickness**	**Inside diameter**	**Outside diameter according to DIN 11866 series B**
13.5	13.5	1.6	10.3	x
17.2	17.2	1.6	14	x
21.3	21.3	1.6	18.1	x
26.9	26.9	1.6	23.7	x
33.7	33,7	2	29.7	x

5.5 Tool

List of tools	
Tool	**Material no.**
Open-ended wrench, a/f 17-19	408-037
Open-ended wrench, a/f 22-24	408-039
Manual emergency actuator	221.310.74
Hose cutter	407-065
Vice with protective jaws	--
Protective gloves, heat-resistant	
Allen key, size 10	408-126
Circlip pliers, angled at 90° for circlip	--

5.6 Lubricants

Lubricants	
Lubricants	**Material no.**
Cassida P1	413-134

5.7 Weights

Weights	
Size	**Weight [kg], valve HLA/HTA***
DN 10	0.58
DN 15	0.64
DN 20	1.05
DN 25	1.64
DN 32	1.74
OD 0.5"	0.58
OD 0.75"	0.64
OD 1"	1.12
ISO 13.5	0.58
ISO 17.2	0.63
ISO 21.3	1.04
ISO 26.9	1.12
ISO 33.7	1.72
* valves HLA/M, HLA/H and HTA/M, HTA/H see enclosed dimension sheet	

6 Assembly and installation

6.1 Safety instructions

Hazardous situations during installation can be avoided by safety-conscious and proactive behaviour of the personnel.

For installation, the following principles apply:

- Only qualified personnel are allowed to set-up, install and commission the component.
- Ensure that adequate working and traffic areas are available at the place of installation.
- Observe the maximum load-bearing capacity of the installation surface.
- Observe the transport instructions and markings on the part(s) to be transported.
- Remove any nails protruding from transport crates immediately after opening the crate.
- Under no circumstances should anyone stand under a suspended load.
- Safety devices of the component may not work effectively during installation.
- Reliably secure sections of the plant which have already been connected against inadvertently being switched on.

6.2 Notes on installation

The valve can be installed in any position. Care must be taken to ensure that the valve housing and the pipe system can drain properly. If the valve is installed in the horizontal position, pay attention that the vent hole in the actuator is aligned horizontally on one side.

To prevent damage, make sure that:

- the valve is installed in the pipe system free of tension and
- no foreign materials (e.g. tools, bolts, lubricants) are left in the system.
- If the valve is installed horizontally, the stress on the seals is higher than in the vertical installation position. Therefore, the valve must be checked especially for tightness.

6.3 Control head

If external valves are connected in a control top with several solenoid valves, make sure that the control air pressure in the main actuator does not fall below the operating pressure.

6.4 Valve with detachable pipe connection elements

This section describes the procedure to fit the valve.

⚠ Caution!

Liquids in pipes

Danger of injury due to liquid spraying out

► Before releasing any pipe or hinged clamp connections: drain and, if necessary, clean or flush the pipe.
► Separate the pipe section in which the valve is to be fitted from the rest of the piping system to prevent product entering again.

Notice

Seals are wearing parts

Old seals will cause malfunction of the valve

► When fitting the valve be sure to carry out a visual check of the condition of the sealing surface.

Carry out the following steps:

1. Fit valves with detachable pipe connection elements – using suitable connection fittings – directly into the pipe system.

→ Valve is installed.

6.5 Valve with welded ends

This section describes the welding procedure for the valve housing.

⚠ Warning!

Spring tension in the valve

Danger of injury when detaching the cap nut at the housing as the released spring pretension will suddenly lift the actuator.

► Therefore, release the spring tension before detaching the cap nut by supplying the actuator with compressed air at max. 8 bar.

Notice

Welding distortions

An open housing can warp during welding.

► To avoid welding distortions, always seal the housing before welding.

Carry out the following steps:

1. Release the spring tension.
2. Remove the valve insert, see chapter Section 10.4, Page 38.
3. Fit the housing and fix it in several places around the circumference.
4. To avoid welding distortions, always seal the housing before welding.
5. Flush the housing with forming gas from the inside to push the oxygen out of the system.
6. Weld the housing into the pipe system; use welding filler if necessary. When technically possible, use the WIG-orbital welding process with pulse configuration, according to guidelines EHEDG documentation. 35.

7. Passivate the seam after welding.
8. Assemble the valve and vent the actuator.

   → The bellows is lowered.

→ Install the valve with welded ends.

Hint!

Welding method: We recommend using the automatic orbital welding method. All welding work should only be performed by certified welders or machine operators (orbital welders).

6.6 Pneumatic connections

6.6.1 Air requirement

Actuator Ø [mm]	**Air requirement (dm^3_n/stroke) dm^3_n at 1.01325 bar at 0 °C as per DIN 1343**
DN 10	0.011
DN 15	0.013
DN 20	0.02
DN 25	0.038
DN 32	0.038
1/2" OD	0.011
3/4" OD	0.013
1" OD	0.02
ISO 13.5	0.011
ISO 17.2	0.014
ISO 21.3	0.019
ISO 26.9	0.02
ISO 33.7	0.038

6.6.2 Establishing Hose Connections

To ensure reliable operation, the compressed air hoses must be cut exactly square.

Tools required:

- A hose cutter

Carry out the following steps:

1. Shut off the compressed air supply.
2. Use the hose cutter to cut the pneumatic hoses square.

3. Push the air hose into the air connector on the control top.
4. Re-open the compressed air supply.

→ Establish a hose connection.

6.7 Electrical connection with T.VIS control top

Danger

Live parts

Electrical shock can result in serious personal injury or death.

► Only allow properly qualified staff to carry out work on the electrical equipment.
► Prior to establishing electrical connections check the maximum permissible operating voltage.

Explosive gases or dusts

An explosion can result in serious personal injury or death.

► Observe the installation and operating regulations for use in potentially explosive areas.

Carry out the following steps:

1. Connect in accordance with the connection diagram and the instructions in the corresponding operating instructions for control tops T.VIS M-15, A-15 or T.VIS P-15.

→ Done

Hint!

The proximity switches are factory set. During transport and installation it can happen that the settings are changed, so that readjustment may be required (see the Operating Instructions for the control top).

7 Start-up

7.1 Safety instructions

Initial commissioning

For initial commissioning, the following principles apply:

- Take protective measures against dangerous contact voltages in accordance with pertinent regulations.
- The valve must be completely assembled and correctly adjusted. All screw connections must be securely tightened. All electrical cables must be installed correctly.
- Reliably secure machine parts which have already been connected against inadvertently being switched on.
- Relubricate all lubricating points.
- Make sure lubricants are used properly.
- After conversion of the valve, residual risks must be reassessed.

Setting into Operation

For commissioning, the following principles apply:

- Only allow properly qualified staff to set the valve into operation.
- Establish all connections correctly.
- The safety devices for the valve must be complete, fully functional and in perfect condition. Check the function before starting any work.
- When the valve is switched on, the danger zones must be free.
- Remove any liquids that have escaped without leaving residues.

7.2 Notes on commissioning

Before starting commissioning observe the following:

- Make sure that there are no foreign materials in the system.
- Actuate the valve once by applying compressed air.
- Clean the pipe system prior to the first product run.
- During commissioning, regularly check all sealing points for leaks. Replace defective seals.

8 Operation and control

8.1 Safety instructions

Dangerous situations during operation can be avoided by safety-conscious and proactive behaviour of the personnel.

For operation, the following principles apply:

- Monitor the component during operation.
- Safety devices must not be changed, removed or taken out of service. Check all safety devices at regular intervals.
- All guards and hoods must be fitted as intended.
- The installation location of the component must always be properly ventilated.
- Structural changes to the component are not permitted. Report any changes to the component immediately to the person in charge.
- Always keep danger zones clear. Do not leave any objects in the danger zone. Only allow persons to enter the danger zone when the machine is de-energized.
- Regularly check that all emergency stop devices are working correctly.

9 Cleaning

9.1 Cleaning

All parts in contact with product must be cleaned at regular intervals. Always observe the safety data sheets issued by the cleaning agent manufacturers. Only use cleaning agents which do not cause damage to the seals and the inner parts of the valve. When the pipe is cleaned, the cleaning medium also flows through and cleans the valve housings.

With respect to the cleaning method and parameters like detergents, temperatures, times, and intervals, the component manufacturer can merely make recommendations but cannot provide any generally applicable details. Method and parameters should be determined and defined by the operator in accordance with the relevant process and product.

The cleaning effect must be checked regularly by the operator!

9.2 Passivation

Before commissioning a plant, passivation is commonly carried out for long pipes and tanks.

Valve blocks are usually excepted from this. Passivation is typically performed using nitric acid (HNO_3) at approx. 80 °C (176 °F) at a concentration of 3 % and a contact time of 6 to 8 hours.

9.3 Sterilisation

The valve is suitable for SIP sterilisation (sterilisation in place).

The permissible sterilisation media and temperatures for the various sealing materials are listed in the resistance table, see Section 5.3, Page 25. Other sterilisation media (e.g. H_2O_2) must be approved by the manufacturer.

Hint!

VESTA® bellows achieve optimal sealing only after an initial SIP cleaning.

- Medium: saturated steam
- Temperature: 135 °C (275 °F)
- Switching: clockwise during the SIP process

The valve must be brought to the closed position for a brief period (min. 3 seconds) immediately SIP cleaning. During commissioning, regularly check all sealing points for leaks. Exchange defective seals and repeat the SIP process.

10 Maintenance

10.1 Safety instructions

Maintenance and repair

Before carrying out maintenance and repair work on the component's electrical equipment, perform the following steps in accordance with the "5 safety rules":

- Isolate from the power supply
- Take appropriate measures to prevent switch on
- Test absence of voltage
- Earthing and short-circuiting
- Cover or safeguard any adjacent live parts.

For maintenance and repair, the following principles apply:

- Observe the intervals specified in the maintenance schedule.
- Only qualified personnel may carry out maintenance or repair work on the component.
- The component must be switched off and secured against being switched back on before maintenance or repair work. Work may only be started once any residual energy has been discharged.
- Block access for unauthorized persons. Put up notice signs which draw attention to the maintenance or repair work going on.
- Do not climb on the component. Use suitable access aids and working platforms.
- Wear suitable protective clothing.
- Only use suitable and undamaged tools to carry out maintenance work.
- When replacing parts only use approved, fully functional load lifting devices and lifting accessories which are suitable for the intended purpose.
- Before setting the unit back into operation, refit all safety devices as originally provided in the factory. Then check that all safety devices are working correctly.
- Make sure lubricants are used properly.
- Check pipes are firmly secured, also check for leaks and damage.
- Check that all emergency stop devices are working correctly.

Disassembly

For disassembly, the following principles apply:

- Only qualified personnel are allowed to dismantle the component.
- The component must be switched off and secured against being switched back on before it is dismantled. Work may only be started once any residual energy has been discharged.

- Disconnect all power and utility lines.
- Markings, e.g. on lines, must not be removed.
- Do not climb on the component. Use suitable access aids and working platforms.
- Mark the lines (if unmarked) prior to disassembly to ensure they are not confused when re-assembling.
- Protect open line ends with blind plugs against ingress of dirt.
- Pack sensitive parts separately.
- For longer periods of standstill, observe the storage conditions, see Section 4.1, Page 22.

10.2 Inspections

Between the maintenance periods, the components must be checked for leakage and proper function.

10.2.1 Leakage openings

Carry out the following steps:

1. Check the leakage opening regularly to determine if they are free of contamination
2. Check the leakage cavity for soiling and continuous leakage of fluids.

→ Done

10.2.2 Pneumatic connection

Carry out the following steps:

1. Check the operating pressure at the pressure reducing and filter station.
2. Regularly clean the air filter in the filter station.
3. Check that the air hoses sit firmly in the air connections.
4. Check the lines for kinks and leaks.
5. Check the solenoid valves for proper function.
   Note: When the control top is mounted, it must be actuated.

→ Done

10.2.3 Electrical connections

Carry out the following steps:

1. Check that the union nut on the cable gland is tight
2. Check that the cable connections are firmly secured.
3. Check the solenoid valves for proper function.
   Note: When the control top is mounted, it must be actuated.
4. Check that the initiator connections are clean.

→ Done

Hint!

The electrical cable must be long enough to allow the control top to be removed via the switch bar!

10.3 Servicing intervals

To ensure the highest operational reliability of the valves, all wearing parts should be replaced at longer intervals. Keep an adequate supply of all wearing parts (bellows and seals) in your spare parts stock.

In practice, the actual maintenance intervals can only be determined by the user since they depend on the operating conditions.

Examples of relevant process parameters are:

- daily period of use,
- switching frequency,
- type and temperature of the product,
- type and temperature of the cleaning solution,
- ambient conditions.

If there is still no or too little information available for the definition of practically-orientated maintenance intervals, the reference values listed in the following table can be considered as a basis. The following information is based on the experience of GEA Flow Components and applies to installations working in a 2-shift operation.

Servicing intervals	
Component	**Measure**
Maintenance activities to be performed once a month	
Valve	Visual check without dismantling
Maintenance activities to be performed after 3 months	
Product contact seals	Media temperature 60...130 °C (140...266 °F)
	Seal replacement
Actuator	Function check
Valve	Function check
Feedback	Function check
Pneumatic connections	Check of mechanical parts and visual inspection of condition – leak test
Electrical connections	Visual inspection
Maintenance activities to be performed once a year	

Servicing intervals	
Component	**Measure**
Product contact seals	Media temperature < 60 °C (< 140 °F)
	Seal replacement
Actuator	Mechanical & visual inspection of condition
Valve	Check of mechanical parts and visual inspection of condition – function test
Feedback	Check of mechanical parts and visual inspection of condition – function test
Pneumatic connections	Check of mechanical parts and visual inspection of condition – function test
Electrical connections	Check of mechanical parts and visual inspection of condition

10.4 Disassembling the Valve

10.4.1 Prior to disassembly

Prerequisite:

- Make sure that during maintenance and repair work no process is in operation in the area concerned.

Carry out the following steps:

1. Drain all pipe system elements that lead to the valve and, if necessary, clean or rinse them.
2. Disconnect the power supply.
3. Take the valve out of the pipe section, with all housings and housing connections if possible.

→ Done

10.4.2 Removing the valve insert

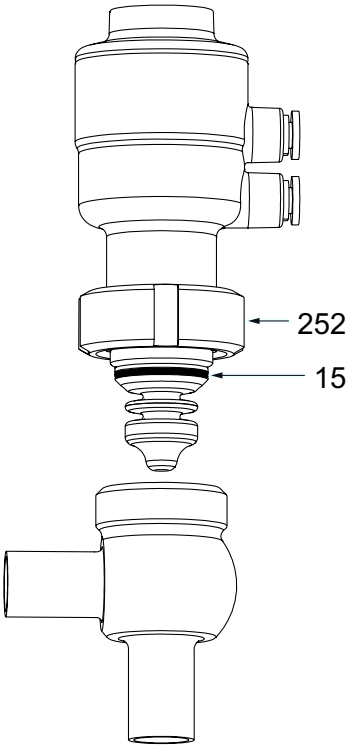

Fig.9: Valve insert with bellows

Requirement:

- No solenoid valve must be actuated electrically or manually.

Spring-closing valve NC

⚠ Warning!

Spring tension in the valve

Danger of injury when detaching the cap nut (252) at the housing as the released spring pretension will suddenly lift the actuator.

► Therefore, release the spring tension before detaching the cap nut by supplying the actuator with compressed air at max. 8 bar.

Notice

The potentiometer spindle (P) is a sensitive component

Damage to potentiometer spindle (P)

► Handle potentiometer spindle (P) carefully
► Do not remove the hood (H) of the control top (B). Do not disassemble the attachments 1+2 of the control top for air/air actuators.

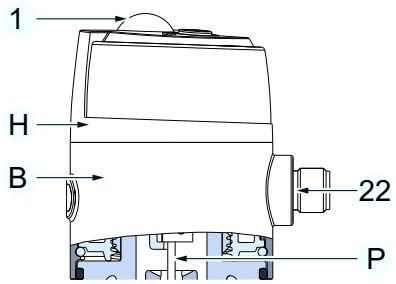

Fig.10: Control top T.VIS V-1

Carry out the following steps:

1. Remove electrical and pneumatic connections from the control top (B).
2. Vent actuator at connection (117) with compressed air, max. 8 bar.
   → The bellows (15) are raised.
3. Undo the cap nut (252) using the joint spanner and remove the valve insert.
   ! Do not hit the valve parts against the housing.
4. Interrupt the compressed air supply.
   → The bellows (15) are lowered.

→ Done

Spring-opening valve NO

Carry out the following steps:

1. Remove electrical and pneumatic connections from the control top (B).
2. Undo the cap nut (252) using the joint spanner and remove the valve insert.
   ! Do not hit the valve parts against the housing.

→ Done

10.4.3 Removing the bellows

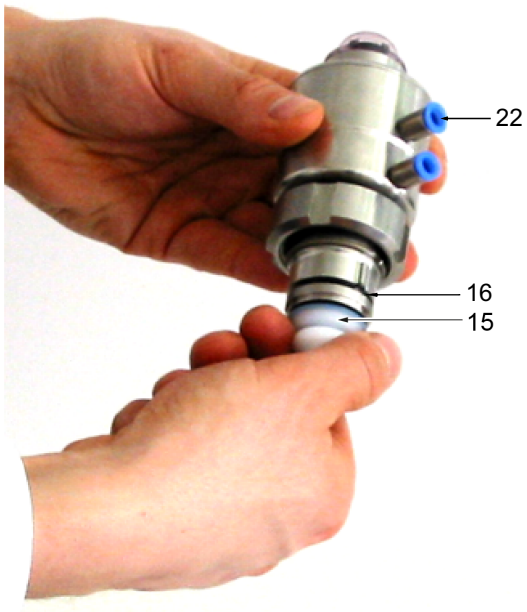

Fig.11: Removed valve seat

⚠ Warning!

Spring tension in spring-opening valve (NO)

Danger of injury.

► Do not put your hand into the valve housing.
► Before removing the valve insert, pressurise connection (22) with air.

⚠ Warning!

In the case of a removed valve insert, (NC) and (NO), there is a risk of injury at point (16).

There is a risk of crushing or clamping.

► Do not reach into the gap at point (16)!

Carry out the following steps:

1. Unscrew bellows (15) from the valve rod.

→ This completes removal of the bellows.

10.4.4 Disassembling the visual position indicator

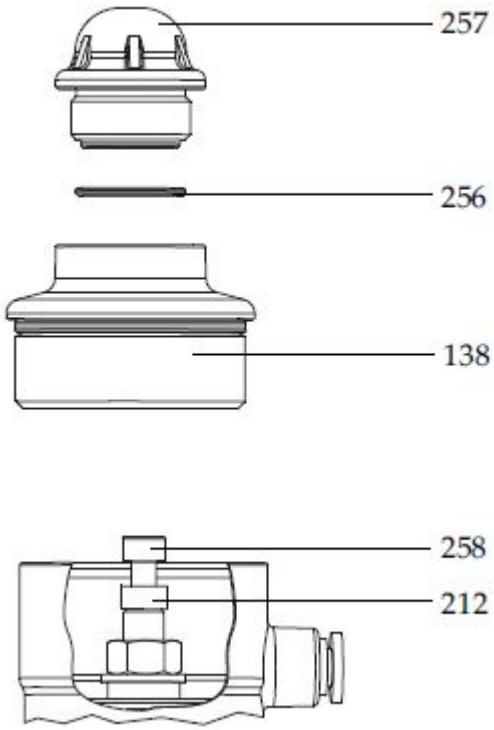

Fig.12: Pneumatic actuator with visual position indicator

Carry out the following steps:

1. Unscrew the position indicator (257) using tools.
2. Take the O-ring (256) out of the housing (138).
3. Remove spacer (212) and screw (258).

→ Visual position indicator is disassembled.

10.4.5 Disassembling the pneumatic actuator

Hint!

For valves in stainless steel, unscrew the screw-in slip connections (117) (hexagon socket AF 2.5).

Removing Actuator NC–spring-closing

Carry out the following steps:

1. Unscrew cover (138) with screwdriver (hexagon socket) AF17.

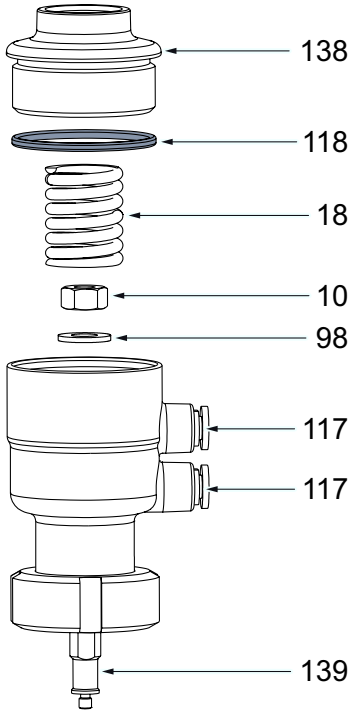

Fig.13: Components pneumatic actuator (1)

2. Take the O-ring (118) out of the housing (138).
3. Remove the compression spring (18), undo the hexagon nut (10) (socket wrench insert) and slide off the rod (139) with the washer (98).
4. Pull the rod (139) down and out of the lantern (9).
5. Push the piston (228) with a screwdriver up and out of the lantern, also remove the washer (98).

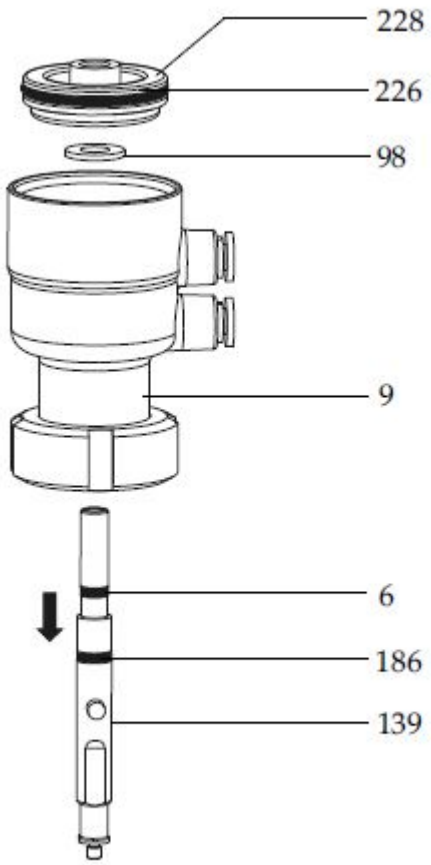

Fig.14: Components pneumatic actuator (2)

6. Remove the O-rings 226, 6, 186.

   → For the stainless steel version, the anti-twist protection can be removed to replace the O-ring (29). To this end, push the pin (251) inwards, the rod must already be removed for this. Remove the sleeve (219) downwards and remove the O-ring (29).

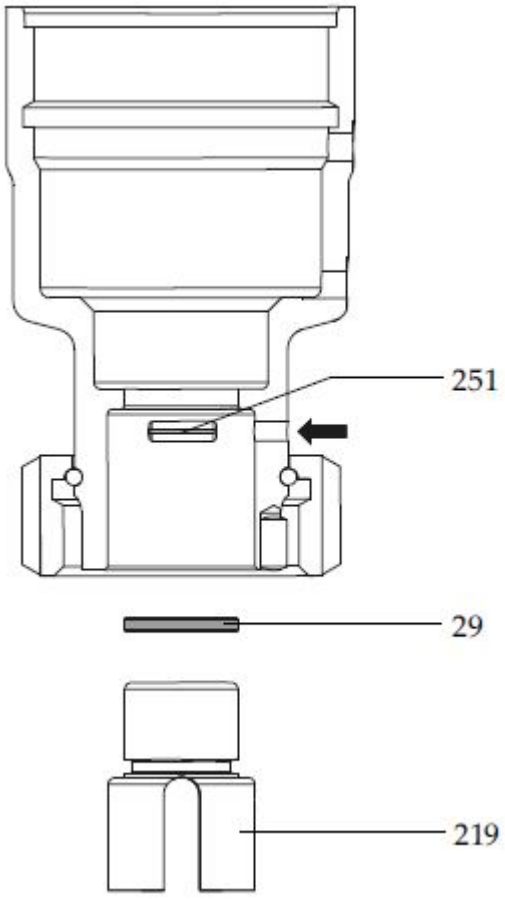

Fig.15: Lantern pneumatic actuator

→ Actuator NC–spring-closing has been removed.

Removing the actuator NO–spring-closing

1. Unscrew cover (138) with screwdriver (hexagon socket) AF17.

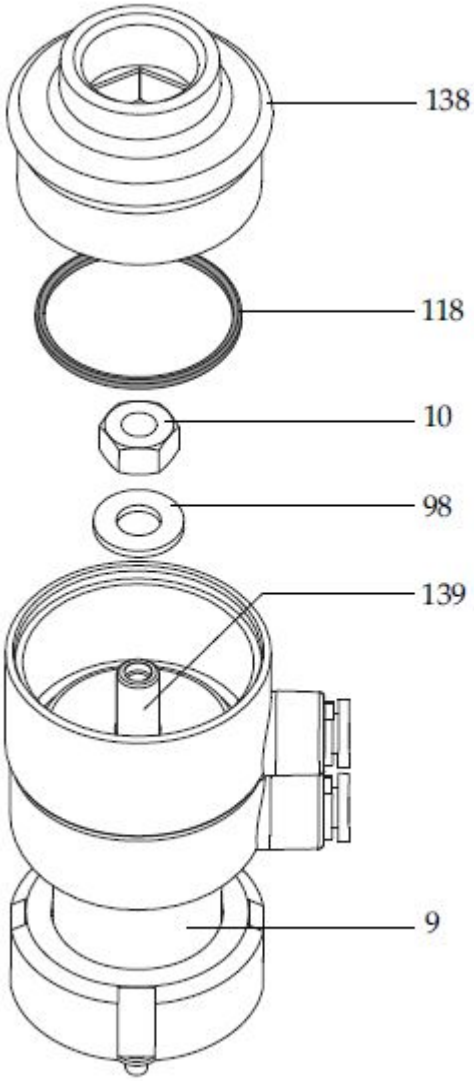

Fig.16: Components pneumatic actuator (3)

2. Removing the O-ring (118).
3. Undo the hexagon nut (10) (socket wrench insert). This relieves the pressure spring (18). Slide the washer (98) off the rod (139).
4. Pull the rod (139) down and out of the lantern (9).

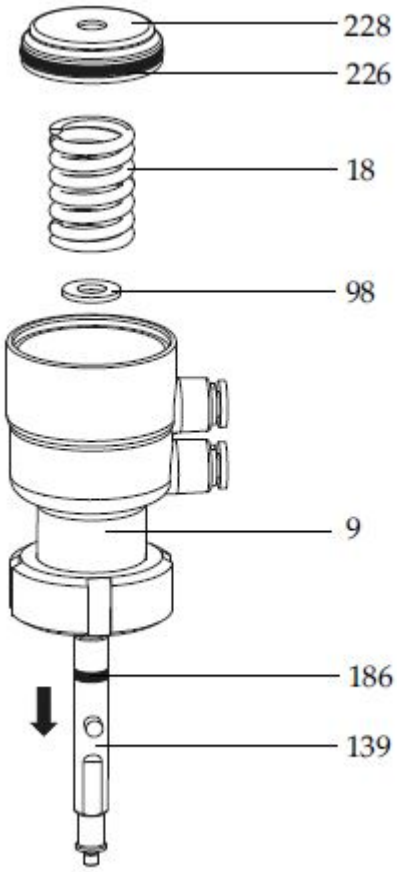

Fig.17: Components pneumatic actuator (4)

5. Remove the piston (228) together with the pressure spring (18) and the washer (98).
6. Remove the O-rings (226, 6, 186).

→ Actuator NO–spring-opening has been removed.

10.4.6 Removing the control top T.VIS V-1/P-1

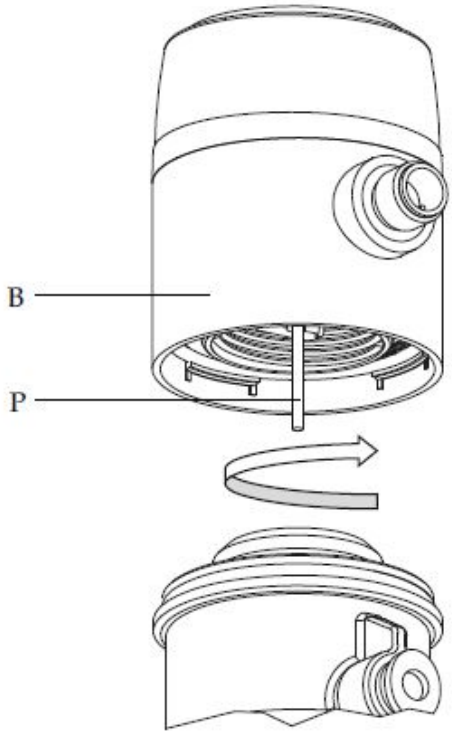

Fig.18: Control top T.VIS V-1

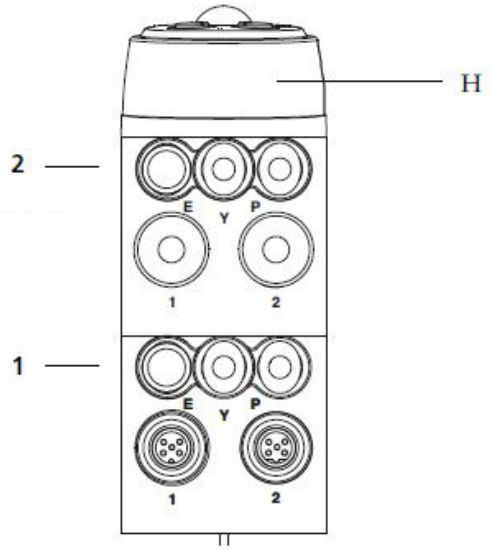

Fig.19: Control top T.VIS P-1, attachment 1 and 2

Notice

The potentiometer spindle (P) is a sensitive component

Damage to potentiometer spindle (P)

► Handle potentiometer spindle (P) carefully

Carry out the following steps:

1. Remove electrical and pneumatic connections from the control top (B).
   - Do not remove the hood (H) of the control top (B).
   - Do not disassemble the attachments 1 and 2 for control tops for air/air actuators.
2. Turn the control top (B) to the left (in the direction of the arrow) until the stop is reached.

→ Control top T.VIS V-1/P-1 has been removed.

10.4.7 Removing the manual actuator

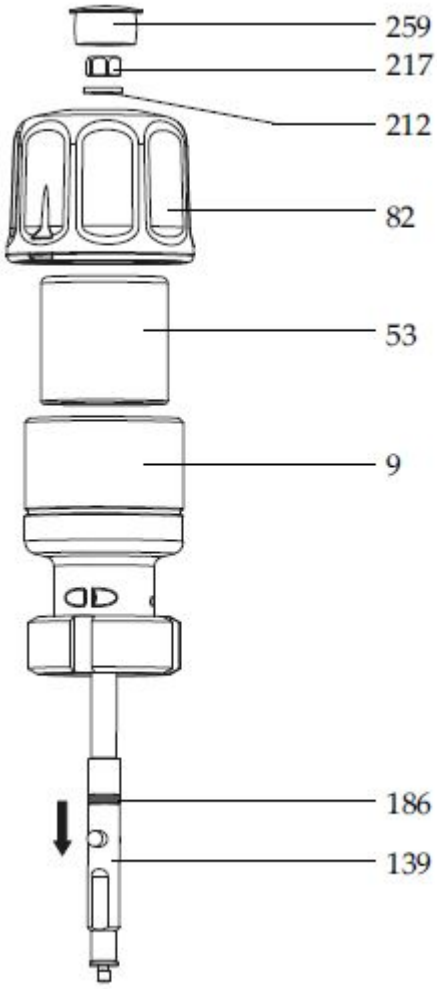

Fig.20: Components manual actuator

Carry out the following steps:

1. Remove the round plug (259), unscrew the hexagon nut (217) AF13 together with the washer (212).
2. Unscrew the handwheel(82), remove the spring package (53) upwards, pull out rod (139) downwards.
3. Remove the O-ring (186).

→ Manual actuator has been removed.

10.5 Maintenance

10.5.1 Note on Seal Replacement

Replace defective seals and bellows to ensure the tightness of the valve. Always use genuine spare parts. Follow maintenance procedures with regard to the seals, see Section 10.3, Page 37.

10.5.2 Cleaning the valve

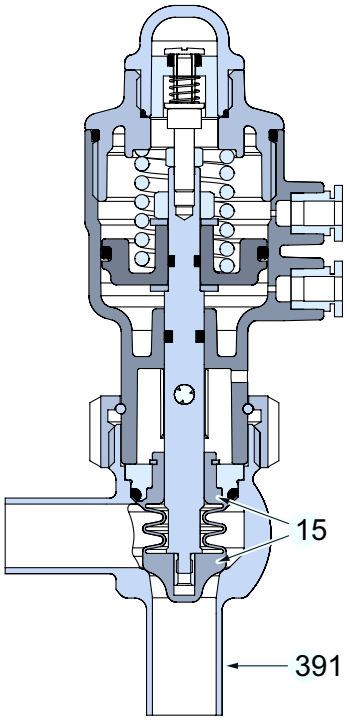

Fig.21: Shut-off valve with pneumatic actuator

Notice

The bellows with valve shaft (15) and housing seat (391) are precision areas. They may not be damaged!

Damage to these parts can result in malfunction.

► Handle the valve with care!

Notice

Damage to the valve

Damage to these parts can result in malfunction.

► Observe the safety information sheets issued by the detergent manufacturers!

► Only use detergents which are non-abrasive and not aggressive towards stainless steel.

Hint!

With plastic actuators made from PPS, the operator must pay particular attention to the selection of a suitable cleaning agent. We also recommend replacing the PP plastic actuator after 2 years.

Carry out the following steps:

1. Disassemble the valve, see Section 10.4, Page 38.
2. Carefully clean the individual parts.

→ Done

10.5.3 Lubricating seals and threads

⚠ Caution!

Damage to seals and threads

Damage to seals and threads can result in malfunction.

► Ensure that an adequate film of lubricant is applied. No grease residues must be visible once the valve has been assembled completely.
► For product contact seals only use suitable greases and oils.
► Observe the safety data sheets issued by the lubricant manufacturer.

Carry out the following steps:

1. Lightly grease the valve rod thread.
2. Grease all seals – including the O-rings of the actuator – very thinly.

   !Do not grease the bellows and the O-ring behind it.

→ Done

Hint!

GEA Tuchenhagen recommends Cassida P1. This lubricant is food grade and has NSF-H1 (USDA H1) registration. It does not affect the taste or the consistency of the products and is compatible with the seals in contact with product.

Cassida P1 can be ordered from GEA Tuchenhagen under material no. 413-134. Using other types of grease can result in malfunctions or in premature seal failure. The warranty will also become null and void.

A Manufacturer's Declaration for these products can be obtained from GEA Tuchenhagen if required.

A thin film of grease is required on the seals to ensure the proper function of the fittings. It reduces friction and extends the service life of the seals. This is absolutely harmless from a health and hygienic point of view.

Running dry must be avoided!

10.6 Installation

10.6.1 Mounting the pneumatic actuator

Hint!

For valves in stainless steel, screw on the screw-in slip connections (117) (hexagon socket AF 2.5) after the installation.

Assembling the actuator NC–spring-closing

Carry out the following steps:

Fit the anti-rotation device for stainless steel model.

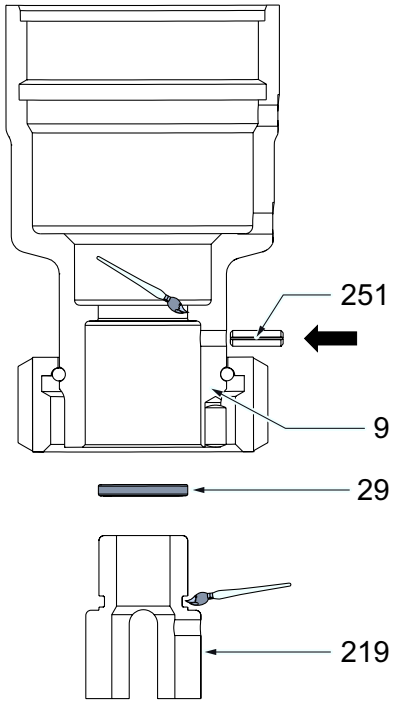

Fig.22: Lantern pneumatic actuator

1. Insert the O-ring (29) into the sleeve (219).
2. Push the sleeve (219) from downwards into the lantern (9).
   Align the holes of lantern and sleeve with each other.
3. Drive in the pin (251) until it is flush from the outside.
4. Mount the O-rings (226, 6, 186).

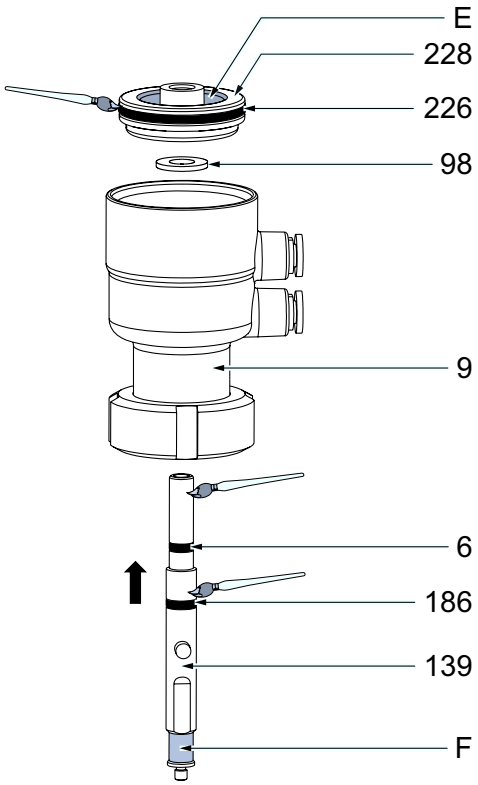

Fig.23: Pneumatic actuator components NC

5. Push the rod (139) from downwards into the lantern (9).
   The recess (F) on the rod (139) must point downwards.
6. Push the washer (98) from the top onto the rod (139).
7. Fit the piston (228).
   The undercutting (E) of the piston must be open towards the top.

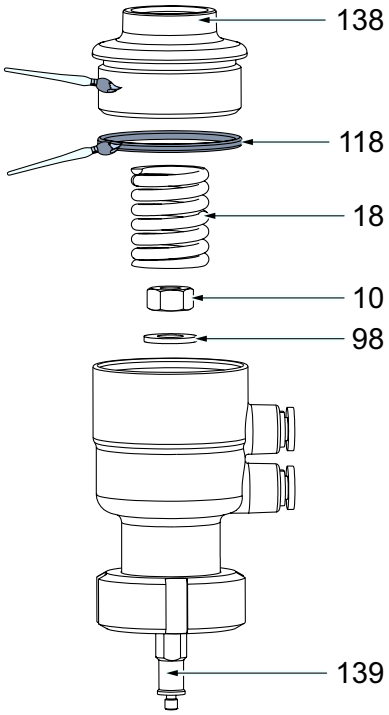

Fig.24: Pneumatic actuator components

8. Push the second washer (98) onto the rod (139). Tighten the hexagon nut (10) using a socket wrench insert.
9. Push the pressure spring (18) from the top onto the rod (139).
10. Install O-ring (118) in the cover (138).
11. Screw on the cover (138) with screwdriver (hexagon socket) AF17.

→ Actuator NC –spring-closing has been removed.

Mount the actuator NO–spring-opening

1. Mount the O-rings (226, 6, 186).

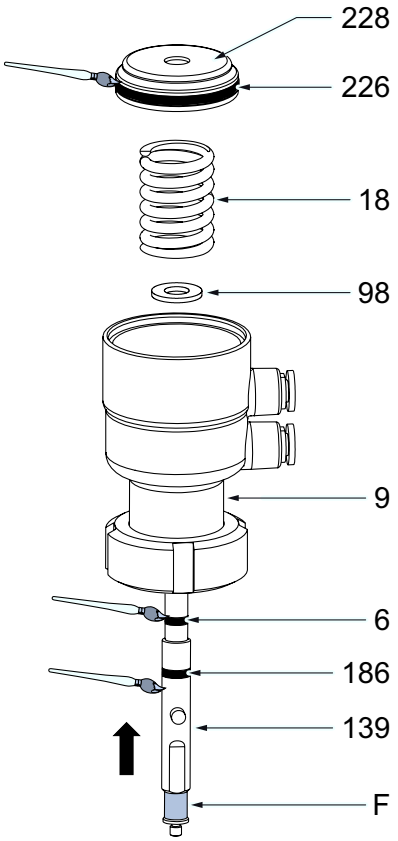

Fig.25: Pneumatic actuator components NO

2. Push the rod (139) from downwards into the lantern (9).
3. Push the washer (98) and pressure spring (18) together with the piston (228) onto the rod (139).
4. Push the second washer (98) from the top onto the rod (139). Tighten the hexagon nut (10) using a socket wrench insert. This loads the pressure spring (18).

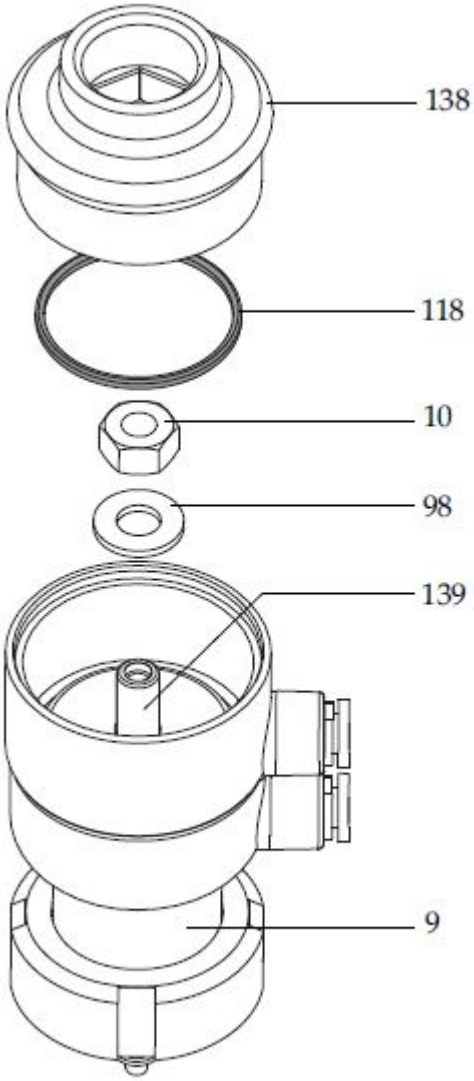

Fig.26: Pneumatic actuator components

5. Install O-ring (118) in the cover (138).
6. Screw on the cover (138) with screwdriver (hexagon socket) AF17.

→ Actuator NO–spring-opening has been mounted.

10.6.2 Assembling the visual position indicator

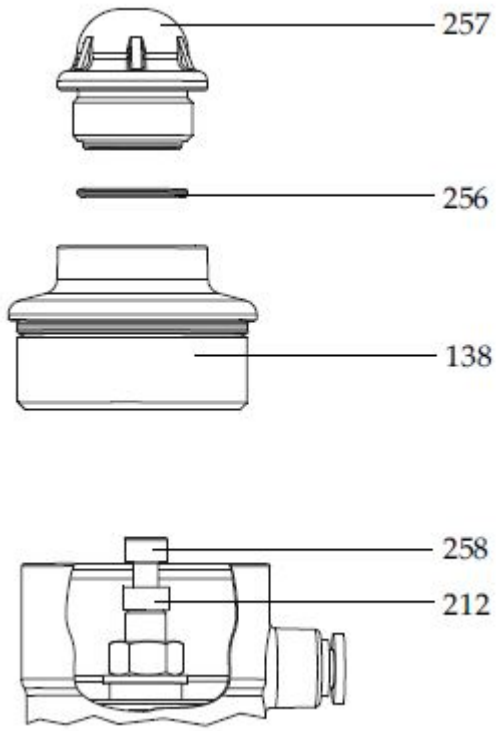

Fig.27: Pneumatic actuator with visual position indicator

Carry out the following steps:

1. Assemble spacer (212) and screw (258).
2. Install O-ring (256) in the cover (138).
3. Screw on position indicator cpl. (257).

→ Visual position indicator has been assembled.

10.6.3 Installing the control top T.VIS V-1 / P-1

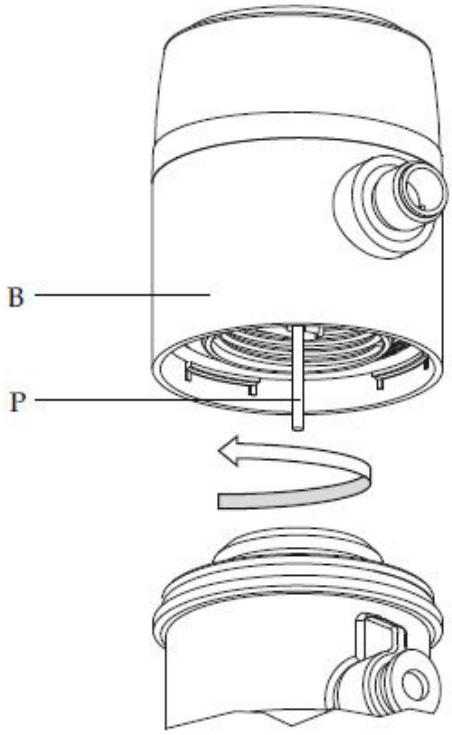

Fig.28: Control top T.VIS V-1

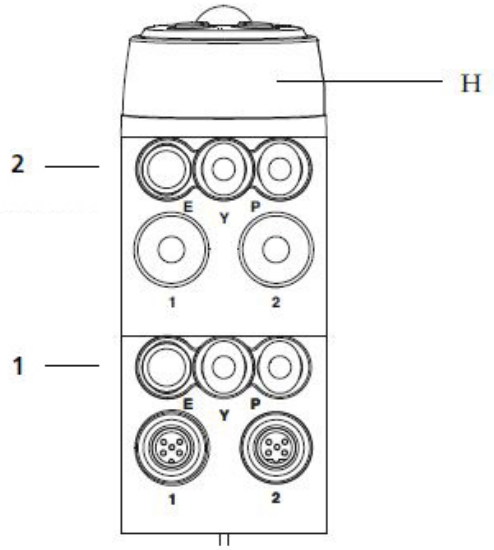

Fig.29: Control top T.VIS P-1 attachment 1 and +2

Notice

The potentiometer spindle (P) is a sensitive component

Damage to potentiometer spindle (P)

► Handle potentiometer spindle (P) carefully

Carry out the following steps:

1. Put on the control top (B) and turn to the right (in the direction of the arrow) until the stop is reached.
2. Remove electrical and pneumatic connections from the control top (B).

→ Control top T.VIS V-1/P-1 has been installed.

10.6.4 Mounting the bellows

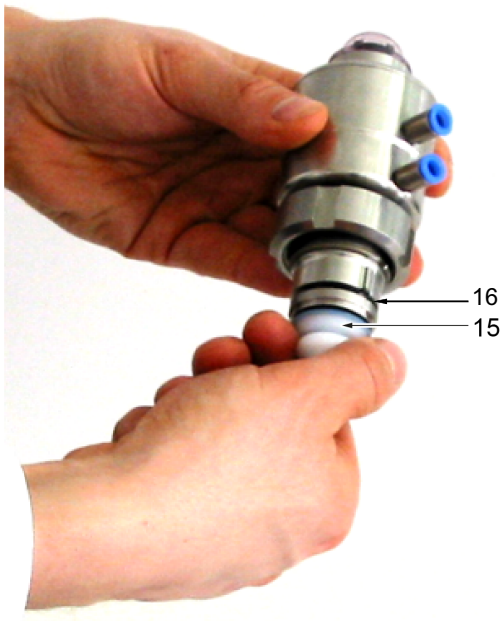

Fig.30

⚠ Warning!

Risk of injury by spring force being released on valves with spring-opened actuation (NO) and spring-closing actuation (NC)

You can sustain serious injuries to your fingers when you put your hand into the valve housing.

► Do not put your hand into the valve housing.

⚠ Warning!

In the case of a removed valve insert, (NC) and (NO), there is a risk of injury at point (16).

There is a risk of crushing or clamping.

► Do not reach into the gap at point (16)!

Notice

Sensitive valve parts

Damage to the valve parts can result in leakage problems and malfunction.

► Protect the valve parts against impact stress.

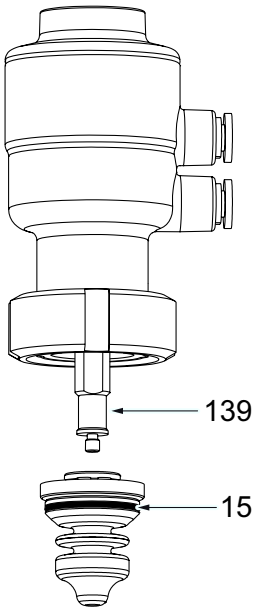

Fig.31

Carry out the following steps:

1. Install bellows (15) on valve disk (139).

→ This completes installation of the bellows.

10.6.5 Installing the valve insert

Prerequisite

- No solenoid valve must be actuated electrically or manually.
- The pneumatic and electrical connections on the plant side can remain on the control top.

Spring-closing valve NC

Carry out the following steps:

⚠ Warning!

Spring tension in the valve

There is the risk of injury due to incorrectly screwed on cap nut (252) when the valve is vented as the spring tension that is released suddenly lifts the actuator.

► Ensure that the cap nut has been assembled correctly before venting.

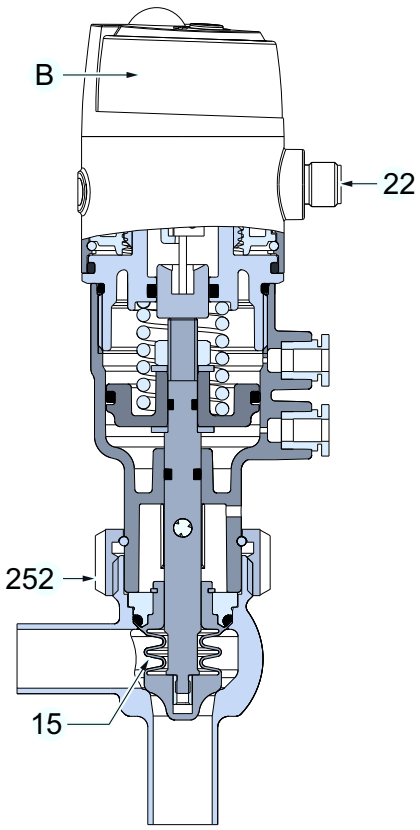

Fig.32: Install valves NC

1. Place the control top (B) on the valve.
2. Pressurize the valve at the connection with compressed air, max. 8 bar.
   → The bellows (15) are raised.
3. Guide the valve insert completely into the housing.
   ! Do not hit the valve parts against the housing.
4. Tighten the cap nut (252) by hand.
   ! Pay attention to torques.
5. Vent the actuator.
   → The bellows (15) are lowered.

→ Done.

Spring-opening valve NO

1. Guide the valve insert completely into the housing.
   ! Do not hit the valve parts against the housing.
2. Tighten the cap nut with torque wrench.
   ! Pay attention to torques.
3. Place the control top (B) on the valve.
   → The valve seat has been installed.

→ Done.

10.6.6 Checking the function

Checking the valve stroke

Carry out the following steps:

1. Actuate the valve with compressed air.
2. Check the valve stroke according to table “valve stroke” (Page 62).

→ Stroke has been checked.

Strokes depending on size

Valve stroke	
Valve size	**Valve stroke [mm]**
DN10	2
DN15	4
DN20	5
DN25	5
DN32	7
OD 0.5"	2
OD 0.75"	4
OD 1"	4.5
ISO 13.5	2
ISO 17.2	3
ISO 21.3	3
ISO 26.9	5
ISO 33.7	7

11 Alarms

11.1 Malfunctions and remedies

Notice

Warning of damage to property/loss of product

Ignoring malfunctions may cause considerable damage to property and loss of product. The safe operation of the valve in the event of a malfunction can no longer be taken for granted and in the worst case can result in a loss of sterility in the process.

► Make sure that malfunctions are quickly identified and promptly fixed.

In the event of malfunctions immediately deactivate the valve and secure it against inadvertent reactivation. Malfunctions may only be remedied by qualified staff, who must observe the safety precautions.

Fault	Cause	Remedy
Valve does not work	Fault in the controller	Check the system configuration
	No compressed air or compressed air too low	Check the compressed air supply Check air hoses for free passage and air tightness
	Fault in the electrical system	Check actuation / external controller and routing of electrical lines
	Actuator leaking	Replacing seals
Valve does not close tight	Dirt/foreign material between valve seat and bellows	Clean valve housing and bellows
	Seat area in the housing damaged	Replace the housing
	PTFE bellows defective	Replace PTFE bellows
Valve closes too slowly	O-rings in the actuator and control top are dry (friction losses)	Grease O-rings
Medium is leaking from the leakage holes of the lantern	Bellows are not fitted correctly or the sealing lip at the bellows is damaged	Fit the bellows correctly or replace if damaged
The maximum stroke is not reached when the valve is actuated pneumatically	Leakage in the actuator.	Check the sealing surfaces in the actuator for damage.
		Replace the seals
Valve feedback not correct.	The feedback unit is not fitted correctly	Check that the feedback unit has been fitted correctly.

Fault	Cause	Remedy
	The proximity switch is not in the correct position or is defective	Check the proximity switch position and readjust if necessary
	Fault in the power supply	Check the wiring
Actuator is filling with water	Unfavourable installation position	Align air connections downwards, if possible
	Unfavourable effect of the exterior cleaning of the plant	For vertical valve installation: Align air connections away from the cleaning direction, if possible

12 Decommissioning

12.1 Safety instructions

For shutting down, the following principles apply:

- Switch off the compressed air.
- Switch off the component with the main switch.
- Padlock the main switch (if fitted) in the off position to prevent it from being switched back on. The key to the padlock must be deposited with the person responsible until the machine is restarted.
- For longer periods of standstill, observe the storage conditions, see Chapter 4, Page 22.

12.2 Disposal

12.2.1 General notes

Dispose of the component in an environmentally safe manner. Observe the statutory waste disposal regulations applicable at the place of installation.

The component consists of the following materials:

- Metals
- Synthetic materials
- Electronic parts
- Lubricants containing oil and grease

Separate the different materials and dispose of them correctly sorted. Also observe the instructions regarding disposal in the operating instructions for the individual components.

13 Spare parts list – GEA VESTA bellows shut-off valve H_A - 10 bar

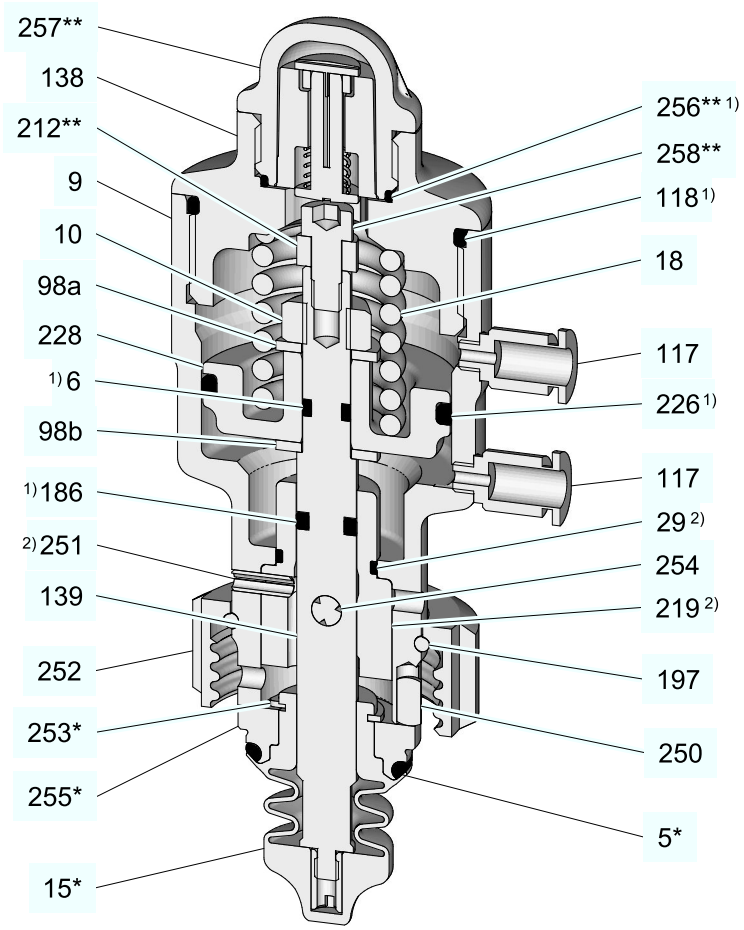

Fig.33: Pneumatic actuator H_A/M - metal version

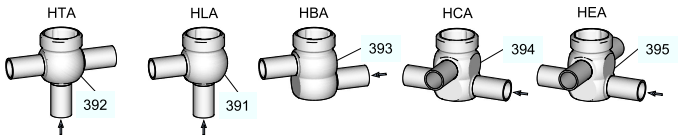

Fig.34: Standard housing combinations

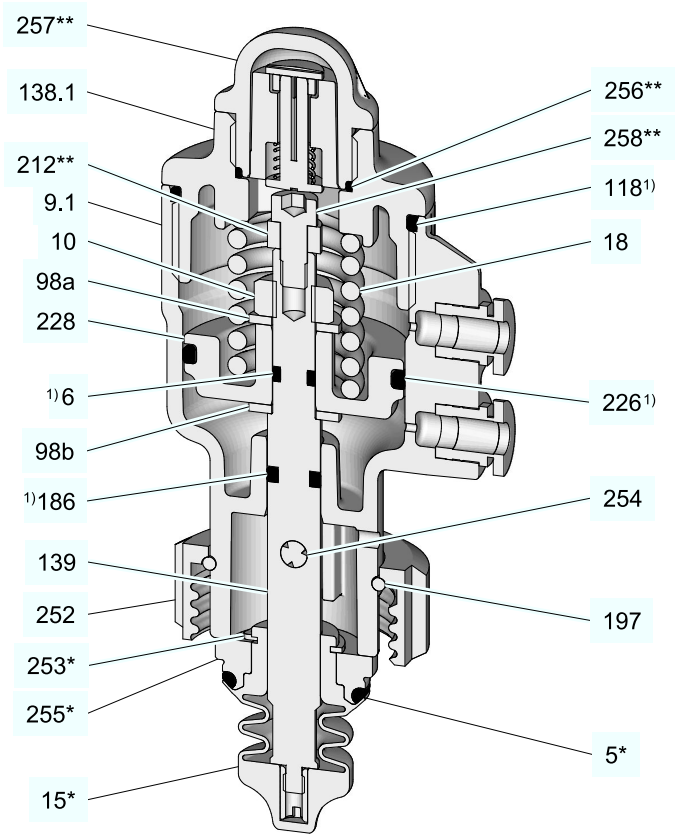

Fig.35: Pneumatic actuator H_A - plastic version

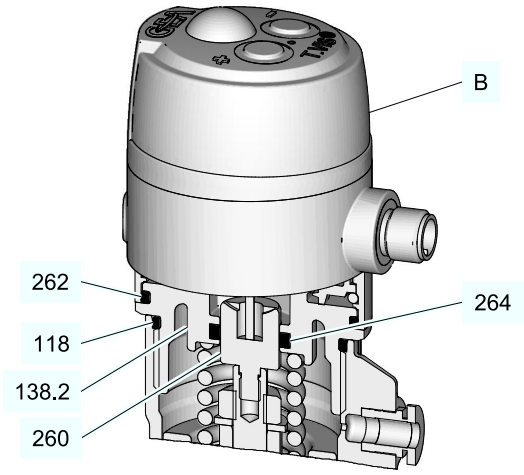

Fig.36: Pneumatic actuator H_A/TV for control top T.VIS V-1/P-1 / The spare parts without positions are listed in the pneumatic actuator H_A.

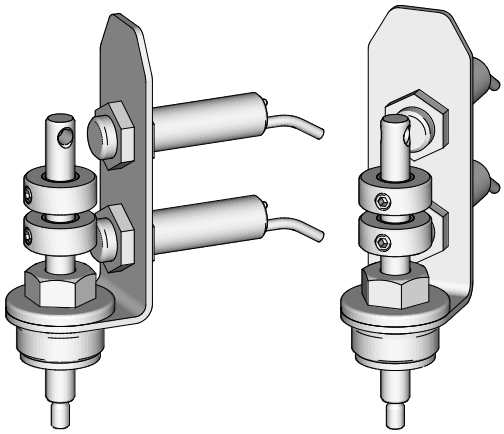

Fig.37: Mounting for proximity switch H_A

Item	Designation	Material	DN 10	DN 15	DN 20	DN 25	DN 32
Sealing set H_A complete			221-003887	221-003887	221-003888	221-003889	221-003889
Sealing set H_A/M complete			221-003890	221-003890	221-003891	221-003892	221-003892
5*	O-ring	EPDM	930-860	930-860	930-862	930-861	930-861
6	O-ring	FKM	930-683	930-683	--	--	--
		NBR	--	--	930-931	930-931	930-931
9	Lantern H_A/M	1.4301	221-001061	221-001061	221-001070	221-001071	221-001071
9.1	Lantern H_A	PPSGV40	221-000900	221-000900	221-000988	221-000911	221-000911
10	Hexagon nut	A2	910-018	910-018	910-026	910-026	910-026
15	Bellows H_A	TFM1705/ 1.4301	221-004594	221-004595	221-000999	221-000936	221-002627
*	Bellows H_A cpl. comprising pos. 5, 15, 253 and 255		221-004640	221-004641	221-001276	221-001277	221-003216
18	Compression spring	1.1200	931-299	931-299	931-300	931-301	931-301
29	O-ring	HNBR	930-957	930-957	930-866	930-867	930-867
98a	Ring	A2	921-014	921-014	921-018	921-018	921-018
98b	Ring	A2	921-014	921-014	921-018	--	--
117	Screw-in plug connection	Brass, nickel-plated	933-977	933-977	933-977	933-977	933-977
118	O-ring	NBR	930-479	930-479	930-061	930-082	930-082
138	Cover H_A/M	1.4301	221-001062	221-001062	221-001063	221-001064	221-001064
138.1	Cover H_A	PPSGV40	221-000881	221-000881	221-000982	221-000882	221-000882
139	Rod H_A	1.4301	221-000908	221-000895	221-000991	221-000939	221-000917
186	O-ring	HNBR	930-921	930-921	930-803	930-922	930-922
197	Snap ring	1.4310	917-172	917-172	917-184	917-173	917-173
212	Space piece	PA	221-001260	221-001260	221-001261	221-001261	221-001261
219	Sleeve H_A/M	PVDF	221-001060	221-001060	221-001073	221-001072	221-001072
226	O-ring	NBR	930-050	930-050	930-065	930-729	930-729
228	Piston H_A	3.2315.T6	221-001127	221-001127	221-001089	221-001088	221-001088
250	Straight pin	A4	915-078	915-078	915-078	915-078	915-078
251	Spring pin	1.4310	925-094	925-094	925-094	925-094	925-094
252	Cap nut H_A	1.4301	221-000898	221-000898	221-000992	221-000938	221-000938
253	Retaining ring	1.4310	917-182	917-182	917-116	917-183	917-183
254	Grooved pin	1.4301	916-040	916-040	916-042	916-041	916-041
255	Thrust washer H_A	1.4301	221-000897	221-000897	221-000990	221-000937	221-000937
256	O-ring	HNBR	930-866	930-866	930-866	930-866	930-866
257	Position indicator H_A	PA6	221-001057	221-001057	221-001057	221-001057	221-001057
**	Position indicator H_A cpl. comprising pos. 212, 256, 257 and 258		221-001298	221-001298	221-001299	221-001299	221-001299
258	Cylinder screw with hex socket	A2-70	902-114	902-114	902-093	902-093	902-093
Standard housing combinations							
391	Housing HLA	1.4435	221-000906	221-000902	221-001158	221-000967	221-002618
392	Housing HTA	1.4435	221-000962	221-000933	221-001159	221-000969	221-002621
393	Housing HBA	1.4435	221-001214	221-001220	221-001226	221-001232	221-002622
394	Housing HCA	1.4435	221-001215	221-001221	221-001227	221-001233	221-002623

Item	Designation	Material	DN 10	DN 15	DN 20	DN 25	DN 32
395	Housing HEA	1.4435	221-001497	221-001498	221-001503	221-001506	on request
Accessories							
Item	**Designation**	**Material**	**Material no.**				
Mounting for proximity switch H_A		1.4301	221-001806				
		see spare parts list for mounting for proximity switch H_A					
B	Control top T.VIS V-1/P-1	see spare parts list for control top T.VIS V-1/P-1					
Pneumatic actuator H_A/TV for control top T.VIS V-1/P-1							
118	O-ring	NBR	930-479	930-479	930-061	930-082	930-082
138.2	Cover T.VIS V-1	PPSGV40	221-002303	221-002303	221-002304	221-002305	221-002305
138.3	Cover T.VIS V-1	1.4305	221-002173	221-002173	221-002174	221-002175	221-002175
260	Adapter T.VIS V-1	1.4301	221-002253	221-002253	221-002253	221-002253	221-002253
262	O-ring	NBR	930-903	930-903	930-903	930-903	930-903
264	O-ring	NBR	930-012	930-012	930-012	930-012	930-012

Item	Designation	Material	0.5" OD	0.75" OD	1" OD
Sealing set H_A complete			221-003887	221-003887	221-003888
Sealing set H_A/M complete			221-003890	221-003890	221-003891
5*	O-ring	EPDM	930-860	930-860	930-862
6	O-ring	FKM	930-683	930-683	--
		NBR	--	--	930-931
9	Lantern H_A/M	1.4301	221-001061	221-001061	221-001070
9.1	Lantern H_A	PPSGV40	221-000900	221-000900	221-000988
10	Hexagon nut	A2	910-018	910-018	910-026
15	Bellows H_A	TFM1705/1.4301	221-004594	221-004595	221-004596
*	Bellows H_A cpl. comprising pos. 5, 15, 253 and 255		221-004640	221-004641	221-004642
18	Compression spring	1.1200	931-299	931-299	931-300
29	O-ring	HNBR	930-957	930-957	930-866
98a	Ring	A2	921-014	921-014	921-018
98b	Ring	A2	921-014	921-014	921-018
117	Screw-in plug connection M5-6/4	Brass, nickel-plated	933-977	933-977	933-977
	Screw-in plug connection G1/8"-6/4		933-176	933-176	933-176
118	O-ring	NBR	930-479	930-479	930-061
138	Cover H_A/M	1.4301	221-001062	221-001062	221-001063
138.1	Cover H_A	PPSGV40	221-000881	221-000881	221-000982
139	Rod H_A	1.4301	221-000908	221-000895	221-000991
186	O-ring	HNBR	930-921	930-921	930-803
197	Snap ring	1.4310	917-172	917-172	917-184
212	Space piece	PA	221-001260	221-001260	221-001261
219	Sleeve H_A/M	PVDF	221-001060	221-001060	221-001073
226	O-ring	NBR	930-050	930-050	930-065
228	Piston H_A	3.2315.T6	221-001127	221-001127	221-001089
250	Straight pin	A4	915-078	915-078	915-078
251	Spring pin	1.4310	925-094	925-094	925-094
252	Cap nut H_A	1.4301	221-000898	221-000898	221-000992
253	Retaining ring	1.4310	917-182	917-182	917-116
254	Grooved pin	1.4301	916-040	916-040	916-042
255	Thrust washer H_A	1.4301	221-000897	221-000897	221-000990
256	O-ring	HNBR	930-866	930-866	930-866
257	Position indicator H_A	PA6	221-001057	221-001057	221-001057
**	Position indicator H_A cpl. comprising pos. 212, 256, 257 and 258		221-001298	221-001298	221-001299
258	Cylinder screw with hex socket	A2-70	902-114	902-114	902-093
Standard housing combinations					
391	Housing HLA	316L	221-001164	221-001166	221-001162
392	Housing HTA	316L	221-001165	221-001167	221-001163
393	Housing HBA	316L	221-001212	221-001222	221-001228
394	Housing HCA	316L	221-001213	221-001223	221-001229
395	Housing HEA	316L	221-001496	221-001501	221-001504

Item	Designation	Material	0.5" OD	0.75" OD	1" OD
Accessories					
Item	**Designation**	**Material**	**Material no.**		
Mounting for proximity switch H_A		1.4301	221-001806		
		see spare parts list for mounting for proximity switch H_A			
B	Control top T.VIS V-1/P-1	see spare parts list for control top T.VIS V-1/P-1			
Pneumatic actuator H_A/TV for control top T.VIS V-1/P-1					
118	O-ring	NBR	930-479	930-479	930-073
138.2	Cover T.VIS V-1	PPSGV40	221-002303	221-002303	221-002304
138.3	Cover T.VIS V-1	1.4305	221-002173	221-002173	221-002174
260	Adapter T.VIS V-1	1.4301	221-002253	221-002253	221-002253
262	O-ring	NBR	930-903	930-903	930-903
264	O-ring	NBR	930-012	930-012	930-012

Item	Designation	Material	ISO 13.5	ISO 17.2	ISO 21.3	ISO 26.9	ISO 33.7
Sealing set H_A complete			221-003887	221-003887	221-003888	221-003889	221-003889
Sealing set H_A/M complete			221-003890	221-003890	221-003891	221-003892	221-003892
5*	O-ring	EPDM	930-860	930-860	930-862	930-861	930-861
6	O-ring	FKM	930-683	930-683	--	--	--
		NBR	--	--	930-931	930-931	930-931
9	Lantern H_A/M	1.4301	221-001061	221-001061	221-001070	221-001071	221-001071
9.1	Lantern H_A	PPSGV40	221-000900	221-000900	221-000988	221-000911	221-000911
10	Hexagon nut	A2	910-018	910-018	910-026	910-026	910-026
15	Bellows H_A	TFM1705/ 1.4301	221-004594	221-000921	221-000999	221-000987	221-000935
*	Bellows H_A cpl. comprising pos. 5, 15, 253 and 255		221-004660	221-001282	221-001276	221-001284	221-001285
18	Compression spring	1.1200	931-299	931-299	931-300	931-301	931-301
29	O-ring	HNBR	930-957	930-957	930-866	930-866	930-867
98a	Ring	A2	921-014	921-014	921-018	921-018	921-018
98b			921-014	921-014	921-018	921-018	--
117	Screw-in plug connection	Brass, nickel-plated	933-977	933-977	933-977	933-977	933-977
118	O-ring	NBR	930-479	930-479	930-061	930-061	930-082
138	Cover H_A/M	1.4301	221-001062	221-001062	221-001063	221-001063	221-001064
138.1	Cover H_A	PPSGV40	221-000881	221-000881	221-000982	221-000982	221-000882
139	Rod H_A	1.4301	221-000908	221-000895	221-000991	221-000991	221-000917
186	O-ring	HNBR	930-921	930-921	930-803	930-803	930-922
197	Snap ring	1.4310	917-172	917-172	917-184	917-184	917-173
212	Space piece	PA	221-001260	221-001260	221-001261	221-001261	221-001261
219	Sleeve H_A/M	PVDF	221-001060	221-001060	221-001073	221-001073	221-001072
226	O-ring	NBR	930-050	930-050	930-065	930-065	930-729
228	Piston H_A	3.2315.T6	221-001127	221-001127	221-001089	221-001089	221-001088
250	Straight pin	A4	915-078	915-078	915-078	915-078	915-078
251	Spring pin	1.4310	925-094	925-094	925-094	925-094	925-094
252	Cap nut H_A	1.4301	221-000898	221-000898	221-000992	221-000992	221-000938
253	Retaining ring	1.4310	917-182	917-182	917-116	917-116	917-183
254	Grooved pin	1.4301	916-040	916-040	916-042	916-042	916-041
255	Thrust washer H_A	1.4301	221-000897	221-000897	221-000990	221-000990	221-000937
256	O-ring	HNBR	930-866	930-866	930-866	930-866	930-866
257	Position indicator H_A	PA6	221-001057	221-001057	221-001057	221-001057	221-001057
**	Position indicator H_A cpl. comprising pos. 212, 256, 257 and 258		221-001298	221-001298	221-001299	221-001299	221-001300
258	Cylinder screw with hex socket	A2-70	902-114	902-114	902-093	902-093	902-093
Standard housing combinations							
391	Housing HLA	1.4435	221-000922	221-000920	221-001115	221-000995	221-000913
392	Housing HTA	1.4435	221-000925	221-000927	221-001116	221-000996	221-000964
393	Housing HBA	1.4435	221-001216	221-001218	221-001224	221-001230	221-001234
394	Housing HCA	1.4435	221-001217	221-001219	221-001225	221-001231	221-001235

Item	Designation	Material	ISO 13.5	ISO 17.2	ISO 21.3	ISO 26.9	ISO 33.7
395	Housing HEA	1.4435	221-001499	221-001500	221-001502	221-001505	221-001508
Accessories							
Item	**Designation**	**Material**	**Material no.**				
Mounting for proximity switch H_A		1.4301	221-001806				
		see spare parts list for mounting for proximity switch H_A					
B	Control top T.VIS V-1/P-1	see spare parts list for control top T.VIS V-1/P-1					
Pneumatic actuator H_A/TV for control top T.VIS V-1/P-1							
118	O-ring	NBR	930-479	930-479	930-061	930-061	930-082
138.2	Cover T.VIS V-1	PPSGV40	221-002303	221-002303	221-002304	221-002304	221-002305
138.3	Cover T.VIS V-1	1.4305	221-002173	221-002173	221-002174	221-002174	221-002175
260	Adapter T.VIS V-1	1.4301	221-002253	221-002253	221-002253	221-002253	221-002253
262	O-ring	NBR	930-903	930-903	930-903	930-903	930-903
264	O-ring	NBR	930-012	930-012	930-012	930-012	930-012

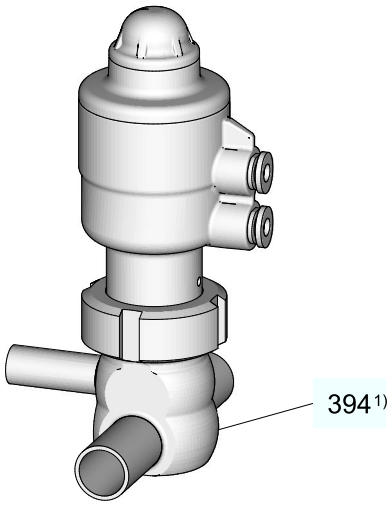

Fig.38: Housing combination HCA, solid, for graduated nominal diameters from DN15/10

Item	Designation	Material	Material no.
Solid graduated housing HCA according to DIN			
394	DN 10	1.4435	221-001215
	DN 15 / 10		221-657.01
	DN 20 / 10		221-657.02
	DN 25 / 10		221-657.03
	DN 32 / 10		221-006688
	DN 15		221-001221
	DN 20 / 15		221-657.09
	DN 25 / 15		221-657.10
	DN 32 / 15		221-006689
	DN 20		221-001227
	DN 25 / 20		221-657.16
	DN 32 / 20		221-004636
	DN 25		221-001233
	DN 32 / 25		221-006690
	DN 32		221-002623
Solid graduated housing HCA according to "OD			
394	0.5"	1.4435	221-001213
	0.75" / 0.5"		221-657.68
	1" / 0.5"		221-657.67
	0.75"		221-001223
	1" / 0.75"		221-657.74
	1"		221-001229
Solid graduated housing HCA according to ISO			
394	13.5	1.4435	221-001217
	17.2 / 13.5		221-657.27
	21.3 / 13.5		221-657.28

Item	Designation	Material	Material no.
	26.9 / 13.5		221-657.29
	33.7 / 13.5		221-657.30
	17.2		221-001219
	21.3 / 17.2		221-657.35
	26.9 / 17.2		221-657.36
	33.7 / 17.2		221-657.37
	21.3		221-001225
	26.9 / 21.3		221-657.49
	33.7 / 21.3		221-657.40
	26.9		221-001231
	33.7 / 26.9		221-657.55

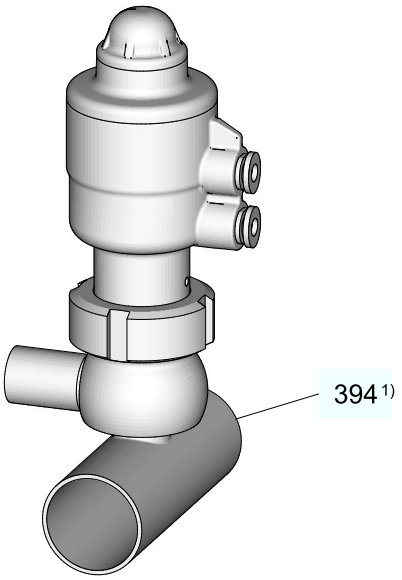

Fig.39: Housing combination HCA, welded, for graduated nominal diameters from DN40/10

Item	Designation	Material	Material no.
Welded graduated housing HCA according to DIN			
394	DN 40 / 10	1.4435	221-005716
	DN 50 / 10		221-005717
	DN 65 / 10		221-005718
	DN 80 / 10		221-005719
	DN 100 / 10		221-005720
	DN 40 / 15		221-005696
	DN 50 / 15		221-005700
	DN 65 / 15		221-005704
	DN 80 / 15		221-005708
	DN 100 / 15		221-005712
	DN 40 / 20		221-005697
	DN 50 / 20		221-005701
	DN 65 / 20		221-005705
	DN 80 / 20		221-005709
	DN 100 / 20		221-005713
	DN 40 / 25		221-005698
	DN 50 / 25		221-005702
	DN 65 / 25		221-005706
	DN 80 / 25		221-005710
	DN 100 / 25		221-005714
	DN 40 / 32		221-005699
	DN 50 / 32		221-005703
	DN 65 / 32		221-005707
	DN 80 / 32		221-005711
	DN 100 / 32		221-005715

Item	Designation	Material	Material no.
Welded graduated housing HCA according to ''OD			
394	1.5" / 0.5"	1.4435	221-005647
	2" / 0.5"		221-005648
	2.5" / 0.5"		221-005649
	3" / 0.5"		221-005650
	4" / 0.5"		221-005651
	1.5" / 0.75"		221-005636
	2" / 0.75"		221-005638
	2.5" / 0.75"		221-005641
	3" / 0.75"		221-005643
	4" / 0.75"		221-005645
	1.5" / 1"		221-005637
	2" / 1"		221-005639
	2.5" / 1"		221-005642
	3" / 1"		221-005644
	4" / 1"		221-005646
Welded graduated housing HCA according to ISO			
394	42.4 / 13.5	1.4435	221-005736
	48.3 / 13.5		221-005737
	60.3 / 13.5		221-005738
	76.1 / 13.5		221-005739
	88.9 / 13.5		221-005740
	114.3 / 13.5		221-005741
	42.4 / 17.2		221-005743
	48.3 / 17.2		221-005747
	60.3 / 17.2		221-005751
	76.1 / 17.2		221-005755
	88.9 / 17.2		221-005759
	114.3 / 17.2		221-005763
	42.4 / 21.3		221-005744
	48.3 / 21.3		221-005748
	60.3 / 21.3		221-005752
	76.1 / 21.3		221-005756
	88.9 / 21.3		221-005760
	114.3 / 21.3		221-005764
	42.4 / 26.9		221-005745
	48.3 / 26.9		221-005749
	60.3 / 26.9		221-005753
	76.1 / 26.9		221-005757
	88.9 / 26.9		221-005761
	114.3 / 26.9		221-005765
	42.4 / 33.7		221-005746
	48.3 / 33.7		221-005750

Item	Designation	Material	Material no.
	60.3 / 33.7		221-005754
	76.1 / 33.7		221-005758
	88.9 / 33.7		221-005762
	114.3 / 33.7		221-005766

14 Spare parts list - GEA VESTA bellows shut-off valve H_A

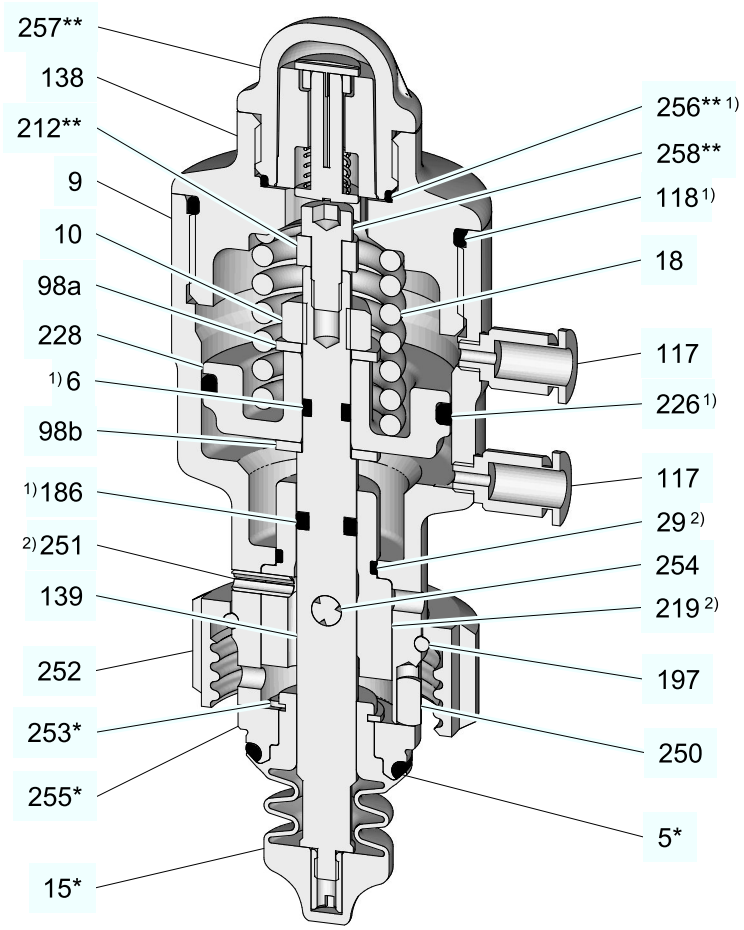

Fig.40: Pneumatic actuator H_A/M - metal version

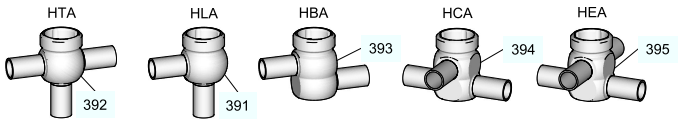

Fig.41: Standard housing combinations

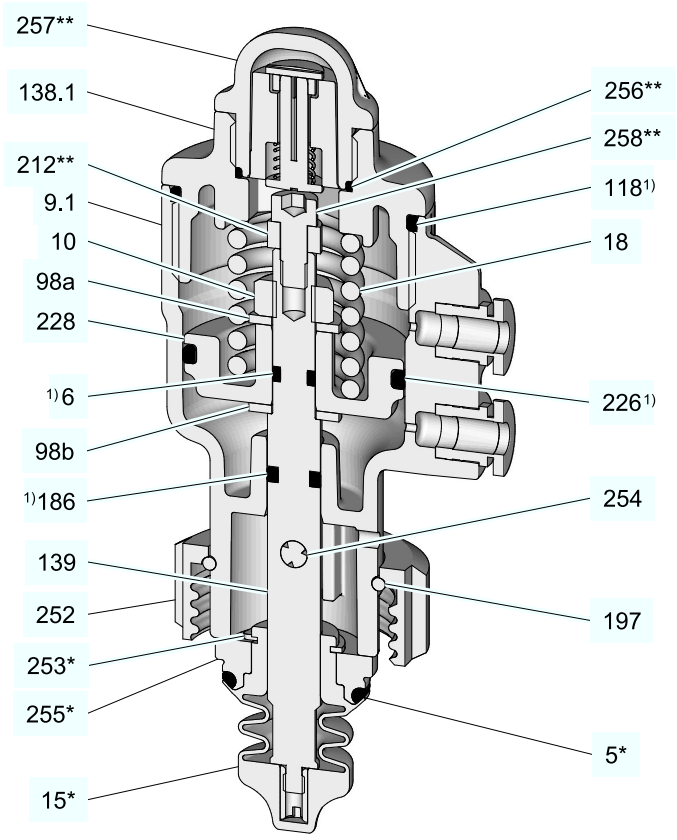

Fig.42: Pneumatic actuator H_A - plastic version

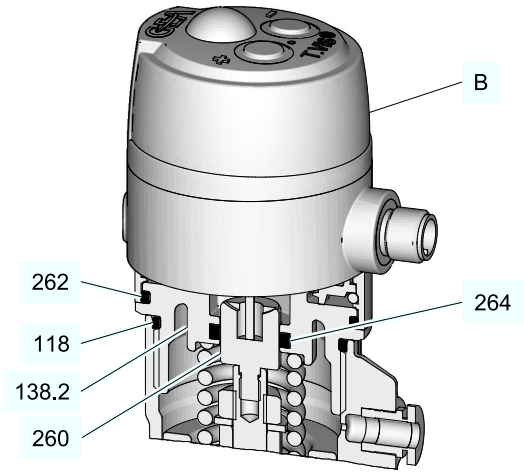

Fig.43: Pneumatic actuator H_A/TV for control top T.VIS V-1/P-1 / The spare parts without positions are listed in the pneumatic actuator H_A.

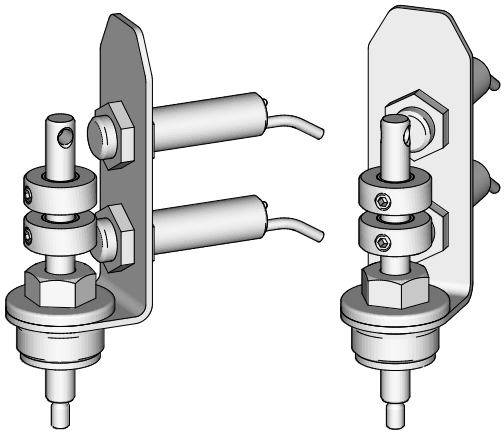

Fig.44: Mounting for proximity switch H_A

Item	Designation	Material	DN 10	DN 15	DN 20	DN 25	DN 32
Sealing set H_A complete			221-003887	221-003887	221-003888	221-003889	221-003889
Sealing set H_A/M complete			221-003890	221-003890	221-003891	221-003892	221-003892
5*	O-ring	EPDM	930-860	930-860	930-862	930-861	930-861
6	O-ring	FKM	930-683	930-683	--	--	--
		NBR	--	--	930-931	930-931	930-931
9	Lantern H_A/M	1.4301	221-001061	221-001061	221-001070	221-001071	221-001071
9.1	Lantern H_A	PPSGV40	221-000900	221-000900	221-000988	221-000911	221-000911
10	Hexagon nut	A2	910-018	910-018	910-026	910-026	910-026
15	Bellows H_A	TFM1705/ 1.4301	221-004594	221-004595	221-000999	221-000936	221-002627
*	Bellows H_A cpl. comprising pos. 5, 15, 253 and 255		221-004640	221-004641	221-001276	221-001277	221-003216
18	Compression spring	1.1200	931-281	931-281	931-283	931-282	931-282
29	O-ring	HNBR	930-957	930-957	930-866	930-867	930-867
98 a	Ring	A2	921-014	921-014	921-018	921-018	921-018
98 b	Ring	A2	921-014	921-014	921-018	--	--
117	Screw-in plug connection	Brass, nickel-plated	933-977	933-977	933-977	933-977	933-977
118	O-ring	NBR	930-479	930-479	930-061	930-082	930-082
138	Cover H_A/M	1.4301	221-001062	221-001062	221-001063	221-001064	221-001064
138.1	Cover H_A	PPSGV40	221-000881	221-000881	221-000982	221-000882	221-000882
139	Rod H_A	1.4301	221-000908	221-000895	221-000991	221-000939	221-000917
186	O-ring	HNBR	930-921	930-921	930-803	930-922	930-922
197	Snap ring	1.4310	917-172	917-172	917-184	917-173	917-173
212	Space piece	PA	221-001260	221-001260	221-001261	221-001261	221-001261
219	Sleeve H_A/M	PVDF	221-001060	221-001060	221-001073	221-001072	221-001072
226	O-ring	NBR	930-050	930-050	930-065	930-729	930-729
228	Piston H_A	3.2315.T6	221-001127	221-001127	221-001089	221-001088	221-001088
250	Straight pin	A4	915-078	915-078	915-078	915-078	915-078
251	Spring pin	1.4310	925-089	925-089	925-089	925-089	925-089
252	Cap nut H_A	1.4301	221-000898	221-000898	221-000992	221-000938	221-000938
253	Retaining ring	1.4310	917-182	917-182	917-116	917-183	917-183
254	Grooved pin	1.4301	916-040	916-040	916-042	916-041	916-041
255	Thrust washer H_A	1.4301	221-000897	221-000897	221-000990	221-000937	221-000937
256	O-ring	HNBR	930-866	930-866	930-866	930-866	930-866
257	Position indicator H_A	PA6	221-001057	221-001057	221-001057	221-001057	221-001057
**	Position indicator H_A cpl. comprising pos. 212, 256, 257 and 258		221-001298	221-001298	221-001299	221-001299	221-001299
258	Cylinder screw with hex socket	A2-70	902-114	902-114	902-093	902-093	902-093
Standard housing combinations							
391	Housing HLA	1.4435	221-000906	221-000902	221-001158	221-000967	221-002618
392	Housing HTA	1.4435	221-000962	221-000933	221-001159	221-000969	221-002621
393	Housing HBA	1.4435	221-001214	221-001220	221-001226	221-001232	221-002622
394	Housing HCA	1.4435	221-001215	221-001221	221-001227	221-001233	221-002623

Item	Designation	Material	DN 10	DN 15	DN 20	DN 25	DN 32
395	Housing HEA	1.4435	221-001497	221-001498	221-001503	221-001506	--
Accessories							
Item	**Designation**	**Material**	**Material no.**				
Mounting for proximity switch H_A		1.4301	221-001806				
		see spare parts list for mounting for proximity switch H_A					
B	Control top T.VIS V-1/P-1	see spare parts list for control top T.VIS V-1/P-1					
Pneumatic actuator H_A/TV for control top T.VIS V-1/P-1							
118	O-ring	NBR	930-479	930-479	930-061	930-082	930-082
138.2	Cover T.VIS V-1	PPSGV40	221-002303	221-002303	221-002304	221-002305	221-002305
138.3	Cover T.VIS V-1	1.4305	221-002173	221-002173	221-002174	221-002175	221-002175
260	Adapter T.VIS V-1	1.4301	221-002253	221-002253	221-002253	221-002253	221-002253
262	O-ring	NBR	930-903	930-903	930-903	930-903	930-903
264	O-ring	NBR	930-012	930-012	930-012	930-012	930-012

Item	Designation	Material	0.5" OD	0.75" OD	1" OD
Sealing set H_A complete			221-003887	221-003887	221-003888
Sealing set H_A/M complete			221-003890	221-003890	221-003891
5*	O-ring	EPDM	930-860	930-860	930-862
6	O-ring	FKM	930-683	930-683	--
		NBR	--	--	930-931
9	Lantern H_A/M	1.4301	221-001061	221-001061	221-001070
9.1	Lantern H_A	PPSGV40	221-000900	221-000900	221-000988
10	Hexagon nut	A2	910-018	910-018	910-026
15	Bellows H_A	TFM1705/1.4301	221-004594	221-004595	221-004596
*	Bellows H_A cpl. comprising pos. 5, 15, 253 and 255		221-004640	221-004641	221-004642
18	Compression spring	1.1200	931-281	931-281	931-283
29	O-ring	HNBR	930-957	930-957	930-866
98 a	Ring	A2	921-014	921-014	921-018
98 b	Ring	A2	921-014	921-014	921-018
117	Screw-in plug connection	Brass, nickel-plated	933-977	933-977	933-977
118	O-ring	NBR	930-479	930-479	930-061
138	Cover H_A/M	1.4301	221-001062	221-001062	221-001063
138.1	Cover H_A	PPSGV40	221-000881	221-000881	221-000982
139	Rod H_A	1.4301	221-000908	221-000895	221-000991
186	O-ring	HNBR	930-921	930-921	930-803
197	Snap ring	1.4310	917-172	917-172	917-184
212	Space piece	PA	221-001260	221-001260	221-001261
219	Sleeve H_A/M	PVDF	221-001060	221-001060	221-001073
226	O-ring	NBR	930-050	930-050	930-065
228	Piston H_A	3.2315.T6	221-001127	221-001127	221-001089
250	Straight pin	A4	915-078	915-078	915-078
251	Spring pin	1.4310	925-094	925-094	925-094
252	Cap nut H_A	1.4301	221-000898	221-000898	221-000992
253	Retaining ring	1.4310	917-182	917-182	917-116
254	Grooved pin	1.4301	916-040	916-040	916-042
255	Thrust washer H_A	1.4301	221-000897	221-000897	221-000990
256	O-ring	HNBR	930-866	930-866	930-866
257	Position indicator H_A	PA6	221-001057	221-001057	221-001057
**	Position indicator H_A cpl. comprising pos. 212, 256, 257 and 258		221-001298	221-001298	221-001299
258	Cylinder screw with hex socket	A2-70	902-114	902-114	902-093
Standard housing combinations					
391	Housing HLA	1.4435	221-001164	221-001166	221-001162
392	Housing HTA	1.4435	221-001165	221-001167	221-001163
393	Housing HBA	1.4435	221-001212	221-001222	221-001228
394	Housing HCA	1.4435	221-001213	221-001223	221-001229
395	Housing HEA	1.4435	221-001496	221-001501	221-001504
Accessories					

Item	Designation	Material	0.5" OD	0.75" OD	1" OD
Item	**Designation**	**Material**	**Material no.**		
Mounting for proximity switch H_A		1.4301	221-001806		
		see spare parts list for mounting for proximity switch H_A			
B	Control top T.VIS V-1/P-1	see spare parts list for control top T.VIS V-1/P-1			
Pneumatic actuator H_A/TV for control top T.VIS V-1/P-1					
118	O-ring	NBR	930-479	930-479	930-061
138.2	Cover T.VIS V-1	PPSGV40	221-002303	221-002303	221-002304
138.3	Cover T.VIS V-1	1.4305	221-002173	221-002173	221-002174
260	Adapter T.VIS V-1	1.4301	221-002253	221-002253	221-002253
262	O-ring	NBR	930-903	930-903	930-903
264	O-ring	NBR	930-012	930-012	930-012

Item	Designation	Material	ISO 13.5	ISO 17.2	ISO 21.3	ISO 26.9	ISO 33.7
Sealing set H_A complete			221-003887	221-003887	221-003888	221-003889	221-003889
Sealing set H_A/M complete			221-003890	221-003890	221-003891	221-003892	221-003892
5*	O-ring	EPDM	930-860	930-860	930-862	930-861	930-861
6	O-ring	FKM	930-683	930-683	--	--	--
		NBR	--	--	930-931	930-931	930-931
9	Lantern H_A/M	1.4301	221-001061	221-001061	221-001070	221-001071	221-001071
9.1	Lantern H_A	PPSGV40	221-000900	221-000900	221-000988	221-000911	221-000911
10	Hexagon nut	A2	910-018	910-018	910-026	910-026	910-026
15	Bellows H_A	TFM1705/ 1.4301	221-004594	221-000921	221-000999	221-000987	221-000935
*	Bellows H_A cpl. comprising pos. 5, 15, 253 and 255		221-004640	221-001282	221-001276	221-001284	221-001285
18	Compression spring	1.1200	931-281	931-281	931-283	931-283	931-282
29	O-ring	HNBR	930-957	930-957	930-866	930-866	930-867
98 a	Ring	A2	921-014	921-014	921-018	921-018	921-018
98 b	Ring	A2	921-014	921-014	921-018	921-018	--
117	Screw-in plug connection	Brass, nickel-plated	933-977	933-977	933-977	933-977	933-977
118	O-ring	NBR	930-479	930-479	930-061	930-061	930-082
138	Cover H_A/M	1.4301	221-001062	221-001062	221-001063	221-001063	221-001064
138.1	Cover H_A	PPSGV40	221-000881	221-000881	221-000982	221-000982	221-000882
139	Rod H_A	1.4301	221-000908	221-000895	221-000991	221-000991	221-000917
186	O-ring	HNBR	930-921	930-921	930-803	930-803	930-922
197	Snap ring	1.4310	917-172	917-172	917-184	917-184	917-173
212	Space piece	PA	221-001260	221-001260	221-001261	221-001261	221-001261
219	Sleeve H_A/M	PVDF	221-001060	221-001060	221-001073	221-001073	221-001072
226	O-ring	NBR	930-050	930-050	930-065	930-065	930-729
228	Piston H_A	3.2315.T6	221-001127	221-001127	221-001089	221-001089	221-001088
250	Straight pin	A4	915-078	915-078	915-078	915-078	915-078
251	Spring pin	1.4310	925-094	925-094	925-094	925-094	925-094
252	Cap nut H_A	1.4301	221-000898	221-000898	221-000992	221-000992	221-000938
253	Retaining ring	1.4310	917-182	917-182	917-116	917-116	917-183
254	Grooved pin	1.4301	916-040	916-040	916-042	916-042	916-041
255	Thrust washer H_A	1.4301	221-000897	221-000897	221-000990	221-000990	221-000937
256	O-ring	HNBR	930-866	930-866	930-866	930-866	930-866
257	Position indicator H_A	PA6	221-001057	221-001057	221-001057	221-001057	221-001057
**	Position indicator H_A cpl. comprising pos. 212, 256, 257 and 258		221-001298	221-001298	221-001299	221-001299	221-001300
258	Cylinder screw with hex socket	A2-70	902-114	902-114	902-093	902-093	902-093
Standard housing combinations							
391	Housing HLA	1.4435	221-000922	221-000920	221-001115	221-000995	221-000913
392	Housing HTA	1.4435	221-000925	221-000927	221-001116	221-000996	221-000964
393	Housing HBA	1.4435	221-001216	221-001218	221-001224	221-001230	221-001234
394	Housing HCA	1.4435	221-001217	221-001219	221-001225	221-001231	221-001235

Item	Designation	Material	ISO 13.5	ISO 17.2	ISO 21.3	ISO 26.9	ISO 33.7
395	Housing HEA	1.4435	221-001499	221-001500	221-001502	221-001505	221-001508
Accessories							
Item	**Designation**	**Material**	**Material no.**				
Mounting for proximity switch H_A		1.4301	221-001806				
		see spare parts list for mounting for proximity switch H_A					
B	Control top T.VIS V-1/P-1	see spare parts list for control top T.VIS V-1/P-1					
Pneumatic actuator H_A/TV for control top T.VIS V-1/P-1							
118	O-ring	NBR	930-479	930-479	930-061	930-061	930-082
138.2	Cover T.VIS V-1	PPSGV40	221-002303	221-002303	221-002304	221-002304	221-002305
138.3	Cover T.VIS V-1	1.4305	221-002173	221-002173	221-002174	221-002174	221-002175
260	Adapter T.VIS V-1	1.4301	221-002253	221-002253	221-002253	221-002253	221-002253
262	O-ring	NBR	930-903	930-903	930-903	930-903	930-903
264	O-ring	NBR	930-012	930-012	930-012	930-012	930-012

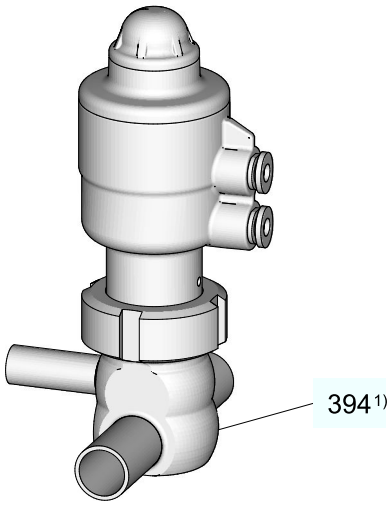

Fig.45: Housing combination HCA, solid, for graduated nominal diameters from DN15/10

Item	Designation	Material	Material no.
Solid graduated housing HCA according to DIN			
394	DN 10	1.4435	221-001215
	DN 15 / 10		221-657.01
	DN 20 / 10		221-657.02
	DN 25 / 10		221-657.03
	DN 32 / 10		221-006688
	DN 15		221-001221
	DN 20 / 15		221-657.09
	DN 25 / 15		221-657.10
	DN 32 / 15		221-006689
	DN 20		221-001227
	DN 25 / 20		221-657.16
	DN 32 / 20		221-004636
	DN 25		221-001233
	DN 32 / 25		221-006690
	DN 32		221-002623
Solid graduated housing HCA according to "OD			
394	0.5"	1.4435	221-001213
	0.75" / 0.5"		221-657.68
	1" / 0.5"		221-657.67
	0.75"		221-001223
	1" / 0.75"		221-657.74
	1"		221-001229
Solid graduated housing HCA according to ISO			
394	13.5	1.4435	221-001217
	17.2 / 13.5		221-657.27
	21.3 / 13.5		221-657.28

Item	Designation	Material	Material no.
	26.9 / 13.5		221-657.29
	33.7 / 13.5		221-657.30
	17.2		221-001219
	21.3 / 17.2		221-657.35
	26.9 / 17.2		221-657.36
	33.7 / 17.2		221-657.37
	21.3		221-001225
	26.9 / 21.3		221-657.49
	33.7 / 21.3		221-657.40
	26.9		221-001231
	33.7 / 26.9		221-657.55

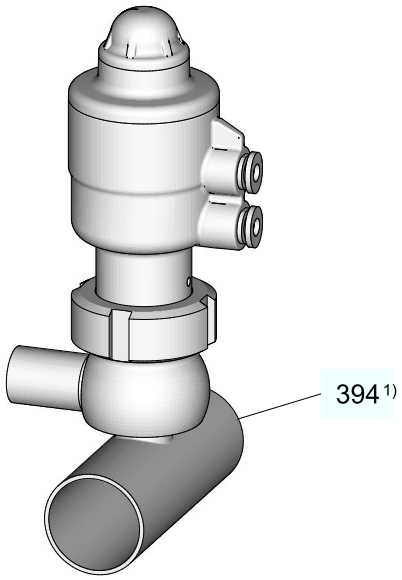

Fig.46: Housing combination HCA, welded, for graduated nominal diameters from DN40/10

Item	Designation	Material	Material no.
Welded graduated housing HCA according to DIN			
394	DN 40 / 10	1.4435	221-005716
	DN 50 / 10		221-005717
	DN 65 / 10		221-005718
	DN 80 / 10		221-005719
	DN 100 / 10		221-005720
	DN 40 / 15		221-005696
	DN 50 / 15		221-005700
	DN 65 / 15		221-005704
	DN 80 / 15		221-005708
	DN 100 / 15		221-005712
	DN 40 / 20		221-005697
	DN 50 / 20		221-005701
	DN 65 / 20		221-005705
	DN 80 / 20		221-005709
	DN 100 / 20		221-005713
	DN 40 / 25		221-005698
	DN 50 / 25		221-005702
	DN 65 / 25		221-005706
	DN 80 / 25		221-005710
	DN 100 / 25		221-005714
	DN 40 / 32		221-005699
	DN 50 / 32		221-005703
	DN 65 / 32		221-005707
	DN 80 / 32		221-005711
	DN 100 / 32		221-005715

Item	Designation	Material	Material no.
Welded graduated housing HCA according to ''OD			
394	1.5" / 0.5"	1.4435	221-005647
	2" / 0.5"		221-005648
	2.5" / 0.5"		221-005649
	3" / 0.5"		221-005650
	4" / 0.5"		221-005651
	1.5" / 0.75"		221-005636
	2" / 0.75"		221-005638
	2.5" / 0.75"		221-005641
	3" / 0.75"		221-005643
	4" / 0.75"		221-005645
	1.5" / 1"		221-005637
	2" / 1"		221-005639
	2.5" / 1"		221-005642
	3" / 1"		221-005644
	4" / 1"		221-005646
Welded graduated housing HCA according to ISO			
394	42.4 / 13.5	1.4435	221-005736
	48.3 / 13.5		221-005737
	60.3 / 13.5		221-005738
	76.1 / 13.5		221-005739
	88.9 / 13.5		221-005740
	114.3 / 13.5		221-005741
	42.4 / 17.2		221-005743
	48.3 / 17.2		221-005747
	60.3 / 17.2		221-005751
	76.1 / 17.2		221-005755
	88.9 / 17.2		221-005759
	114.3 / 17.2		221-005763
	42.4 / 21.3		221-005744
	48.3 / 21.3		221-005748
	60.3 / 21.3		221-005752
	76.1 / 21.3		221-005756
	88.9 / 21.3		221-005760
	114.3 / 21.3		221-005764
	42.4 / 26.9		221-005745
	48.3 / 26.9		221-005749
	60.3 / 26.9		221-005753
	76.1 / 26.9		221-005757
	88.9 / 26.9		221-005761
	114.3 / 26.9		221-005765
	42.4 / 33.7		221-005746
	48.3 / 33.7		221-005750

Item	Designation	Material	Material no.
	60.3 / 33.7		221-005754
	76.1 / 33.7		221-005758
	88.9 / 33.7		221-005762
	114.3 / 33.7		221-005766

15 Spare parts list -mounting for proximity switch H_A

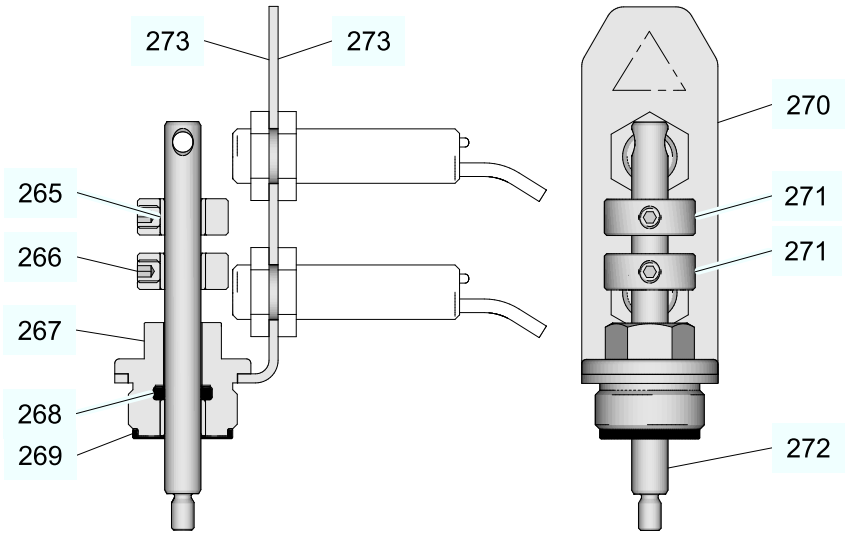

Fig.47

Item	Designation	Material	Material no.
Mounting for proximity switch H_A		1.4301	221-001806
265	Plain bearing	IGLIDUR-G	704-059
266	Set screw	A2-70	914-056
267	Mounting base	1.4301	221-001772
268	O-ring	NBR	930-005
269	O-ring	HNBR	930-866
270	Retaining plate H_A	1.4301	221-001769
271	Switch ring H_A	1.4301	221-001774
272	Switch rod H_A	1.4301	221-001770
273	Triangular sign	PCV film	700-130

16 Spare parts list -manual venting H_A

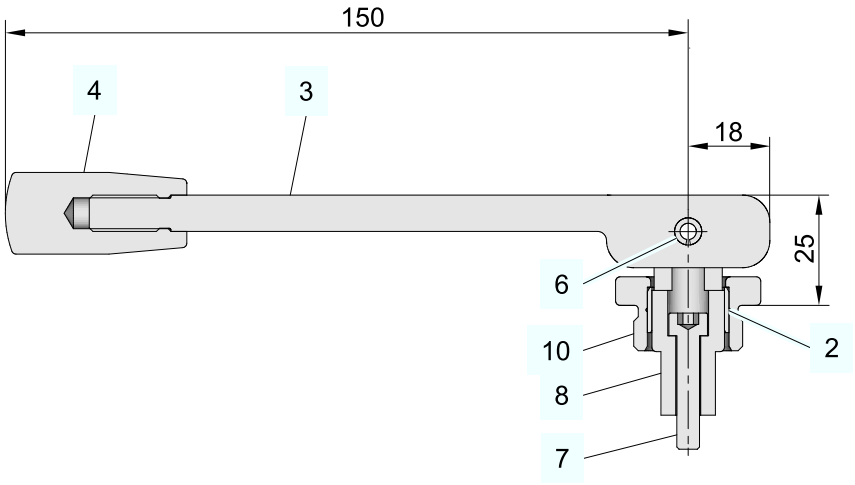

Fig.48

Item	Designation	Material	Material no.	
Lever H_A cpl.			221-003068	221-003067
Use for			DN10 to DN32 0.5"OD; 0.75"OD; 1"OD ISO13,5; ISO17,2; ISO26,9; ISO33,7	ISO 21.3
2	Plain bearing	IGLIDUR-G	704-043	704-043
3	Lever H_A	1.4301	221-003064	221-003064
4	Cylinder knob	PF 31	941-020	941-020
6	Spring pin	1.4310	925-064	925-064
7	Cylinder screw with hex socket	1.4301	902-117	902-117
8	Rod H_A	1.4301	221-003065	221-003066
10	Mounting base H_A	1.4301	221-003060	221-003060

17 Appendix

17.1 Lists

17.1.1 Abbreviations and terms

Abbreviation	Explanation
BS	British Standard
bar	Unit of measurement of pressure [bar] All pressure data expressed in [bar/psi] is assumed to be gauge pressure [bar_g/psi_g] unless explicitly specified otherwise.
approx.	approximately
°C	Unit of measurement of temperature [degree Celsius]
CIP	Cleaning in place
D-tec	Stem diaphragm technology
dm3 n	Unit of measurement of volume [cubic decimetre] standard volume (standard litres)
DN	DIN nominal width
DIN	German standard issued by DIN (Deutsches Institut für Normung e.V., German Institute for Standardization)
EN	European Standard
EPDM	Material designation Brief designation according to DIN/ISO 1629: Ethylene-propylene-diene- rubber
°F	Unit of measurement of temperature [degree Fahrenheit]
FKM	Material designation, short designation according to DIN/ISO 1629: Fluorine rubber
h	Unit of measurement of time [hour]
IP	Protection class
ISO	International Standard of the International Organization for Standardization
kg	Unit of measurement of weight [kilogram]
kN	Unit of measurement of force [kilonewton]
Kv value	Flow coefficient [m³/s] 1 KV = 0.86 x Cv
l	Unit of measurement of volume [litre]
max.	maximum
mm	Unit of measurement of length [millimetre]
mm	Unit of measurement of length [micrometre]
M	Metric

Abbreviation	Explanation
NC	normally closed Air-to-close/spring-to-open action
Nm	Unit of measurement of work [newton metre] SPECIFICATION FOR THE TORQUE: 1 Nm = 0.737 lbft Pound-Force (lb) + Feet (ft)
NO	normally open Spring-to-close/air-to-open action
PA	Polyamide
PE-LD	Low-density polyethylene
psi	Anglo-American unit of measurement for pressure [pound-force per square inch] All pressure data expressed in [bar/psi] is assumed to be gauge pressure [barg/psig] unless explicitly specified otherwise.
PTFE	Polytetrafluoroethylene
SET-UP	Self-learning installation During commissioning and maintenance, the SET-UP procedure carries out all the necessary settings for the generation of messages.
SIP	Sterilization in place
AF	Indicates the size of spanners [width across flats]
TEFASEP gold	Sealing material for the valve seat seal
T.VIS	Tuchenhagen valve information system
V AC	Volt alternating current
V DC	Volt direct current
W	Unit of measurement of power [Watt]
TIG	Welding method Tungsten inert gas welding
Inch	Unit of measurement of length in the Anglo-American language area
Inch OD	Tube measurement according to British Standard (BS), outside diameter

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