OPERATING INSTRUCTIONS

Translation from the original language



Control and feedback systems

GEA T.VIS® A-15

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

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Fax:+49 4155 49-2035

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1.4 EU Declaration of Conformity

Engineering for a better world.

EU Declaration of Conformity

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

We hereby declare that the devices named below

Model:	Control Top T.VIS® A-15 Control top T.VIS® A-15/ Class I Division 2
Type:	24 VDC AS-i DeviceNet IO-Link

due to their 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:	2014/30/EU 2011/65/EU	EMC RoHS
Applicable harmonized standards, in particular:	EN 61000-6-2: 2019 EN 61000-6-4: 2019 EN IEC 62026-1:2019 EN 62026-2:2013 IEC 61131-9:2013	
Other applied standards and technical specifications:	DIN EN 61326-1 :2013-07 DIN EN 61131-2: 2008 CISPR11:2015	

Remarks:

- The device type IO-Link meets the IO-Link test specification (Version 1.1.2 - 2014)
- Model T.VIS® A-15/ Class I Div. 2 not for type IO-Link!
- The above mentioned standards have been taken into account in accordance with the respective scope of application

Person authorised for compilation and handover of technical documentation:

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

Büchen, 08 November 2022

Franz Bürmann
Managing Director

pp. Stephan Dirks
Director Hygienic Valves I & Control Top

GEA INTERNAL

1.5 Translated copy of the EU Declaration of Conformity

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

We hereby declare that the devices named below

Model:	Control top T.VIS® A-15 Control top T.VIS® A-15/Class I Division 2
Type:	24 VDC AS-i DeviceNet IO-Link

due to their 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:	2014/30/EU EMC 2011/65/EU RoHS
Applicable harmonized standards, in particular:	EN 61000-6-2: 2019 EN 61000-6-4: 2011-09 DIN IEC 62026-2: 2013 IEC 61131-9: 2013
Other applied standards and technical specifications:	DIN EN 61326-1: 2013-07 DIN EN 61131-2: 2008 CISPR11: 2015

Remarks:

- The device type IO-Link complies with the IO-Link test specifications (version 1.1.2 - 2014)
- Model T.VIS® A-15/ Class I Div. 2 cannot be used with the type IO-Link!
- The standards stated have been taken into consideration according to the respective application area.

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

Büchen, 08. November 2022

Franz Bürmann
Managing Director

by order Stephan Dirks
Director Hygienic Valves I & Control Top

1.6 UK Declaration

Engineering for a better world.

UK- Declaration of Conformity by Electromagnetic Compatibility Regulations 2016

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

Hereby, we declare that the machine designated in the following

Model:	Control top T.VIS® A-15 Control top T.VIS® A-15 / Class I Division 2
Type:	24 VDC AS-i DeviceNet IO-Link

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 UK legislation:	Electromagnetic Compatibility Regulations 2016 Regulations: restriction of hazardous substances (RoHS)
Applicable harmonized standards, in particular:	EN IEC 61000-6-2: 2019 EN IEC 61000-6-4: 2019 EN IEC 62026-1: 2019 EN IEC 62026-2: 2013 EN IEC 61131-9:2013
Other applied standards and technical specifications:	DIN EN 61326-1:2013 DIN EN 61161-2: 2008 CISPR11:2015

Remarks:
- The device type IO-Link meets the IO-Link test specification (Version 1.1.2 – 2014)
- Model T.VIS® A-15/ Class I Div. 2 not for type IO-Link!
- The above-mentioned standards have been taken into account in accordance with the respective scope of application

Person authorised for compilation and handover of technical documentation:

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Büchen, 08 November 2022

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1/1

GEA CONFIDENTIAL

1.7 Translated copy of the UK Declaration of Conformity according to the provisions on electromagnetic compatibility from 2016

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

We hereby declare that the devices named below

Model:	**Control top T.VIS® A-15**
	Control top T.VIS® A-15 / Class I Division 2
Type:	**24 VDC**
	AS-i
	DeviceNet
	IO-Link

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 UK directives:	Regulations on electromagnetic compatibility 2016
	Regulations: Restriction of hazardous substances (RoHS)
Applicable harmonized standards, in particular:	EN IEC 61000-6-2: 2019
	EN IEC 61000-6-4: 2011-09
	DIN IEC 62026-1:2019
	DIN IEC 62026-2:2013
	DIN IEC 61131-9:2013
Other applied standards and technical specifications:	EN IEC 61326-1: 2013
	EN IEC 61161-2: 2008
	CISPR11:2015

Remarks:

- The IO-Link device type meets the IO-Link test specification (version 1.1.2 – 2014)
- Model T.VIS® A-15/ class I div. 2 not for type IO-Link!
- The standards stated have been taken into consideration according to the respective application area.

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

Büchen, 08. November 2022

Franz Bürmann
Managing Director

by order Stephan Dirks
Director Hygienic Valves I & Control Top

2 Safety

2.1 Intended use

With the automatic control top T.VIS A-15 all Tuchenhagen and ASEPTOMAG process valves with VARIVENT adaptation can be connected pneumatically and electrically. Using the device for any other purpose is considered contrary to its designated use.

The control top T.VIS A-15 is available as

- position indicator without solenoid valve
- with solenoid valve as control top

The control top T.VIS A-15 is completely installed on the dedicated actuator/ adapter of the process valve by means of a clamp connection. Due to the internal air guiding system, the control air can pass directly from the control top into the actuator on suitable process valves. For process valves which do not allow the air to be guided internally, the control top has a connection option for supplying the air externally via a hose.

The control top T.VIS A-15 may not be used in areas where ATEX approval is required.

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 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 IP Protection classes

The control top T.VIS A-15 in its standard version fulfils the requirements of protection class IP66, IP67 and IP69 (DIN EN 60529) and protection class IP6k9k (ISO 20653).

IP classes provide information about the degree of protection an electrical device housing provides against the ingress of solids (first digit) or humidity (second digit). So-called IP codes are assigned to the protected systems. Its digits represent common possible errors the system is protected from. The code always starts with the letter IP for “international protection”.

First digit *		**Meaning**	
ISO 20653	**DIN EN 60529**	**Protection against contact**	**Protection against solids**
6k	6	Complete contact protection	Complete protection against dust ingression (dustproof)
Second digit *		**Meaning**	
ISO 20653	**DIN EN 60529**	**Protection against humidity**	
5	5	Protected against water jet (nozzle) from any angle	
6	6	Protected against powerful water jets	
6k		Protected against powerful water jets under increased pressure	
7	7	Protected against temporary immersion	
	9	Protected against high pressure spray downs	
9k		Protected against high pressure spray downs	
* For additional digits and more detailed descriptions please refer to the pertinent standard.			

Digits not to be mentioned can be replaced by the letter x (e. g. IPx6). Concerning the ingress of humidity, IPx6 includes all lower IP classes. This is, however, not the case for the higher protection class IPx7!

Hint!

The specified IP classes only apply if the connectors are connected correctly, if the cable gland is properly sealed and if the control top is fitted on the valve, see Chapter 6, Page 46.

2.5 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

2.5.1 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.

2.5.2 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.

2.5.3 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.

2.6 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.

2.7 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.

2.8 Safety equipment

2.8.1 Signs

Dangerous points on the control top are indicated by warning signs, prohibition signs and mandatory signs.

The signs and notes on the control top must always be legible. Any illegible signs must be replaced immediately.

Signs on the control top	
Sign	**Meaning**
 Fig.1	General hazard warning
 Fig.2	Warning Crushing

2.9 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 control top and measures		
Danger	**Cause**	**Measure**
Danger to life	Inadvertent switch-on of the control top	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.
Damage to property	Welding can cause damage to the electronics or result in data loss.	Do not carry out any welding work in the vicinity of the control top or make sure electronics are properly protected.
	Voltage peaks	The permitted voltage ranges of the respective connection types can be found in chapters 5.3 to 5.6 and must not be exceeded.

2.9.1 Electrostatically Endangered Components and Modules

The control top contains electronic components that are sensitive to electrostatic discharge (ESD). Contact with electrostatically-charged persons or objects can endanger these components. In the worst case they are destroyed immediately or fail after being put into operation.

To minimize or prevent the possibility of damage resulting from sudden electrostatic discharge,

- observe the requirements of DIN EN 61340-5-1 and 5-2 and
- take care not to touch the electronic components!

2.9.2 Instructions for the Safe Handling of Electronic Components During Welding Work

Notice

Stray welding currents during welding

Can cause damage to electronic components

► Follow the steps below to prevent this.

1. Before starting welding work, carry out the following preparations:
   1.a. Ensure the device is switched off and no electrical connections are active.
   1.b. Disconnect the device from the power supply.
   → This protects the electronic components from potential damage caused by stray welding currents.
2. Establish a correct grounding connection:
   2.a. Place the ground connection of the welding machine as close as possible to the welding point.
   → This minimises the risk of stray welding currents and helps protect nearby electronic components from damage.
3. After completing the welding work, proceed as follows:
   3.a. Remove the welding machine's ground connection.
   3.b. Reconnect the device to the power supply.
   3.c. Perform a function test.

2.10 Danger zones

Please observe the following notes:

- In the event of malfunctions, shut down the control top (disconnect from the power and air supply) and secure it against being used.
- Before starting any service, maintenance or repair work, disconnect the control top 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 control top 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.

3 Description

3.1 Functional description

3.1.1 Operation Principle

The control top T.VIS A-15 works with a microprocessor that contains the software for operation, visualization and intelligent position detection. The valve stroke is detected by a contactless position measuring system integrated in the control top and the information is supplied to the microprocessor.

Electrostatically endangered components/modules!

- The control top contains electronic components that are sensitive to electrostatic discharge (ESD). Contact with electrostatically-charged persons or objects can endanger these components. In the worst case they are destroyed immediately or fail after being put into operation.
- Observe the requirements of DIN EN 61340-5-1 and 5-2 to minimize or prevent the possibility of damage resulting from sudden electrostatic discharge.
- Also take care not to touch electronic components when supply voltage is present.
- Use ESD-compliant packaging when returning electronic components. (Contact GEA Tuchenhagen if you have any questions.)

3.1.2 Control top without solenoid valves

The T.VIS A-15 control top without solenoid valves acts as a position indicator. After programming, it indicates the status of the process valve locally by coloured LEDs under the illuminated dome so that it is visible over a long distance.

The position feedback signals are supplied to the user in one of the following ways, depending on the communication method selected:

- 24V DC switching output
- AS interface data bit
- DeviceNet data bit
- IO-Link data bit

For programming, the process valve must be moved once to its end positions by an external solenoid valve.

3.1.3 Control Top with Solenoid Valves

The control top with solenoid valves acts as a control top. The signalling takes place in the same way as with the control top without solenoid valves. The difference is that the solenoid valve integrated in the base is operated in accordance with the control signals. Depending on the design of the process valve, up to 4 solenoid valves can be installed in the control top.

As an option, a pneumatic NOT logic element can be used to support the actuator spring with compressed air. This reduces the max. number of solenoid valves to 3 pieces.

The control signals are given by the user's process control system or by the microprocessor in the control top during automatic end position programming.

In manual mode, the main actuator can be controlled using the buttons in the cap in order to move the process valve to its end positions or by operating the solenoid valves manually. To do this, use a screwdriver to turn the screw (S) from 0 to 1, see figure.

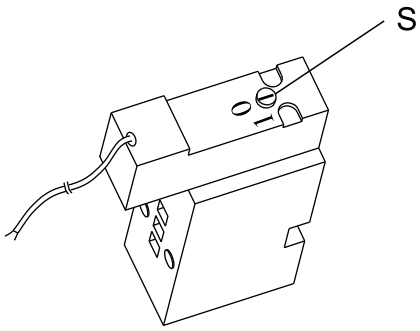


Fig.3

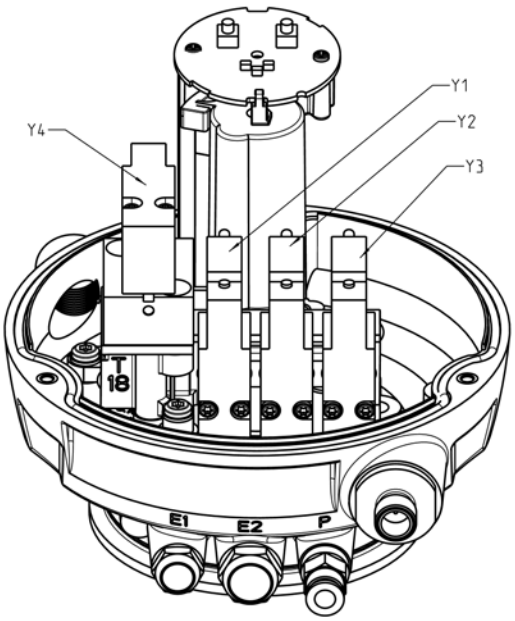


Fig.4

To assemble or disassemble the valve insert, the main actuator can be controlled in service mode using the buttons in the cap in order to relieve the spring tension, which depends on the valve type.

3.1.4 Control Top with Cap Including Buttons

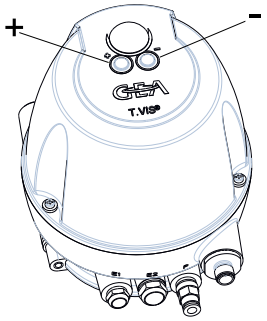


Fig.5: Control top with cap including buttons (standard variant in IP66)

According to protection class IP66 (EN 60529) the control top T.VIS A-15 is suitable for use in this design and if the electrical and pneumatic connections are installed correctly.

The control top is operated with the cap closed using the plus/minus buttons.

Operation see Chapter 8, Page 99.

3.1.5 Control top with hood without buttons

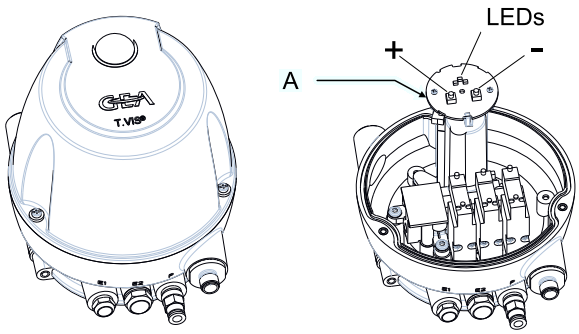


Fig.6: Control top with hood without buttons

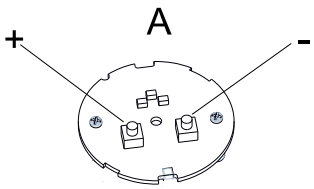


Fig.7: Circuit board (A)

According to protection class IP66, IP67 and IP69 (DIN EN 60529) as well as protection class Ip6k9k (ISO 20653), the control top T.VIS A-15 is suitable for use in this design and if the electrical and pneumatic connections are installed correctly.

To operate the control top, take off the cap and press the plus/minus buttons directly on the circuit board (A).

Observe the general instructions regarding ESD protection.

Operation see .

3.1.6 Function of the Buttons

Automatic end position programming and manual mode are generally activated using the buttons in the cap. For safety reasons, the buttons are only enabled within a specific time window after activation of the operating voltage. During this time window, functions can be started. The buttons are automatically locked again after the allowed time has expired.

During automatic end position programming, the control top autonomously detects the number of solenoid valves fitted in the control top and carries out the required programming steps fully automatically.

After end position programming the following is also possible:

- Changing the tolerance ranges manually,
- factory setting to set the attenuation of feedback signals to inactive,
- activating the LEFF function on double-seat valves with lifting actuator.

It is also possible to change the colours for visualizing the end positions using the "colour variant" function, which also results in the outputs for the feedback signals being switched.

3.1.7 Safety Air Exhaust/Installation Position

To provide protection against excess pressure which can build up in the inside of the control top, a vent plug E2 is fitted in the base. In operating mode, the exhaust air from the lifting actuators is discharged via this vent plug. In the unlikely event of a damaged solenoid valve or in case of sealing problems, pressure relief is ensured.

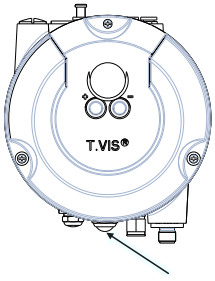


Fig.8: Control top (standard variant in IP66)

This vent plug is a safety device that must be handled as such. Do not cover the vent plug. When fitting the control top note that the installation position of the vent plug E2 must never be pointing vertically upwards.

4 Transport and storage

4.1 Storage conditions

You must first dry and preserve the control top to prevent damage if the control top is exposed to temperatures ≤ 0°C during transport or storage.

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 lifting gear and slings for transporting the package units/ control tops.
- Observe the pictograms on the package.
- Control tops must be protected from animal and vegetable fats.
- The synthetic materials of the control tops are susceptible to breaking. Take care when transporting the control top. Do not grip sensitive parts of the unit to lift or push the unit or to support yourself.

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 is used to uniquely identify the control top.



Fig.9

Code/Type	T A 1 5	L	8	B	A	H
Item in the order code	14	15	16	17	18	19

Explanation of the items in the order code		
Item in the order code	**Designation**	**Explanation**
14	**Feedback location**	
	T A 1 5	Control top T.VIS A-15
15	**Control top type**	
	N	without solenoid valve
	P	1 solenoid valve
	R	1 solenoid valve Y1 (retrofittable: Y2, Y3)
	M	2 solenoid valves Y1= main stroke; Y4= spread lift double-disk
	G	4 solenoid valves Y1 main stroke; Y2= Lift valve disk; Y3= lift double-disk; Y4= spread lift double-disk
	F	3 solenoid valves Y1 main stroke; Y3= Lift double-disk; Y4= spread lift double-disk
	N	2 solenoid valves Y1=main stroke; Y2= valve disk lifting
	J	2 solenoid valves Y1=main stroke; Y3=lifting of the double-disk, for the external air connection of an air/air actuator or an external process valve

Explanation of the items in the order code		
Item in the order code	**Designation**	**Explanation**
	L	3 solenoid valves
	V	1 solenoid valve, 1 NOT element
	X	2 solenoid valves, 1 NOT element
	Y	3 solenoid valves, 1 NOT element
16	**Feedback**	
	6	3 digital feedbacks S1; S2 incl. an external initiator S3 (spread lift double-disk)
	7	3/4 digital feedbacks S1; S2; S4 incl. two external initiators S3 (spread lift double-disk)
	8	2 digital feedbacks S1 and S2
	9	3/4 digital feedbacks S1; S2; S4 incl. one external initiator S3
17	**Type of interface/mode**	
	A	AS-interface (A/B slave)
	B	24 V DC 3-wire PNP
	D	DeviceNet
	N	IO-Link
18	**Solenoid valve**	
	A	24 V DC
	0	without
19	**Screw connection (cable/air) for air hose Ø 6/4 mm**	
	J	5-pin connector M12/5-wire/M20x1.5 24 V DC; IO-Link; AS-interface; DeviceNet
	H	8-pin plug M12/8-wire/M20x1.5 24 V DC
	G	12-pin connector M12/9-wire/M20x1.5 24VDC (only for interface 24VDC and 4. feedback)
	M	M20x1.5 cable gland 24 V DC
	for air hose Ø 6,35/4,31 mm	
	P	5-pin connector M12/5-wire/M20x1.5 24 V DC; IO-Link; AS-interface; DeviceNet
	N	8-pin plug M12/8-wire/M20x1.5 24 V DC

Explanation of the items in the order code		
Item in the order code	**Designation**	**Explanation**
	T	12-pin connector M12/9-wire/M20x1.5 24VDC (only for interface 24VDC and 4. feedback)
	S	0.5 "NPT cable gland 24 V DC
Options	/18	Supply air throttle: regulates the opening speed of the valves (cannot be used with control top type V; X or Y)
	/19	Exhaust air throttle: regulates the closing speed of the valves
	/22	5-pin M12 junction box for screw connection J, P (Material No. 508-963) 8-pin M12 junction box for screw connection H, I (Material No. 508-061) 12-pin M12 junction box for screw connection G; T
	/66	Protection class IP 66 (powerful water jet)
	/67	Protection class IP 67 (immersion)
	/69k	Protection class IP 69 (high-pressure cleaning)
	/81	ASi junction box on cable 1m with M12 junction box for screw connection L or U
	/82	ASi junction box on cable 2m with M12 junction box for screw connection L or U
	/A	For ASEPTOMAG valves Example: TA15L8BAH/A
	/UC	Certification UL/CSA For indoor use and only for the type of interface connection: A - AS-interface B - 24 V DC D - DeviceNet I - IO-Link

Explanation of the items in the order code		
Item in the order code	**Designation**	**Explanation**
	/CD*	UL 121201 - Non-incendive Electrical Equipment for Use in Class I, Division 2 , Hazardous (Classified) Locations. CSA C22.2 No. 213-17 - Non-incendive Electrical Equipment for Use in Class I, Division 2, Locations.
* Please pay attention to separate operating instructions 430BAL013622..!		

5.2 Technical data

Refer to the following tables for the key technical data of the control top:

Technical data: compressed air supply, product pressure and CIP pressure	
Designation	**Description**
Air hose	
• Metric	Material PE-LD Outer-Ø 6 mm +/- 0.1 mm Inside Ø 4 mm
• Inch	Material PA outer-Ø 6.35 mm +/- 0.1 mm Inside Ø 4.3 mm
Control air	acc. to ISO 8573-1
• Solid particle content:	Quality class 6 Particle size max. 5 µm Particle density max. 5 mg/m^3
• Water content:	Quality class 4 max. dew point +3 °C If the unit is used at higher altitudes or at low ambient temperatures, the dew point must be adapted accordingly.
• Oil content:	Quality class 3 preferably oil free max. 1 mg oil in 1m^3 air
Control air pressure	6 bar (87 psi), max. 8 bar (116 psi) configuration with standard drive Alternative combinations of product pressure and control air pressure on request

Technical data: compressed air supply, product pressure and CIP pressure	
Designation	**Description**
Product pressure	5 bar (72.5 psi) configuration with standard actuator max. 10 bar (116 psi) configuration with correspondingly designed actuator > 10 bar (145.0 psi) for static applications and on request
CIP pressure	2-5 bar (29-72.5 psi), a test may be necessary for higher CIP pressures

Technical data: materials	
Designation	**Description**
Housing	PA 12/L
Seals	NBR / EPDM / FKM
Operating elements	TPE

Technical data: electrical specifications	
Designation	**Description**
Protection class EN 60529*	Standard: IP66 - powerful water jet Optional: IP67 - immersion Optional: IP69k - high pressure* IP6k9k - high pressure (ISO 20653)
Electrical wiring configuration	– 5-pin M12 circular connector or – 8-pin M12 circular connector only for 24 V version with 2 to 3 solenoid valves – 12-pin M12 round connector only for version 24V with 4 feedbacks – Terminal strip
Switch point tolerance	adjustable 0.3; 0.7; 1.0; 2.0 mm
Signal attenuation of feedback group	none; short; medium; long

* If cleaning agents are used that significantly reduce the surface tension and/or if high-pressure cleaners are used, we recommend using devices in optional protection class IP69 (DIN EN 60529) or Ip6k9k (ISO 20653).

5.3 Specifications for 24V DC version

Technical data: supply	
Designation	**Description**
Supply voltage UV	24 V DC (+20%... -12.5%)
Current consumption	
– No-load current	≤ 25 mA
– one solenoid valve	35...45 mA
– Max. load of the feedback	50 mA
Total	approx. 200 mA

Technical data: inputs	
Designation	**Description**
Control voltage	max. 28.8 V DC High = ≥ 13 V DC Low = ≤ 6 V DC
Control current	≤ 10mA

Technical data: outputs	
Designation	**Description**
Output voltage	High = UV - ≤ 1 V Low = ≤ 5 V
Max. current per output	100 mA short circuit proof
Switching frequency (ohmic + inductive loads ≤ 25 mH)	2 Hz

5.4 IO-Link specifications

Technical data: supply	
Designation	**Description**
Supply voltage UV	24 VDC (±25%)
Current consumption - No-load current	 ≤ 45 mA

Technical data: supply	
Designation	**Description**
- One solenoid valve	35...45 mA
Total	approx. 135 mA

Material number:

221-005030 --> from software version 0A (see version label 24V/0A)

221-005023 --> from software version A (see version label AIOL)

Technical data: inputs as seen from the IO-Link			
Bit		**Feedback**	**Signal**
DIB X			
DI0*	(single-seated valves / disk valves)	**S1** Main stroke	1 = valve in non-actuated position 0 = valve outside tolerance for non-actuated position
	(double-seated valves)	**S1** Valve disk	1 = valve closed 0 = valve outside tolerance
DI1*		**S2** Main stroke	1 = valve in actuated position 0 = valve outside tolerance for actuated position
DI2		**S3** (if PV Y1 = 0) Double-disk	1 = double-disk closed 0 = double-disk not closed or no external sensor present
		S3 (if PV Y1 = 1)	

Technical data: inputs as seen from the IO-Link			
Bit		**Feedback**	**Signal**
DI3		Spread lift Double-disk	1= double-disk not spread 0 = double-disk spread
	(double-seated valves)	**S4** Main stroke	1 = valve in non-actuated position 0= valve disk **and** double-disk not closed
DI4 … DI7		not assigned	
DIB X +1		**Actuation**	**Signal**
DI0		**PV Y1 on** Solenoid valve Y1 activated	1 = solenoid valve activated 0 = solenoid valve inactive
DI1		**PV Y2 on** Solenoid valve Y2 activated	1 = solenoid valve activated 0 = solenoid valve inactive
DI2		**PV Y3 on** Solenoid valve Y3 activated	1 = solenoid valve activated 0 = solenoid valve inactive
DI3		**Error on** Error active	1= error active 0 = error inactive
DI4		**Y7** not assigned	
DI5		**Y6** not assigned	
DI6		**Y5** not assigned	
DI7		**SUP** Setup active	1= setup active 0= setup inactive

Technical data: inputs as seen from the IO-Link		
Bit	**Feedback**	**Signal**
DIW X +2		
	Actual valve position	0 … 1023 (10Bit)
	Valve position	0 … 78mm

* Assignment for colour variant green, see Section 6.5.2, Page 64.

Technical data: outputs as seen from the IO-Link		
Bit	**Actuation**	**Signal**
DOB X		
DO0	**PV Y1** Activation of solenoid valve Y1	1 = solenoid valve activated 0 = solenoid valve not activated
DO1	**PV Y2** Activation of solenoid valve Y2	1 = solenoid valve activated 0 = solenoid valve not activated
DO2	**PV Y3 (if PV Y1 = 0)** Activation of solenoid valve Y3	1 = solenoid valve activated 0 = solenoid valve not activated
	PV Y4 (if PV Y1 = 1) Activation of solenoid valve Y4	1 = solenoid valve activated 0 = solenoid valve not activated
DO3	**X4** not assigned	
DO4	**X5** not assigned	
DO5	**X6** not assigned	
DO6	**X7** not assigned	
DO7	**HAS** Activation of setup	1= activate setup

Technical data: electrical specifications	
Designation	**Description**
IO-Link version	V1.1 Port class A / COM2
Reverse voltage protection	yes
SIO mode	not supported

You can download the IODD from the following link:

https://ioddfinder.io-link.com/productvariants/search?vendorName=%22GEA%20Tuchenhagen%20GmbH%22

Technical data: non-cyclical data exchange						
Sub-index	**Offset**	**Function**	**Access rights**	**Range**	**Default**	**Signal**
Index 0x00 - Identification						
0x01	0x00	Master Command	M	0x00 - 0xFF	0x00	
0x02	0x01	Master Cycle Time	R/W	0x00 - 0xFF	0x1E	
0x03	0x02	Min Cycle Time	M	0x00 - 0xFF	0x1E	
0x04	0x03	M-Sequence	M	0x00 - 0xFF	0x08	
0x05	0x04	Revision ID	R/W	0x00 - 0xFF	0x11	
0x06	0x05	Process Data In	M	0x00 - 0xFF	0x83	
0x07	0x06	Process Data Out	M	0x00 - 0xFF	0x08	
0x08	0x07	Vendor ID 1	M	0x00 - 0xFF	0x05	
0x09	0x08	Vendor ID 2	M	0x00 - 0xFF	0x2C	
0x0A	0x09	Device ID 1	R/W	0x00 - 0xFF	0x12	
0x0B	0x0A	Device ID 2	R/W	0x00 - 0xFF	0x34	
0x0C	0x0B	Device ID 3	R/W	0x00 - 0xFF	0x56	
Index 0x01 - Parameter						
0x01	0x00	Colour Selection	R/W	0x00 - 0x01	0x01	0= yellow 1= green
0x02	0x01	Tolerance	R/W	0x00 - 0x04	0x02	0= 2.0mm 1= 1.0mm 2= 0.7mm 3= 0.3mm
0x03	0x02	Signal Damping	R/W	0x00 - 0x04	0x03	0= 1.0 sec. 1= 0.5 sec. 2= 0.1 sec. 3= OFF
0x04	0x03	LEFF	R/W	0x00 - 0x04	0x02	0= OFF 1= VT-Lift 2= DT-Lift 3= VT + DT-Lift
0x05 0x06	0x04 0x05	Not-Activated Position	M	0x00 - 0x04 0x00 - 0xFF		0 … 1023 (10Bit) 0 … 78mm

Technical data: non-cyclical data exchange						
Sub-index	**Offset**	**Function**	**Access rights**	**Range**	**Default**	**Signal**
0x07 0x08	0x06 0x07	Activated Position	M	0x00 - 0x04 0x00 - 0xFF		0 … 1023 (10Bit) 0 … 78mm
0x09 0x0A	0x08 0x09	Lift Position	M	0x00 - 0x04 0x00 - 0xFF		0 … 1023 (10Bit) 0 … 78mm

Where access to the entire record of an index takes place, the offset within the record applies (table above).

On account of the setup of the T.VIS necessary for commissioning and following seal changeover, we have refrained from implementing data retention!

5.5 Specifications for AS-interface

Technical data: supply	
Designation	**Description**
Supply voltage UV	26.5...31 V DC
Current consumption - No-load current - One solenoid valve	 ≤ 25 mA 35...45 mA
Total	approx. 90 mA

Software version A and B (see version labels AASi / BASi)

Technical data: inputs as seen from the AS-interface master			
Bit		**Feedback**	**Signal**
DI0*		**S1** Main stroke	1 = valve in non-actuated position 0 = valve outside tolerance for non-actuated position
DI1*		**S2** Main stroke	1 = valve in actuated position 0 = valve outside tolerance for actuated position
DI2		**S3**	1 = double-disk closed

Technical data: inputs as seen from the AS-interface master			
Bit		**Feedback**	**Signal**
		Double-disk	0 = double-disk not closed or no external sensor present
DI3			not assigned

* Assignment for colour variant green, see Section 6.5.2, Page 64.

from software version C (see version label #ASI)

Technical data: inputs as seen from the AS-interface master			
Bit		**Feedback**	**Signal**
DI0*	(single-seated valves / disk valves)	**S1** Main stroke	1 = valve in non-actuated position 0 = valve outside tolerance for non-actuated position
	(double-seated valves)	**S1** Valve disk	1 = valve disk closed 0 = valve outside tolerance
DI1*		**S2** Main stroke	1 = valve in actuated position 0 = valve outside tolerance for actuated position
DI2		**S3** (if PV Y1 = 0) Double-disk	1 = double-disk closed 0 = double-disk not closed or no external sensor present
		S3 (if PV Y1 = 1) Spread lift** Double-disk	1= double-disk not spread 0 = double-disk spread

Technical data: inputs as seen from the AS-interface master			
Bit		**Feedback**	**Signal**
DI3	(double-seated valves)	**S4** Main stroke	1 = valve in non-actuated position 0= valve disk **and** double-disk not closed

Technical data: outputs as seen from the AS-interface master		
Bit	**Actuation**	**Signal**
DO0	**PV Y1** Activation of solenoid valve Y1	1 = solenoid valve activated 0 = solenoid valve not activated
DO1	**PV Y2** Activation of solenoid valve Y2	1 = solenoid valve activated 0 = solenoid valve not activated
DO2	**PV Y3 (if PV Y1 = 0)** Activation of solenoid valve Y3	1 = solenoid valve activated 0 = solenoid valve not activated
	PV Y4 (if PV Y1 = 1) Activation of solenoid valve Y4	1 = solenoid valve activated 0 = solenoid valve not activated
DO3	Reserved for A/B identification	

Technical data: electrical specifications	
Designation	**Description**
ASi specification	V3.0 (A/B slave)
Configuration IO code / ID code / ID2 code	7.A.7.E.
Reverse voltage protection	yes

5.6 DeviceNet specifications

Technical data: supply	
Designation	**Description**
Supply voltage UV without solenoid valve	11...26 V DC
Supply voltage UV with solenoid valve	21...26 V DC
Current consumption - No-load current - One solenoid valve	 ≤ 35 mA 35...45 mA
Total	approx. 90 mA

Software version C (see version label CDN)

Technical data: inputs as seen from the DeviceNet master		
Bit	**Feedback**	**Signal**
I-0*	**S1** Main stroke	1 = valve in non-actuated position 0 = valve outside tolerance for non-actuated position
I-1*	**S2** Main stroke	1 = valve in actuated position 0 = valve outside tolerance for actuated position
I-2	**S3** Double-disk	1 = double-disk closed 0 = double-disk not closed or no external sensor present

* Assignment for colour variant green, see Section 6.5.2, Page 64.

Technical data: outputs as seen from the DeviceNet master		
Bit	**Actuation**	**Signal**
DO0	**PV Y1** Activation of solenoid valve Y1	1 = solenoid valve activated 0 = solenoid valve not activated
DO1	**PV Y2** Activation of solenoid valve Y2	1 = solenoid valve activated 0 = solenoid valve not activated

Technical data: outputs as seen from the DeviceNet master		
Bit	**Actuation**	**Signal**
DO2	**PV Y3** Activation of solenoid valve Y3	1 = solenoid valve activated 0 = solenoid valve not activated
DO3		not assigned

Software version C (see version label CDN)

Technical data: inputs as seen from the DeviceNet master		
Bit	**Feedback**	**Signal**
I-0* (single seated valves)	**S1** Main stroke	1 = valve in non-actuated position 0 = valve outside tolerance for non-actuated position
I-0* (double seated valves)	**S1** Valve disk	1 = valve disk closed 0 = valve outside tolerance
I-1*	**S2** Main stroke	1 = valve in actuated position 0 = valve outside tolerance for actuated position
I-2	**S3** (if PV Y1 = 0) Double-disk	1 = double-disk closed 0 = double-disk not closed or no external sensor present
	S3 (if PV Y1 = 1) Spread lift** Double-disk	1= double-disk not spread 0 = double-disk spread
I-3 (double seated valves)	**S4** Main stroke	1 = valve in non-actuated position 0= valve disk **and** double-disk not closed

* Assignment for colour variant green, see Section 6.5.2, Page 64.

Technical data: outputs		
Bit	**Actuation**	**Signal**
DO0	**PV Y1** Activation of solenoid valve Y1	1 = solenoid valve activated 0 = solenoid valve not activated
DO1	**PV Y2** Activation of solenoid valve Y2	1 = solenoid valve activated 0 = solenoid valve not activated
DO2	**PV Y3 (if PV Y1 = 0)** Activation of solenoid valve Y3	1 = solenoid valve activated 0 = solenoid valve not activated
	PV Y4 (if PV Y1 = 1) Activation of solenoid valve Y4	1 = solenoid valve activated 0 = solenoid valve not activated
DO3		not assigned

** spread lift function only in connection with printed circuit board 221-005026 (78)

Technical data: LED indicators for module and network status	
	Description
Green	Operation
Flashing green	Communication time-out or module faulty
Flashing red	Power-up test
Flashing orange	Baud rate detection
Red	Communication not possible

DIP switches

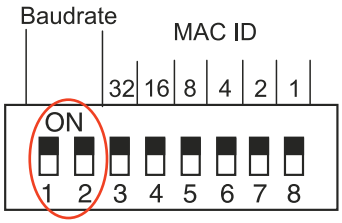


Fig.10

Switches 1 and 2 = baud rate		
DIP 1	**DIP 2**	**Baud rate**
OFF	OFF	125 kBaud
ON	OFF	250 kBaud
OFF	ON	500 kBaud
ON	ON	Selectable via software Delivery state

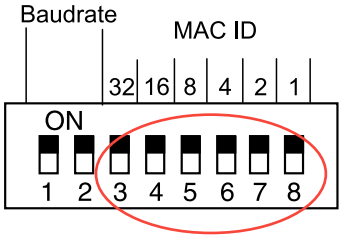


Fig.11: DIP switches: switches 3 and 8 = MAC ID (address)

Switches 3 to 8 = MAC ID (address)						
DIP 3	**DIP 4**	**DIP 5**	**DIP 6**	**DIP 7**	**DIP 8**	**MAC ID**
OFF	OFF	OFF	OFF	OFF	OFF	0
OFF	OFF	OFF	OFF	OFF	ON	1
OFF	OFF	OFF	OFF	ON	OFF	2
...	...	...	...	...	...	...
ON	ON	ON	ON	ON	OFF	62
ON*	ON	ON	ON	ON	ON	63

* Factory setting

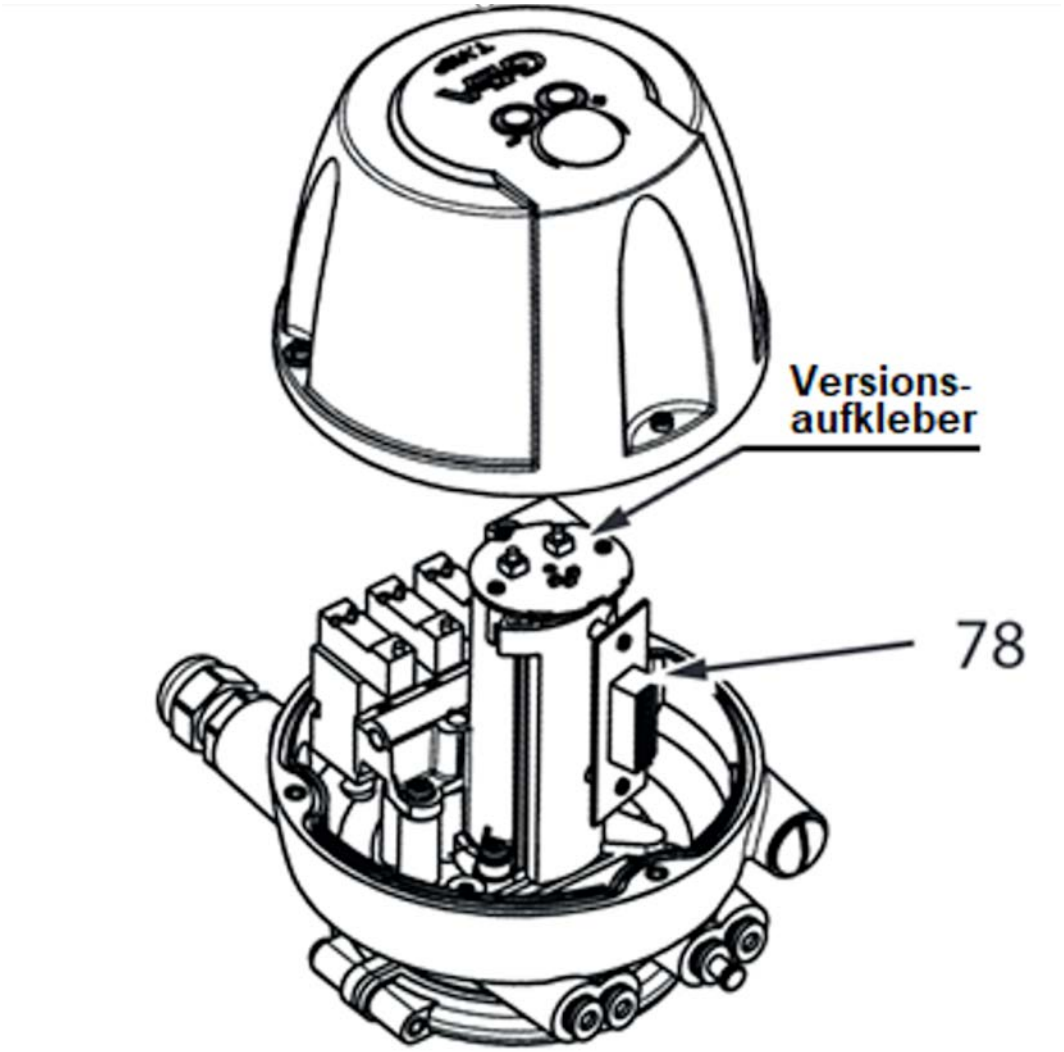


Fig.12

5.7 Accessories

Accessories must be ordered separately.

Accessories	Part no.
Cable socket, right-angle – M12; 5-pole: A-coded	508-963
Cable socket, straight – M12; 8-pole: A-coded	508-061
Cable socket, straight – M12; with 1 m cable and ASI insulation displacement terminal	508-027
Cable socket, straight – M12; with 2 m cable and ASI insulation displacement terminal	508-028
Supply air throttle for reducing the opening speed of the main stroke at the central air supply P	603-042
Exhaust air throttle for reducing the closing speed of the main stroke at the exhaust air connection E1	603-042

5.8 Tool

List of tools	
Tool	**Material no.**
Hose cutter	407-065
Hex key, size 3	408-121
Pin-type face spanner, pin dia. 4	9065837
Open-ended wrench a/f 23	408-046
Open end spanner a/f 16x18	408-138
Open-ended wrench a/f 15	408-035
Open end spanner a/f 13x17	408-036
Open-ended wrench, a/f 24+27	408-040

5.9 Lubricants

Lubricants	**Material no.**
Rivolta F.L.G. MD-2	413-071
PARALIQ GTE 703	413-064

5.10 Equipment

Technical data - equipment	
Equipment	**Material no.**
Proximity switch M12x1 in the lantern • As per NAMUR, normally closed contact • 7.5...30 V DC • Ambient temperature: -20...+70 °C • Protection class IP 67 • Non-metal contact switching	505-098
Logic element NOT • Pressure range: 2.0...8.0 bar • Ambient temperature: -20...+70 °C	512-137
Solenoid valve • 24 V DC (+20% / -12.5%), 0.85 W • Ambient temperature: -20...+60 °C • Protection class IP 51 • Pressure range: 2.0...8.0 bar	512-169

Technical data - equipment	
Equipment	**Material no.**
Sound absorber G 1/8" • Filter material: stainless steel wool • Ambient temperature: -20...+70 °C • max. pressure 10 bar	933-175
Sound absorber G 1/4" • Filter material: stainless steel wool • Ambient temperature: -20...+70 °C • max. pressure 10 bar	933-174
Supply/exhaust air throttle G ¹/8" • Filter material: sintered stainless steel • Pressure range: 0.2 ... 10 bar • Infinitely adjustable flow at Δp 6 bar: 310 dm^3 / min_n • Ambient temperature: -10 ... +70 °C • Flow rate setting at 0 ... +70 °C	603-042

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 Establishing Hose Connections

To ensure reliable operation, the compressed air hoses must be cut exactly at a right angle.

Tools required:

- Hose cutter

Carry out the following steps:

1. Shut off the compressed air supply.
2. Use the hose cutter to cut the pneumatic hoses at a right angle.
3. Push the air hose into the air connector on the control top.
4. Re-open the compressed air supply.

→ Done.

Hint!

Avoid kinks in the pneumatic hoses!

6.3 Pneumatic connections

6.3.1 Control Top with 1 Solenoid Valve or Without Solenoid Valve

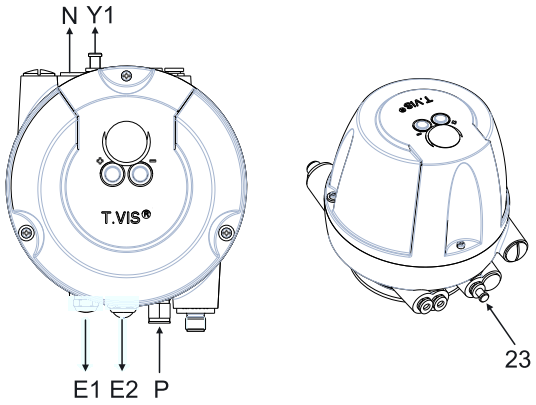


Fig.13: Control top (standard variant in IP66)

E1	Exhaust air of the main stroke Y1 with sound absorber optional: exhaust air throttle Connection E1 must not be closed!
E2	Safety vent against excess pressure and exhaust air of lifting actuators or from an external main stroke via reflux valve/sound absorber Connection E2 must not be closed!
P	Central air supply with integrated filter optional: supply air throttle
N	Air connection for spring force backup Only with logic element NOT
Y1	Air connection for external main stroke connection with plug (23)
23	Plug Control air pressure can be present at the plugs for the air connections! Before removing a sealing plug (23), make sure that the respective air connection is pressure-free!

On most of the GEA Tuchenhagen valve types, solenoid valve Y1 internally guides the main control air through the switch bar into the main actuator. The external air connection Y1 is provided in addition.

6.3.2 Control Top with 2 Solenoid Valves – for Lifting the Valve Disk

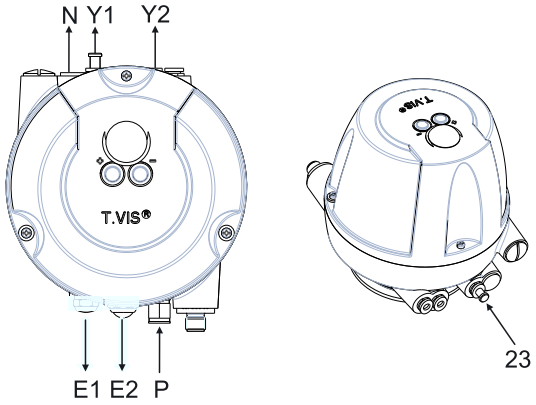


Fig.14: Control top (standard variant in IP66)

E1	Exhaust air of the main stroke Y1 with sound absorber optional: exhaust air throttle Connection E1 must not be closed!
E2	Safety vent against excess pressure and exhaust air of lifting actuators or from an external main stroke via reflux valve/sound absorber Connection E2 must not be closed!
P	Central air supply with integrated filter optional: supply air throttle
N	Air connection for spring force backup Only with logic element NOT
Y1	Air connection for external main stroke connection with plug (23)
Y2	Air connection for lifting the valve disk Not permitted for the main stroke of an external process valve!
23	Plug Control air pressure can be present at the plugs for the air connections! Before removing a sealing plug (23), make sure that the respective air connection is pressure-free!

On most of the GEA Tuchenhagen valve types, solenoid valve Y1 internally guides the main control air through the switch bar into the main actuator. The external air connection Y1 is provided in addition.

6.3.3 Control top with 2 solenoid valves – for lifting the double-disk, for the external air connection of an air/air actuator or for the main stroke of an external process valve

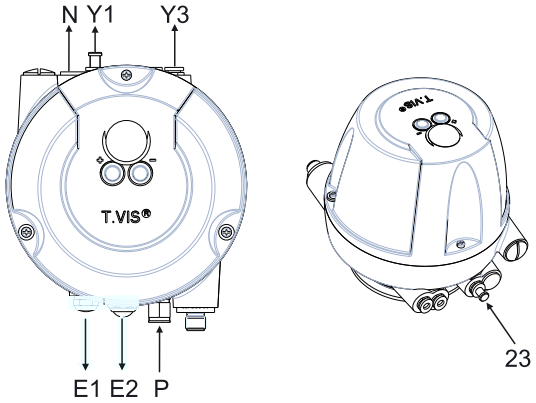


Fig.15: Control top (standard variant in IP66)

E1	Exhaust air of the main stroke Y1 with sound absorber optional: exhaust air throttle Connection E1 must not be closed!
E2	Safety vent against excess pressure and exhaust air of lifting actuators or from an external main stroke via reflux valve/sound absorber Connection E2 must not be closed!
P	Central air supply with integrated filter optional: supply air throttle
N	Air connection for spring force backup Only with logic element NOT
Y1	Air connection for external main stroke connection with plug (23)
Y3	Air connection for lifting the double-disk, for external air connection of an air/air actuator or for main stroke of an external process valve or for ASEPTOMAG valves with seat ventilation
23	Plug Control air pressure can be present at the plugs for the air connections! Before removing a sealing plug (23), make sure that the respective air connection is pressure-free!

On most of the GEA Tuchenhagen valve types, solenoid valve Y1 internally guides the main control air through the switch bar into the main actuator. The external air connection Y1 is provided in addition.

6.3.4 Control top with 2 solenoid valves- for spreader lift of the double-disk

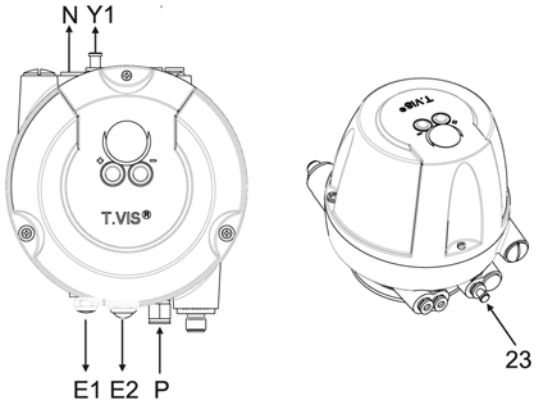


Fig.16: Control top (standard variant in IP66)

E1	Exhaust air of the main stroke Y1 with sound absorber optional: exhaust air throttle Connection E1 must not be closed!
E2	Safety vent against excess pressure and exhaust air of lifting actuators or from an external main stroke via reflux valve/sound absorber Connection E2 must not be closed!
P	Central air supply with integrated filter optional: supply air throttle
N	For VARIVENT® mixproof valves: Air connection for spreader lift of the double-disk, if main stroke is active.
Y1	Air connection for external main stroke connection with plug (23)
23	Plug Control air pressure can be present at the plugs for the air connections! Before removing a sealing plug (23), make sure that the respective air connection is pressure-free!

On most of the GEA Tuchenhagen valve types, solenoid valve Y1 internally guides the main control air through the switch bar into the main actuator. The external air connection Y1 is provided in addition.

6.3.5 Control top with 3 solenoid valves for lifting the valve disk and double-disk

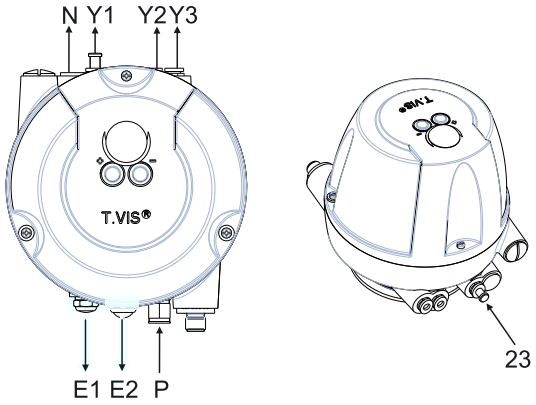


Fig.17: Control top (standard variant in IP66)

E1	Exhaust air of the main stroke Y1 with sound absorber optional: exhaust air throttle Connection E1 must not be closed!
E2	Safety vent against excess pressure and exhaust air of lifting actuators or from an external main stroke via reflux valve/sound absorber Connection E2 must not be closed!
P	Central air supply with integrated filter optional: supply air throttle
N	Air connection for spring force backup Only with logic element NOT
Y1	Air connection for external main stroke connection with plug (23)
Y2	For VARIVENT® valves with lifting actuator: Air connection for lifting the valve disk For STERICOM® double-seal valves: lifting actuator down (air connection at actuator top) Not permitted for the main stroke of an external process valve! On ASEPTOMAG valves with lifting of the upper seat
Y3	For VARIVENT® valves with lifting actuator: Air connection for lifting the double-disk For STERICOM® double-seal valves: lifting actuator up (air connection at actuator bottom) On ASEPTOMAG valves with lifting of the lower seat
23	Plug Control air pressure can be present at the plugs for the air connections! Before removing a sealing plug (23), make sure that the respective air connection is pressure-free!

On most of the GEA Tuchenhagen valve types, solenoid valve Y1 internally guides the main control air through the switch bar into the main actuator. The external air connection Y1 is provided in addition.

Hint!

To ensure adequate compressed air supply to the process actuators, a max. of 2 solenoid valves are electrically activated at the same time!

It must be ensured that there can be no simultaneous control of the actuator or the lifts at the same process valve!

6.3.6 Control top with 3 pilot valves - to lift the double-disk and to spread lift the double-disk

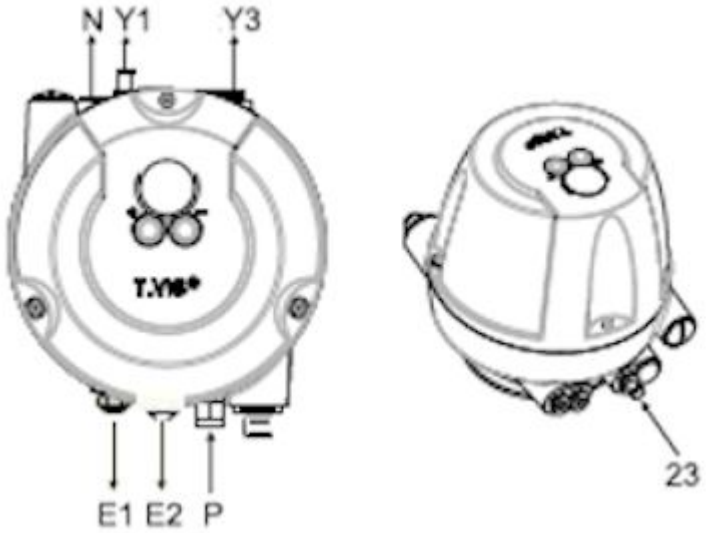


Fig.18: Control top (standard variant in IP66)

E1	Exhaust air of the main stroke Y1 with sound absorber optional: exhaust air throttle Connection E1 must not be closed!
E2	Safety vent against excess pressure and exhaust air of lifting actuators or from an external main stroke via reflux valve/sound absorber Connection E2 must not be closed!
P	Central air supply with integrated filter optional: supply air throttle
N	For VARIVENT® mixproof valves: Air connection for spreader lift of the double-disk, if main stroke is activated.
Y1	Air connection for external main stroke connection with plug (23)
Y3	For VARIVENT® valves with lift: Air connection for lifting the double-disk For STERICOM® double seal valves: lifting actuator up (air connection at actuator bottom) On ASEPTOMAG valves with lifting of the lower seat
23	Plug Control air pressure can be present at the plugs for the air connections! Before removing a sealing plug (23), make sure that the respective air connection is pressure-free!

On most of the GEA Tuchenhagen valve types, solenoid valve Y1 internally guides the main control air through the switch bar into the main actuator. The external air connection Y1 is provided in addition.

6.3.7 Control top with 4 pilot valves for the lift of the valve disk and of the double-disk and for the spread lift of the double-disk

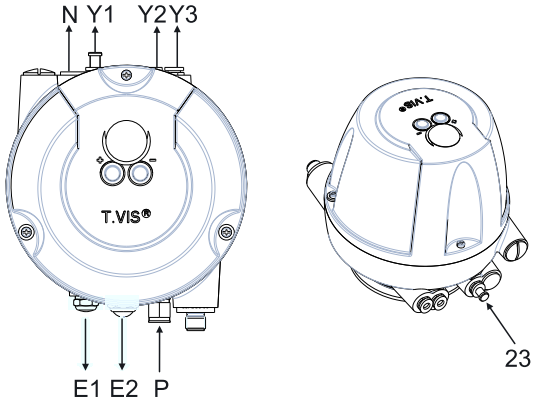


Fig.19: Control top (standard variant in IP66)

E1	Exhaust air of the main stroke Y1 with sound absorber optional: exhaust air throttle Connection E1 must not be closed!
E2	Safety vent against excess pressure and exhaust air of lifting actuators or from an external main stroke via reflux valve/sound absorber Connection E2 must not be closed!
P	Central air supply with integrated filter optional: supply air throttle
N	For VARIVENT mixproof valves: Air connection for spreader lift of the double-disk, if main stroke is activated.
Y1	Air connection for external main stroke connection with plug (23)
Y2	For VARIVENT® valves with lifting actuator: Air connection for lifting the valve disk For STERICOM® double-seal valves: lifting actuator down (air connection at actuator top) Not permitted for the main stroke of an external process valve! On ASEPTOMAG valves with lifting of the upper seat
Y3	For VARIVENT® valves with lifting actuator: Air connection for lifting the double-disk For STERICOM® double-seal valves: lifting actuator up (air connection at actuator bottom) On ASEPTOMAG valves with lifting of the lower seat
23	Plug Control air pressure can be present at the plugs for the air connections! Before removing a sealing plug (23), make sure that the respective air connection is pressure-free!

On most of the GEA Tuchenhagen valve types, solenoid valve Y1 internally guides the main control air through the switch bar into the main actuator. The external air connection Y1 is provided in addition.

Hint!

To ensure adequate compressed air supply to the process actuators, a max. of 2 solenoid valves are electrically activated at the same time!

It must be ensured that there can be no simultaneous control of the actuator or the lifts at the same process valve!

Exception: When using a spreader lift drive and installed solenoid valve Y4 in the control top.

6.4 Electrical connections

Danger

To satisfy the UL requirements, use a protective insulation power-limited power supply according to UL/IEC 60950 or power limited according to UL/IEC 61010-1 3cd cl. 9.4 or a Class II power supply according to NEC.

►

6.4.1 Overview

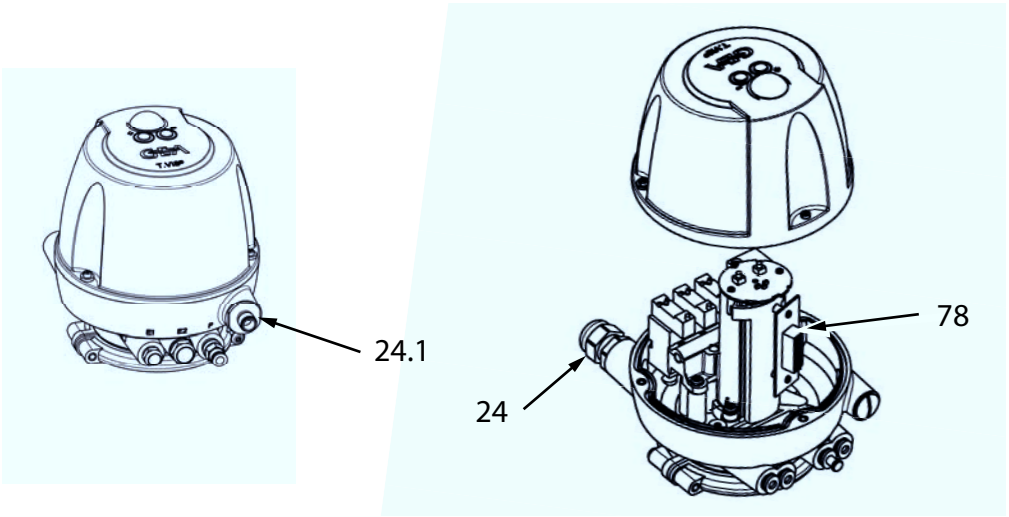


Fig.20

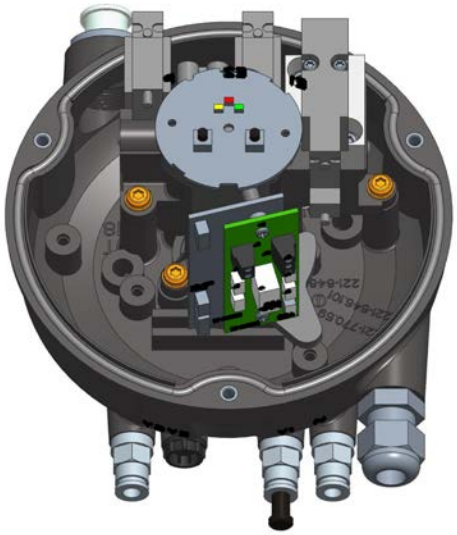


Fig.21

Danger

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

►

Hint!

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

The cables must be suitable for use in the temperature range from -20 °C to 75 °C!

6.4.2 Electrical 24 V DC Wiring

6.4.2.1 Plug M12 / 5-pin (24.1)

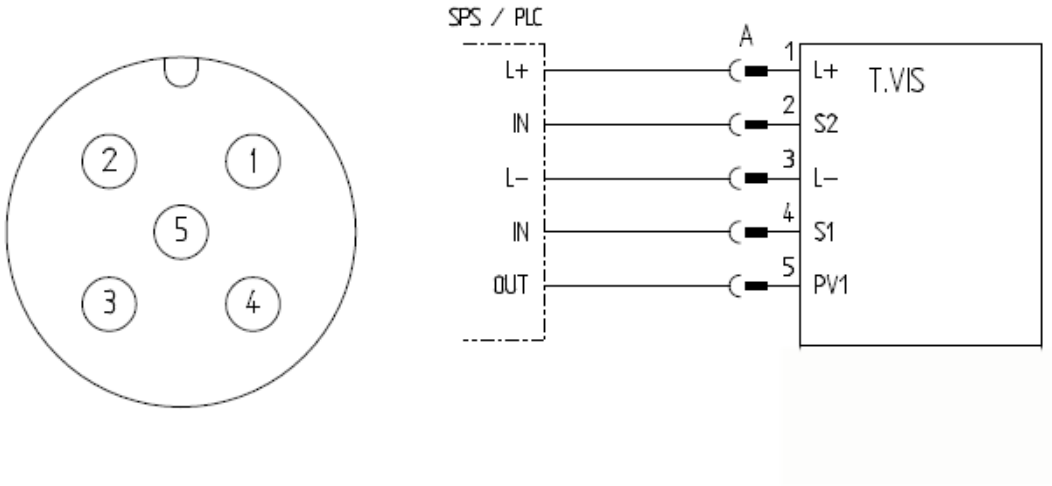


Fig.22: 5-pin M12 plug-in connector A-coded: device connector and view of pin strip

Corresponding cable socket part no. 508-963.

1	L+	U_V L+24 V DC supply voltage
2	S2	Feedback end position valve*
3	L-	U_V L- reference potential
4	S1	Feedback end position valve*
5	PV1	Actuation of solenoid valve Y1

* Assignment for colour variant green, see "Colour changeover" (Page 38).

Carry out the following steps:

1. Connect cable via air connector M12/5-pin.

→ Done.

6.4.2.2 Connector M12 / 8-pin (24.1)

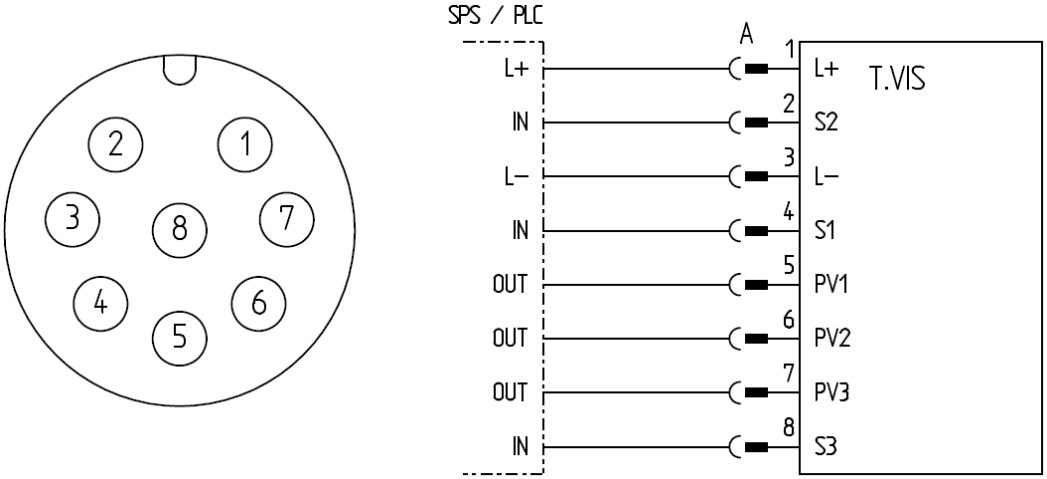


Fig.23: 8-pin M12 plug-in connector A-coded: device connector and view of pin strip

Corresponding cable socket part no. 508-061.

1	L+	U_V L+24V DC supply voltage
2	S2	Feedback end position valve
3	L-	U_V L- reference potential
4	S1	Feedback non-actuated position valve
5	PV1	Actuation of solenoid valve Y1
6	PV2	Actuation of solenoid valve Y2
7	PV3	Actuation of solenoid valve Y3
8	S3	Feedback non-actuated position double-disk closed (only with external initiator)

Carry out the following steps:

1. Connect cable via air connector M12/8-pin.

→ Done.

6.4.2.3 Connector M12/12-pin / 9-strand

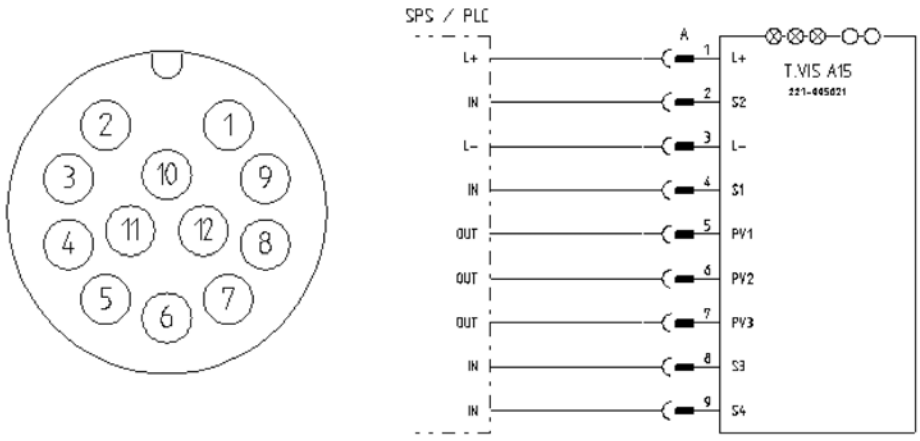


Fig.24: 12-pin M12 plug-in connector A-coded: device connector and view of pin strip

1	L+	U_V L+24V DC supply voltage
2	S2	Feedback end position valve
3	L-	U_V L- reference potential
4	S1	Feedback idle position valve disk closed
5	PV1	Actuation of solenoid valve Y1
6	PV2	Actuation of solenoid valve Y2
7	PV3	Actuation of solenoid valve Y3
8	S3	Feedback idle position double-disk closed or double-disk not spread (only with external initiator)
9	S4	Feedback idle position valve (valve disk or double-disk closed)

*Assignment for colour variant green, see "Colour changeover” section 6.5. 2, page 52.

Carry out the following steps:

1. Connect cable via air connector M12/12-pin.

→ Done.

6.4.2.4 Cable gland (24)

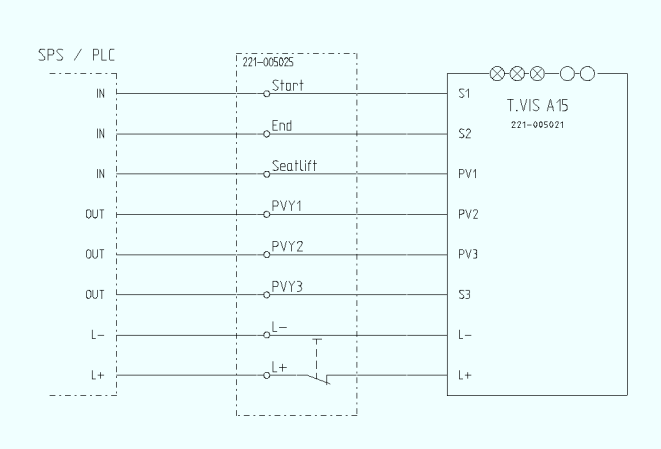


Fig.25: Terminal assignment of the optional additional board 24VDC (78), material no. 221-005025

Carry out the following steps:

1. Insert the cable (diameter 6-12 mm) through the cable gland (24) and connect to the additional board (78) in the control top according to the connection diagram.

   Use wires with ferrules, max. 1.5 mm².

2. Secure the cable in the cable gland at a tightening torque of 2.5 Nm.

→ Done.

6.4.3 Electrical 24 V DC Wiring

6.4.3.1 Plug M12 / 5-pin (24.1)

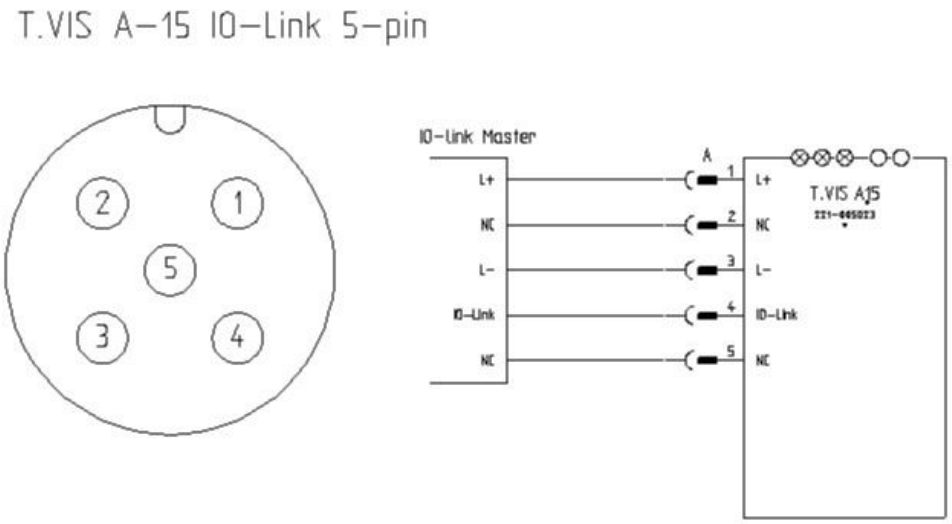


Fig.26: 5-pin M12 plug-in connector A-coded: device connector and view of pin strip

Corresponding cable socket part no.: 508-963

1	L+
2	Not connected
3	L-
4	IO-Link
5	Not connected

*For assignment for green colour variant, see Section 6.5, Page 63

Carry out the following steps:

1. Connect cable via air connector M12/5-pin.

→ Done.

6.4.4 Electrical Wiring of AS-Interface

6.4.4.1 Plug M12 / 5-pin (24.1)

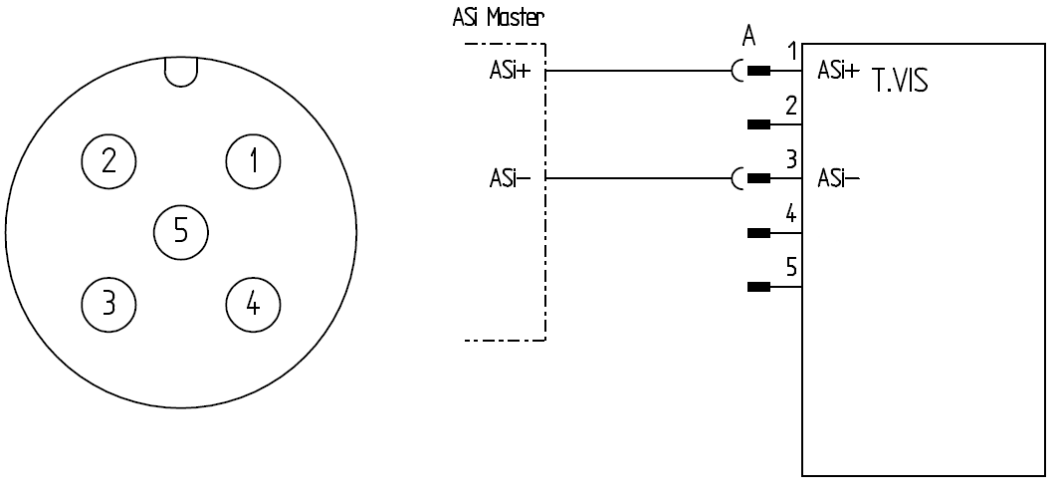


Fig.27: 5-pin M12 plug-in connector A-coded: device connector and view of pin strip

Associated cable sockets part 508-027, 508-028 and 508-963.

1	AS-I+
2	Not connected
3	AS-I-
4	Not connected
5	Not connected

Carry out the following steps:

1. Connect cable via air connector M12/5-pin.

→ Done.

6.4.5 Electrical DeviceNet Wiring

6.4.5.1 Plug M12 / 5-pin (24.1)

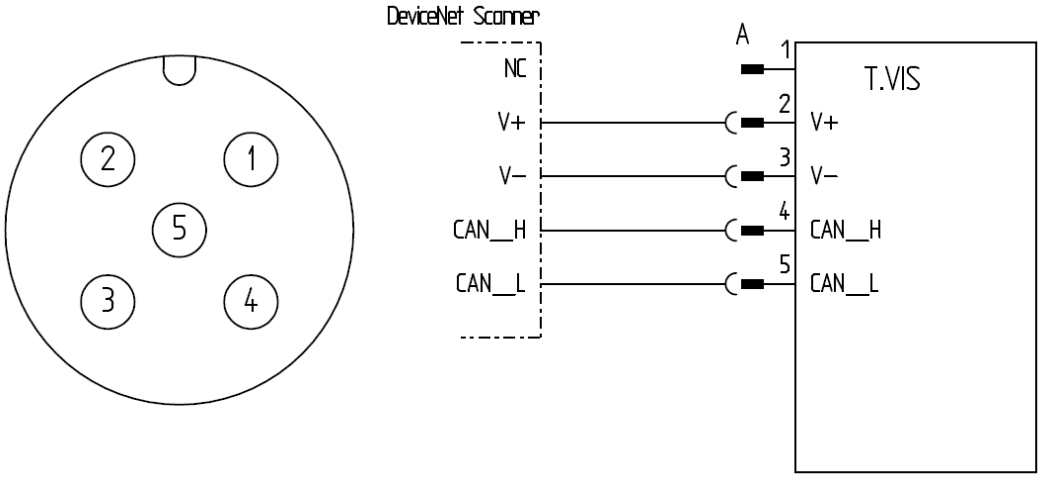


Fig.28: 5-pin M12 plug-in connector A-coded: device connector and view of pin strip

Corresponding cable sockets part no. 508-963.

1	Not connected
2	V+
3	V-
4	CAN_H
5	CAN_L

Carry out the following steps:

1. Connect cable via air connector M12/5-pin.

→ Done.

6.4.5.2 External Proximity Switch (170)

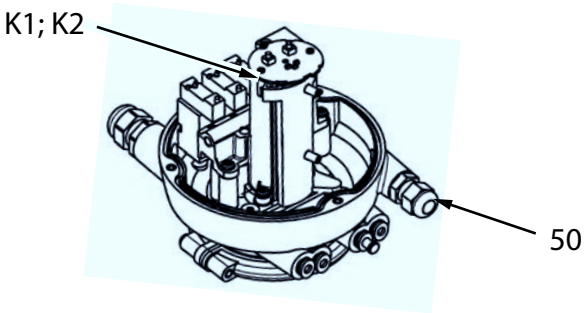


Fig.29

⚠ Caution!

Only use proximity switches specified in the chapter "Technical data", see Chapter 5, Page 26.

▶

Carry out the following steps:

1. Insert the cable (Ø 3-7mm) through the cable gland (50) and connect it to the terminals (K1) and (K2) in the control top according to the connection diagram.
2. Secure the cable in the cable gland at a tightening torque of 2.5 Nm.

→ Done.

6.5 Visual Display

6.5.1 Illuminated dome

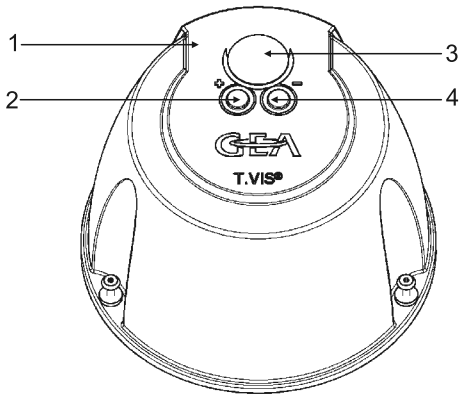


Fig.30

1	Cap
2	+ button
3	Illuminated dome
4	- button

The following statuses are visualized by the illuminated dome:

- Valve in rest position: green, see also Section 6.5.2, Page 64
- Valve in end position: yellow, see also Section 6.5.2, Page 64
- Lift valve disc (without LEFF): yellow flashing, see also Section 6.5.2, Page 64
- Lift/spread double-disk (without LEFF): quick flashing yellow, see also Section 6.5.2, Page 64
- Valve-disk VT or double-disk DT LEFF: flashing yellow/green (with proximity switch only)
- Valve disk moving to the non-actuated position: flashing green
- Valve disk moving to the actuated position: flashing yellow
- Programming mode active: red
- Error/malfunction: rapidly flashing red
- Default, standard version:

Control top not programmed: flashing 3 times - pause - flashing 3 times - pause

- Default, special version:

  Control top not programmed: flashing 2 times - pause - flashing 2 times - pause

There is a power failure if no signal is displayed for more than 5 seconds!

6.5.2 Colour Changeover

The "colour changeover" function allows you to swap the colour from green to yellow or yellow to green for the following visualizations: valve in non-actuated position, travel, lift valve disk (without LEFF), lift double-disk (without LEFF).

Carry out the following steps:

1. Disconnect the control top from the power supply.
2. Press both buttons at the same time and keep them pressed.
3. Switch the power supply back on. After switching on the power supply voltage, continue to press the buttons for another 3 seconds.

→ Done.

Hint!

When the colours are swapped, the feedback signals are also swapped!

6.5.3 Connection diagram for T.VIS circuit board (bottom)

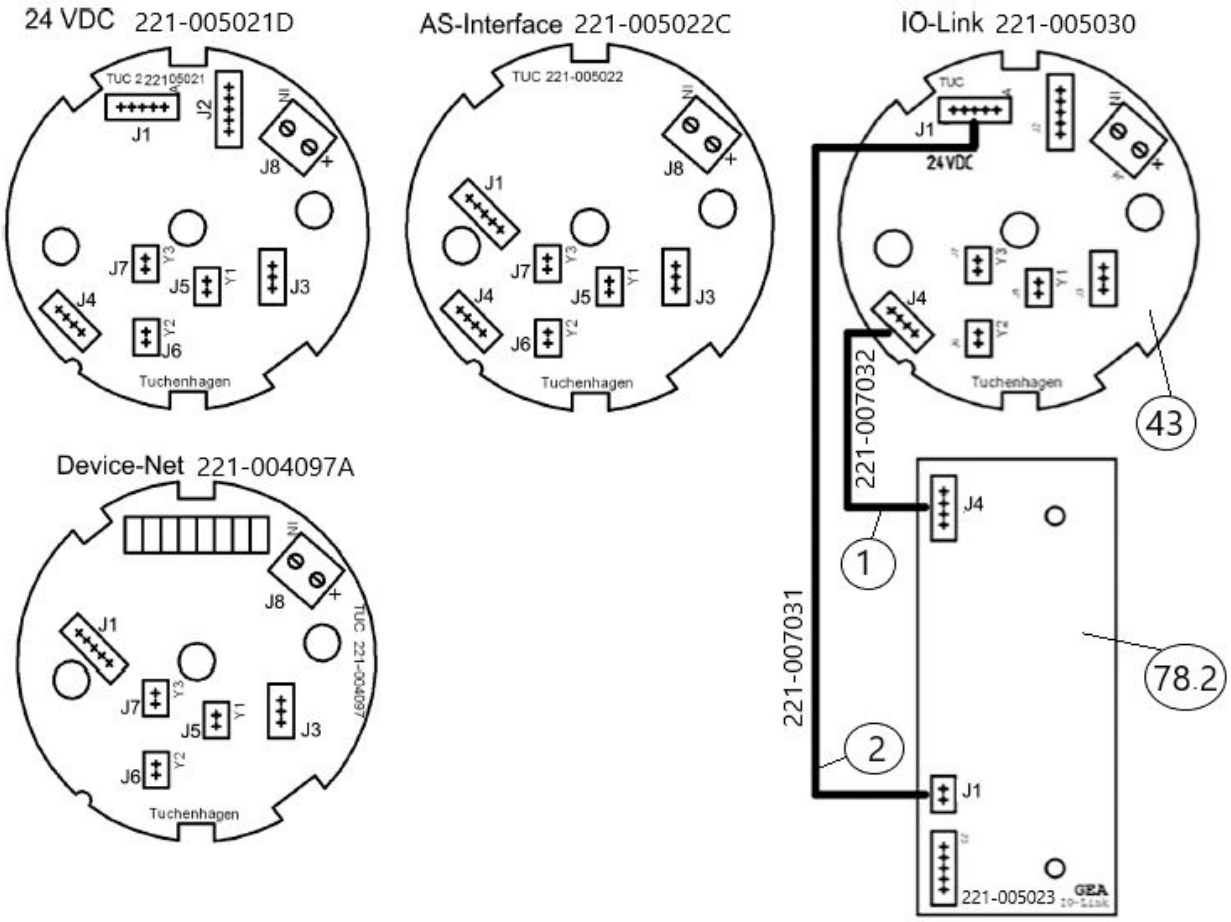


Fig.31

24VDC 221-005031 with spread lift 221-005026

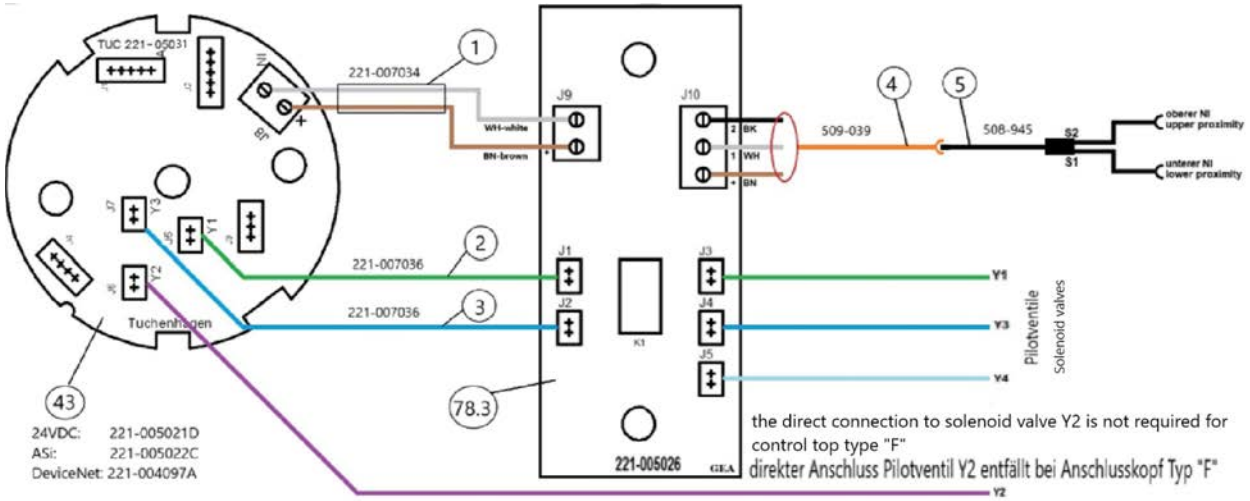


Fig.32

24VDC 221-005031 with IO-Link 221-005023 and spread lift 221-005026

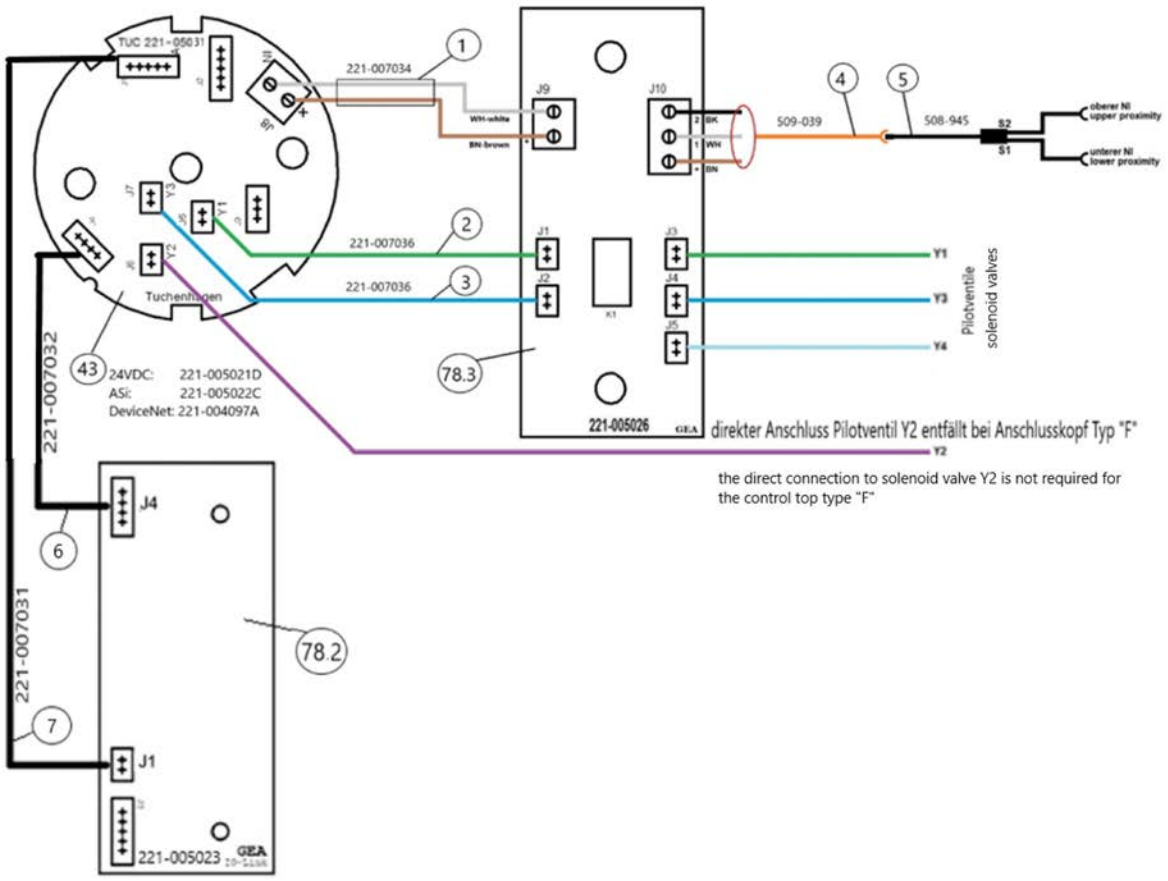


Fig.33

Explanation of the pin assignment			
Plug position	**Connector type**	**Item no. in the Spare Parts List**	**Designation**
J1	PicoBlade 5-pin	24.1	Plug-in connector M12/5-wire/M20
J1 IO-Link	PicoBlade 5-pin	--	Voltage supply
J2	PicoBlade 5-pin	24.1	Plug-in connector M12 / 3-wire/M20 (only with circuit board 24VDC)
J3	PicoBlade 3-pin	9	T.VIS sensor module
J4 IO-Link	PicoBlade 4-pin	--	Diagnostics connection / data interface
J5	PicoBlade 2-pin	63	Solenoid valve Y1
J6	PicoBlade 2-pin	63	Solenoid valve Y2

Explanation of the pin assignment			
Plug position	**Connector type**	**Item no. in the Spare Parts List**	**Designation**
J7	PicoBlade 2-pin	63	Solenoid valve Y3
J8	Terminal strip	171	Cable connection external initiator

Explanation of the pin assignment of spread lift printed circuit board mat. no. 221-005026 (fig. 28)			
Connector position	**Connector type**	**Item no. in the spare parts list**	**Designation**
J1	Pico-Blade 2-pin	--	Solenoid valve signal Y1
J2	Pico-Blade 2-pin	--	Solenoid valve signal Y3
J3	Pico-Blade 2-pin	--	Solenoid valve Y1
J4	Pico-Blade 2-pin	--	Solenoid valve Y3
J5	Pico-Blade 2-pin	--	Solenoid valve Y4
J9	Terminals 2-pin	--	Signal initiator
J10	Terminals 3-pin	--	Initiators

6.6 Mounting the control top to different valves

This chapter describes how the control top is installed and removed on actuators of different valve types. Observe the following notes when doing so.

Notice

The vent plug E2 is a safety element.

If the element is not installed correctly or if the vent is covered, the safety function is no longer guaranteed.

► The installation position of the vent plug E2 must never be pointing vertically upwards.
► The vent plug E2 must never be covered.

6.6.1 Mounting to a VARIVENT Valve

This chapter describes how the control top is installed on VARIVENT single and double-seat valves (also with lifting actuator). The instructions do not apply to installation on VARIVENT double-seat valve types R, T_R, M/2.0, M_0(06), MT/T_R(08) with lifting actuator. This installation is described below in chapter "Installation on VARIVENT mixproof valves with lifting actuator type R, T_R, M/2.0, M_0(06), MT/T_R(08)" (CROSS REFERENCE).

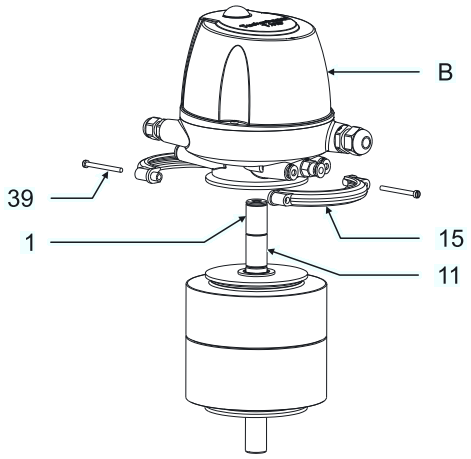


Fig.34

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

1. Check that the switch bar (1) is firmly in place. If necessary, tighten using a jaw wrench AF 13, tightening torque 2 Nm (1.4 lbft).
2. Fit the control top (B) over the switch bar (1) and on the actuator (A.1).
3. Fix the clamps (15) by tightening the screws (39) to a torque of 1 Nm (0.7 lbft).
4. Align the pneumatic and electrical connections in accordance with the valve block configuration.
5. Close the air connection Y1 with a sealing plug (23) since the control top T.VIS A-15 has an inner air duct.

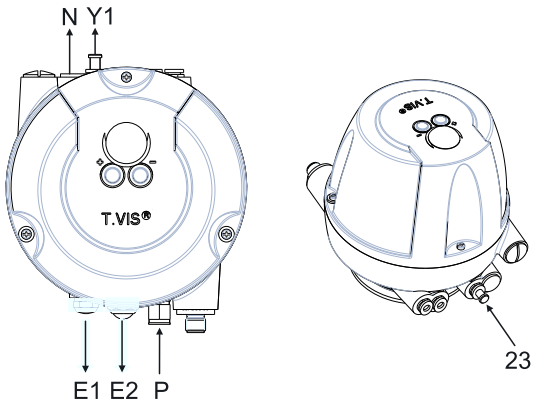


Fig.35

6. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.

→ Done.

6.6.2 Fitting to FLOWVENT Valve

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

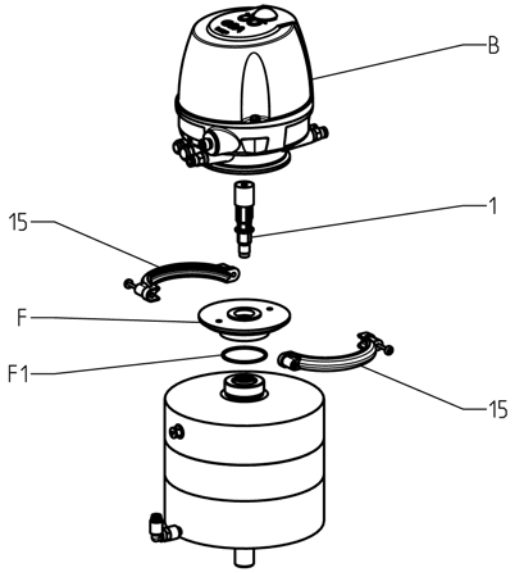


Fig.36

Carry out the following steps:

1. Insert the O-ring (F1) into the lower O-ring groove of the installation base (F).
2. Lightly grease the O-ring (F1) and the inner thread of the installation base (F) and then screw the installation base onto the actuator and tighten using a pin-face spanner and a tightening torque of 20 Nm. When setting the torque heed the correction factor of the plug tool. If the plug tool (408-451) is used, the tightening torque to be set is 15 Nm.
3. Screw switch bar (1) into the actuator and tighten with AF 13, tightening torque 2 Nm (1.4 lbft).
4. Fit the control top (B) over the switch bar (1) onto the installation base and push until stop. For optimum assembly the O-ring (31) should be slightly greased.
5. Turn the control top into the required position and tighten the clamp connection (15) and screws (15) with a tightening torque of 1 Nm (base/ installation base).

   On FLOWVENT valves, internal air guiding is not possible!
6. Therefore, use an air hose (L) to connect the air connection (Y1) on the control top with the connection Y1 on the valve actuator. In the case of a FLOWVENT valve and control tops with lift stroke, connect the air connections Y2 and Y3 to the connections Y2 and Y3 of the valve actuator. In the case of valves with air assist, connect Y2 to connection Y2 of the valve actuator (see hose connection plan of the valve).
7. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.
8. Fit the hood and tighten the screws to 1 Nm.

→ Done.

6.6.3 Installation on VARIVENT mixproof valves with Lifting Actuator Type R, T_R, M/2.0, M_0(06), MT/T_R(08), MX, MT, MT_DA

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

1. Screw the sliding piece (1.2) into the piston rod A 4.1 of the actuator A.4 using a 12 mm slotted screwdriver, tightening torque 2 Nm (1.4 lbft).

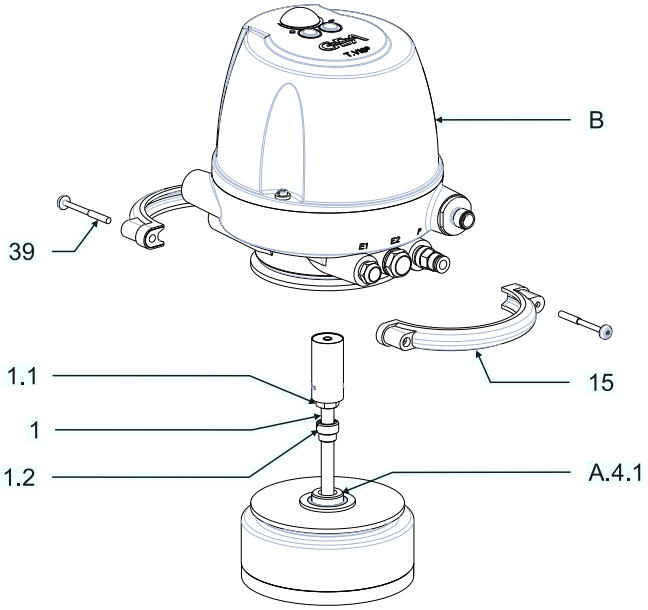


Fig.37

2. Insert the switch bar (1) through the sliding piece into the piston rod A 4.1 and tighten with an open end spanner (a/f 13) at 1.1 (22 Nm).
3. Fit the control top (B) over the switch bar (1) and on the actuator.
4. Tighten the half rings (15) and screws (39) to a tightening torque of 1 Nm (0.7 lbft).
5. Align the pneumatic and electrical connections in accordance with the valve block configuration.
6. Close the air connection Y1 with a sealing plug (23) since the control top T.VIS A-15 has an inner air duct.

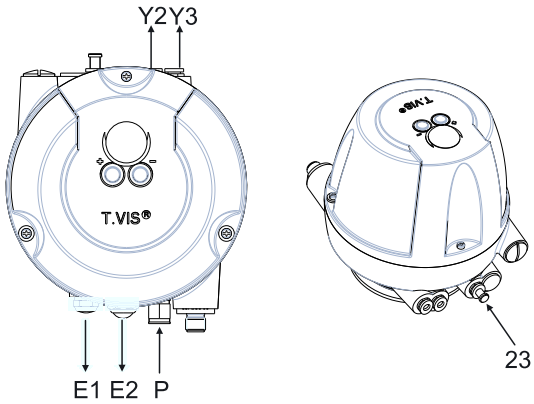


Fig.38

7. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.

→ Done.

6.6.4 Mounting to a Butterfly Valve T-smart 8000

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

1. Fit the bearing (201) into the locking screw (198).

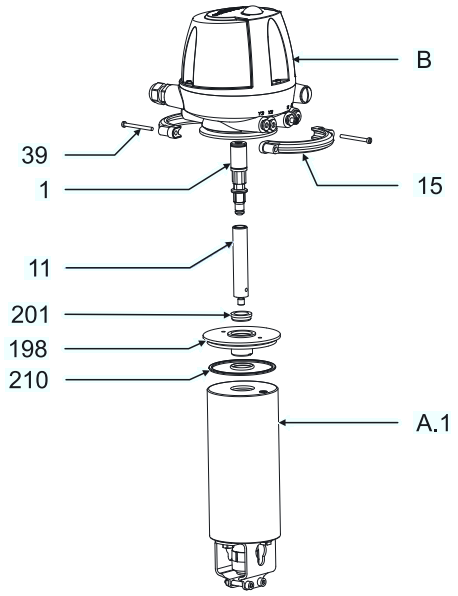


Fig.39

2. Fit the O-ring (210).
3. Use a face spanner to screw the locking screw (198) into the actuator (A.1).
4. Screw the switch bar (1) together with switch bar (11) into the actuator, tightening torque 2 Nm.
5. Fit the control top (B) over the switch bar (1) and on the actuator.
6. Tighten the half rings (15) and screws (39) to a tightening torque of 1 Nm (0.7 lbft).

7. Align the pneumatic and electrical connections in accordance with the valve block configuration.
8. Close the air connection Y1 with a sealing plug (23) since the control top T.VIS A-15 has an inner air duct.

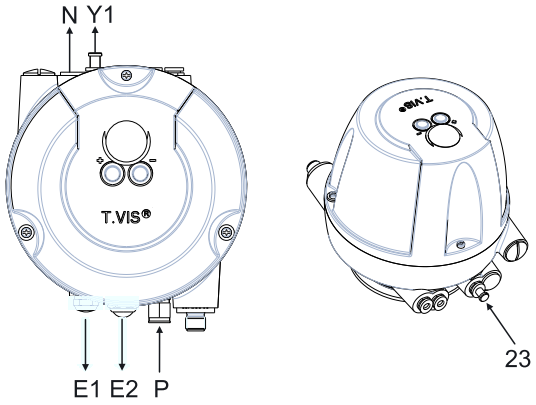


Fig.40

9. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.

→ Done.

6.6.5 Mounting to a Butterfly Valve T-smart 7 and a Mixproof Butterfly Valve T-smart 9

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

1. Screw the switch bar (240) into the actuator and tighten to a tightening torque of 22 Nm (16 lbft).

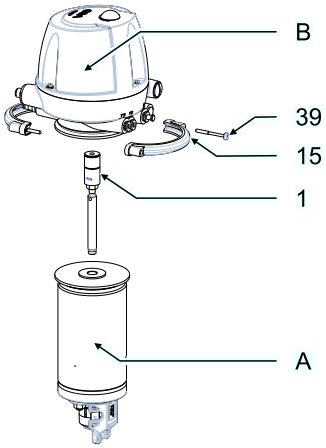


Fig.41

2. Fit the control top (B) over the switch bar (240) and on the actuator.
3. Tighten the half rings (15) and screws (39) to a tightening torque of 1 Nm (0.7 lbft).
4. Align the pneumatic and electrical connections in accordance with the valve block configuration.

5. Close the air connection Y1 with a sealing plug (23) since the control top T.VIS A-15 has an inner air duct.

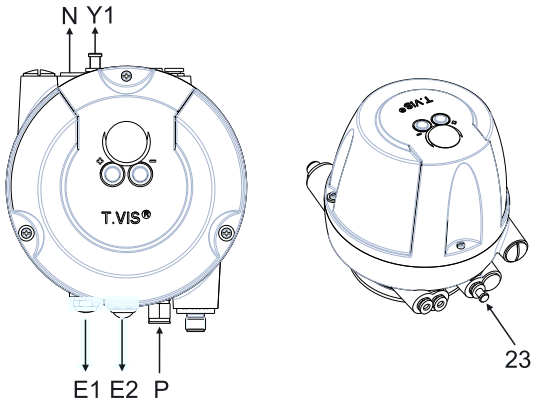


Fig.42

6. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.

→ Done.

6.6.6 Mounting to ECOVENT Valves N_ECO and W_ECO

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

1. Complete the T.VIS mounting base (198) with O-rings (29, 101) and a plain bearing (202).

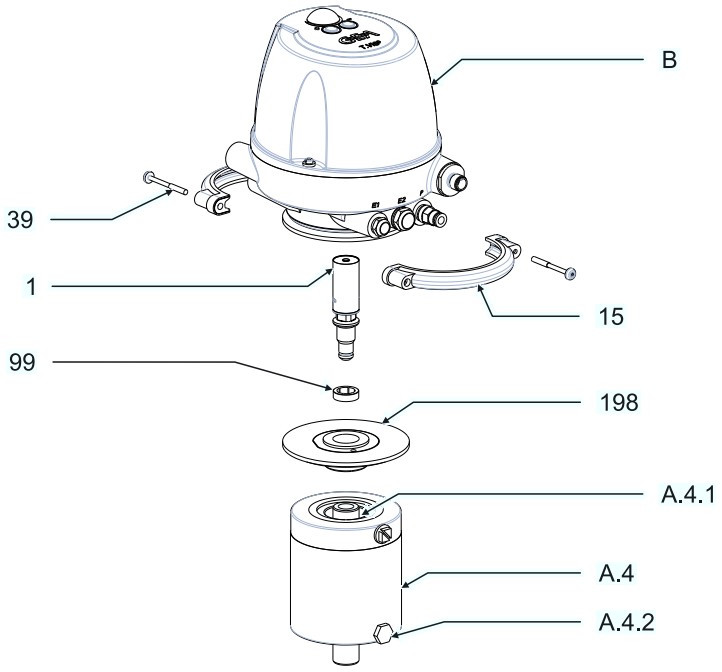


Fig.43

2. Screw the installation base (198) into the actuator (A.4) and tighten using a face spanner.

3. Screw the switch bar (1) with ring (99) into the piston rod (A.4.1) and tighten by applying an a/f 13 jaw wrench at (1.1); tightening torque 2 Nm (1.4 lbft).
4. Fit the control top (B) over the switch bar (1) and on the actuator. 5. Tighten the half rings (15) and screws (39) to a tightening torque of 1 Nm (0.7 lbft).
5. Align the pneumatic and electrical connections in accordance with the valve block configuration.
6. Due to the internal air guiding of the control top T.VIS A-15 (B), the connection A 4.2 on the actuator and air hose Y1 (23) on the steering top are closed.

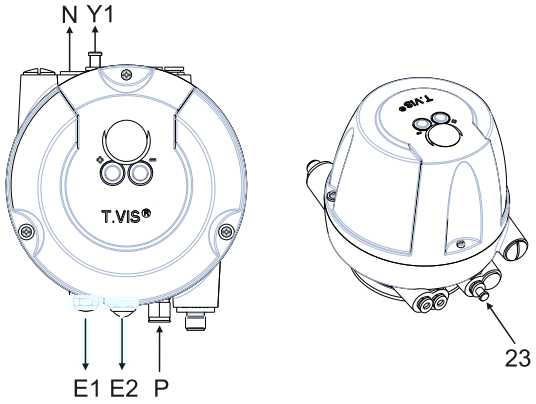


Fig.44

7. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.

→ Done.

6.6.7 Mounting to VESTA Valve H_A/M

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

1. Complete the T.VIS mounting base (198) with O-rings (29, 101) and a plain bearing (202).

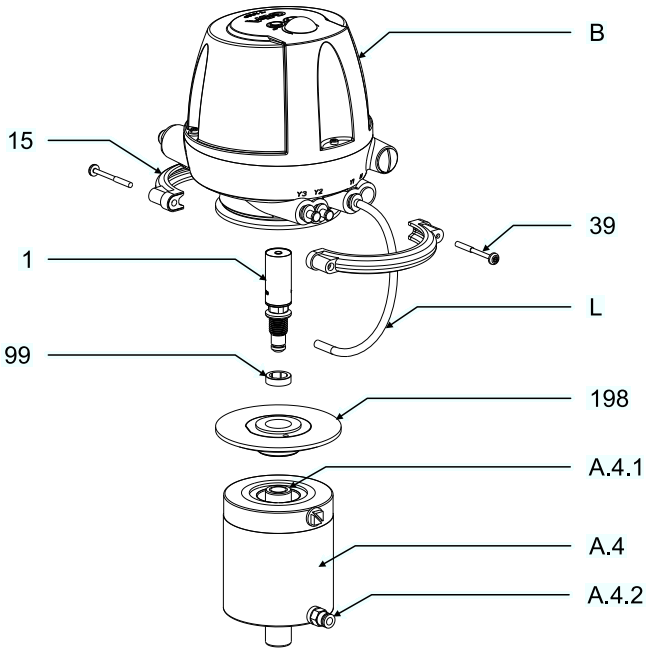


Fig.45

2. Screw the mounting base (198) into the actuator (A4) and tighten using a face spanner.
3. Screw switch bar (1) with ring (99) into the piston rod (A4.1) and tighten with jaw wrench SW 13, tightening torque 2 Nm (1.4 lbft).
4. Fit the control top (B) over the switch bar (1) and on the actuator.
5. Tighten the half rings (15) and screws (39) to a tightening torque of 1 Nm (0.7 lbft).
6. Align the pneumatic and electrical connections in accordance with the valve block configuration.
7. As internal air guiding is not possible on VESTA valves, connect the air connection (Y1) on the control top to connection A4.2 on the actuator with an air hose (L).
8. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.

→ Done.

6.6.8 Mounting to VESTA Valve H_A

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

1. Place O-rings (139.2) in the adapter (139) at the bottom side of the thread (139.1).

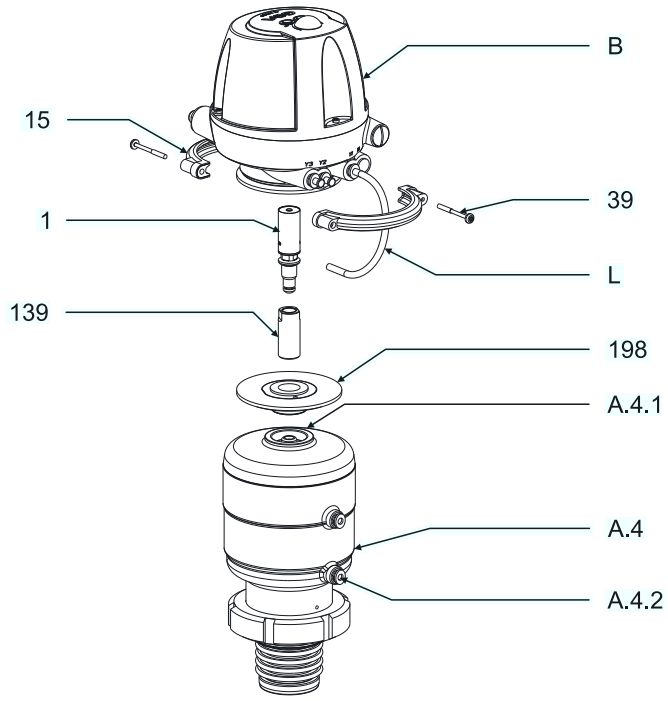


Fig.46

2. Screw the adapter into the actuator (A4.1) and tighten using an a/f 17 open end spanner.
3. Complete the T.VIS mounting base (198) with O-rings (29, 101) and a plain bearing (202).
4. Screw the mounting base (198) into the actuator (A4) and tighten using a face spanner.
5. Screw the switch bar (1) into the adapter (139) and tighten using a jaw wrench AF 13; tightening torque 2 Nm (1.4 lbft).
6. Fit the control top (B) over the switch bar (1) and on the actuator.
7. Tighten the half rings (15) and screws (39) to a tightening torque of 1 Nm (0.7 lbft).
8. Align the pneumatic and electrical connections in accordance with the valve block configuration.
9. As internal air guiding is not possible on VESTA valves, connect the air connection (Y1) on the control top to connection A4.2 on the actuator with an air hose (L).
10. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.

→ Done.

6.6.9 Mounting to Valve N_/E or W_/E or STERICOM Valve

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

1. Complete the T.VIS mounting base (198) with O-rings (29, 101) and a plain bearing (202).

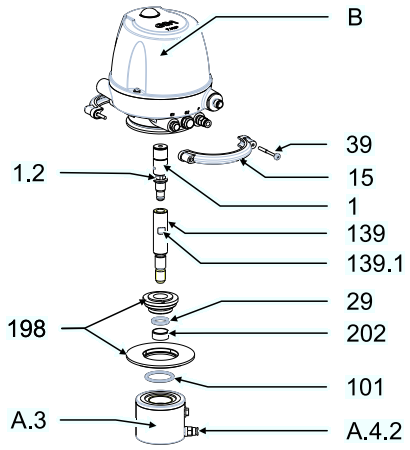


Fig.47

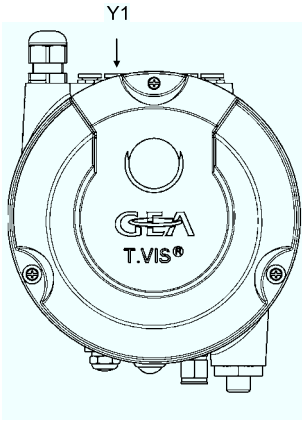


Fig.48

2. Screw the adapter T.VIS E/SHO (139) into the actuator with jaw wrench on wrench surface (139.1) and tighten.
3. Screw the mounting base (198) into the actuator (A.3) via the adapter T.VIS E/SHO (139) and tighten using a face spanner.
4. Screw the T.VIS switch bar (1) into the T.VIS E/SHO adapter (139) and tighten by applying a jaw wrench at (1.2); tightening torque 2 Nm.
5. Place the control top over the T.VIS switch bar (1) and on the actuator.
6. Tighten the clamp connection (15) with screws (39) to a tightening torque of 1 Nm.
7. Align the pneumatic and electrical connections in accordance with the valve block configuration.

   ! Internal air guiding is not possible on these valve types. Therefore connect the air connection (Y1) on the control top and the connection (A.4.2) on the actuator to the air hose (L).
8. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.

→ Done.

6.6.10 Mounting to a T-smart Single-Seat and Double-Seal Valve

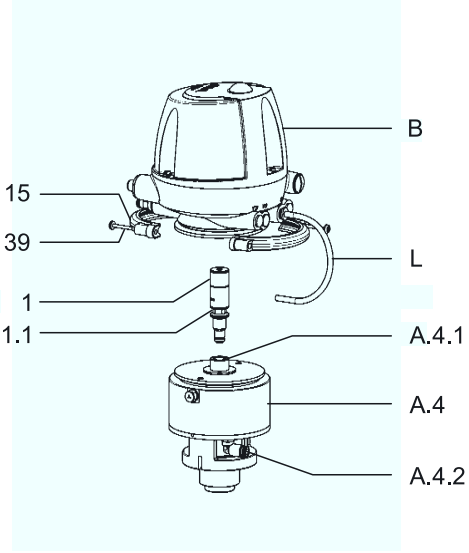


Fig.49

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

1. Screw the switch bar (1) into the piston rod A4.1 and tighten by applying an a/f 13 jaw wrench at (1.1), tightening torque 2 Nm.
2. 2. Fit the control top (B) over the switch bar (1) and on the actuator (A.4).
3. 3. Tighten the clamp connection (15) and screws (39) to a tightening torque of 1 Nm.
4. 4. Align the pneumatic and electrical connections in accordance with the valve block configuration.

   ! Internal air guiding is not possible on these valve types. Therefore connect the air connection (Y1) on the control top and the connection (A.4.2) on the actuator to the air hose (L).
5. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.

→ Done.

6.6.11 Fitting to an ASEPTOMAG Valve

Requirement:

- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

1. Place the T.VIS adapter plate (M), with O-rings (M1), on the actuator (A.4) and secure it with four M5 screws (M.2).

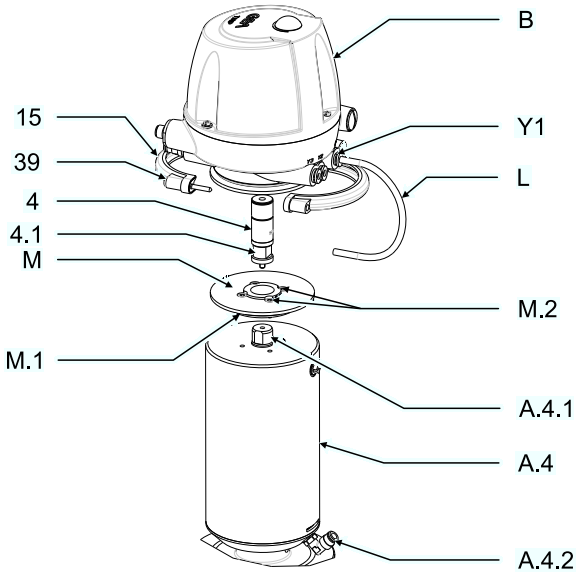


Fig.50

2. Screw the switch bar (4) Mat. 221-589.87, into the piston rod (A4.1) and tighten with jaw wrench AF 13, tightening torque 3 Nm.
3. Fit the control top (B) over the switch bar (4) and on the actuator.
4. Tighten the clamp connection (15) and screws (39) to a tightening torque of 1 Nm.
5. Align the pneumatic and electrical connections in accordance with the valve block configuration. ! On ASEPTOMAG valves, internal air guiding is not possible. Therefore connect the air connection (Y1) on the control top and the connection (A.4.2) on the actuator to the air hose (L).
6. Connect the pneumatic hose, or 2-3 hoses for valves with seat lifting, in accordance with the hose connection diagram for the valve.
7. Perform commissioning, see Chapter 6, Page 46 and Chapter 7, Page 80.

→ Done.

6.6.12 Replacing Control Tops

When replacing the control top observe the following warning note:

⚠ Caution!

Collision of the switch bar with the pneumatic block

If a valve with the wrong type of switch bar is used, there is a risk of injury as the switch bar can damage the pneumatic block.

► When replacing a predecessor model with a control top T.VIS A-15 the switch bar must always be replaced!

7 Start-up

7.1 Safety notes

Initial commissioning

For initial commissioning, the following principles apply:

- Take protective measures against dangerous contact voltages in accordance with pertinent regulations.
- The control top 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.
- After conversion of the control top, residual risks must be reassessed.

Hint!

The optional external sensor in the lantern is still in the original factory setting and must therefore be reset during initial commissioning, see Section 7.2, Page 80. The manufacturer will not accept any liability for malfunctions. The risk is borne solely by the operating company.

Commissioning

For commissioning, the following principles apply:

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

7.2 Commissioning – Control Top without Solenoid Valves

Activating the Control Top

Once the control top has been properly mounted on the valve and the electrical connections have been established correctly, commissioning can be carried out.

Requirement:

- The process valve must be in the safety position, i.e. an external solenoid valve must not be actuated.

Carry out the following steps:

1. Check the function of the external solenoid valve.
2. Switch on the power supply.

3. Press the relevant buttons to switch to programming mode, see Section 8.3, Page 101.
4. Wait at least 5 seconds after starting the programming function before activating the external solenoid valve and keeping it activated until the process valve has reliably reached its actuated end position.
5. Deactivate the solenoid valve. During this period, the illuminated dome is lit red.

   → After completion of end position programming, the colours in the illuminated dome change cyclically. Here you can select switching point tolerances and attenuations which deviate from the factory setting, see Section 8.3, Page 101.

   → If no selection is made within 30 seconds, the setting last selected is automatically adopted. The process valve moves to the non-actuated position, which is visualized by a steady light in the selected colour.

→ The control top is activated.

Hint!

When the colours are swapped, the feedback signals are also swapped!

Checking the Control Top

Carry out the following steps:

1. Activate and deactivate the external solenoid valve in order to check the proper function of the T.VIS feedback signals.

→ This completes commissioning.

7.3 Commissioning – Control Top with Solenoid Valves

Activating the Control Top

Once the control top has been properly mounted on the valve and the electrical connections have been established correctly, commissioning can be carried out. Since the T.VIS A-15 detects its solenoid valve fitting and therefore requires corresponding process valve conditions, the so-called special default must selected prior to SETUP in the event of a different.

Notice

Solenoid valve Y3 for the main stroke of an external process valve is connected.

The main stroke of the external process valve is briefly activated during the SETUP.

► Only carry out the SETUP when the pipe is empty.

Carry out the following steps:

1. Switch on the control air supply.
2. Check the valve function by activating the solenoid valves:

→ Switch on the solenoid valves in sequence Y1, Y2 and Y3 (if fitted) by means of the manual operating element: Turn the screw (S) from 0 to 1 using a screwdriver.

→ Switch off again all pilot valves in sequence Y1, Y2 and Y3 (if fitted): Turn the screw (S) to 0 using a screwdriver.

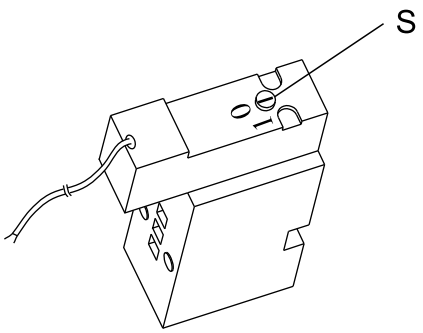


Fig.51

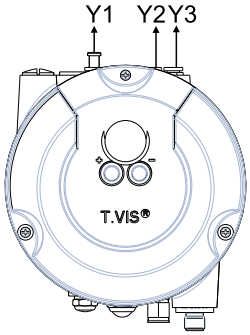


Fig.52

→ Further information about Y1/Y2/Y3: seeSection 6.3, Page 46.

3. Switch on the power supply.
4. Press the relevant buttons to switch to programming mode, see Section 8.3, Page 101.

   → While the programming routine runs automatically, the solenoid valves in the control top are activated and deactivated, which causes the process valve to automatically move to the positions in succession. During this period, the illuminated dome is continuously lit red. After completion of end position programming, the colours in the illuminated dome change cyclically.

   → In deviation from the factory setting you can select switching point tolerances, attenuations and the LEFF function (only if the valve is LEFF compatible, i.e. mixproof valve with lifting actuator), see Section 8.3, Page 101.

   → If 24/7 PMO valves (types M_O (06), M/2.0, MT/T_T (08) are used in conjunction with the control top T.VIS A-15, the factory settings in the control top may not be changed.

   → If no selection is made within 30 seconds, the setting last selected is automatically adopted and visualized in accordance with the colours selected.

→ The control top is activated.

Checking the Control Top

Once the control top has been properly mounted on the valve and the electrical connections have been established correctly, commissioning can be carried out.

Carry out the following steps:

1. Activate the solenoid valves in succession via the PLC in order to check the proper function of the T.VIS feedback signals.

→ This completes commissioning.

Hint!

The solenoid valve can also be activated and deactivated in manual mode using the operating buttons, see .

7.4 Service Function

If maintenance must be conducted on a process valve that is fitted with a control top T.VIS A-15, the valve core must be pulled out of the housing. For this purpose, the valve disk pretension of the process valve must be relieved by actuating the main actuator. This is possible with the service function, see “Operating overview” .

Another option with the hood removed is the manual override on the solenoid valve, see “Control top with solenoid valves” .

7.5 Adjust the initiator in the lantern - for unbalanced double-disks of the valves D, R, Y, B, T_R and MT

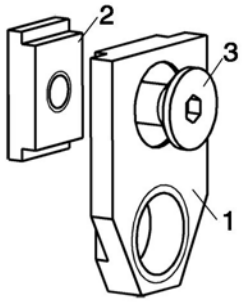
Hint!

Check the external proximity switch in the yoke whenever the valve is installed or removed and readjust it if necessary. Proper monitoring of the double-seat valve can only be ensured in this way.

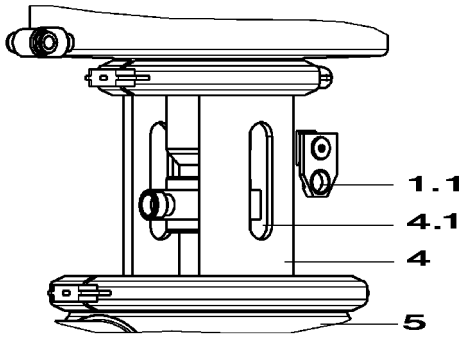
Fitting the initiator holder

Carry out the following steps:

1. Preassemble sliding piece (1), countersunk screw (3) and nut NI (2).



2. Insert the preassembled part in the slot (4.1) in the lantern (4) with the mounting hole (1.1) facing in the direction of the housing (5).



3. Turn the nut NI (2) in the slot (4.1) in the lantern through 90° and tighten with the countersunk screw (3).

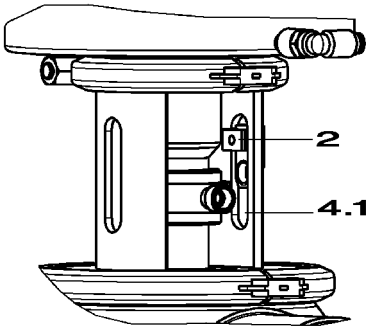


Fig.55

→ Done.

Adjusting the proximity switch holder

Carry out the following steps:

1. Screw the adjusting screw (6) into the proximity switch holder down to the cleaning connection (7).

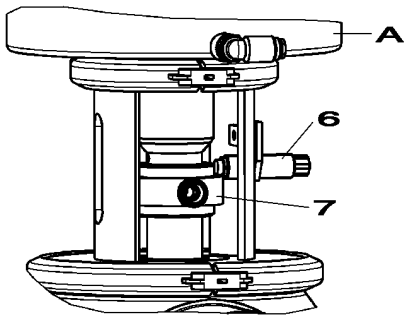


Fig.56

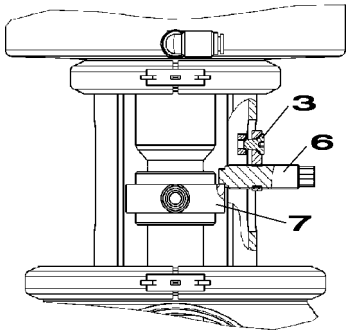


Fig.57

2. By slightly slackening the countersunk screw, position the proximity switch holder in the slot in the lantern so that the point of the adjusting screw (6) rests on the shoulder of the cleaning connection in the direction of the actuator (A).
3. Fix the proximity switch holder in position with the countersunk screw.

→ Done.

Fitting the proximity switch

Carry out the following steps:

1. Remove the adjusting screw.
2. Screw proximity switch M12 (8) into the proximity switch holder until the cleaning connection is reached.

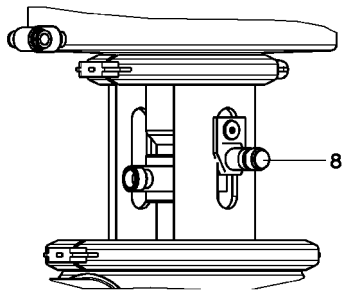


Fig.58

→ Done.

Adjusting the proximity switch

Carry out the following steps:

1. Unscrew the proximity switch by one full turn (360°) to set the gap (a) in the range from 0.5 to 1.0 mm.

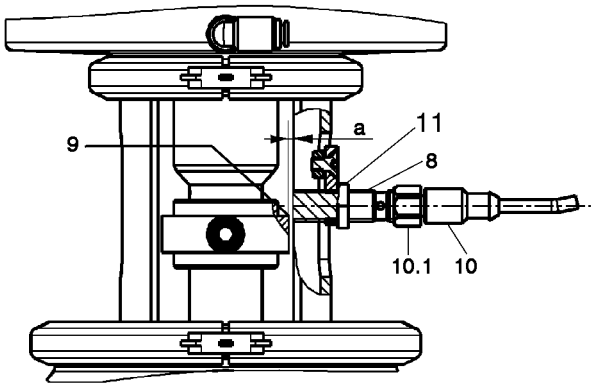


Fig.59

2. Tighten the lock nut (11).
3. Secure the connector (10), which has already been electrically connected to the control top, to the proximity switch using the cap nut M12 (10.1).
   → The LED on the proximity switch must now be lit in operating mode.

→ Done.

Checking the function

Carry out the following steps:

1. Check the feedback function by actuating solenoid valve Y3.
   → The LED must go out.
   → Done

→ The proximity switch has now been adjusted and checked.

7.5.1 Adjust the initiator in the lantern - for double-disk of the tank bottom valves MT-DA (spreader lift)

Hint!

Only in combination with T.VIS A-15.

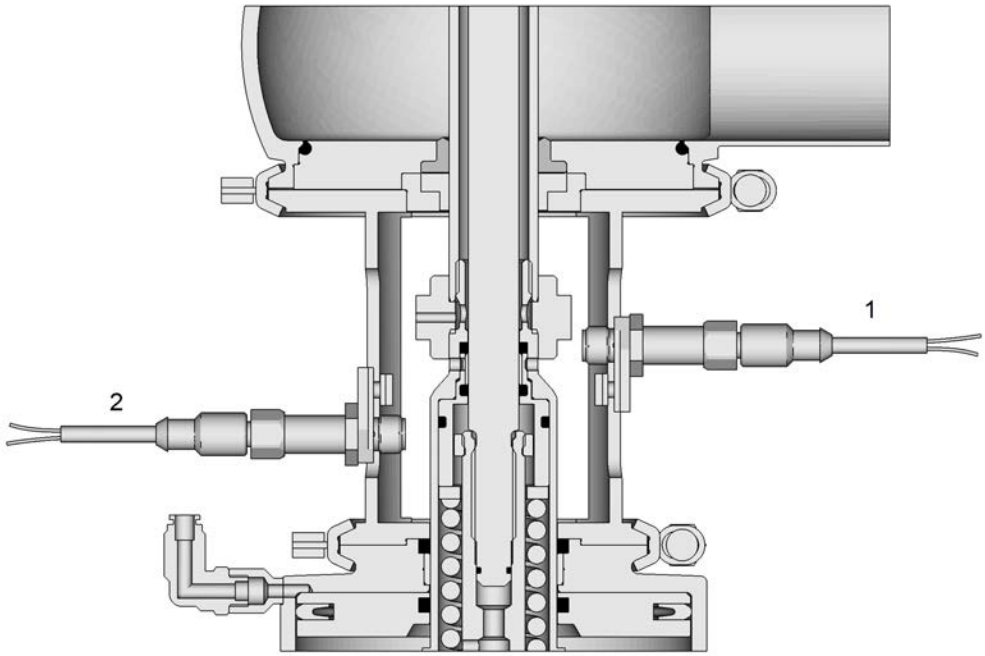


Fig.60: 1 = Initiator / 2 = Initiator

The valve type MT DA contains tow initiators located in the lantern. Initiator 1 monitors the rest position of the double-disk resp. records the position of the double-disk when it leaves this position. Initiator 2 records the double-disk in the spreading lift position resp. the lifted double-disk during the valve main stroke.

Danger

Risk during assembly of initiators 1 and 2 during valve actuation.

Unintentional actuation or stopping of the valve can lead to serious injuries!

► If the valve is actuated unintentionally, the valve moves to the end position.
► If the valve is stopped unintentionally (e.g. due to unintentional control signal or lack of supply air), the valve moves back to the rest position.
► Do not reach into the lantern during assembly of initiators 1 and 2.

Fitting the proximity switch holder

Requirement:

The valve has to be in the non-actuated rest position for adjustment of initiator 1.

To adjust initiator 2, please actuate the valve via the PLC to the main stroke position.

Switching to spreader lift mode is done via the actuator signal of the pilot valve of the main stroke.

Carry out the following work steps for initiators 1 and 2:

1. Position the proximity switch nut (2) against the slot (4.1) in the lantern (4) from the inside and use one finger to hold it in position.

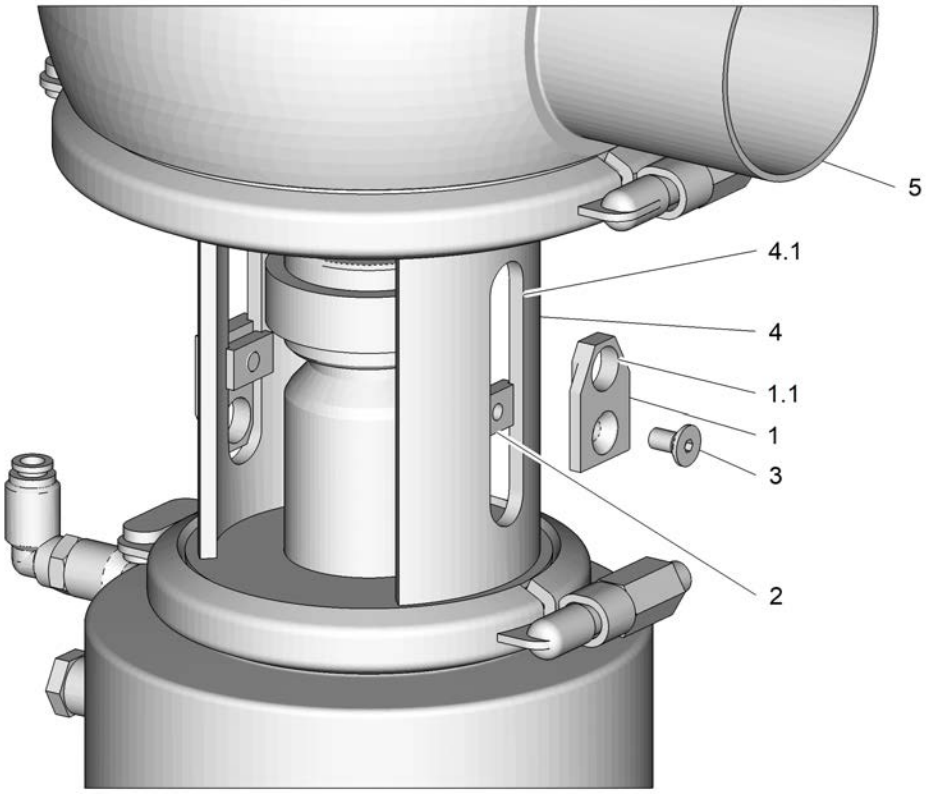


Fig.61

2. Attach the sliding piece (1) with the countersunk screw (3) with the assembly borehole (1.1) in the direction shown pointing toward the housing (5).
3. Tighten the proximity switch nut (2) with the countersunk screw (3).

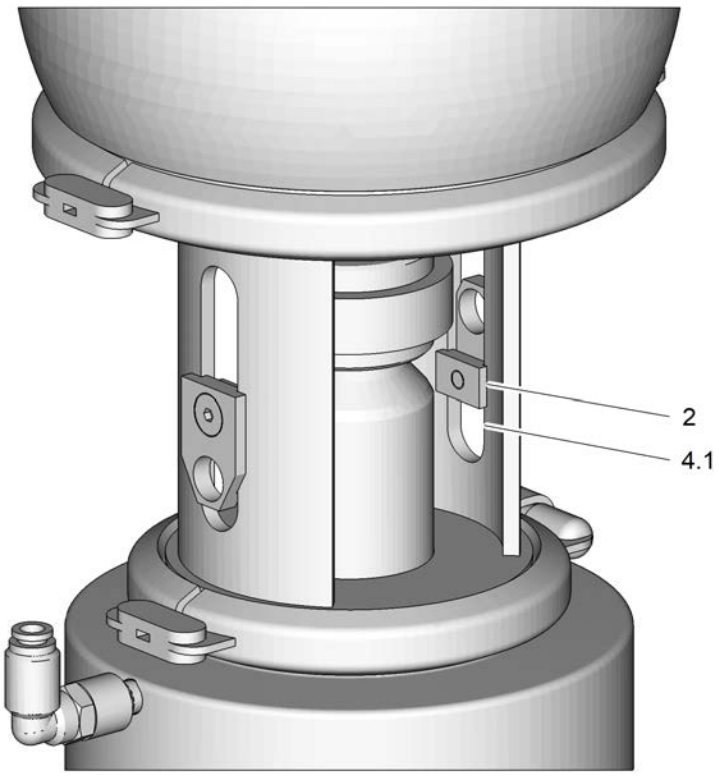


Fig.62

→ Done

Adjusting the proximity switch holder

Carry out the following steps:

1. Screw the adjusting mandrel (6) into the proximity switch holder until it reaches the upper edge of the leakage indicator (7).

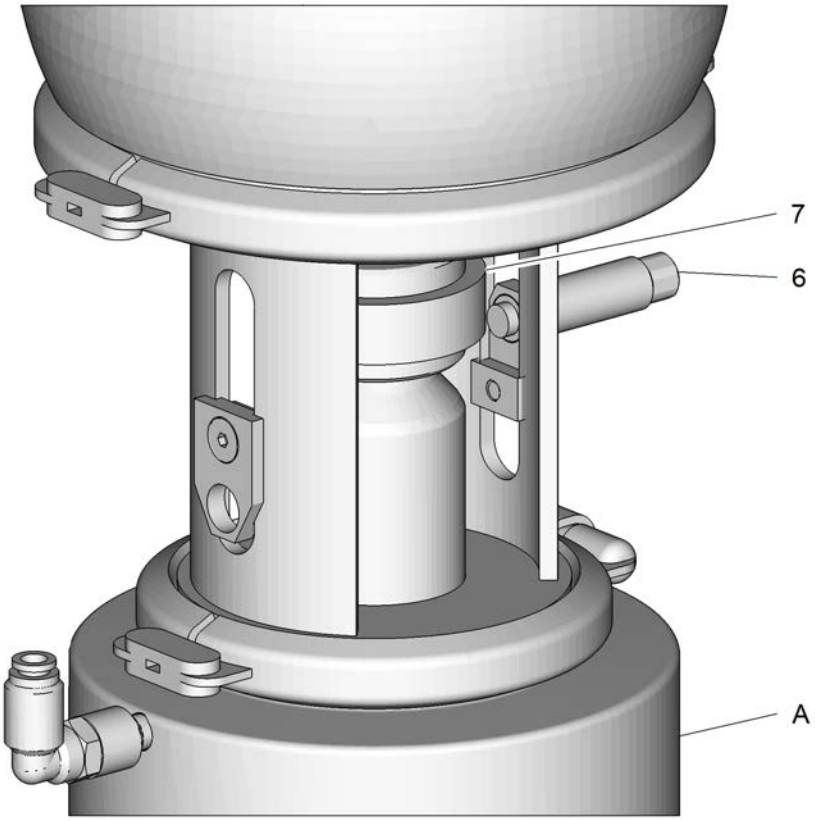


Fig.63

2. Position the proximity switch holder by slightly loosening the countersunk screw in the lantern recess in such a way that the tip of the adjusting mandrel (6) is resting on the collar of the leakage indicator (7) facing the drive (A), see Figure 63.
3. Tighten the proximity switch holder with the countersunk screw (3).

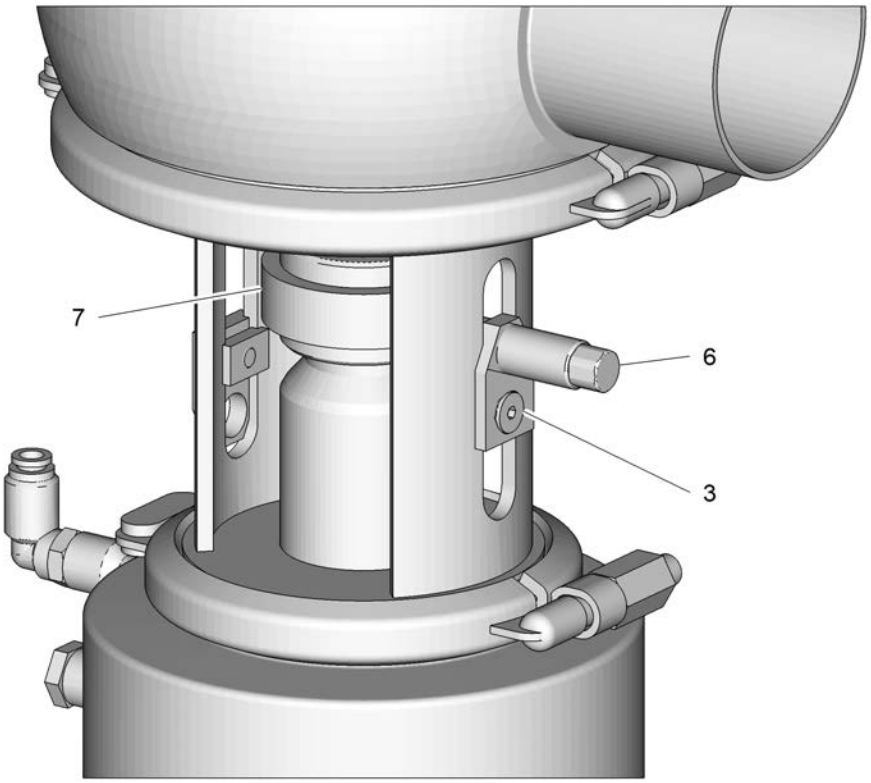


Fig.64

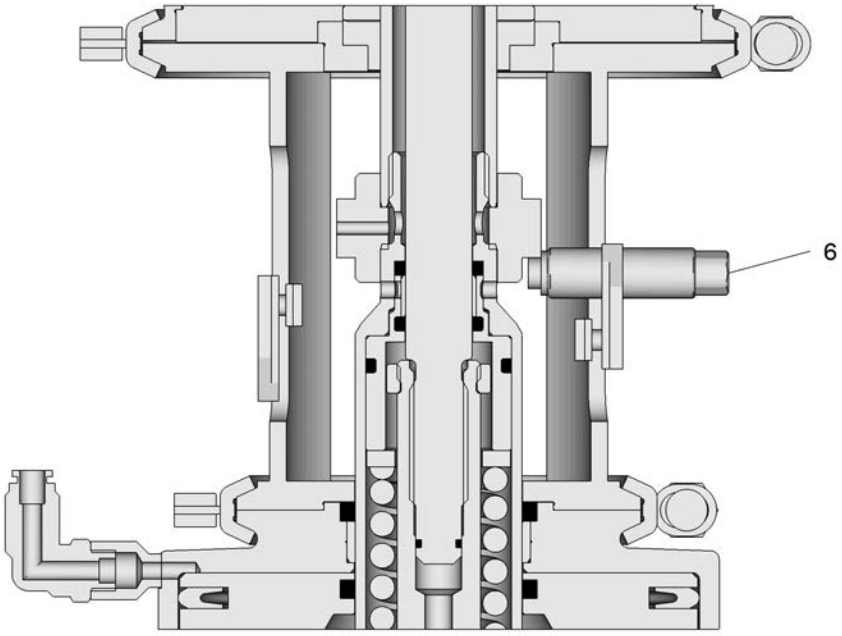


Fig.65

→ Done

Fitting the proximity switch

Carry out the following steps:

1. Remove the adjusting mandrel (6).
2. Screw in the proximity switch M12 (8) together with the counter nut (11) into the proximity switch holder (12) up to the leakage indicator (7).

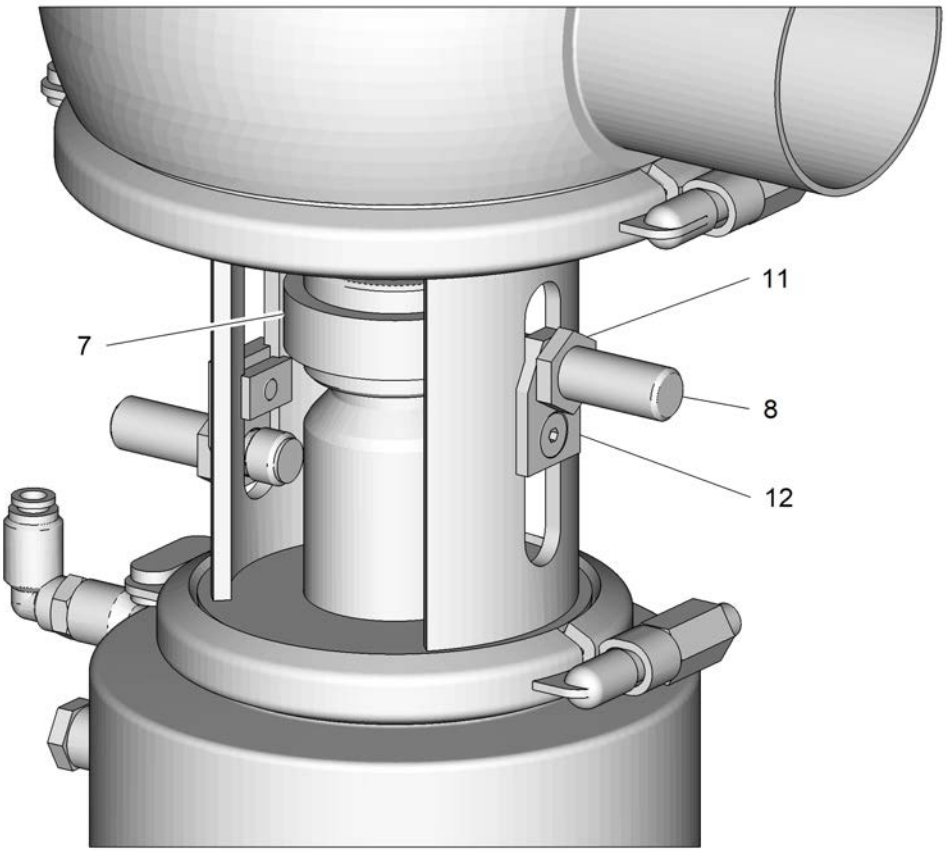


Fig.66

→ Done

Adjusting the proximity switch

Carry out the following steps:

1. Unscrew the proximity switch (8) by one full turn (360°) to set the gap (a) by 0.5 to 1.0 mm.

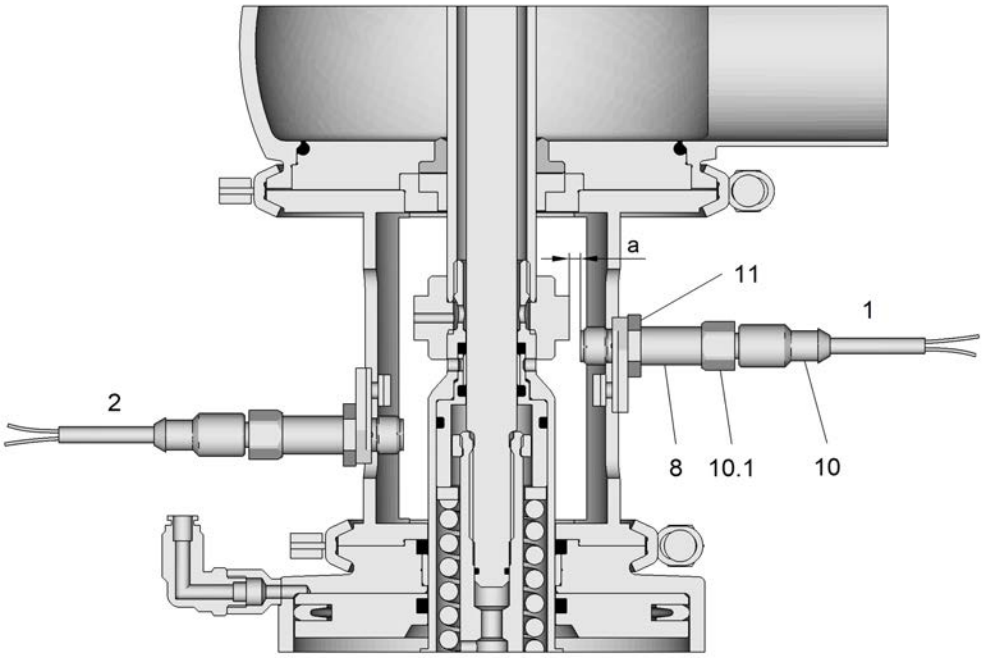


Fig.67: 1 = Initiator / 2 = Initiator

2. Tighten the counter nut (11).
3. Attach the connector (10), that is already connected electrically to the control panel, on the proximity switch using the cap nut M12 (10.1). The LED on the proximity switch must now be lit in operating mode.

   → Done

7.6 Adjusting the Proximity Switch in the lantern of PMO Valve Type M/2.0

Fitting the proximity switch holder

Carry out the following steps:

1. Position the nut (2) against the slot (4.1) in the lantern (4) from the inside and hold it in position with a finger.

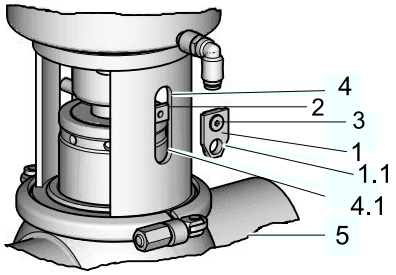


Fig.68

2. Secure the sliding piece (1) with the countersunk screw (3). Pay attention that the orientation is as shown in the diagram. The mounting hole (1.1) must face in the direction of the housing (5).
3. Tighten the proximity switch nut (2) with the countersunk screw (3).

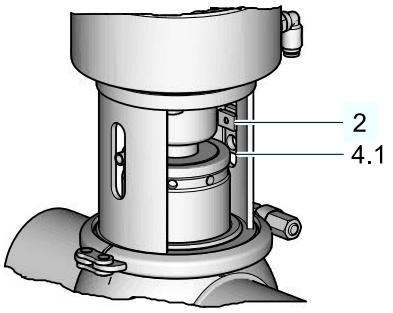


Fig.69

→ Done.

Adjusting the proximity switch holder

Carry out the following steps:

1. Screw the adjusting screw (6) into the proximity switch holder until it reaches the upper edge of the balancer (7).

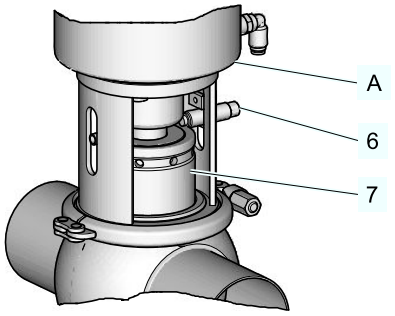


Fig.70

2. By slightly slackening the countersunk screw, position the proximity switch holder in the slot in the lantern so that the point of the adjusting screw (6) rests on the shoulder of the upper balancer in the direction of the actuator (A).
3. Fix the proximity switch holder in position with the countersunk screw (3).

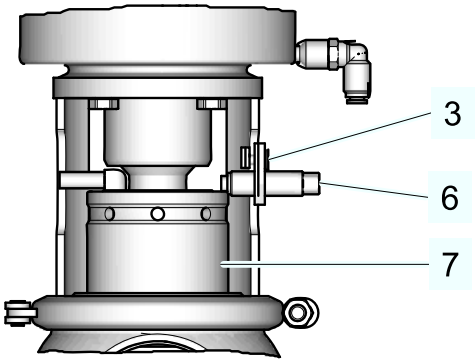


Fig.71

→ Done.

Fitting the proximity switch

Carry out the following steps:

1. Remove the adjusting screw (6).
2. 2. Screw the proximity switch M12 (8), together with the lock nut (11), into the holder as far as the balancer (7).

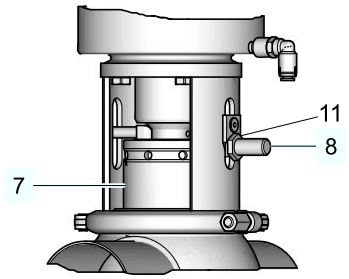


Fig.72

→ Done.

Adjusting the proximity switch

Carry out the following steps:

1. Unscrew the proximity switch by one full turn (360°) to set a gap (a) in the range from 0.5 to 1.0 mm.

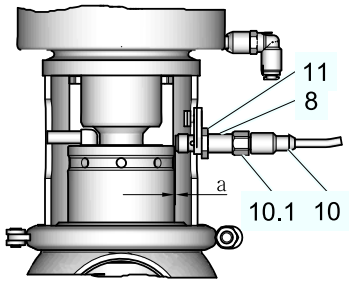


Fig.73

2. Tighten the lock nut (11).
3. Secure the connector (10), which has already been electrically connected to the control top, to the proximity switch using the cap nut M12 (10.1).

   → During operation, the LED on the proximity switch must now light up

→ Done.

Checking the function

Carry out the following steps:

1. Check the feedback function by actuating solenoid valve Y3.

   → The LED must go out.

   → Done

→ The proximity switch has now been adjusted and checked.

7.7 Test procedure for Tuchenhagen PMO valves type M / 2.0

7.7.1 Purpose

- The purpose of test procedure 1 is to verify and ensure that the detection devices which detect and confirm the closed position of the upper and lower seats of the PMO valve (in accordance with PMO Item 15p (B) – point 1. b. (2)) are adjusted and are functioning properly.
- The purpose of test procedure 2 is to confirm that the interlock provided for PMO valve type M/2.0 is working correctly during active switching of a CIP operation.

7.7.2 Process Overview

Carrying out test procedure 1 allows the Regulatory Inspector to manually perform seat lifting of the upper and the lower valve disk on the valve in order to verify that the position detection devices for the upper and lower valve disks change their feedback signals when the corresponding valve disk leaves the closed position.

7.7.3 Hardware Description

1. Three solenoid valves are installed in the control top T.VIS A-15:
   - 1.a Solenoid valve Y1 – actuation of main valve
   - 1.b Solenoid valve Y2 – lifting of lower seat
   - 1.c Solenoid valve Y3 – lifting of upper seat
   - 1.d Solenoid valve Y4 - lifting of upper seat if main stroke is activated.

   These valves can be activated externally by signals from the PLC.
2. The closed position of the lower seat is detected by a position measuring system. The correct adjustment of the system to detect the closed position of the lower seat is described in detail in the M/2.0 valve operating instructions as well as in Section 7.3, Page 81.

   The sensitivity of the position measuring system is 0.1 mm.
3. The closed position of the upper seat is detected by proximity switch S3 that is installed externally on the lantern. The correct setting of this proximity switch for detecting the closed position of the upper seat is described in detail in the operating instructions of the M/2.0 valve and in Section 7.6, Page 93.

   The sensitivity of the position measuring system is 0.1 mm.

7.7.4 Test Procedure 1

Step 1

The valve should be in the closed position. This position can be identified by the green LED on the top of the control top.

Step 2

Carry out the following steps:

1. Activate the lower valve disk by activating solenoid valve Y2 via the PLC.

→ When the seat moves downwards (approx. 6 mm), the green LED on the top of the control top will turn off and changes to a yellow flashing light (LEFF deactivate) or a green/yellow flashing light (LEFF activated) to indicate that the position detection device is detecting that the lower valve disk has left the closed position.

→ If the green LED does not go out, the position detection device is NOT set correctly and the setting must be repeated, refer to the operating instructions of the M/2.0 valve and Section 7.3, Page 81.

→ Done

Step 3

Carry out the following steps:

1. Activate the upper valve disk by activating solenoid valve Y3 via the PLC.

   → When the seat moves upwards (approx. 2 mm), the yellow LED on the external proximity switch in the lantern will turn off to indicate that proximity switch S3 is detecting that the upper valve disk has left the closed position. In addition, a quickly flashing yellow (LEFF deactivated) or green/yellow flashing light (LEFF activated) is visible on the top of the control top.

   → If the yellow LED of the initiator mounted externally in the lantern does not turn off, the position detection device is NOT set correctly and the adjustment procedure must be repeated as described, see Section 7.6, Page 93.

→ Done

7.7.5 Test Procedure 2

Test procedure 2 is carried out by the Regulatory Inspector to verify that the system interlock programmed in the PLC is working correctly by manually actuating the valve disk that shuts off the pipe of the valve which currently is not part of the cleaning circuit. If interlocking is implemented correctly, the CIP supply pump or the source generating the cleaning solution pressure must switch off automatically.

Hint!

Please note that test procedure 2 has to be performed with great care. There is a danger of cleaning solution mixing with product if the control system interlocks are not working correctly. Make sure that there is no product in the valve body, which is not part of the active CIP circuit, for the duration of the test!

Step 1

Make sure that the valve being tested is part of an active cleaning circuit and determine which of the two housings is part of this active cleaning program.

Step 2

Carry out the following steps:

1. If the upper housing is part of the active CIP circuit:
   Activate lifting of the lower seat by activating solenoid valve Y2 via the PLC.
2. If the lower housing is part of the active CIP circuit:
   Activate lifting of the upper seat by activating solenoid valve Y3 via the PLC.

→ Done

Step 3

If the programmed control system interlock is working correctly, the CIP supply pump will be deactivated. If the CIP supply pump or source for generating cleaning solution pressure is not deactivated, immediately shut down the system and perform a programmed lockout test.

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.

8.2 Settings in Programming Mode

Hint!

If 24/7 PMO valves (types M_O (06), M/2.0, MT/T_T (08) are used T.VIS A-15 in conjunction with the control top , the factory settings in the control top may not be changed.

Setting the Position Tolerance for the Main Stroke

If the tolerance is not set in accordance with the intended purpose, this can result in malfunctions of the valve. GEA Tuchenhagen will not accept any liability for damage resulting from improper setting: the risk lies entirely with the operator of the facility.

Tolerance	Size	Setting for
Tolerance 1	0.3 mm	Valves with bellows; not for ASEPTOMAG valves
Tolerance 2	0.7 mm	Seat valves (factory setting)
Tolerance 3	1.0 mm	Valves with logic element NOT Control air for spring-side power assistance and ASEPTOMAG valves
Tolerance 4	2.0 mm	Butterfly valves

Signal Attenuation for Position Feedback

Attenuation suppresses the signal changes of the feedback device for the attenuation period specified.

At the same time, a static change of a feedback signal is delayed by the attenuation period. This allows user-specific process sequences to be optimally set.

For the reliable monitoring of the valve seat seal GEA Tuchenhagen recommends the factory setting without signal attenuation. GEA Tuchenhagen will not accept any liability for damage resulting from the use of signal attenuation. The risk lies entirely with the operator of the facility.

Setting the LEFF Function

The LEFF function achieves steady pulsing (opening and closing) of the valve disks during the typical lifting operation for cleaning the leakage cavity on mixproof valves. For this purpose, solenoid valves Y2 and Y3 are actuated by the PLC.

When the LEFF function is used on valve types D or B, a lifting stroke of 1.2 to 1.4 must be set in the lifting actuator; also refer to the operating instructions for the mixproof valve types D and B.

LEFF activation	
Off	Factory setting
Valve-disk and double-disk	For mixproof valves with lifting actuator, solenoid valves Y2 and Y3 and external proximity switch in the lantern
Valve disk	For mixproof valves with lifting actuator and solenoid valve Y2
Double-disk	For mixproof valves with lifting actuator and solenoid valve Y3 and external proximity switch in the lantern

Semi-Automatic SETUP

In the event that SETUP should be required while a process is running that does not allow activation of the relevant valve, a semi-automatic SETUP can be performed.

This makes it possible after the replacement of a control top to automatically detect and output the defined rest position of a process valve, whereas the end position is only approached and detected by the next process step.

Only after detection of the rest and end positions are both valve states monitored and the production process can be continued without any danger. If necessary, parameters specific to valves may have to be set again in a subsequent standard SETUP, see operating overview .

8.3 Operating Overview

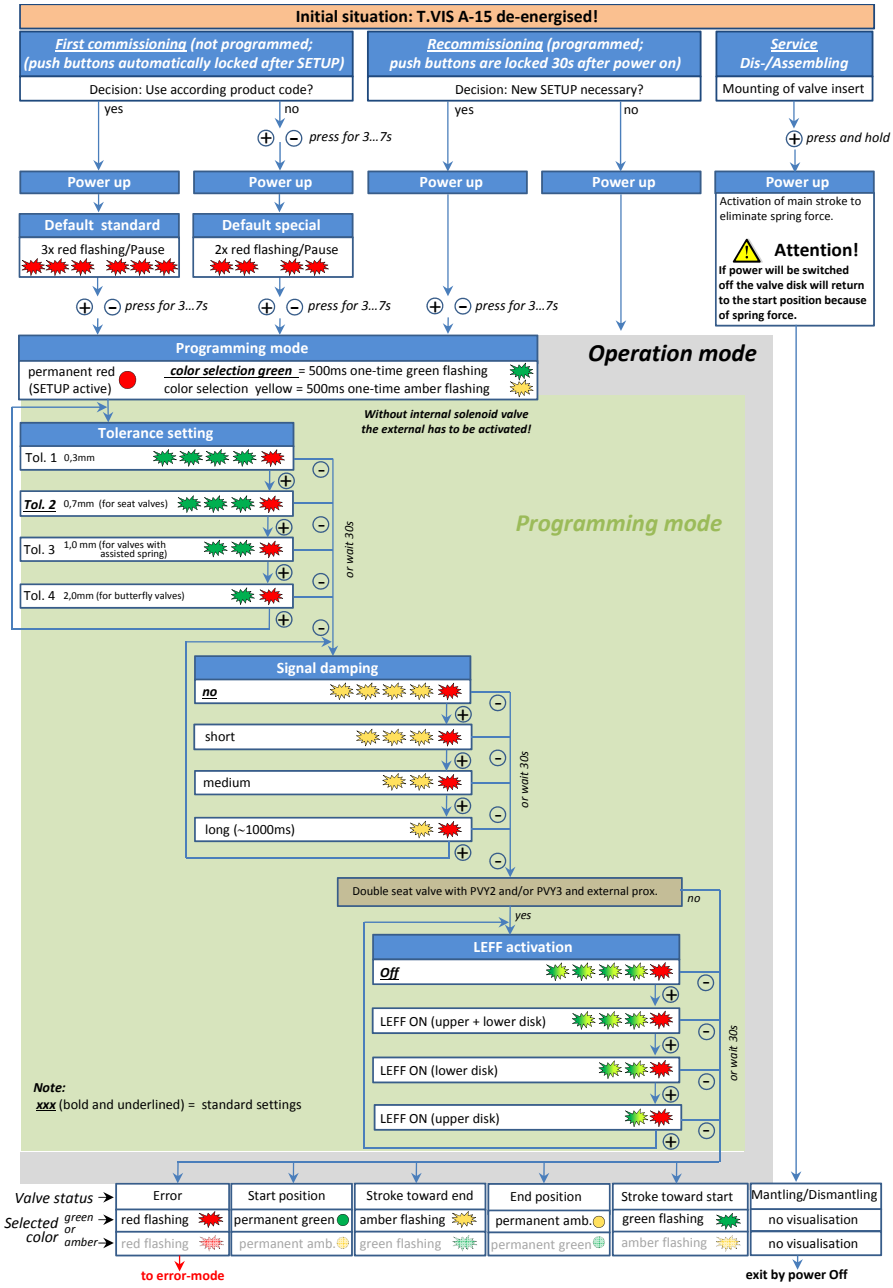


Fig.74

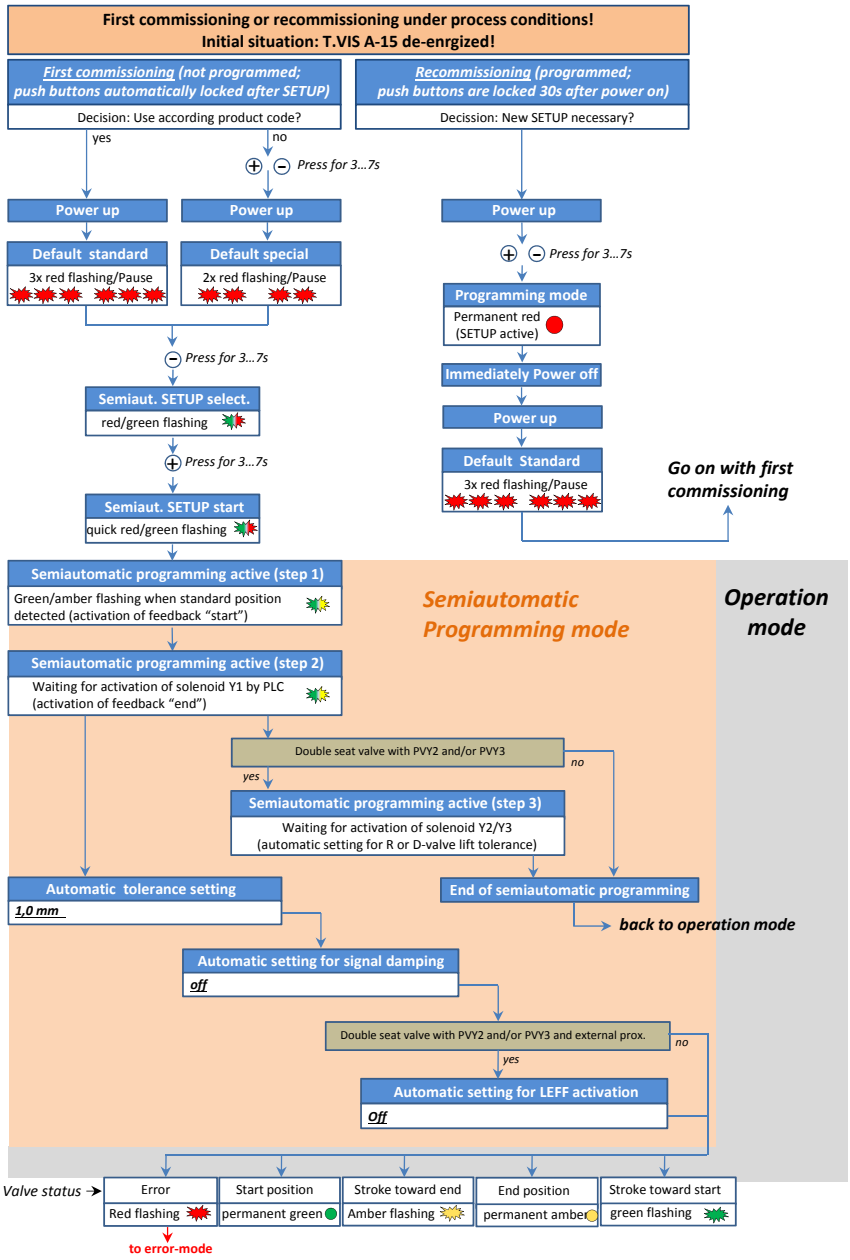

First commissioning or recommissioning under process conditions!
Initial situation: T.VIS A-15 de-enrgized!
First commissioning (not programmed; push buttons automatically locked after SETUP)
Decision: Use according product code?
yes
no
Press for 3...7s
Power up
Default standard
3x red flashing/Pause
Power up
Default special
2x red flashing/Pause
Press for 3...7s
Semiaut. SETUP select.
red/green flashing
Press for 3...7s
Semiaut. SETUP start
quick red/green flashing
Recommissioning (programmed; push buttons are locked 30s after power on)
Decission: New SETUP necessary?
Power up
Press for 3...7s
Programming mode
Permanent red (SETUP active)
Immediately Power off
Power up
Default Standard
3x red flashing/Pause
Go on with first commissioning
Semiautomatic programming active (step 1)
Green/amber flashing when standard position detected (activation of feedback "start")
Semiautomatic Programming mode
Operation mode
Semiautomatic programming active (step 2)
Waiting for activation of solenoid Y1 by PLC (activation of feedback "end")
Double seat valve with PVY2 and/or PVY3
yes
no
Semiautomatic programming active (step 3)
Waiting for activation of solenoid Y2/Y3 (automatic setting for R or D-valve lift tolerance)
Automatic tolerance setting
1,0 mm
End of semiautomatic programming
back to operation mode
Automatic setting for signal damping
off
Double seat valve with PVY2 and/or PVY3 and external prox.
yes
no
Automatic setting for LEFF activation
Off
Valve status
Error
Red flashing
Start position
permanent green
Stroke toward end
Amber flashing
End position
permanent amber
Stroke toward start
green flashing
to error-mode

Fig.75

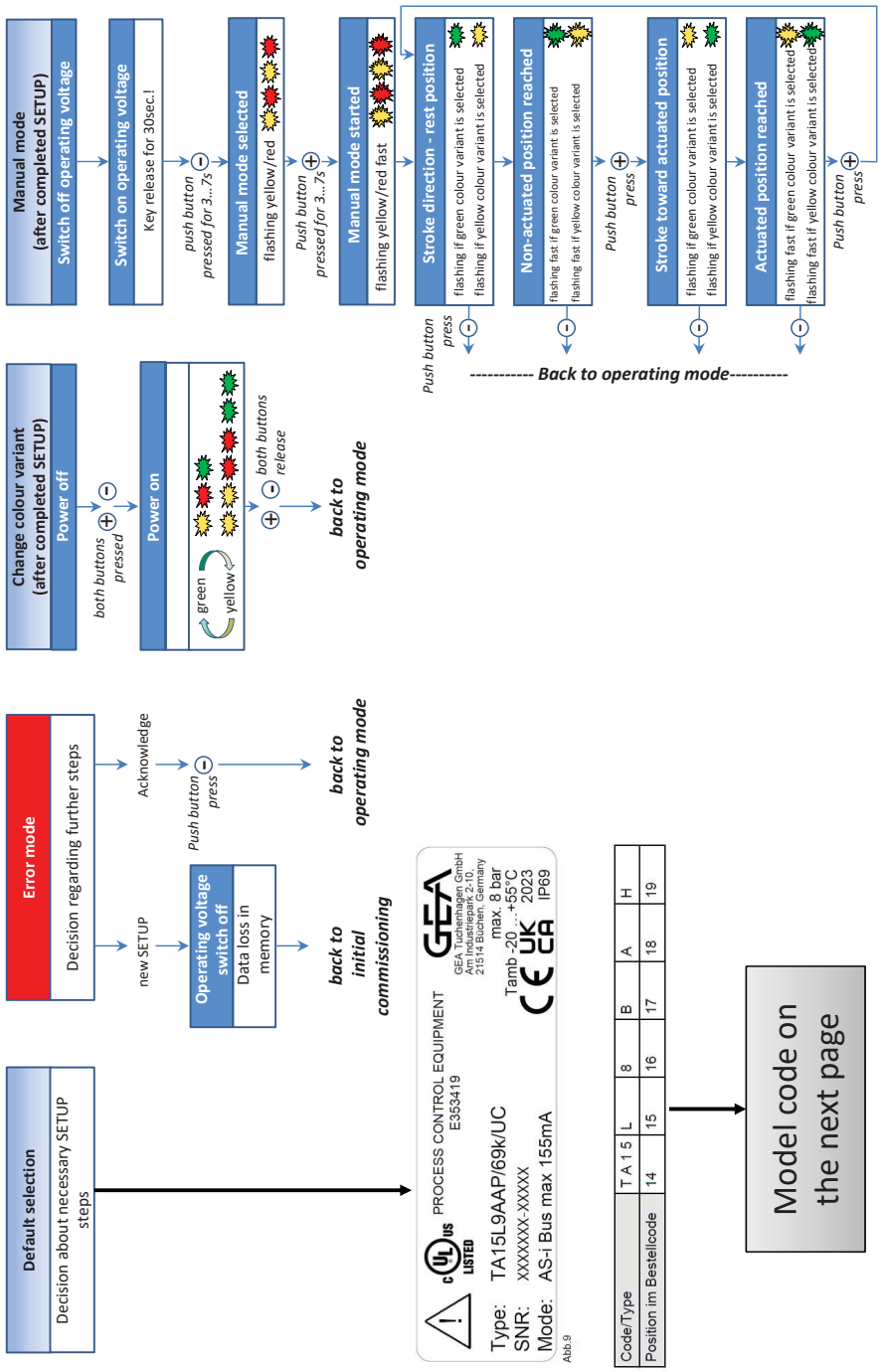
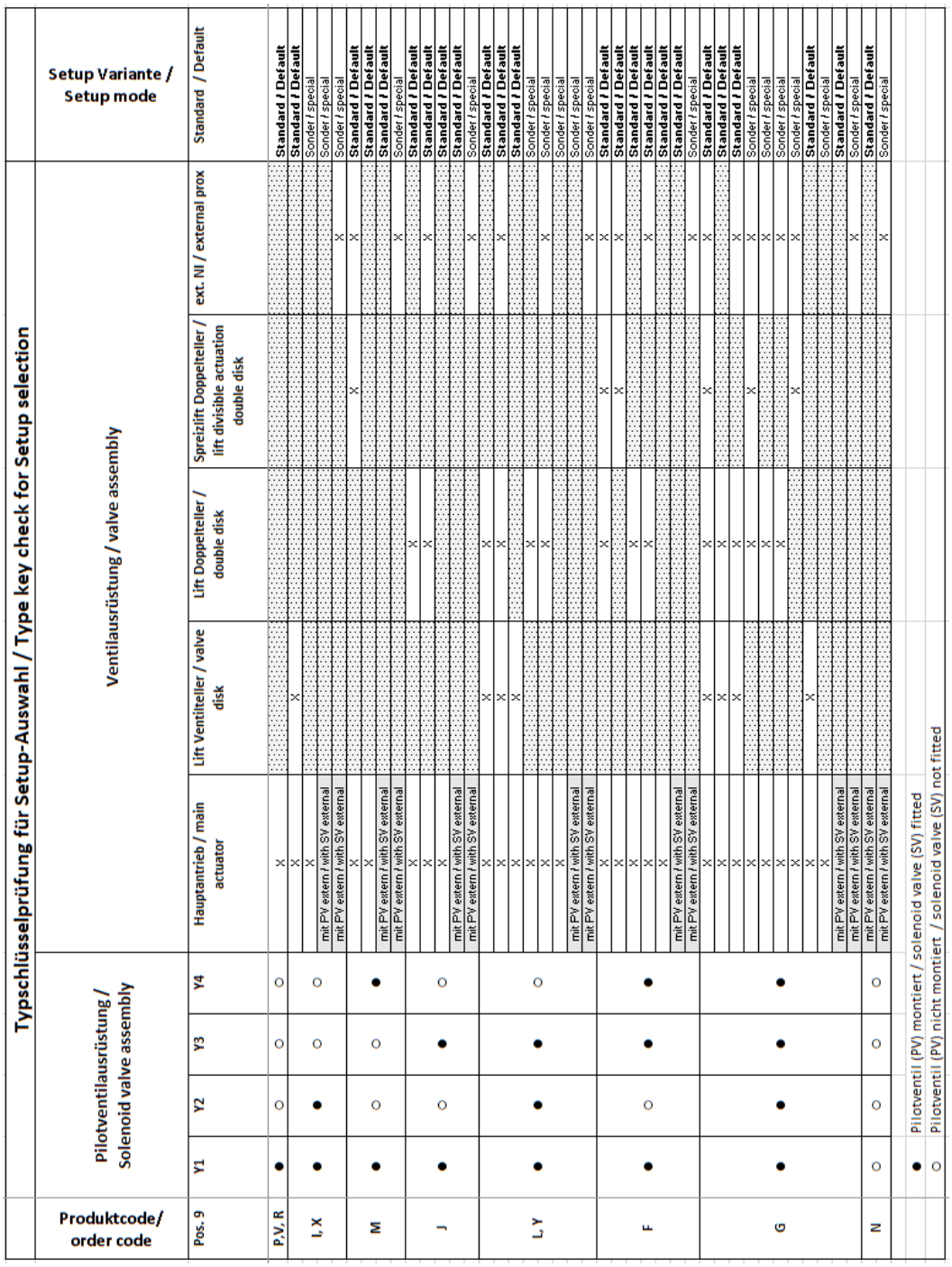


Fig.76

GEA INTERNAL



Typschlüsselprüfung für Setup-Auswahl / Type key check for Setup selection												
	Produktcode/ order code	Pilotventilausrüstung / Solenoid valve assembly				Ventilausrüstung / valve assembly						Setup Variante / Setup mode
	Pos. 9	Y1	Y2	Y3	Y4	Hauptantrieb / main actuator	Lift Ventilteller / valve disk	Lift Doppelteller / double disk	Spreizlift Doppelteller / lift divisible actuation double disk	ext. NI / external prox		Standard / Default
	P,V, R	●	○	○	○	x						Standard / Default
	I, X	●	●	○	○	x	x					Standard / Default
						x						Sonder / special
						mit PV extern / with SV external						Sonder / special
						mit PV extern / with SV external				x		Sonder / special
	M	●	○	○	●	x			x			Standard / Default
						x				x		Standard / Default
						mit PV extern / with SV external						Standard / Default
						mit PV extern / with SV external				x		Standard / Default
	J	●	○	●	○	x		x				Standard / Default
						x		x		x		Standard / Default
						mit PV extern / with SV external						Standard / Default
						mit PV extern / with SV external				x		Standard / Default
	L, Y	●	●	●	○	x	x	x				Standard / Default
						x	x	x		x		Standard / Default
						x	x	x				Standard / Default
						x		x		x		Sonder / special
						x						Sonder / special
						mit PV extern / with SV external						Sonder / special
						mit PV extern / with SV external						Sonder / special
	F	●	○	●	●	x		x	x			Standard / Default
						x		x	x	x		Standard / Default
						x		x				Standard / Default
						x		x		x		Standard / Default
						mit PV extern / with SV external						Standard / Default
						mit PV extern / with SV external						Sonder / special
	G	●	●	●	●	x	x	x	x			Standard / Default
						x	x	x		x		Standard / Default
						x	x	x		x		Standard / Default
						x	x	x	x	x		Standard / Default
						x	x	x		x		Standard / Default
						x						Sonder / special
						mit PV extern / with SV external						Sonder / special
						mit PV extern / with SV external						Sonder / special
						mit PV extern / with SV external						Sonder / special
	N	○	○	○	○	x	x	x		x		Standard / Default
						mit PV extern / with SV external						Sonder / special
						mit PV extern / with SV external						Standard / Default
						mit PV extern / with SV external						Sonder / special

● Pilotventil (PV) montiert / solenoid valve (SV) fitted

○ Pilotventil (PV) nicht montiert / solenoid valve (SV) not fitted

Fig.77

9 Cleaning

9.1 Cleaning

Observe the safety data sheets supplied by the detergent manufacturers.

Only use detergents which are not aggressive towards synthetic materials and the sealing materials used and which are non-abrasive.



Hint!

After all cleaning work, make sure that the control top still complies with all safety instructions in this operating manual and thus that intended use is still given.

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 .

10.2 Inspections

Checking parts are firmly secured

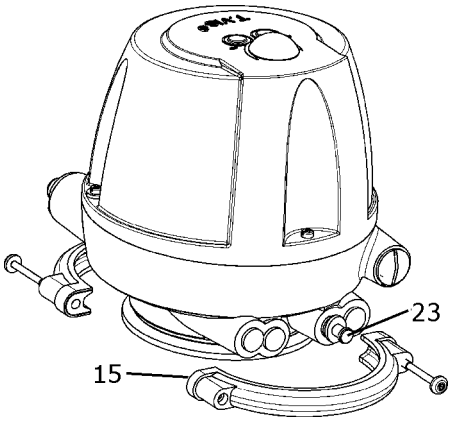


Fig.78

Carry out the following steps:

1. Check that the electrical connectors are properly secured.
2. Check that the air hose connections are firmly secured.
3. Check that the clamp (15) is firmly in place.
4. Check that the plug (23) is firmly in place.
5. Check the sound absorber, filter, non-return valve and the exhaust air throttle for soiling.
6. Check the housing for mechanical damage.
7. Check the union nut for the cable glands for a tight fit.
8. Check solenoid valves and optional NOT element for pressure-tight fit.
9. Check hood and base for firm screws. Tighten all three screws to 2 Nm if necessary.

→ Done

10.3 Maintenance intervals

To ensure the highest operational reliability of the magnetic separator, all wearing parts should be replaced at longer intervals.

The actual maintenance intervals can only be determined by the user since they depend on the operating conditions, for instance:

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

Maintenance intervals	
Applications	**Maintenance intervals (guideline values)**
Media at temperatures of 60 °C to 130 °C (140 °F to 266 °F)	approx. every 3 months
Media at temperatures of < 60 °C (< 140 °F)	approx. every 12 months

10.4 Removing the Control Top from the Valve

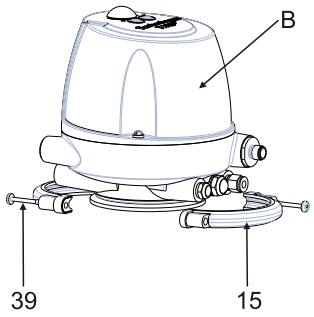


Fig.79

Requirement:

- Make sure that the solenoid valve is not actuated.

Carry out the following steps:

1. Undo the screw connection (39).
   Remove the clamp (15).
   Pull the control top vertically off the valve.
   → The green LED goes out after 5 seconds and the yellow LED flashes.

→ Done

10.5 Dismantling the Control Top into its Components

10.5.1 Variants of the Control Top

The control top can be fitted with:

- 3 solenoid valves (63) and without or with 1 logic element NOT (64) or
- 2 solenoid valves (63) and 1 control plate (65) and without or with 1 logic element NOT (64) or
- 1 solenoid valve (63) and 2 control plates (65) and without or with 1 logic element NOT (64) or
- 1 solenoid valve (63) or
- without solenoid valve with 1 control plate (65).

10.5.2 Removing the Cap

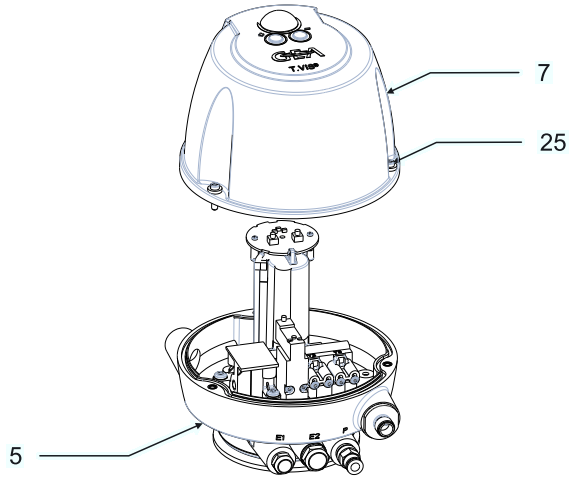


Fig.80

Notice

Electrical voltage

Danger to life

► Switch off the voltage supply and the control air before removing the control top.

Carry out the following steps:

1. Undo the 3 screws (25) of the cap (7) and remove the cap (7) from the base (5).

→ Done

10.5.3 Removing the printed circuit board

Carry out the following steps:

1. Unscrew and remove the screws (77).

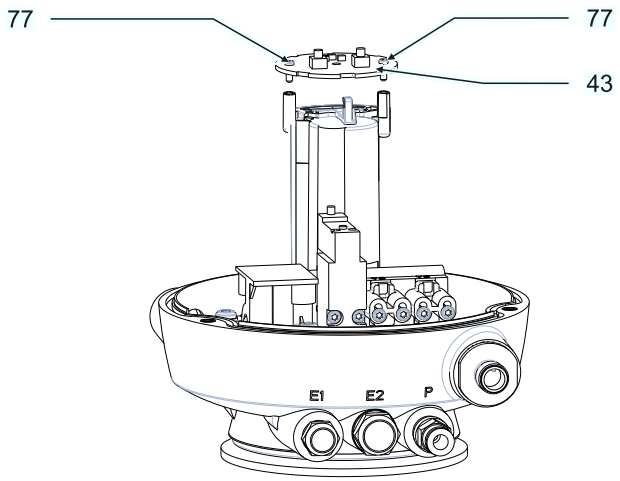


Fig.81

Hint!

IO-Link version can be seen on the label.

2. Remove all wires from the printed circuit board (43).

→ Done

Hint!

In order to avoid or minimize the possibility of damage from electrostatic discharge:

- Observe the requirements of DIN EN 61340-5-1 and 5-2.
- Be careful not to touch the electronic components!

10.5.4 Install the circuit board

To install the circuit board, observe the wiring diagram for the T.VIS circuit board (underside), see Section 6.5.3, Page 65!

10.5.5 Removing the sensor module (9)

Carry out the following steps:

1. Loosen the screws (57).

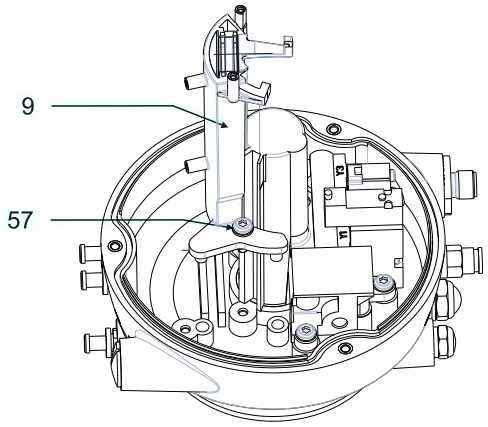


Fig.82

2. Lift the sensor module (9) off the base plate.

→ Done

10.5.6 Removing the logic element NOT (seal pack)

Requirement:

- Logic element NOT is only provided in connection with the pneumatic block T.VIS/NOT!

Carry out the following steps:

1. Loosen the screws (67) and remove logic element NOT (64) with flat gasket and adapter plate (64.1).

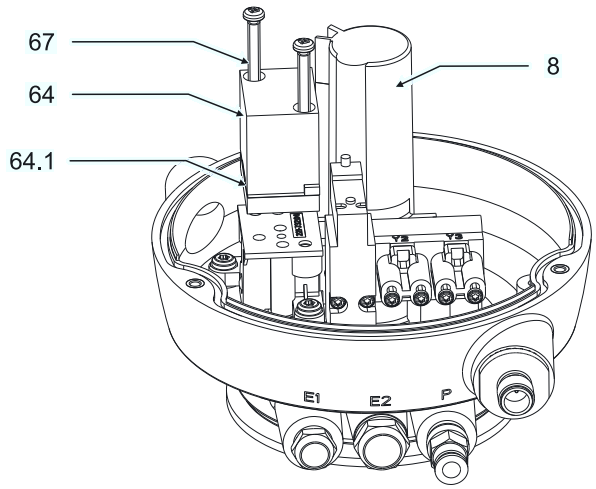


Fig.83

→ Done.

10.5.7 Fitting the Logic Element NOT (Sealing Package)

Requirement:

- Logic element NOT is only provided in connection with the pneumatic block T.VIS/NOT!

Carry out the following steps:

1. Fit the logic element NOT (64) in the reverse order.

! Place the logic element NOT, with adapter plate and seal, on the pneumatic block (8) as shown in the illustration.

! When inserting and tightening the screws, be careful to use existing threads.

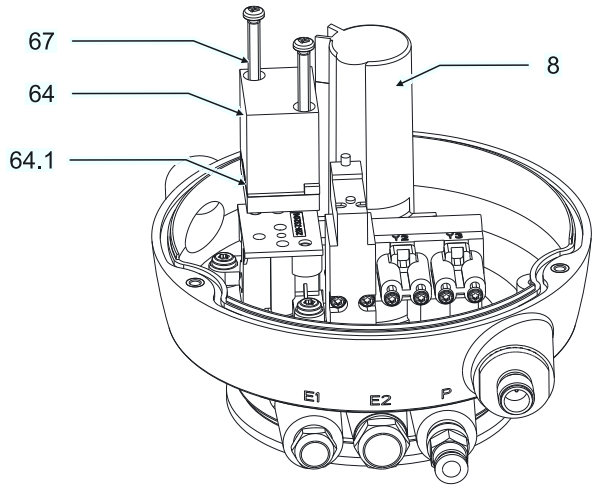


Fig.84

→ Done

Hint!

Faulty assembly may cause malfunctions, as the spring force backup is then not given.

10.5.8 Removing the Solenoid Valves and the Valve Plate

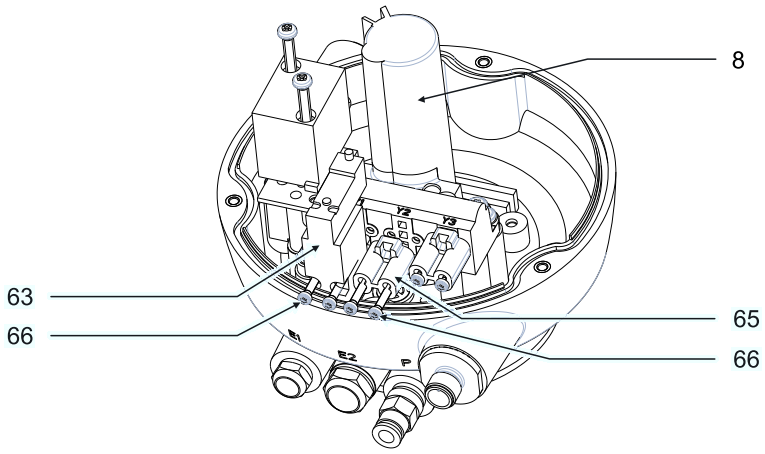


Fig.85

Requirement:

- Pay attention to the correct assignment of cables between the solenoid valves and the circuit board (9) – solenoid valve Y1 must be connected to terminal Y1; solenoid valve Y2 to terminal Y2 and solenoid valve Y3 to terminal Y3.
- Use only solenoid valves as listed in the chapter "Technical data", see Chapter 5, Page 26.

Warning!

Long switch-on time and high ambient temperature.

Risk of burns from the solenoid valve

► Allow to cool before dismantling.

Carry out the following steps:

1. Disconnect the electrical connection from the solenoid valve to the Pico Blade on the circuit board (43).
2. Loosen the screws (66) and remove the solenoid valve (63) from the pneumatic block (8).
3. Loosen the screws (66) and remove the control plates (65) from the pneumatic block (8).

→ Done

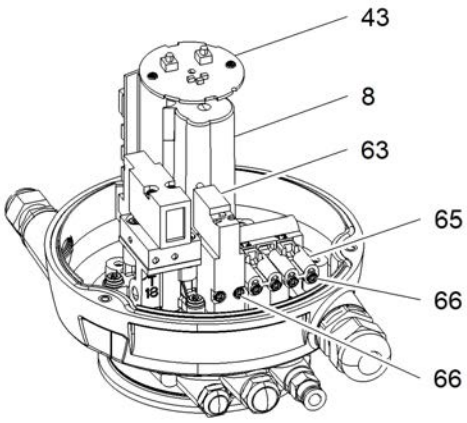


Fig.86

Hint!

When using the pneumatic block (8.2) with 1 valve plate (65), the groove (65.12) must be fitted on the left side.

The two screws (66) are located in the left mounting holes.

When using the pneumatic block (8) with 1 or 2 control plates (65), the groove (65.22) must be mounted upward.

The screws (66) are located in the lower mounting holes.

Hint!

For ASEPTOMAG valves, use special types of the pneumatic block!

Tighten the screws (66) at a tightening torque of 0.8 Nm.

10.5.9 Removing the pneumatic block

Requirement:

- If only the O-rings (42) and (55) must be changed then the solenoid valves (63)/control plate (65) and element NOT (64) can remain on the pneumatic block (8).

Carry out the following steps:

1. Undo the screws (57.1, 57.2).

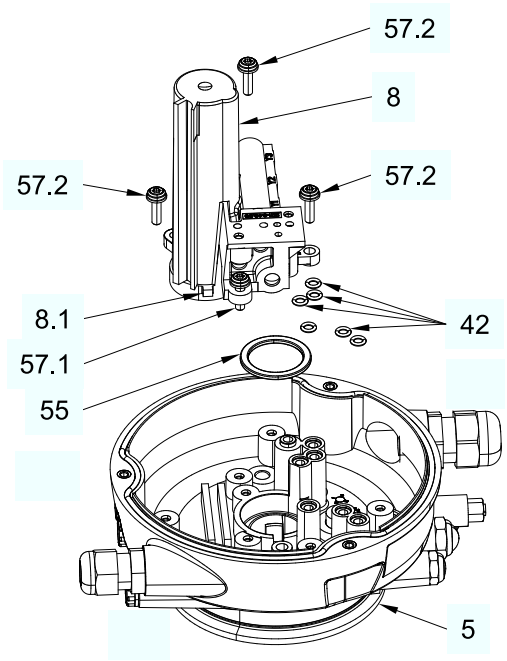


Fig.87

2. Pull off the pneumatic block (8).
3. Change the 6 O-rings (42) of the base (5).
4. Replace the O-ring (55).

→ Done

10.5.10 Fitting the Pneumatic Block

Requirement:

- When fitting the pneumatic block, make sure that it is compatible!
- Insert the journal (8.1) on the pneumatic block into the groove of the base (5)!
- Use the following pneumatic block types on ASEPTOMAG valves:
  - Pneumatic block T.VIS-15/NOT 3PV/ASG material no. 221-646.93
  - Pneumatic block T.VIS-15/ 3PV/ASG material no. 221-646.92

Carry out the following steps:

1. Tighten the screw (57.1): Tightening torque: 1.5 Nm (1.0 lbft).

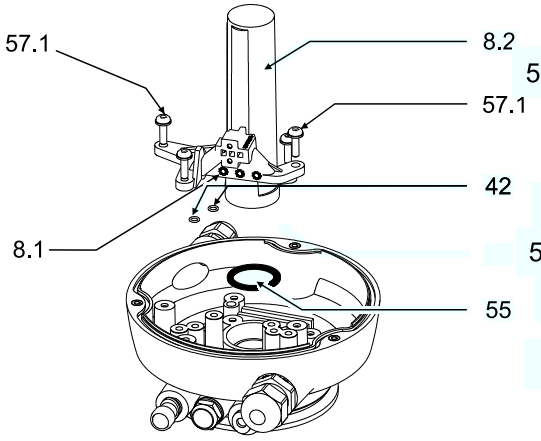


Fig.88

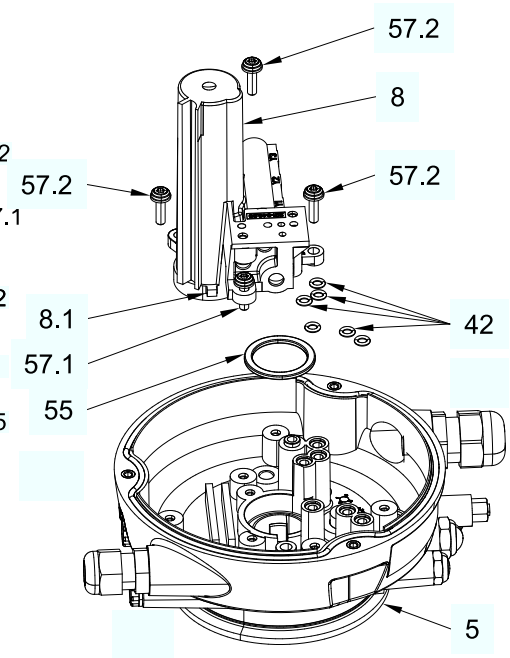


Fig.89

Pneumatic block (8.2) for max. 1 solenoid valve / pneumatic block (8) for max. 3 solenoid valves

2. Tighten the screw (57.2): Tightening torque: 1.5 Nm (1.0 lbft).
3. For other parts to be installed (sensor, circuit board, solenoid valves, control plate, element NOT) see previous pages.

→ Done

10.6 Install pneumatic connections

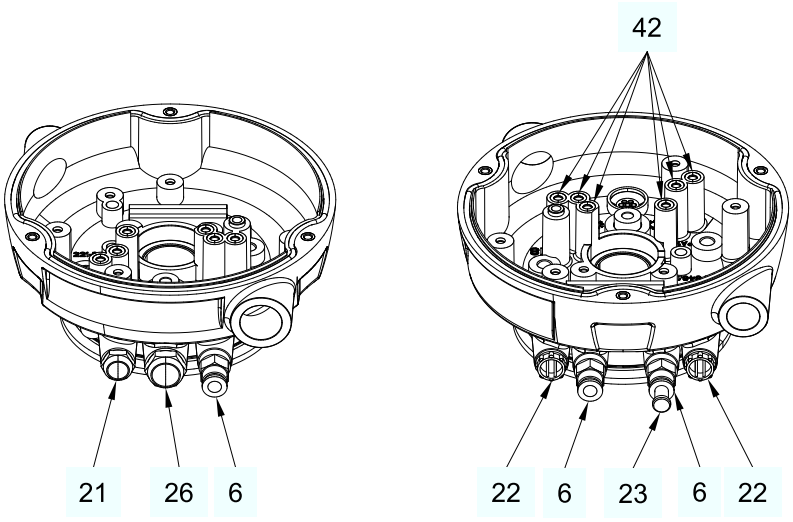


Fig.90

No.	Designation	Tightening torques
6	Screw-in plug connection	2.0 Nm
21	Sound absorber	2.0 Nm
22	Locking screw	0.5 Nm
23	Plug	
26	Sound absorber	2.0 Nm
42	O-ring	

Carry out the following steps:

1. Establish the pneumatic connections in accordance with the codes on the control top.

→ Done

10.7 Maintenance

10.7.1 Replacing the Seals on the Base

On VARIVENT actuators with a vent hole in the actuator cover the control top must be fitted without O-ring (54)!

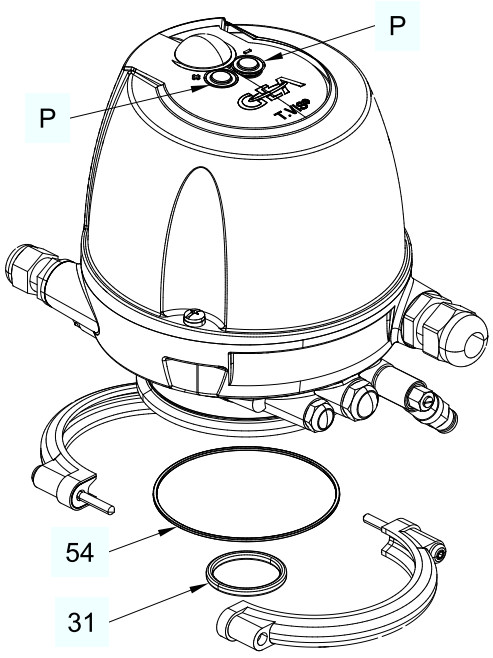


Fig.91

Carry out the following steps:

1. Remove the O-rings (31, 54) and replace.

→ Done

10.7.2 Maintenance of Sound Absorber, Filter, Non-Return Valve and Exhaust Air Throttle

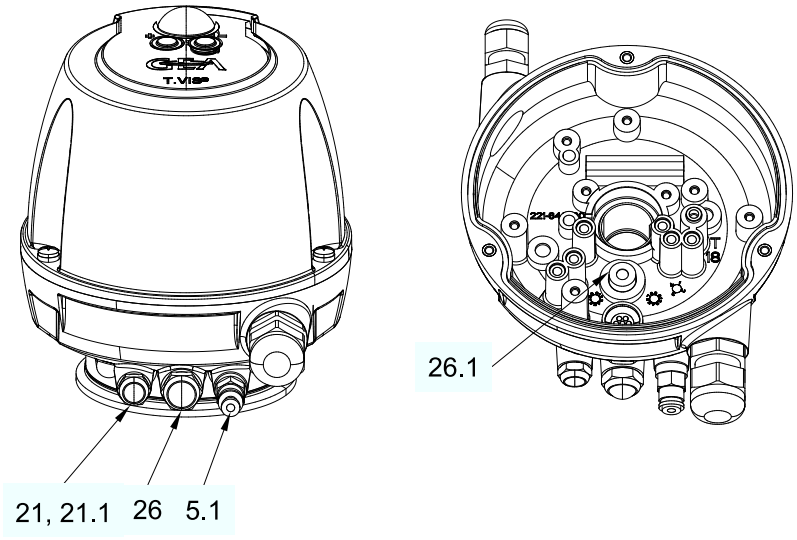


Fig.92

Requirement:

- Use only the throttle (21.1) and sound absorber (26) specified in the spare parts list, see Chapter 13, Page 123.

Carry out the following steps:

1. Check the sound absorber (21, 26), non-return valve (26.1), filter (5.1) and exhaust air throttle (21.1) for free control air leakage and replace if necessary.

   ! The reflux valve (26.1) cannot be replaced.

2. Do not grease the spare parts before fitting them.

→ Done

10.7.3 Mounting cap

Hint!

To ensure the IP protection class, the hood must be correctly mounted on the base!

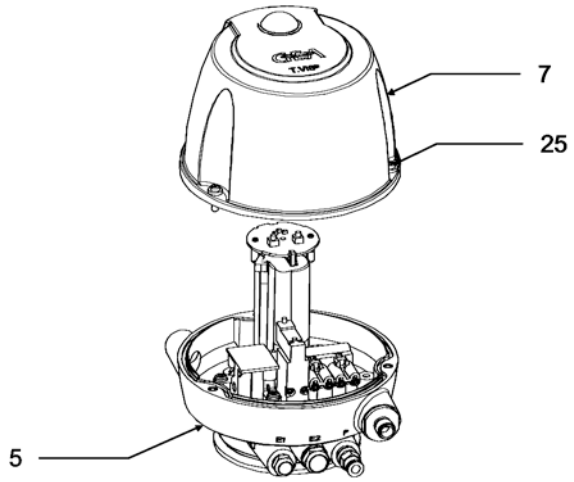


Fig.93

Carry out the following steps:

1. Use three screws (25) to fasten the hood (7) on the base (5) to tightening torque 2 Nm.

→ Done

11 Alarms

11.1 Malfunctions and remedies

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.

Malfunction, signalling, cause, remedy			
Malfunction	**Signalling**	**Cause**	**Remedy**
Programming is not possible after connecting the supply voltage.	No LED is lit	• No voltage at connector 1 (PINs 1 and 3) • Polarity of PINs 1 and 3 mixed up • Service function active	• Check the electrical connections for correct wiring • Connect PIN 1 and PIN 3 correctly • Disconnect the plug
SETUP cannot be activated	Green or yellow	Time window no longer active	Disconnect from the power supply again and carry out the operation within 30 s
Manual operation cannot be activated	Green or yellow	Time window no longer active	Disconnect from the power supply again and carry out the operation within 30 s
After connecting the supply voltage, green/ yellow is indicated immediately	Green or yellow	Device already programmed at least 1 x	Programme again to adapt to process conditions: actuate keys + and - simultaneously for 3... 7 s, see restarting Section 8.3, Page 101
Valve opens very slowly	Time exceeded in PLC	Fault in the compressed air supply or filter clogged up	• Clean or replace the filter • Open the supply air throttle further
Programming cannot be completed	Rapidly flashing red light	Actuated positions cannot be reached	

Malfunction, signalling, cause, remedy			
Malfunction	**Signalling**	**Cause**	**Remedy**
		due to missing control air pressure or	Check the control air pressure: pay attention to the minimum pressure of the solenoid valve on type plate
		due to incorrectly fitted switch bar	Check and tighten the fitted adapter, see Section 6.6, Page 67
		Throttle settings are incorrect	Open the supply air throttle further
		The control top configuration is not suitable for the valve, i.e. the number of solenoid valves does not correspond to the number of actuators	Open the exhaust air throttle further
		Air hoses for the lifting actuators mixed up	Use a suitable control top
		External proximity switch connected but set incorrectly	Select special default, correct connection, set proximity switch correctly
		The minimum stroke when lifting the valve disk has not been reached.	Correct the lifting stroke
No feedback signal is pending at the PLC although one of the end positions has been reached	Red LED flashing	T.VIS A-15 in factory setting and not yet programmed	Programming according to Operating overview, see Section 8.3, Page 101

Malfunction, signalling, cause, remedy			
Malfunction	**Signalling**	**Cause**	**Remedy**
	Red LED permanently lit	T.VIS A-15 currently in programming mode	Wait until programming mode ends
	Red LED flashing rapidly	T.VIS A-15 has a malfunction: Programmed position overrun (possibly from shape change of the bellows) only at 0.3 mm tolerance setting) or LEFF function malfunctioning	Check the bellows and possibly reprogram, see operating overview Section 8.3, Page 101 Acknowledge the fault on the valve by pressing the button or on the PLC by activating the 3 solenoid valves. Afterwards check the LEFF requirements: air pressure, external proximity switch In addition to the LEFF function, pulsing is programmed in the PLC

11.2 Carrying out a Reset – Back to Default Standard

Carry out the following steps:

1. Start the SETUP procedure.
2. Switch off the operating voltage while running the SETUP.

   → LED goes out, loss of data in the memory module.
3. Commissioning the control top, see "Commissioning - control top without solenoid valves" (Section 7.2, Page 80) or "Commissioning - control top with solenoid valves" (Section 7.3, Page 81).

→ Done.

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 25.

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 - control top type T.VIS A-15

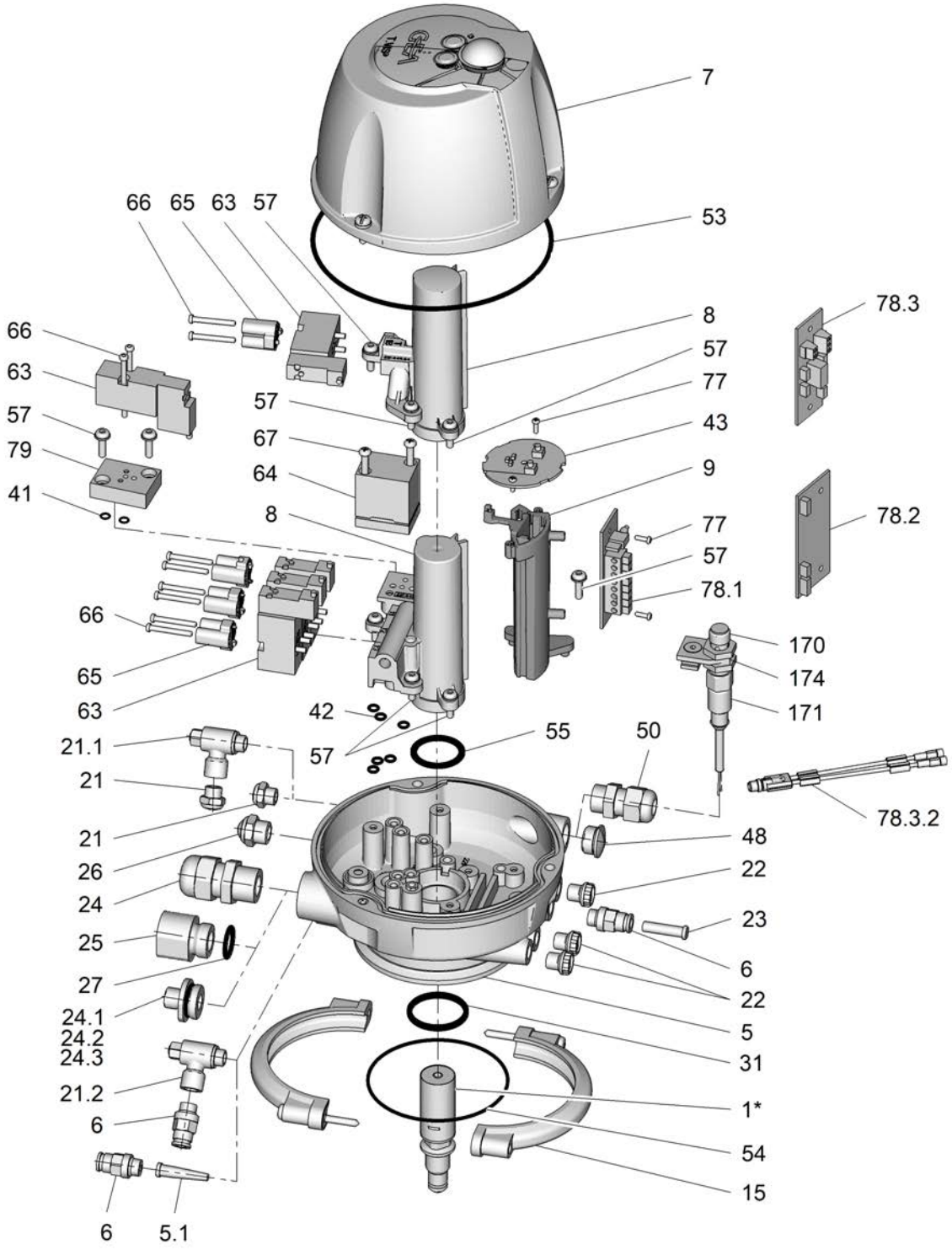


Fig.94

Control top T.VIS® A-15 with cable connection and air connection with metric connections						
			without NOT logic element			with NOT logic element
Order code				TA18R...M		
			TA18N...M	TA18I...M	TA18G...M	TA18V...M
			TA18P...M	TA18J...M	TA18F...M	TA18X...M
Item	Designation	Material		TA18L...M	TA18M...M	TA18Y...M
1*	For switch bar T.VIS A-15 refer to the separate spare parts list 221ELI010728EN.					
5	Base T.VIS-T18	PA12/L	221-646.100	221-646.100	221-646.100	221-646.100
5.1	Filter	PE	221-003869	221-003.869	221-003.869	221-003869
6	Screw-in plug connection D 6.0	MS CV	933-176	933-176	933-176	933-176
7	Hood T.VIS M/A-15	PA12/L	221-646.88	221-646.88	221-646.88	221-646.88
	Hood with button T.VIS P/A-15		221-646.87	221-646.87	221-646.87	221-646.87
8	Pneumatic block 3PV without NOT	PA12/L	--	221-646.89	--	--
	Pneumatic block 3PV with NOT for VARIVENT valves with spread lift	PA12/L	--	--	221-646.90	221-646.90
	Pneumatic block with NOT for ASEPTOMAG valves and VARIVENT valves with spread lift	PA12/L	--	--	221-646.93	221-646.93
	Pneumatic block without NOT for ASEPTOMAG valves	PA12/L	221-646.92	221-646.92	--	--
	Pneumatic block 1PV, not for ASEPTOMAG valves	PA12/L	221-646.94	--	--	--
9	Sensor module T.VIS A/P-15	PA6/GF30	221-589.74	221-589.74	221-589.74	221-589.74
15	Clamp connection KU	--	221-507.08	221-507.08	221-507.08	221-507.08
21	Sound absorber G1/8"	MS CV	933-175	933-175	933-175	933-175
22	Locking screw G1/8"	PE-HD	922-369	922-369	922-369	922-369
23	Plug	PP	922-281	922-281	922-281	922-281
24	Cable gland M20	PA	508-995	508-995	508-995	508-995
26	Sound absorber G1/4"	MS CV	933-174	933-174	933-174	933-174
31	O-ring	NBR	930-041	930-041	930-041	930-041
41	O-ring	NBR	--	--	930-436	--
42	O-ring	FKM	930-169	930-169	930-169	930-169
43	Printed circuit board 24V DC	--	221-005021#	221-005021#	221-005021#	221-005021#
	Printed circuit board ASi except MT-valves	--	221-005022#	221-005022#	221-005022#	221-005022#
	Printed circuit board 24VDC for IO-Link except MT-valves	--	221-005030#	221-005030#	221-005030#	221-005030#
	Printed circuit board DeviceNet	--	221-004097A	221-004097A	221-004097A	221-004097A
	Printed circuit board ASi only MT-valves	--	221-005032	221-005032	221-005032	221-005032
	Printed circuit board 24VDC for IO-Link only MT-valves	--	221-005031	221-005031	221-005031	221-005031
48	Locking screw	PA6	922-370	922-370	922-370	922-370
50	Cable gland M16	PA	508-914	508-914	508-914	508-914
53	O-ring	NBR	930-833	930-833	930-833	930-833
54	O-ring	NBR	930-117	930-117	930-117	930-117
55	O-ring	NBR	930-038	930-038	930-038	930-038
57	Thread-forming screw	A2	514-750	514-750	514-750	514-750
63	Solenoid valve 24VDC	PBT	512-169* *without TA18N...	512-169	512-169	512-169
64	Logic element NOT	--	--	--	--	512-137
65	Valve plate	PPO	221-589.27	221-589.27* *without TA18L...	221-589.27* *without TA18G...	221-589.27* *without TA18Y...
66	Thread-forming screw	A2	514-761	514-761	514-761	514-761
67	Thread-forming screw	A2	--	--	514-758	514-758
77	Thread-forming screw	Galv. steel	514-763	514-763	514-763	514-763
78.1	Printed circuit board T.VIS A-15/Zus/24V	--	221-005.025	221-005.025	221-005.025	221-005.025
78.2	Printed circuit board T.VIS A-15/IO-Link/ cpl. consisting of:	--	221-007.218	221-007.218	221-007.218	221-007.218
	- Printed circuit board T.VIS A-15/IO-Link	--	221-005023#	221-005023#	221-005023#	221-005023#
	- cable IO-Link 5-pole fitted	--	221-007.031	221-007.031	221-007.031	221-007.031
	- cable IO-Link 4-pole fitted	--	221-007.032	221-007.032	221-007.032	221-007.032
	- Thread-forming screw	Galv. steel	514-763	514-763	514-763	514-763
78.3	Printed circuit board T.VIS spread lift/cpl. consisting of:	--	221-007562	221-007562	221-007562	221-007562
	- Printed circuit board T.VIS spread lift	--	221-005026	221-005026	221-005026	221-005026
	- Round plug-in connector Y-adapter		508-945	508-945	508-945	508-945
	- Wire T.VIS A-15 NI	--	221-007034	221-007034	221-007034	221-007034

Control top T.VIS® A-15 with cable connection and air connection with metric connections						
			without NOT logic element			with NOT logic element
Order code				TA18R...M		
			TA18N...M	TA18I...M	TA18G...M	TA18V...M
			TA18P...M	TA18J...M	TA18F...M	TA18X...M
Item	Designation	Material		TA18L...M	TA18M...M	TA18Y...M
	- Wire T.VIS A-15 PV	--	221-007036	221-007036	221-007036	221-007036
	- Proximity switch cpl.	--	221-105.111	221-105.111	221-105.111	221-105.111
	- Support sleeve (only for IO-Link)	--	933-949	933-949	933-949	933-949
	- Thread-forming screw (only for IO-Link)	--	514-768	514-768	514-768	514-768
	- Round plug-in connector M12/3 wire	--	508-039	508-039	508-039	508-039
79	Adapter 4PV	PA6	--	--	221-589.111	--
# Placeholder for version status (Please contact GEA Tuchenhagen if there are any questions.)						

Control top T.VIS® A-15 with cable connection and air connection with imperial connections						
			without NOT logic element			with NOT logic element
Order code				TA18R...Z		
			TA18N...Z	TA18I...Z	TA18G...Z	TA18V...Z
			TA18P...Z	TA18J...Z	TA18F...Z	TA18X...Z
Item	Designation	Material		TA18L...Z	TA18M...Z	TA18Y...Z
1*	For switch bar T.VIS A-15 refer to the separate spare parts list 221ELI010728EN.					
5	Base T.VIS-T18	PA12/L	221-646.100	221-646.100	221-646.100	221-646.100
5.1	Filter	PE	221-003869	221-003.869	221-003.869	221-003869
6	Screw-in plug connection D 6.35	MS CV	933-173	933-173	933-173	933-173
7	Hood T.VIS M/A-15	PA12/L	221-646.88	221-646.88	221-646.88	221-646.88
	Hood with button T.VIS M/A-15		221-646.87	221-646.87	221-646.87	221-646.87
8	Pneumatic block 3PV without NOT	PA12/L	--	221-646.89	--	--
	Pneumatic block 3PV with NOT for VARIVENT valves with spread lift	PA12/L	--	--	221-646.90	221-646.90
	Pneumatic block SPV with NOT for ASEPTOMAG valves and VARIVENT valves with spread lift	PA12/L	--	--	221-646.93	221-646.93
	Pneumatic block SPV without NOT for ASEPTOMAG valves	PA12/L	221-646.92	221-646.92	--	--
	Pneumatic block 1PV, not for ASEPTOMAG valves	PA12/L	221-646.94	--	--	--
9	Sensor module T.VIS A/P-15	PA6/GF30	221-589.74	221-589.74	221-589.74	221-589.74
15	Clamp connection KU	--	221-507.08	221-507.08	221-507.08	221-507.08
21	Sound absorber G1/8"	MS CV	933-175	933-175	933-175	933-175
22	Locking screw G1/8"	PE-HD	922-369	922-369	922-369	922-369
23	Plug	PP	922-280	922-280	922-280	922-280
24	Cable gland G1/2"	PA	508-915	508-915	508-915	508-915
25	Adapter G1/2"	PA	221-004094	221-004.094	221-004.094	221-004094
26	Sound absorber G1/4"	MS CV	933-174	933-174	933-174	933-174
27	O-ring	NBR	930-017	930-017	930-017	930-017
31	O-ring	NBR	930-041	930-041	930-041	930-041
41	O-ring	NBR	--	--	930-436	--
42	O-ring	FKM	930-169	930-169	930-169	930-169
43	Printed circuit board 24V DC	--	221-005021#	221-005021#	221-005021#	221-005021
	Printed circuit board ASi except MT-valves	--	221-005022#	221-005022#	221-005022#	221-005022#
	Printed circuit board 24VDC for IO-Link except MT-valves	--	221-005030#	221-005030#	221-005030#	221-005030#
	Printed circuit board DeviceNet	--	221-004097A	221-004097A	221-004097A	221-004097A
	Printed circuit board ASi only MT-valves	--	221-005032	221-005032	221-005032	221-005032
	Printed circuit board 24VDC for IO-Link only MT-valves	--	221-005031	221-005031	221-005031	221-005031
48	Locking screw	PA6	922-370	922-370	922-370	922-370
50	Cable gland M16	PA	508-916	508-916	508-916	508-916
53	O-ring	NBR	930-833	930-833	930-833	930-833
54	O-ring	NBR	930-117	930-117	930-117	930-117
55	O-ring	NBR	930-038	930-038	930-038	930-038
57	Thread-forming screw	A2	514-750	514-750	514-750	514-750
63	Solenoid valve 24VDC	PBT	512-169* *without TA18N...	512-169	512-169	512-169
64	Logic element NOT	--	--	--	--	512-137
65	Valve plate	PPO	221-589.27	221-589.27* *without TA18L...	221-589.27* *without TA18G...	221-589.27* *without TA18Y...
66	Thread-forming screw	A2	514-761	514-761	514-761	514-761
67	Thread-forming screw	A2	--	--	514-758	514-758
77	Thread-forming screw	Galv. steel	514-763	514-763	514-763	514-763
78.1	Printed circuit board T.VIS A-15/Zus/24V	--	221-005.025	221-005.025	221-005.025	221-005.025
78.2	Printed circuit board T.VIS A-15/IO-Link/ cpl. consisting of:	--	221-007.218	221-007.218	221-007.218	221-007.218
	- Printed circuit board T.VIS A-15/IO-Link	--	221-005023#	221-005023#	221-005023#	221-005023#
	- cable IO-Link 5-pole fitted	--	221-007.031	221-007.031	221-007.031	221-007.031
	- cable IO-Link 4-pole fitted	--	221-007.032	221-007.032	221-007.032	221-007.032
	- Thread-forming screw	Galv. steel	514-763	514-763	514-763	514-763
78.3	Printed circuit board T.VIS spread lift/cpl. consisting of:	--	221-007562	221-007562	221-007562	221-007562
	- Printed circuit board T.VIS spread lift	--	221-005026	221-005026	221-005026	221-005026

Control top T.VIS® A-15 with cable connection and air connection with imperial connections						
			without NOT logic element			with NOT logic element
Order code				TA18R...Z		
			TA18N...Z	TA18I...Z	TA18G...Z	TA18V...Z
			TA18P...Z	TA18J...Z	TA18F...Z	TA18X...Z
Item	Designation	Material		TA18L...Z	TA18M...Z	TA18Y...Z
	- Round plug-in connector Y-adapter		508-945	508-945	508-945	508-945
	- Wire T.VIS A-15 NI	--	221-007034	221-007034	221-007034	221-007034
	- Wire T.VIS A-15 PV	--	221-007036	221-007036	221-007036	221-007036
	- Proximity switch cpl.	--	221-105.111	221-105.111	221-105.111	221-105.111
	- Support sleeve (only for IO-Link)	--	933-949	933-949	933-949	933-949
	- Thread-forming screw (only for IO-Link)	--	514-768	514-768	514-768	514-768
	- Round plug-in connector M12/3 wire	--	508-039	508-039	508-039	508-039
79	Adapter 4PV	PA6	--	--	221-589.111	--
# Placeholder for version status (Please contact GEA Tuchenhagen if there are any questions.)						

Control top T.VIS® A-15 with metric cable connection and air connection with imperial connections						
			without NOT logic element			with NOT logic element
Order code				TA18R...ZM		
			TA18N...ZM	TA18I...ZM	TA18G...ZM	TA18V...ZM
			TA18P...ZM	TA18J...ZM	TA18F...ZM	TA18X...ZM
Item	Designation	Material		TA18L...ZM	TA18M...ZM	TA18Y...ZM
1*	For switch bar T.VIS A-15 refer to the separate spare parts list 221ELI010728EN.					
5	Base T.VIS-T18	PA12/L	221-646.100	221-646.100	221-646.100	221-646.100
5.1	Filter	PE	221-003869	221-003.869	221-003.869	221-003869
6	Screw-in plug connection D 6.35	MS CV	933-173	933-173	933-173	933-173
7	Hood T.VIS M/A-15	PA12/L	221-646.88	221-646.88	221-646.88	221-646.88
	Hood with button T.VIS M/A-15		221-646.87	221-646.87	221-646.87	221-646.87
8	Pneumatic block 3PV without NOT	PA12/L	--	221-646.89	--	--
	Pneumatic block 3PV with NOT for VARIVENT valves with spread lift	PA12/L	--	--	221-646.90	221-646.90
	Pneumatic block SPV with NOT for ASEPTOMAG valves and VARIVENT valves with spread lift	PA12/L	--	--	221-646.93	221-646.93
	Pneumatic block SPV without NOT for ASEPTOMAG valves	PA12/L	221-646.92	221-646.92	--	--
	Pneumatic block 1PV, not for ASEPTOMAG valves	PA12/L	221-646.94	--	--	--
9	Sensor module T.VIS A/P-15	PA6/GF30	221-589.74	221-589.74	221-589.74	221-589.74
15	Clamp connection KU	--	221-507.08	221-507.08	221-507.08	221-507.08
21	Sound absorber G1/8"	MS CV	933-175	933-175	933-175	933-175
22	Locking screw G1/8"	PE-HD	922-369	922-369	922-369	922-369
23	Plug	PP	922-281	922-281	922-281	922-281
24	Cable gland M20	PA	508-995	508-995	508-995	508-995
26	Sound absorber G1/4"	MS CV	933-174	933-174	933-174	933-174
31	O-ring	NBR	930-041	930-041	930-041	930-041
41	O-ring	NBR	--	--	930-436	--
42	O-ring	FKM	930-169	930-169	930-169	930-169
43	Printed circuit board 24V DC	--	221-005021#	221-005021#	221-005021#	221-005021#
	Printed circuit board ASi except MT-valves	--	221-005022#	221-005022#	221-005022#	221-005022#
	Printed circuit board 24VDC for IO-Link except MT-valves	--	221-005030#	221-005030#	221-005030#	221-005030#
	Printed circuit board DeviceNet	--	221-004097A	221-004097A	221-004097A	221-004097A
	Printed circuit board ASi only MT-valves	--	221-005032	221-005032	221-005032	221-005032
	Printed circuit board 24VDC for IO-Link only MT-valves	--	221-005031	221-005031	221-005031	221-005031
48	Locking screw	PA6	922-370	922-370	922-370	922-370
50	Cable gland M16	PA	508-914	508-914	508-914	508-914
53	O-ring	NBR	930-833	930-833	930-833	930-833
54	O-ring	NBR	930-117	930-117	930-117	930-117
55	O-ring	NBR	930-038	930-038	930-038	930-038
57	Thread-forming screw	A2	514-750	514-750	514-750	514-750
63	Solenoid valve 24VDC	PBT	512-169* *without TA18N...	512-169	512-169	512-169
64	Logic element NOT	--	--	--	--	512-137
65	Valve plate	PPO	221-589.27	221-589.27* *without TA18L...	221-589.27* *without TA18G...	221-589.27* *without TA18Y...
66	Thread-forming screw	A2	514-761	514-761	514-761	514-761
67	Thread-forming screw	A2	--	--	514-758	514-758
77	Thread-forming screw	Galv. steel	514-763	514-763	514-763	514-763
78.1	Printed circuit board T.VIS A-15/Zus/24V	--	221-005.025	221-005.025	221-005.025	221-005.025
78.2	Printed circuit board T.VIS A-15/IO-Link/ cpl. consisting of:	--	221-007.218	221-007.218	221-007.218	221-007.218
	- Printed circuit board T.VIS A-15/IO-Link	--	221-005023#	221-005023#	221-005023#	221-005023#
	- cable IO-Link 5-pole fitted	--	221-007.031	221-007.031	221-007.031	221-007.031
	- cable IO-Link 4-pole fitted	--	221-007.032	221-007.032	221-007.032	221-007.032
	- Thread-forming screw	Galv. steel	514-763	514-763	514-763	514-763
78.3	Printed circuit board T.VIS spread lift/cpl. consisting of:	--	221-007562	221-007562	221-007562	221-007562
	- Printed circuit board T.VIS spread lift	--	221-005026	221-005026	221-005026	221-005026
	- Round plug-in connector Y-adapter		508-945	508-945	508-945	508-945

Control top T.VIS® A-15 with metric cable connection and air connection with imperial connections						
			without NOT logic element			with NOT logic element
Order code				TA18R...ZM		
			TA18N...ZM	TA18I...ZM	TA18G...ZM	TA18V...ZM
			TA18P...ZM	TA18J...ZM	TA18F...ZM	TA18X...ZM
Item	Designation	Material		TA18L...ZM	TA18M...ZM	TA18Y...ZM
	- Wire T.VIS A-15 NI	--	221-007034	221-007034	221-007034	221-007034
	- Wire T.VIS A-15 PV	--	221-007036	221-007036	221-007036	221-007036
	- Proximity switch cpl.	--	221-105.111	221-105.111	221-105.111	221-105.111
	- Support sleeve (only for IO-Link)	--	933-949	933-949	933-949	933-949
	- Thread-forming screw (only for IO-Link)	--	514-768	514-768	514-768	514-768
	- Round plug-in connector M12/3 wire	--	508-039	508-039	508-039	508-039
79	Adapter 4PV	PA6	--	--	221-589.111	--
# Placeholder for version status (Please contact GEA Tuchenhagen if there are any questions.)						

Item	Designation	Material	Material no.	
21.1	Throttle valve G 1/8	Brass/ nickel-plated	603-042	to reduce the closing speed main stroke (air outlet with sound absorber pos. 21)
21.2	Throttle valve G 1/8	Brass/ nickel-plated	603-042	to reduce the opening speed main stroke (connection with screw-in plug connection pos. 6)
24.1	Connector M12/8-pin/ M20x1.5	A2	221-005.102	Cable connection 24VDC with cable socket M12/8-pole/A-coded
24.2	Connector M12/5-pole/ 5-wire/M20x1.5	A2	221-005.101	Cable connection 24VDC max.1 solenoid valve without proximity switch on the lantern with cable socket M12/5-pin/A-coded; cable connection ASi and Device Net
24.3	Connector M12/12-pin/9 wire/M20x1.5	A2	221-005103	Cable connection 24VDC with additional 4. Feedback
170	Proximity switch M12 cpl.	--	221-105.28	Used in the lantern / items 170.1, 171 and 174 are included in the proximity switch cpl. (item 170)
170.1	Proximity switch M12x1/ external	A2	505-098	Used in the lantern
171	Round connector M12 with cable	--	508-031	Only with proximity switch item 170.1
174	Holder proximity switch cpl.	A2	221-105.26	Only with proximity switch item 170.1

Accessories (to be ordered separately)	Material no.	Application
Angular cable socket M12 / 5-pole / A-coded / 24VDC / DeviceNet	508-963	Electrical connection to connector Items 24.2/24.5
Straight cable socket M12 / 8-pole / A-coded / 24VDC	508-061	Electrical connection to connector Item 24.1
Angular cable socket M12 / 4-pole / A-coded / ASi	514-161	Electrical connection to connector Item 24.3
Straight cable socket M12 with 1.0m cable and ASi insulation displacement connector	508-027	Electrical connection to connector Item 24.3
Straight cable socket M12 with 2.0m cable and ASi insulation displacement connector	508-028	Electrical connection to connector Item 24.3
Quick air vent valve D6 (with plug connection for hose 6mm on both sides)	603-039	

14 Spare parts list - switch bar T.VIS A-15

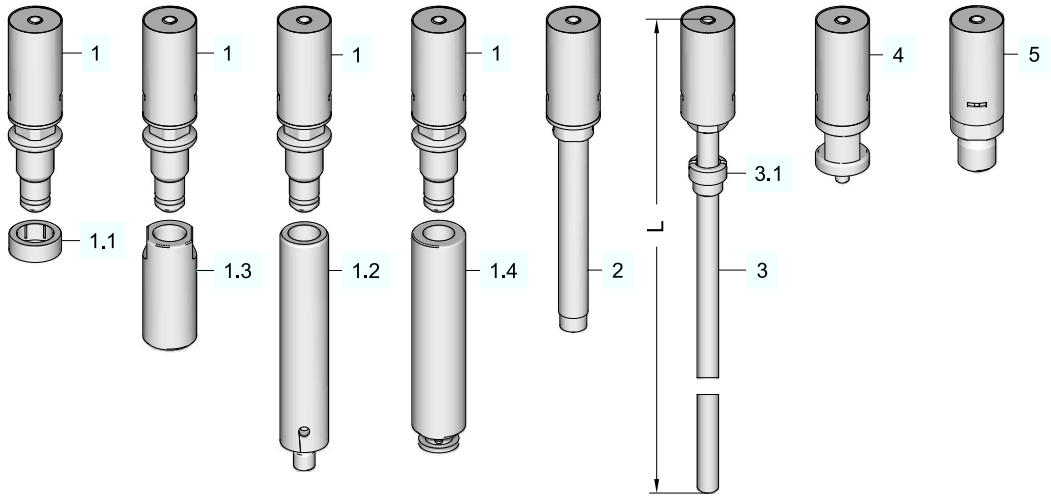
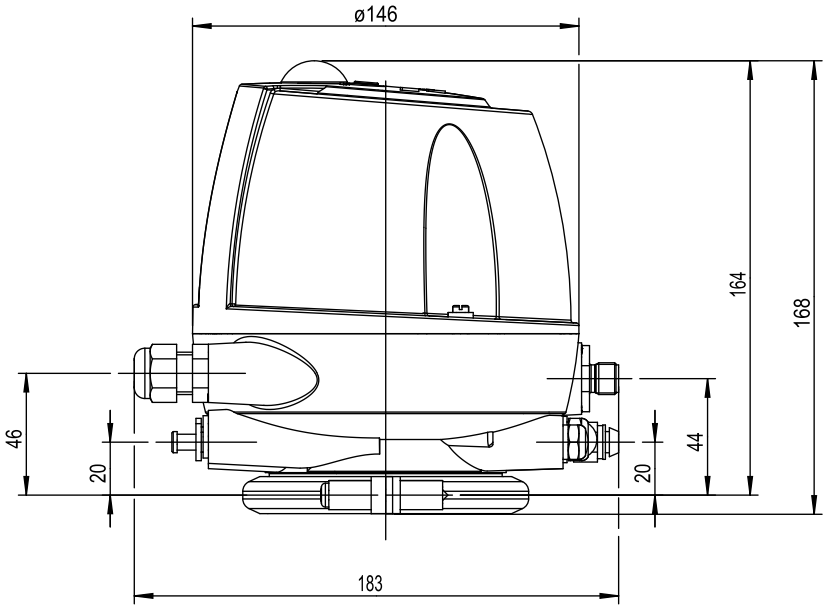


Fig.95

Item	Designation	Material	Material no.	Application
1	Switch bar	PA6/GK30	221-589.104	Standard for all valves with the exception of butterfly valves T-smart 7 and valves with lifting actuator R; T_R; L; M_O(06); MT/T_R(08); M/2.0
1.1	Ring T.VIS®/ECO	Noryl/GFN2	221-002396	In addition to item 1, only for ECOVENT-valves and VESTA XL H_A/M-valves
1.2	Switch bar	1.4301	224-000214	In addition to item 1, adapter only for T-smart 8000 butterfly valves
1.3	Switch bar incl. O-ring	1.4305	221-589.57	In addition to item 1, adapter only for valves type XL H_A
1.4	TME/T.VIS adapter	1.4305	221-573.06	In addition to item 1, only for butterfly valves ECOVENT-S
2	Switch bar BFV-7	1.4301/PA6	224-001696	For butterfly valves T-smart 7 and 9
3	Switch bar LFT-R	1.4301/PA6	see type	For valves with lifting actuator R; T_R; L; M_O(06); MT/T_R(08); M/2.0
4	Switch bar A/P-15 ASG	1.4305/PA6	221-589.88	For all GEA ASEPTOMAG valves
5	Switch bar A/P-15 N_V	1.4305/PA6	221-589.90	only for VARIVENT long-stroke valves with ZEF/V and ZFD/V actuator and butterfly valve with limit stop
6	Switch bar T.VIS M-20/A/P-15/IS	1.4301/PA6	221-589.86	only for VARIPUT in-line spray cleaner

Type		125	200	205	166	256
Use on standard actuators		see dimension sheet 221MBL010805EN				
Item	Designation	Material no.				
3	Switch bar LFT-R cpl. incl. slider	221-618.20	221-618.21	221-618.22	221-618.23	221-618.24
L = Length		286	316	346	405	453
3.1	Sliding piece	221-619.04				

15 Dimension sheet - Control top type T.VIS A-15



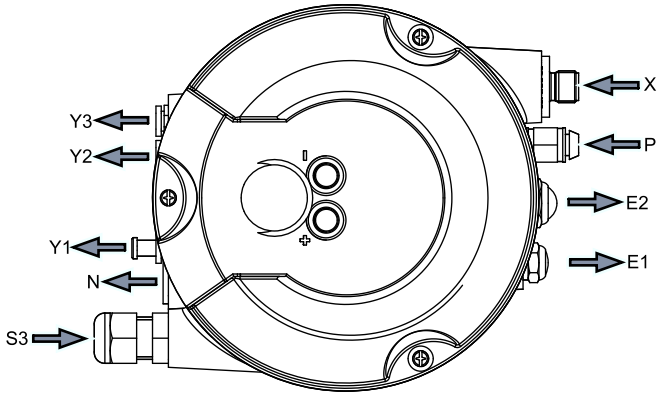


Fig.96

For assignment of N, Y1, Y2, Y3, E1, E2 and P refer to the Operating Instructions “Control Top T.VIS A-15”.

X - supply voltage, electric actuation and feedback

S3 - electrical connection for external proximity switch

16 Dimension sheet - switch bar LFT-R T.VIS A-15/M-20 for lifted valves R; T_R; L; M_O(06); MT/T_R(08); M/2.0; MT; MT-DA; MX

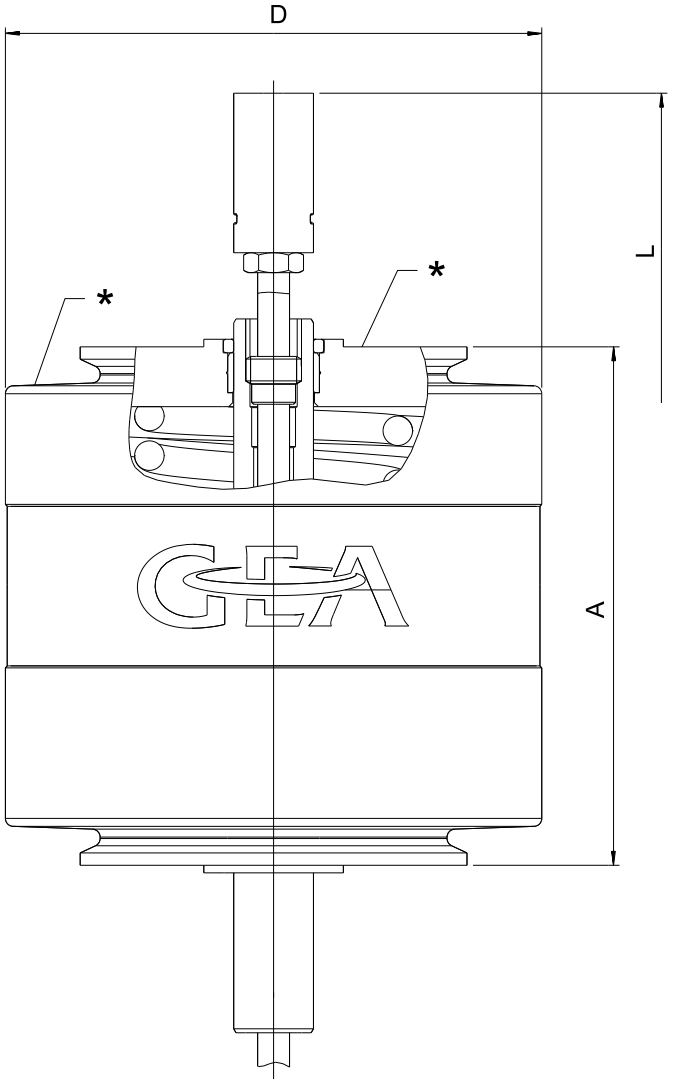


Fig.97

Actuator				Switch bar T.VIS A-15	
Type	Material no.	Actuator		Material no.	Length
		A	D		L
AA	221-118.01	95	99	--	--
BA	221-120.01	130	110	221-618.20	286
BB	221-118.02	130	110	221-618.20	286
BD	221-119.02	130	110	221-618.20	286
				221-618.21 in valve DN25; 1"OD; or PMO 2.0	316
BE	221-119.09	130	110	221-618.21	316
CA	221-181.01	130	135	221-618.20	286
CB	221-120.02	130	135	221-618.20	286
CD	221-118.03	130	135	221-618.20	286
CF	221-119.03	130	135	221-618.20	286
DB	221-181.02	160	170	221-618.21	316
DD	221-120.03	160	170	221-618.21	316
DF	221-118.04	160	170	221-618.21	316
DG	221-119.04	160	170	221-618.21	316
DH	221-265.05	160	170	221-618.21	316
ED	221-181.03	160	210	221-618.21	316
EF	221-120.04	160	210	221-618.21	316
EG	221-118.05	160	210	221-618.21	316
EH	221-119.05	160	210	221-618.21	316
BD5	221-119.06	140	110	221-618.21	316
BE5	221-119.07	140	110	221-618.21	316
CE5	221-119.08	140	135	221-618.21	316
CF5	221-119.10	140	135	221-618.21	316
DD5	221-183.01	160	170	221-618.22	346
DE5	221-183.06	160	170	221-618.22	346
DF5	221-184.01	170	170	221-618.22	346
				221-618.30 in valve PMO/06	356
DG5	221-185.01	170	170	221-618.22	346
ED5	221-183.05	160	210	221-618.22	346
EF5	221-183.02	170	210	221-618.22	346
EG5	221-184.02	170	210	221-618.22	346
EH5	221-185.02	170	210	221-618.22	346
DF6Z	221-585.11	199	170	221-618.23	405
DG6Z	221-585.13	199	170	221-618.23	405
SH6Z	221-585.02	246	260.5	221-618.24	453
SK6Z	221-585.03	246	260.5	221-618.24	453
SM6Z	221-585.04	246	260.5	221-618.24	453

Actuator				Switch bar T.VIS A-15	
Type	**Material no.**	**Actuator**		**Material no.**	**Length**
		A	**D**		**L**
SN6Z	221-585.05	246	260.5	221-618.24	453
EF6Z	221-585.07	246	210	221-618.24	453
EG6Z	221-585.08	246	210	221-618.24	453
EH6Z	221-585.09	246	210	221-618.24	453
EK6Z	221-585.10	246	210	221-618.24	453
SG6A	221-586.01	246	260.5	221-618.24	453
SH6A	221-586.02	246	260.5	221-618.24	453
SK6A	221-586.03	246	260.5	221-618.24	453
SM6A	221-586.04	246	260.5	221-618.24	453
SN6A	221-586.05	246	260.5	221-618.24	453
EF6A	221-586.07	246	210	221-618.24	453
EG6A	221-586.08	246	210	221-618.24	453
EH6A	221-586.09	246	210	221-618.24	453
EK6A	221-586.10	246	210	221-618.24	453

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 [barg/psig] unless explicitly specified otherwise.
approx.	approximately
°C	Unit of measurement of temperature [degree Celsius]
dm^3_n	Unit of measurement of volume [cubic decimetre] Standard volume (standard litre)
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 Short 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]
HNBR	Material designation Short designation according to DIN/ISO 1629: Hydrogenated Acrylonitrile Butadiene Rubber
IP	Protection class
ISO	International standard issued by the International Organisation for Standardisation
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]
µm	Unit of measurement of length [micrometre]

Abbreviation	Explanation
M	Metric
Nm	Unit of measurement of work [newton metre] Specification of torque 1 Nm = 0.737 lbft Pound-Force (lb) + Feet (ft)
PA	Polyamide
PE-LD	Low-density polyethylene
PPE	Polytetrafluoroethylene
psi	America measurement for pressure [Pound-forse 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.
AF	Specifications for the size of spanners width across flats
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	Pipe measurement according to British Standards (BS), Outside Diameter
Inch IPS	American pipe measure - Iron Pipe Size

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