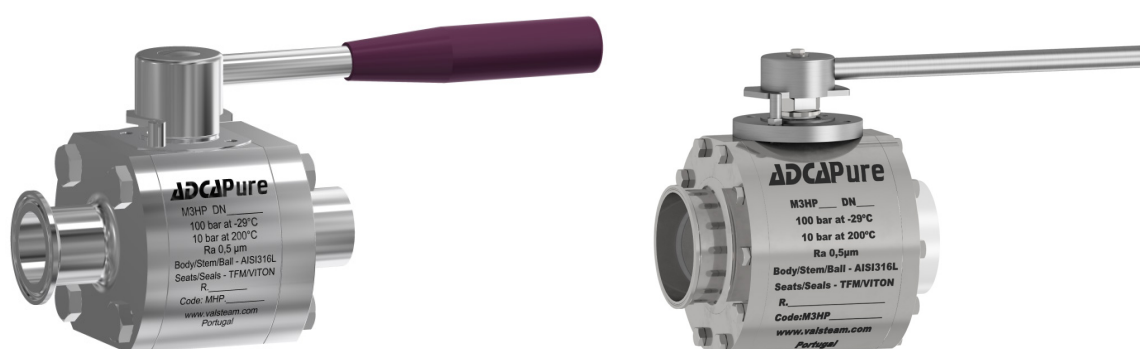


M3HP HIGH PURITY BALL VALVES

INSTALLATION AND MAINTENANCE INSTRUCTIONS



GENERAL INFORMATION

- These instructions must be carefully read before performing any work involving VALSTEAM ADCA products. Failure to observe these instructions may result in hazardous situations.
- These instructions describe the entire life cycle of the product. Keep them in a location that is accessible to every user and make these instructions available to every new owner of the product.
- Current regional and plant safety regulations must be considered and followed during installation, operation, and maintenance work.
- The images shown in these instructions are for illustration purposes only.
- For the problems that cannot be solved with the help of these instructions, please contact VALSTEAM ADCA or its representative.

VALSTEAM ADCA ENGINEERING S.A

Zona Ind. da Guia
Pav.14 - Brejo
3105-467 Guia, Pombal
PORTUGAL
quality@valsteam.com

We reserve the right to change the design and material of this product without notice.

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1. SAFETY INFORMATION

1.1. Explanation of symbols



DANGER

Hazardous situation which, if not avoided by applying the correct preventive measures, could result in fatal or serious injury and/or considerable damage to property.



WARNING

Hazardous situation which, if not avoided by applying the correct preventive measures, could result in fatal or serious injury and/or considerable damage to property.



CAUTION

Hazardous situation which, if not avoided by applying the correct preventive measures, could result in moderately severe or minor injury.



NOTICE

Situation which, if not avoided, can result in property damage or product malfunction.



NOTE

Indicates additional information, tips and recommendations.

1.2. Intended use

Refer to the markings on the device, such as nameplate and laser markings, Information Sheet (IS) and these Installation and Maintenance Instructions (IMI) to check that the product was designed for the intended use and meets the specifications used for sizing and selection. This includes checking application, material suitability, process medium, pressure and temperature as well as their respective limiting values.

VALSTEAM ADCA does not assume any responsibility for damage resulting from inappropriate use of the product, damage caused by external stresses or any other external factors. Correct installation of the product is the full responsibility of the contractor.

Inappropriate use of the product is any use other than the one described in this chapter. Inappropriate use also includes:

- Use of spare parts which are not genuine;
- Performance of maintenance work not described in these instructions;
- Use outside the limits defined by the accessories connected to the product.
- Unauthorized modifications to the product.

If the product is to be used for an application or with a fluid other than the one it was designed for, contact VALSTEAM ADCA.

1.3. Qualification of personnel

Handling, installation, operation and maintenance work must be carried out by fully trained and qualified personnel, capable of judging the work which they are assigned to perform and recognizing potentially hazardous situations. They should be trained to properly use this product according to these Installation and Maintenance Instructions.

Where a formal “Permits to Work” system is implemented in the plant it must be complied with.

1.4. Personal protective equipment

Personal protective equipment should always be worn during work in order to protect against hazards posed by e.g. the process medium, dangerous temperatures, noise, falling or projected objects, working at height. These equipment includes a helmet, safety glasses, safety harness, protective clothes, safety shoes, hearing protection, etc.



NOTE

Always assess whether you or others in your vicinity require any protective equipment. When in doubt check with the plant’s health & safety responsible personnel for details on required protective equipment.

1.5. The system

The complete system should be assessed as well as every action (e.g. closing of shut-off valves, disconnection of the power supply) to ensure this will not bring additional risk to personnel or property.

Dangerous actions that can result in a hazardous situation include isolation of protective devices such as safety valve, vents, vacuum relief valves, disconnection of electric safety devices, sensors and alarms.

1.6. ATEX

If the product is in the scope of the ATEX 2014/34/EU directive and as such bears the Ex marking, consult its specific Additional Instructions for use in Potentially Explosive Areas (IMI EX). In such cases, handling, installation, operation and maintenance work must only be performed by personnel qualified and authorized to work in potentially explosive areas.

1.7. General safety notes



DANGER

RISK OF BURSTING IN PRESSURE EQUIPMENT

Valves, ancillaries and pipelines are pressure equipment. Working above their operating limits or improper opening can lead to component bursting.

- Observe the maximum operating limits of the product and check if they are lower than those of the system in which it is being installed. Check the product Information Sheet (IS).
- Install a safety device.
- Before starting any work on the product, depressurize it and cool or heat it up to ambient temperature. This also applies to the line in which it is fitted.
- Drain the process medium from the product and all the relevant plant sections.



WARNING

RISK OF BURNS

Depending on the operating conditions, products and pipelines may get very hot or cold and cause burn injuries.

- Do not touch the product while it is hot or cold, allowing it firstly to cool down or heat up.
- Wear protective clothing and safety gloves during working operation.
- Thermally insulate tubes and product's as a preventive measure.

RISK OF INJURY AS A RESULT OF ILLEGIBLE INFORMATION

Important information written in the product nameplate, markings and warning signs may wear overtime or get illegible due to e.g. dirt accumulation, resulting in hazardous situations and personal injury or property damage.

- Keep nameplates, markings and warning signs in a legible state, replacing when illegible, missing or damaged.



WARNING

RISK OF INJURY CAUSED BY FLUID ATTACK ON PRODUCTS MATERIALS

The product must only be used with mediums that do not attack the materials of the product (body, gaskets, seals). Otherwise, leaks may occur, and hot and/or hazardous fluid can escape.

- Do not use the product with mediums other than the ones it was designed for. Check section 1.2 - Intended Use.
- Prevent medium contamination.

RISK OF INJURY CAUSED BY UNDER TIGHTENED PRODUCT OR ITS COMPONENTS

Excessively low tightening torques may cause medium to escape or and/or components to be projected at high speed which may result in a hazardous situation depending on the medium, chemical properties and/or its operating conditions.

- Do not loosen any screw while the equipment is pressurized.
- Observe the specified tightening torques on these Installation and Maintenance Instructions. If the relevant torque value is not mentioned contact VALSTEAM ADCA.

RISK OF HEARING LOSS

Depending on the operating conditions, the product may generate loud noises.

- Wear hearing protection when in the vicinity of the product.



CAUTION

RISK OF INJURY DUE TO RESIDUAL PROCESS MEDIUM

Direct contact with dangerous process medium may lead to personal injury, e.g. smoke inhalation and chemical burns.

- Drain the process medium from the product and all the relevant plant sections.
- Wear protective clothing, safety gloves, mask, and eye protection.

RISK OF INJURY DUE TO IMPROPER HANDLING

Manual handling (e.g. lifting, carrying, pushing, pulling) of large and/or heavy products may result in personal injury.

- Assess the risk associated with the handling task.
- Use adequate handling methods and appropriate auxiliary handling equipment.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO EXCESSIVELY HIGH TIGHTENING TORQUES

High tightening torques may lead to premature wearing of product components.

- Observe the specified tightening torques on these Installation and Maintenance Instructions. If the relevant torque value is not mentioned contact VALSTEAM ADCA.

2. PRODUCT INFORMATION

The ADCAPure M3HP three-piece body ball valves are isolating valves designed for use with clean steam, condensate and other liquids and gases. These true bore floating ball design valves are mainly suitable for hygienic and aseptic applications found in the pharmaceutical, biotech, semiconductor, cosmetic, fine chemical and food & beverage industries.

The M3HP series ball valves are suitable for use with a manual lever handle or actuator assembled through its integrated ISO 5211 body mounting. These valves are available with clamped connections, extended tube weld ends (ETO) and others on request.

2.1. Principle of operation

The valve stem (5) is connected to a floating ball (6) with a central bore through a notch, allowing its rotation inside the valve body (1) to provide on/off control of flow. When the floating ball is positioned in such a way that its bore is aligned in the same direction as the pipeline, it is in the “fully open” position. When rotated by $\frac{1}{4}$ turn, the bore becomes perpendicular to the flow path and the valve closes sealing by means of soft seats (7).

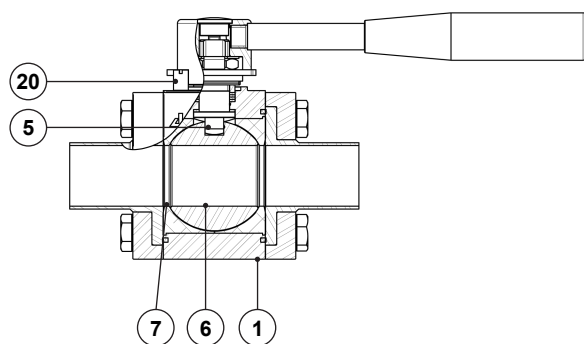


Fig. 1

For manual valves, operation is performed by turning the handle by $\frac{1}{4}$ turn to “fully close” or “fully open” the valve. The valve is “fully open” or “fully closed” when the handle is parallel or perpendicular to the pipeline respectively.

When automated, the stop pin (20) is removed and the actuator is placed on top of the valve and connected through its ISO 5211 mounting.

2.2. Certification

This product has been specifically designed for use with liquids and gases which are in Group 2 of the European PED – 2014/68/EU Pressure Equipment Directive and it complies with its requirements.

CE MARKING – GROUP 2 (PED – European Directive)				
PN 16	PN 40	PN 63	PN 100	Category
–	–	DN 25 to 32	1/2" to 1" DN 10 to 20	SEP
6" – DN 150	2 1/2" to 4" DN 65 to DN 100	1 1/2" to 2" DN 40 to 50	–	1 (CE Marked)



NOTE

If the product falls within category SEP it must not be CE marked, unless other directives are applicable.

When the product is supplied with a lever handle or other manual means of actuation, it is classified as hand-operated valves and is thus not in the scope of the ATEX 2014/34/EU directive. Nonetheless, personnel responsible for the plant installation must assess the risks caused by static electricity and take the necessary precautionary measures to prevent static charge. These measures include e.g. connection of the product to the equipotential bonding system.

When the product is supplied with “bare stem” and meant to be automated (e.g. with a pneumatic quarter turn actuators), it is optionally available in an ATEX version, distinguishable by the additional Ex Marking found on the device – see section 2.3 – Product identification. If that is the case the product complies with the requirements of the ATEX 2014/34/EU and as such bears the Ex marking, is CE marked and its specific Additional Instructions for use in Potentially Explosive Areas (IMI EX) must be consulted.

The product has been designed in accordance with ASME BPE and EHEDG guidelines.

The product surface finishing conditions and non-metallic material approvals such as FDA and USP CL. VI are detailed in the ADCAPure specific inspection certificate.

Refer to IS PV20.00 Technical Information Sheet - ADCAPure for further information.

2.3. Product identification

The following items are indicated on the product nameplate or directly on its body:

- Manufacturer
- Product model (e.g. M3HP)
- Pressure rating (e.g. PN 16) or maximum allowable pressure (e.g. Pmax = 16 bar)
- Nominal size (e.g. TC 1/2" BPE)
- Min. operating temperature (e.g. Tmin = -10 °C)
- Max. operating temperature (e.g. Tmax = 150 °C)
- Flow direction (indicated by an arrow)
- Serial number and year of manufacturing (e.g. Reg.:17483/19)
- CE Marking (when applicable – see section 2.2 – Certification)
- EX Marking (when applicable e.g. EX h IIB T6...T3 Gb – see section 2.2 – Certification)

2.4. Technical data

For technical data including dimensions, materials, limiting conditions and versions refer to the product respective Information Sheet (IS).

2.5. Factory assembly and cleaning

Assembly of the product is performed in a certified clean room according to ISO 14644-1 and all its components are cleaned and, when admissible, degreased and passivated. Such operations are performed in accordance with certified procedures and rigorous control.

3. TRANSPORT, STORAGE AND PACKAGING



DANGER

RISK DUE TO FALLING LOADS

- Use suitable equipment when moving or lifting suspended loads.
- Make sure no one is standing below the suspended load.



WARNING

RISK OF INJURY DUE TO IMPROPER HANDLING

Manual handling (e.g. lifting, carrying, pushing, pulling) of large and/or heavy products may result in personal injury such as back injury.

- Assess the risk associated with the handling task.
- Use adequate handling methods and appropriate auxiliary handling equipment.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO IMPROPER STORAGE

- Do not remove any packaging or protective covers until immediately before installation at the site.
- Store the product in a solid base in a dry, cool and dust-free environment.
- Until its installation, protect it from the weather, dirt, corrosive atmospheres and other harmful influences.

RISK OF PRODUCT DAMAGE DUE TO LONG TERM STORAGE

Some product components may deteriorate with time (e.g. valve packings, seals).

- Do not store the product for more than 12 months.
- If for any reason the product must be stored for longer periods of time contact VALSTEAM ADCA.
- The valve should be stored in the “fully open” position.

The product is end capped and sealed with recyclable thermo shrinkable plastic film inside the clean room where it was assembled to prevent contamination as it leaves the clean environment. The product is stored in a cardboard box as it leaves VALSTEAM ADCA. Avoid removing packaging, covers and sealings until immediately before installing the product at the site.




NOTE

If the transport packaging has any shipping damage contact VALSTEAM ADCA or its representative.

Before storing and transporting the product protect it from impacts and mechanical damage, paying special care with sealing surfaces and other fragile parts.

4. INSTALLATION


Before performing any installation work, refer to section 1 – Safety information.

 **WARNING**

RISK OF INJURY DUE TO INSUFFICIENT SUPPORT DURING INSTALLATION

Insufficient support of the product during installation may cause it to fall and cause personal injury.

- Ensure the product is safely held in place during installation.
- Wear protective safety shoes.

 **NOTICE**

RISK OF PRODUCT DAMAGE DUE TO STRESS

The product is not intended to withstand external stresses that may be induced by the system to which it is being connected to.

- Make sure that the connected pipe does not subject the body to any stress (forces or torques) during installation and operation.
- Do not use the product as an elevation point.

4.1. Preparation for installation

Before installation, make sure the following conditions are met:

- The installation area has easy access and the device is to be installed in a position where operation and maintenance work can be performed safely.
- The product will be installed with proper support and free of any stresses that can be induced by the system due to e.g. thermal pipe expansions / contractions during CIP/SIP. The necessary precautions are recommended during system design.
- The pipeline where the product will be installed is designed in such a way that it takes into account the weight of the product. The pipeline may require support on both sides next to the product, particularly if its size and weight are considerable and especially if vibrations are to be expected in the system.
- Consider good hydraulic flow control to avoid pressure surges and avoid dead legs on pipeline branches.
- The product is not damaged.

- Make sure all the necessary materials and tools are readily available during installation work.
- Referring to these Installation and Maintenance Instructions (IMI), Information Sheet (IS) and nameplate, check that the product is suitable for the intended installation: temperature, medium, pressure, temperature, etc. – see section 1.2 – Intended use.
- Check that there are no foreign bodies inside the pipelines and ancillaries, flushing may be necessary. These should be thoroughly cleaned.
- Check any mounted pressure gauges and make sure these function properly.
- A filter may be necessary to install upstream of the ball valve in some applications, preventing solid particles from the process medium from damaging its seats.



NOTE

Assembly Drawings (AD) with assembly details and parts lists are available on request.

4.2. Installation procedure

1. Remove plastic film and other packaging, as well as the protective covers which are placed on clamps or ETO connections. Make sure the ball valve is free from foreign matter.
2. Handle the valve carefully to prevent damage to its surface finish.
3. If the valve is to be fitted with an actuator the stop pin (20) is removed and the actuator is placed on top of the valve and connected through its ISO 5211 mounting. Follow the actuator respective Installation and Maintenance Instruction (IMI) when mounting it onto the valve.
4. The recommended installation position of the valve is horizontal with the stem vertical pointing upwards, however the valve may be installed in any other position.
5. The valve can be installed in either direction, independent of the fluid flow.
6. When a clamp ferrule version is being installed, use appropriate gaskets. Sanitary clamps must respect the system operating limit conditions.
7. When an ETO version is being installed, the welding should be carried out by qualified personnel following an appropriate orbital welding procedure. The valve does not require to be disassembled prior to welding, nonetheless, disassembly may prove to be practical due to e.g. valve weight. If that is the case proceed according to the following steps:

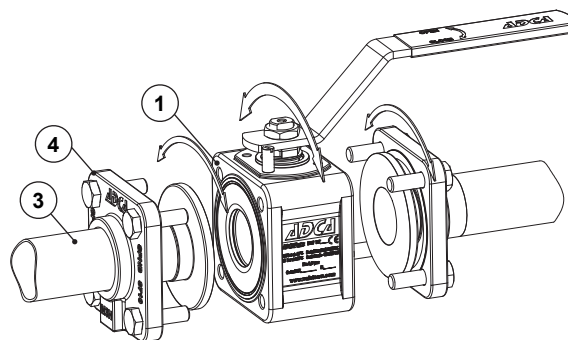


Fig. 2 - Tube weld ends with loose flanges.

- a. Place the valve in its “fully open” position.
- b. Remove the body bolts (19) and separate the valve body assembly from the flanges (4) and tube weld connection ends (3).
- c. Prepare the surfaces to be welded.
- d. Fit the tube weld connection ends (3) with the flanges (4) into the pipeline after protecting the end faces from splatters and proceed with the welding procedure. Note that the flanges don’t need to be aligned since they can later rotate freely to meet the required valve position – see Fig. 2.
- e. When cool, thoroughly clean the valve connector ends.
- f. Fit the valve body assembly between the connection ends (3), join the flanges (4) with the valve body (1) and loosely tighten the body bolts (19) in place.
- g. Align the valve by rotating the full assembly into the desired position.
- h. Gradually tighten the body bolts (19) in a crisscross pattern until the recommended torques are achieved – see section 9.5 – Tightening torques.



NOTE

Before welding the complete assembled valve onto the pipeline, place it in the “fully open” position.

4.3. Fitting the SEF unit onto the valve (valves up to ASME BPE 4" or DIN DN 100)

Different SEF stem extension units are available for mounting onto ball valves.

SEF/H: Stem extension with an overall height which readily clears common thermal insulation thickness. The installation of the SEF/H unit is tight against the ball valve body avoiding fluid leakage inside the insulation. All SEF/H stem extension units allow ISO 5211 mounting. The lever handle parts from the valve, should be reassembled on the extension unit.

SEF/P: Similar to the SEF/H stem extension unit with an additional secondary safety packing set. The model is optionally available with two G 1/8" connection, allowing quick leakage detection.

SEF/A: Direct ISO 5211 mounting assembling unit for actuators with no need for additional brackets and couplings. This mounting adapter serves dual purpose as a mounting adapter and a stem extension.

Ball valves which are to be fitted with SEF units are generally delivered with the unit already installed. If delivered separately or when retrofitting, follow the relevant instructions below:

8. Remove the handle fixing bolt (22) and washer (22A) or handle fixing nut (17A), handle assembly (14, 14A, 14B, 15), handle stopper (21) and locking flange (21A) if installed.
9. Place the SEF unit together with the gasket (46) over the valve stem (5) with the lock washer (18) still in place – see Fig. 3.
10. Tighten the four bolts (40) in a crisscross pattern until the recommended tightening torques are achieved – see section 9.5 – Tightening torques.
11. If a SEF/P unit is being installed and it is equipped with G 1/8" leakage connections, connect and forward to a safe place.
12. If a SEF/H or SEF/P unit is being installed refit the manual lever assembly if required.

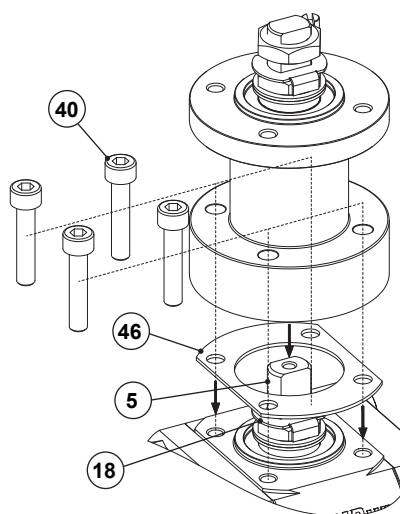


Fig. 3 - SEF stem extension assembly.

5. START-UP

Before performing the start-up procedure, refer to section 1 – Safety information.

The start-up procedure must be followed every time the product is put back into service.

5.1. Preparation for start-up

Before starting up, make sure the following conditions are met:

- All works on the system have been completed.
- All the necessary safety devices have been installed.
- When required, warning notices are used to alert others that the system is starting up.
- The product is correctly installed – see section 4 – Installation.
- Referring to this Installation and Maintenance Instructions (IMI), Information Sheet (IS) and nameplate, check that the product is suitable for the intended installation: temperature, medium, pressure, temperature, etc. – see section 1.2 – Intended use.
- A safety check was performed by qualified personnel. Checking for leaks, structural damage and integrity of system components.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO CONTAMINATION

The plant operator is responsible for cleaning the pipelines in the plant as well as keeping the product well maintained. At start-up, the presence of small particles in the medium (dirt, scale, weld splatters, etc.) may damage the product or cause malfunction.

- Flush pipelines before start-up.
- Clean protection varnishes from pipes and flanges, leftover paint, graphite, grease, etc.
- Use a pipeline strainer or a filter.

5.2. Start-up procedure

1. Open shut-off valves slowly, until normal operating conditions are achieved.
2. Check for any leaks.
3. Check the product to ensure it is operating correctly.



NOTE

24 hours after system start-up, it is recommended to check pipe connection for leaks and retighten when necessary. Clean strainers/filters to avoid blocking.

6. OPERATION

Before operating the product refer to section 1 – Safety information.

Immediately after completing the start-up procedure, the product is ready for operation.



NOTICE

RISK OF PRODUCT DAMAGE DUE TO INAPPROPRIATE OPERATION

Leaving soft-seated ball valves in a partially open position may result in premature wear of the valve seats.

- Isolating ball valves must not be used for flow control.
- Always set the valve in the “fully open” or “fully open” position.

For manual valves, operation is performed by turning its handle by $\frac{1}{4}$ turn to “fully close” or “fully open” the valve. The valve is “fully open” or “fully closed” when the handle is parallel or perpendicular to the pipeline respectively, making it possible to see when the

valve is open or closed depending on the position of the handle. If the handle is removed after operation, the flats on the stem (5) will also indicate the valve position.



NOTE

When operating the ball valve manually do not apply excessive loads on the valve handle.

Operate automated valves in accordance with the Installation and Maintenance Instruction (IMI) of the installed actuator.

7. SHUTDOWN

Before performing the shutdown procedure, refer to section 1 – Safety information.

7.1. Shutdown procedure

1. Switch off the system and secure it so it cannot be turned on by unauthorized personnel.
2. Place the valve in its “fully open” position to ensure there is no trapped pressure or fluid in the valve cavity.
3. Fully close the upstream shut-off valve, to stop the process medium from flowing through the ball valve.
4. Allow medium to cool down and completely drain it from the pipeline and valve.
5. Make sure the pipeline and valve are not under pressure and are at a safe temperature.
6. If an actuator is fitted put it out of operation, referring to its respective Installation and Maintenance Instructions (IMI).
7. Fully close the downstream shut-off valve.
8. If the ball valve is to be removed from the pipeline – see section 3 - Transport, storage and packaging.

8. PARTS LIST

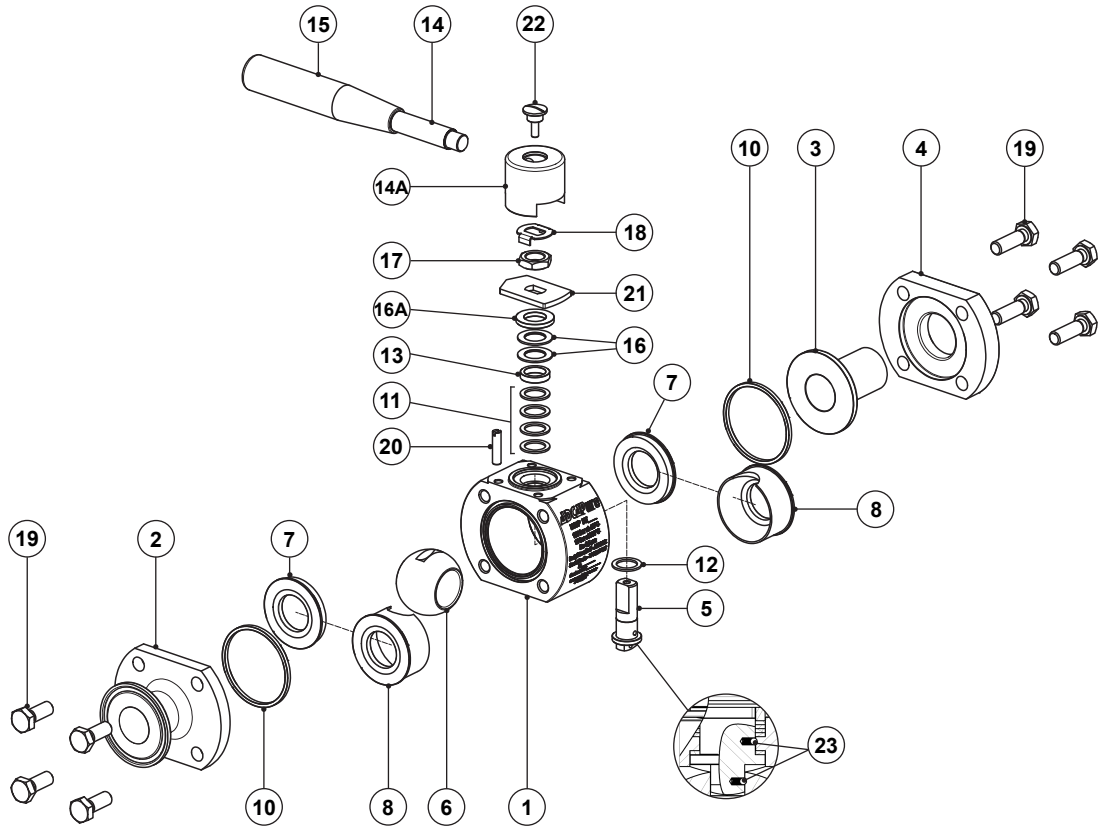


Fig. 4 - M3HP ASME BPE 1/2" to 2" and DIN DN 10 to DN 50.

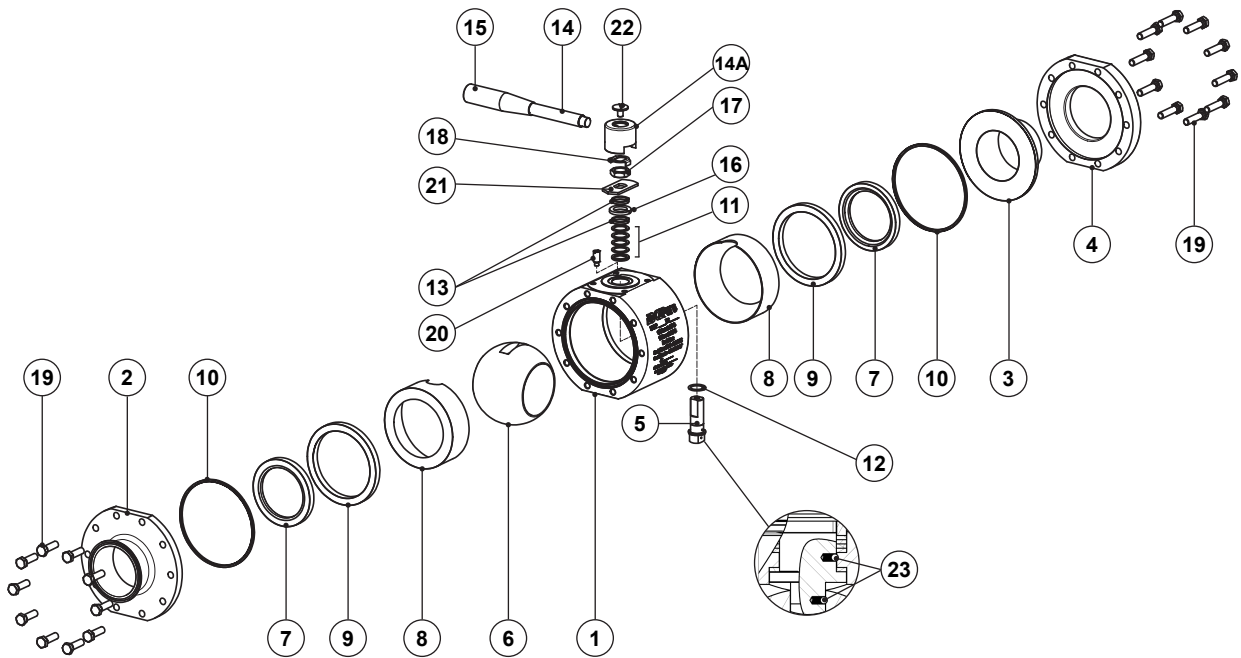


Fig. 5 - M3HP ASME BPE 2 1/2" to 4" and DIN DN 65 to DN 100.

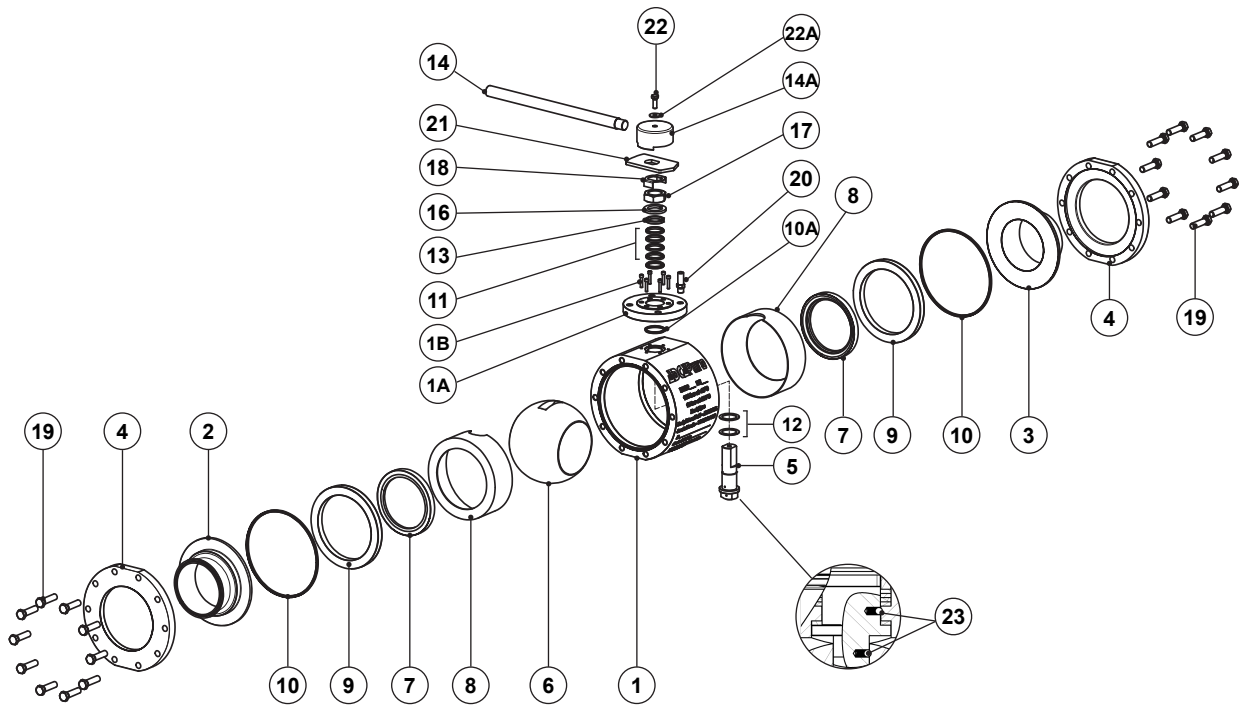


Fig. 6 - M3HP ASME BPE 6" and DIN DN 150.

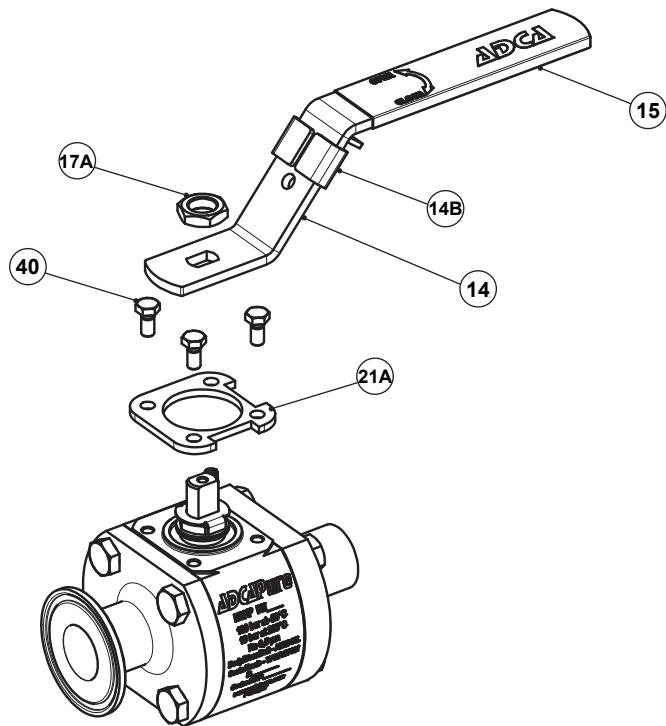


Fig. 7 - Valve with lockable lever.

POS. N°	DESIGNATION	SPARE PARTS
1	Valve body	
1A	Seal retainer	
1B	Bolts	
2	TC connection end	
3	Tube weld connection end	
4	Flange	
5	Stem	
6	Valve ball	X
7	Standard seat	X
8	Cavity filler seat	X
9	Body ring	
10	Body seal	X
10A	Retainer seal	X
11	Stem seals	X
12	Stem thrust seal	X
13	Spacer	X
14	Handle	
14A	Handle body	
14B	Locking piece	
15	Handle end	
16	Spring washer	X
16A	Washer	

POS. N°	DESIGNATION	SPARE PARTS
17	Compression nut	
17A	Nut	
18	Lock washer	X
19	Body fixing bolts	
20	Stop pin	
21	Handle stopper	
21A	Locking flange	
22	Handle fixing bolt	
22A	Washer	
23	Antistatic device	
35	Body (All SEF units)	
36	Stem (All SEF units)	
37	Plain bearing (SEF/H unit only)	
38	Compression nut (SEF/P & SEF/H units only)	
39	Stop pin (SEF/P & SEF/H units only)	
40	Fixing bolts	
41	Stem seals (SEF/P unit only)	X
42	Stem thrust seal (SEF/P unit only)	
43	Spacer (SEF/P unit only)	
44	Spring washer (SEF/P unit only)	X
45	Lock washer (SEF/P unit only)	
46	Gasket (All SEF units)	X

9. MAINTENANCE

Before performing a maintenance procedure, refer to section 1 – Safety information.

The product requires maintenance to ensure that it operates correctly and safely throughout its lifetime. Maintenance work should be performed in a planned manner at periodic intervals. These intervals must be defined by the operator according to the service conditions.

9.1. Maintenance procedure

1. Make sure all necessary materials and tools are readily available during maintenance work.
2. Perform the shutdown procedure – see section 7 – Shutdown.
3. If an actuator is installed on the valve remove it, referring to its respective Installation and Maintenance Instructions (IMI).
4. Perform the maintenance procedure – see the following sections.
5. If the valve is to be refitted with an actuator, refer to its respective Installation and Maintenance Instructions (IMI) when mounting it onto the valve.

- Put the valve back into operation – see section 5 – Start-up.

9.2. Replacing the valve seats and body seals

- Place the valve in its “fully open” position to prevent the ball from protruding out of the valve body assembly and fouling the connection ends.
- Remove the body bolts (19) and carefully separate the valve body assembly from the flanges (4) and connection ends (2, 3).
- With the body removed, remove the seats (7, 8) and body seals (10). In valves above ASME BPE 2" or DIN DN 50 remove the body ring (9).
- Turn the valve stem (5) to place the ball (6) in its “fully closed” position and carefully tap out the ball (6).
- Clean the ball (6) and the surfaces on the inside of the valve body (1) thoroughly. Renew ball if necessary.
- Orient the ball into its “fully closed” position and carefully position and slide it inside the valve body. Turn the valve stem to place the ball in the “fully open” position.
- Clean sealing faces on flanges (4), connection ends (2, 3) and valve body (1).
- Fit new seats (7, 8) and body seals (10) on the valve body assembly.
- Join the valve body assembly with the connection ends (2, 3), and flanges (4) if any, and gradually tighten the body bolts (19) in a crisscross pattern until the recommended torques are achieved – see section 9.4 – Tightening torques.

9.3. Replacing the stem seals

- Place the valve in its “fully open” position to prevent the ball from protruding out of the valve body assembly and fouling the connection ends.
- Remove the body bolts (19) and carefully separate the valve body assembly from the flanges (4) and connection ends (2, 3).
- With the body removed, remove the seats (7, 8) and body seals (10). In valves above ASME BPE 2" or DIN DN 50 remove the body ring (9).
- Turn the valve stem (5) to place the ball (6) in its “fully closed” position and carefully tap out the ball (6).
- Remove the handle fixing bolt (22) and washer (22A) or handle fixing nut (17A), handle assembly (14, 14A, 14B, 15), handle stopper (21) and locking flange (21A) if installed.
- Remove the lock washer (18) and unscrew the compression nut (17) fixing the stem (5) with a suitable wrench to prevent it from turning.
- Remove spring washers (16, 16A) and spacers (13).
- Remove the stem (5) and stem thrust seals (12) through the inside of the body (1) and pull out the stem seals (11) with a suitable tool from the inside of the packing box.

9. Thoroughly clean the inside of the packing box and stem.
10. Fit new stem thrust seals (12) on the stem (5) and insert the stem in place through the inside of the valve body.
11. Carefully slide the new stem seals (11), spacer (13) and washers (16, 16A) into the packing box.
12. Screw the compression nut (17) with the recommended tightening torque while fixing the stem (5) with a suitable wrench to prevent it from turning – see section 9.4 – Tightening torques. Make sure two of the compression nut faces are aligned with the stem flats and fit the lock washer (18).
13. Refit the manual lever assembly if required and turn the stem (5) to place the valve in its “fully closed” position. If the locking flange (21A) is to be installed hold it in place with the bolts (40) and tighten with the recommended torques – see section 9.4 – Tightening torques.
14. Clean the ball (6) and the surfaces on the inside of the valve body (1) thoroughly. Renew ball if necessary.
15. Orient the ball into its “fully closed” position and carefully position and slide it inside the valve body. Turn the valve stem to place the ball in the “fully open” position
16. Clean sealing faces on flanges (4), connection ends (2, 3) and valve body (1).
17. Fit new seats (7, 8) and body seals (10) on the valve body assembly.
18. Join the valve body assembly with the connection ends (2, 3), and flanges (4) if any, and gradually tighten the body bolts (19) in a crisscross pattern until the recommended torques are achieved – see section 9.4 – Tightening torques.

9.4. Replacing the SEF/P stem seals (valves up to ASME BPE 4" or DIN DN 100)

1. Unscrew the four bolts (40), remove the SEF/P unit and gasket (46).
2. Remove the handle fixing nut (17A), handle (14), handle stopper (21), bolts (40) and locking flange (21A) if installed.
3. Remove the lock washer (44) and unscrew the compression nut (38) fixing the stem (36) with a suitable wrench to prevent it from turning.
4. Remove spring washers (44) and spacer (43).
5. Remove the stem (36) and stem thrust seals (42) through the inside of the SEF/P unit body (35) and pull out the stem seals (41) with a suitable tool from the inside of the packing box.

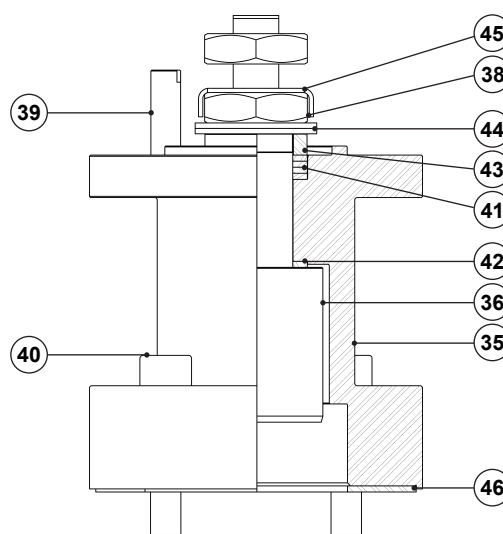


Fig. 8 - SEF/P stem extension.

6. Thoroughly clean the inside of the packing box and stem.
7. Fit new stem thrust seals (42) on the stem (36) and insert the stem in place through the inside of the valve body.
8. Carefully slide the new stem seals (41), spacer (43) and spring washers (44) into the packing box.
9. Screw the compression nut (38) with the recommended tightening torque while fixing the stem (36) with a suitable wrench to prevent it from turning – see section 9.4 – Tightening torques. Make sure two of the compression nut faces are aligned with the stem flats and fit the lock washer (45).
10. Fit the SEF/P unit on the valve body – see section 4.3 - Fitting the SEF unit onto the valve.

9.5. Tightening torques

SIZE		COMPRESSION NUT (17, 18)		BODY BOLTS (19)		BOLTS (40)
ASME BPE	DIN	Thread size	Torque (Nm)	N° of bolts x Thread size	Torque (Nm)	Torque (Nm)
1/2"	10	M10	20	4 x M6	15	10 - 15
3/4"	15	M10	20	4 x M6	15	10 - 15
1"	20	M12	25	4 x M8	25	10 - 15
–	25	M12	25	4 x M8	25	10 - 15
1 1/2"	32	M16	30	4 x M10	30	15 - 20
–	40	M16	30	4 x M10	30	15 - 20
2"	50	M16	30	4 x M12	35	15 - 20
2 1/2"	65	M24	40	6 x M12	35	15 - 20
3"	80	M24	40	8 x M12	35	15 - 20
4"	100	M24	40	10 x M12	35	20 - 25
6"	150	M39	100	10 x M16	60	–

10. DISPOSAL

Once the product has reached the end of its working life, it should be sent for disposal in accordance with the prevailing national and local regulations.

Before disposal make sure that the product is clean and free from fluid residues.

During its disposal, pay special attention to rubbers, resins and polymer components (PVC, PTFE, PP, PVDF, FKM, NBR, etc.).

Do not dispose of components and hazardous substances together with household waste.

11. RETURNING PRODUCTS

Information regarding hazards and precautionary measures to be considered due to contaminating fluids and residues or mechanical damage that may represent a health, safety or environmental risk, must be provided in writing when returning products to VALSTEAM ADCA.



WARNING

RISK DUE TO PRESENCE OF HAZARDOUS RESIDUES ON RETURNED PRODUCTS

Contaminated fluids and residues may represent an environmental risk, or risk to VALSTEAM ADCA personnel.

- Information regarding any hazards or precautionary measures to be considered must be provided in writing when returning products to VALSTEAM ADCA.
- Health and Safety information sheets relating to any substances identified as hazardous or potentially hazardous must be provided outside the packaging.
- Use Hazmat labels on the packaging.

IMPORTANT NOTE

Total or partial disregard of these Installation and Maintenance Instructions involves loss of any right to warranty.

The extent and warranty period are specified in the “General sales conditions”.