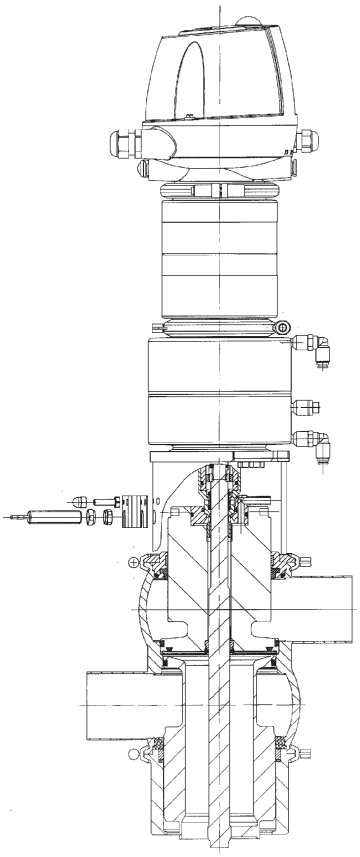


Operating Instructions

VARIVENT® Mixproof Valve M_OB (06)

Issue 2017-06 Revision 8
Valve code ending ...B/06
English

Contents

Remark:
Please see Chapter "Test Procedures for Tuchenhagen PMO Valve Type M_O, in Operating Instructions "Control Module T.VIS M-1 for PMO Valve Type M_O (B/06)", step 5, page 16

Introduction

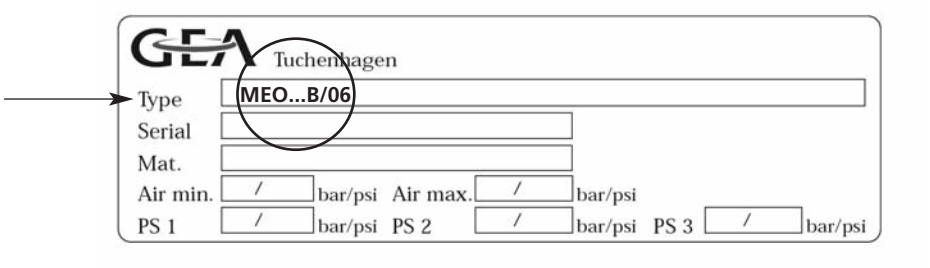
Manufacturer's name and address

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

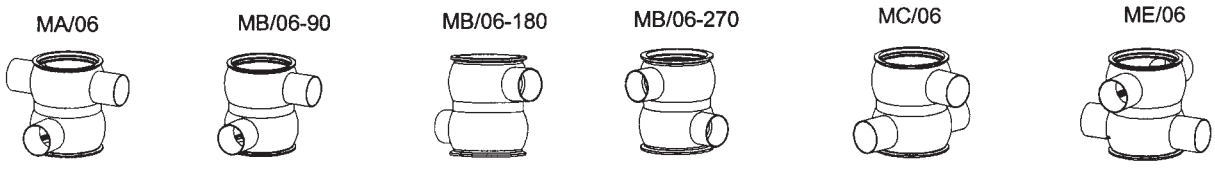
House address:
Berliner Straße 25
D-21514 Büchen
Germany

Phone.: +49-(0)41 55 / 49 -0
Fax: +49(0)41 55 /49 2423
E-Mail: sales.geatuchenhagen@gea.com
www.tuchenhagen.com

Identification of GEA Tuchenhagen valves



GEA Tuchenhagen valves are fitted with a type plate located in the middle of the actuator.
Please specify the complete valve identification code in all correspondence and when ordering spare parts.
In these operating instructions, the GEA Tuchenhagen valves are designated with the following letter combinations (see circle above): MSA, MSB, MSC and MSE.



Wichtige Abkürzungen und Begriffe

BS	Britischer Standard
bar	Maßeinheit für den Druck Alle Druckangaben [bar/psi] stehen für Überdruck [bar_g/psi_g] soweit dies nicht explizit anders beschrieben ist.
ca.	cirka
°C	Maßeinheit für die Temperatur Grad Celsius
dm^3_n	Maßeinheit für das Volumen Kubikdezimeter Normvolumen (Normliter)
DN	DIN-Nennweite
DIN	Deutsche Norm des *DIN Deutschen Institut für Normung e.V.*
EN	Europäische Norm
EPDM	Materialangabe *Kurzbezeichnung nach DIN/ ISO 1629* *Ethylen-propylen-Dien-Kautschuk*
°F	Maßeinheit für die Temperatur Grad Fahrenheit
FKM	Materialangabe *Kurzbezeichnung nach DIN/ ISO 1629* *Fluor-Kautschuk*
h	Maßeinheit für die Zeit Stunde
HNBR	Materialangabe *Kurzbezeichnung nach DIN/ ISO 1629* *Hydrierter Acrylnitril-Butadien-Kautschuk*
IP	Schutzart
ISO	Internationaler Standard der *International Organization for Standardization*
kg	Maßeinheit für das Gewicht Kilogramm
kN	Maßeinheit für die Kraft Kilonewton
l	Unit of measure for volume litre
max.	maximum
mm	Unit of measure for length millimetre
µm	Unit of measure for length micrometre
M	metric
Nm	Unit of measure for work Newton metre *Unit for torque* 1 Nm = 0,737 lbft Pound-Force (lb) + Feet (ft)
Size	Size of spanners
PA	Polyamide
PE-LD	Polyethylen low density
see Chapt.	see Chapter
s. ill.	see illustration
T.VIS®	Tuchenhagen Valve Information System
V DC	Volt direct current
V AC	Volt alternating current
W	Unit of measure for power Watt
Inch OD	Pipe dimension acc. to British standard (BS), Outside Diameter
Inch IPS	US pipe dimension Iron Pipe Size

Safety Instructions

Designated use

The valve is designed exclusively for the purposes described below. Using the valve for purposes other than those mentioned is considered contrary to its designated use. GEA Tuchenhagen cannot be held liable for any damage resulting from such use; the risk of such misuse lies entirely with the user.
The prerequisite for the reliable and safe operation of the valve is proper transportation and storage as well as competent installation and assembly.
Operating the valve within the limits of its designated use also involves observing the operating, inspection and maintenance instructions.

Personnel

Personnel entrusted with the operation and maintenance of the valve must have the suitable qualification to carry out their tasks. They must be informed about possible dangers and must understand and observe the safety instructions given in the relevant manual. Only allow qualified personnel to make electrical connections.

Modifications, spare parts, accessories

Unauthorized modifications, additions or conversions which affect the safety of the valve are not permitted.
Safety devices must not be bypassed, removed or made inactive.
Only use original spare parts and accessories recommended by the manufacturer.

General instructions

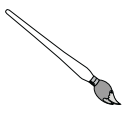
The user is obliged to operate the valve only when it is in good working order.
In addition to the instructions given in the operating manual, please observe the following:
– relevant accident prevention regulations
– generally accepted safety regulations
– regulations effective in the country of installation
– working and safety instructions effective in the user's plant.
– Installation and operating instructions if used within potentially explosive areas.

Marking of safety instructions in the operating manual

Special safety instructions are given directly before the operating instructions. They are marked by the following symbols and associated signal words.
It is essential that you read and observe the texts belonging to these symbols before you continue reading the instructions and handling the valve.

Symbol	Signal word	Meaning
	**DANGER**	Imminent danger, which may cause severe bodily injury or death.
	**CAUTION**	Dangerous situation, which may cause slight injury or damage to material.
		When working in potentially explosive atmospheres, strictly observe the instructions for commissioning and maintenance

Further symbols

Symbol	Meaning
•	Process / operating steps which must be performed in the specified order.
✗	Information about the optimum use of the valve.
–	General enumeration
	points to be lubricated

Special hazardous spots

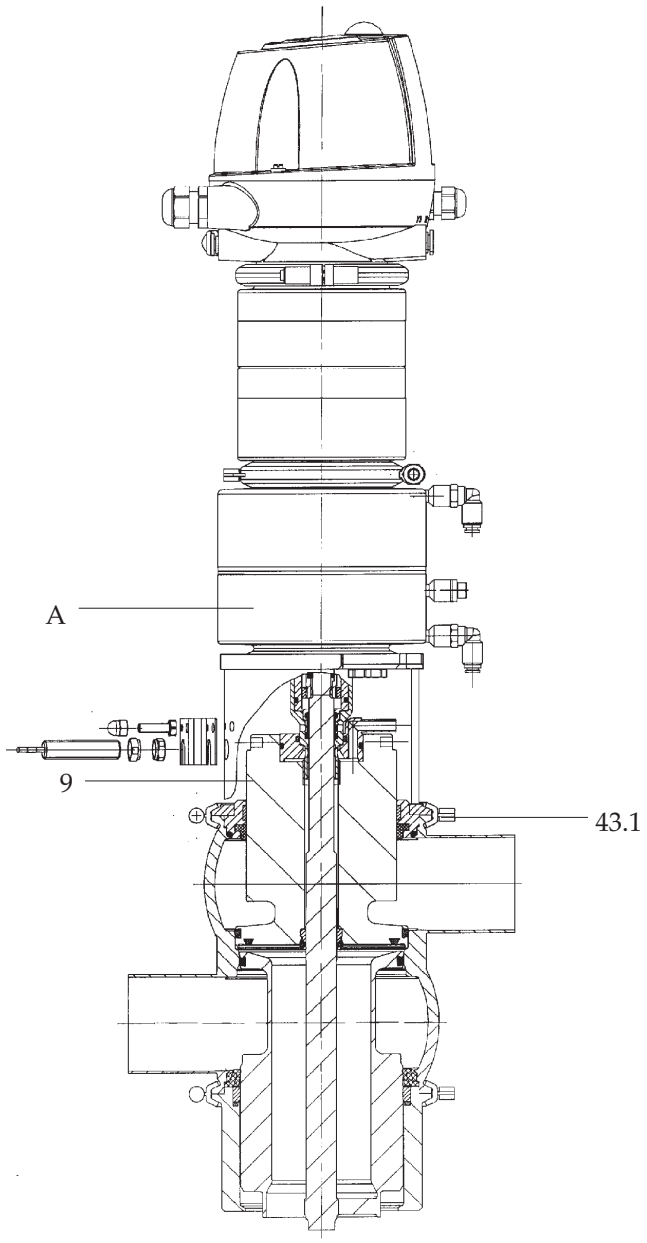
DANGER

In the event of malfunctions set the valve out of operation (disconnect the valve from the power and the air supply) and secure it against reactivation.
Immediately rectify the fault.

Never put your hand into the lantern (9) or into the valve housing.

When the hinged clamps (43.1) of the non-actuated valve (spring-closing action) are detached, there is danger of injury, since the released spring pressure suddenly lifts the actuator(A).

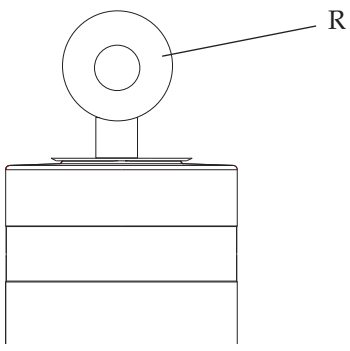
Therefore, prior to detaching the hinged clamp (43.1), release the spring
tension:
– through the pneumatic emergency switchbar.
– by pressurizing the actuator with compressed air.



CAUTION

Housing sockets have very sharp edges. Therefore wear suitable protection gloves during transport or installation of the valves.

For transportation and installation of the valve, it is imperative to remove the control module and the valve stem and to use the screwed-in eye bolt (R), part no. 221-104.98 for lifting the valve.



Designated Use

The Double-seat Mixproof Valve type M_OB with lifting actuator MN is used for mixproof shut-off of high quality, non-abrasive products at points of intersection in pipe systems.
It is resistant to pipe hammers.

CAUTION
Do not install the valve with actuator spring-to-open, because the valve may open in case of power / air failure and cause product intermixing.

Double-seat Mixproof Valve, type M_OB are pressure keeping equipment parts (without safety function) in the sense of the press. to Appendix II in Article 3, Section 3. In case of deviations thereof, a separate Declaration of Conformity will be handed out together with the equipment.

Transport and Storage

Checking the consignment

Upon receipt of the valve check whether the
– type and serial number on the type plate correspond to the data in the order and delivery documents and
– the equipment is complete and all components are in good order.

The forwarding agent must immediately be notified of any transport damage detectable from the outside and/or missing packages (confirmation on the consignment note). The consignee shall take recourse against the forwarding agent immediately in writing and inform GEA Tuchenhagen accordingly.
Transport damages which cannot be recognized immediately shall be brought to the forwarder´s notice within 6 days. Later claims on damages shall be born by the consignee.

Transport

DANGER
For transport of the package units/valves only use suitable lifting gears and slings. Observe the instruction symbols on the package and on the valve.
Handle the valve with care to avoid damage caused by shock or careless loading and unloading.
The plastic materials of the control modules are susceptible to breaking.
For the transportation of the valve, it is imperative to remove the control module and the valve stem and to use the screwed-in eye bolt, part no. 221-104.98 for lifting the valve, see Chapt. „Special hazardous spots“.

Storage

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

In the case that during transport or storage the valve was exposed to temperatures ≤ 0°C, it must be stored in a dry place against damage.
We recommend, prior to any handling (dismounting the housings / activation of actuators) an intermediate storage of 24 h at a temperature of ≥ 5 °C so that any ice crystals formed by condensation water may melt.

Design and Function

Design

A actuator

B control module

1 sealing ring

2 rod guide ring

3 sealing disk

5 O-Ring

7 V-ring RA

8 V-ring

9 lantern

15 valve disk M/06

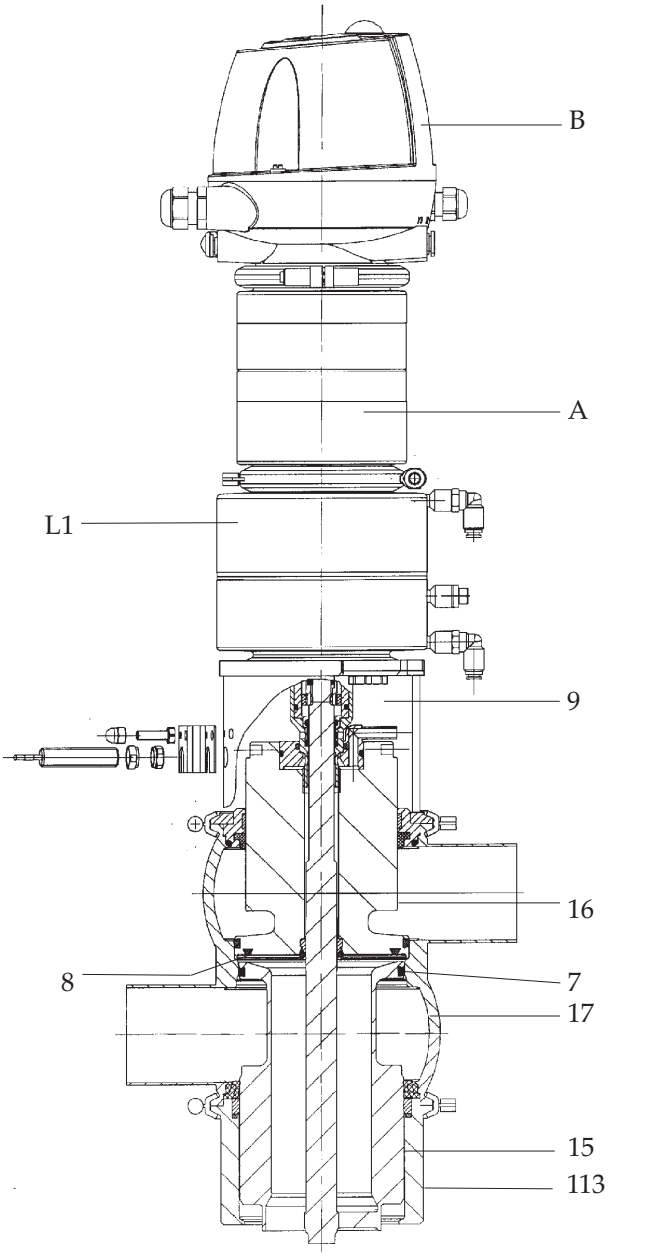
16 double valve disk M/06

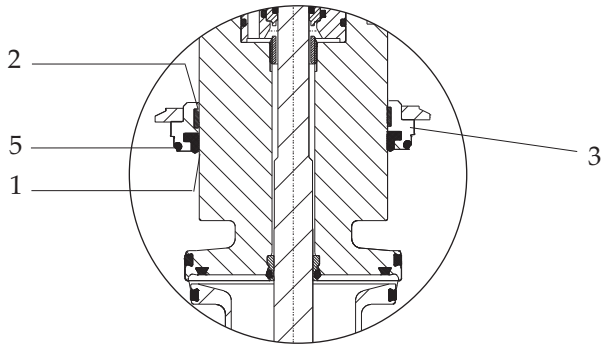
L1 lifting actuator MN

17 valve housing

113 balancer cleaning device

✗For housing configurations see spare parts drawing.





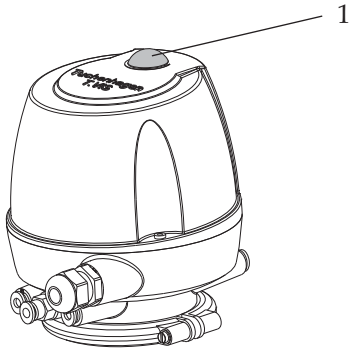
Function

The valve M_OB with lifting actuator MN
– works with a radial gasket seat design
  and
– is resistant to pressure hammers up to 50 bar.

Leakageproof shut-off

In valve M_OB with lifting actuator MN, the upper and the lower valve housing are each fitted with a valve seat. The chamber between the valve disks is connected to the open environment by an isolation outlet integrated into the lower valve spindle.
Should seal damage occur, leaking fluid flows safely into the open. Defective seals can thus easily be detected. The penetration of leaking fluids from one pipe into the other is excluded under normal operating conditions.

Actuator function



Actuator with spring closing function (Z)
The valve is closed in the non-actuated position.

Distinguishing feature with **control module T.VIS** on completed installation (SET-UP):
– Permanent light (1)
  green: Valve in non-actuated position

– Permanent light (1)
  yellow: actuated valve position

Installation and Operation

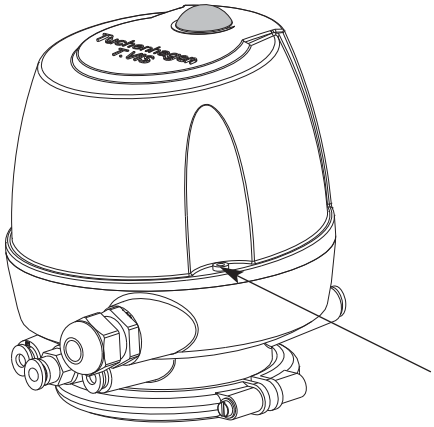
Make sure that
– the valve is installed in the pipe system free of stress
  and
– no foreign materials (e. g. tools, bolts) are enclosed in
  the system.

Installation position

The standard installation position of the valve is upright and in no case more than 15 degrees to the vertical. Care must be taken that the valve housing, the pipe system and the leakage outlet system can drain properly.

Control module T.VIS

✗Tighten firmly all three screws at the cap in order to prevent dust and splash water from penetrating into to the control module.



CAUTION

Using valve M with lifting actuator in connection with the control module T.VIS A-7, the LEFF Function in the control module must not be activated.

DANGER

If liquids are running in the pipe system, they can gush out when the line is opened and cause injury to people. Therefore, prior to detaching pipe connection fittings or clamp connections:

– drain and – if necessary – rinse or clean the pipe.
– disconnect the pipe segment with the valve to be mounted from the rest of the pipe system to secure the pipe against incoming product.

Valve with detachable housing connections

Valves with detachable housing connections can be installed directly into the pipe system, if suitable connection fittings are used.

Valve with welded connections

CAUTION

For welding operations, all internals must be removed from the valve housing.

DANGER

When the hinged clamps at the actuator or at the housing of the valve are detached, there is danger of injury, since the released spring pressure suddenly lifts the actuator.
Therefore, prior to detaching the valve housing, lift the double valve disk by actuating the valve with compressed air by connection X, see hosing diagrams in the Chapter "Pneumatic Connections".

- Make sure that no foreign materials are enclosed in the system.
- Actuate the valve once by applying compressed air.
- Check lift stroke of the valve disk and that of the double disk.
- Prior to the first product run clean the pipe system.
- During commissioning, regularly check the seals for leakage. Replace defective seals.
- Release the spring tension.
- Dismantle the valve insert (follow the instructions under "Dismantling").
- Weld the housing (without seal rings) stress-free into the pipe system and for this purpose:
- Fit in the housing and tack it.

CAUTION

Prior to welding, always seal the housing, otherwise the housing gets distorted during the welding operations.

- Seal the housing.
- Purge the housing on the inside with forming gas to remove oxygen from the system.
- Use a suitable welding method.
  GEA Tuchenhagen recommends the TIG welding method with pulsating current.
- Weld the housing into the pipe system, if necessary using a welding filler.
- After welding, passivate the seam.

Pneumatic Connections

Air requirement

The amount of compressed air required for switching operations of the valve depends on the type of actuator.

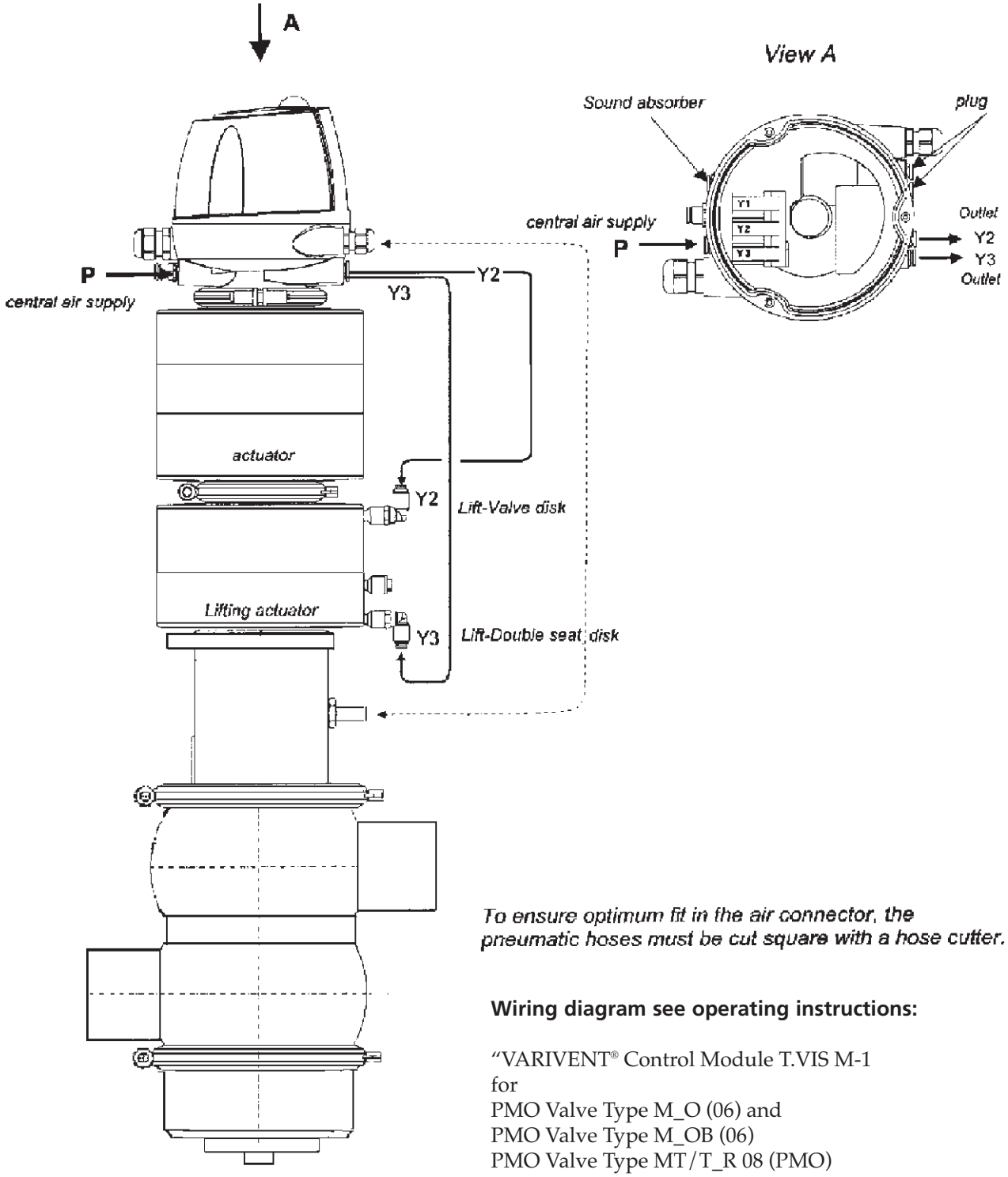
Antriebstyp *Actuator type*	**Luftbedarf (dm^3_n/Hub)* für** *Air needed (dm^3_n/ stroke)* for* **Gesamthub** *Total stroke*
BD/BL Ø100	0,66
BD/CL Ø125	0,89
DF5/DLM5 Ø160	2,07
EK62/ELR6	4,45

* $1\,dm^3_n$ /Hub = $1\,l_n$ /Hub ≈ $61\,inch^3$/Hub

Antriebstyp *Actuator type*	**Luftbedarf (dm^3_n/Hub)* für Lifthub** *Air needed (dm^3_n/ stroke)* for Lifting* **Ventilteller** *stroke of valve disk (lower disk)*	 **Doppelteller** *stroke of double seat disk (upper disk)*
BL Ø100	0,36	0,08
CL Ø125	0,55	0,14
DLM5 Ø160	1,04	0,19
EL6	2,25	0,30

Installing the air hose

- Carry out hosing according to hosing diagram, see the following page.



To ensure optimum fit in the air connector, the pneumatic hoses must be cut square with a hose cutter.

Wiring diagram see operating instructions:

"VARIVENT® Control Module T.VIS M-1
for
PMO Valve Type M_O (06) and
PMO Valve Type M_OB (06)
PMO Valve Type MT/T_R 08 (PMO)
Part no. 430-510

- Shut off the compressed air supply.
- Push the air hose into the air connector in the control module.
- Reopen the compressed air supply.

Electrical Connections

DANGER

Only allow qualified personnel to make electrical connections. Prior to making electrical connections check the maximum permissible operating voltage.

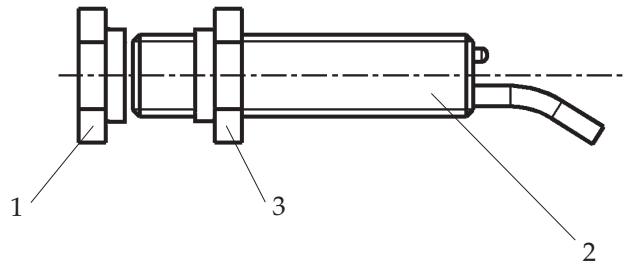
Observe the installation and operating instructions if used within potentially explosive areas!

- Make the electrical connection for the valve in accordance with the operating instructions for the control module.

Adjust the proximity switches

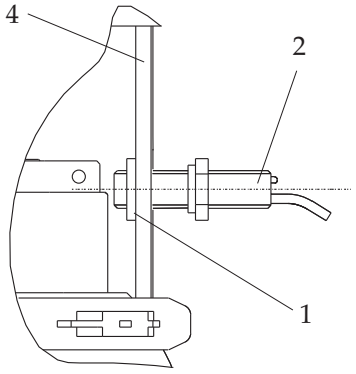
In the control module

✗ Proximity switches in the control module are adjusted at factory.
Due to transport and installation the adjustment may alter and may need re-adjustment (see operating instructions Control module).



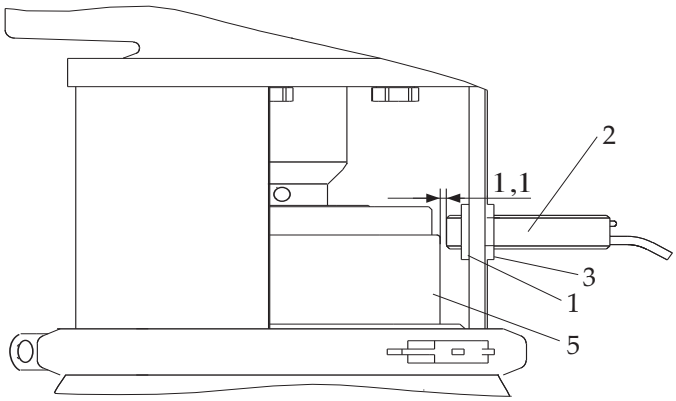
In the lantern

- Screw off first nut (1) from sensor (2).
- Unscrew second nut (3) until approx. 10 mm before the end of the sensor.



- Insert proximity switch (2) into the corresponding bore in the lantern (4).
- Position nut (1) inside and screw-in proximity switch (2).

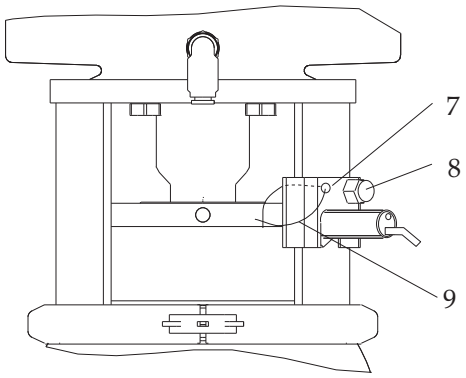
- Hold position of the nut (1) in lantern and with the help of a feeler gauge screw in the sensor (2) until a distance of approx. 1.1 mm (0,43 inch) to the upper double disk (5) remains.
- Tighten nut (3).



CAUTION

- Actuate the valve once to check the switching function. The diode will go off, as soon as the double disk is moving upwards.

- If necessary, adjust the gap clearance until the correct switch point is achieved.
- Pull safety plate (7) for the switch over the shaft of the proximity switch.
- Insert the hex. screw from the inside into the corresponding bore and tighten from the outside with the cap nut (8)
- Thread seal wire (9) through the bore and seal.



Commissioning

- Make sure that no foreign materials are enclosed in the system.
- Actuate the valve once by applying compressed air.
- Check lift stroke of the valve disk and that of the double disk.
- Prior to the first product run clean the pipe system.
- During commissioning, regularly check the seals for leakage. Replace defective seals.

Cleaning and passivation

Cleaning

All parts in contact with product must be cleaned at regular intervals. Always observe the safety data sheets issued by the cleaning agent manufacturers. Only use cleaning agents which do not cause damage to the seals and inner valve parts. During pipe cleaning, the cleaning fluid also flows through the valve housings and cleans them.
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 plant operator in accordance with the relevant process.

The cleaning effect must be checked regularly by the plant operator!

Cleaning process examples

Typical cleaning parameters in dairy operations

Example of a two-phase cleaning process::
– Sodium hydroxide and combination products based on sodium hydroxide in concentrations from 0.5% to 2.5% at 75 °C to 80 °C..
– Phosphoric acid or nitric acid and combination products based on these acids in concentrations from 0.3 to 1.5% at approx. 65 °C.

Example of a cleaning operation in one cleaning step:
– Formic acid and combination products based on formic acid at up to 85 °C.

Typical cleaning parameters in breweries

– Sodium hydroxide and combination products based on sodium hydroxide in concentrations from 1% to 4% at approx. 85 °C.
– Phosphoric acid or nitric acid and combination products based on these acids in concentrations from 0.3 to 1.5% at 20 °C.

The cleaning effect 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.

Cleaning of the leakage outlet system

The leakage chamber is cleaned via a spray nozzle in the double disk, which is connected to a valve seat cleaning pipe.
Here, only general recommendations can be made about the number and duration of spray cleaning. Because depending on the prevailing conditions such as type of product, temperatures, cleaning agents, cleaning intervals, etc., longer or more frequent cleanings may be required.
It is recommended to set the cleaning conditions in the system in a test phase to save cleaning medium. To optimize the seat cleaning is thereby determined by occasional checks valves after cleaning, if the valve seats are clean.

Valves with lift cleaning without spray cleaning lift actuator

The leakage outlet is cleaned by ventilating the upper or lower valve discs when the particular pipe is cleaned. During this process, cleaning fluid flows past the seals via a metal throttle gap in the leakage outlet and cleans the seal surfaces of the lifted valve disc and the leakage outlet.
This kind of leakage outlet cleaning process is used for sensitive media, in which the seal surfaces also need to be cleaned in order to flush away microorganisms that may have adhered to them. This kind of cleaning is also recommended for media that adheres and crystallises.

Valves with lift cleaning with spray cleaning lift actuator

In addition to lift cleaning (see R_C type) the leakage outlet can also be cleaned via a spray nozzle, independently of the pipe cleaning process, i.e. also during production.
This type of cleaning is recommended for double-seat valves used in the area of critical media, which adhere strongly, crystallise easily, and are sticky (e.g. sugar solutions) or are viscous (e.g. yoghurt). With an intermediate cleaning process via spray cleaning, products which do not flow off easily can be prevented from burning onto the leakage outlet via heat transfer before the next opportunity arises to ventilate the valve disc.

Sugar solutions or sticky media often adhere to surfaces that come in contact with product, such as the seating ring, and may crystallise there before they can be cleaned away via a lifting process. This may result in damage to the seals the next time the valve is switched. This can also be prevented by an additional spray cleaning, since these surfaces can be cleaned before the next switching procedure and also during production.
An additional short intermediate cleaning is often done after each switching procedure.

A further advantage of this cleaning method is the ability to shorten the sometimes long periods of time between two leakage outlet cleaning processes via an intermediate cleaning process, since lifting the valve disk is only possible when the product feed pipes are cleaned.

Examples of cleaning by lifting

Medium	Period (s)	Number of liftings of the valve disk	Remark
Beer	1-2	2-3	During each cleaning phase 1. Prewash 2. Hot caustic 3. Intermediate washing 4. Acid 5. Rinse
Yeast	1-2	2-3	
Fruit juice	2-6	3	
Milk	2-5	3	
Yogurt	3-5	3	

Provide information on the manner of of cleaning such as cleaning agents, temperature, and time intervals from a component manufacturer can only made a recommendation, however, should be given here. This should be determined by the operator tailored to the particular process or set.

Depending on the cleaning method (medium concentration, temperature and contact time), the seals are attacked differently. This can lead to impairments in function and durability.

Passivation

Before commissioning a plant, passivation is commonly carried out for long pipes and tanks. Valve blocks are usually excluded from this.

Passivation is typically performed using nitric acid (HNO_3) at approx. 80°C (176 °F) at a concentration in the 3% range and a contact time of 6 to 8 hours.

Malfunction, Cause, Remedy

CAUTION

In the event of malfunctions immediately deactivate the valve and secure it against inadvertent reactivation. Defects may only be rectified by qualified personnel observing the safety instructions.

Malfunction	Cause	Remedy
Valve does not work	Error in control system	Check plant configuration
	No compressed air Air pressure too low	Check air supply Check air hoses for free passage and leaks
	Error in electric system	Check actuation /external controller and routing of electric lines
	Solenoid valve defective	Replace solenoid valve
	the valve is operating against the hydraulically closed pipe	open pipe
Double valve disk oscillates during lifting or does not open	Air pressure too low	Increase air pressure
	Product pressure too high	Reduce product pressure
Valve does not close	Dirt/foreign materials between valve seat and valve disk	Clean valve housing and valve seat
Valve closes too slowly	O-rings dry in the actuator and in the control module (friction losses)	Grease O-rings
Leakage at the valve housing	O-rings in the housing defective	Dismantle valve housing, replace O-rings
Leakage at the leakage outlet (closed position)	Valve disk V-ring defective	Dismantle valve insert replace V-rings

Maintenance

Inspections

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

Product contact seals

- Check at regular intervals:
  – upper sealing ring
  – O-rings between the valve housings
  – V-rings in the valve disks. Deficiency visible at the leakage on the leakage outlet during the closed position of the valve.
  – lower sealing ring

Pneumatic connection

- Check the operating pressure at the pressure reducing and filter station.
- Clean the air filter in the filter station at regular intervals.
- Check whether the air hose sits firmly in the air connector.
- Check the air hoses for bends and leaks.
- Check function of the solenoid valves.

Electrical connection

- Check the cap nut on the cable gland for firm seat.
- Check the cable connections at the luster terminal.

Maintenance intervals

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

The actual maintenance intervals can only be determined by the plant user, since they depend on the operating conditions, for instance
– daily period of operation
– switching frequency
– type and temperature of the product
– type and temperature of the cleaning solution
– ambient conditions

Application	Maintenance interval (recommendations)
Media at temperatures from 60 °C to 130 °C (140 °F to 266 °F)	around every 3 months
Media at temperatures < 60 °C (<140 °F)	around every 12 months

Prior to dismantling the valve

DANGER

Before detaching the pipe connection and the hinged clamp connections on the valve housings, always take the following preparatory measures:

- Make sure that during maintenance and repair work no process is in operation in the area concerned.
- All pipe system elements attached to the valve must be drained and, if necessary, cleaned or rinsed.
- Shut off the control air supply, unless it is required for dismantling the valve.
- Disconnect the power supply.
- If possible, take the valve out of the pipe segment together with all housings and housing connections.

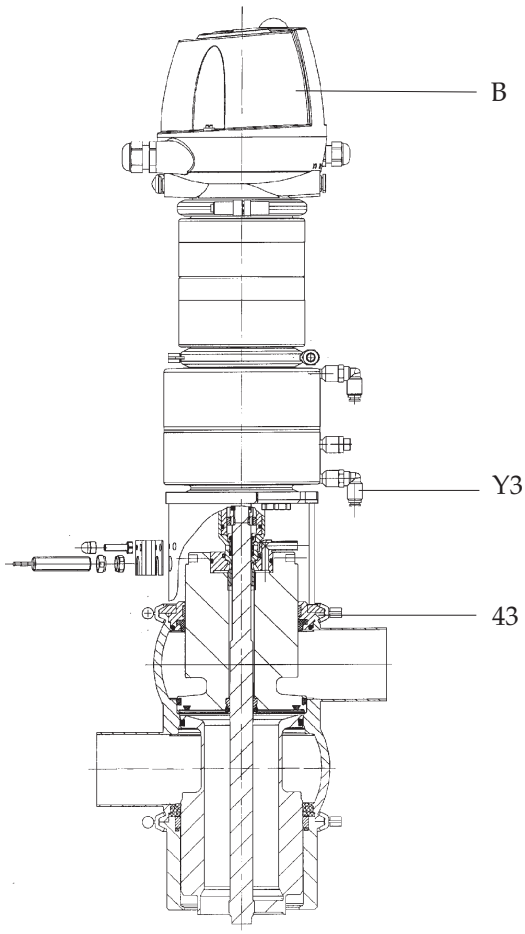
Dismantling

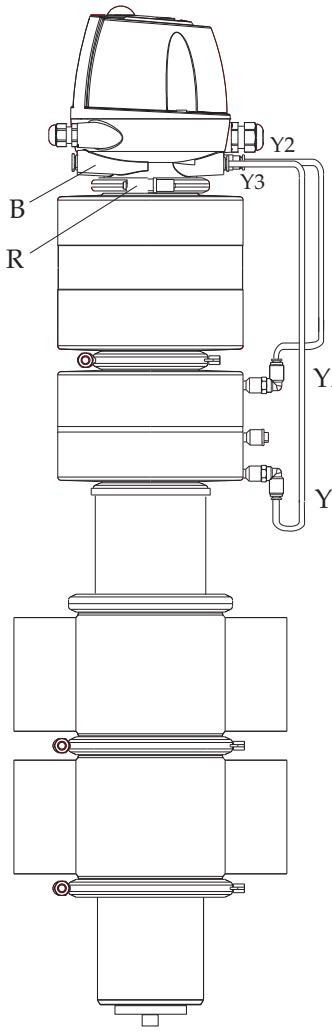
- Unscrew the hood (B) of the control module.

DANGER

When the hinged clamps (43) at the housing of the non-actuated valve are detached, the released spring force suddenly lifts the actuator. There is danger of injury. Therefore, prior to detaching the hinged clamps, release the spring tension by actuating the valve actuator with compressed air.

- Pressurize the actuator at (Y3).
- Detach the hinged clamps (43) between the housing and the lantern.
- Depressurize the actuator.





Y2 Lift – Ventilteller R
Lift – Valve disk R

Y3 Lift – Doppelsitzteller
Lift – Double seat disk

Dismantling the control module

- Remove the semi-annular clamps (R) at the control module (B).

✗The pneumatic and electrical connections can remain at the control module.

- Remove the pneumatic connections at the actuator.
- Pull the control module (B) upwards and off.

Separating the valve from the housing

CAUTION

The surfaces of the balancer are sealing surfaces and must not be
damaged.
Take care when removing the valve from the pipe that the balancer does not hit the valve housing.
Carefully draw out the valve.

- Pull the valve insert out of the housing.

- Unscrew switching rod (B1) from the piston rod (A3) using a mandrel 4 mm.
- Remove hinged clamp (46) and pull actuator (A) together with slider (B3), rod guide ring (B4), adapter (L4) with O-ring (L8) and locking flange (L3) out of the lifting actuator (L1).
- Unscrew adapter (L4) using a face spanner from the piston rod (A3). Don't grease the thread of the adapter and the piston rod.
- Hold striker (L2) using a tubular hex. box spanner size 36.
- Set the head face spanner at (15.1) and unscrew valve disk (15).

CAUTION

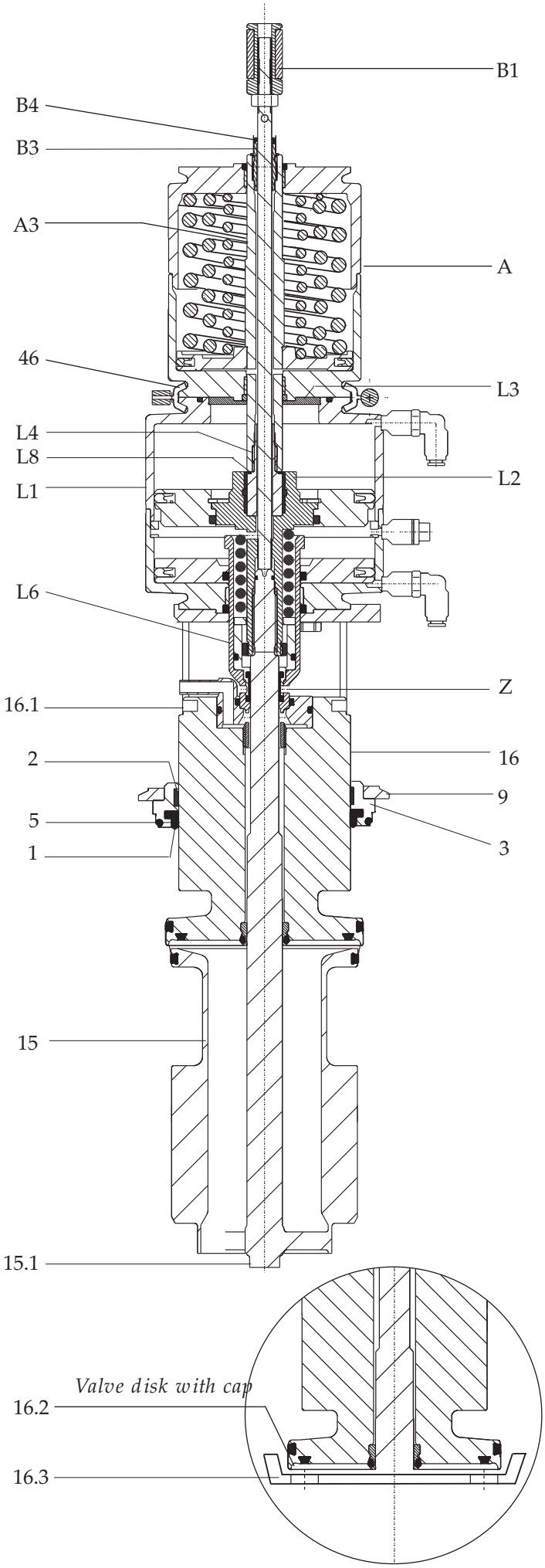
The running surfaces of the double seat disk (16) are sealing surfaces and must not – the same as the sealing disk (3) – be damaged.

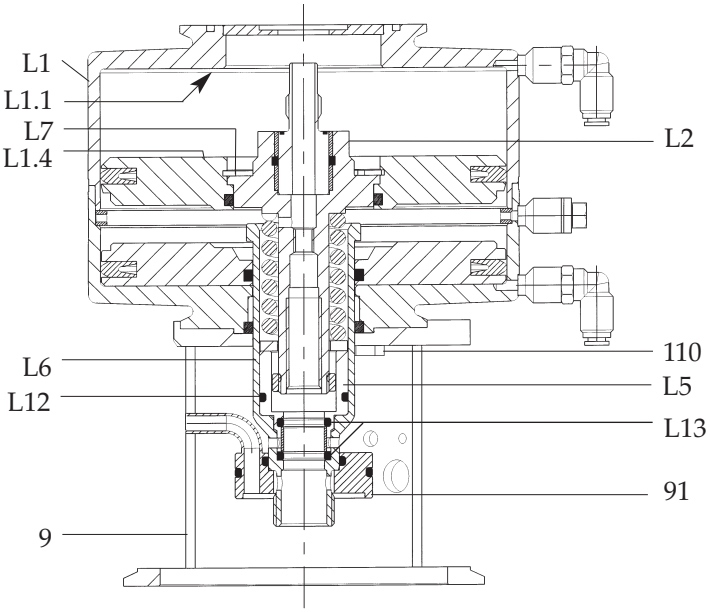
✗ While unscrewing the double seat disk, press the sealing disk (3) against the lantern (9).

CAUTION

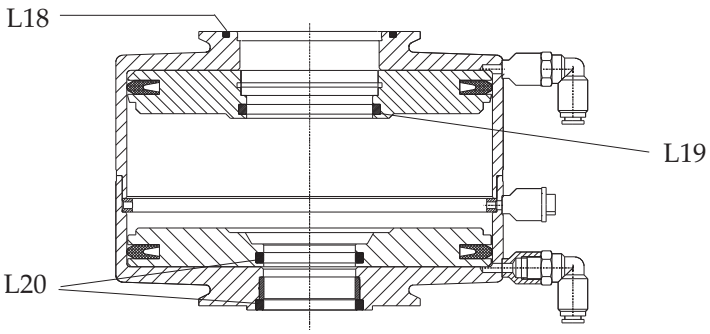
To prevent damage to the deflection edge (16.2) on the double valve disk, the deflection edge must be protected using the delivered cap (16.3).

- Hold the drive sleeve (L6) at (Z) with hook spanner.
- Insert pin punch into the bore (16.1) and unscrew double seat disk (16).
- Withdraw sealing disk (3) with rod guide ring (2), O-ring (5), sealing ring (1) from the lantern (9).





- Pull-off CIP connection (91) from the drive sleeve (L6).
- Put lifting actuator (L1) down for further disassembly.
- Push the piston (L1.4) with fitted striker (L2) and drive sleeve (L6) upwards against the lifting actuator flange (L1.1) and remove the circlip (L7) from the piston (L1.4) using nippers.
- Push striker (L2) complete with drive sleeve (L6) out of the lifting actuator (L1).
- Pull bushing (L5) out of the drive sleeve (L6), the O-rings (L12, L13) are then accessible.
- Remove 4 hex. nuts (110), pull-off lantern (9) from lifting actuator (L1).



- O-rings (L18, L19, L20) are now accessible.

Maintenance

Cleaning the valve

CAUTION

The shaft of the valve disk, the housing seat, the valve seat, the V-ring groove and the lower edge of the double disk are precision parts which must not be damaged!

- Dismantle the valve. See Chapter “Dismantling“.
- Carefully clean the individual components.

CAUTION

Observe the safety information sheets issued by the detergent manufacturer! Only use detergents which are non-abrasive and non-aggressive towards stainless steel.

Replacing the seals

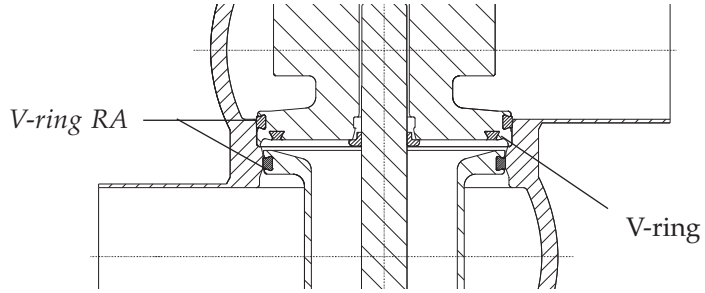
✗ Replace defective seals. Always replace the housing O-rings to ensure the tightness of the valve. Always use original spare parts.

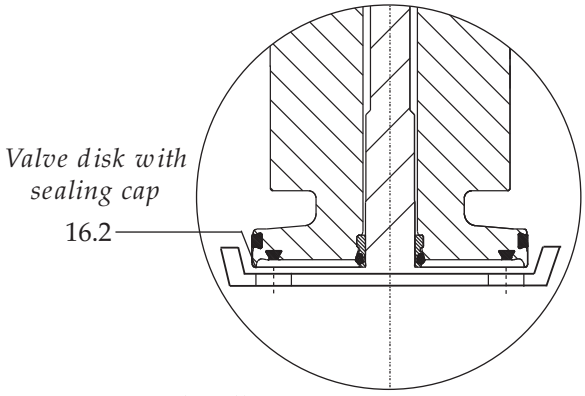
CAUTION
The deflection edge (16.2) at the bottom side of the double valve disk is very sharp. Risk of injury!

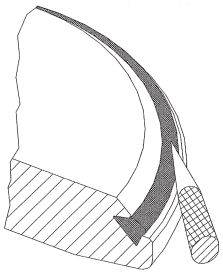
Do not use the deflection edge on the double valve disk for supporting the scriber!

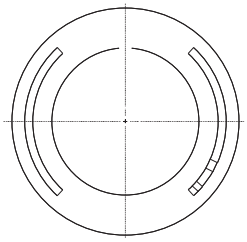
CAUTION
Removing the V-ring with a scriber, the scriber may slip off. There is danger of injury.
Therefore clamp the valve disk into a vice fitted with protected jaws.
Also unscrew the curved end of the scriber, in order to protect the hand of the technician.

- Insert the scriber into the V-ring and lever it out.









Changing the V-ring

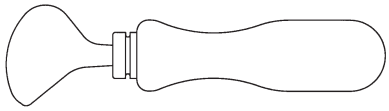
Use the insertion tool (part no. 229-109.88) to mount the new V-ring.

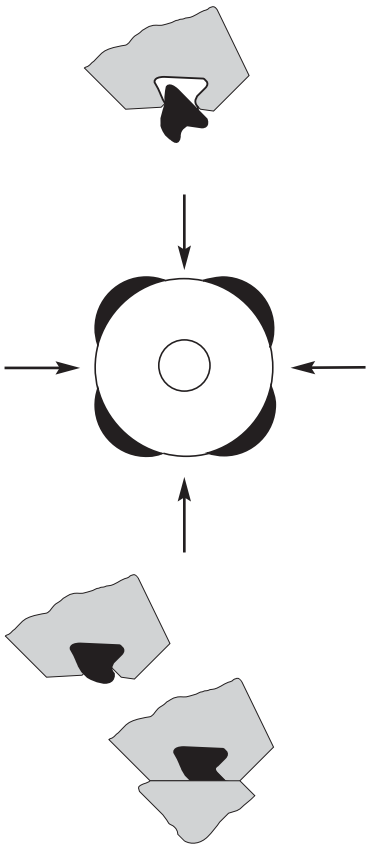
✗Do not grease the V-ring before inserting it. We recommend using water with household liquid soap (1 drop/1 l) as an aid to inserting V-rings. In order to prevent oxidation from infiltration prepare the liquid solution in a ceramic, plastic or stainless steel container.

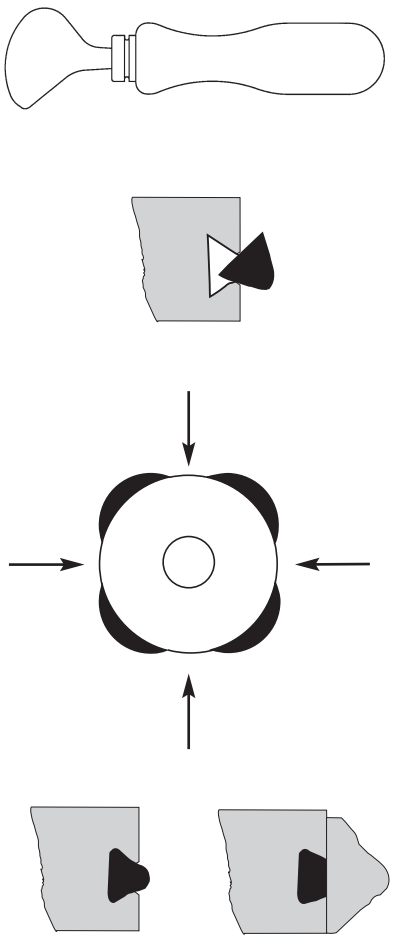
Before inserting the V-ring wet it a little on the back (side not in contact with the product). Take care that water does not enter the seal groove in the valve disk.

CAUTION
Observe the required installation position of the V-ring.

- Insert the V-ring (s. pict.).
- By use of the V-ring insertion tool, press the V-ring into the groove at several opposite places along the circumference.
- Insert the V-ring evenly into position.







Changing the V-ring RA

Use the insertion tool to mount the new RA V-ring.

✗Do not grease the V-ring RA before inserting it. We recommend using water with household washing-up liquid (1 drop/1 l) as an aid to inserting V-rings. In order to prevent oxida-tion from infiltration prepare the liquid solution in a ceramic, plastic or stainless steel container.

Before inserting the V-ring RA, wet it a little on the back (side not in contact with the product). Take care that water does not enter the seal groove in the valve disk.

CAUTION
Observe the required installation position of the V-rings RA (s. illustr.).

- Insert the V-ring RA (s. illustr.).
- Using the V-ring insertion tool press the V-ring RA into the groove at several opposite places along the circumference.
- Insert the V-ring RA evenly into position.
- Replace all the other seals correspondingly marked in the spare parts drawing.

✗Used seals must not be refitted, since this would adversely affect the sealing function.

Lubrication of seals and threads

CAUTION
For product contact seals do not use conventional greases and oils.
No grease residues must be visible after fitting the complete valve.
Observe the safety information sheets issued by the lubricant manufacturers.

- Grease the threads of the valve disk and those of all screws. Don’t grease the thread of the adapter and the piston rod.
- Do not grease the V-ring.
- Apply a very light film of grease to all seals – including the O-rings at the top and bottom of the piston rod for the actuator.
- Lubricate the balancer.

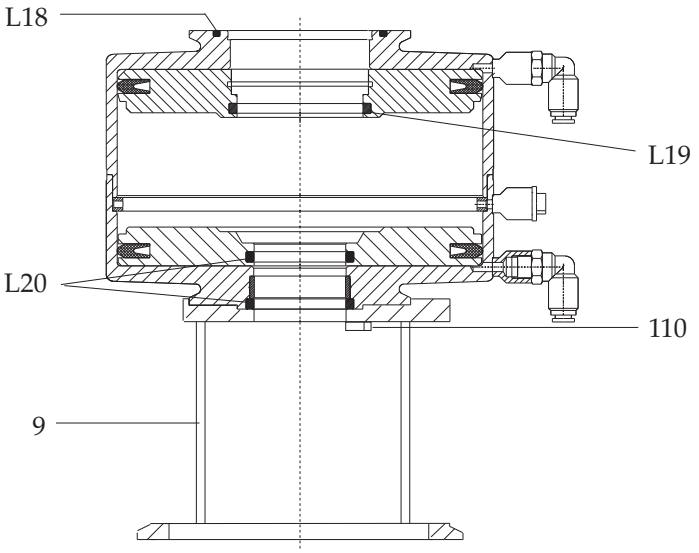
GEA Tuchenhagen recommends Rivolta F.L.G. MD-2 and PARALIQ GTE 703. These lubricants are approved for foodstuff and is resistant to beer froth and have the NSF-H1 (USDA H1)-registration.

PARALIQ GTE 703 can be ordered from Tuchenhagen under part no. 413-064 and Rivolta F.L.G. MD-2 under part no. 413-071. If other types of grease are used this can result in malfunctions or in premature seal failure. The warrenty will 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. Run dry must be prevented!

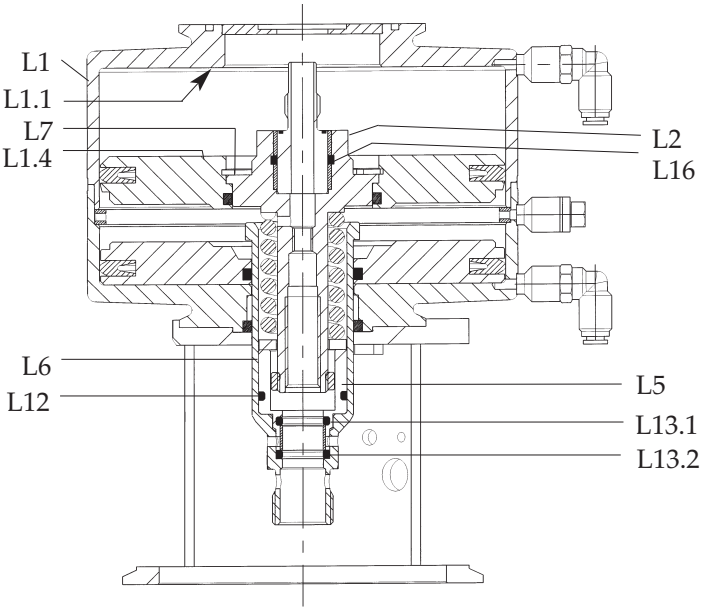
Assembly

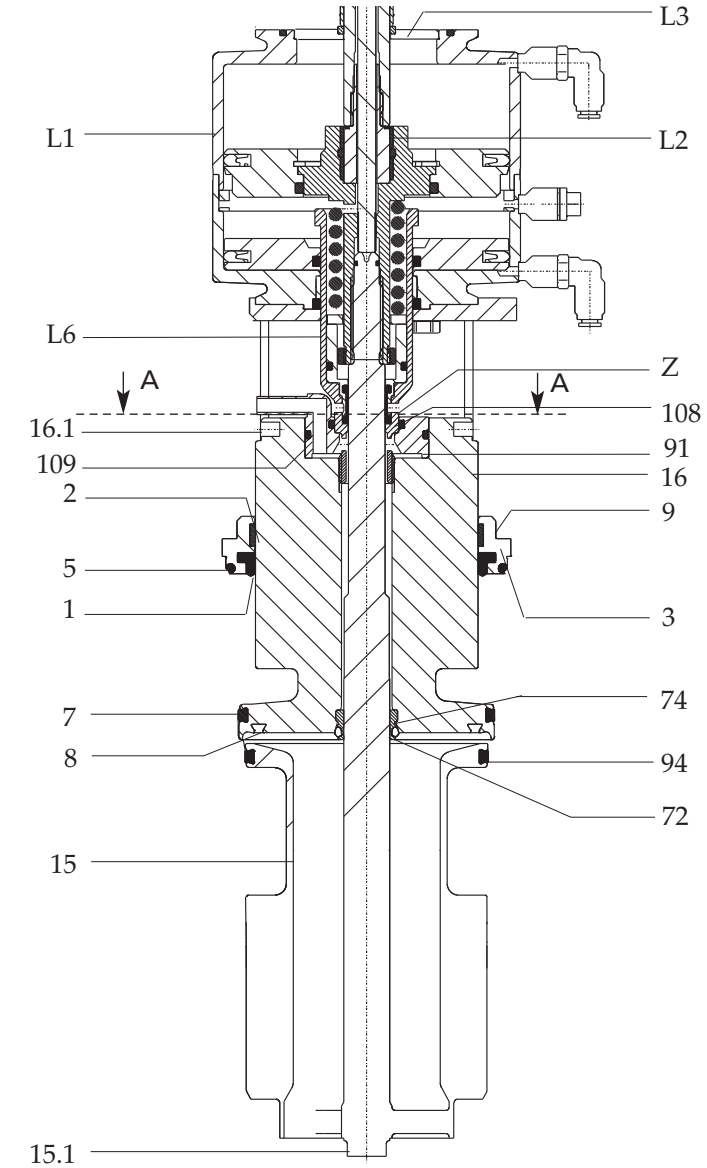
- Equip the lifting actuator MN (L1) with O-ring (L18, L19, L20) and fix it at the lantern (9) with 4 hex. nuts (110)

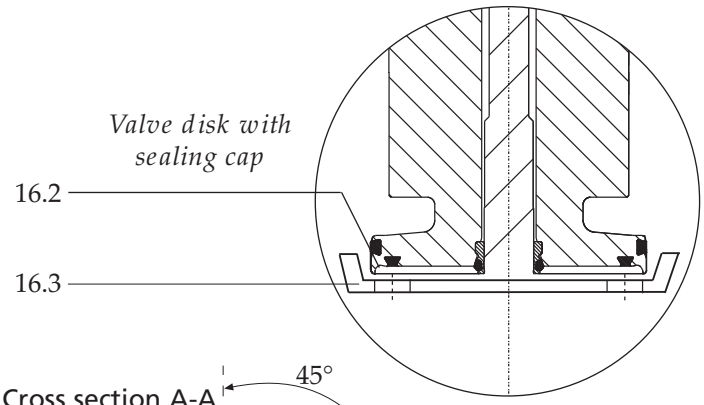


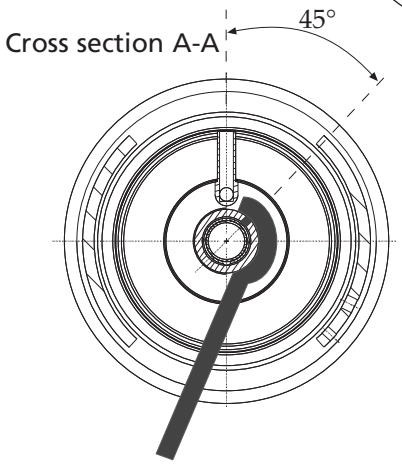
- Provide bushing (L5) with O-rings (12, 13.1) and plug it on to the mandrel, part no. 221-105.94 or 221-105.95. Then place O-ring (13.2) on the top and push everything into the drive sleeve (L6). Remove mandrel.

- Push striker (L2) complete with O-ring (L16) into the drive sleeve (L6) and pre-stress with mandrel (part no. 221-105.76) and tubular hex. box spanner size 36. Insert everything into the lifting actuator (L1) and fix with circlip (L7) at the piston (L1.4) and then relieve.









CAUTION

The running surfaces of the double seat disk (16) are sealing surfaces and must not – the same as the sealing disk (3) be damaged.

✗ While screwing the double seat disk, press the sealing disk (3) against the lantern.

CAUTION

The deflection edge (16.2) at the bottom side of the double valve disk is very sharp. Risk of injury!

To prevent damage to the deflection edge on the double valve disk, the deflection edge must be protected using the delivered cap (16.3) .

- Push CIP connection (91) equipped with O-rings (108, 109) on to the drive sleeve (l6). Hold drive sleeve at (Z) using a hook spanner, see cross section A-A. Tighten the double disk (16) complete with V-rings (7, 8), snap sealing (74), O-ring (72), sealing disk (3), O-ring (5), sealing ring (1), rod guide ring (2) by applying an pin punch at (16.1).

- Remove protecting cap (16.3).

- Hold striker (L2) with tubular hex. box spanner size 36 and tighten valve disk (15) together with installed V-ring (94) at bore Y with flexible head face spanner (15.1).

- Insert locking flange (L3) into the lifting actuator (L1).

- Don't grease the thread of the adapter and the piston rod. Screw adapter (L4) with O-ring (L8) at the piston side firmly into the piston rod (A3) of the actuator (a) using a face spanner.

- Fix slider (B3), complete with rod guide ring (B4) at the piston rod (A3) of the actuator (5) using a mandrel (4 mm).

- Insert actuator (A) into into the lifting actuator (L1) and fix with hinged clamp (46.1).

CAUTION

Take care not to damage the magnet in the switching rod!

- Put the switching rod (B1) through the piston rod (A3) and lock with valve disk (15), see spare parts list / dimension sheet switching rod (annex).

- Actuate lift stroke of double-disk at (Y3) and carefully introduce valve insert into the housing and fix with hinged clamp (46.2).

Semi-annular clamps

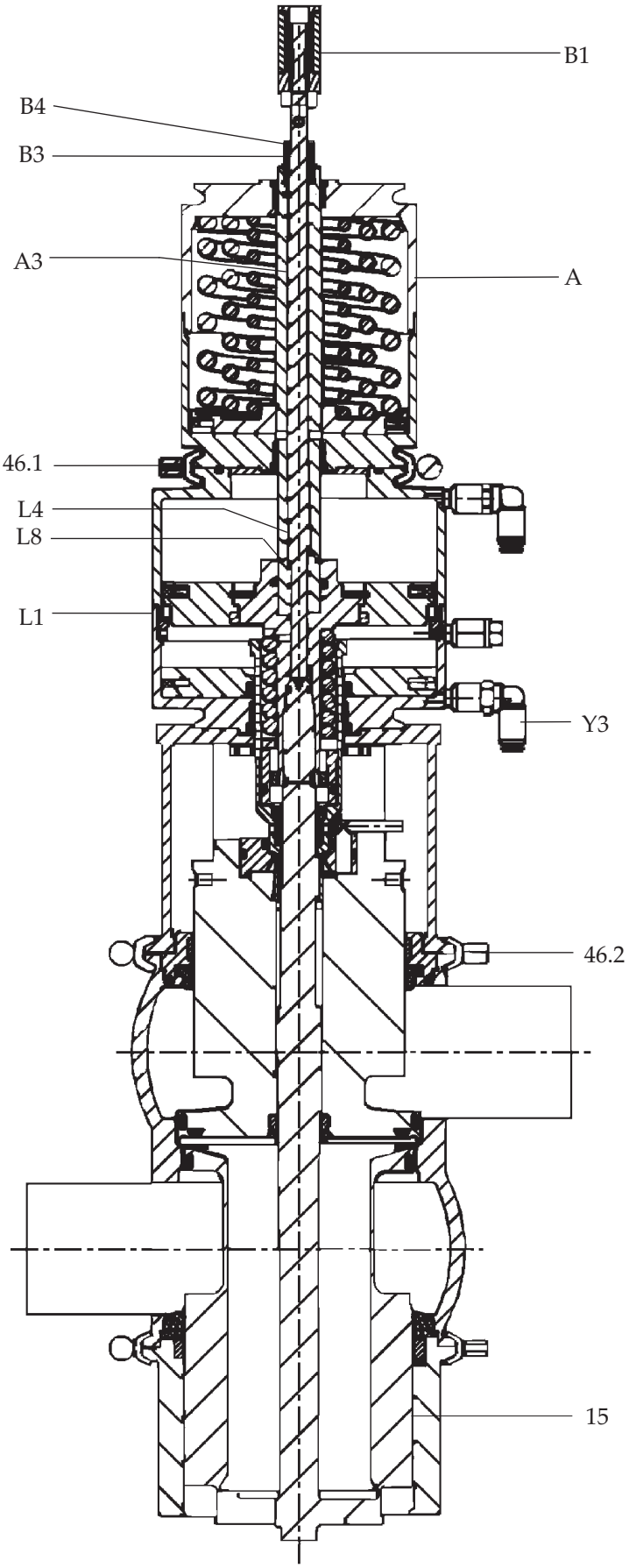
- Tighten the nuts of the semi-annular clamps at the control module with a torque of 1 Nm (0,7 lbft).

Hinged clamps

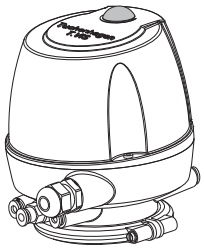
- Tighten the nuts of the hinged clamps with following torques:
  M 6 9 Nm (6,6 lbft)
  M 8 22 Nm (16,2 lbft)

Cast-semi-annular clamps

- Tighten the nuts of the cast-semi-annular clamps with a torque of 45 Nm (33 lbft).



Control module T.VIS



Checking the valve stroke

Control module S and T.VIS M-1
- Actuate the valve by applying compressed air.
- Check the function of the proximity switches and if necessary readjust it.
- Check whether the valve stroke (c) is correct.

Control module T.VIS A-7
- Actuate the valve by applying compressed air.
- Read stroke via palm.
- Check whether the valve stroke is correct.

Lifting strokes
- It is not nessecary to adjust the lifting strokes.

Valve size	Valve stroke C mm	Lifting stroke Double disk mm	Valve disk mm
inch OD			
11/2"	22	2,5…3,5	6
2	31	2,5…3,5	6
21/2"	35	2,5…3,5	6
3"	45	2,5…3,5	6
4"	45	2,5…3,5	6
6"	65	2,5…3,5	6

Disposal of valve actuators

DANGER

When actuators are opened, the prestressed spring can cause loss of life.
The spring tension can be as much as 24 kN. Therefore never try to force the actuator open. Only deactivated actuators may be scrapped.

✗ GEA Tuchenhagen accepts unopened actuators and arranges for proper disposal free of charge.

Technical Data

Size	1 ½" to 6" OD
Material of product contact parts	stainless steel 1.4404 Check corrosion resistance with respect to media and detergents.
Installation position	upright and in no case more than 15 degrees to the vertical, so that the leakage cavity can drain properly.
Ambient temperature	0...45 °C (32...113°F) standard
Valve	< 0 °C (< 32°F): use control air with low dew point. Protect valve stems against freezing < –15 °C (< 5°F): no solenoid valves in the control module > +50 °C (> 122°F): no solenoid valves in the control module
Proximity switch	–20...+80 °C (–4...176°F)
Product temperature and operating temperature	depending on the sealing material
Product pressure	10 bar max. (145 psi)
Resistant to pressure blows level	50 bar max.
Control air pressure	4 bar up to 8 bar 58 psi up to 116 psi
Control air	acc. to ISO 8573-1
– Solid particle content:	quality class 6 particle size max. 5 μm part. density max. 5 mg/m^3
– Water content:	quality class 4 max. dew point +3 °C If the valve 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

Pipe ends – VARIVENT® system

Inch OD	outside diameter	wall thickness	inside diameter	outside diameter acc. to ASME-BPE
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

Resistance of Sealing Materials

The resistance of sealing materials depends on the type and temperature of the medium conveyed.
The contact time can negatively 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.

Medium	Temperature	Sealing material (general operating temperature)		
		EPDM -40...+135°C) -40...275°F	**FKM** –10...+200 °C 14...+392°F	**HNBR** -25...+140 °C 13...+284°F
Caustics up to 3%	up to 80 °C (176°F)	good resistant	reduced service life	good resistant
Caustics up to 5%	up to 40 °C (104°F)	good resistant	reduced service life	reduced service life
Caustics up to 5%	up to 80 °C (176°F)	good resistant	not resistant	not resistant
Caustics über 5%		reduced service life	not resistant	not resistant
Anorganic Acids up to 3%	up to 80 °C (176°F)	good resistant	good resistant	good resistant
Anorganic Acids up to 5%	up to 80 °C (176°F)	reduced service life	good resistant	reduced service life
Anorganic Acids up to 5%	up to 100 °C (212°F)	not resistant	good resistant	not resistant
Water	up to 80 °C (176°F)	good resistant	good resistant	good resistant
Steam	up to 135 °C (275°F)	good resistant	reduced service life	reduced service life
Steam, app. 30 min	up to 150 °C (302°F)	good resistant	reduced service life	not resistant
Treibstoffe/Kohlen-wasserstoffe		not resistant	good resistant	good resistant
Product with a fat content of max. 35%		good resistant	good resistant	good resistant
Product with a fat content of more than 35%		not resistant	good resistant	good resistant
Oils		not resistant	good resistant	good resistant

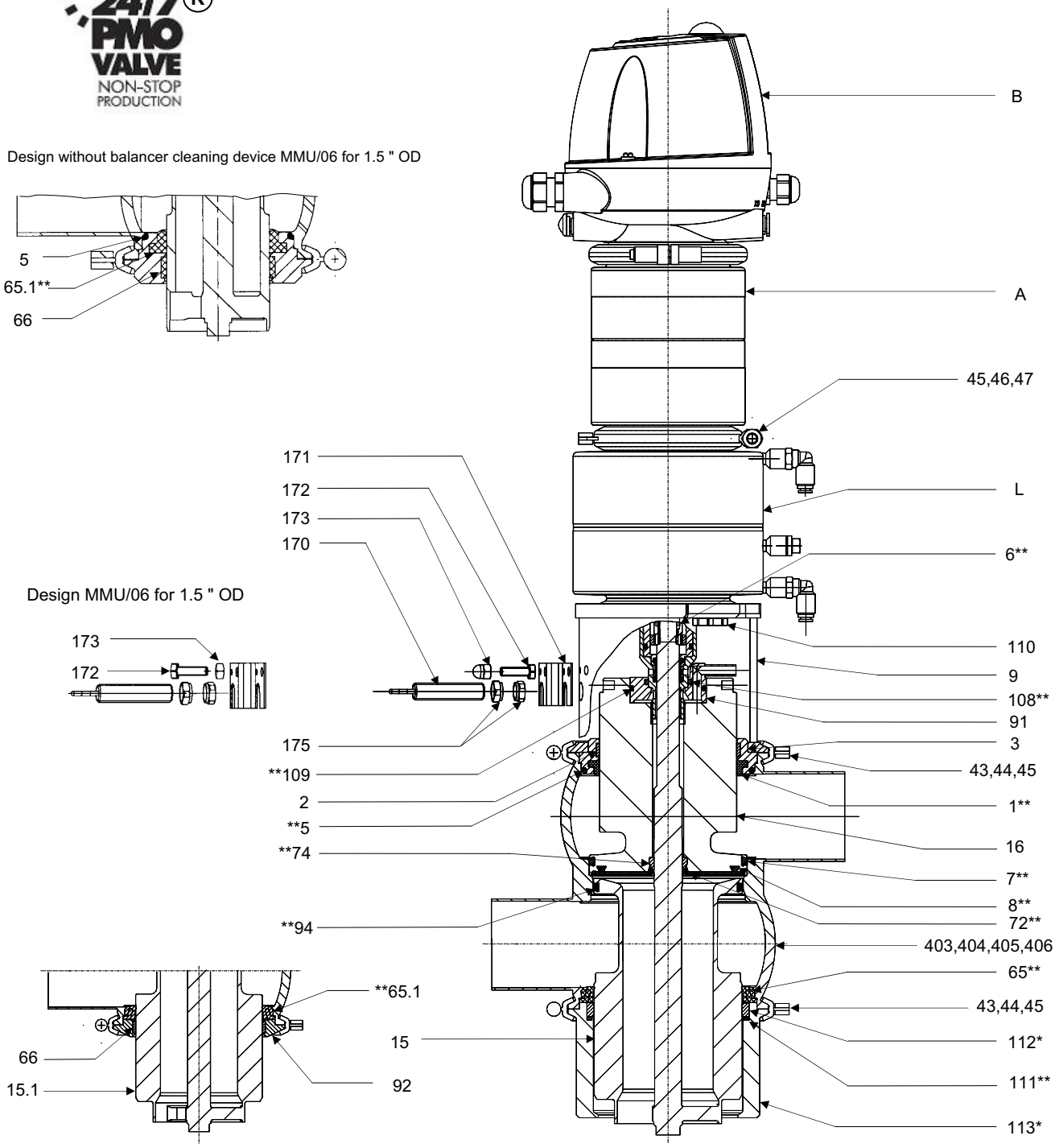
Tools / Lubricant

Tool	Part no.
Hose cutter	407-065
V-ring insertion tool	229-109.88
Open spanner, ends ground, SW / size 17-19	229-119.01
Open spanner, ends ground, SW / size 21-23	229-119.05
Open spanner, ends ground, SW / size 22-24	229-119.03
Open spanner SW / size 30-32	408-041
Hook spanner for holding the drive sleeve Ø30/Ø4 for 2", 2 1/2"	
Hook spanner for holding the drive sleeve Ø34/Ø4 for 3", 4"	
Mandrel 6 mm	
Mandrel	221-105.76 221-105.77
Mandrel used for installing the bushing into the drive sleeve/	221-105.94 (2", 2 1/2") 221-105.95 (3", 4")
Tubular hex. box spanner size 36	408-208
Screwed-in eye bolt T.VIS M14	221-104.98
Snap ring pliers for bores up to DN 100 Ø 60; DN 125/6"IPS Ø 72	
Mounting device	
to DN 50	229-109.89
to DN 100	229-109.90
to DN 162	229-109.91
Pin punch for undoing the double disk Ø 6	
Adjustable head face spanner for adapter neckØ 3	
Tapered plug for double disk 2" OD	922-327
Tapered plug for double disk 2 1/2"OD	922-093
Tapered plug for double disk 3" OD	922-323
Tapered plug for double disk 4" OD	922-325
Lubricant	
Rivolta F.L.G. MD-2 PARALIQ GTE 703	413-071 413-064

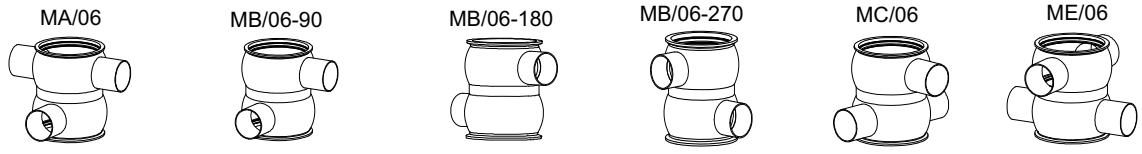
Spare parts list

Double-Seat Mixproof Valve M_OB (06) with Lifting Actuator MN

Valve code ending …B/06



Housing Configurations



Spare parts list

Double-Seat Mixproof Valve M_OB (06) with Lifting Actuator MN

Item	Designation	Material	1.5" OD	2" OD	2.5" OD	3" OD	4" OD	6" OD
			Sach-Nr. / Part no.					
*	Valve insert MS.O cpl.	--	221-179.86	221-179.87	221-179.88	221-179.89	221-179.90	--
*	Valve insert M.O cpl.	--	221-179.85	221-179.69	221-179.70	221-179.71	221-179.72	--
**	Sealing set MS cpl.	EPDM FKM	221-003277 221-003278	221-003279 221-003280	221-003281 221-003282	221-003283 221-003284	221-003285 221-003286	-- --
**	Sealing set M cpl.	EPDM FKM	221-002981 221-002983	221-002231 221-002235	221-002232 221-002236	221-002233 221-002237	221-002234 221-002238	-- --
***	Housing configurations Typ/type MA	--	221-202.48	221-202.49	221-202.55	221-202.61	221-202.67	--
	Typ/type MB-90		221-202.47	221-202.50	221-202.56	221-202.62	221-202.68	--
	Typ/type MB-180		221-202.46	221-202.51	221-202.57	221-202.63	221-202.69	--
	Typ/type MB-270		221-202.45	221-202.52	221-202.58	221-202.64	221-202.70	--
	Typ/type MC		221-202.44	221-202.53	221-202.59	221-202.65	221-202.71	--
	Typ/type ME		221-202.43	221-202.54	221-202.60	221-202.66	221-202.72	--
1**	Sealing ring	EPDM FKM	924-305 924-307	924-296 924-308	924-254 924-309	924-262 924-319	924-261 924-320	924-261 924-320
2	Rod guide ring	Turcite	935-056	935-042	935-043	935-044	935-045	935-045
3	Seal disk	1.4404	221-476.05	221-476.03	221-476.01	221-476.04	221-476.02	221-141.28
5**	O-ring	EPDM FKM	930-144 930-171	930-150 930-176	930-156 930-178	930-372 930-409	930-260 930-259	930-845 ---
6**	O-ring	NBR	930-004	930-004	930-004	930-007	930-007	930-007
7**	V-ring RA	EPDM FKM	221-365.07 221-365.10	221-365.08 221-365.11	221-365.09 221-365.12	221-365.14 221-365.15	221-365.16 221-365.17	221-365.25 --
8**	V-ring	EPDM FKM	932-019 932-032	932-023 932-034	932-027 932-038	932-059 932-063	932-045 932-044	221-365.25 ---
9	Lantern	1.4301	221-533.19	221-533.09	221-533.10	221-533.11	221-533.12	221-533.20
15	Valve disk MS/06	1.4404	221-691.05	221-691.01	221-691.02	221-691.03	221-691.04	221-691.06
15.1	Valve disk M/06	1.4404	221-662.06	221-662.01	221-662.02	221-662.03	221-662.04	221-662.07
16	Double valve disk M/06	1.4404	221-661.05	221-661.01	221-661.02	221-661.03	221-661.04	221-661.06
43	Hinged clamp Cast clamp	1.4401 1.4408	701-075 ---	701-076 ---	701-077 ---	--- 701-011	--- 701-010	--- 701-080
44	Hex. screw	A2-70	---	---	---	901-296	901-296	901-296
45	Hex. nut	1.4305 A2	912-035 ---	912-036 ---	912-036 ---	--- 910-025	--- 910-025	--- 910-025
46	Hinged clamp	1.4401	701-073	701-073	701-073	701-073	701-073	701-073
47	Hex. nut	1.4305	912-036	912-036	912-036	912-036	912-036	912-036
65**	Sealing ring RA	EPDM FKM	221-367.02 221-367.12	221-367.03 221-367.08	221-367.04 221-367.09	221-367.05 221-367.10	221-367.06 221-367.11	221-367.16 ---
65.1**	Sealing ring RA	EPDM FKM	924-305 924-307	221-367.03 221-367.08	221-367.04 221-367.09	221-367.05 221-367.10	221-367.06 221-367.11	221-367.16 ---
66	Rod guide ring	Turcite	935-056	935-078	935-076	935-079	935-072	935-090
72**	O-ring	EPDM FKM	930-610 930-662	930-611 930-663	930-611 930-663	930-612 930-664	930-612 930-664	930-612 930-664
74**	Snap sealing	PVDF	221-000522	221-000523	221-000523	221-000524	221-000524	221-000524
91	CIP connection	1.4404	221-428.06	221-428.04	221-428.04	221-428.05	221-428.05	221-428.05
92	Balancer locking	1.4404	221-348.03	221-538.01	221-538.02	221-538.03	221-538.04	221-538.07
94**	V-ring RA	EPDM FKM	221-365.07 221-365.10	221-365.08 221-365.11	221-365.09 221-365.12	221-365.14 221-365.15	221-365.16 221-365.17	221-365.25 ---
108**	O-ring	EPDM FKM	930-243 930-244	930-243 930-244	930-243 930-244	930-356 930-357	930-356 930-357	930-356 930-357
109**	O-ring	EPDM FKM	930-246 930-247	930-701 930-606	930-701 930-606	930-266 930-265	930-266 930-265	930-266 930-265
110	Hex. screw	A2	---	901-043	901-043	901-089	901-089	901-089
111**	O-ring	EPDM	930-266	930-148	930-923	930-924	930-925	930-937
112	Guide MU-0/06	PTFE	221-696.07	221-696.08	221-696.09	221-696.10	221-696.11	221-696.12
113	Balancer cleaning device MU/06	1.4305	221-695.05	221-695.04	221-695.01	221-695.02	221-695.03	221-695.06
403	Welded housing Typ/type MA/06	1.4404	221-666.05	221-666.01	221-666.02	221-666.03	221-666.04	---
404.1	Typ/type MB/06-90	1.4404	221-667.13	221-667.01	221-667.02	221-667.07	221-667.08	---
404.2	Typ/type MB/06-180	1.4404	221-667.14	221-667.03	221-667.04	221-667.09	221-667.10	---
404.3	Typ/type MB/06-270	1.4404	221-667.15	221-667.05	221-667.06	221-667.11	221-667.12	---
405	Typ/type MC/06	1.4404	221-668.05	221-668.01	221-668.02	221-668.03	221-668.04	---
406	Typ/type ME/06	1.4404	221-669.05	221-669.01	221-669.02	221-669.03	221-669.04	221-669.06
A	Actuator	--	**BD**	**BD**	**BD**	**DF 5**	**DF 5**	**EK 6Z**
			221-119.02	221-119.02	221-119.02	221-184.01	221-184.01	221-585.10
B	Control module T.VIS® A-7	siehe Ersatzteilliste für Anschlusskopf T.VIS / see spare parts list for control module T.VIS						
L	Lifting actuator MN	--	221-609.39	221-609.20	221-609.21	221-609.19	221-609.19	221-609.42
		See spare parts list Lifting actuator (221ELI001815G)						
170	Proximity switch	1.4305 / PTFE	505-102	505-102	505-102	505-102	505-102	505-102
171	Switch locking plate	1.4404	221-478.08	221-478.02	221-478.02	221-478.02	221-478.02	221-478.02
172	Hex. screw	A2-70	901-350	901-020	901-020	901-023	901-023	901-023
173	Cap nuT Hex. nut	1.4301 A2	-- 910-009	912-002 --	912-002 --	912-002 --	912-002 --	912-002 --
175	Nut NI/M/06	1.4305	221-478.07	221-478.07	221-478.07	221-478.07	221-478.07	221-478.07

* In valve insert are according items 2; 3, 15, 16, (66), 72, 74, 91 (92), 112, 113.

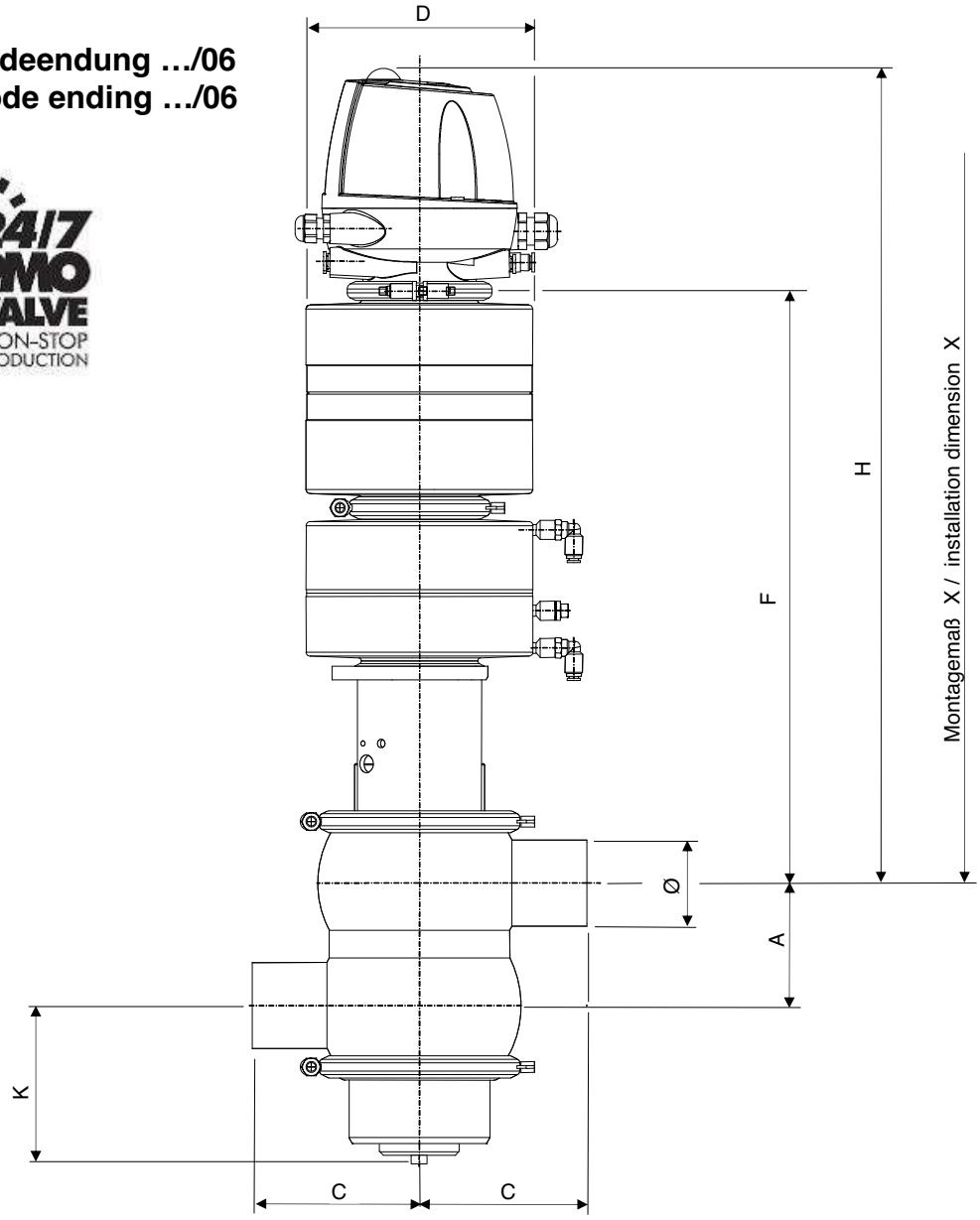
** The sealing set and wearing parts are the items 1; 5, 6, 7, 8, 65, 72, 74, 94, 108, 109, (111).

*** In housing configurations are according items 43, 44, 45, 403, (404,405,406).

Datum/date: 2008-10-29 Ersatz für/replacement for 221MBL001584G 221MBL004196G_0.DOC	Maßblatt / Dimension sheet **Doppelsitzventil M_OB (06) mit Liftantrieb MN** **Double-Seat Mixproof Valve M_OB (06) with Lifting Actuator MN**	GEA

Ventilcodeendung …/06
Valve code ending …/06

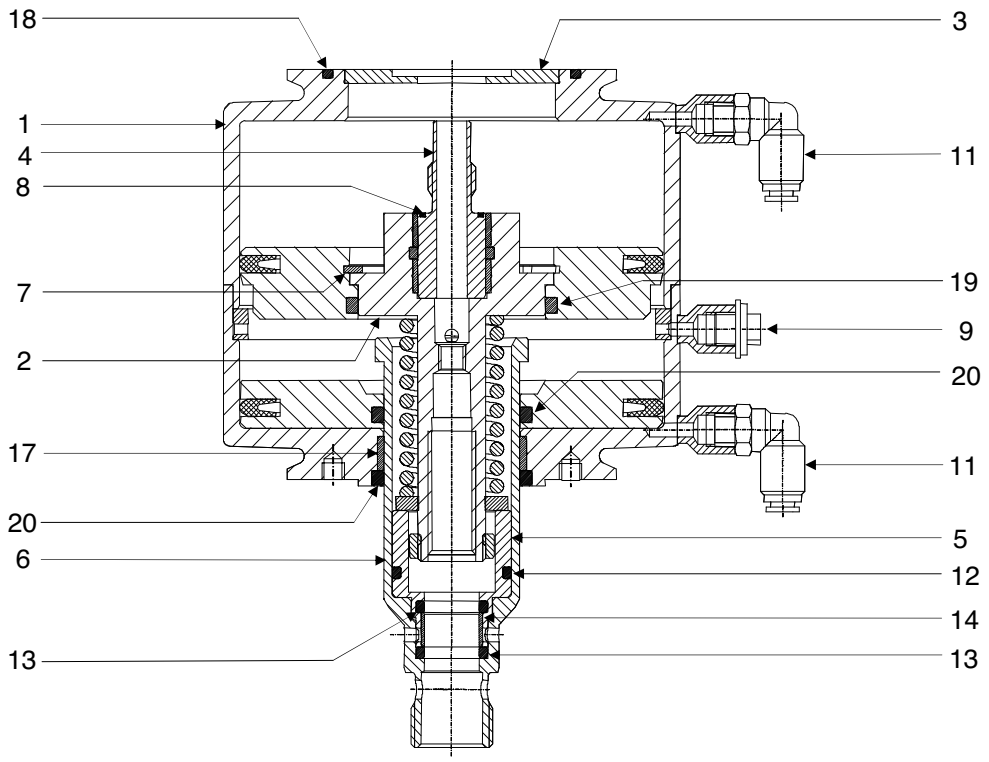
24/7 PMO VALVE NON-STOP PRODUCTION



Maß / Dimension (mm)	1 ½" OD	2" OD	2 ½" OD	3" OD	4" OD	6" OD
A	59	71,5	90	103	127,5	177
C	90	90	125	125	150	175
Ø	35	47,5	60	73	97,5	147
D	110	110	135	170	170	210
F	393	391	398	502	514	639
H mit/with T.VIS A-7	557	555	561	665	678	803
K	65	111	133	136	156	201
X	820	823	934	1020	1045	1275
Hub/stroke	22	31	35	45	45	65
Steuerluftdruck / control air pressure	4,8 bar (70 psi)					
Produktdruck federschließend / spring-closing valve	6 bar					
Produktdruck luftöffnend / air to open valve	6 bar					
Gewicht / weight (kg)	18	21	32	51,5	61	115

Spare parts list

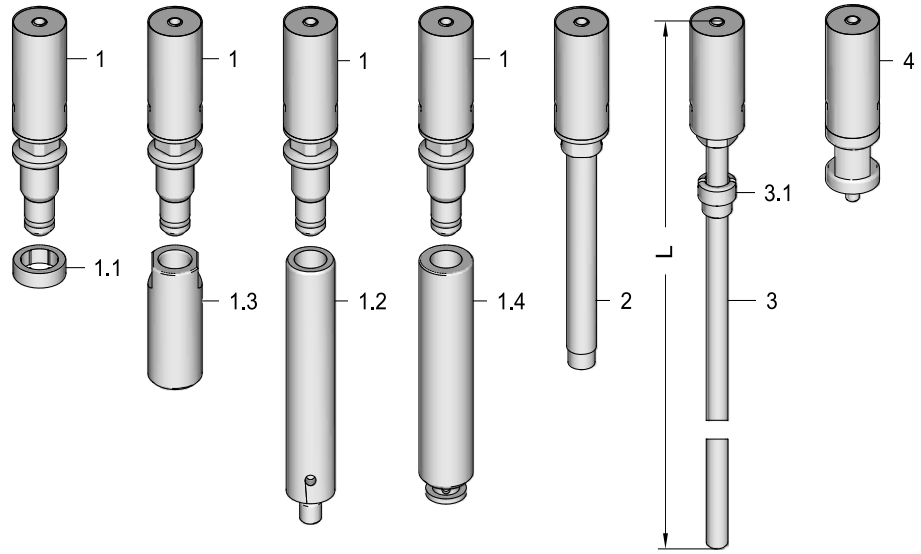
Lifting Actuator MN



Items marked with * are wearing parts.

Item	Designation	Material	Sach-Nr. / Part no.						
Lifting Actuator MN			1 ½ " OD BLRN	2" OD BLRN	2 ½ " OD CLRN	3"OD / 4"OD DLM5	4"OD/ 3"OD ELM6	4"OD/3"OD ELMT6	6" OD ELRN6
			221-609.39	221-609.20	221-609.21	221-609.19	221-609.37	221-609.44	221-609.15
1	Lifting actuator	--	221-605.01	221-605.12	221-605.13	221-605.18	221-605.07	221-605.21	221-605.07
2	Striker	--	221-622.10	221-622.03	221-622.04	221-622.11	221-622.06	221-622.14	221-622.06
3	Locking flange LFT-R	3.2315.T6	221-613.05	221-613.04	221-613.01	221-613.01	221-613.10	221-613.02	221-613.02
4	Adaptor	3.2315.T6	221-614.01	221-614.01	221-614.01	221-614.03	221-614.02	221-614.04	221-614.02
5	Bush LFT-B	1.4301	221-616.02	221-616.02	221-616.02	221-616.03	221-616.03	221-616.07	221-616.03
6	Drive sleeve	1.4301	221-617.02	221-617.02	221-617.02	221-617.05	221-617.04	221-617.04	221-617.04
7	Circlip	3.2315.T6	917-179	917-179	917-179	917-179	917-154	917-154	917-154
8	O-ring*	NBR	930-846	930-846	930-846	930-846	930-847	930-847	930-847
9	Locking screw	1.4571	922-316	922-316	922-316	922-316	922-316	922-316	922-316
11	Angular union 6 -1/8"	Ms/vern. Ms/nickled	933-475	933-475	933-475	933-475	933-475	933-475	933-475
	Angular union 6,35-1/8"		933-979	933-979	933-979	933-979	933-979	933-979	933-979
12	O-ring*	NBR	930-041	930-041	930-041	930-052	930-052	930-052	930-052
13	O-ring*	EPDM FKM	930-235 930-162	930-235 930-162	930-235 930-162	930-268 930-164	930-268 930-164	930-268 930-164	930-268 930-164
14	Plain bearing	IGLIDUR-G	704-043	704-043	704-043	704-038	704-038	704-038	704-038
17	Plain bearing Rod guide ring	IGLIDUR-G TURCITE	704-057 --	704-057 --	704-057 --	-- 935-015	-- 935-015	-- 935-015	-- 935-015
18	O-ring*	NBR	930-850	930-850	930-850	930-850	930-107	930-107	930-107
19	O-ring*	NBR	930-848	930-848	930-848	930-848	930-849	930-849	930-849
20	O-ring*	NBR	930-242	930-242	930-242	930-249	930-249	930-249	930-249

Switch bar T.VIS A-15



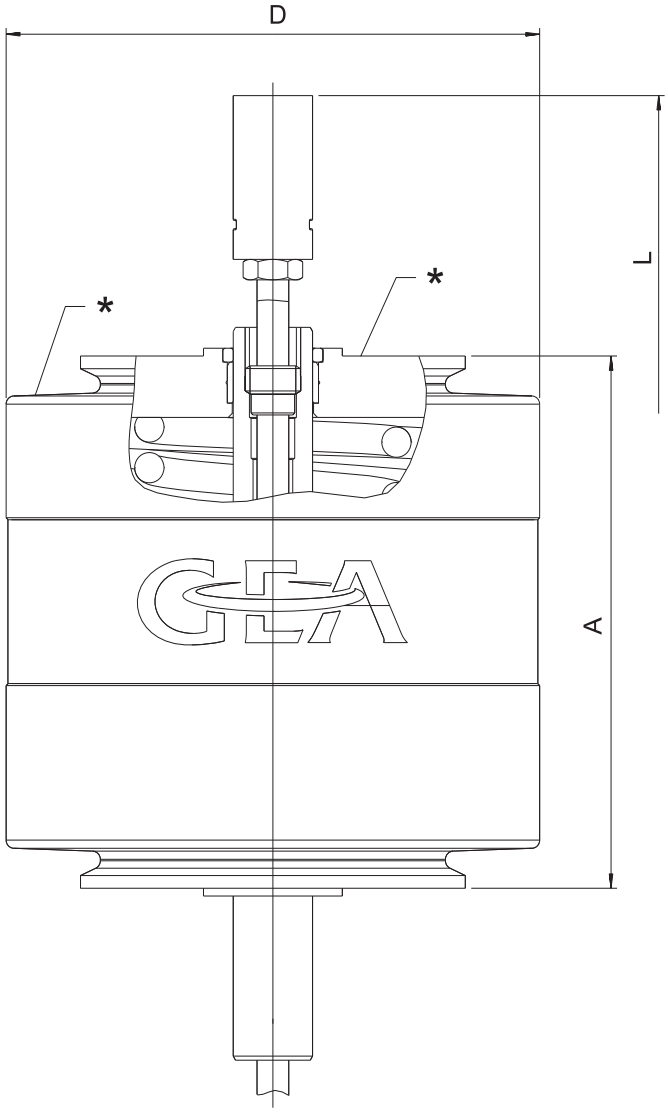
Item	Designation	Material	Part no.	Application
1	Switch bar	PA6/GK30	221-589.75	Standard for all valves with the exception of Butterfly Valve T-smart 7 and Valve with Lift R; T_R; L; M_O(06); MT/T_R(08); M/2.0
1.1	Ring T.VIS®/ ECO	Noryl/GFN2	221-002396	In addition to item 1, only for ECOVENT valves and VESTA XL H_A/M valves
1.2	Switch bar	1.4301	224-000214	In addition to item 1, adapter only for T-smart 8000 butterfly valves
1.3	Switch bar incl. O-ring	1.4305	221-589.57	In addition to item 1, adapter only for 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
2	Switch bar BFV-7	1.4301/PA6	224-001696	for Butterfly Valve T-smart 7 and 9
3	Switch bar LFT-R	1.4301/PA6	see type	for Valve with Lift R; T_R; L; M_O(06); MT/T_R(08); M/2.0

Typ		125	200	205	166	256
Use with standard actuator		see Dimension sheet 221MBL010805EN				
Item	Designation	Part no.				
3	Switch bar LFT-R cpl. incl. Slide	221-618.20	221-618.21	221-618.22	221-618.23	221-618.24
L = length		286	316	346	405	453
3.1	Slide	221-619.04				

Dimension Sheet

Switch bar LFT-R T.VIS A-15 for valves with lifting actuator / valves R; T_R; L; M_O(06); MT/T_R(08); M/2.0

Switch bar LFT-R T.VIS A-15 for valves with lifting actuator / valves R; T_R; L; M_O(06); MT/T_R(08); M/2.0



* Actuator identification type

Switch bar LFT-R T.VIS A-15

Actuator				Switch bar T.VIS A-15	
Type	Material no.	Actuator		Material no.	Length
		A	D		L
AA	221-118.01	95	99	--	--
BA	221-120.01	130	110	221-618.20	286
BB	221-118.02	130	110	221-618.20	286

Dimension Sheet

Switch bar LFT-R T.VIS A-15 for valves with lifting actuator / valves R; T_R; L; M_O(06); MT/T_R(08); M/2.0

Switch bar LFT-R T.VIS A-15 (Forts.)

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

Dimension Sheet

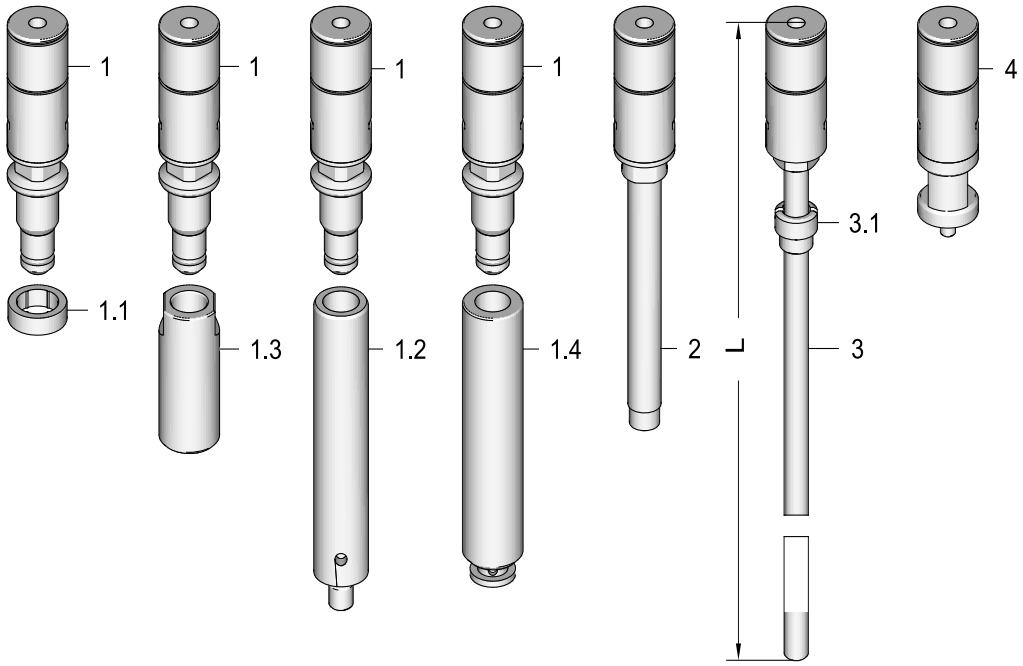
Switch bar LFT-R T.VIS A-15 for valves with lifting actuator / valves R; T_R; L; M_O(06); MT/T_R(08); M/2.0

Switch bar LFT-R T.VIS A-15 (Forts.)

Actuator				Switch bar T.VIS A-15	
Type	Material no.	Actuator		Material no.	Length
		A	D		L
SK6Z	221-585.03	246	260.5	221-618.24	453
SM6Z	221-585.04	246	260.5	221-618.24	453
SN6Z	221-585.05	246	260.5	221-618.24	453
EF6Z	221-585.07	246	210	221-618.24	453
EG6Z	221-585.08	246	210	221-618.24	453
EH6Z	221-585.09	246	210	221-618.24	453
EK6Z	221-585.10	246	210	221-618.24	453
SG6A	221-586.01	246	260.5	221-618.24	453
SH6A	221-586.02	246	260.5	221-618.24	453
SK6A	221-586.03	246	260.5	221-618.24	453
SM6A	221-586.04	246	260.5	221-618.24	453
SN6A	221-586.05	246	260.5	221-618.24	453
EF6A	221-586.07	246	210	221-618.24	453
EG6A	221-586.08	246	210	221-618.24	453
EH6A	221-586.09	246	210	221-618.24	453
EK6A	221-586.10	246	210	221-618.24	453

Spare Parts List
Switch bar, T.VIS M-15

Switch bar, T.VIS M-15



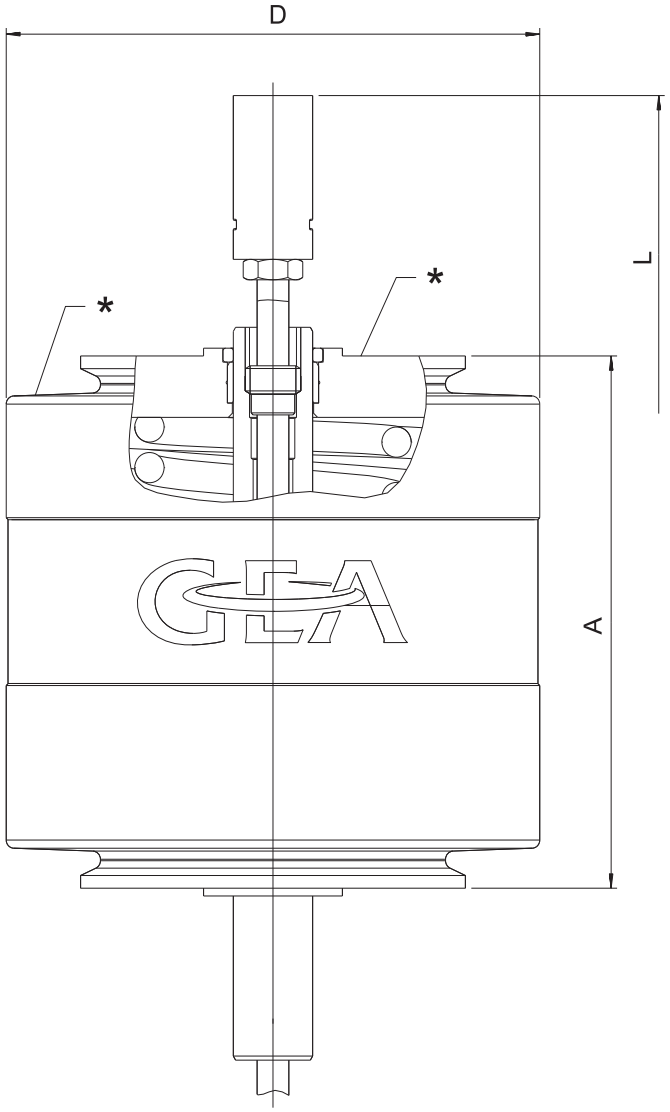
Item	Designation	Material	Material no.	Application
1	Switch bar	PA6/GK30	221-589.80	Standard for all valves with the exception of butterfly valves T-smart 7 and valves with lifting actuator R; T_R; L; M_O(06); MT/T_R(08); M/2.0
1.1	Ring T.VIS/ ECO	Noryl/GFN2	221-002396	In addition to item 1, only for ECOVENT valves and valves VESTA H_A/M
1.2	Switch bar	1.4301	224-000214	In addition to item 1, adapter only for T-smart 8000 butterfly valves
1.3	Switch bar incl. O-ring	1.4305	221-589.57	In addition to item 1, adapter only for valves type VESTA H_A
1.4	TME/T.VIS adapter	1.4305	221-573.06	In addition to item 1, only for butterfly valves type ECOVENT-S
2	Switch bar BFV-7	1.4301/PA6	224-001697	For butterfly valves T-smart 7 and 9
3	Switch bar LFT-R	1.4301/PA6	see type	For valves with lifting actuator R; T_R; L; M_O(06); MT/T_R(08); M/2.0
4	Switch bar M-15 / ASG	1.4305/PA6	221-589.87	For all valves GEA ASEPTOMAG

Type		125	200	205	166	256
Use on standard actuators		See dimension sheet 221MBL010829DE				
Item	Designation	Material no.				
3	Switch bar LFT-R cpl. incl. sliding piece	221-618.25	221-618.26	221-618.27	221-618.28	221-618.29
L = Length		286	316	346	405	453
3.1	Sliding piece	221-619.04				

Dimension Sheet

Switch bar LFT-R T.VIS M-15 for valves with lifting actuator / valves R; T_R; L; M_O(06); MT/T_R(08); M/2.0

Switch bar LFT-R T.VIS M-15 for valves with lifting actuator / valves R; T_R; L; M_O(06); MT/T_R(08); M/2.0



Drawing for switch bar LFT-R T.VIS M-15

Switch bar LFT-R T.VIS M-15

Actuator				Switch bar, T.VIS M-15	
Type	Part no.	Actuator		Part no.	Length
		A	D		L
AA	221-118.01	95	99	--	--
BA	221-120.01	130	110	221-618.25	286
BB	221-118.02	130	110	221-618.25	286

Dimension Sheet

Switch bar LFT-R T.VIS M-15 for valves with lifting actuator / valves R; T_R; L; M_O(06); MT/T_R(08); M/2.0

Switch bar LFT-R T.VIS M-15 (Forts.)

Actuator				Switch bar, T.VIS M-15	
Type	Part no.	Actuator		Part no.	Length
		A	D		L
BD	221-119.02	130	110	221-618.25	286
				221-618.26 in Valve DN25; 1"OD or PMO 2.0	316
BE	221-119.09	130	110	221-618.26	316
CA	221-181.01	130	135	221-618.25	286
CB	221-120.02	130	135	221-618.25	286
CD	221-118.03	130	135	221-618.25	286
CF	221-119.03	130	135	221-618.25	286
DB	221-181.02	160	170	221-618.26	316
DD	221-120.03	160	170	221-618.26	316
DF	221-118.04	160	170	221-618.26	316
DG	221-119.04	160	170	221-618.26	316
DH	221-265.05	160	170	221-618.26	316
ED	221-181.03	160	210	221-618.26	316
EF	221-120.04	160	210	221-618.26	316
EG	221-118.05	160	210	221-618.26	316
EH	221-119.05	160	210	221-618.26	316
BD5	221-119.06	140	110	221-618.26	316
BE5	221-119.07	140	110	221-618.26	316
CF5	221-119.10	140	110	221-618.26	316
DD5	221-183.01	160	170	221-618.27	346
DF5	221-184.01	170	170	221-618.27	346
				221-618.31 in Valve PMO/06	356
DG5	221-185.01	170	170	221-618.27	346
ED5	221-183.05	160	210	221-618.27	346
EF5	221-183.02	170	210	221-618.27	346
EG5	221-184.02	170	210	221-618.27	346
EH5	221-185.02	170	210	221-618.27	346
DF6Z	221-585.11	199	170	221-618.28	405
DG6Z	221-585.13	199	170	221-618.28	405
SH6Z	221-585.02	246	260.5	221-618.29	453

Dimension Sheet

Switch bar LFT-R T.VIS M-15 for valves with lifting actuator / valves R; T_R; L; M_O(06); MT/T_R(08); M/2.0

Switch bar LFT-R T.VIS M-15 (Forts.)

Actuator				Switch bar, T.VIS M-15	
Type	Part no.	Actuator		Part no.	Length
		A	D		L
SK6Z	221-585.03	246	260.5	221-618.29	453
SM6Z	221-585.04	246	260.5	221-618.29	453
SN6Z	221-585.05	246	260.5	221-618.29	453
EF6Z	221-585.07	246	210	221-618.29	453
EG6Z	221-585.08	246	210	221-618.29	453
EH6Z	221-585.09	246	210	221-618.29	453
EK6Z	221-585.10	246	210	221-618.29	453
SG6A	221-586.01	246	260.5	221-618.29	453
SA6A	221-586.02	246	260.5	221-618.29	453
SK6A	221-586.03	246	260.5	221-618.29	453
SM6A	221-586.04	246	260.5	221-618.29	453
SN6A	221-586.05	246	260.5	221-618.29	453
EF6A	221-586.07	246	210	221-618.29	453
EG6A	221-586.08	246	210	221-618.29	453
EH6A	221-586.09	246	210	221-618.29	453
EK6A	221-586.10	246	210	221-618.29	453

Konformitätserklärung
Conformity Declaration

im Sinne der EG-Maschinenrichtlinie 2006/42/EG
as defined by Machinery Directive 2006/42/EC

Hiermit erklären wir, daß die nachfolgend bezeichnete Maschine aufgrund ihrer Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Maschinenrichtlinie entspricht.

We, the manufacturer, herewith declare that the subsequently described machine conforms with respect to its design, construction and workmanship to the fundamental safety and health requirements to the regulations of the EC-Machinery Directive.

Bei einer nicht mit uns abgestimmten Änderung an der Maschine verliert diese Erklärung ihre Gültigkeit.

This declaration becomes invalid in case of alterations at the machine which have not been agreed with us.

Bezeichnung der Maschine: Machine´s designation:	Ventil mit Antrieb Valve with actuator
Maschinentypen: Machine type:	VARIVENT® VARIVENT®
Einschlägige EG-Richtlinien: Relevant EC-Directives	2006/42/EG 2006/42/EC
Angewendete harmonisierte Normen: Applicable, harmonized standards:	DIN EN ISO 12100 DIN EN ISO 12100
Bevollmächtigter für die Zusammenstellung der technischen Unterlagen: Authorised representative for the compilation of the technical documentation:	CE-Dokumentationsbevollmächtigter GEA Tuchenhagen GmbH Am Industriepark 2-10 21514 Büchen

Büchen, 16.02.2015

Franz Bürmann
Managing Director

i.V. Matthias Südel
Team Leader Product Development

GEA Tuchenhagen GmbH

Am Industriepark 2-10, 21514 Büchen, Germany
Telefon +49 (0)4155 49-0,Telefax +49 (0)4155 49-2035, www.gea.com
Sitz der Gesellschaft: Büchen, Handelsregister: HRB 836 SB in Lübeck, Geschäftsführung: Franz Bürmann
Deutsche Bank Hamburg, BLZ 200 700 00, Konto 262222300, Swift-Code / BIC DEUTDEHH, IBAN: DE56 2007 0000 0262 2223 00
Commerzbank AG, BLZ 230 400 22, Konto 142343300, Swift-Code / BIC COBADEFF, IBAN: DE43 2304 0022 0142 3433 00
Ust-Id. Nr.: DE 812589019, Steuer-Nr.: 105/5857/1004 (mit Organträger)

We live our values.

Excellence Passion Integrity Responsibility GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 index.

GEA Mechanical Equipment

GEA Tuchenhagen GmbH

Am Industriepark 2-10, 21514 Büchen
Telefon 04155 49-0, Telefax 04155 49-2423
sales.geatuchenhagen@gea.com, www.tuchenhagen.de