



Operating Instructions - provisionally

Control top T.VIS[®] A-15

Edition 07/11/2014
English

Product	Control top T.VIS® A-15
Document	Operating Instructions Edition 07/11/2014 English
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Notes for the Reader

The present operating instructions are part of the user information for the control top. The operating instructions contains all the information you need to transport, install, commission, operate and carry out maintenance for the control top.

Binding Character of These Operating Instructions

These operating instructions contain the manufacturer's instructions to the owner of the control top and to all persons who work on or use the control top regarding the procedures to follow.

Carefully read these operating instructions before starting any work on or using the control top. Your personal safety and the safety of the control top can only be ensured if you act as described in the operating instructions.

Store the operating instructions in such a way that it is accessible to the owner and the operating staff during the entire life cycle of the control top. When the location is changed or the control top is sold make sure you also provide the operating instructions.

Notes on the Illustrations

The illustrations in these operating instructions show the control top in a simplified form. The actual design of the control top can differ from the illustration. For detailed views and dimensions of the control top please refer to the design documents.

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 cause serious damage to health, or even death.

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



EXPLOSION HAZARD

Warning: Explosions.

Failure to observe the warning may result in a severe explosion.

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



WARNING

Warning: Serious Injuries.

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

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

IMPORTANT NOTE

Warning: Damage to property.

Non-observance of the warning note can cause serious damage to the control top or in the vicinity of the control top.

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

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

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.

NOTE

Further useful information.

Abbreviations and Terms

Abbreviation	Explanation
A	Output
approx.	approximately
°C	Unit of measurement of temperature [degree Celsius]
CAN_H	Communication DeviceNet
CAN_L	Communication DeviceNet
CSA	Canadian Standards Association
COM	Communication
DIN	German standard issued by DIN (Deutsches Institut für Normung e.V, German Institute for Standardization)
EN	European Standard
E	Input
ext.	external
GEA	GEA AG group of companies GEA stands for Global Engineering Alliance
IP	Protection class
LED	Light-emitting diode
LEFF®	Low Emission Flip Flop Low emission clock pulse circuit
L+	Positive conductor
L-	Negative conductor
mA	Unit of measurement of current [milliampere]
max.	maximum
mm	Unit of measurement of length [millimetre]
M	metric
Nm	Unit of measurement of work [newton metre] UNIT OF TORQUE 1 Nm = 0.737 lbft Pound-Force (lb) + Feet (ft)
NOT element	Logic element
NPN	Current sinking, negative logic
PA	Polyamide
PCB	Printed circuit board
PE-LD	Low-density polyethylene

Abbreviation	Explanation
PNP	Current sourcing, positive logic
Prox.	Proximity switch
SET-UP	Self-learning installation During commissioning and maintenance, the SET-UP procedure carries out all the necessary settings for the generation of messages.
PLC	Programmable Logic Controller
a/f	Indicates the size of spanners [width across flats]
T.VIS	Tuchenhagen Valve Information System
TPE	Thermoplastic elastomer
U	Voltage
UL	Underwriters Laboratories
V+	Supply +DeviceNet
V-	Supply -DeviceNet
V AC	Volt alternating current
V DC	Volt direct current
W	Unit of measurement of power [Watt]
Inch OD	Pipe dimension acc. to British standard (BS), Outside Diameter
Inch IPS	US pipe dimension Iron Pipe Size

Safety

Safety Note

The control top is operationally reliable. It was built according to state-of-the art standards.

Nevertheless, the control top can pose dangers, especially if

- the control top is not used in accordance with its intended use,
- the control top is not used correctly,
- the control top is operated under impermissible operating conditions.

Operator's Duties

In your capacity as operator of the facility you bear a particular responsibility for the proper and safe handling of the control top in your facility. Only use the control top when it is in perfect condition to prevent danger to persons and property.

These operating instructions contain the information you and your staff need for the safe and reliable operation during the entire service life of the control top. 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 allow qualified staff to work on the control top.
- The operator must authorize the staff to carry out the relevant tasks.
- Working areas and the entire environment of the control top must be neat and clean.
- The staff must wear suitable work clothing and personal protective equipment. As the operator of the facility make sure that work clothing and personal protective equipment are used.
- Instruct the staff with regard to any properties of the product which might pose a health risk and the preventative measures to be taken.
- Have a qualified first-aider on call during the operation, who can initiate the necessary first-aid measures in case of an emergency.
- Clearly define processes, lines of authority and responsibilities associated with the control top. Everybody must know what to do in case of an emergency. Instruct the staff in this respect at regular intervals.
- The signs relating to the control top must always be complete and legible. Check, clean and replace the signs as necessary at regular intervals.

NOTE

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

Qualification of Staff

This section contains information about the qualifications that staff working on the control top must have.

Operating and maintenance staff 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 staff to carry out any work on explosion-protected equipment. 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:

- Vocational training as a skilled worker who can work on the control top independently.
- Sufficient instruction to work on the control top under the supervision and direction of a qualified specialist.

Each member of staff must meet the following requirements to be allowed to work on the control top:

- Personal qualification for the relevant task.
- Sufficient professional qualification for the relevant task.
- Instructed with regard to the function of the control top.
- Instructed with regard to the operating sequences of the control top.
- Familiar with the safety devices and their function.
- Familiar with this 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.

For work to be carried out on the control top the following user groups are distinguished:

User groups	
Staff	Qualifications
Operating staff	<p>Adequate instruction and sound knowledge in the following areas:</p> <ul style="list-style-type: none"> • Function of the control top • Operating sequences of the control top • What to do in case of an emergency • Lines of authority and responsibilities with respect to the task.
Maintenance staff	<p>Adequate instruction as well as sound knowledge of the design and function of the control top.</p> <p>Sound knowledge in the following areas:</p> <ul style="list-style-type: none"> • Mechanical equipment • Electrical equipment • Pneumatic system <p>Authorization with regard to safety engineering standards to carry out the following tasks:</p> <ul style="list-style-type: none"> • Setting devices into operation • Earthing of devices • Marking of devices <p>The relevant certificate of qualification must be submitted before work can be carried out on ATEX certified machines.</p>

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.

Instructions for the Safe Operation

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

General Principles:

To ensure the safe operation of the control top the following principles apply:

- The operating instructions must be kept ready to hand at the control top's place of use. It must be complete and in clearly legible form.
- Only use the control top for its intended use.
- The control top must be functional and in good working order. Check the condition of the control top before starting work and at regular intervals.
- Wear tight-fitting work clothing for all work on the control top.
- Ensure that nobody can get hurt on the parts of the control top.
- Immediately report any faults or noticeable changes on the control top to the person responsible.
- Observe the accident prevention regulations and all local regulations.

Installation

For installation, the following principles apply:

- Only properly qualified staff is allowed to install, assemble and set the control top into operation.
- 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.
- During assembly, the control top's safety devices might not be working effectively.
- Reliably secure machine parts which have already been connected against inadvertently being switched on.

Commissioning/Setup Mode

For 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.

Setting into Operation

For setting into operation, the following principles apply:

- Only allow properly qualified staff to set the control top into operation.
- Establish all connections correctly.
- 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.

Operation

For operation, the following principles apply.

- Monitor the control top during the 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 place of installation of the control top must be adequately ventilated at all times.
- Structural alterations of the control top are not permitted. Immediately report any changes on the control top to the person responsible.
- 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.

Shutting down

For shutting down, the following principles apply:

- Switch off the compressed air.
- Switch off the control top via 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 "Transport and Storage" (Page 19).

Maintenance and Repair

Before starting and maintenance and repair work on the electrical devices of the control top, carry out 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
- Cover or safeguard any adjacent live parts.

For maintenance and repair, the following principles apply:

- Observe the intervals specified in the maintenance schedule.
- Only allow qualified staff to carry out maintenance or repair work on the valve.
- Before starting any maintenance or repair work, the control top must be switched off and secured against being switched back on. 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 valve. 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 valve 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 allow qualified staff to disassemble the control top.
- Before starting disassembly, the control top must be switched off and secured against being switched back on. 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 valve. 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 "Transport and Storage" (Page 19).

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.

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 after the express permission of the manufacturer.
- After completion of all work, check that the protective devices are fully functional.

Signage

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
	General hazard warning
	Warning Crushing

Residual Risk

Hazard Areas

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.

Residual Dangers

Dangerous situations can be avoided by safety-conscious and proactive behaviour of the staff 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 Cover or safeguard any adjacent live parts.
Damage to property	Welding work can cause loss of data.	Do not carry out any welding work in the vicinity of the control top.
	Sensitive electrical connections.	Do not take the cap off the base.

Electrostatic sensitive devices and assemblies

The control top contains electronic components that are sensitive to electrostatic discharge. Contact with electrostatically charged persons or objects may endanger these components. At worst, they will be destroyed immediately or will fail after commissioning.

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

- observe the requirements of DIN EN 61340-5-1 and 5-2 and
- make sure that you do not touch electronic components when the supply voltage is connected!

Transport and Storage

Scope of Supply

On receipt of the control top check whether

- 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.

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.
- The synthetic materials of the control tops are fragile. Take care when transporting the control top. Do not grip sensitive parts of the cleaner to lift or push the cleaner or to support yourself.

Storage

If, during transport or storage, the control top is going to be exposed to temperatures $\leq 0^{\circ}\text{C}$, it must be dried and suitable measures be taken to protect it from damage.

NOTE

We recommend that the control top should be stored at a temperature of $\geq 5^{\circ}\text{C}$ for a period of 24 hours prior to any handling so that any ice crystals formed by condensation water can melt.

Intended Purpose

Designated Use

The programmable T.VIS A-15 control top can be used for the pneumatic and electrical connection of all Tuchenhagen process valves with VARIVENT adaptation . Using the device for any other purpose is considered contrary to its designated use.

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

- Position indicator without solenoid valve
- control top with solenoid valve

The complete unit is mounted on the actuator or adapter of the process valve provided for this purpose using two clamps.

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 T.VIS A-15 control top must not be used in areas which require ATEX approval. For UL conform installation and operation please observe special notes

NOTE

The manufacturer will not accept any liability for damage resulting from any use of the control top which is not in accordance with its designated use. The risk of such misuse lies entirely with the operator of the facility.

Requirements for the Operation

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

Improper Operating Conditions

The operational reliability of the valve cannot be ensured under improper operating conditions. Therefore avoid improper operating conditions.

Operating the control top 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 control top.
- Damage has been detected on the control top.
- Maintenance intervals have been exceeded.

Conversion Work

You should never make any technical modifications to the control top. 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 the reliable and economical operation of the control top.

Function

Operation Principle

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

Position Indicator

In its function as position indicator the T.VIS A-15 indicates the status of the process valve locally by coloured LEDs under the illuminated dome after programming.

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.

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

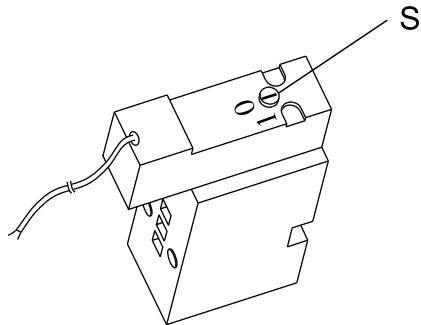
Control top

In its function as a control top, the positions are signalled in the same manner as for the position indicator function, with the difference being that the solenoid valve in the base is operated in accordance with the control signals. Depending on the design of the process valve, up to 3 solenoid valves can be installed in the control top.

To provide compressed air support to the actuator spring, a pneumatic NOT logic element can be used.

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

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 by manual operation or at the solenoids manual override. (Use a screw driver to turn the screw (S) by 45° in direction 1, see fig.).



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.

Buttons in the Cap

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:

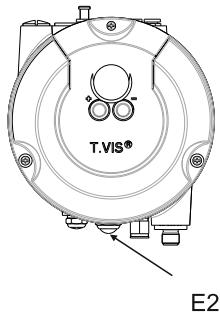
- Changing the tolerance ranges manually,
- factory setting to set the attenuation of feedback signals to inactive,
- the LEFF function can be activated on double-seat valves with lifting actuator.

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

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.



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 vent plug E2 must never be pointing vertically upwards.

Connections and Operation

Establishing Hose Connections

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

Requirement

- A hose cutter.

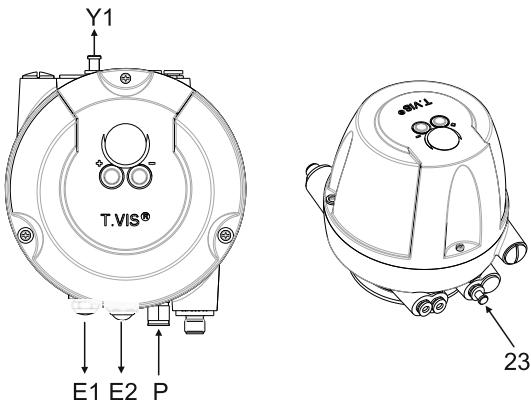
Carry out the following steps:

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

✓ Done

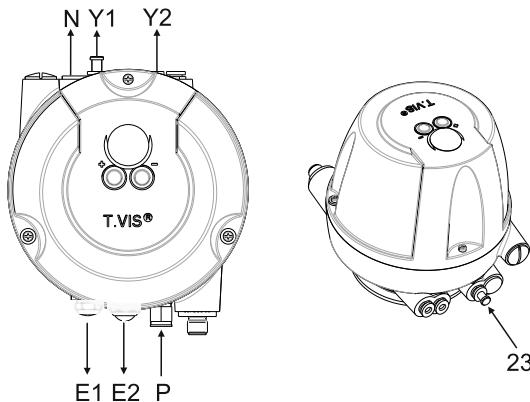
Pneumatic Connections

Control top with 1 Solenoid Valve or Without Solenoid Valve



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 Y2 and Y3 via sound absorber non-return valve Connection E2 must not be closed!
P	Central air supply with integrated filter Optional: Intake 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 plug (23) make sure that the relevant air connection is depressurized!

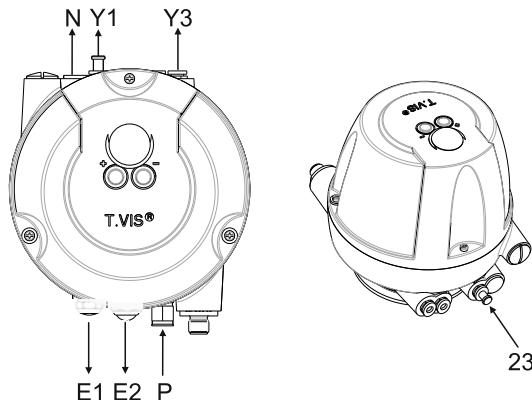
On most of the GEA Tuchenhagen valve types, solenoid valve P1 internally guides the main control air through the switch bar into the main actuator. The external air connection Y1 is provided in addition.

Control top with 2 solenoid – for lifting of the valve disc


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 Y2 and Y3 non-return valve Connection E2 must not be closed!
P	Central air supply with integrated filter Optional: Intake 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 or Not permitted for 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 plug (23) make sure that the relevant air connection is depressurized!

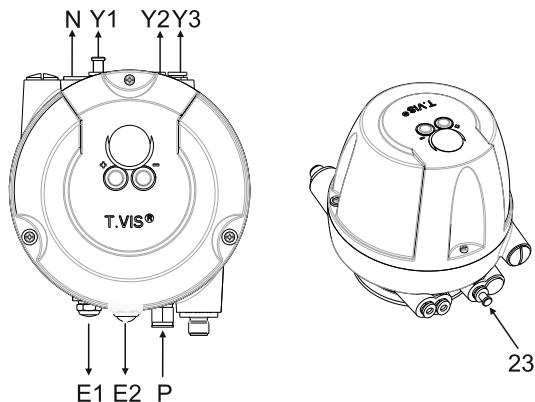
On most of the GEA Tuchenhagen valve types, solenoid valve P1 internally guides the main control air through the switch bar into the main actuator. The external air connection Y1 is provided in addition.

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



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 Y2 and Y3 non-return valve Connection E2 must not be closed!
P	Central air supply with integrated filter Optional: Intake 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 of the double disk, for external air connection of an air-air actuator or for 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 plug (23) make sure that the relevant air connection is depressurized!

The majority of types of Tuchenhagen valves the main control air is internally performed by the solenoid valve Y1 by the switching rod in the main actuator. The external air supply Y1 is also available.

Control top with 3 solenoid valves


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 Y2 and Y3 non-return valve Connection E2 must not be closed!
P	Central air supply with integrated filter Optional: Intake 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: Lift down (air connection at actuator top) Not permitted for main stroke of an external process valve
Y3	For VARIVENT® valves with lifting actuator: Air connection for lifting the double-disk For STERICOM® double-seal valves: Lift up (air connection at actuator bottom)
23	Plug Control air pressure can be present at the plugs for the air connections! Before removing a plug (23) make sure that the relevant air connection is depressurized!

On most of the GEA Tuchenhagen valve types, solenoid valve P1 internally guides the main control air through the switch bar into the main actuator. The external air connection Y1 is provided in addition.

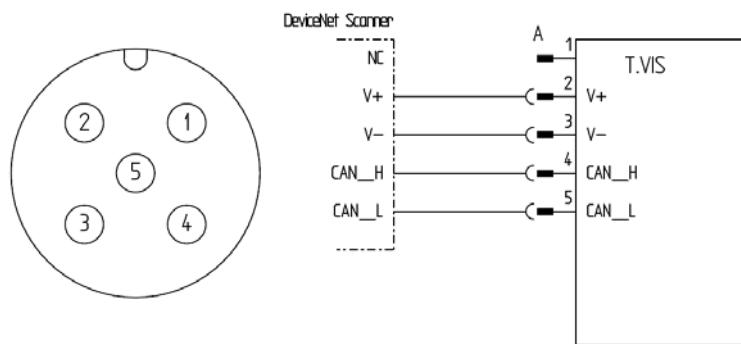
Electrical Connections



DANGER

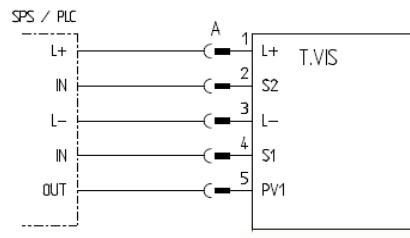
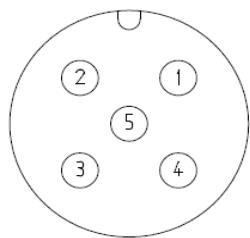
To fulfill UL requirements use a power supply with double isolation from hazardous voltages and supply by limited power circuit per UL/IEC 60950 or limited energie circuit per UL/IEC 61010 or class II power supply per NEC.

Electrical DeviceNet Wiring



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

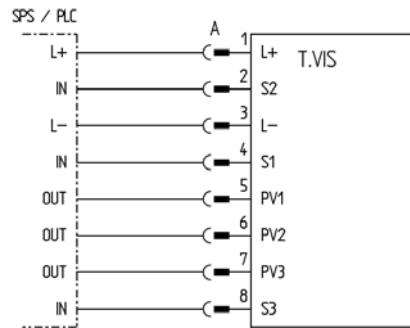
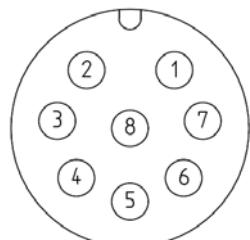
Electrical 24 V DC Wiring



5-pole M12 connector A-coded: device connector and view of male connector
 Matching cable socket part no. 508-963, see "Technical Data" (Page 75)

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

* For assignment for green colour variant, see "Colour Changeover" (Page 33)

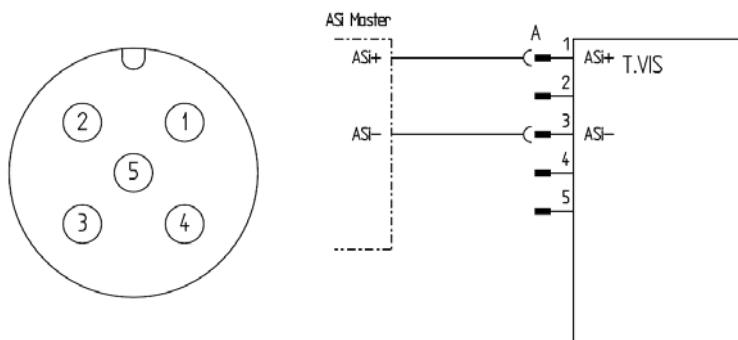


8-pole M12 connector A-coded: device connector and view of male connector
 Matching cable socket part no. 508-061, see "Technical Data" (Page 75)

1	L+	U_V L+24V DC supply voltage
2	S2	Feedback of actuated position*
3	L-	U_V L- reference potential
4	S1	Feedback of non-actuated position
5	PV1	Actuation of solenoid valve Y1
6	PV2	Actuation of solenoid valve Y2
7	PV3	Actuation of solenoid valve Y3
8	S3	Feedback (external proximity switch)

* For assignment for green colour variant, see "Colour Changeover" (Page 33)

Electrical AS-Interface Wiring

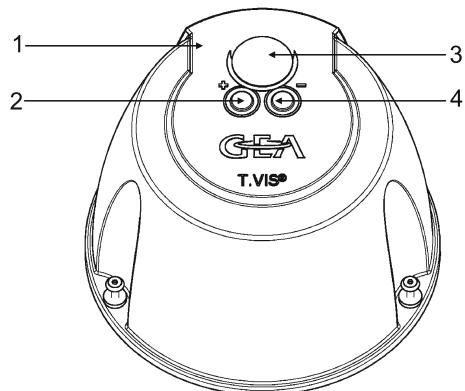


5-pole M12 connector A-coded: device connector and view of male connector
Matching cable sockets part no. 508-963, 508-027 and 508-028, see "Technical Data" (Page 75)

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

Visual Display

Luminous Cap



1	Cap
2	+ button
3	Luminous cap
4	- button

The following statuses are visualized by the luminous cap:

- Valve in non-actuated position: green, see "Colour Changeover" (Page 33)
- Valve in actuated position: yellow
- Valve disk lifting (without LEFF): flashing yellow
- Double-disk lifting (without LEFF): quick flashing yellow
- Valve disk VT or double-disk DT LEFF: flashing yellow/green
- Valve disk moving to the non-actuated position: flashing green
- Valve disk moving to the actuated position: flashing yellow
- Programming mode active: red
- Fault/malfunction: rapidly flashing red
- Default, standard version
Control top unprogrammed: flashing 3 times - pause - flashing 3 times - pause
Default, special version:
Control top unprogrammed: flashing 2 times - pause - flashing 2 times - pause

If no signal is displayed for a period of more than 5s, this indicates a power failure!

Colour Changeover

The "colour changeover" function allows you to change green to yellow and yellow to green.

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.



NOTE

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

Commissioning the Control top without solenoid valve

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:

- Check the function of the external solenoid valve.
- Switch on the power supply.
- Press the relevant buttons to switch to programming mode, see "Operating Overview" (Page 48).
- 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.
- Deactivate the solenoid valve. During this period, the luminous cap is lit red.
 - After completion of end position programming, the colours in the luminous cap change cyclically. Here you can select switching point tolerances and attenuations which deviate from the factory setting, see chapter "Operating Overview" (Page 48).
 - 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.

 Position indication is activated.

Checking Position Indication

Carry out the following steps:

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

 This completes commissioning.

Commissioning the Control top with solenoid valve

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. As the T.VIS A-15 is able to identify its solenoid valve configuration and assumes that the process valve is equipped accordingly, the so-called 'default, special version' must be selected prior to the SETUP if the actual use deviates from the configuration.

IMPORTANT NOTE

When using the function LEFF safety of the operation is no longer guaranteed.
Loss of the PMO approval.

- ➔ The LEFF function must not be activated at PMO valves.

IMPORTANT NOTE

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 compressed air supply.
 2. Switch on the power supply.
 3. Press the relevant buttons to switch to programming mode, see "Operating Overview" (Page 48).
 - ➔ 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 luminous cap is continuously lit red. After completion of end position programming, the colours in the luminous cap 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), also refer to "Operating Overview" (Page 48).
 - ➔ If 24/7 PMO valves (M_O types (06), M/2.0, MT / T_T (to 08) used in conjunction with the control top T.VIS A-15, the factory settings in the control top must 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 process valve moves to the non-actuated position.
- ✓ 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:

- ➔ Activate the solenoid valves via PLC in order to check the proper function of the T.VIS feedback signals.
- ✓ This completes commissioning.

NOTE

The solenoid valve can also be activated and deactivated in manual mode using the operating buttons, see “Operating Overview“ (Page 48).

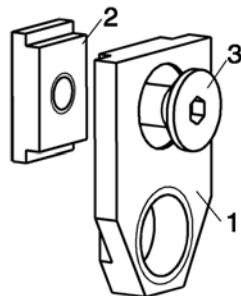
Service Function

If maintenance is to be carried out on a process valve equipped with T.VIS A-15, the valve insert must be pulled out of the body. For this purpose, the valve disk pretension of the process valve must be relieved by actuating the main actuator. This is made possible by the Service function, see “Operating Overview“ (Page 48).

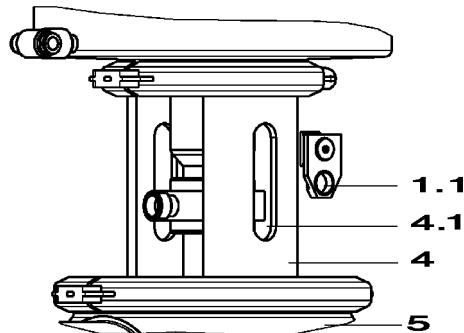
Fitting the proximity switch holder**Adjusting the Proximity Switch in the Lantern on Double-Disks Without Balancer on Valves D, R, Y, B**

Carry out the following steps:

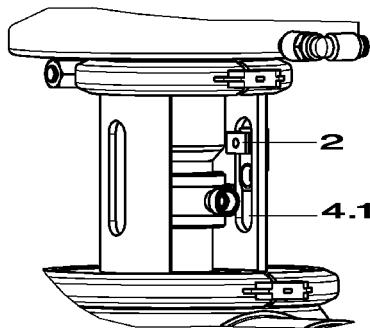
1. Preassemble sliding piece (1), countersunk screw (3) and nut NI (2).



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).



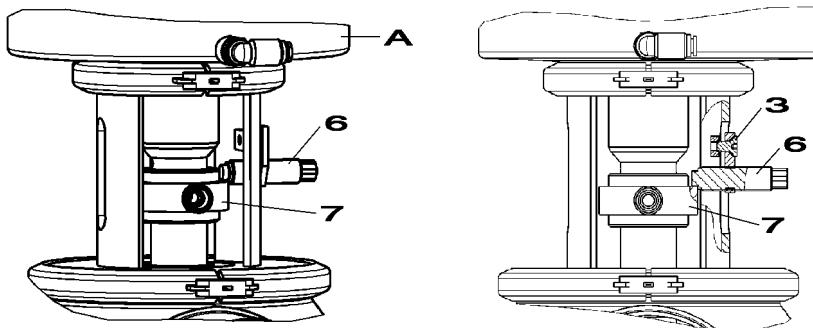
Done

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).



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.

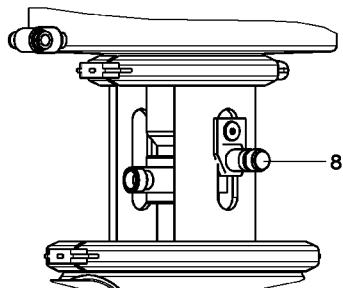
Done

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.

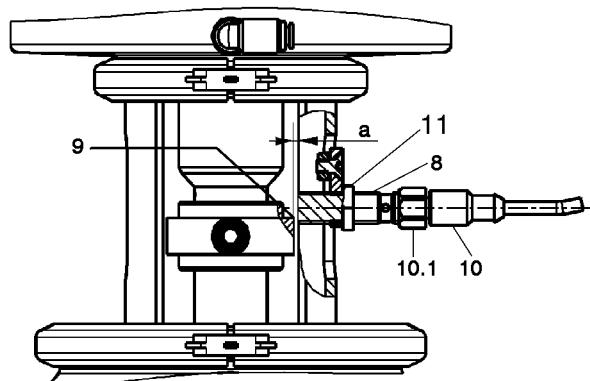


Done

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.



- 2.** Tighten the lock nut.
- 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:

- Check the feedback function by actuating solenoid valve Y3.
→ The LED must go out.
- ✓ The proximity switch has now been adjusted and checked.

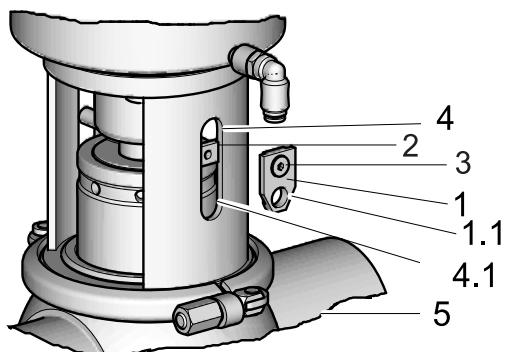
Adjusting of the external Sensor in the Lantern on the Valve PMO Type M/2.0

Fitting the proximity switch holder

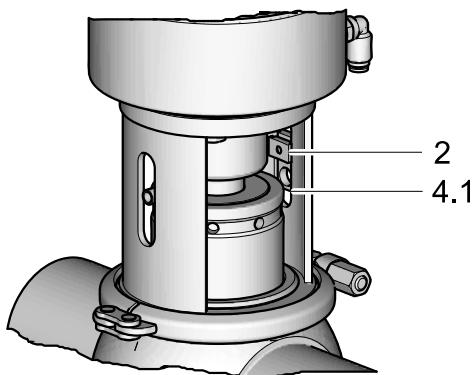


Carry out the following steps:

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



2. Fix the sliding piece (1) with the countersunk screw (3) in the orientation shown – with the mounting hole (1.1) facing in the direction of the housing (5).
3. Tighten the proximity switch nut (2) with the countersunk screw (3).

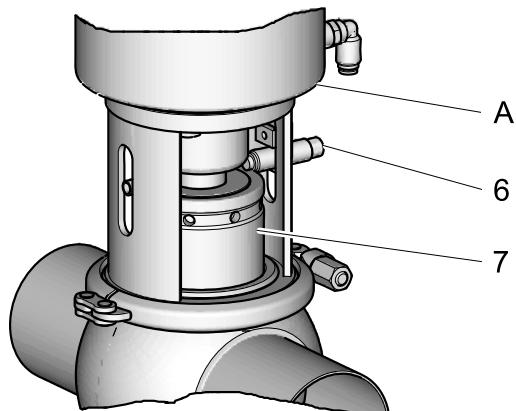


Done

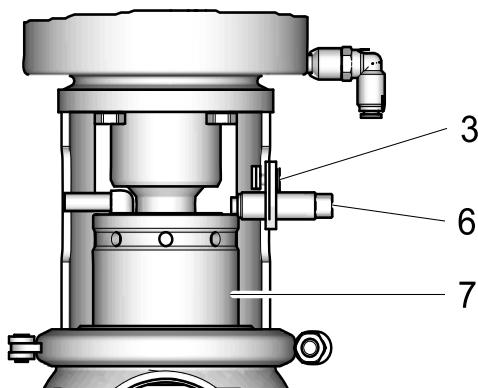
Adjusting the proximity switch holder


Carry out the following steps:

- 1.** Screw the adjusting screw (6) into the proximity switch holder down to the upper edge of the balancer (7).



- 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 balancer in the direction of the actuator (A).
- 3.** Fix the proximity switch holder in position with the countersunk screw (3).

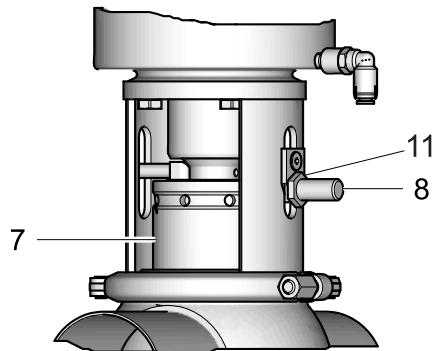


Done

Fitting the proximity switch


Carry out the following steps:

- 1.** Remove the adjusting screw (6).
- 2.** Screw the proximity switch M12 (8) into the proximity switch holder up to the balancer (7) together with counter nut (11).



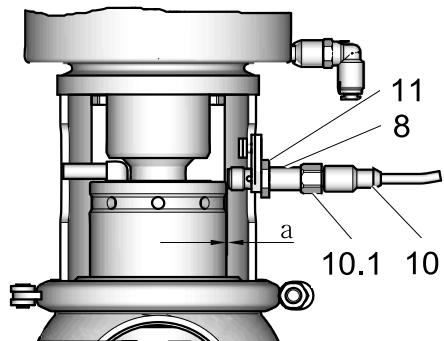
Done

Adjusting the proximity switch



Carry out the following steps:

1. Unscrew the proximity switch a full rotation (360°), to adjust distance (a) up 0.5 to 1.0 mm.



2. Tighten counternut (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:

- Check the feedback function by actuating solenoid valve Y3.
- The LED must go out.

✓ **Done**

Test Procedures for Tuchenhagen PMO Valve Type M/2.O

Purpose

- The purpose of test procedure 1 is for the Regulatory Inspector to check and ensure that the detecting devices which detect and confirm the closed position of the upper and lower seats of the PMO valve respectively (as per PMO Item 15p.(B) - Point 1.b.(2)) are adjusted and functioning properly.
- The purpose of test procedure 2 is to allow the Regulatory Inspector to confirm the proper control system interlocking of the PMO Valve type M/2.O during an active circuit CIP operation.

Test Procedure Overview

The methodology behind the test procedure 1 is for the Regulatory inspector to manually implement the upper seat lift and the lower seat lift operations locally at the valve, thereby verifying that the position detecting devices used for upper and lower seat closed position detection DO change status.

Hardware Description

1. The (blue-coloured) T.VIS A-15 Control Top on the top of the valve will house 3 solenoid valves
 - a) Solenoid Y1 – Main Valve Activation
 - b) Solenoid Y2 – Lower Seat Lift Activation
 - c) Solenoid Y3 – Upper Seat Lift Activation

These valves can be activated externally by sending signals from the PLC.

2. The lower seat closed position is detected by path measurement system. The correct adjustment of this system to detect the closed position of the lower seat is given in detail in Chapter “Commissioning the Control top with solenoid valve” (Page 35).

The sensitivity of the path measurement system is 0.1 mm.

3. The upper seat closed position is detected by the externally-mounted lantern proximity switch S3. The correct adjustment of this switch to detect the closed position of the upper seat is given in detail in the Operating instructions of the PMO Valve M/2.0 and in Chapter “Adjusting of the external Sensor in the Lantern on the Valve PMO Type M/2.0“ (Page 40).

The sensitivity of this proximity switch is also 0.1 mm.

Test procedure 1

Step 1

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

Step 2

Carry out the following steps:

- Activate the lower seat lift operation by activating solenoid Y2 from the PLC.
 - When the seat moves downwards (approx. 6 mm), the GREEN LED on the top of the control top will turn off to indicate that the position detecting device no longer sees the lower seat in its closed position.
 - If the GREEN LED does not turn off, the position detecting device is NOT adjusted correctly and the adjustment procedure described in the Operating instructions of the PMO Valve M/2.0 and in Chapter "Adjusting of the external Sensor in the Lantern on the Valve PMO Type M/2.0" (Page 40) should be repeated.

✓ Done

Step 3

Carry out the following steps:

- Activate the upper seat lift operation by activating solenoid Y3 from the PLC.
 - When the seat moves upwards (approx. 2 mm), the YELLOW LED on the externally-mounted lantern proximity switch will turn off to indicate that the proximity switch S3 no longer sees the upper seat in its closed position.
 - If the YELLOW LED does not turn off, the upper seat proximity switch S3 is NOT adjusted correctly and the adjustment procedure described in the Operating instructions of the PMO Valve M/2.0 and in Chapter "Adjusting of the external Sensor in the Lantern on the Valve PMO Type M/2.0" (Page 40) should be repeated.

✓ Done

Test procedure 2

The **methodology** behind test procedure 2 is to allow the Regulatory Inspector to manually force open the seat opposite to the valve housing which is part of an active CIP circuit to ensure that proper control system interlocking is in place. In this case, the CIP supply pump or the source of the CIP solution pressure should be deactivated.

CAUTION

Please note that great care should be taken with test procedure 2 as there is danger of CIP mixing with product if the proper control system interlocks are not in place. Ensure that product is NOT present in the valve housing opposite to the housing which is part of the active CIP circuit for the duration of this test!

Step 1

Ensure that the valve being tested is part of an active CIP circuit program and determine which housing (upper or lower) of the valve is part of that active CIP circuit.

Step 2

Carry out the following steps:

1. If the upper housing is part of the active CIP circuit
Activate the lower seat lift by activating solenoid Y2 from the PLC
2. If the lower housing is part of the active CIP circuit
Activate the upper seat lift by activating solenoid Y3 from the PLC

✓ Done

Step 3

If the control system is properly interlocked, the CIP supply pump or the source of the CIP solution pressure will be deactivated. If the CIP supply pump or the source of the CIP solution pressure does NOT deactivate, the system should be shut down immediately for an investigation of the control system interlocking software.

Operation

Settings in Programming Mode

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
Tolerance 2	0.7 mm	Seat valves (factory setting)
Tolerance 3	1.0 mm	Valves with logic element NOT Control air for spring force backup
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 isolation chamber on mixproof valves. For this purpose, solenoid valves Y2 and Y3 are actuated in succession by the PLC. Simultaneous actuation is not possible. This also applies to the operating mode.

By using the LEFF function in valves of type D or B in the lift stroke must be set from 1.2 to 1.4, see also operating instructions Mixproof valve type D and B.

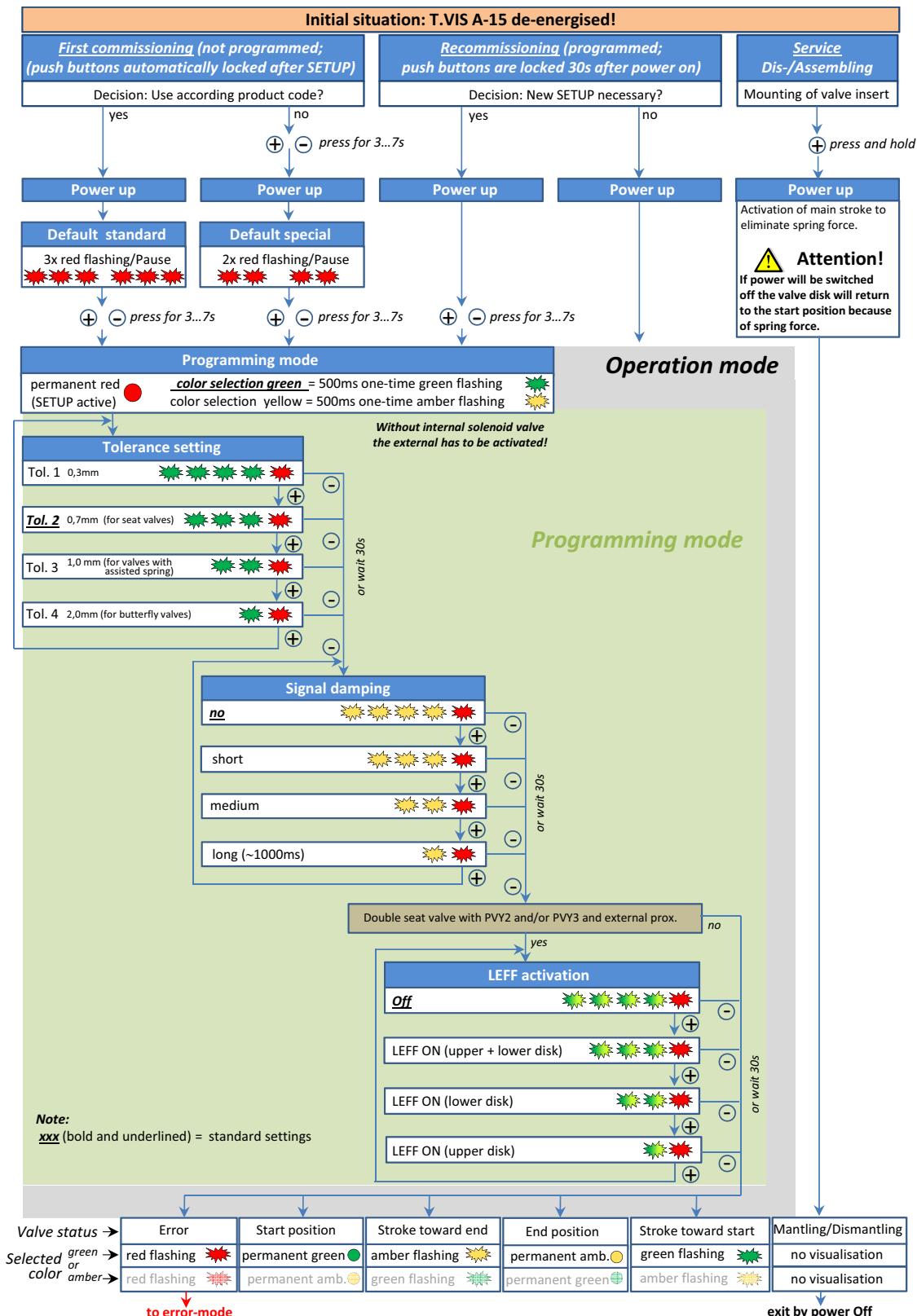
LEFF activation	
Off	Factory setting
Valve disk and double-disk	For lifted mixproof valves with solenoid valves Y2 and Y3 and external proximity switch in the lantern
Valve disk	For lifted mixproof valves with solenoid valve Y2
Double-disk	For lifted mixproof valves with solenoid valve Y3 and external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

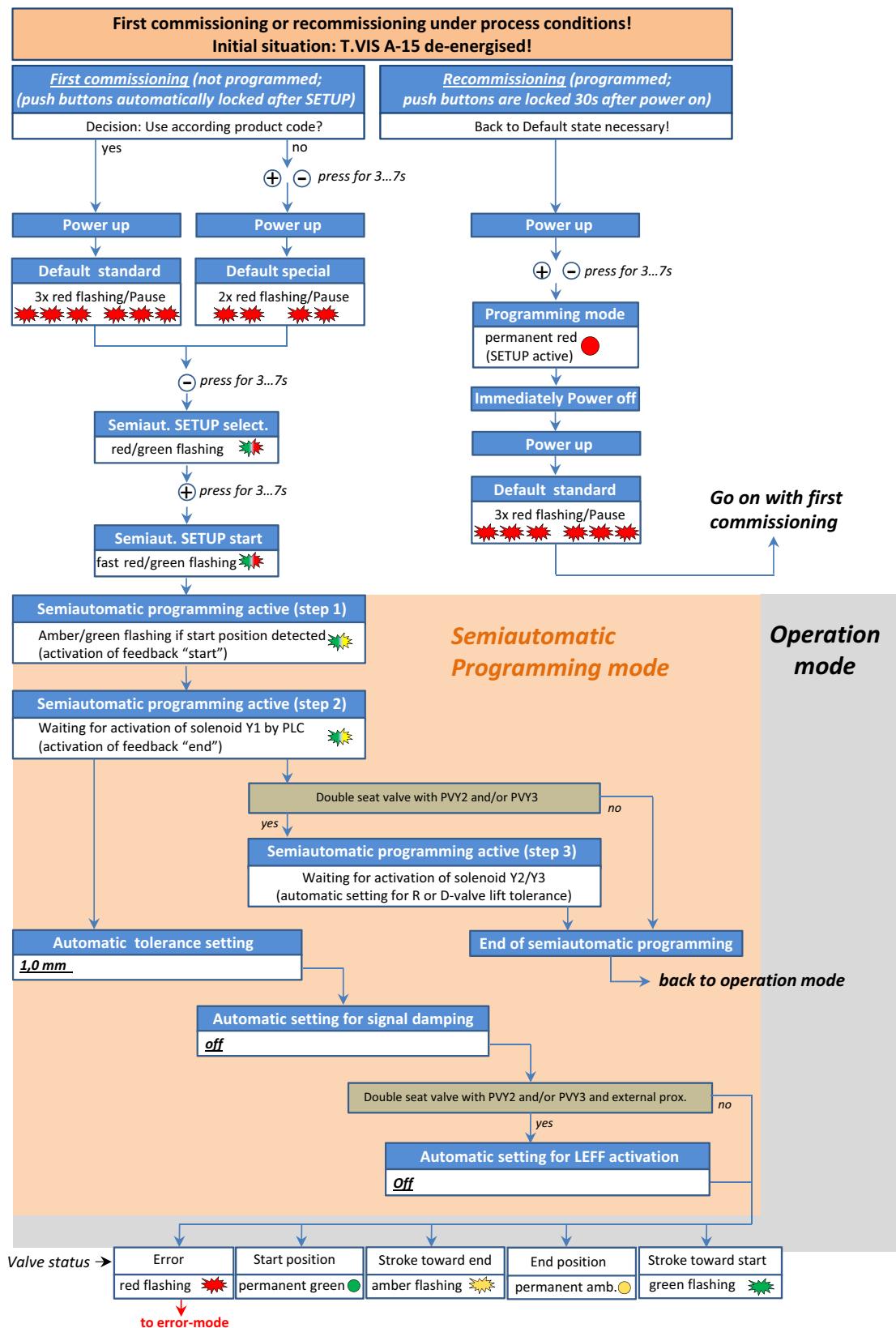
Semi-automatic SETUP

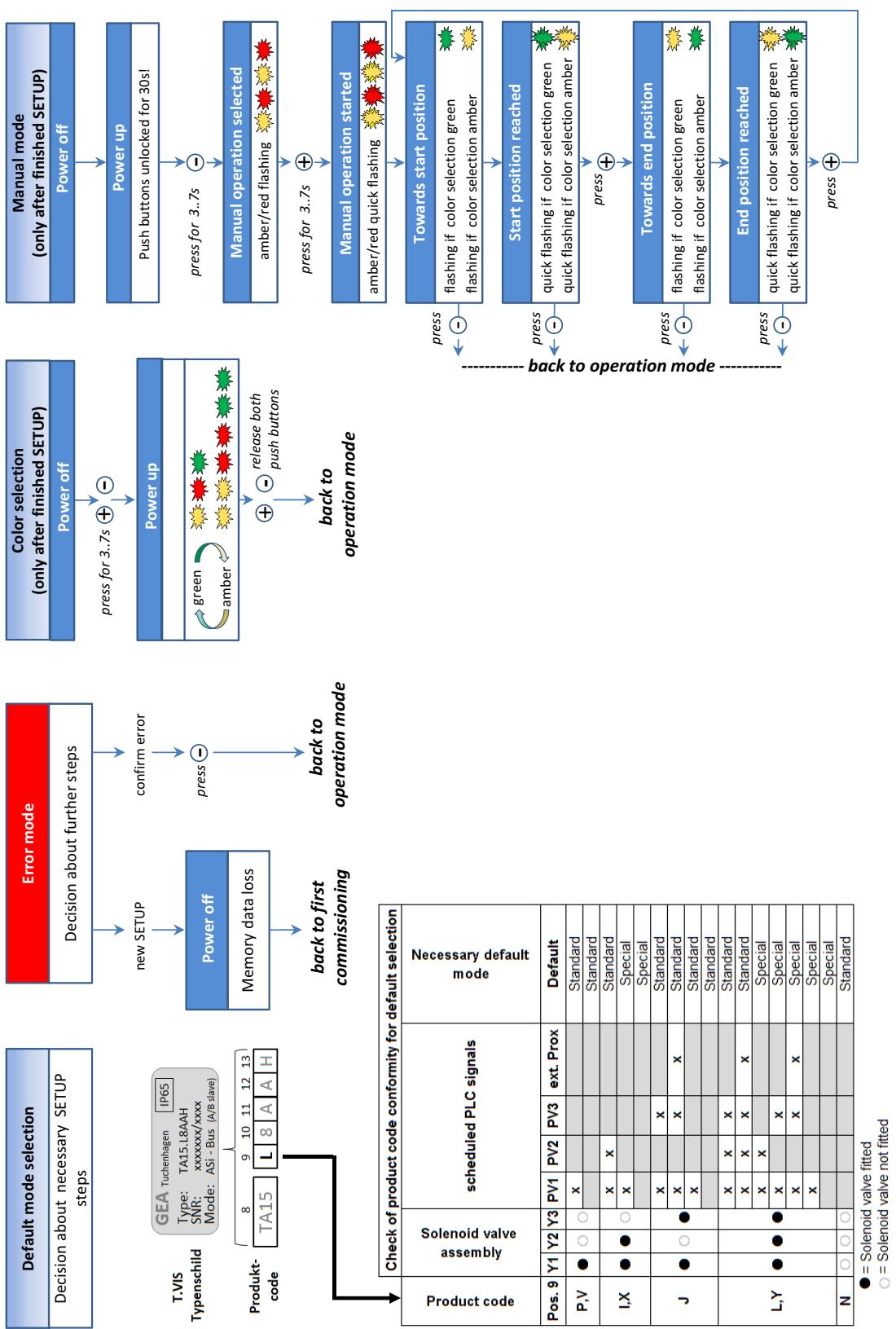
In the event that SETUP should be required during a production phase that does not allow manual activation of the individual actuators, a semi-automatic SETUP can be performed.

This makes it possible, for instance after replacing a control module, to automatically detect the definite end positions of a process valve and to output them as a feedback signal without having to run a standard SETUP procedure in which the valve is moved to its end positions several times. If semi-automatic SETUP is activated, the PLC can continue the production process without any restrictions and without any danger to the product. Full monitoring of the valve is still ensured.

Operating Overview







Mounting the Control top to different Valves

This chapter describes how the T.VIS A-15 control top is mounted to and removed from actuators of different valve types.

IMPORTANT NOTE

Magnetic fields can affect the proximity switch system.

Measured values can be changed.

- Protect the control top from external magnetic fields.

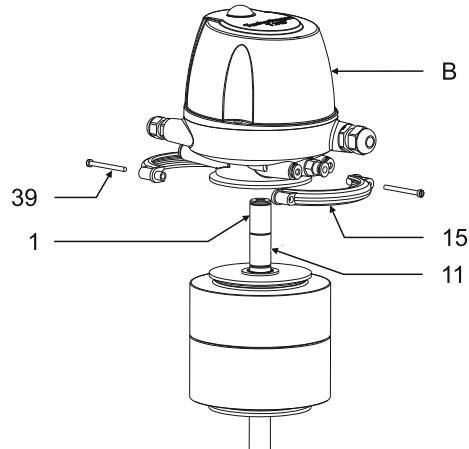
IMPORTANT NOTE

The vent-E2 is a safety element.

Incorrect installation or covering the vent security is no longer guaranteed.

- The installation position of the vent-E2 must never be directed vertically upwards.
- The vent-E2 must never be covered.

Mounting to VARIVENT Valve or STERICOM Valve Types N_A/D, N_A(08), T_A(08)



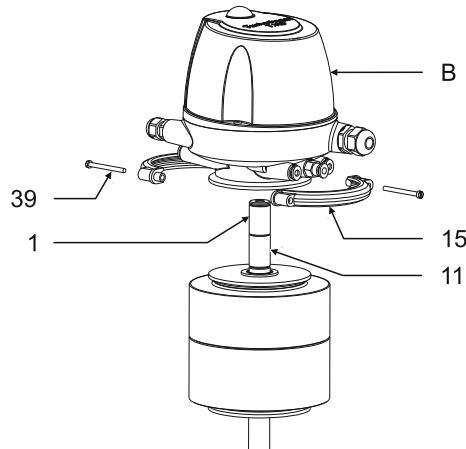
Requirement

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

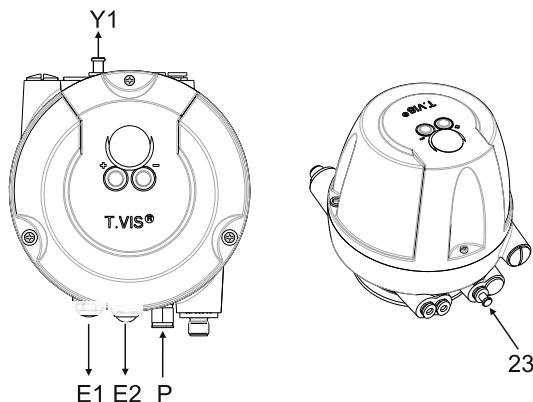
Carry out the following steps:

1. Check that the switch bar (1) is firmly in place. If necessary, tighten at (1.1) using an open end spanner, tightening torque 2 Nm (1.4 lbf).
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 air connection Y1 with a plug (23), as the air is guided inside the T.VIS A-15 control top.



6. Carry out commissioning, see "Connections and Operation" (Page 25).

Done

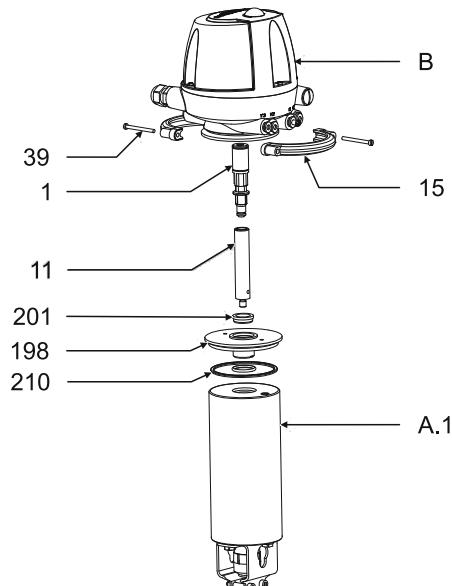
Mounting to Butterfly Valve T-smart 8000

Requirement

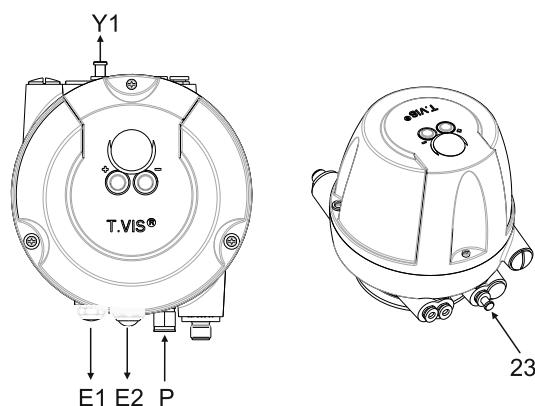
- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

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



2. Mount the O-ring (210).
3. Use a face spanner to screw the locking screw (198) into the actuator (A.1).
4. Screw switch bar (1) and switch bar (11) into the actuator.
5. Fit the control top (B) over the switch bar (1) and on the actuator.
6. Fix the clamps (15) by tightening the screws (39) to a torque of 1 Nm (0.7 lbft).
7. Align the pneumatic and electrical connections in accordance with the valve block configuration.
8. Close air connection Y1 with a plug (23), as the air is guided inside the T.VIS A-15 control top.



9. Carry out commissioning, see "Connections and Operation" (Page 25).

✓ Done

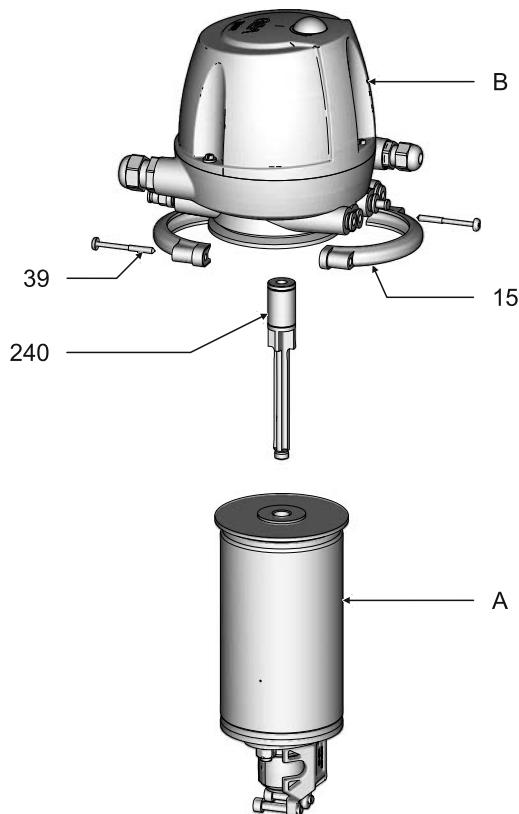
Mounting to Butterfly Valve T-smart 7

Requirement

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

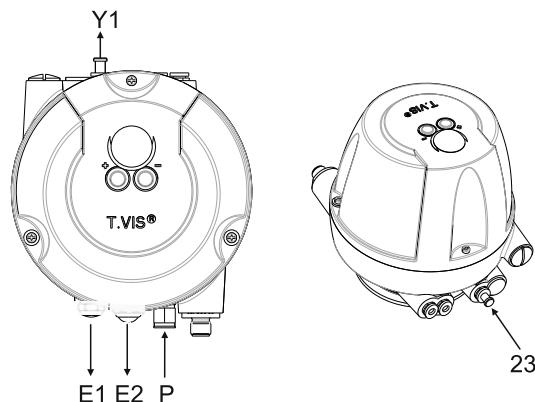
Carry out the following steps:

1. Screw switch bar (240) into the actuator and fix with a torque of 22 Nm (16 lbft).



2. Fit the control top (B) over the switch bar (240) and on the actuator.
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 air connection Y1 with a plug (23), as the air is guided inside the T.VIS A-15 control top.



6. Carry out commissioning, see "Connections and Operation" (Page 25).

Done

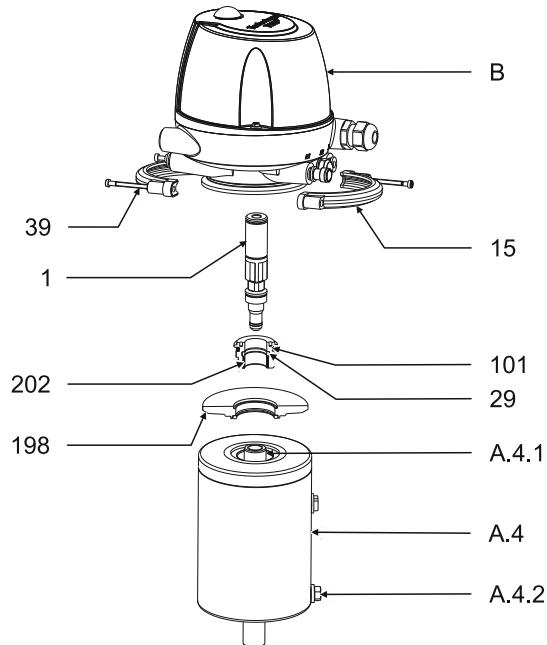
Mounting to ECOVENT Valves N_ECO and W_ECO

Requirement

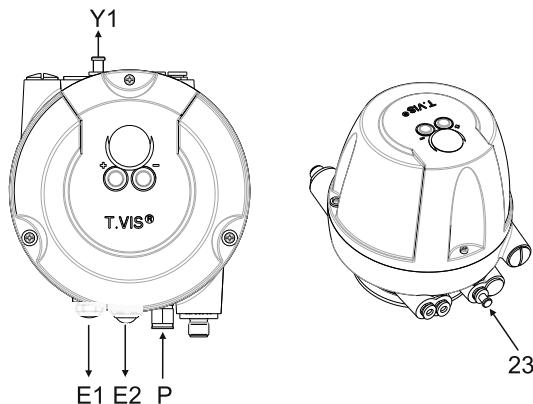
- Pay attention not to kink the air hoses when mounting the control top.

Carry out the following steps:

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



2. Screw the mounting 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 open end spanner 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. Fix the clamps (15) by tightening the screws (39) to a torque of 1 Nm (0.7 lbft).
6. Align the pneumatic and electrical connections in accordance with the valve block configuration.
7. As the air is guided inside the T.VIS control top (B), connection A.4.2 on the actuator and air connection Y1 (23) on the control top are closed.



8. Carry out commissioning, see "Connections and Operation" (Page 25).

✓ Done

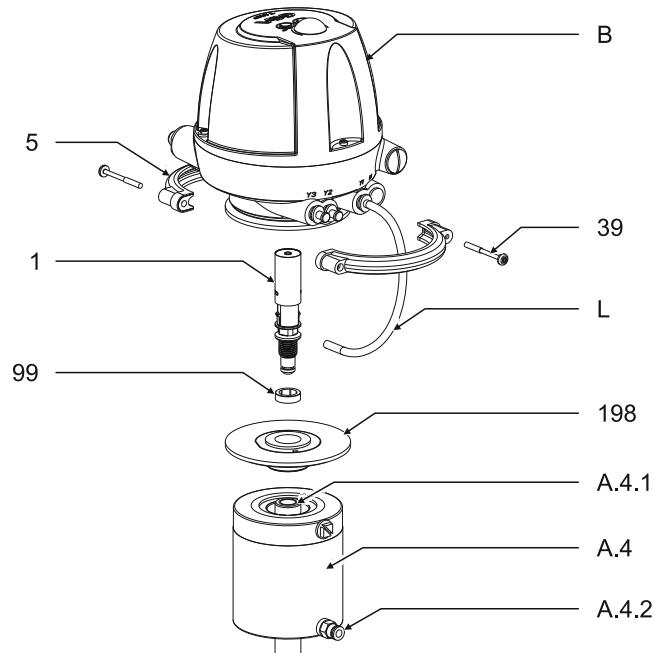
Mounting to VESTA XL Valve H_A/M

Requirement

- Pay attention not to kink the air hoses when mounting the control top.
- The axial hole in the actuator piston rod must be long enough to accommodate the stroke length to ensure that the proximity switch can be introduced without being damaged.

Carry out the following steps:

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



2. Screw the mounting 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 open end spanner 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. Fix the clamps (15) by tightening the screws (39) to a 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 XL valves, connect the air connection (Y1) on the control top to connection A.4.2 on the actuator with an air hose (L).
8. Carry out commissioning, see "Connections and Operation" (Page 25).

Done

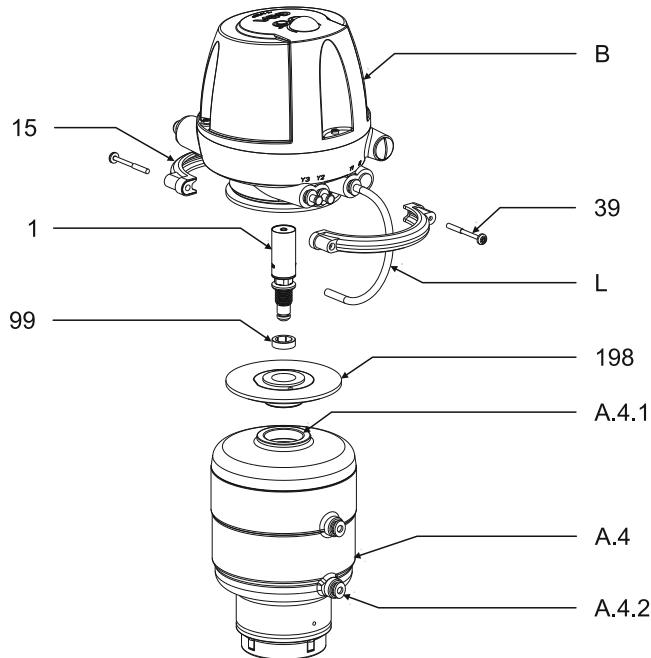
Mounting to VESTA XL Valve H_A

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).



2. Screw the adapter into the actuator (A.4.1) 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 (A.4) and tighten using a face spanner.
5. Screw the switch bar (1) into the adapter (139) and tighten by applying an open end spanner at (1.1), tightening torque 2 Nm (1.4 lbft).
6. Fit the control top (B) over the switch bar (1) and on the actuator.
7. Fix the clamps (15) by tightening the screws (39) to a 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 XL valves, connect the air connection (Y1) on the control top to connection A.4.2 on the actuator with an air hose (L).
10. Carry out commissioning, see "Connections and Operation" (Page 25).

✓ Done

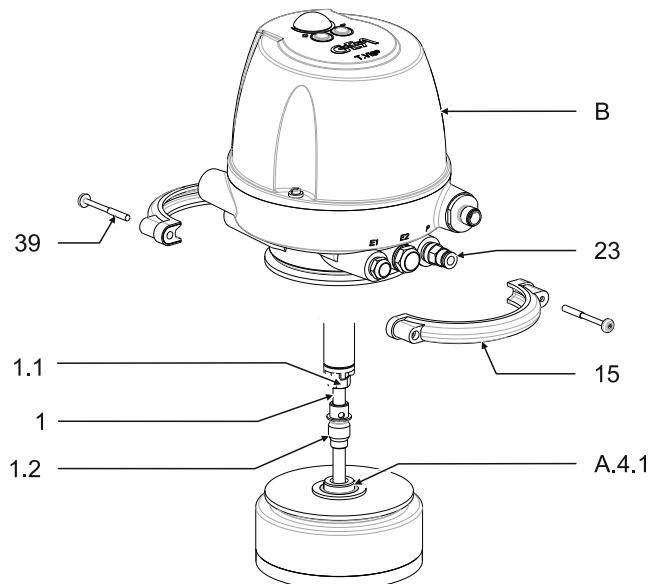
Mounting to Mixproof Valves Type R, T_R, M/2.0, M_0(06), MT/T_R(08) with Lifting Actuator

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 pin punch Ø4, tightening torque 2 Nm (1.4 lbft).



2. Insert the switch bar (1) through the sliding piece into the piston rod A 4.1 and use a open end spanner SW13 to tighten at 1.1 (22 Nm).
3. Fit the control top (B) over the switch bar (1) and on the actuator.
4. Fix the clamps (15) by tightening the screws (39) to a torque of 1 Nm (0.7 lbft).
5. Align the pneumatic and electrical connections in accordance with the valve block configuration.
6. Close air connection Y1 with a plug (23), as the air is guided inside the T.VIS A-15 control top.
7. Carry out commissioning, see "Connections and Operation" (Page 25).

✓ Done

Malfunctions

Remedy faults

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

Malfunction, 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 activ	Check the electrical connection 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	Unit has at least been programmed once	Reprogram in order to adjust to the process conditions: Press the + and - buttons at the same time for 3-7 s, see "Operating Overview" (Page 48)
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 intake air throttle further.

Malfunction, Cause, Remedy (Cont.)

Malfunction	Signalling	Cause	Remedy
Programming cannot be completed	Rapidly flashing red light	<p>End positions cannot be reached due to missing control air pressure or</p> <p>due to incorrectly fitted switch bar</p> <p>Throttle settings are incorrect</p> <p>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</p> <p>Air hoses for the lifting actuators mixed up</p> <p>External proximity switch connected but set incorrectly</p> <p>The minimum stroke when lifting the valve disk has not been reached.</p>	<p>Check the control air pressure: Observe the minimum pressure for the process valve indicated on the type plate</p> <p>Check and tighten the fitted adapter, see "Replacing the Seals on the Base" (Page 73)</p> <p>Open the intake air throttle further Open the exhaust air throttle further</p> <p>Use a suitable control top or Select default, special version</p> <p>Correct the connections</p> <p>Set the proximity switch correctly</p> <p>Correct the lifting stroke</p>
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 in accordance with "Operating Overview" (Page 48)
	Red LED permanently lit	T.VIS A-15 currently in programming mode	Wait until programming mode ends
	Red LED flashing rapidly	<p>Fault on T.VIS A-15:</p> <p>Programmed position has been overrun (possibly as a result of deformation of the bellows) only if tolerance 0.3 mm is selected or</p> <p>LEFF function faulty</p>	<p>Check the bellows and reprogram the unit if necessary in accordance with the "Operating Overview" (Page 48)</p> <p>Acknowledge the fault using the - button and check the LEFF requirements: air pressure, external proximity switch</p> <p>In addition to the LEFF function, pulsing is programmed in the PLC.</p>

Carry out Reset – back into Default Standard

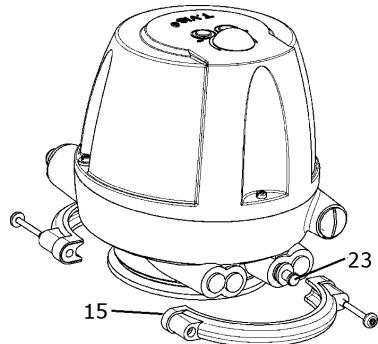
Carry out the following steps:

1. Start SET UP procedure.
2. Switch off the operating voltage.
→ LED off, data loss in the memory
3. Set the control top into operation, see “Commissioning the Control top without solenoid valve“ (Page 34) or “Commissioning the Control top with solenoid valve“ (Page 35).

 Done

Maintenance

Inspections



Carry out the following steps:

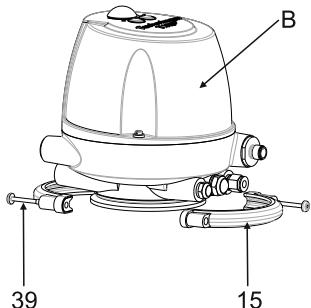
1. Check that the electrical connectors are properly secured.
2. Check that the air hose connections are firmly secured.
3. Check that the clamp (15) is firmly in place.
4. Check that the plug (23) is firmly in place.
5. Check the sound absorber, filter, non-return valve and the exhaust air throttle for soiling.
6. Check the housing for mechanical damage.

✓ Done

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.

Removing the Control top from the Valve



Requirement

- Make sure no solenoid valve is electrically activated.

Carry out the following steps:

1. Undo the screws (39).
2. Remove the clamps (15).
3. Pull off the control top (B) upwards. The green LED goes out and the yellow LED is flashing.

Done

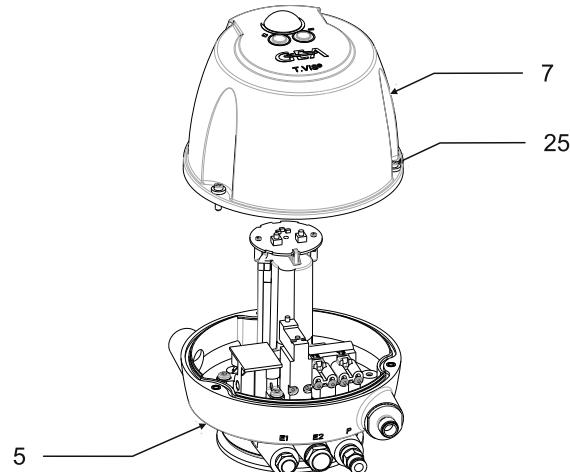
Dismantle the Control top into its Components

Variants of the Control top

The control top can be fitted with:

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

Removing the Hood



DANGER

Electric power

Danger of life!

→ Switch off electrical current and control air before taking apart the control module.

Carry out the following steps:

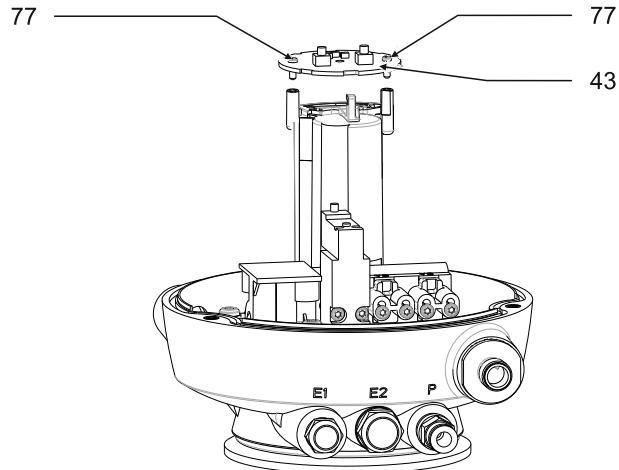
→ Undo the 3 screws (25) of the hood (7) and remove hood (7) from base plate (5).

✓ Done

Dismantling and Assembling the PCB

Carry out the following steps:

1. Unscrew and remove screws (77).



2. Remove all cables from the PCB (43).



NOTE

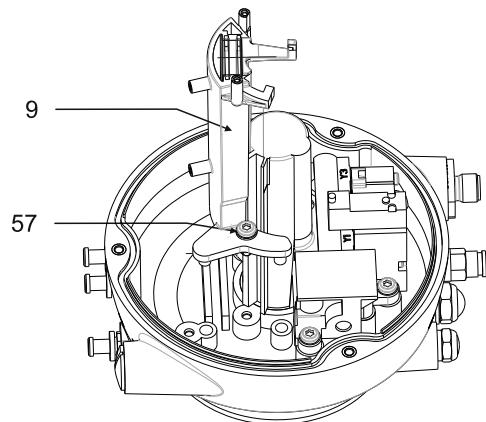
In order to minimize or avoid the possibility of damage from electrostatic discharge:

- observe the requirements of DIN EN 61340-5-1 and 5-2 and
- make sure that you do not touch electronic components when the supply voltage!

Dismantling and Assembling the Sensor module (9)

Carry out the following steps:

- 1.** Unscrew and remove screws (57).



- 2.** Remove the sensor module (9) from the base plate.



Dismantling the Logic element NOT (gasket package)

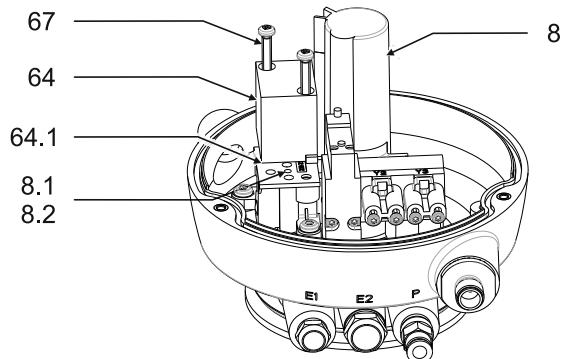
Requirement

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

Carry out the following steps:

→ Undo screws (67) and remove logic element NOT (64) complete with flat gasket and adapter plate (64.1).

! If needed, change the gasket package only (64.1), consisting of screws and gasket.



Mounting the Logic element NOT (gasket package)

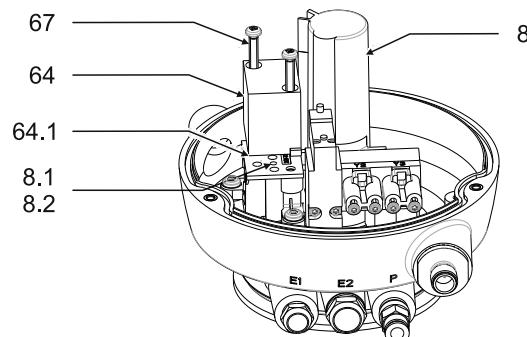
Requirement

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

Carry out the following steps:

- Mount the logic element NOT (64) in reverse order.

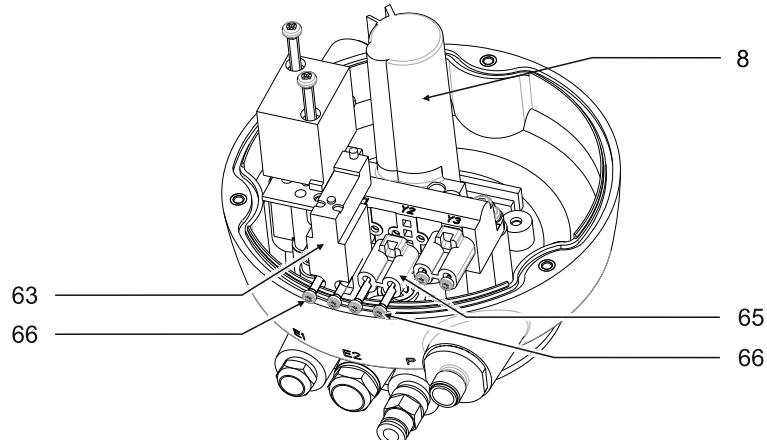
- ! Insert the positioning peg of the logic element NOT into the bore (8.1) of the pneumatic block (8) and take care that the position of the bore (8.2) fits with flat seal (64.1).



NOTE

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

Dismantling Solenoid valves and Control plate



Requirement

- Adhere to the assignment of the cable between the solenoid valve and the PCB – Solenoid valve Y1 to be connected to Pico Blade Y1; solenoid valve Y2 to Pico Blade Y2 and solenoid valve Y3 to Pico Blade Y3.
- Use only solenoid valves which are specified in the Chapter “Technical Data” > “Technical Data“ (Page 75).



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 cable of the solenoid valve from the Pico Blade of the PCB (43).
2. Undo screws (66) and separate the solenoid valve (63) from the pneumatic block (8).
3. Undo screws (66) and separate the control plate (65) from the pneumatic block (8).

Done

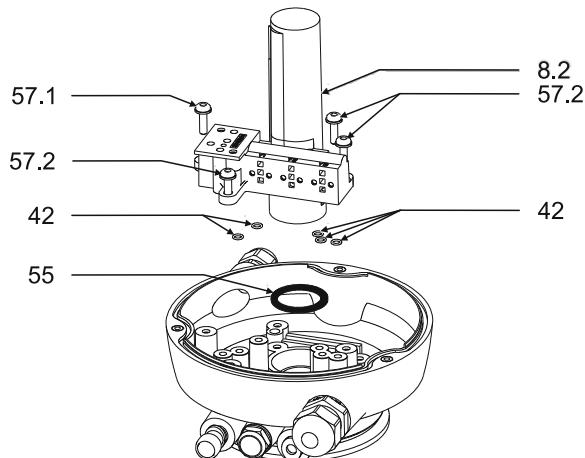
Dismantling the Pneumatic block

Requirement

- If only the O-rings (42) and (55) are to be changed, the solenoid valves (63) /control plate and the logic element NOT (64) on the pneumatic block (8) can remain screwed in place.
- Prior to installation, slightly lubricate seals to prevent them from falling out!

Carry out the following steps:

1. Undo screws (57.1, 57.2).



2. Pull out pneumatic block (8).
3. Change the 3 O-rings (42) on the pneumatic block (8.1).
! Prior to installation, slightly lubricate O-rings to prevent them from falling out!
4. Change the 6 O-rings (42) on pneumatic block (8.2) (without logic element NOT 5 pieces).
! Prior to installation, slightly lubricate O-rings to prevent them from falling out!
5. Change the O-ring (55).
! Prior to installation, slightly lubricate O-rings to prevent them from falling out!



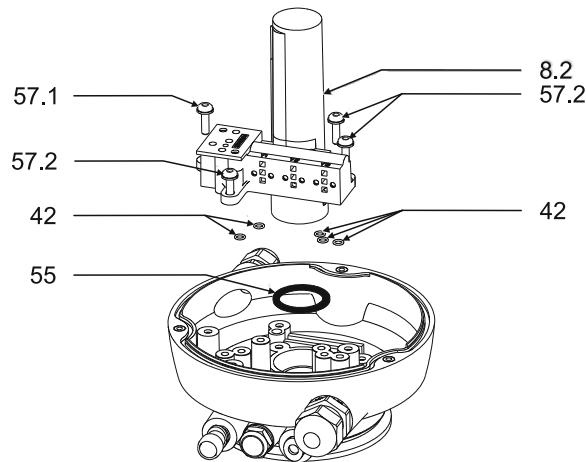
Assembling the Pneumatic block

Requirement

- Prior to installation, slightly lubricate seals to prevent them from falling out!

Carry out the following steps:

- When installing the pneumatic block, first screw in screw (57.1) and then screw (57.2): tightening torque 2 Nm (1.4 lbft).

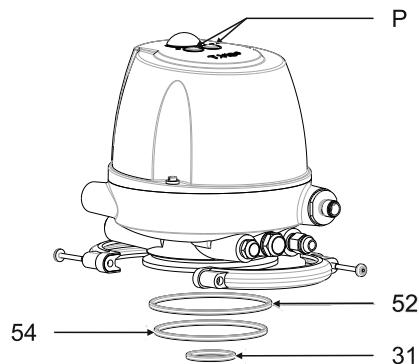


- For other mounting parts (interface module, adaptor module, solenoid valves, control plate, logic element NOT), see the corresponding chapter on the preceding pages.



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).

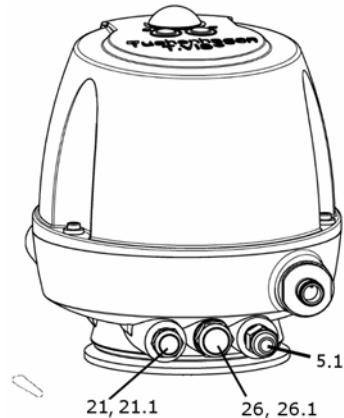


Carry out the following steps:

1. Check the two push buttons (P) on aging and cracks.
2. Take out the O-rings (31, 52, 54) and replace them with new ones.

✓ Done

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



Requirement

- Only use a non-return valve (26.1) and sound absorber (26) as specified in chapter “> “Spare Parts Lists“ (Page 82).

Carry out the following steps:

- Check that the control air can exit freely from the sound absorbers (21, 26), non-return valve (26.1), filter (5.1) and the exhaust air throttle (21.1) and replace the parts if necessary.
- Do not grease the spare parts before fitting them.

✓ Done

Disposal

Dispose of the control top at the end of its life cycle in an environmentally friendly manner. Observe the statutory waste disposal regulations applicable at the place of installation.

The control top is made 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 manuals for the individual components.

Technical Data

General Technical Data

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

Technical data: temperatures and compressed air supply

Designation	Description
Ambient temperature	-20 to +60 °C
Control air	acc. to ISO 8573-1:2001
- Solid particle content:	Quality class 6 (recommended) Particle size max. 5µm 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
Air hose	
- Metric	Material PE-LD Outside dia. 6 mm Inside dia. 4 mm
- Inch	Material PA Outside dia. 6.35 mm Inside dia. 4.3 mm
Control air pressure	max 8 bar, min 2 bar
Sound pressure level using sound absorber	max. 72 dB

Technical data: materials

Designation	Description
Housing	PA 12/L
Seals	NBR / EPDM
Operating elements	TPE

Technical data: electrical data

Designation	Description
Protection class	IP66, optionally IP67 (EN 60529) optionally IP69k
Installation position	any position
EC EMC directives	89/336/EEC
Immunity for industrial environments	EN 61000-6-2
EC Low Voltage Directive	73/23/EEC
UL61010-1	CSA-22.2 No.61010-1
Electrical wiring configuration	– 5pol. M12 circular connector only for – 8pol. M12 circular connector only for 24 V version with 2 to 3 solenoid valves
Switch point tolerance	adjustable: 0.3; 0.7; 1.0; 2.0 mm
Signal attenuation of feedback group	none; short; medium; long



To fulfill UL requirements use a power supply with double isolation from hazardous voltages and supply by limited power circuit per UL/IEC 60950 or limited energie circuit per UL/IEC 61010 or class II power supply per NEC.

Furthermore please notice following restrictions:

1. Indoor use only
2. Maximum altitude 2000 m
3. Maximum humidity 93%rh

Specification of 24V DC Version

Technical data: power supply

Designation	Description
Supply voltage U_V	24 V DC (+20%... -12.5%)
Current consumption - No-load current - One solenoid valve - Max. feedback load	$\leq 25 \text{ mA}$ 35...45 mA 200 mA
Total	approx. 265 mA

Technical data: inputs

Designation	Description
Control voltage	max. 28.8 V DC High = ≥ 13 V DC Low = ≤ 6 V DC
Control current	≤ 10 mA

Technical data: outputs

Designation	Description
Output voltage	High = $U_V - \leq 1$ V Low = ≤ 5 V
Max. current per output	100 mA short circuit proof
Switching frequency (resistive + inductive loads ≤ 25 mH)	2 Hz

AS-Interface Specifications

Technical data: power supply

Designation	Description
Supply voltage U_V	26.5...31 V DC
Current consumption - No-load current - One solenoid valve	≤ 25 mA 35...45 mA
Total	approx. 65 mA

Technical data: inputs as seen from the AS-Interface master

Bit	Function	Signal
DIO*	Feedback Main stroke	1 = valve in non-actuated position 0 = valve outside tolerance for non-actuated position
DI1*	Feedback Main stroke	1 = valve in actuated position 0 = valve outside tolerance for actuated position
DI2	Feedback Double-disk	1 = double-disk closed 0 = double-disk not closed
DI3		not assigned

* For assignment for green colour variant, see "Colour Changeover" (Page 33)

Technical data: outputs as seen from the AS-Interface master

Bit	Function	Signal
DO0	Activation of solenoid valve Y1	1 = solenoid valve activated 0 = solenoid valve not activated
DO1	Activation of solenoid valve Y2	1 = solenoid valve activated 0 = solenoid valve not activated
DO2	Activation of solenoid valve Y3	1 = solenoid valve activated 0 = solenoid valve not activated
DO3	reserved for A/B identification	

Designation	Description
AS-i-Specification	V3.0
Configuration IO-Code / ID-Code / ID2-Code	7.A.E.
Reverse voltage protection	yes

DeviceNet Specifications

Technical data: power supply

Designation	Description
Supply voltage U_V without solenoid valve	11...26 V DC
Supply voltage U_V with solenoid valve	21...26 V DC
Current consumption - No-load current - Solenoid valve	≤ 35 mA 35...45 mA
Total	approx. 75 mA

Technical data: inputs

Bit	Function	Signal
I-0*	Feedback Main stroke	1 = valve in non-actuated position 0 = valve outside tolerance for non-actuated position
I-1*	Feedback Main stroke	1 = valve in actuated position 0 = valve outside tolerance for actuated position
I-2	Double-disk feedback	1 = double-disk in non-actuated position 0 = double-disk not in non-actuated position Or no external sensor present.
* For assignment for green colour variant, see "Colour Changeover" (Page 33)		

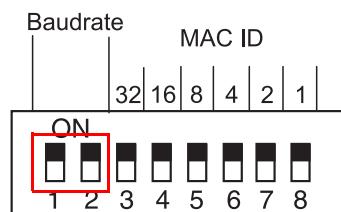
Technical data: outputs

Bit	Function	Signal
O-0	Activation of solenoid valve Y1	1 = solenoid valve activated 0 = solenoid valve not activated
O-1	Activation of solenoid valve Y2	1 = solenoid valve activated 0 = solenoid valve not activated
O-2	Activation of solenoid valve Y3	1 = solenoid valve activated 0 = solenoid valve not activated
O-3		not assigned

Technical data: LED displays for module and network status

Designation	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

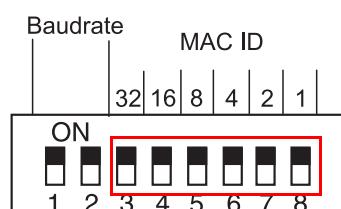
DIP Switch



DIP switch: Switches 1 and 2 = baud rate

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



DIP switch: Switches 3 to 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
ON	OFF	OFF	OFF	OFF	OFF	1
OFF	ON	OFF	OFF	OFF	OFF	2
...
OFF	ON	ON	ON	ON	ON	62
ON*	ON	ON	ON	ON	ON	63
* Factory setting						

Accessories

Accessories must be ordered separately

Accessories	Material no.
Cable socket, angular – M12; 5-poles: A coded	508-963
Cable socket, straight – M12; 8-poles: 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

Tools

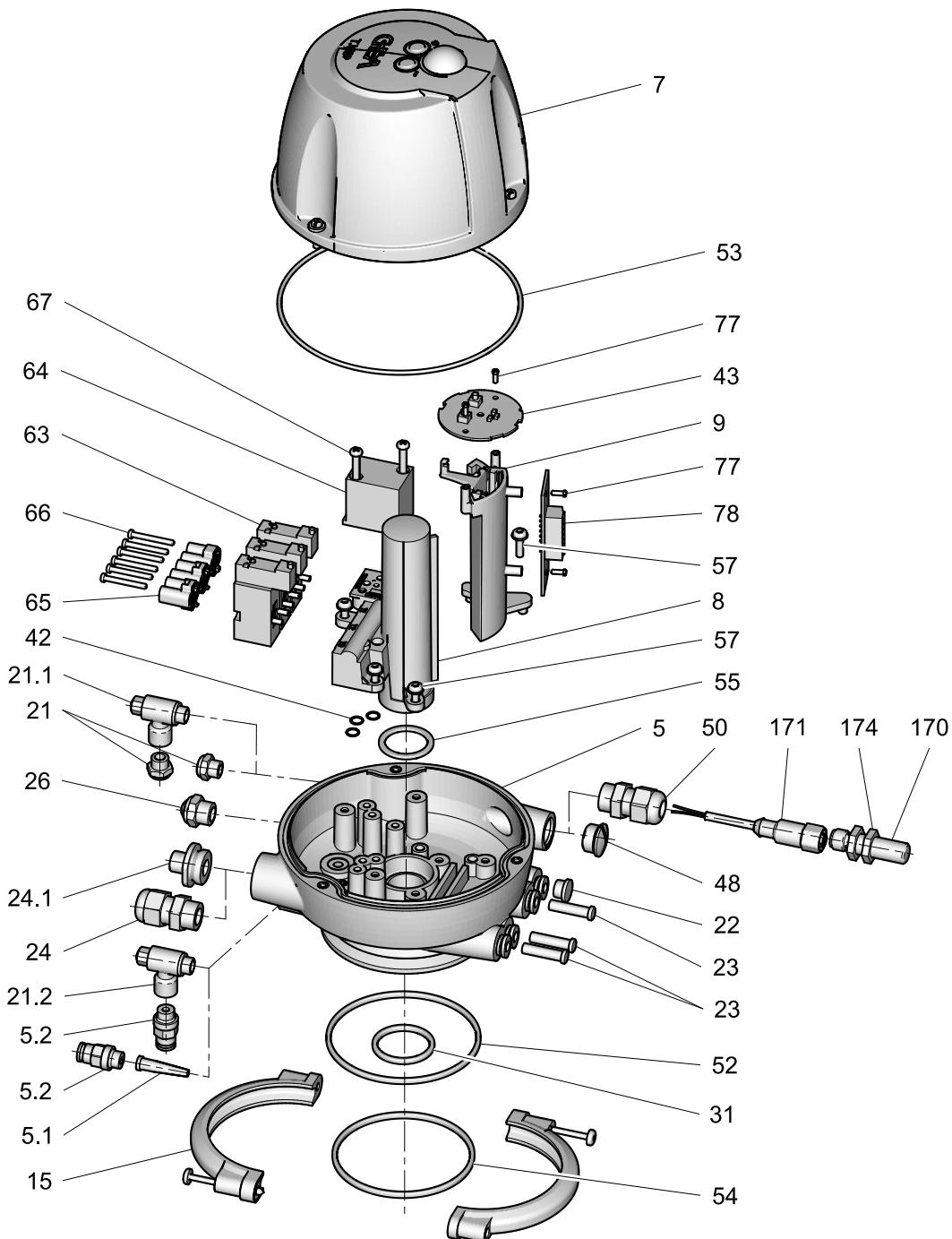
Tool	Material no.
Hose cutter	407-065
Hex key, size 3	408-121
Pin-type face spanner, pin dia. 4	9065837
Open end spanner a/f 23	408-046
Open end spanner a/f 16x18	408-138
Open end spanner a/f 15	408-035
Open end spanner a/f 13x17	408-036

Lubricant

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

Spare Parts Lists

Control top T.VIS® A-15



Control top T.VIS® A-15 with cable connections and air connections in metric

			without Logik Element NOT		with Logik Element NOT
Ordercode			TA15N...M	TA15I...M	TA15V...M
			TA15P...M	TA15J...M	TA15X...M
Item	Designation	Material		TA15L...M	TA15Y...M
5	Base T.VIS -15/PM Base T.VIS -15/PNM	PA12/L PA12/L	221-646.76	221-646.76	221-646.77
5.1	Filter	PE	221-003869	221-003869	221-003869
5.2	Plug-in screw connector	MS CV	933-176	933-176	933-176
7	Cap T.VIS P/A-15 with push button Cap T.VIS P/A-15	PA12/L PA12/L	221-646.87 221-646.88	221-646.87 221-646.88	221-646.87 221-646.88
8	Pneumatic block 3PV without NOT Pneumatic block 3PV with NOT	PP PP	221-732.05	221-732.05	221-732.04
9	Sensor modul T.VIS P/A-15	--	221-589.74	221-589.74	221-589.74
15	Clamp incl. screw	PA	221-320.93	221-320.93	221-320.93
21	Sound absorber G1/8"	MS CV	933-175	933-175	933-175
21.1	Throttle valve G1/8"	MS CV	603-047	603-047	603-047
22	Round plug	HD-PE	922-284	922-284	922-284
23	Locking plug	PP	922-281	922-281	922-281
24	Cable union M20	PA	508-995	508-995	508-995
24.1	Connector M12/5-pol/M20/A-15 Connector M12/8-pol/M20/A-15		221-005101 221-005102	221-005101 221-005102	221-005101 221-005102
26	Sound absorber G1/4"	MS CV	933-174	933-174	933-174
31	O-ring	NBR	930-041	930-041	930-041
42	O-ring	NBR	930-436	930-436	930-436
43	Circuit board T.VIS A-15/24VDC Circuit board T.VIS A-15/Asi Circuit board T.VIS A-15/DeviceNet	--	221-005021A 221-005022A 221-005023A	221-005021A 221-005022A 221-005023A	221-005021A 221-005022A 221-005023A
48	Locking screw	PA	508-250	508-250	508-250
50	Cable union	PA	508-914	508-914	508-914
52	O-ring	EPDM	930-148	930-148	930-148
53	O-ring	NBR	930-833	930-833	930-833
54	O-ring	NBR	930-093	930-093	930-093
55	O-ring	NBR	930-038	930-038	930-038
57	Threaded screw	A2	514-750	514-750	514-750
63	Solenoid valve 24VDC	PBT	512-151* * without at TA15N...	512-151	512-151
64	Logic element NOT	--	--	--	512-137

Control top T.VIS® A-15 with cable connections and air connections in metric

			without Logik Element NOT		with Logik Element NOT
Ordercode			TA15N...M	TA15I...M	TA15V...M
			TA15P...M	TA15J...M	TA15X...M
Item	Designation	Material		TA15L...M	TA15Y...M
65	Control plate	PPO	221-589.27	221-589.27* * without at TA15L...	221-589.27* * without at TA15Y...
66	Threaded screw	A2	514-761	514-761	514-761
67	Threaded screw	A2	--	--	514-758
77	Threaded screw	galvanic steel	514-762	514-762	514-762
78	Circuit board T.VIS A-15/ Zus/24VDC	--	221-005025	221-005025	221-005025
170	Proximity switch M12x1 / external	A2	505-098	505-098	505-098
171	Round connector M12 with cable	--	508-031	508-031	508-031
174	Holder for proximity	--	221-105.26	221-105.26	221-105.26

Control top T.VIS® A-15 with cable connections and air connections in inch

			without Logik Element NOT		with Logik Element NOT
Ordercode			TA15N...Z	TA15I...Z	TA15V...Z
			TA15P...Z	TA15J...Z	TA15X...Z
Item	Designation	Material		TA15L...Z	TA15Y...Z
5	Base T.VIS -15/PZ Base T.VIS -15/PNZ	PA12/L PA12/L	221-646.84	221-646.84	221-646.85
5.1	Filter	PE	221-003869	221-003869	221-003869
5.2	Plug-in screw connector	MS CV	933-176	933-176	933-176
7	Cap T.VIS P/A-15 with push button Cap T.VIS P/A-15	PA12/L PA12/L	221-646.87 221-646.88	221-646.87 221-646.88	221-646.87 221-646.88
8	Pneumatic block 3PV without NOT Pneumatic block 3PV with NOT	PP PP	221-732.05	221-732.05	221-732.04
9	Sensor modul T.VIS P/A-15	--	221-589.74	221-589.74	221-589.74
15	Clamp incl. screw	PA	221-320.93	221-320.93	221-320.93
21	Sound absorber G1/8"	MS CV	933-175	933-175	933-175
21.1	Throttle valve G1/8"	MS CV	603-047	603-047	603-047
22	Round plug	HD-PE	922-284	922-284	922-284
23	Locking plug	PP	922-280	922-280	922-280

Control top T.VIS® A-15 with cable connections and air connections in inch

			without Logik Element NOT		with Logik Element NOT
Ordercode			TA15N...Z	TA15I...Z	TA15V...Z
			TA15P...Z	TA15J...Z	TA15X...Z
Item	Designation	Material		TA15L...Z	TA15Y...Z
24	Cable union G1/2"	PA	508-299	508-299	508-209
24.1	Connector M12/5-pol/M20/A-15 Connector M12/8-pol/M20/A-15		not applicable	not applicable	not applicable
26	Sound absorber G1/4"	MS CV	933-174	933-174	933-174
31	O-ring	NBR	930-041	930-041	930-041
42	O-ring	NBR	930-436	930-436	930-436
43	Circuit board T.VIS A-15/24VDC Circuit board T.VIS A-15/Asi Circuit board T.VIS A-15/DeviceNet	--	221-005021A 221-005022A 221-005023A	221-005021A 221-005022A 221-005023A	221-005021A 221-005022A 221-005023A
48	Locking screw	PA	508-251	508-251	508-251
50	Cable union	PA	508-913	508-913	508-913
52	O-ring	EPDM	930-148	930-148	930-148
53	O-ring	NBR	930-833	930-833	930-833
54	O-ring	NBR	930-093	930-093	930-093
55	O-ring	NBR	930-038	930-038	930-038
57	Threaded screw	A2	514-750	514-750	514-750
63	Solenoid valve 24VDC	PBT	512-151* *without at TA15N...	512-151	512-151
64	Logic element NOT	--	--	--	512-137
65	Control plate	PPO	221-589.27	221-589.27* *without at TA15L...	221-589.27* *without at TA15Y...
66	Threaded screw	A2	514-761	514-761	514-761
67	Threaded screw	A2	--	--	514-758
77	Threaded screw	galvanic steel	514-762	514-762	514-762
78	Circuit board T.VIS A-15/ Zus/24VDC	--	221-005025	221-005025	221-005025
170	Proximity switch M12x1 / external	A2	505-098	505-098	505-098
171	Round connector M12 with cable	--	508-031	508-031	508-031
174	Holder for proximity	--	221-105.26	221-105.26	221-105.26

Control top T.VIS® A-15 with cable connections in metric and air connections in inch

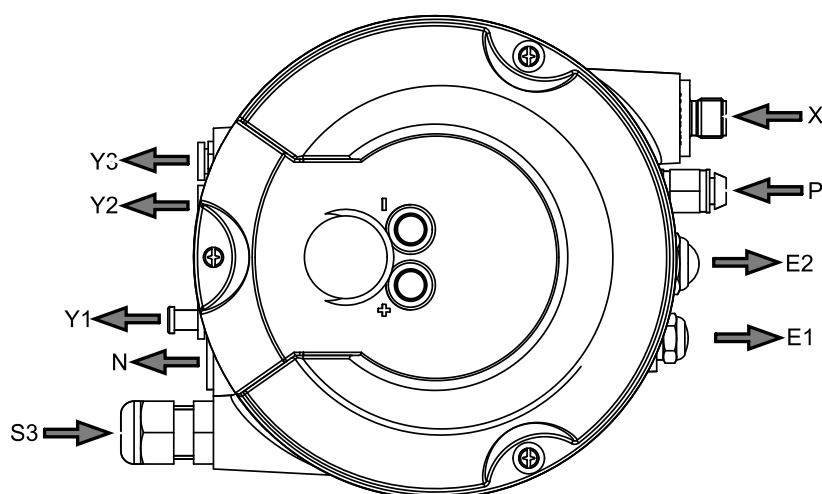
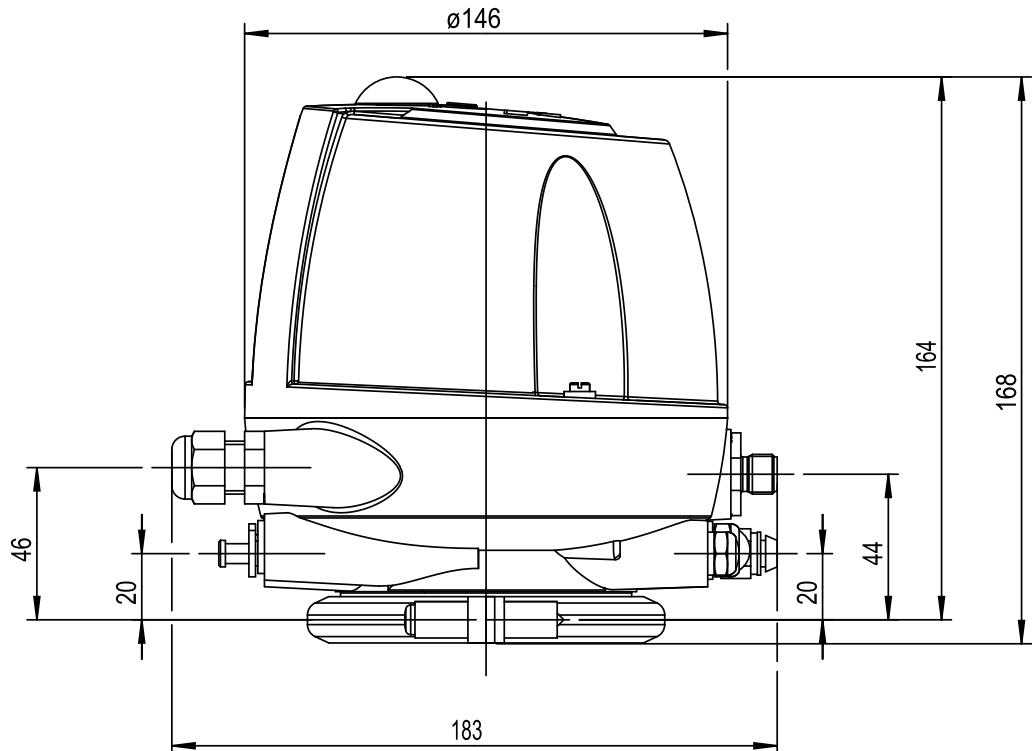
			without Logik Element NOT		with Logik Element NOT
Ordercode			TA15N...ZM	TA15I...ZM	TA15V...ZM
			TA15P...ZM	TA15J...ZM	TA15X...ZM
Item	Designation	Material		TA15L...ZM	TA15...ZM
5	Base T.VIS -15/PZM Base T.VIS -15/PNZ	PA12/L PA12/L	221-646.78	221-646.78	221-646.79
5.1	Filter	PE	221-003869	221-003869	221-003869
5.2	Plug-in screw connector	MS CV	933-176	933-176	933-176
7	Cap T.VIS P/A-15 with push button Cap T.VIS P/A-15	PA12/L PA12/L	221-646.87 221-646.88	221-646.87 221-646.88	221-646.87 221-646.88
8	Pneumatic block 3PV without NOT Pneumatic block 3PV with NOT	PP PP	221-732.05	221-732.05	221-732.04
9	Sensor modul T.VIS P/A-15	--	221-589.74	221-589.74	221-589.74
15	Clamp incl. screw	PA	221-320.93	221-320.93	221-320.93
21	Sound absorber G1/8"	MS CV	933-175	933-175	933-175
21.1	Throttle valve G1/8"	MS CV	603-047	603-047	603-047
22	Round plug	HD-PE	922-284	922-284	922-284
23	Locking plug	PP	922-281	922-281	922-281
24	Cable union M20	PA	508-995	508-995	508-995
24.1	Connector M12/5-pol/M20/A-15 Connector M12/8-pol/M20/A-15		221-005101 221-005102	221-005101 221-005102	221-005101 221-005102
26	Sound absorber G1/4"	MS CV	933-174	933-174	933-174
31	O-ring	NBR	930-041	930-041	930-041
42	O-ring	NBR	930-436	930-436	930-436
43	Circuit board T.VIS A-15/24VDC Circuit board T.VIS A-15/Asi Circuit board T.VIS A-15/DeviceNet	--	221-005021A 221-005022A 221-005023A	221-005021A 221-005022A 221-005023A	221-005021A 221-005022A 221-005023A
48	Locking screw	PA	508-250	508-250	508-250
50	Cable union	PA	508-914	508-914	508-914
52	O-ring	EPDM	930-148	930-148	930-148
53	O-ring	NBR	930-833	930-833	930-833
54	O-ring	NBR	930-093	930-093	930-093
55	O-ring	NBR	930-038	930-038	930-038
57	Threaded screw	A2	514-750	514-750	514-750
63	Solenoid valve 24VDC	PBT	512-151* *without at TA15N...	512-151	512-151
64	Logic element NOT	--	--	--	512-137

Control top T.VIS® A-15 with cable connections in metric and air connections in inch

			without Logik Element NOT		with Logik Element NOT
Ordercode			TA15N...ZM	TA15I...ZM	TA15V...ZM
			TA15P...ZM	TA15J...ZM	TA15X...ZM
Item	Designation	Material		TA15L...ZM	TA15...ZM
65	Control plate	PPO	221-589.27	221-589.27* *without at TA15L...	221-589.27* *without at TA15Y...
66	Threaded screw	A2	514-761	514-761	514-761
67	Threaded screw	A2	--	--	514-758
77	Threaded screw	galvanic steel	514-762	514-762	514-762
78	Circuit board T.VIS A-15/ Zus/24VDC	--	221-005025	221-005025	221-005025
170	Proximity switch M12x1 / external	A2	505-098	505-098	505-098
171	Round connector M12 with cable	--	508-031	508-031	508-031
174	Holder for proximity	--	221-105.26	221-105.26	221-105.26

Dimension Sheets

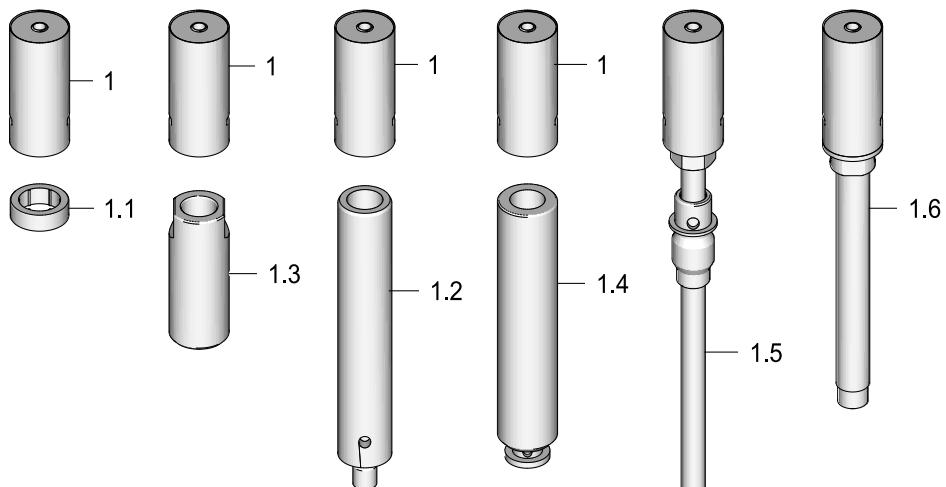
Control Module T.VIS® A-15



For assignment of N, Y1, Y2, Y3, E1, E2 and P refer to operating manual 430-568

X - supply voltage, electric actuation and feedback
S3 - electrical connection for external proximity switch

Switch bar T.VIS® A-15



Item	Designation	Material	Material no.	Application
1	Switch bar	PA6/GK30	221-589.75	Standard for all valves with the exception of valves type R with lifting actuator
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 VESTA XL H_A valves
1.4	TME/T.VIS adapter	1.4305	221-573.06	In addition to item 1, only for butterfly valves ECOVENT-S
1.5	Switch bar LFT-R/A-15 cpl. T.VIS A-15 for valves type R with lifting actuator			
1.6	Switch bar	1.4301	221-589.81	for T-smart 7 butterfly Valves



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