OPERATING INSTRUCTIONS

Original instructions

Hygienic valves

GEA Hygienic butterfly valve

GEA Tuchenhagen GmbH
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Table of Contents

1 General

This chapter contains basic instructions for using the valve and explanations of illustration conventions. It also contains information about the design and structure.

The term valve in these Operating Instructions refers to Hygienic valves.

1.1 Information about the document

1.1.1 Purpose and structure of the document

The objective of these Operating Instructions is to provide information on how to operate the valve. To achieve this, it is divided into several chapters which are oriented on the various life phases of the valve. Compliance with the instructions will enhance the valve's longevity and reliability, and reduce the likelihood of harm to individuals or damage to property. The Operating Instructions also acts as the basis for creating operating instructions.

1.1.2 Design elements

In this document, the following design elements are used as orientation aids.

General orientation aids

- Figure numbers
- Table numbers
- Chapter numbers
- Page numbers
- Headers and footers
- References
- Lists

Lists

Bullet points are shown in lists and do not prescribe a specific sequence.

- Bullet point
- Bullet point
  - Sub-point
  - Sub-point
- Bullet point

Numbered lists

In a sequence of actions, the order of the action steps is specified by a numbered list. Partial results and the result of a sequence of actions are marked by arrows.

1. Action step one
2. Action step two
   2.1 First sub-step two
   2.2 Second sub-step two
   → Partial result
3. Action step three
   → Partial result
4. Action step four

⇒ Outcome

INFO

Informational texts contain additional information about a description or action step.

1.1.3 Reading obligation and storage

Every person who works on or with the valve must have read these Operating Instructions. They must be available to these persons at all times.

1.2 Manufacturer address

GEA Tuchenhagen GmbH

Am Industriepark 2-10

Germany

21514 Büchen

1.3 Customer service

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Fax: +49 4155 49-2035

flowcomponents@gea.com

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1.4 Declarations of conformity

Engineering for a better world.

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

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

Hereby, we declare that the machine designated in the following

Designation:	GEA Hygienic Butterfly Valve with actuator GEA Hygienic Leakage Butterfly Valve with actuator
Type:	711-788 988

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

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

Remarks:

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

Person authorised for compilation and handover of technical documentation:

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

Büchen, 23 July 2025

Sören de Boon
Senior Vice President
Business Unit Valves & Pumps

i.V. Stephan Dirks
Senior Director Product Engineering & Development
Business Line Hygienic Valves/ BU Valves & Pumps

Translated copy of the EU - Declaration of conformity in accordance with the Pressure Equipment Directive 2006/42/EU

Manufacturer:	GEA Tuchenhagen GmbH Am Industriepark 2-10 21514 Büchen
We hereby declare that the machine named below	
Designation:	GEA Hygienic butterfly valve GEA Hygienic leakage butterfly valve
Type:	711-788 988
due to its design and construction as well as in the versions sold by us, meet the basic safety and health requirements of the following guideline:	
Relevant EC directives:	2006/42/EC EC Machinery Directive
Applicable harmonized standards, in particular:	EN ISO 12100: 2010
Remarks:	• This declaration will become invalid if any alterations are made to the machine which have not been agreed with us. • We also declare that the relevant technical documentation for this machine has been prepared in accordance with Annex VII, Part A, and agree to submit the documentation on justified request of national authorities on a data carrier.
Person authorised for compilation and handover of technical documentation:	GEA Tuchenhagen GmbH Am Industriepark 2-10 21514 Büchen, Germany
Büchen, 23rd July 2025	
Sören de Boon Senior Vice President Business Unit Valves & Pumps	Signed by Stephan Dirks Senior Director Product Engineering & Development Business Line Hygienic Valves/BU Valves & Pumps

Engineering for a better world.

UK- Declaration of conformity by Supply of Machinery (Safety) Regulations 2008

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

Hereby, we declare that the machine designated in the following

Designation:	GEA Hygienic Butterfly Valve with actuator GEA Hygienic Leakage Butterfly Valve with actuator
Type:	711-788 988

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

Relevant UK legislation:	Supply of Machinery (Safety) Regulations 2008
Applicable harmonized standards, in particular:	EN ISO 12100: 2010

Remarks:

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

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2 Safety

This chapter describes the minimum requirements for the intended use of the valve. It forms the basis for safe operation of the valve.

2.1 Intended use

The butterfly valve is intended exclusively for opening and for partially or fully shutting off sections of piping within a closed pipeline system. Additionally, shutting off a pipeline against the atmosphere is permitted, provided the medium involved poses no risks or hazards to health or life. For hazardous media, shutting off against the atmosphere is not permitted and is considered improper use.

Proper use of the valve also includes compliance with these Operating Instructions.

INFO The medium should preferably flow in the opening direction of the valve disk to avoid pipe hammers when the valve is opened or closed.

INFO In a closed pipe system, hydraulic pressure build-up may occur when the valve switches and result in seal damage.

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

2.1.1 Requirements for the operation

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

2.1.2 Flow speed

With slow flow speeds, existing solids holding space can potentially settle.

When the butterfly valve is closed quickly, this causes negative pressure on the disk and in the area of the butterfly valve seal, as a result of a stall. With flow speeds of ≥ 3.5 m/s, the valve may only be closed with significantly reduced speed.

2.1.3 Pressure equipment directive

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

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

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

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

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

2.1.4 ATEX directive

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

Refer to and observe the additional instruction manual “ATEX version valves”. For details regarding the marking of valves for potentially hazardous areas also refer to the additional instruction manual “ATEX version valves”.

If these valves are used in areas with a potentially explosive atmosphere, it is mandatory to comply with directive 2014/34/EC with respect to all ignition hazards.

2.1.5 Improper operating conditions

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

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

2.2 Modification

Subsequent alterations of the valve are not permitted. Otherwise you will have to undergo a new conformity process in accordance with the EC Machinery Directive on your own.

In general, only genuine spare parts supplied by GEA Tuchenhagen GmbH should be fitted. This ensures the reliable and economical operation of the valve.

2.3 Structure of warning notices

Warning notices warn of hazards that may exist when performing certain actions. In this document, the following warning notices are used. The extent of the hazards is categorized into risk levels and can be recognized by the corresponding signal words.

2.3.1 Preceding warning notices

Preceding warning notices are used when there is a hazard during a sequence of actions. Warning notices are colour-highlighted and supplemented by a pictogram in the event of possible personal injury.

⚠SIGNAL WORD

Nature and source of the hazard

Consequence of disregarding the warning.

- Measure to avoid or escape the danger.

Figure 2-1 - Structure of a preceding warning notice

2.3.2 Integrated warning notices

Integrated warning notices are used when there is a hazard involved in a single action step.

1. **SIGNAL WORD** Nature and source of the hazard
   Consequence of disregarding the warning.
   - Measure to avoid or escape the danger.

Figure 2-2 - Structure of an integrated warning notice

2.3.3 Signal words

ATTENTION

The signal word ATTENTION indicates a hazard that could result in property damage if not avoided.

CAUTION

The signal word CAUTION indicates a hazard with a low risk level which could result in light to medium injuries if not avoided.

WARNING

The signal word WARNING indicates a hazard with a medium risk level which could result in death or severe injury if not avoided.

DANGER

The signal word DANGER indicates a hazard with a high risk level which will result in death or serious injury if not avoided.

2.4 Personnel qualification

The following basic requirements must be fulfilled for all actions carried out on the valve.

- These Operating Instructions have been read and understood.
- Safety tasks in and around the valve are regulated and assigned.
  - Maintaining order
  - Compliance with safety requirements
  - Securing hazard zones

Additionally, the following groups of people must possess the personnel qualifications or skills listed below and be authorised by the operator to perform actions on the valve.

Operating staff

- Trained by the operating company, a qualified customer specialist or a GEA service expert

Customer specialist

- Technical training

Trained customer specialist

- Technical training in a specific field of expertise
- Training by GEA personnel or participation in training courses of the GEA Tuchenhagen

GEA service expert

- Personnel from GEA Tuchenhagen, see *1.3 Customer service*

Where necessary, reference is made to the respective group of individuals in these Operating Instructions.

2.5 General safety instructions

The valve was built in accordance with the state of the art and recognised safety regulations at the time of its launch. However, the safety measures stipulated by the operator and listed below must still be adhered to in order to ensure safety.

2.5.1 General hazard

Source	Consequences	Measures
Faulty valve	Injury and damage	Check that the valve is fully functional.
Non-compliance with these Operating Instructions	Injury and damage	Read and familiarise yourself with these Operating Instructions.
Operating materials	Injuries	• Wear personal protective equipment. • Avoid contact with operating materials.

Table 1: General hazard

2.5.2 Mechanical hazard

Source	Consequences	Measures
Moving or rotating components	• Being drawn in or caught • Entrapment • Crushing • Impact	• Remove jewellery. • Tie hair back or wear a hair net. • Wear tight-fitting clothing.
• Sharp edges • Cutting parts • Pointed parts	• Cutting or shearing • Penetration or puncture • Shearing • Rubbing or grazing	• Wear personal protective gear. • Use transport protection and available jigs.
• Rough or slippery surfaces • Stumbling hazards	• Slipping • Stumbling • Falling	• Wear personal protective gear. • Eliminate leaked liquids and stumbling hazards.
• Gravity • Falling objects	• Impact • Crushing	• Do not walk under suspended loads. • Eliminate the stumbling hazards.
Height above the ground	Falling	Use supports and permitted climbing aids.

2.5.3 Electrical hazard

Source	Consequences	Measures
Electromagnetic processes	Implications for electronic medical implants	People with medical implants must keep their distance.
Electrostatic processes	• Electric shock • Fire • Chemical reaction	• Avoid contact to components. • Check the voltage of components. • Wear personal protective gear. • Eliminate leaked flammable substances.

2.5.4 Thermal hazard

Source	Consequences	Measures
Objects or materials at high or low temperature	• Freezing • Burns • Scalding	• Wear personal protective gear. • Wait for adjustment to room temperature.
Radiation from heat sources	• Burns • Discomfort	• Wear personal protective gear. • Keep time spent to a minimum.

2.6 Personal protective equipment

To prevent possible personal injuries, the personal protection equipment must be worn.

In addition, GEA recommends keeping the requirements listed below.

- Locally applicable accident prevention regulations
- Instruction manual from the operator or employer

2.7 Safety devices

No safety devices are attached to this valve.

2.8 Residual dangers

Despite all the measures taken, the following residual hazards can lead to personal injuries and property damage at any time.

- Improper use
- Material fatigue
- Failure of safety devices

Danger zones

Please observe the following notes:

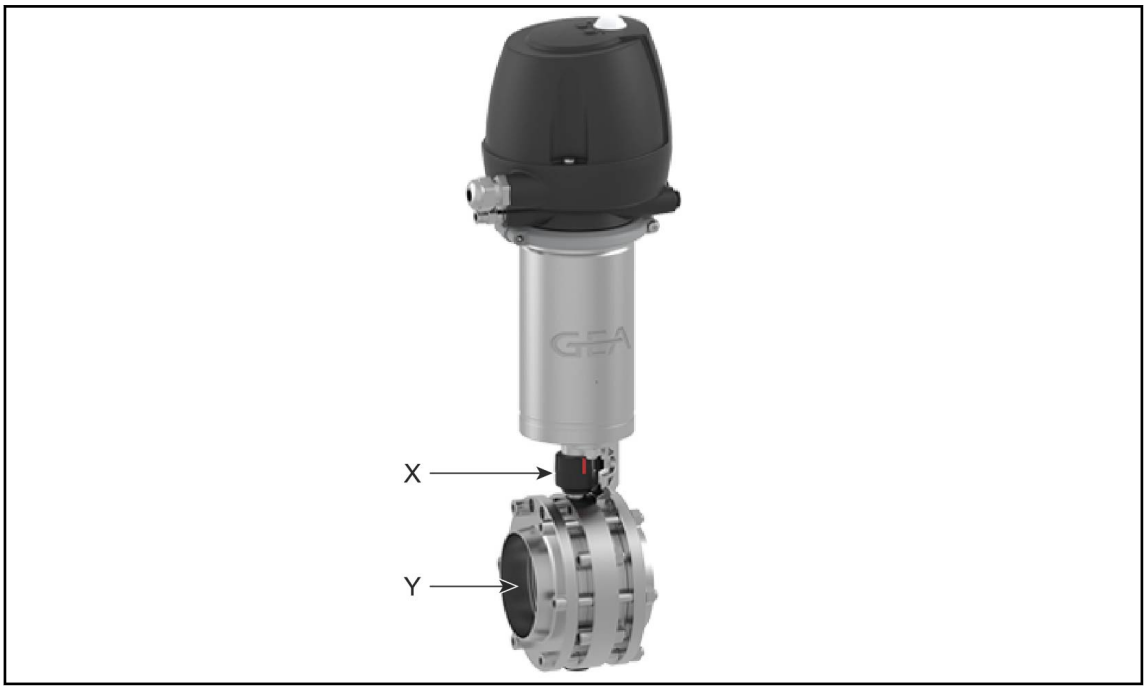


Figure 2-3 - Danger zone at the valve

- In the event of malfunctions, shut down the valve (disconnect from the power and air supply) and secure it against being used.
- Before starting any maintenance, servicing or repair work, disconnect the valve from the power supply and secure it against inadvertently being switched back on again.
- Only allow a qualified electrician to carry out any work on the electrical power supply.
- Check the electrical equipment of the valve at regular intervals. Immediately remedy loose connections and molten cables.
- If work on live parts cannot be avoided, call in a second person, who can operate the main switch in case of an emergency.

- When the valve is switching, never reach into pipe Y or into bracket X (on pneumatic actuators). Fingers can be crushed or cut off.

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

Residual dangers on the valve and measures

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

Table 2: Residual dangers and measures

Instructions for the Safe Handling of Electronic Components During Welding Work

ATTENTION

Stray welding currents during welding
Can cause damage to electronic components
- Follow the steps below to prevent this.

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

2.9 Safety signs

The safety symbols listed below are attached to the valve.

The position of the applicable safety symbols on the valve are shown in an overview, see *3.1.3 Signs*.

Warning signs

General warning sign

Hazard for persons, conveyed by the additional sign.

Explosion-hazarded zones warning

Special explosion protection sign

Warning, spring tension

Hazard posed by spring tension. Do not open the actuator.

2.10 Emergency measures

In case of any emergencies on the valve, the operating regulations must be observed and the following actions implemented.

Fire

- Call local specialists
- Use extinguishing agents as outlined in the operating regulations
- Exit the hazard zone
- Warn individuals that are endangered

Injuries

- Administer first aid
- Call local emergency services

3 Description

This chapter contains instructions on how to install the valve and its functions.

3.1 Structure and function

3.1.1 Design

3.1.1.1 Butterfly valve with control top

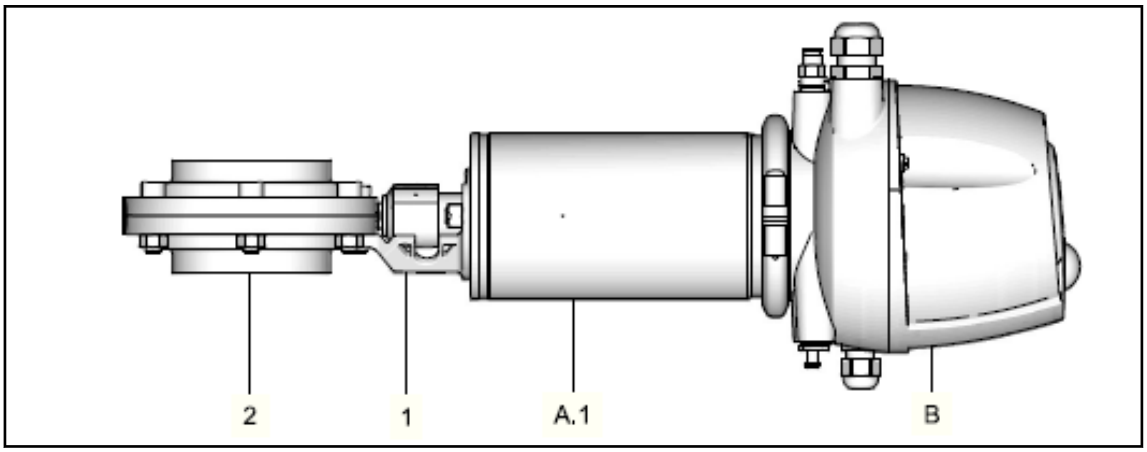


Figure 3-1 - Design of the butterfly valve with control top

Position	Description	Position	Description
	A.1 - Pneumatic actuator		B - T.VIS control top
	1 - Bracket		2 - Butterfly valve body

3.1.1.2 Butterfly valve without control top

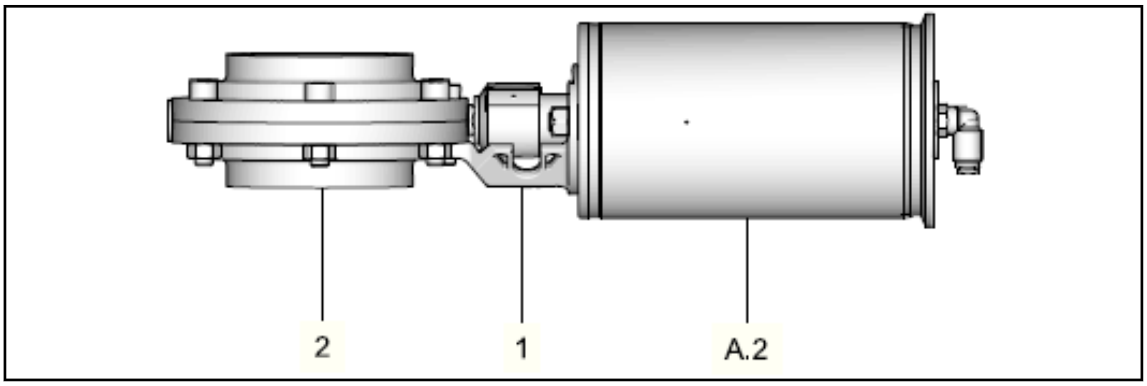


Figure 3-2 - Design of the butterfly valve without control top

Position	Description	Position	Description
	A.2 - Pneumatic actuator		1 - Bracket
	2 - Butterfly valve body		Optional - Electrical feedback (initiator in the bracket)

3.1.1.3 Intermediate flange design – VV (788)

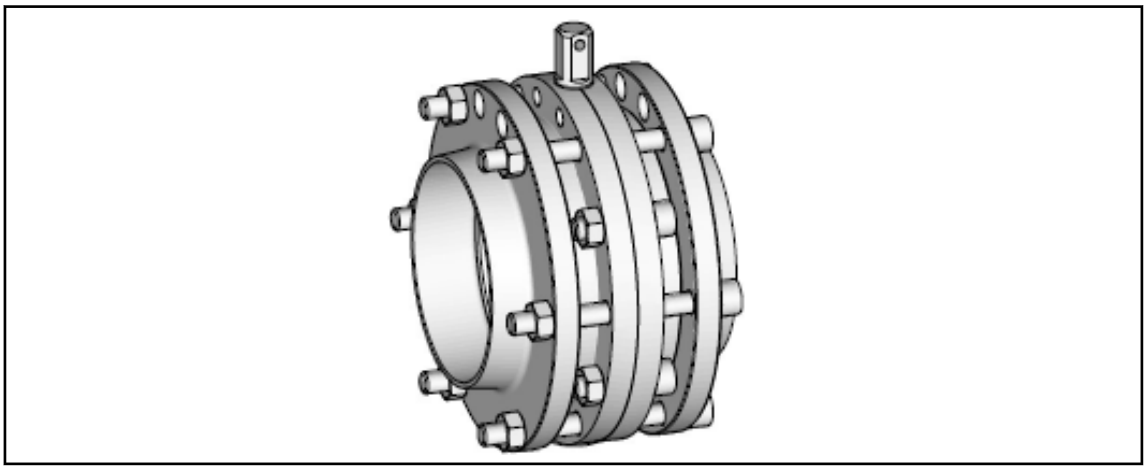


Figure 3-3 - Intermediate flange design – VV (788)

Butterfly valve design for matrix-piped systems.

3.1.1.4 Manual actuator

There are different construction designs for the manual actuator.

Standard design of manual actuator

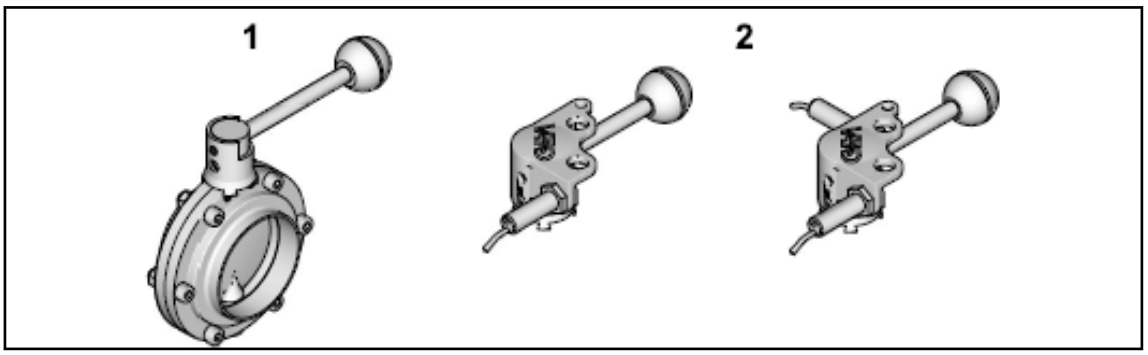


Figure 3-4 - Standard design of manual actuator

Position Description	Position Description
1 - Standard	2 - Electrical feedback

Scissor grip drive

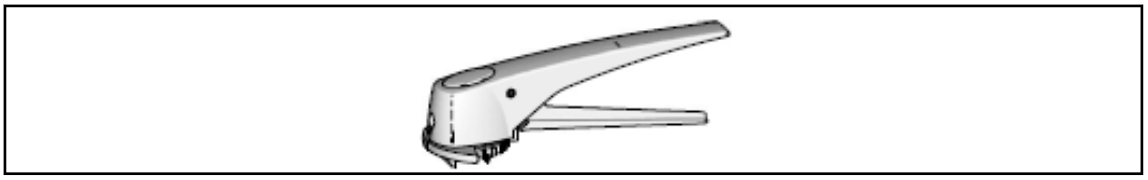


Figure 3-5 - Scissor grip drive

The scissor grip drive can position the shut-off disk in the predefined positions around the circumference (12 x 15°).

Adjustable manual operation

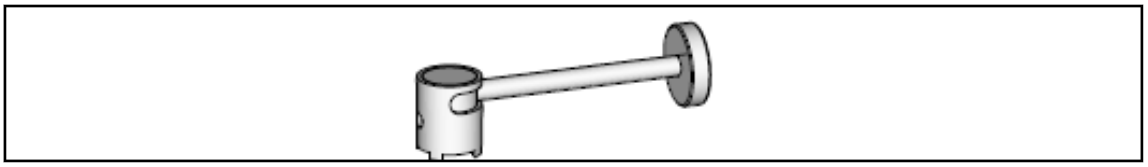


Figure 3-6 - Adjustable manual mode design

The lever on the adjustable hand drive can be continually adjusted in the range of 0° to 90°.

3.1.2 Functional description

3.1.2.1 Pneumatic Actuator

The compressed air which enters above the piston causes a downwards movement of the piston and the flap of the valve opens or closes, depending on the definition of the resting position.

When the air supply is shut off, the valve closes automatically as a result of the pneumatic/spring force.

Optional air/air actuators are also available for the valve.

The stroke of the piston is converted into a rotary movement of the shaft. The travel of the piston is limited, so that the shaft performs a 90° rotation per stroke. This rotary movement corresponds precisely to the required angle for opening and closing the valve flap.

3.1.2.2 Actuator A.1

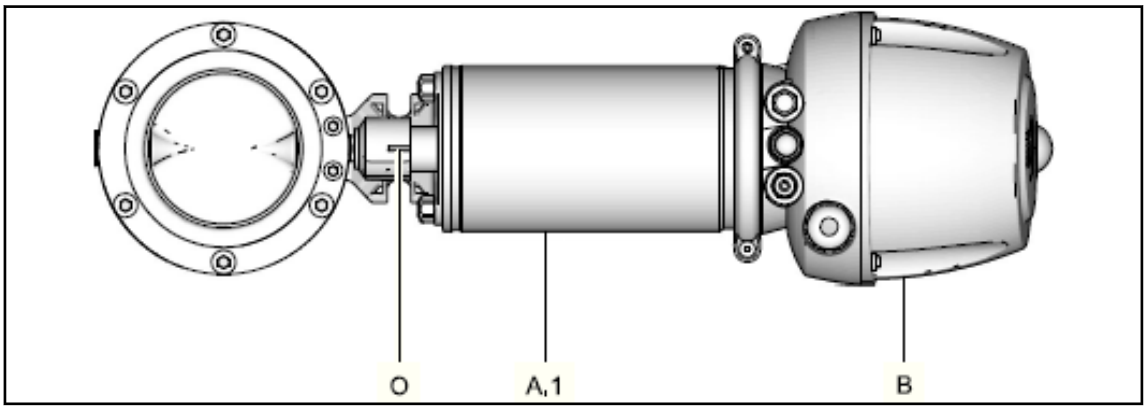


Figure 3-7 - Actuator A.1

Position	Description	Position	Description
	A.1 - Actuator		B - Control top
	O - Position display		

The switching state is detected and indicated by the control top (B).

The visual position indication (O) can be recognized by the red marking.

3.1.2.3 Actuator A.2

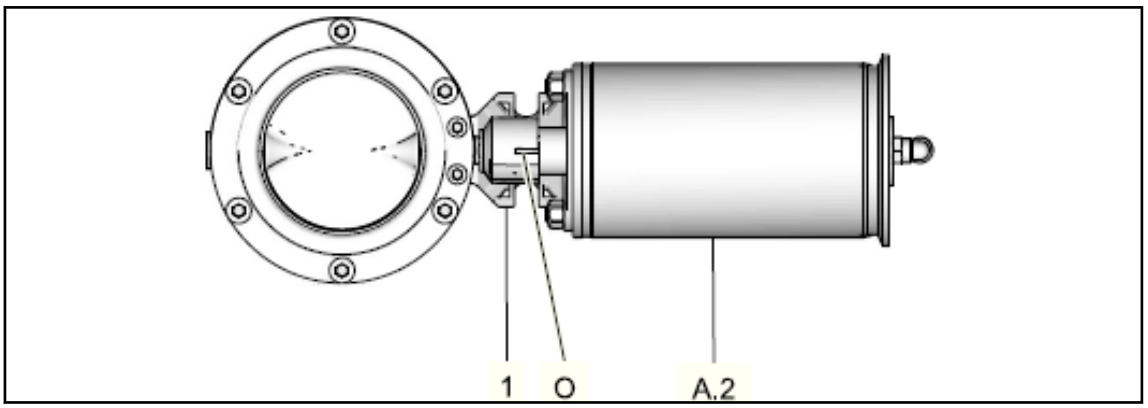


Figure 3-8 - Actuator A.2

Position	Description	Position	Description
	1 - Bracket		A.2 - Actuator
	O - Position display		

Feedback of switching states can be provided by proximity switches in the mounting bracket (1). The resting position can be reported by proximity switches that can be attached to the mounting bracket as required.

The visual position indication (O) can be recognized by the red marking.

3.1.2.4 Manual Actuator Type H

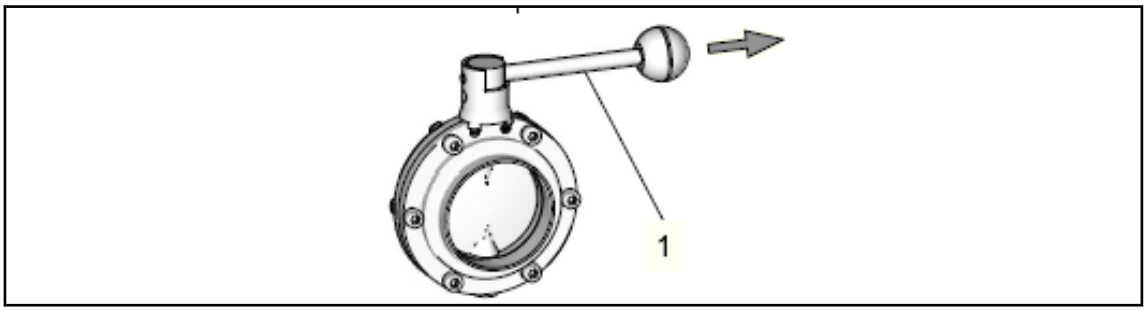


Figure 3-9 - Manual Actuator Type H

Position	Description	Position	Description
	1 - Hand lever		

To open or close the valve, release the hand lever (1) by gently pulling it out of the locking device and turning it by 90°.

When the lever is released, it locks into place in the holes provided.

The limit positions of the butterfly valve can be detected by proximity switches.

3.1.2.5 Butterfly Valve Body without Actuator

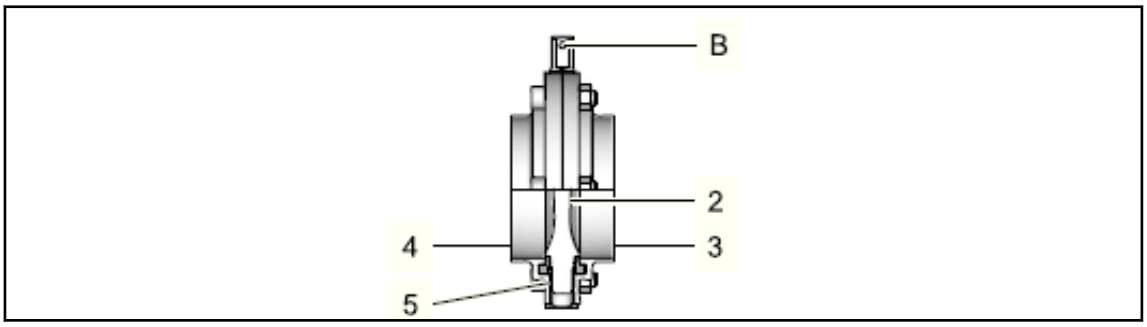


Figure 3-10 - Butterfly Valve Body without Actuator

Position	Description	Position	Description
	2 - Valve flap		3 - Flange
	4 - Flange		5 - Slide bearing
	B - Borehole		

The valve disk (2) is supported between two flanges screwed together (3, 4) and a separate plain bearing (5).

Depending on the actuator position, the valve disk is opened to different angles and activated in the pipe opened. If the blade of the disk is parallel to the centre axis of the pipe, the butterfly valve is located in the fully opened position and guarantees maximum flow.

When in the closed position, the blade of the valve disk blocks the flow of the butterfly valve.

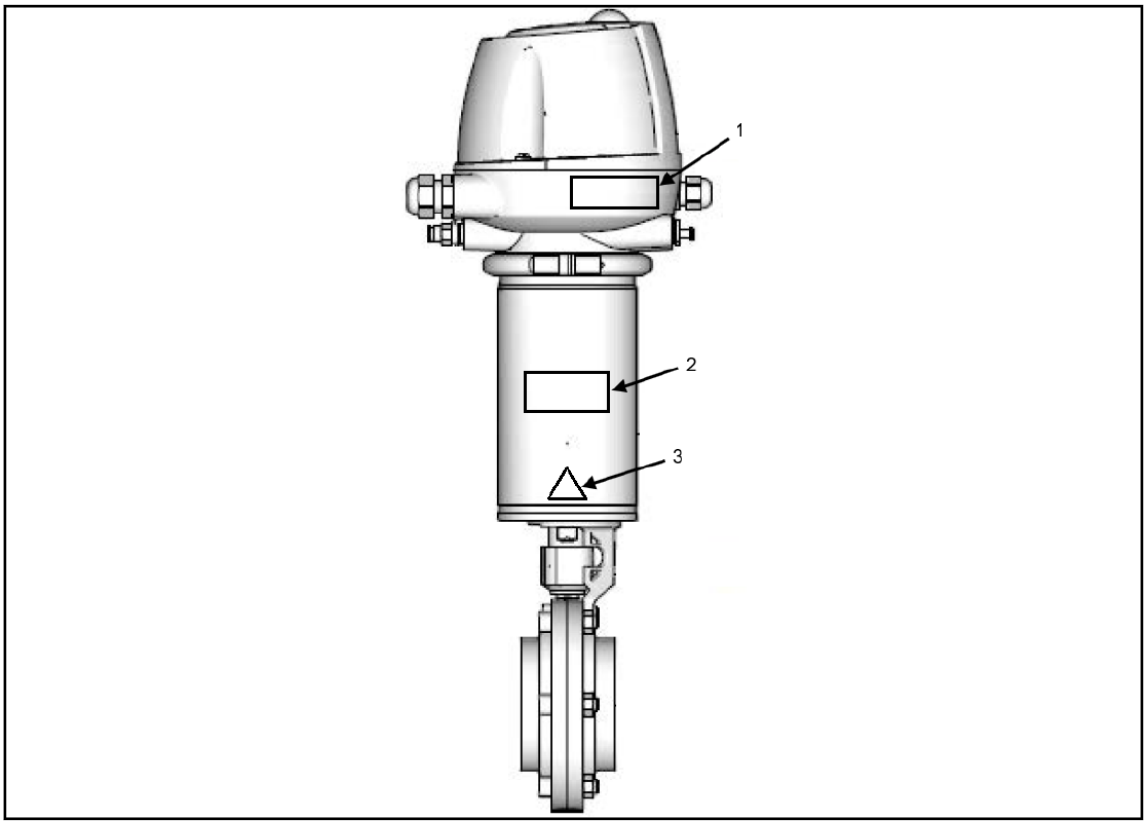
INFO The hole (B) in the square end and the markings on the lower shaft are used as position indicators for the valve disk.

3.1.3 Signs

Overview and layout

All safety symbols and other signs must meet the following criteria throughout the life cycle of the valve.

- Complete
- Attached as shown
- Clean and legible



No.	Signs
1	Type plate T.VIS; adhered to T.VIS
2	Type plate valve; adhered to actuator
3	Warning: do not open, taut springs; adhered to actuator

The representation and meaning of the safety symbols used are listed in an overview corresponding to their category, see chapter *2.9 Safety signs*

3.1.4 Protective devices

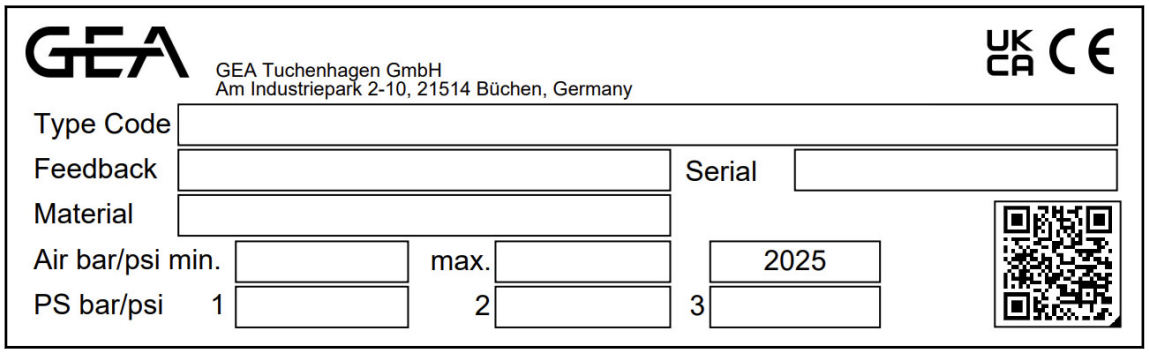
To avoid personal injuries, danger zones are made inaccessible by protective devices. The following protective devices are installed on this machine.

There are no protective devices installed on this machine.

3.2 Technical data

3.2.1 Type plate

The type plate clearly identifies the valve.



The type plate provides the following key data:

Key data of the valve

Characteristics	Values
Type code	Hygienic butterfly valve
Feedback	Order code control top T.VIS
Serial	Serial number
Material	e.g. AISI 316L (1.4404)/EPDM (FDA)
Control air pressure bar/psi	min. 4.8/69.6 max. 8.0/116
Product pressure bar/psi	10/ 145

3.2.2 Technical data

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

Technical data: Valve

Designation	Description
Size	DN 15 to DN 150 ½" to 4" OD
Material of product contact parts	Stainless steel AISI 304/316L (1.4301 / 1.4404) Check corrosion resistance with respect to media and detergents.

Technical data: Ambient temperatures

Designation	Description
Valve	0 to 45 °C (32 to 113 °F), standard < 0 °C (32 °F): Use control air with low dew point. Protect valve rods against freezing.
Proximity switch	-20 to +80 °C (-4 to +176 °F)

Designation	Description
Control top T.VIS M-15, A-15	-20 to +50 °C (-4 to +122 °F)
Control Top T.VIS P-15	0 to +50 °C (32 to +122 °F)
Product temperature and operating temperature	Dependent on the seal material, see also *3.2.3 Resistance and permitted operating temperature of the sealing materials*

Technical data: Compressed air supply

Designation	Description
Air hose	
• Metric	Material PE-LD Outside Ø 6 mm Inside Ø 4 mm
• Inch	Material PA Outside Ø 6.35 mm Inside Ø 4.3 mm
Control air	acc. to ISO 8573-1
• Solid particle content:	Quality class 6 Particle size max. 5 µm Particle density max. 5 mg/m^3
• Water content:	Quality class 4 max. dew point +3 °C If the unit is used at higher altitudes or at low ambient temperatures, the dew point must be adapted accordingly.
• Oil content:	Quality class 3 preferably oil free max. 1 mg oil to 1 m^3 air
Control air pressure	min. 4.8 bar (69.6 psi) max. 8 bar (116.0 psi)
Control air pressure for air/air - A/A actuator	min. 4.8 bar (69.6 psi) max. 8 bar (116.0 psi)
Control air pressure for booster cylinder plus air/spring actuator (air/air not allowed)	min. 3.0 bar (43.5 psi) max. 4.0 bar (58.0 psi)
Product pressure	max. 10 bar (145.0 psi)

Air requirement per switching operation

Actuator type	Actuator diameter [mm]	Air requirement (dm^3_n/stroke) dm^3_n at 1.01325 bar at 0 °C as per DIN 1343
BFV-7 83	88.9	0.325
BFV-7 109	114.3	0.530
BFV-7 AA	88.9	0.900

Equipment

Initiators - actuator without T.VIS		
Operating voltage [V]	10...65 DC	20...25 AC
Switching distance [mm]	5	5
Max. continuous current [mA]	>3...<100	>3...<100
Ambient temperature [°C]	-25...+80	-25...+80
Protection class	IP 67	IP 67

Weights

TYPE GS - Weight butterfly valve with actuator [kg]

Size	Manual actuator	Pneumatic actuator without control top	Pneumatic actuator with T.VIS control top
DN 25, 1"	1.6	5.5	6.7
DN 40, 1.5"	1.7	5.7	6.9
DN 50, 2"	2.2	6.1	7.3
DN 65, 2.5"	2.4	6.7	7.8
DN 80, 3"	3.6	7.5	8.7
DN 100, 4"	4.8	8.7	9.9
DN 125	7.4	11.4	12.5
DN 150	8.8	13.2	14.4

TYPE SS - Weight butterfly valve with actuator [kg]

Size	Manual actuator	Pneumatic actuator without control top	Pneumatic actuator with T.VIS control top
DN 15, 0.5"	1.4	5.3	6.5
DN 20, 0.75"	1.4	5.3	6.5
DN 25, 1"	1.4	5.3	6.5

Size	Manual actuator	Pneumatic actuator without control top	Pneumatic actuator with T.VIS control top
DN 40, 1.5"	1.5	5.5	6.7
DN 50, 2"	1.9	5.8	7.0
DN 65, 2.5"	2.0	6.3	7.5
DN 80	3.1	7.0	8.2
3"	3.4	7.3	8.5
DN 100, 4"	4.4	8.3	9.5
DN 125	6.2	10.2	11.3
DN 150	7.0	11.4	12.6

TYPE VV - Weight butterfly valve with actuator [kg]

Size	Manual actuator	Pneumatic actuator without control top	Pneumatic actuator with T.VIS control top
DN 15, 0.5"	2.5	6.5	7.7
DN 20, 0.75"	2.5	6.5	7.7
DN 25, 1"	2.5	6.5	7.7
DN 40, 1.5"	3.0	6.9	8.1
DN 50, 2"	3.6	7.6	8.8
DN 65, 2.5"	4.6	8.6	9.7
DN 80, 3"	5.3	9.2	10.4
DN 100, 4"	7.7	11.6	12.8
DN 125	9.6	13.5	14.7
DN 150	13.0	17.0	18.2

3.2.3 Resistance and permitted operating temperature of the sealing materials

The resistance and permitted operating temperature of the sealing materials depend on the type and temperature of the medium conveyed. The exposure time can adversely affect the service life of the seals. The sealing materials comply with the regulations of FDA 21 CFR 177.2600 or FDA 21 CFR 177.1550.

The maximum operating temperature is defined by the seal type and its mechanical load.

Due to the versatile conditions of use (e.g. usage duration, switching frequency, type and temperature of product and cleaning agents as well as usage environment), GEA Tuchenhagen recommends that the user carries out resistance tests.

Resistance:

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

Seal resistance / permissible application temperature of the seal materials

Medium	Maximum operating temperatures	EPDM	FKM	HNBR	VMQ
Alkalis up to 3%	up to 80 °C (176°F)	+	o	+	o
Alkalis up to 5%	up to 40 °C (104°F)	+	o	o	o
Alkalis more than 5%	up to 80 °C (176°F)	+	–	–	o
Alkalis more than 5%		o	–	–	o
Inorganic acids ** up to 3%	up to 80 °C (176°F)	+	+	+	o
Inorganic acids ** up to 5%	up to 80 °C (176°F)	o	+	o	o
Inorganic acids ** up to 5%	up to 100 °C (212°F)	–	+	–	o
Water	up to 80 °C (176°F)	+	+	+	+
Water	up to 100 °C (212°F)	+	+	+	o
Steam	up to 135 °C (275°F)	+	o	o	o
Steam, approx. 30 min	up to 150 °C (302°F)	+	o	–	o
Fuels/hydrocarbons		–	+	+	–
Product with a fat content of max. 35%		+	+	+	o
Product with a fat content of more than 35%		–	+	+	o
Oils		–	+	+	o

Other applications upon request
** Inorganic acids are, e.g. carbonic acid, nitric acid and sulphuric acid

Table 3: Seal resistance / permissible application temperature of the seal materials

Temperature resistance of the sealing materials

Sealing materials	General temperature resistance*
EPDM	-40 to +135 °C (-40 °F to 275 °F)
FKM	-10 to +200 °C (+14 °F to +392 °F)
HNBR	-25 to +140 °C (-13 °F to +284 °F)
VMQ	-50...+200 °C (-58...+392 °F)

* The general resistance of the material does not correspond to the maximum operating temperature.

Table 4: Temperature resistance of the sealing materials

3.2.4 Pipe ends - General table of measurements

INFO Not every valve is available in every size. For information about the available sizes of valves, see *3.2.2 Technical data*.

Dimensions for tubes in DN

Metric DN	Outside diameter	Wall thickness	Inside diameter	Outside diameter acc. to DIN 11850
10	13	1.5	10	X
15	19	1.5	16	X
20	23	1.5	20	X
25	29	1.5	26	X
40	41	1.5	38	X
50	53	1.5	50	X
65	70	2.0	66	X
80	85	2.0	81	X
100	104	2.0	100	X
125	129	2.0	125	X
150	154	2.0	150	X

Table 5: Dimensions pipe DN

Dimensions for pipes in inch OD

Inch OD	Outside diameter	Wall thickness	Inside diameter	Outside diameter acc. to BS 4825
0.5"	12.7	1.65	9.4	X
0.75"	19.05	1.65	15.75	X
1"	25.4	1.65	22.1	X
1.5"	38.1	1.65	34.8	X
2"	50.8	1.65	47.5	X
2.5"	63.5	1.65	60.2	X
3"	76.2	1.65	72.9	X
4"	101.6	2.11	97.38	X
6"	152.4	2.77	146.86	X

Table 6: Dimensions pipe OD

Dimensions for tubes in Inch IPS

Inch IPS	Outside diameter	Wall thickness	Inside diameter	Outside diameter according to DIN EN ISO 1127
2"	60.3	2	56.3	X
3"	88.9	2.3	84.3	X
4"	114.3	2.3	109.7	X
6"	168.3	2.77	162.76	X

Table 7: Dimensions pipe IPS

3.2.5 Lubricants

Lubricant designation	Material no.
Rivolta F.L.G. MD-2 (1000 g)	413-071
Rivolta F.L.G. MD-2 (100 g)	413-136
Grease BARRIERTA L 55/3 (only for seals VMQ)	413-137

Table 8: Lubricants

4 Storage and transport

This chapter contains information about transporting the valve. It also describes the minimum requirements for storage after delivery and for any necessary intermediate storage.

The target group of this chapter is all persons who carry out actions related to the transport or storage of the valve.

4.1 Scope of supply

On receipt of the valve 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.

4.2 Storage

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

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

INFO We recommend storing at a temperature of ≥ 5 °C for a period of 24 hours prior to any handling (removal of the housing / activation of actuators with compressed air) so that any ice crystals formed by condensation water can melt.

4.3 Transport

For transport, the following principles apply:

- Only use suitable hoist and slings for transporting the package units/valves.
- Observe the pictograms on the package.
- Handle valves with care to avoid damage caused by impact or careless loading and unloading. The outside synthetic materials are susceptible to breaking.
- Control tops must be protected from animal and vegetable fats.
- Only allow qualified staff to transport the valve.
- Movable parts must be properly secured.
- Only use approved, fully functional load lifting devices and lifting accessories which are suitable for the intended purpose. Observe the maximum load-bearing capacities.
- Secure the valve against slipping. Take the weight of the valve into account and the position of the point of gravity.
- Under no circumstances should anyone stand under a suspended load.
- Take care when transporting the valve. Do not grip sensitive parts of the unit to lift or push the unit or to support yourself. Avoid jerky movements when putting down the unit.

5 Assembly and installation

This chapter contains information and instructions about the assembly and installation of the valve.

The target group of this chapter is all persons who carry out actions related to the valve.

5.1 Notes on installation

The valve can be installed in any position. Care must be taken to ensure that the valve housing and the pipe system can drain properly.

To prevent damage, make sure that:

- the valve is installed in the pipe system free of tension.
- no foreign materials (e.g. tools, bolts, lubricants) are left in the system.
- with all pneumatic actuators that are used in a vertical pipe, the brackets are facing upwards.

5.2 Butterfly Valve with Welding Flange Design

ATTENTION

Damage caused by welding

The butterfly valve can be damaged by distortion due to welding and when the position of the grooves is altered.

- Only weld the butterfly valve in assembled condition without seal and disk.
- To ensure that a proper weld is formed when the valve is welded into the pipe, make sure that the root side of the weld is protected against oxidation by forming gas.

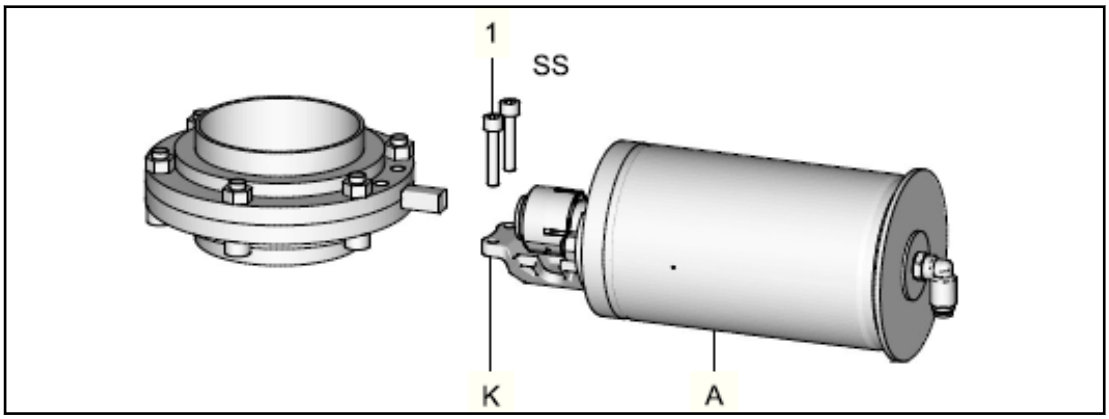
ATTENTION

Stray welding currents during welding

Can cause damage to electronic components

- For avoidance measures, see *Instructions for the Safe Handling of Electronic Components During Welding Work*.

1. Remove the complete actuator (A). To do so, unscrew the screws (1) from the bracket (K) and the butterfly valve body.

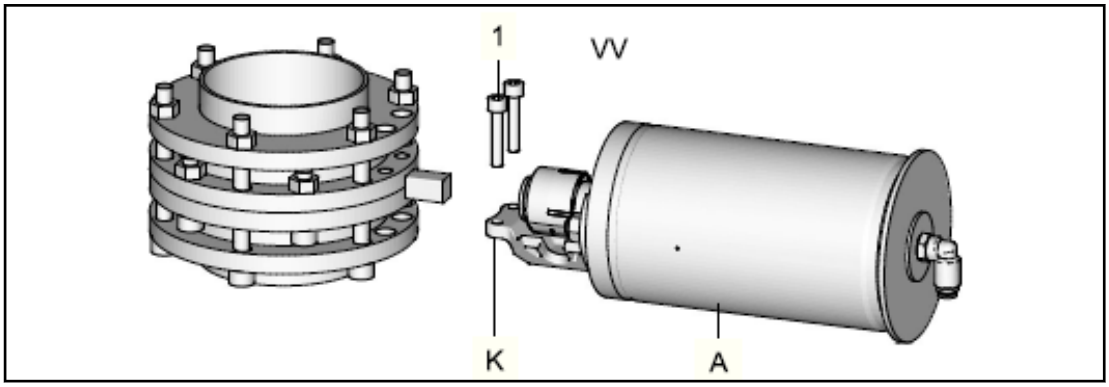


2. Cut the pipe open at the point of installation.
3. Weld the butterfly valve body in position in the pipe system, ensuring that the connection is free of stress and distortion. Use the TIG welding with pulse method.
4. Remove the welding beads.
5. Fit the complete actuator (A).

⇒ The butterfly valve is welded in.

5.3 Butterfly Valve with Intermediate Flange Design

1. Remove the complete actuator (A). To do so, unscrew the screws (1) from the bracket (K) and the butterfly valve body.



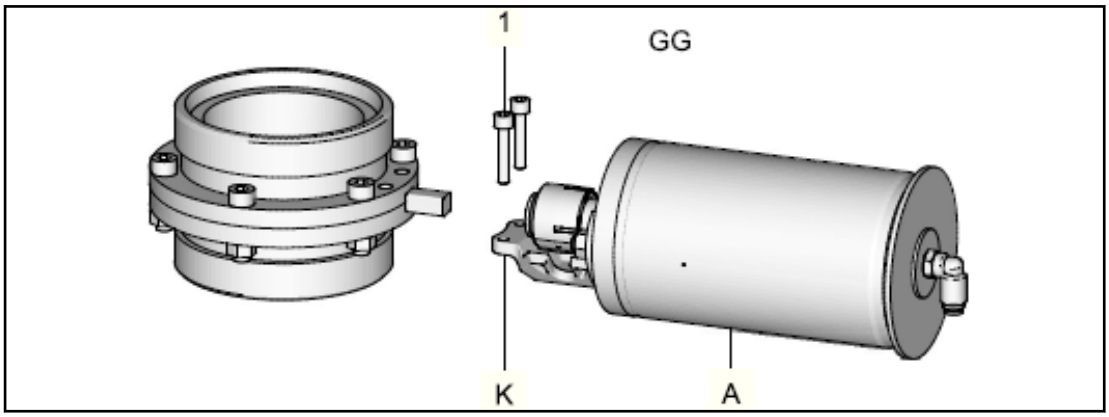
2. Detach the plain flanges from the butterfly valve body.
3. Weld the plain flanges in position in the pipe system, ensuring that the connection is free of stress and distortion. Use the TIG welding with pulse method.
4. Screw the butterfly valve body to the plain flanges.
   → Installation of outer flange Type VV: Arrange additional holes so that bracket (K) can be dismantled in assembled condition.
5. Fit the complete actuator (A).

⇒ The butterfly valve is mounted.

INFO Fit exhaust air/supply air flow control devices for all compressed-air operated design variants. This way you prevent pipe hammers.

5.4 Butterfly valve with screw connection (G, K, C)

1. Remove the complete actuator (A). To do so, unscrew the screws (1) from the bracket (K) and the butterfly valve body.



2. Open the pipe connection at the connection fittings.
3. Fit the butterfly valve body to the connection fittings.
4. Fit the complete actuator (A).

⇒ The butterfly valve is mounted.

INFO Fit exhaust air/supply air flow control devices for all compressed-air operated design variants. This way you prevent pipe hammers.

5.5 Checking the pneumatic connection

5.5.1 Air requirement

See *3.2.2 Technical data*.

5.5.2 Establishing hose connections

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

Tools

- Hose cutter

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

⇒ Hose connection has been established.

5.5.3 Actuator with T.VIS control top

1. Push the air hose into the air connector on the control top.
2. Re-open the compressed air supply.

⇒ Hose connection has been established.

5.5.4 Actuator without a control top

1. Remove the screw plugs from the cylinder.
2. Screw in the air connector G 1/8“
3. Push the air hose into the air connector.
4. Re-open the compressed air supply.

⇒ Hose connection has been established.

5.6 Electrical connections

5.6.1 Electrical connection with T.VIS control top

⚠DANGER

Live parts
Electrical shocks can cause serious personal injuries or death.

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

⚠DANGER

Explosive gases or dusts
An explosion can cause serious personal injuries or death.

- Observe the installation and operating regulations for use in potentially explosive areas!

Prerequisites

- Valve is installed

1. Connect the control top in accordance with the connection diagram and the instructions in the operating instructions for T.VIS control tops.

⇒ Control top is connected.

INFO The proximity switches are set ex-works. Settings can become changed during transport and installation and may need to be reset, see the instruction manual for the control top.

5.6.2 Adjusting the proximity switch – actuator without T.VIS

⚠DANGER

Live parts
Electrical shocks can cause serious personal injuries or death.

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

⚠DANGER

Explosive gases or dusts
An explosion can cause serious personal injuries or death.

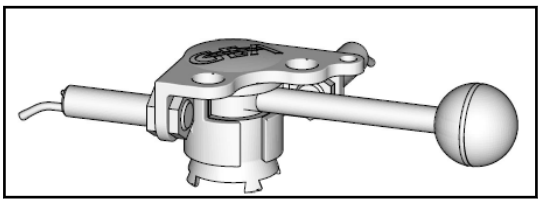
- Observe the installation and operating regulations for use in potentially explosive areas!

1. Loosen the cap nuts on the proximity switch.
2. Hold the proximity switch and turn the cap nuts until a switching gap of max. 4 mm to the associated contact element is achieved.
3. Tighten the cap nuts.

⇒ The initiator has been adjusted.

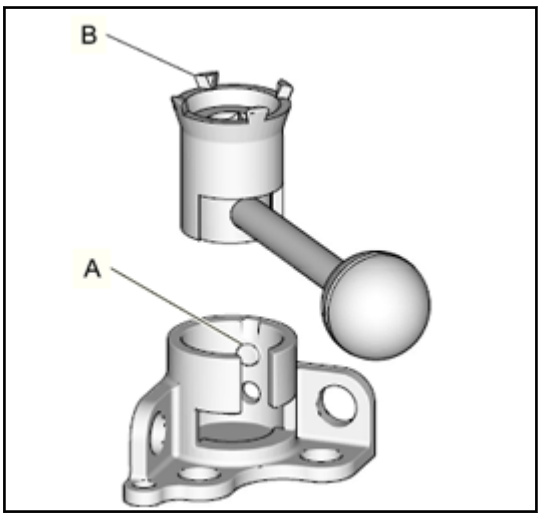
5.7 Retrofitting a proximity switch

1. Place the proximity switch holder "overhead" on the workbench.

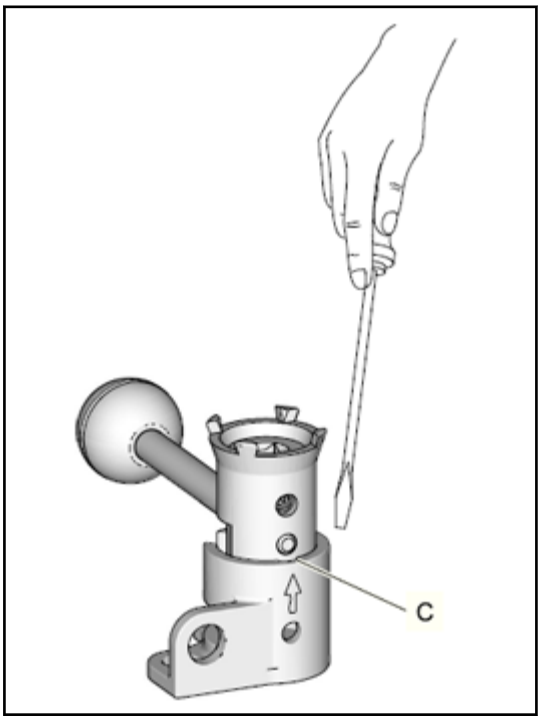


2. Angle the level of the manual actuator at 45°.
3. Insert the manual actuator in the proximity switch holder up to the fixation cam (A).

→ Make sure that the components do not tilt together and position them so that the ball of the hand lever does not lie on the workbench during assembly.



4. To protect against injuries, place a cloth or other suitable material over the four “retaining rods” (B) on the hand lever, press down slightly and insert a screwdriver into the side opening (C).
5. “Press on” the proximity switch holder using the screwdriver and push the hand lever up to the stop in the holder.



6. Check that the proximity switch is positioned correctly.
7. If necessary, push the fixation cam downwards by applying slight pressure.

⇒ Proximity switch holder has been retrofitted.

6 Commissioning

This chapter contains information for the initial and any subsequent commissioning of the valve. It also describes the necessary checks and tests.

The target group of this chapter is all persons who carry out actions related to the valve.

6.1 Preparing commissioning

For initial commissioning, the following principles apply:

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

Notes on commissioning

Before starting commissioning observe the following:

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

6.2 Restarting

The following principles apply for restarting:

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

7 Operation and control

This chapter contains information on operating and shutting down the valve.

The target group of this chapter is the operators of the valve.

7.1 Monitoring operation

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

For operation, the following principles apply:

- Monitor the valve 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 mounted as intended.
- The place of installation of the valve must be adequately ventilated at all times.
- Structural alterations of the valve are not permitted. Immediately report any changes on the valve 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.

7.2 Shutdown

The following principles apply for shutdown:

- Switch off the compressed air.
- Switch off the valve.
- 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.
- In case of longer shut-downs, observe the storage conditions, see *4.2 Storage*.

8 Cleaning

This chapter contains information about cleaning the valve. It also contains information about cleaning intervals and the use of cleaning agents.

The target group of this chapter is all persons who carry out actions related to cleaning the valve.

8.1 General

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

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

The cleaning effect must be checked regularly by the operating company!

8.1.1 Cleaning process examples

Typical cleaning parameters in dairy operations

Example of a two-phase cleaning process:

- Sodium hydroxide solution and sodium hydroxide based combination products in concentrations from 0.5% to 2.5% at 75 °C (167 °F) to 80 °C (176 °F)
- Phosphoric or nitric acid, and combination products based thereon in the concentrations of 0.3 % to 1.5% at approx. 65 °C (149 °F).

Example of a cleaning operation in one cleaning step:

- Formic acid and formic acid-based combination products at up to 85 °C (185 °F).

Typical cleaning parameters in breweries

Example of a two-phase cleaning process:

- Sodium hydroxide solution and sodium hydroxide based combination products in concentrations of 1% to 4% at about 85 °C (185 °F).
- Phosphoric or nitric acid, and combination products based thereon in the concentrations of 0.3 to 1.5% at 20 °C (68 °F).

8.1.2 Cleaning results

The cleaning result depends on the following factors:

- Temperature
- Time
- Mechanics
- Chemicals
- Degree of soiling

These factors can be combined in such a way as to make an optimal cleaning result probable.

8.1.3 Rinsing operations

The table lists the values for the duration and number of rinsing operations.

Medium	Duration [s]	Number of rinsing operations	
Beer	1...2	2...3	During every cleaning phase: 1. Pre-flush 2. Hot lye 3. Intermediate flushing 4. Acid 5. Flush
Yeast	1...2	2...3	
Fruit juices	2...6	3	
Milk	2…5	3	
Yoghurt	3…5	3	

Depending on the cleaning method (medium, concentration, temperature and contact times), the seals are affected to different degrees. This can impair the function and the service life.

8.2 Passivation

Before a system with long pipes and tanks is commissioned, it usually needs to be passivated.

Valve blocks are usually excepted from this.

Passivation is usually carried out with nitric acid (HNO_3) at about 80 °C (176 °F) in a concentration of 3 % and a contact time of 6 to 8 hours.

9 Maintenance

This chapter contains information about valve maintenance, inspection and repairs.

The target group of this chapter is all persons who carry out actions related to the valve.

9.1 Carrying out inspections

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

9.1.1 Checking the pneumatic connection

Prerequisites

- Access to the pneumatic connection

1. Check the operating pressure at the pressure reducing and filter station.
2. Regularly clean the air filter in the filter station.
3. Check that the air connections are tight.
4. Check the lines for kinks and leaks.
5. Check the solenoid valves for proper function.

⇒ The pneumatic connection has been checked.

9.1.2 Checking the electrical connection

Prerequisites

- Access to the electrical connection

1. Check that the union nut on the cable gland is tight
2. Check that the cable connections are firmly secured.
3. Check the solenoid valves for proper function.
4. Check that the proximity switch connections are clean.

⇒ The electrical connection has been checked.

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

9.1.3 Check mechanical connections

1. Check that all screw connections and locking devices are firmly secured.

⇒ Mechanical connections have been tested.

9.1.4 Checking the signs on the valve

Prerequisites

- Valve is accessible

1. Check the signs on the valve, see also *2.9 Safety signs*.
2. If necessary, replace damaged or missing labels with new labels.

⇒ The signs on the valve have been checked.

9.2 Servicing intervals

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

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

- Daily period of use
- Switching frequency
- Type and temperature of the product
- Type and temperature of the cleaning solution
- Ambient conditions

Servicing intervals

Applications	Servicing Intervals (Guideline Values)
Media at temperatures of 60 °C to 130 °C (140 °F to 266 °F)	approx. every 3 months
Media at temperatures of < 60 °C (< 140 °F)	approx. every 12 months

9.3 List of tools

Tool	Intended Purpose	Material no.
Hose cutter	Cutting the pneumatic hoses to size	407-065
Jaw wrench ground SW 8, 9, 10, 12 bis 19, 24	Removing and installing the valve	
Pin punch Ø 4		403-209
Belt wrench	Removing/mounting the actuator	408-142
Adjustable face wrench 80/4 mm	Removing / installing the valve	408-197
Hex. key a/f 3; 4; 5		
Installation mandrel BFV		229-000061

Table 9: List of tools

9.4 Prior to removal

Prerequisites

- Ensure that no active processes are running in the relevant area during maintenance and servicing work .

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

9.5 Removing the valve

9.5.1 Removing control top T.VIS M-15

ATTENTION

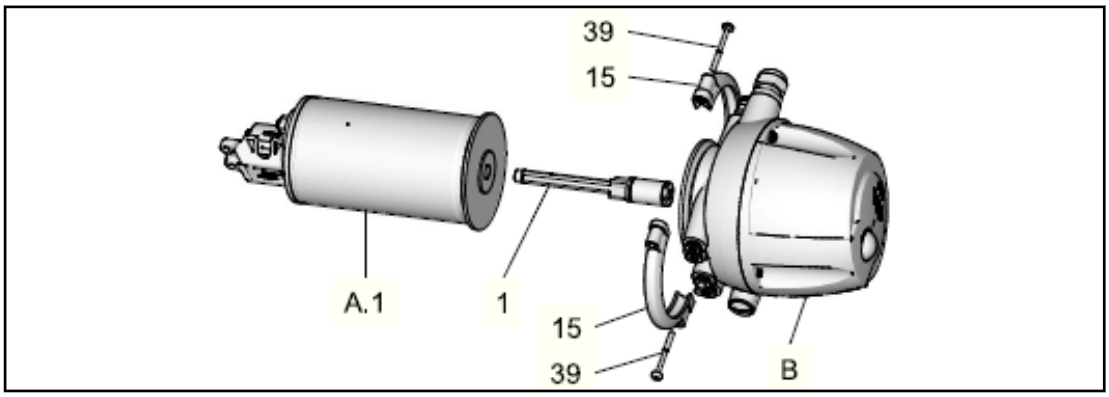
The permanent magnet of the switch bar is fragile and must be protected against impact stress.
Damage to the permanent magnet.

- Protect the permanent magnet against impact stress.

Prerequisites

- The pneumatic and electrical connections on the plant side can remain on the control top.

1. Loosen the screws (39).



2. Remove the clamps (15).
3. Withdraw the control top (B) via the switch bar (1) from the actuator (A.1).
4. Unscrew the switch bar (1).

⇒ Control top is removed.

9.5.2 Removing control top T.VIS P-15 and A-15

ATTENTION

The permanent magnet of the switch bar is fragile and must be protected against impact stress.
Damage to the permanent magnet.

- Protect the permanent magnet against impact stress.

ATTENTION

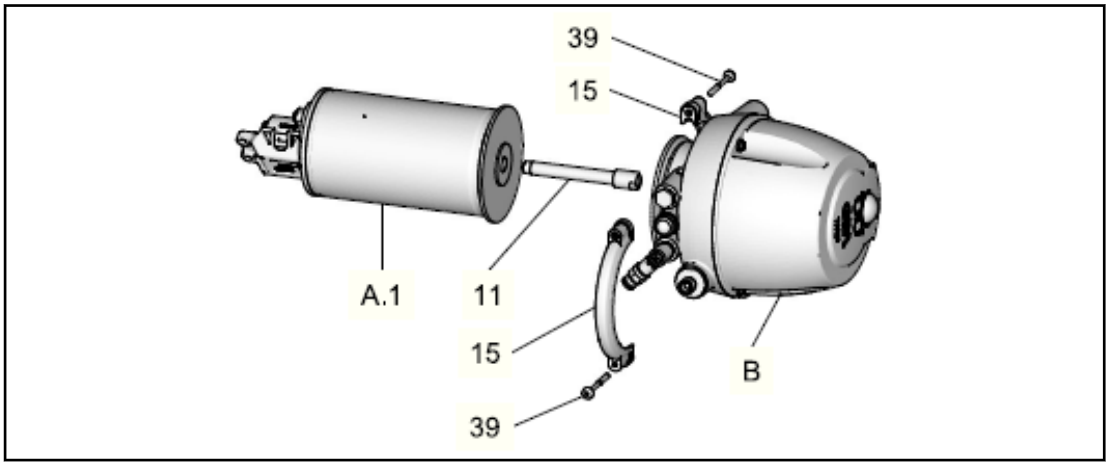
The sensor is a sensitive component.
Damage of the sensor and failure of the valve.

- Always handle the sensor with care!

Prerequisites

- The pneumatic and electrical connections on the plant side can remain on the control top.

1. Loosen the screws (39).

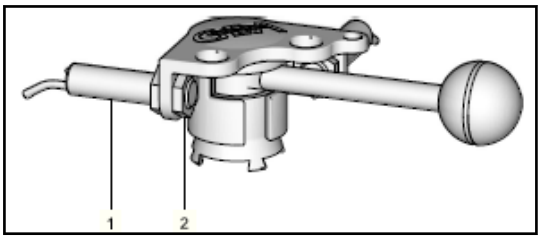


2. Remove the clamps (15).
3. Withdraw the control top (B) via the switch bar (11) from the actuator (A.1).
4. Unscrew the switch bar (11).

⇒ Control top is removed.

9.5.3 Removing the initiator – actuator without T.VIS

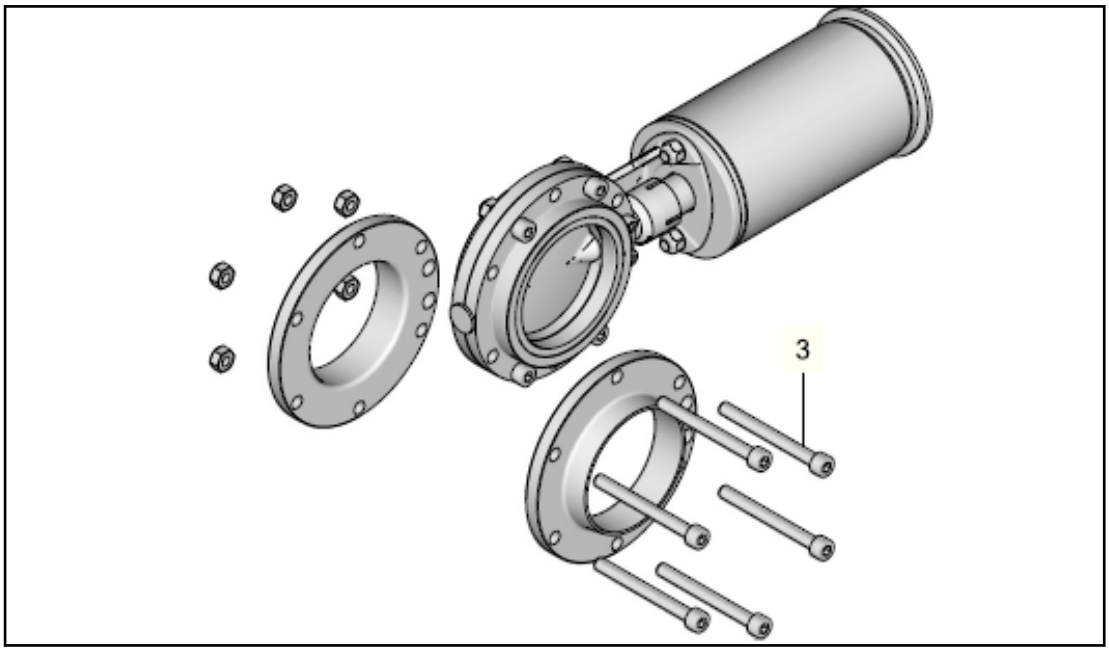
1. Unscrew the hexagon nuts (2) on the initiators (1).
2. Remove the proximity switches (1).



⇒ The initiators are removed.

9.5.4 Intermediate flange design type VV – removing the valve

1. Undo the screw connections (3).

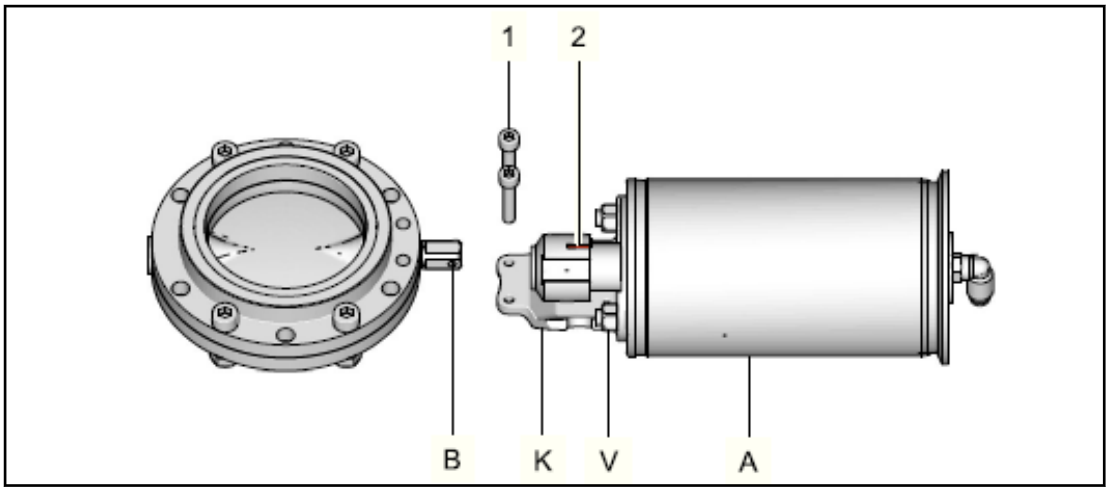


2. Remove the valve from the pipe.

⇒ The valve is removed.

9.5.5 Disconnecting the actuator

1. Undo the screw connections (1).



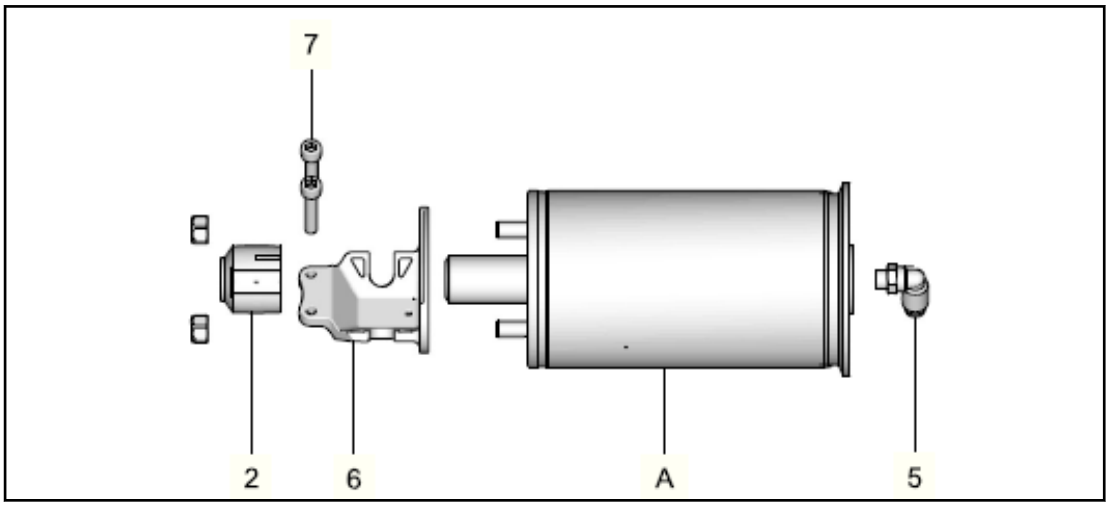
2. Lift out the actuator (A).

⇒ The actuator is disconnected.

INFO The red position indication marker (2) is aligned with the hole in the flap so that it indicates the position of the flap in the valve.

9.5.6 Dismantling the actuator parts

1. Undo the screw connections (7).

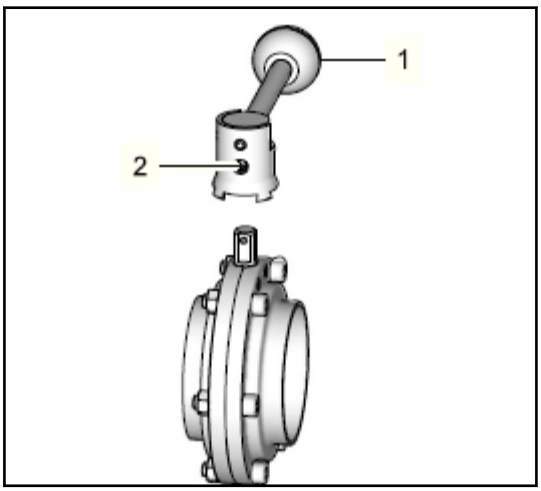


2. Remove the position indicator (2) together with the bracket (6).
3. Unscrew the elbow screw-in plug connection (5).
   → For air/air actuators: Unscrew both elbow screw-in plug connections.

⇒ Individual parts have been removed from the actuator.

9.5.7 Removing the manual actuator H

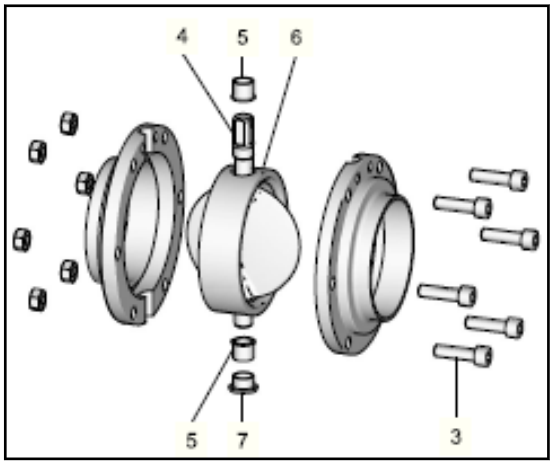
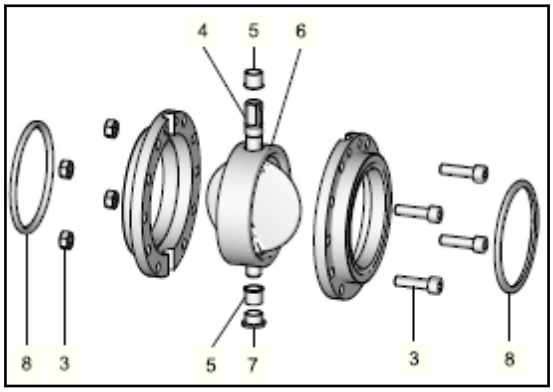
1. Use an AF 4 hex socket wrench to unscrew the locking screw (2) until it is flush with the bushing.
2. Take off the hand lever (1).



⇒ The manual actuator (H) has been removed.

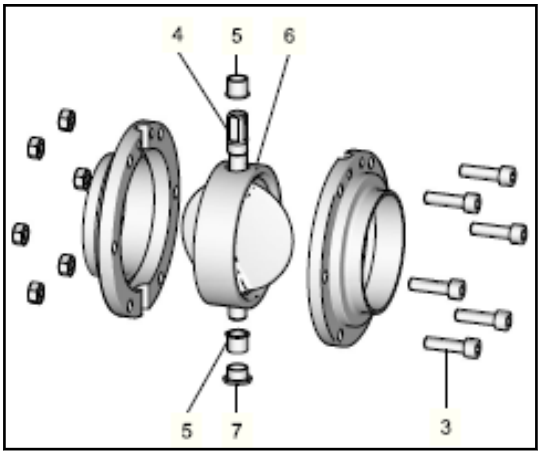
9.5.8 Dismantling the valve flap into individual parts

The work steps to remove the disk seal are the same for both valve types.

Valve type SS	Valve type VV
	

Removing the Flanges

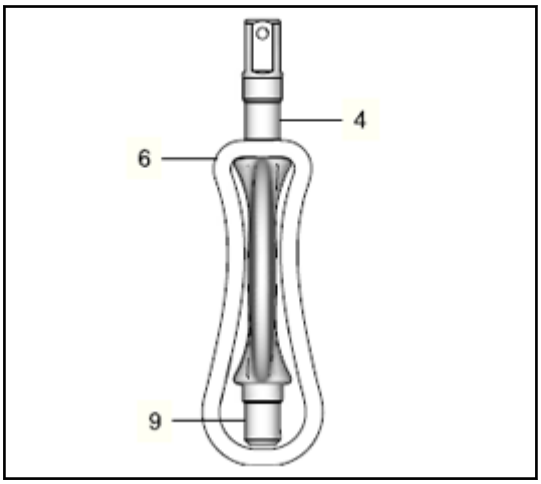
1. Undo the screw connections (3).
2. Pull the butterfly valve body apart.
3. Remove the stopper (7).
   → The stopper protects the plain bearing from soiling.
4. Take out the shut-off disk (4) with the seal (6).



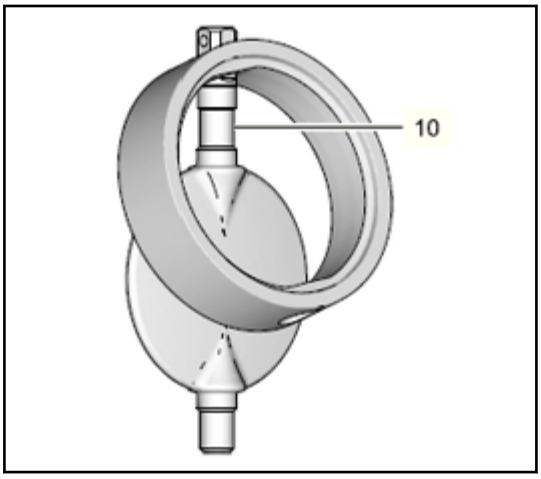
⇒ The flange has been removed.

Removing the Seal

1. Pull off the plain bearings (5).
2. Turn the seal (6) until it is positioned at a 90° angle to the disk (4).
3. Pull the seal over the short end (9) of the disk.



4. Unclamp the disk.
5. Pull the seal over the long end of the shaft (10).



⇒ The disk seal has been removed.

9.6 Installing the valve

9.6.1 Tightening torques

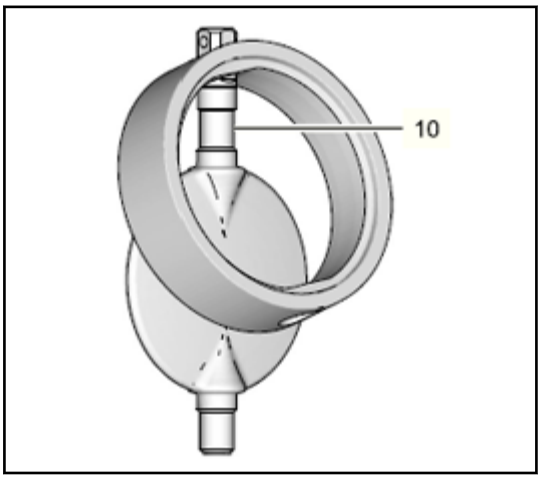
Tighten the following valve connections to the torques specified in the table.

Tightening torques for		[Nm]	[lbft]
Clamps on the control top		1	0.7
Bolts	M6	8	5,9
	M8	15	11
	M10	45	33
	M12	78	57.5

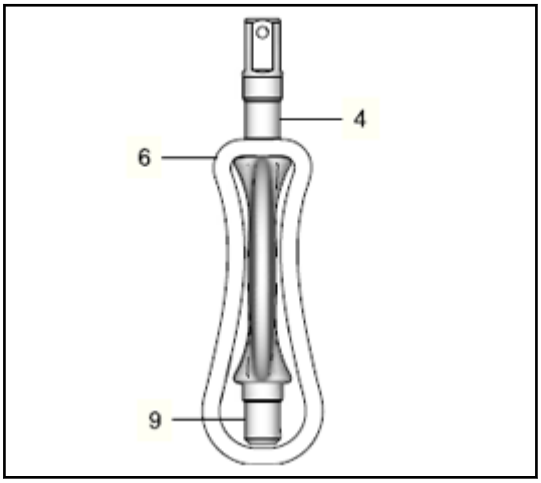
9.6.2 Mounting the valve flap from individual parts

Installing the seal

1. Pull the seal over the long end of the shaft (10).

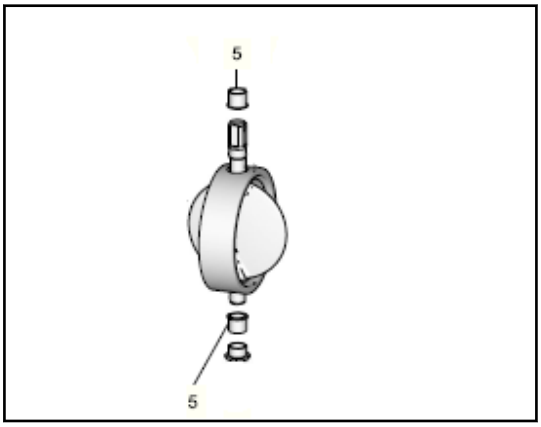


2. Clamping the flap.
3. Turn the seal (6) until it is positioned at a 90° angle to the disk (4).
4. Pull the seal over the short end (9) of the disk.



5. Pull off the slide bearings (5).

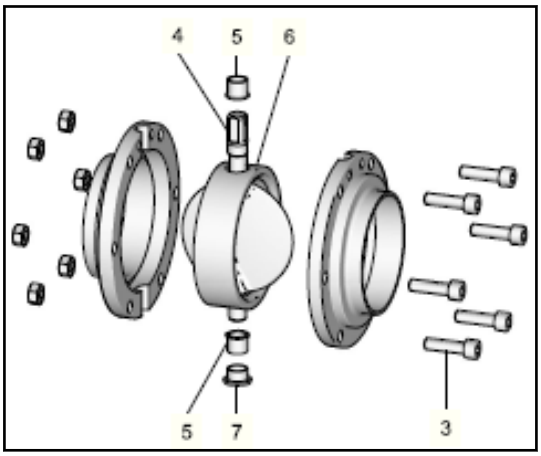
→ To fit the upper plain bearing on valves with nominal widths DN 80 and DN 100 or 3" OD and 4" OD put installation mandrel 229-000061 over the square end to mount the plain bearing.



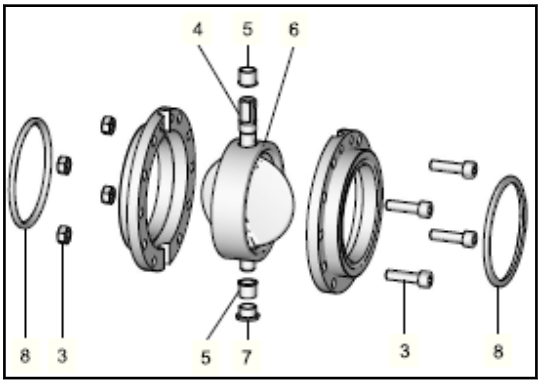
⇒ The flap seal has been installed.

Installing the flanges

1. Position the shut-off flap (4) at a 90° angle to the seal and insert it into the flange.
2. Fit the plug (7).
   → The stopper protects the plain bearing from soiling.
3. Assembling the butterfly valve body.
4. Mounting the screw connections (3).



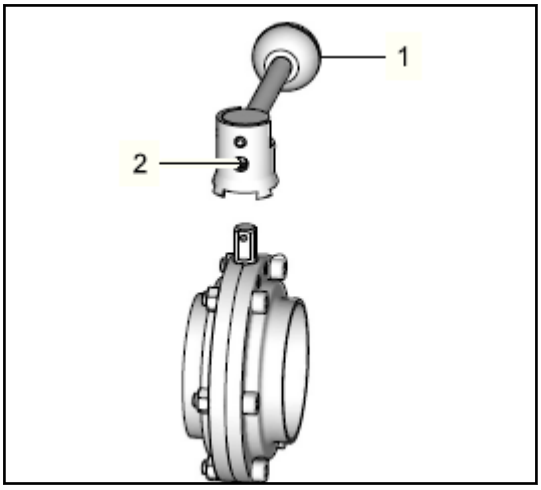
5. For valve type VV: Mounting the O-ring (8).



⇒ The flanges have been mounted.

9.6.3 Mounting the manual actuator H

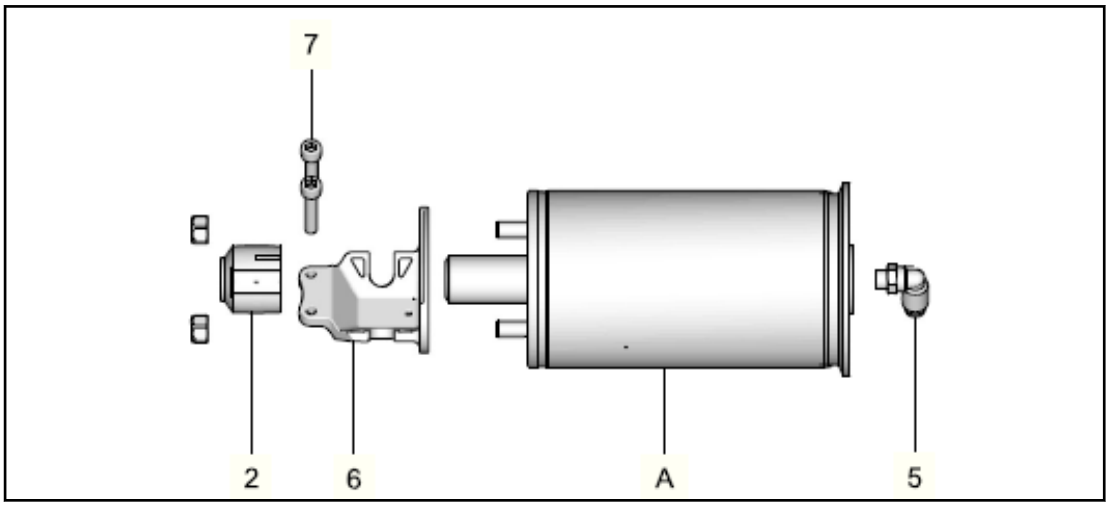
1. Position the hand lever (1).
2. Screw in locking bolt (2) using a hexagon socket wrench AF 4.



⇒ The hand lever (H) is mounted.

9.6.4 Mounting the individual parts on the actuator

1. Screw in the elbow screw-in plug connection (5).



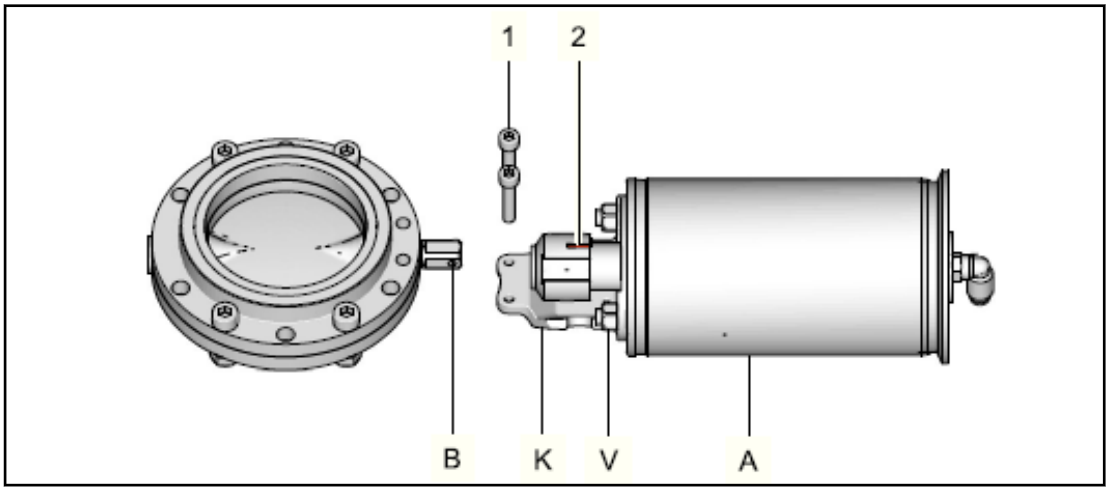
→ For air/air actuators: Screw in both elbow screw-in plug connections.

2. Mounting the position indicator (2) together with the bracket (6).
3. Mounting the screw connections (7).

⇒ The individual parts are mounted on the actuator.

9.6.5 Mounting the drive

1. Mount the actuator (A) onto the butterfly valve body.



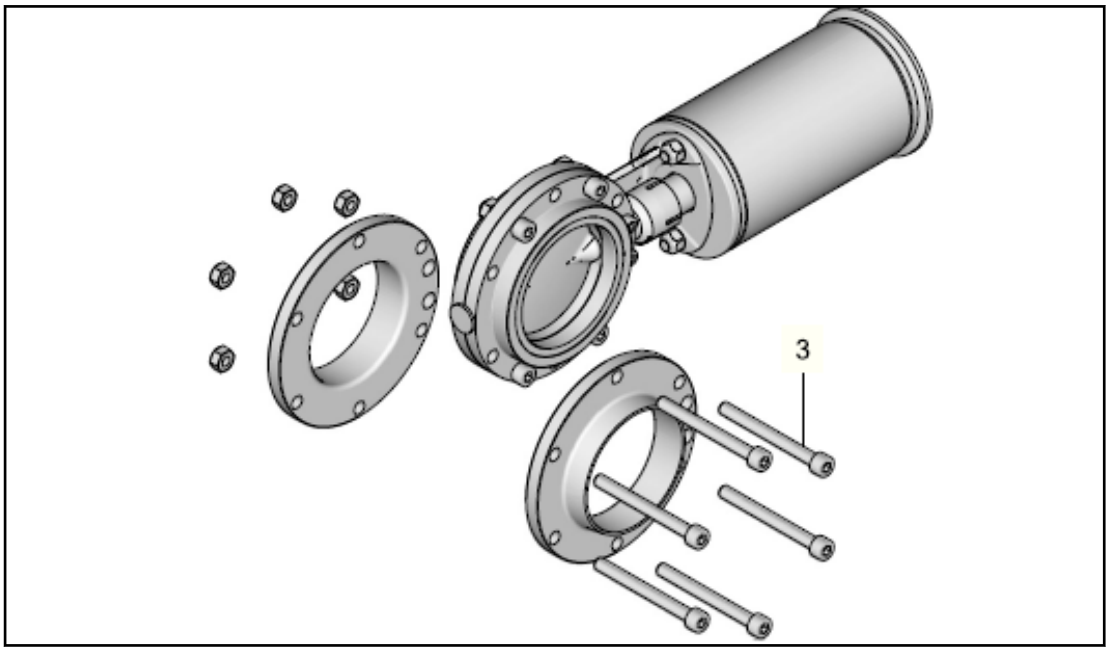
2. Mounting the screws (1).

⇒ The actuator is mounted.

INFO The red position indication marker (2) is aligned with the hole in the flap so that it indicates the position of the flap in the valve.

9.6.6 Intermediate flange design type VV – mounting the valve

1. Inserting the valve in the pipe.



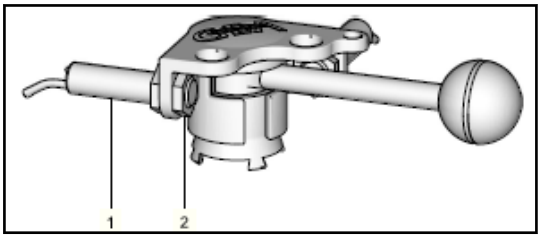
→ Arrange additional holes so that the bracket can be dismantled in an assembled condition.

2. Mounting the screw connections (3).

⇒ The valve is fitted.

9.6.7 Mounting the initiator

1. Inserting the initiators (1).
2. Mounting the hexagon nuts (2) on the initiators (1).



⇒ The initiators are mounted.

9.6.8 Mounting control top T.VIS M-15

ATTENTION

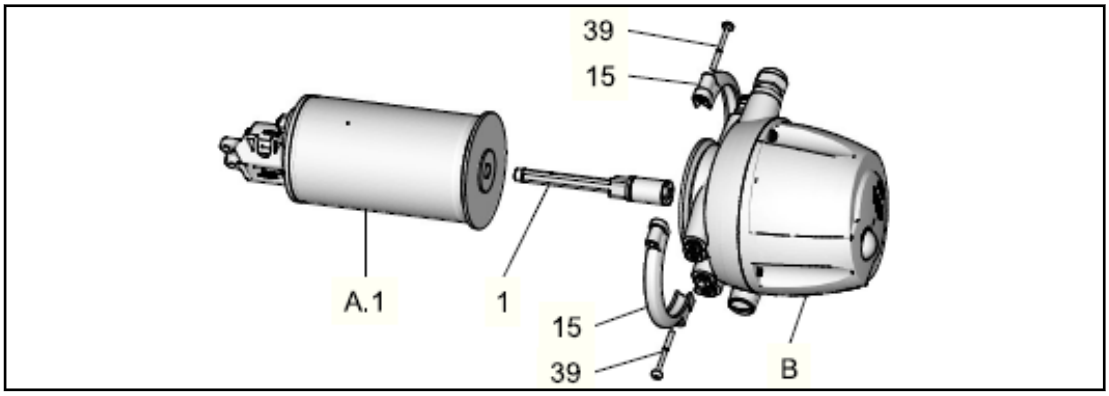
The permanent magnet of the switch bar is fragile and must be protected against impact stress.

Damage to the permanent magnet.

- Protect the permanent magnet against impact stress.

INFO Also refer to the instruction manual for the T.VIS M-15.

1. Screw in the switch bar (1).



2. Push the control top (B) via the switch bar (1) onto the actuator (A.1).
3. Mounting the half-rings (15).
4. Mounting the screws (39).

⇒ Control top is fitted.

9.6.9 Mounting control top T.VIS P-15 and A-15

ATTENTION

The permanent magnet of the switch bar is fragile and must be protected against impact stress.
Damage to the permanent magnet.

- Protect the permanent magnet against impact stress.

ATTENTION

The sensor is a sensitive component.
Damage of the sensor and failure of the valve.

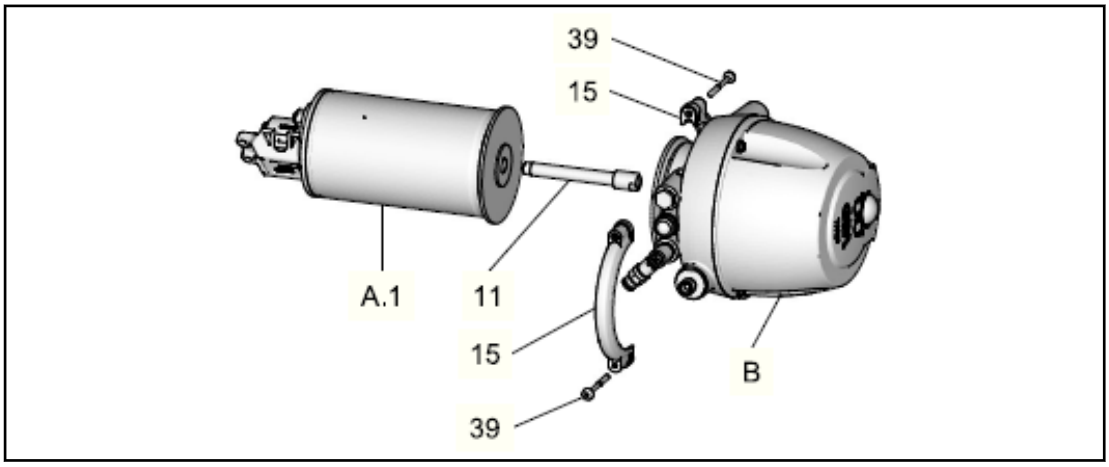
- Always handle the sensor with care!

INFO Also refer to the instruction manual for the T.VIS P-15 / A-15.

Prerequisites

- The pneumatic and electrical connections on the plant side can remain on the control top.

1. Screw in the switch bar (11).



2. Push the control top (B) via the switch bar (11) onto the actuator (A.1).
3. Mounting the half-rings (15).
4. Mounting the screws (39).

⇒ Control top is fitted.

9.7 Maintenance

9.7.1 Cleaning the valve

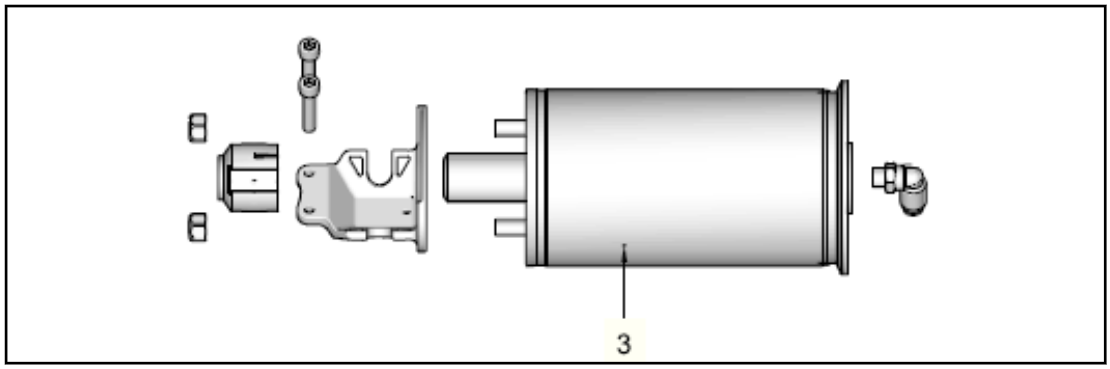
ATTENTION

Damage to the valve

Damage to the valve parts can result in a malfunction.

- Observe the safety information sheets issued by the detergent manufacturers!
- Only use detergents which are non-abrasive and not aggressive towards stainless steel.
- Use only cleaning mediums which do not damage the materials of the control top (PPE, PA).

1. Disassemble the valve, see *9.5 Removing the valve*.
2. Carefully clean the individual parts.
3. Check that air can exit freely from the vent screw (3).



⇒ The valve has been cleaned.

INFO Observe the safety data sheets supplied by the detergent manufacturers. Only use detergents which are non-abrasive and not aggressive towards stainless steel.

9.7.2 Lubricating seals and threads

Prerequisites

- The valve has been removed, see *9.5 Removing the valve*.

Tools

- Lubricants Rivolta F.L.G. MD-2 and PARALIQ GTE

ATTENTION

Damage to seals and threads

Stainless steel threads tend to seize and stick, and must be greased. Damage to seals and threads can result in malfunction.

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

1. Apply a light film of lubricant to all threads.
2. Apply a light film of lubricant to all seals.
3. Apply a light film of lubricant to the shaft ends.

⇒ Seals and threads have been lubricated.

INFO GEA Tuchenhagen recommends Rivolta F.L.G. MD-2 und PARALIQ GTE 703. These lubricants are approved for foodstuff and are resistant to beer froth. They have the NSF-H1 (USDA H1) registration. They do not affect the taste or the consistency of the products and are compatible with the seals in contact with product. Rivolta F.L.G. MD-2 can be ordered from GEA Tuchenhagen. Using other types of grease can result in malfunctions or in premature seal failure. The warranty will also become null and void. A Manufacturer's Declaration for these products can be obtained from GEA Tuchenhagen if required. A thin film of grease is required on the seals to ensure the proper function of the fittings. It reduces friction and extends the service life of the seals. This is absolutely harmless from a health and hygienic point of view. Running dry must be avoided!

10 Malfunctions

This chapter contains information about how to rectify problems with the valve.

The target group of this chapter is all persons who carry out actions related to the valve.

Fault	Possible cause	Measure
Actuator does not work	Air hoses clogged or leaking	Clean or replace the air hoses
	Control air pressure too low	Increase the control air pressure
	Solenoid valve defective	Replace the solenoid valve
	Valve disk is blocked	Clear the blockage
No feedback signal	Proximity switch adjusted	Adjusting the proximity switch
	Loose switch bar (Caution: the switch bar might be under pressure).	Check that the switch bar is firmly in place
	Proximity switch not connected correctly	Check and correct the wiring
	Proximity switch faulty	Replace the proximity switch
Leakage at flanges	Disk seal defective	Replace the disk seal
Leak within the pipe	Disk seal defective Flap defective	Replace the disk seal Replace the flap

Table 10: Malfunctions

11 Decommissioning, dismantling and disposal

This chapter contains information about decommissioning the valve. It also describes the removal and disposal processes. The target group of this chapter is all persons who carry out actions related to the valve.

11.1 Decommissioning

The following principles apply for decommissioning:
- Switch off the compressed air.
- Switch off the component with the main switch.
- Padlock the main switch (if fitted) in the off position to prevent it from being switched back on. The key to the padlock must be deposited with the person responsible until the machine is restarted.
- For longer periods of standstill, observe the storage conditions, see *4.2 Storage*.

11.2 Dismantling

Prerequisites
- Ensure that no active processes are running in the relevant area during dismantling.

1. Empty all pipe elements that lead to the valve.
2. Shut off the control air supply.
3. Disconnect the power supply.
4. Take the valve out of the pipe section, with all housings and housing connections if possible.
   → The valve has been dismantled.

11.3 Disposal

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

The valve 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 instruction manual for the individual components.

⚠DANGER

The spring forces in the actuator can be as high as 24 kN.
The pre-stressed spring can cause serious personal injury or death.

- Never open the actuator.
- GEA Tuchenhagen accepts unopened actuators and arranges the proper disposal free of charge.

Prerequisites

- The valve should be disposed of

1. Remove the actuator.
2. Pack the actuator securely and send it to GEA Tuchenhagen GmbH.

⇒ The valve actuator has been disposed of.

12 Replacement parts

This chapter contains information on ordering replacement parts for the valve and is aimed at all users of the valve.

12.1 Order information

Only original spare parts from GEA may be used. All spare parts are packed in GEA original packaging and marked accordingly.

The spare parts are not included in the scope of supply of the machine.

The specifications listed below must be cited on every spare part order.

- Machine type: see type plate
- Machine number: see type plate
- Order number: see spare parts list
- Name: see spare parts list

12.2 Spare parts lists

- Parts list - Manual actuator hygienic butterfly valve
- Parts list - Pneumatic actuator hygienic butterfly valve
- Dimension sheet - Butterfly valve body hygienic butterfly valve (two-piece flange variants)
- Dimension sheet - Hygienic butterfly valve (intermediate flange variant)
- Dimension sheet - Hygienic butterfly valve (two-piece variants)
- Dimension sheet - Hygienic butterfly valve (intermediate flange)
- Dimension sheet - Hygienic butterfly valve/ seals

www.assets.gea.com

Link to spare parts list for: GEA Hygienic butterfly valve

www.assets.gea.com

Link to seal set: GEA Hygienic butterfly valve

www.assets.gea.com

Link to dimensional sheets for: GEA Hygienic butterfly valve

13 Annex

13.1 List of abbreviations

Abbreviation	Explanation
BS	British Standard
bar	Unit of measurement of pressure [bar] All pressure data expressed in [bar/psi] is assumed to be gauge pressure [barg/psig] unless explicitly specified otherwise.
approx.	approximately
°C	Unit of measurement of temperature [degree Celsius]
CIP	Clean in Place
dm^3n	Unit of measurement of volume [cubic decimetre] standard volume (standard litres)
DN	DIN nominal width
DIN	German standard issued by DIN (Deutsches Institut für Normung e.V., German Institute for Standardization)
EN	European Standard
EPDM	Material designation, Brief designation according to DIN/ISO 1629: Ethylene-propylene-diene- rubber
°F	Unit of measurement of temperature [degree Fahrenheit]
FKM	Material designation, short designation according to DIN/ISO 1629: Fluorine rubber
h	Unit of measurement of time [hour]
HNBR	Material designation,
	short designation according to DIN/ISO 1629: Hydrated nitrile butadiene rubber
IP	Protection class
ISO	International Standard of the International Organization for Standardization
kg	Unit of measurement of weight [kilogram]
kN	Unit of measurement of force [kilonewton]
Kv value	Flow coefficient [m^3/s] 1 KV = 0.86 x Cv
l	Unit of measurement of volume [litre]
max.	maximum
mm	Unit of measurement of length [millimetre]
µm	Unit of measurement of length [micrometre]
M	Metric
NC	Normally Closed; actuator is spring-to-close, valve is closed in idle position

Abbreviation	Explanation
Nm	Unit of measurement for the tightening torque [newton metre] 1 Nm = 0.737 lbft Pound-Force (lb) + Feet (ft)
NO	Normally Open; actuator is spring-to-open, valve is open in idle position
PA	Polyamide
PE-LD	Low-density polyethylene
PPE	Polytetrafluoroethylene
psi	Anglo-American unit of measurement for pressure [pound-force per square inch] All pressure data expressed in [bar/psi] is assumed to be gauge pressure [barg/psig] unless explicitly specified otherwise.
PTFE	Polytetrafluoroethylene
SET-UP	Self-learning installation During commissioning and maintenance, the SET-UP procedure carries out all the necessary settings for the generation of messages.
AF	Indicates the size of spanners [width across flats]
T.VIS	Tuchenhagen valve information system
V AC	Volt alternating current
V DC	Volt direct current
W	Unit of measurement of power [Watt]
TIG	Welding method Tungsten inert gas welding
Inch	Unit of measurement of length in the Anglo-American language area
Inch OD	Tube measurement according to British Standard (BS), outside diameter
Inch IPS	American pipe measurement, iron pipe size

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