

OPERATING/INSTALLATION INSTRUCTIONS

(Translation)



Ball Valve with Handle
Ball Valve with Pneumatic Actuator

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Ball Valve Operating/Installation Instructions

- with handle (standard design): Type: DN 40 – DN 100 / PN10
1 ½" – 4" / PN10
- with pneumatic actuator (standard design): Type: DN 40 – DN 100 / PN10
1 ½" – 4" / PN10

NOTE



These operating/installation instructions are part of the ball valve and must be available to operating and maintenance personnel at all times. The safety instructions contained therein must be observed.

If the ball valve is sold on, the operating/installation instructions must be included in the delivery or downloaded from the following Internet page:

<http://www.awh.eu/de/downloads>.

Translation

The operating instructions must be written in an official European Community language acceptable to the manufacturer of the machine in which the partly completed machine will be installed, or to his authorized representative. If there are any discrepancies in the translated text, the original operating instructions (German) must be consulted for clarification, or the manufacturer must be contacted.

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1 Introduction

These operating / installation instructions (hereinafter called “manual”) provide you with all the information you need for smooth operation of the ball valve (hereinafter also called “fitting”).

The manual applies to the following variants

- Ball valve with handle (standard design) and
- ball valve with pneumatic actuator (standard design).

In principle, this manual applies to all designs. In the event of differences between the designs, this will be pointed out clearly.

The manual must be read, understood and applied by all persons assigned with the assembly, maintenance, cleaning and troubleshooting of the fitting. This applies in particular to the safety instructions listed.

After studying the instructions, you will be able to

- Assemble and operate the fitting safely,
- Clean and service the fitting correctly and
- Take the correct action if a fault occurs.

In addition to this manual, the generally valid, statutory and other binding regulations with regard to accident prevention and environmental protection in the country of use must also be observed.

The manual must always be kept or made available at the place of use of the fitting. Download the instructions, if nec., from the website: <http://www.awh.eu/de/downloads>.

1.1 Means of representation

As an instruction and direct warning against danger, statements for which special attention needs to be paid are identified as follows in this manual:



DANGER

This warning notice describes a hazard with a high level of risk that will result in death or serious injury if not avoided.



WARNING

This warning notice describes a hazard with a medium level of risk that could result in death or serious injury if not avoided.



CAUTION

This warning notice describes a hazard with a low level of risk that could result in minor or moderate injury if not avoided.

NOTE

This warning notice describes a hazard with a low level of risk that could result in damage to property if not avoided.



The “info” symbol provides useful information.

Embedded Warnings

The embedded warnings apply to specific actions and are integrated directly into the action before the specific action step.

- **▲ DANGER/WARNING/CAUTION**
- **NOTE**

The following means of presentation are also used:

- Texts that follow this mark are enumerations.
- Texts following this mark describe activities that need to be carried out in the specified order.
- “ ” Texts in quotation marks are references to other chapters or sections.

Symbols used



Crushing hazards are indicated by this symbol.



Burn hazards are indicated by this symbol.



“Observe manual” is indicated by this symbol.



Environmental measures are indicated by this symbol.



Warning of substances that pose a water hazard

1.2 Abbreviations

A/A	Air-opening, air-closing
A/S	Air-opening, spring-closing
AWH	Armaturenwerk Hötensleben GmbH
BV	Ball valve
CIP	Cleaning in place
DA	Outer diameter
DI	Inner diameter
DN	Nominal width
EEA	European Economic Area
EEC	European Economic Community
EPDM	Ethylene propylene diene monomer rubber (sealing material)
FKM	Fluorinated rubber (sealing material)
IF	Intermediate flange (connection variant)
NC	Normally closed (valve setting)
NO	Normally open (valve setting)
PN	Nominal pressure
PTFE	Polytetrafluoroethylene (sealing material)
Ra	Average roughness value (dimension for surface roughness)

S/A	Spring-opening, air-closing
T/LN	Thread/liner with nut (connection variant)
T/T	Thread/thread (connection variant)
T/W	Thread/weld-on end (connection variant)
W/W	Weld-on/weld-on (weld-on ends; connection variant)
WIG	Welding process with tungsten electrode and inert gas

1.3 Guarantee, Warranty and Liability

Guarantee

If the fitting is used as intended, a guarantee is provided according to the statutory warranty obligation. This does not apply to wearing parts.

Increased wear due to abrasive media is not a product defect. Any claims resulting from this cannot be taken into account as part of the warranty.

Warranty and liability

The commitments agreed in the contract of supply and delivery, the general terms and conditions and terms of delivery of Armaturenwerk Hötensleben GmbH (hereinafter referred to as AWH), and the statutory regulations valid at the time the contract was concluded shall apply.

Warranty and liability claims in case of personal injury and material damage shall be ruled out, in particular if these can be attributed to one or more of the following causes:

- Improper or incorrect use of the fitting,
- Incorrect assembly, commissioning, operation and maintenance of the fitting,
- Failure to observe the instructions in the manual in terms of assembly, commissioning, operation and maintenance of the fitting,
- Structural modifications to the fitting (conversions or other modifications to the fitting must not be carried out without previous written approval from Armaturenwerk Hötensleben GmbH. In case of infringement, the fitting will lose its EC conformity and the operating license.),
- Use of spare parts that do not comply with the specified technical requirements,
- Improperly performed repairs,
- Disasters, the effects of foreign matter and force majeure.

Disclaimer

AWH reserves the right to make changes to this document at any time and without prior notice. AWH provides no guarantee (neither explicitly nor implied) with regard to all information in this document, including but not limited to the implied warranty of merchantability and suitability for a particular purpose. Furthermore, AWH does not guarantee the correctness or completeness of information, text, graphics or other parts in this document.

2 Safety

The fitting has been built in accordance with state-of-the-art technology and the recognized rules of safety. Nevertheless, use of the fitting may represent a danger to the life and limb of the user and third parties, or a risk of impairments to the device and other objects of material value as a result of its function.

The following basic safety instructions are intended to prevent injury to personnel and material damage. The owner must ensure that the basic safety instructions are observed and adhered to.

These instructions contain basic notes on installation, operation, maintenance and servicing of the fitting which must be complied with.

Everyone involved in assembly, installation, operation, maintenance and servicing must have read and understood these instructions.

The safety systems and safety instructions described in these instructions must be adhered to.

WARNING



Failure to comply with these instructions, incorrectly performed installation and repair work or incorrect operation could lead to malfunctions at the device and to dangerous situations!

There is a risk of death or severe physical injury.

- Have all work on the fitting carried out only by an **expert** and in compliance with
 - the corresponding detailed operating and installation instruction(s),
 - the warnings and safety signs on the device,
 - the regulations and requirements specific to the plant and
 - the national/regional regulations for safety and the prevention of accidents.
- Never install damaged fittings or components.



The figures in these instructions are intended to provide a basic understanding, and are primarily illustrations of the principles involved. They may differ from the actual design of the fitting.

2.1 Intended use

WARNING

Improper use presents a risk of serious injury.

This fitting was designed exclusively for the purposes described above. Any other use beyond that described here or alteration of the fitting without written approval from AWH is considered contrary to the intended use. AWH accepts no liability for damage arising from such use. The owner bears the sole risk. The fitting may only be commissioned once it is certain that all the safety systems are fully functioning, and the facility in which the fitting is installed meets the safety requirements of all relevant EC directives.

NOTE

*The fitting may be installed only by an **expert**.*

*The work described in this manual is described in a way intended to be understood and carried out by experts **only** (see section “2.6 Qualification Requirements for Personnel”).*

AWH ball valves have been developed, designed and built for shutting off the flow of fluid in pipelines in commercial and industrial operations (food, chemical and pharmaceutical industries and low-germ processes).

The valve is suitable for use in conjunction with water, foodstuffs and chemical, cosmetic and pharmaceutical products. The medium can be highly viscous or pasty. An additional technical examination to decide on the application possibilities is necessary when using media containing particles, fibers or other abrasive substances.

Media with very small particles or micro-particles have a special property. Problem-free operation can be ensured through a prior technical examination and subsequent appropriate modification.

AWH ball valves are intended for installation in piggable pipelines. Special variants offering the necessary settings or adjustments are available.

Actuation/switching of the valve is permitted up to temperatures of 90°C. Sealing and bearing elements can be subjected to excessive loads above this temperature.

The intended use also includes compliance with this manual, including the maintenance conditions.

Please contact AWH directly for professional design information and advice.

2.2 Labeling the Fitting

The information in these operating instructions only applies to ball valves of the type and version specified on the title page (title page and rear side).

If you have any queries, specify the following correctly:

- The nominal width
- The sealing material
- The housing material
- The type of connection (DIN 11851, DIN 11864, weld-on etc.)
- Handle or actuator
- Accessories (feedback etc.)

This is the only way to ensure quick and efficient processing.

2.3 Danger Warnings

The safety systems and safety instructions described in these instructions must be adhered to.

The ball valve with handle is operated manually on site.

The ball valve with pneumatic actuator is operated from the control room of the higher-level plant or from the local control point.

2.3.1 Dangers



WARNING



Risk of burns due to hot media!

There is a risk of burning during operation or maintenance if flow media have temperatures over +60 °C / +140 °F.

- Let the flow medium cool down prior to cleaning work.
- Empty the pipelines prior to installation or disassembly work.
- Wear protective work clothing, protective gloves and protective goggles when carrying out work on the fitting (see section “2.7 Personal Protective Equipment”).



WARNING



Danger due to ball switching!

When the valve ball is moved, there is a danger of crushing and even amputating your fingers, hands and other limbs.

- Never insert fingers, hands or other parts of the body into the valve.
- Only operate the fitting when it is installed.
- Prior to assembly or disassembly work, empty the pipelines and depressurize the compressed air lines.

NOTE

Risk of damage to the fitting!

- The fitting, length and quality of the lines must meet the requirements.
- Assembly is to be carried out by specialist personnel.
- Make sure that only the media specified in the manual are used.
- The parameters listed in the manual must always be complied with (see chapter “4 Technical Data”).

2.3.2 Hazardous Area of the Fitting

The hazardous area during setup, maintenance and repair work extends to 1 m around the fitting. Take into consideration the swing range of any switch cabinet doors that can open. The operator shall ensure that persons are prevented from entering the hazard area during motion sequences.

2.3.3 Installation of Replacement Parts and Wearing Parts

Replacement and accessory parts not supplied by AWH have not been checked or approved by AWH. Installing and/or using this type of product can therefore negatively alter the structural properties of your plant under certain circumstances. AWH accepts no liability for any damage arising from the use of non-original parts or non-original accessory parts. Standard parts can be obtained from specialist dealers.

2.3.4 Switch-off Procedures

WARNING



Risks presented by moving parts and escaping compressed air or media at high pressure!

When the valve ball is moving, there is a risk of crushing your fingers and hands.

Escaping compressed air or flow media at high pressure poses a risk of serious eye or skin injuries.

*It is imperative that the following **switch-off procedure** is observed before cleaning, maintenance or repair work is carried out (by specialist personnel only).*

- Disconnect the higher-level plant/machine from the power supply.
- Shut off the pneumatic system:
 - Close the shut-off valve.
 - Check that the facility is depressurized.
 - Secure the shut-off valve against reopening.
- Shut off the media supply:
 - Relieve the pressure in the pipelines.
 - Drain the pipelines afterwards (take particular care with hazardous materials).
 - Check that a supply of media is securely prevented (insert dummy discs if necessary).
- Observe a cooling-down phase for media temperatures over +60 °C/+140 °F.

2.4 Duties of the owner

The fitting is used in the commercial sector. The owner is thus subject to the legal obligations regarding occupational safety.

In the EEA (European Economic Area), the national implementations of the framework directive (89/391/EEC) on carrying out measures for improving safety and protecting the health of employees during work, as well as the associated individual directives on the minimum specifications for safety and health protection of employees using work equipment, shall be observed and complied with in their currently valid versions.

As a basic rule, the operating company in Germany must observe the Industrial Safety Ordinance (BetrSichV).

In other countries, the respective national guidelines, statutes and country-specific regulations regarding occupational safety and accident prevention must be complied with. The following, non-exhaustive instructions apply in particular:

- The owner/operating company must ensure that the fitting is used only as intended (see section “2.1 Intended use”).
- The owner/operating company must keep itself informed of locally applicable industrial safety regulations, and - in addition - use a risk assessment to determine the hazards resulting from the specific working conditions at the place of use of the fitting. They must then be implemented in the form of operating instructions for the operation of the fitting.
- When using hazardous materials, protective measures must be specified in accordance with the safety data sheets and operating instructions must be compiled for hazardous materials. Personnel must be instructed accordingly.

This also applies to hazardous substances that may arise during work processes.

- A continuous hazard assessment must be carried out for workplaces, including temperature conditions for the medium and the place of use (falling). The measures must be recorded in operating instructions, and personnel must be instructed accordingly.
- Supervisors must monitor compliance with the measures specified in the operating instructions.
- Throughout the entire operating period of the fitting, the owner/operating company must check whether the operating instructions that they have compiled actually correspond to the current status of the regulations, and adjust the instructions if necessary.
- The operating company must clearly regulate and specify the responsibilities of personnel (e.g. for operation, maintenance and cleaning).
- The owner/operating company must allow only sufficiently qualified and authorized personnel to work on the fitting.
- The owner/operating company must ensure that all employees handling the fitting have read and understood the manual.
Furthermore, he must provide personnel with training at regular intervals with certification and inform them of the hazards.
- The owner/operating company must provide sufficient workplace lighting at the higher-level plant in accordance with the locally applicable regulations for occupational health and safety in order to prevent hazards occurring as a result of poor lighting.
- The owner/operating company must provide personnel with personal protective equipment and make sure that it is used (see section “2.7 Personal Protective Equipment”).
- The owner/operating company must make sure that no persons work on the fitting whose ability to respond is impaired through drugs, alcohol, medication or similar.
- The owner/operating company must use appropriate measures to inform groups of persons who are not intended for direct contact with the fitting (e.g. visitor groups) about the potential dangers involved.
- The owner/operating company is obliged to operate the fitting in perfect condition at all times.
- Wherever high pneumatic pressures develop, there is a possibility of sudden failure of or damage to the lines and connections. This poses a hazard risk. The owner must instruct operating and maintenance personnel at least once a year on the possible hazards.
- The constructor of the overall plant must install the switching and safety devices required for setting up, inspection, shutting down (including emergency shutdown), operating, maintenance, cleaning and repair, and provide proof of their installation.
- The operating company must provide fire safety devices, e.g. the appropriate quantity of suitable hand-held fire extinguishers of the appropriate size, in easily accessible places and provide employees with training in fire safety.
- Warnings in the documentation of externally supplied assembly groups must be adhered to and incorporated into the hazard assessments for the specific workplace.
- Before operating the machine with the fitting, the owner/operating company shall ensure that the local specifications were followed during assembly and commissioning if they were carried out by the owner/operating company.

NOTE

Due to deviating operating conditions at the operating company's site, additional safety measures may be required. In such cases, these measures must be added to the original safety measures by the operating company.

2.5 Safety Measures (to Be Implemented by Owner/Operating Company)

- The owner/operating company must ensure that unauthorized persons (not operating or maintenance personnel) are prevented from entering the hazardous area of the system (in which the fitting is installed).
- The owner/operating company must empty the pipelines prior to assembly and maintenance work on the fitting.
- The disconnection of energy sources from the system shall be designed technically by the owner/operating company so as to enable compliance with the shutdown procedures described in section 2.3.4.
- This manual must be retained for future reference.
It must be available in the vicinity of the higher-level facility in which the fitting is installed.
- The owner must define and adhere to the intervals for inspections and control measures in accordance with the environment and media used.
- The work described in the chapters Transport, Installation, Assembly, Maintenance, Malfunctions and Disassembly/Disposal must be carried out only by experts.

2.6 Qualification Requirements for Personnel

The fitting must be operated, maintained and repaired only by persons who have the appropriate qualifications. These persons must be familiar with the instructions and act in accordance with them. The respective authorizations for personnel must be clearly defined.

The following qualifications are designated in the instructions for various fields of activity:

Expert / specialist personnel

A person with appropriate training, suitable apprenticeship and experience who is in a position to identify risks and avoid dangers.

An expert is a person whose professional training, knowledge and experience, and whose knowledge of the relevant standards and regulations, enables them to carry out work on the fitting, identify potential risks independently and avoid them.

Only personnel with the following specific knowledge may be employed for work on the fitting:

- **Assembly/disassembly:** Industrial mechanic or similar training, practical experience in the installation/disassembly of fittings
- **Welding work:** Welding training in pipeline engineering or similar training

- **Electrical work:** Electrician; person with appropriate specialized training, knowledge and experience, enabling them to identify and prevent risks which may be caused by electricity.

2.7 Personal Protective Equipment

In order to minimize health risks, personal protective equipment must be worn when working on the fitting.



Protective work clothing

Protective work clothing is tight-fitting work clothing with low resistance to tearing, with close-fitting sleeves and without protruding parts. It is mainly used for protection against becoming entangled in moving components.

Do not wear any rings, necklaces or other jewelry.



Safety shoes

Wear slip-resistant safety shoes for protection from heavy, falling objects and to prevent slipping on slippery surfaces.



Protective gloves

Wear protective gloves to protect your hands against friction, grazes, punctures or deeper injuries and against coming into contact with hot surfaces or chemical substances.



Protective goggles

Wear protective goggles for protection against media escaping at high pressure and against flying parts.



Hard hat

Wear a hard hat for protection against falling or flying parts.



Welding mask

Wear a welding hood for protection from damage to the eyes or skin due to the welding arc, and from burns caused by flying particles during welding.

Personal protective equipment must be provided by the owner in accordance with the valid requirements.

Furthermore, both the national regulations and, if nec., internal instructions by the owner must be observed.

3 Overview and Function

3.1 Ball Valve with Handle

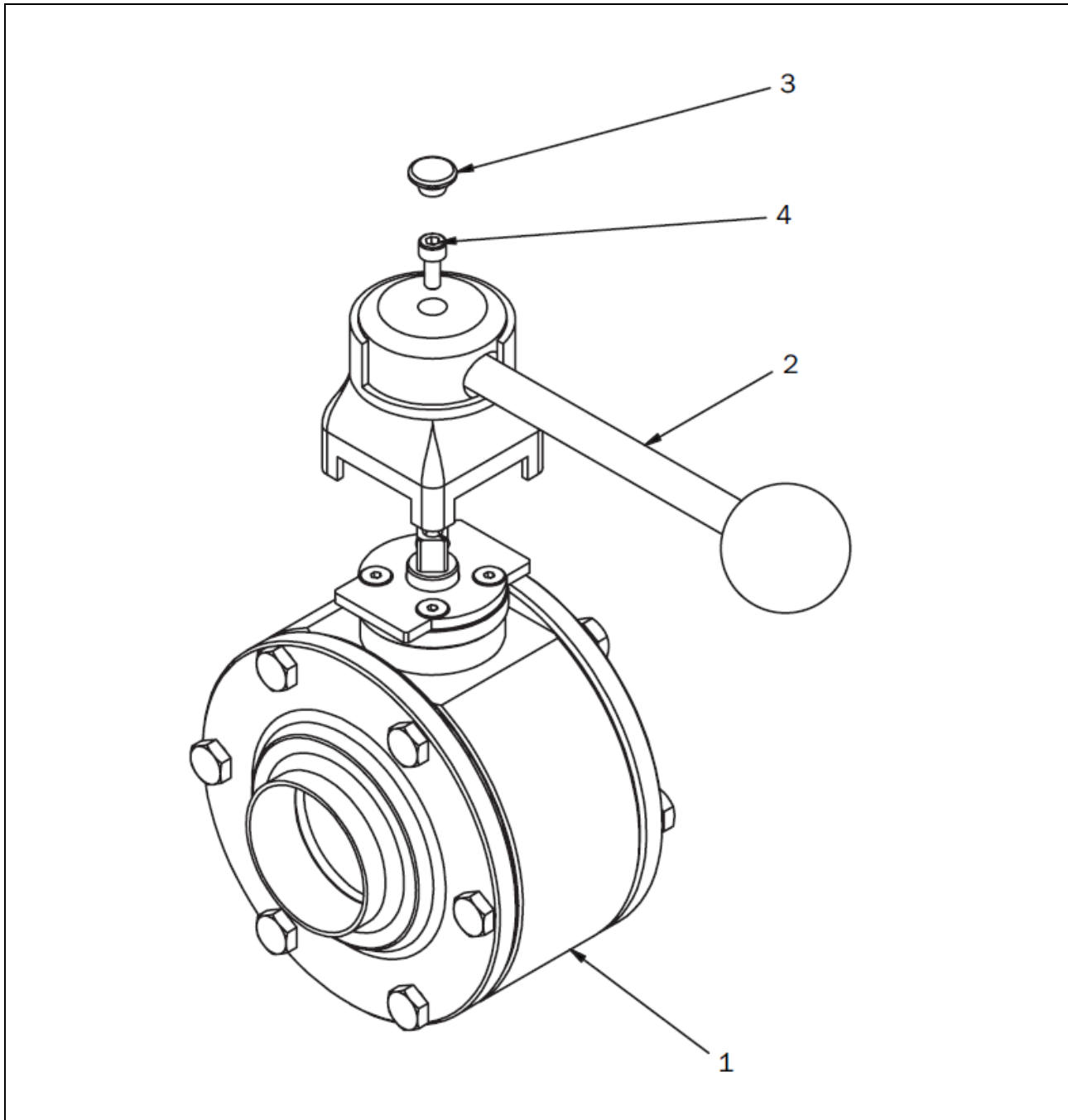


Fig. 3-1: Overview of ball valve with handle

- | | |
|--------------|---------------------|
| 1 Ball valve | 3 Blanking plug |
| 2 Handle | 4 Socket-head screw |

3.2 Ball Valve with Pneumatic Actuator

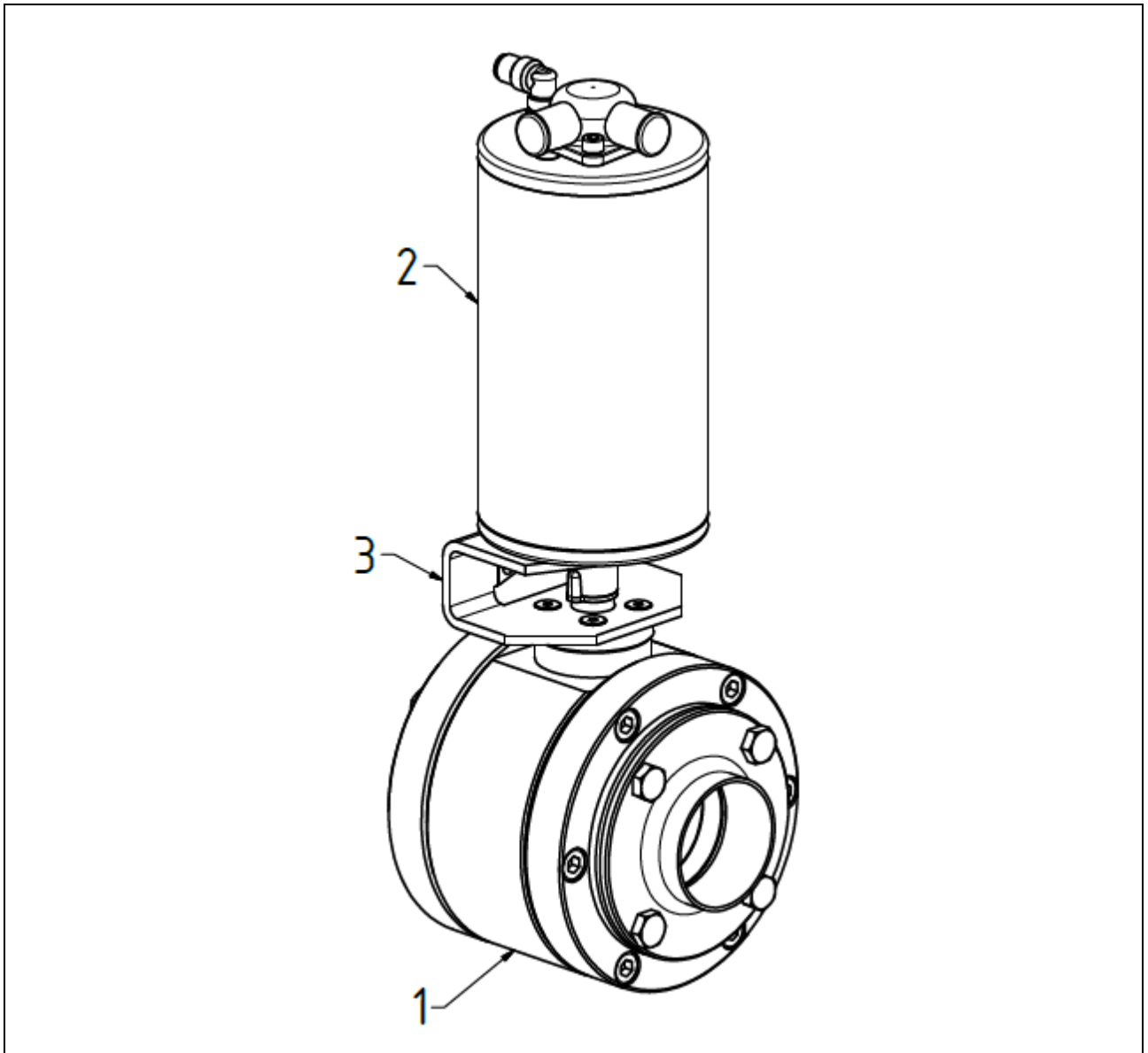


Fig. 3-2: Overview of ball valve with pneum. actuator

- 1 Ball valve
- 2 Actuator
- 3 Holding bracket

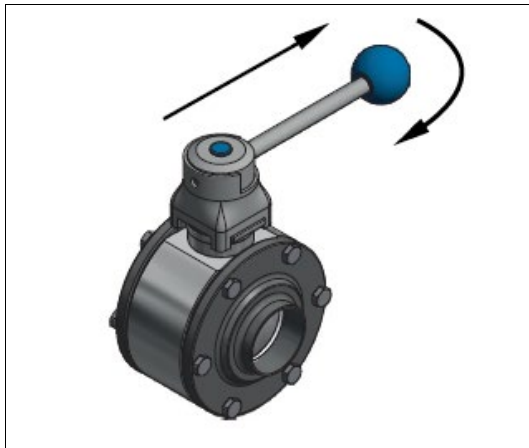
3.3 Function

The ball valve is actuated either manually (by a handle) or by a pneumatic actuator.

3.3.1 Ball Valve with Handle



Note that the lock engages only in the fully “open” and fully “closed” positions. In these full travel positions the lever lock engages automatically.



The lock on the handle must be released in order to actuate the ball valve. The lock is released by pulling the handle axially (see adjacent figure).

Ensure that the lock engages only in the fully “open” and fully “closed” positions. Prolonged residence in intermediate positions can lead to deformation of the seals and thus to the valve jamming.

Fig. 3-3: Actuating the handle

3.3.2 Ball Valve with Pneumatic Actuator

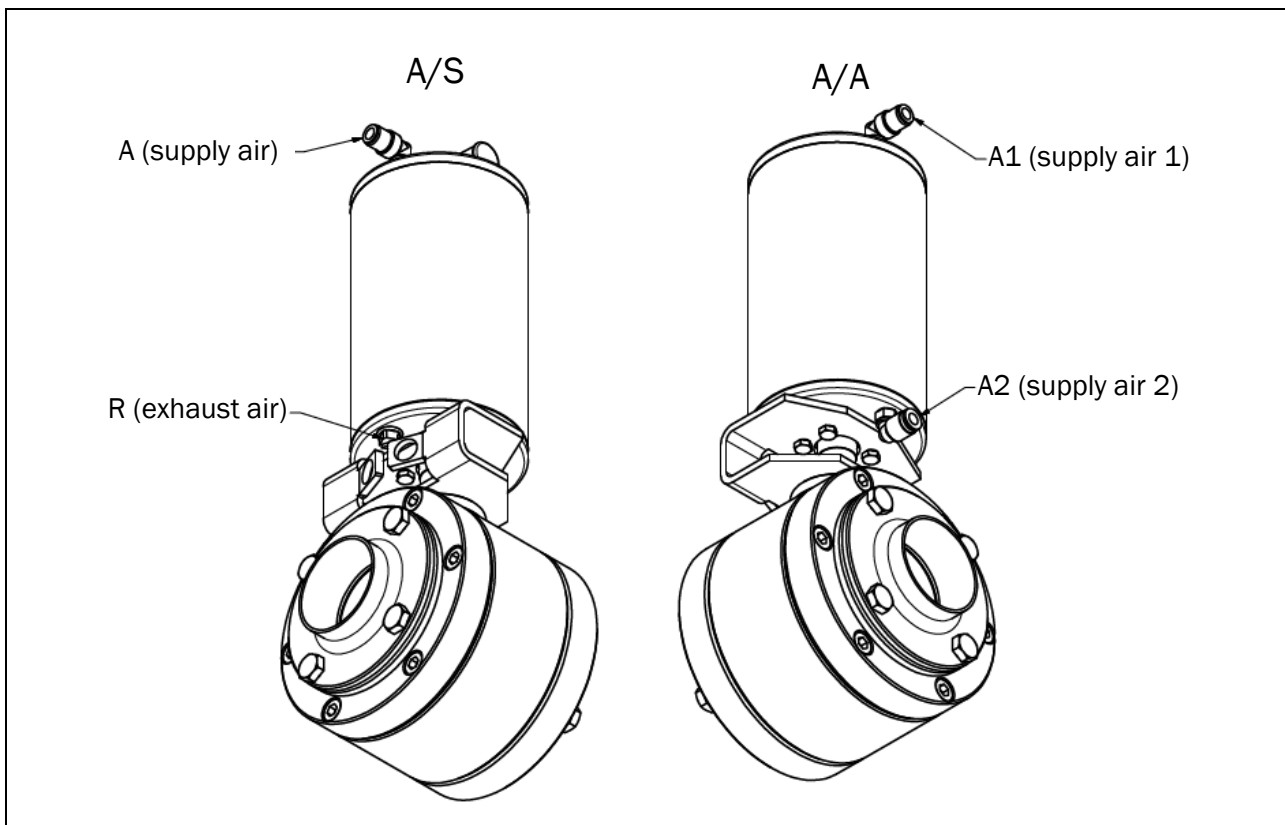


Fig. 3-4: Ball valve with pneum. actuator: Control air connections

NOTE***Damage to the valve and actuator from pressure shocks!***

- With the ball valve with a pneumatic actuator, the switching times must not fall below 1 second.
- The air flow can be restricted through the use of throttle check valves in the operating company's compressed air line.



The air/air (A/A) actuator requires compressed air for each switching procedure. It must be present at all times, otherwise the fitting will be able to be switched independently by the product flow. If the compressed air fails, the ball position cannot be precisely defined.

There are two types of pneumatic actuators:

- 1) **For NC (normally closed) valve assemblies:** air-opening, spring-closing (A/S)

The pneumatic actuator with integrated return spring closes the valve in the event of a pressure failure (control air)

or

- For NO (normally open) valve assemblies:** spring-opening, air-closing (S/A)

The pneumatic actuator with integrated return spring opens the valve in the event of a pressure failure (control air).

The pneumatic actuator with the A/S function is available with clockwise rotation.

Clockwise rotation means: When viewed from below, the actuator shaft turns clockwise (to the right) when supplied with compressed air.

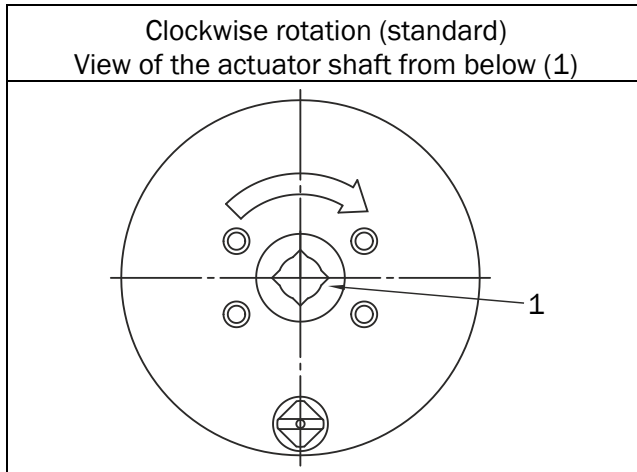


Fig. 3-5: Pneum. actuator's direction of rotation

- 2) Air-opening, air-closing, (A/A)

The pneumatic actuator opens or closes the fitting depending on which air connection (A1 or A2) is pressurized with compressed air.

3.4 Use in Product Recovery Systems

AWH ball valves are well suited for use in product recovery systems. Ball valves with an intermediate flange connection or ball valves with DIN 11864-2 connections should preferably be used for these applications.

To ensure trouble-free operation when pigging it must be ensured that, when the valve is in the “open” position, the bore in the ball lines up correctly with the bores in the connection with no steps or jumps at the transition points. Any such features would damage the pigging, perhaps even beyond repair.

It is therefore necessary to re-adjust the position of the ball each time after removing the valve together with the actuator (see section “6.2.5 Adjusting the Ball Position”). When the valve is removed, check the position of the ball when the valve is “open”.

3.5 Use in Superordinate Chocolate Processing Plants

We recommend using heatable valves for applications in systems used for processing chocolate. The processing temperature should be between 40 °C / 104 °F and 50 °C / 122 °F. Lower temperatures and temperatures above 60 °C / 140 °F can cause functional problems with the valves due to hardening of the chocolate or coagulation of the protein molecules.

Alternatively, special gaskets are available for chocolate and other special media to seal the ball to the housing

4 Technical Data

4.1 General Data

Ambient temperature range:

Lower limit temperature:

+5 °C / +41 °F

Upper limit temperature:

+40 °C / +104 °F

Noise level:

< 70 dB (A)

Max. permissible operating pressure:

DN 10 – DN 100

10 bar / 145 psi

Max. permissible operating temperature:

(depends on the sealing material and medium)

+90 °C / +194 °F

Max. permissible pressure in the heating circuit

3.0 bar



The area of application for the fitting must always be adjusted to the corresponding operating conditions and the materials that come into contact with the product.

The maximum continuous temperature is dependent on the media.

Installation position

- Preferably vertical: Handle or actuator facing forwards
- Horizontal: Handle or actuator facing upwards or forwards; if the housing has rinsing connections, the actuator must be facing upwards

4.2 Materials in Contact with the Product

See Fig. 6-1 or Fig. 6-7

Housing (Item 1):	1.4404 (316 L)
Flange (item 2):	1.4404 (316 L)
Ball (item 4):	1.4404 / 1.4409 (316 L)
Gaskets (items 15-20):	PTFE / elastomers (selected to suit the operating conditions)
Spindle (item 5):	1.4404 (316 L)

Auxiliary Materials

Heating medium: Water

To assist installation and protect the O-rings against damage, we recommend using the following grease approved for foodstuffs: BERULUB SIHAF 1.

We further recommend that all threaded connections are smeared with BECHEM-ANTISEIZE before assembly, to prevent fretting corrosion.

Surfaces

Exterior surface: bare metal / precision machined
 Inner surfaces in contact with the product: Ra < 0.8 µm

The service life of the fitting is approximately 10 years when chlorine-free drinking water is used. If used with caustic media, the service life is correspondingly shorter.

The service life of the pneumatic actuator is approx. 5 years or 300,000 switching operations when used with filtered (5 µm) lubricated or non-lubricated instrument air according to DIN/ISO 8573 class 3. If used with unfiltered compressed air, the service life will be correspondingly shorter.

4.3 Power Supply

4.3.1 Compressed Air Connection (Ball Valve with Pneumatic Actuator)

Compressed air connection (A):	A/A	min.:	3 bar /	44 psi
		max.:	7 bar /	101 psi
	A/S	min.:	5 bar /	73 psi
		max.:	10 bar /	145 psi

Internal thread G 1/8" ISO 228-1, hose connection for hose D_A = 6 mm, D_I = 4 mm

Exhaust air connection (R): Internal thread G 1/8 ISO 228-1, throttle with hole D = 2 mm

Compressed air requirement: (dependent on air pressure)	DN 40 – 65 / 1 1/2" – 2 1/2":	1.7 – 3.5 l	(5-10 bar)
	DN 80 – 100 / 3" – 4":	3.0 – 4.5 l	(5-10 bar)

4.3.2 Electrical Energy Supply

Refer to the external data sheets and manufacturer's instructions for the data on the energy supply for connection of proximity switches (< 50 V).

4.4 Connection Variants, Type Series, Dimensions



The dimensions in the table are in mm, except for the thread dimension, which is in inches, e.g. Rd 65 x 1/6".

4.4.1 Ball Valve with Handle

The various connection variants for the fitting are listed below. There are no restrictions on the choice of installation position. The positional range with locking function is 90° for the "open" and "closed" positions.

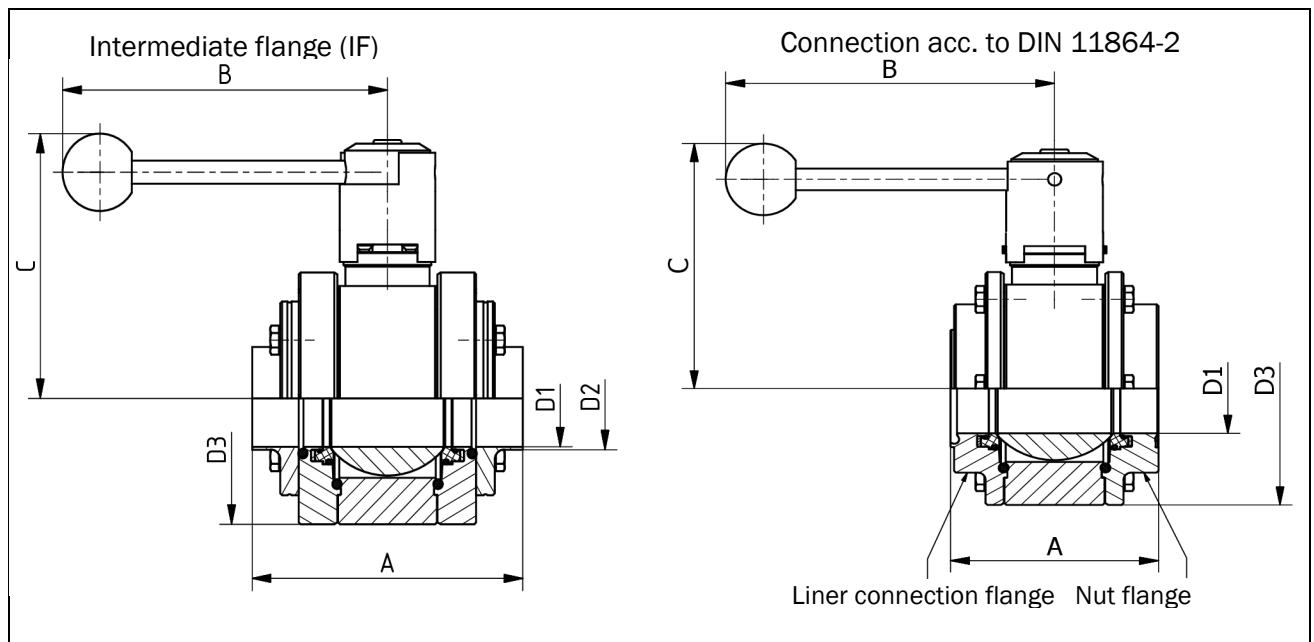


Fig. 4-1: Ball valve with handle: Connection variant with intermediate flange, DIN 11864-2

DN	IF	DIN 11864-2	B	C	D1	D2	D3
	A						
40	136	100	139.5	125	38	41	112
50	145	110	173	137	50	53	130
65	165	130	173	157	66	70	155
80	180	160	217	179	81	85	175
100	209	200	217	197	100	104	210
1 ½"	136	91	139.5	125	34.8	38.1	112
2"	150	100	173	137	47.5	50.8	130
2 ½"	170	122	173	149.5	60.2	63.5	155
3"	188	160	217	179	72.9	76.2	175
4"	215	193	217	197	97.38	102	210
1 ½" SMS	136	91	139.5	125	35.5	38	112
2" SMS	150	101	173	137	48.5	51	130
2 ½" SMS	170	122	173	149.5	60.5	63.5	155

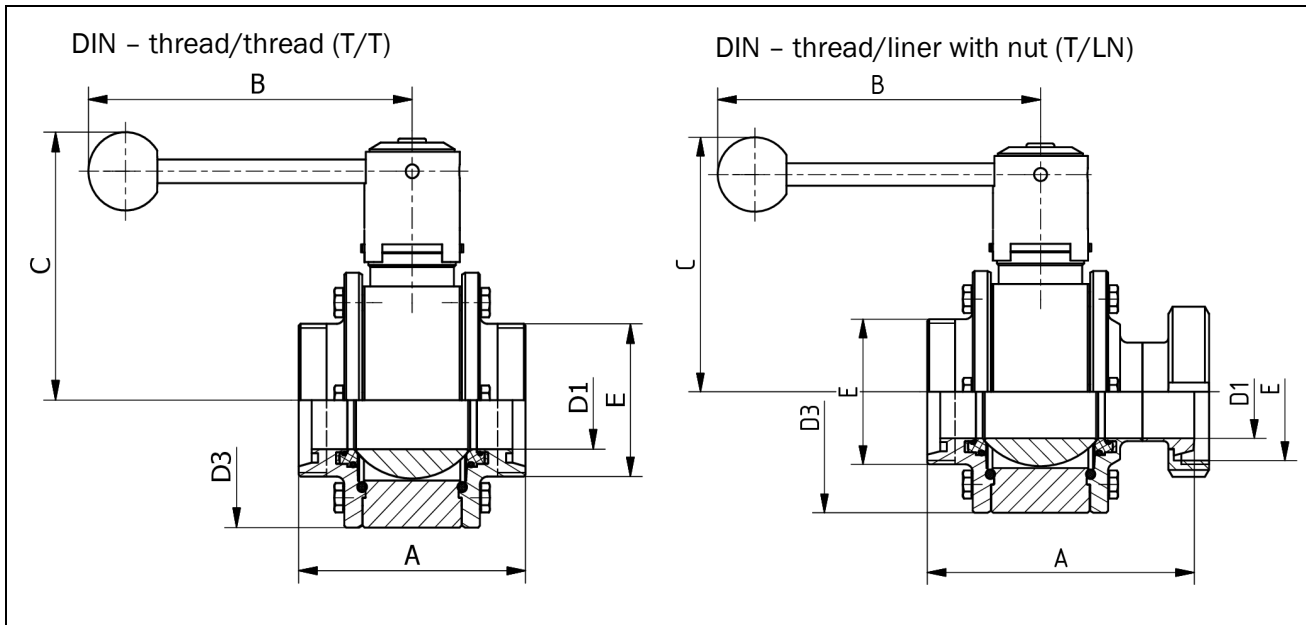


Fig. 4-2: Ball valve with handle: Connection variants: thread/thread, thread/liner with nut

DN	T/T	T/LN	B	C	D1	D3	E
	A						
40	100	132.5	139.5	125	38	112	Rd 65 x 1/6"
50	110	144	173	137	50	130	Rd 78 x 1/6"
65	130	170	173	157	66	155	Rd 95 x 1/6"
80	160	216	217	179	81	175	Rd 110 x 1/6"
100	200	264	217	197	100	210	Rd 130 x 1/4"

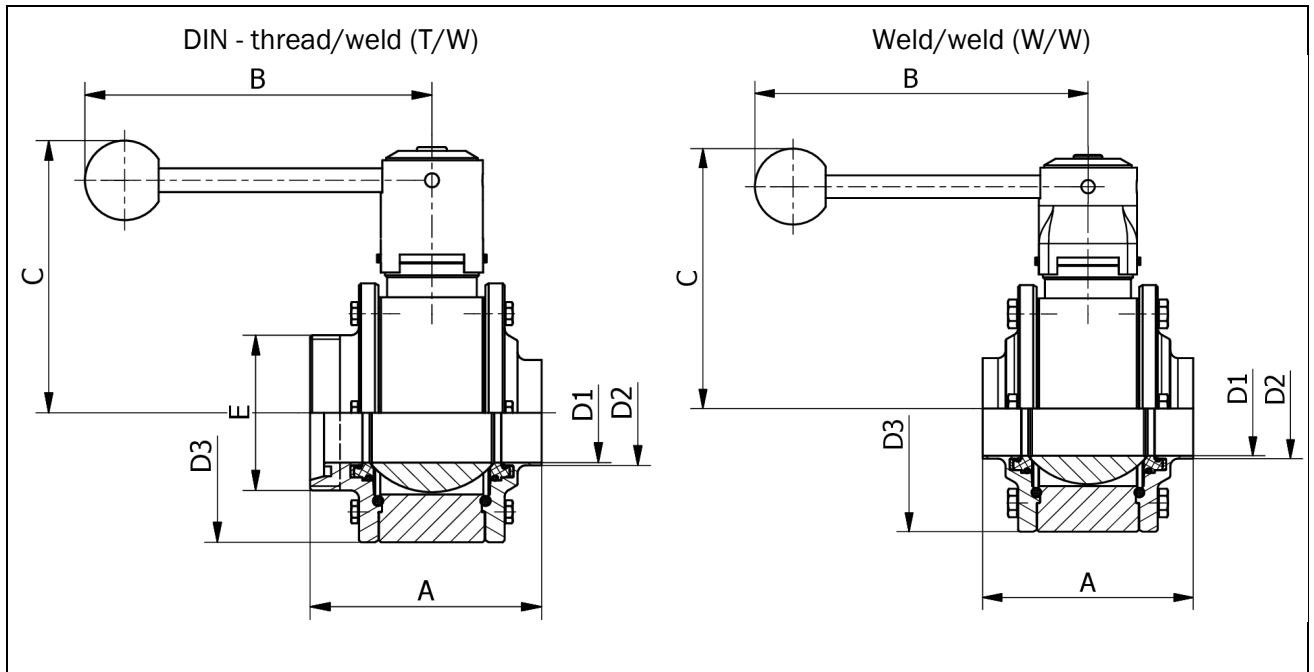


Fig. 4-3: Ball valve with handle: Connection variants: thread/weld, weld/weld

DN	T/W	W/W	B	C	D1	D2	D3	E
	A							
40	106.55	100	139.5	125	38	41	112	Rd 65 x 1/6"
50	116	110	173	137	50	53	130	Rd 78 x 1/6"
65	138	130	173	157	66	70	155	Rd 95 x 1/6"
80	179	160	217	179	81	85	175	Rd 110 x 1/6"
100	220	200	217	197	100	104	210	Rd 130 x 1/4"
1 ½"		100	139.5	125	34.8	38.1	112	
2"		120	173	137	47.5	50.8	130	
2 ½"		136	173	149.5	60.2	63.5	155	
3"		168	217	179	72.9	76.2	175	
4"		200	217	197	97.38	102	210	
1 ½" SMS		100	139.5	125	35.5	38	112	
2" SMS		120	173	137	48.5	51	130	
2 ½" SMS		136	173	149.5	60.5	63.5	155	

4.4.2 Ball Valve with Pneumatic Actuator

NOTE

Liquid can enter if the exhaust air opening of the actuator is pointing upwards!
 The plant manufacturer must take appropriate measures to prevent this from happening.

The various connection variants for the fitting are listed below. There are no restrictions on the choice of installation position. The positional range is 90° for the “open” and “closed” positions.

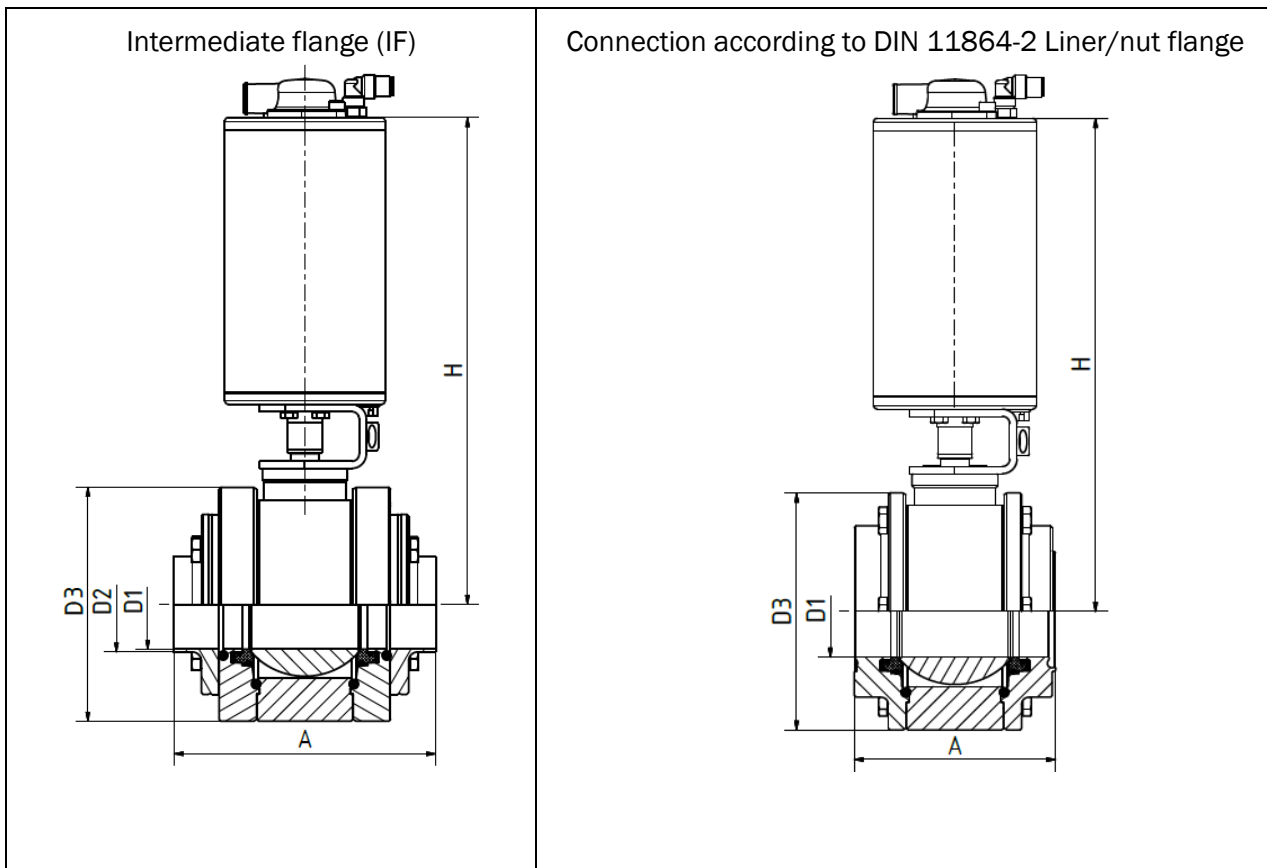


Fig. 4-4: Ball valve with pneum. actuator: Connection variant with intermediate flange, DIN 11864-2

DN	IF	DIN 11864-2	D1	D2	D3	H
	A					
40	136	100	38	41	112	265
50	150	110	50	53	130	271
65	170	130	66	70	155	283
80	188	160	81	85	175	373
100	215	200	100	104	210	390.5

DN	IF	DIN 11864-2	D1	D2	D3	H
	A					
1 ½"	136	91	34.8	38.1	112	265
2"	150	100	47.5	50.8	130	271
2 ½"	170	122	60.2	63.5	155	283
3"	188	160	72.9	76.2	175	373
4"	215	193	97.38	102	210	373.5
1 ½" SMS	136	91	35.5	38	112	390.5
2" SMS	150	101	48.5	51	130	271
2 ½" SMS	170	122	60.5	63.5	155	283

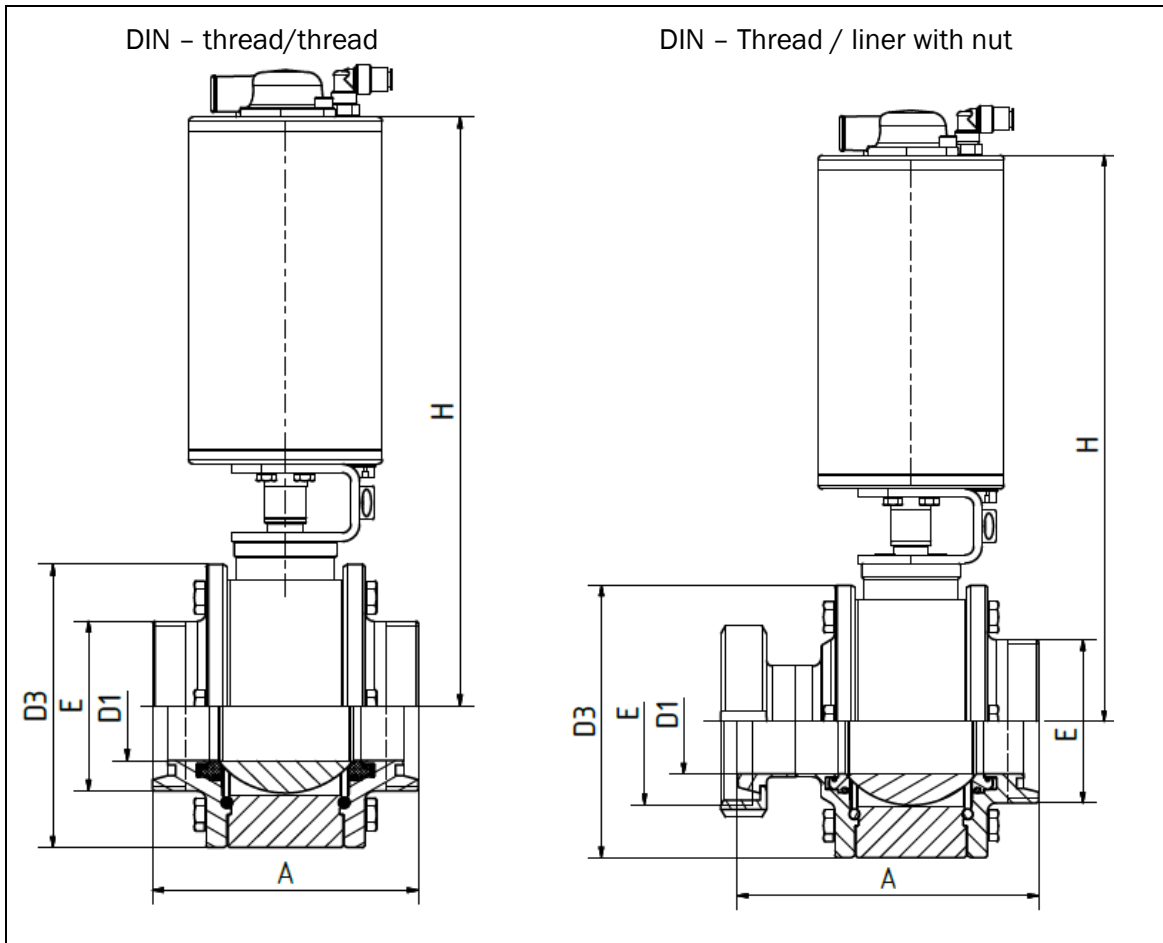


Fig. 4-5: Ball valve with pneum. actuator: Connection variants: thread/thread, thread/liner with nut

DN	T/T	T/LN	D1	D3	E	H
	A					
40	113	132.5	38	112	Rd 65 x 1/6"	265
50	122	144	50	130	Rd 78 x 1/6"	271
65	146	170	66	155	Rd 95 x 1/6"	283
80	198	216	81	175	Rd 110 x 1/6"	373
100	240	264	100	210	Rd 130 x 1/4"	390.5

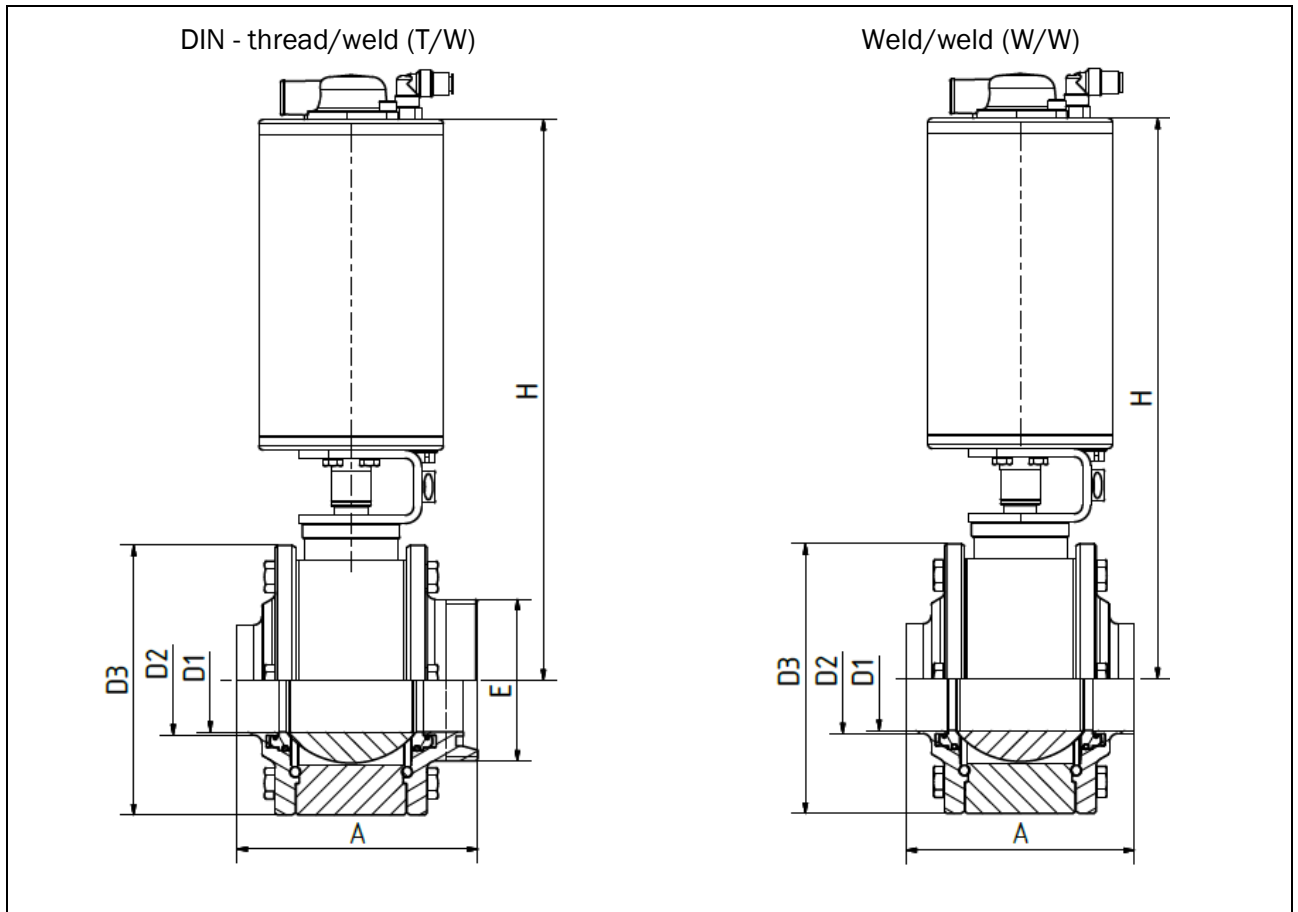


Fig. 4-6: Ball valve with pneum. actuator: Connection variants: thread/weld, weld/weld

DN	T/W	W/W	D1	D2	D3	E	H
	A						
40	106.5	100	38	41	112	Rd 65 x 1/6"	265
50	116	110	50	53	130	Rd 78 x 1/6"	271
65	138	130	66	70	155	Rd 95 x 1/6"	283
80	179	160	81	85	175	Rd 110 x 1/6"	373
100	220	200	100	104	210	Rd 130 x 1/4"	390.5
1 1/2"		100	34.8	38.1	112		265
2"		120	47.5	50.8	130		271
2 1/2"		136	60.2	63.5	155		283
3"		168	72.9	76.2	175		373
4"		200	97.38	102	210		390.5
1 1/2" SMS		100	35.5	38	112		265
2" SMS		120	48.5	51	130		271
2 1/2" SMS		136	60.5	63.5	155		283

4.4.3 Rinsing Connections

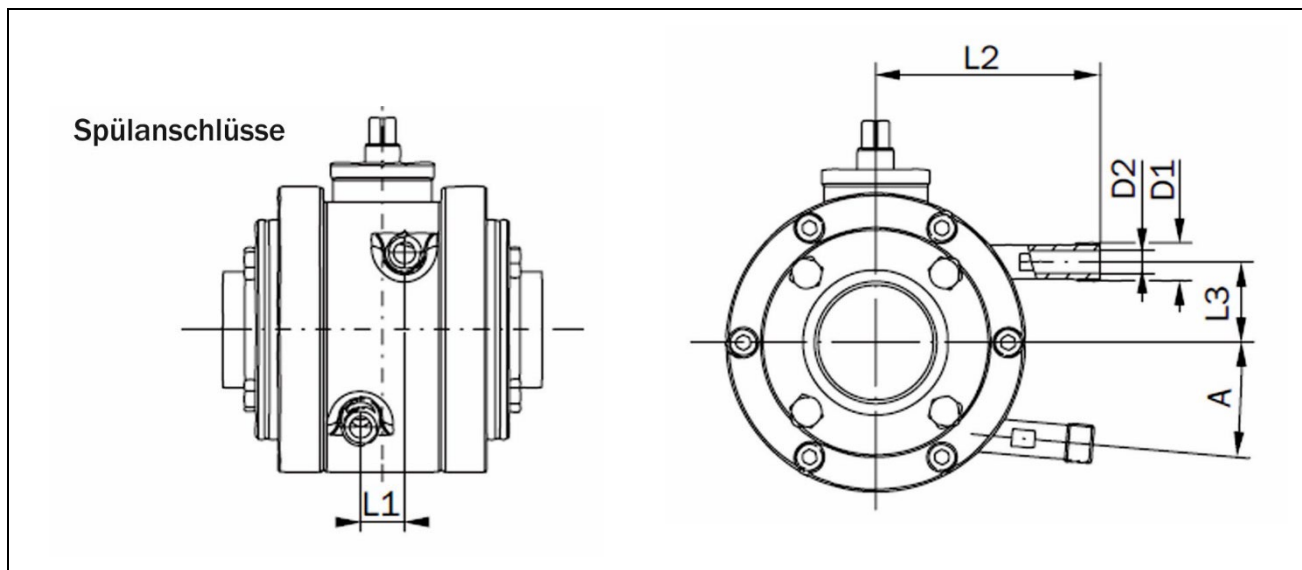


Fig. 4-7: Rinsing connections

DN	L1	L2	L3	D1	D2	A	
40	1 ½"	15	81.5	26	G 3/8"	10	4 °
50	2"	20	97.5	35	G 3/8"	10	5 °
65	2 ½"	30	102.5	47.5	G 3/8"	10	5 °
80	3"	40	106.5	58.5	G 3/8"	10	5 °
100	4"	60	110.5	76	G 3/8"	10	3 °

4.4.4 Heatable Housing

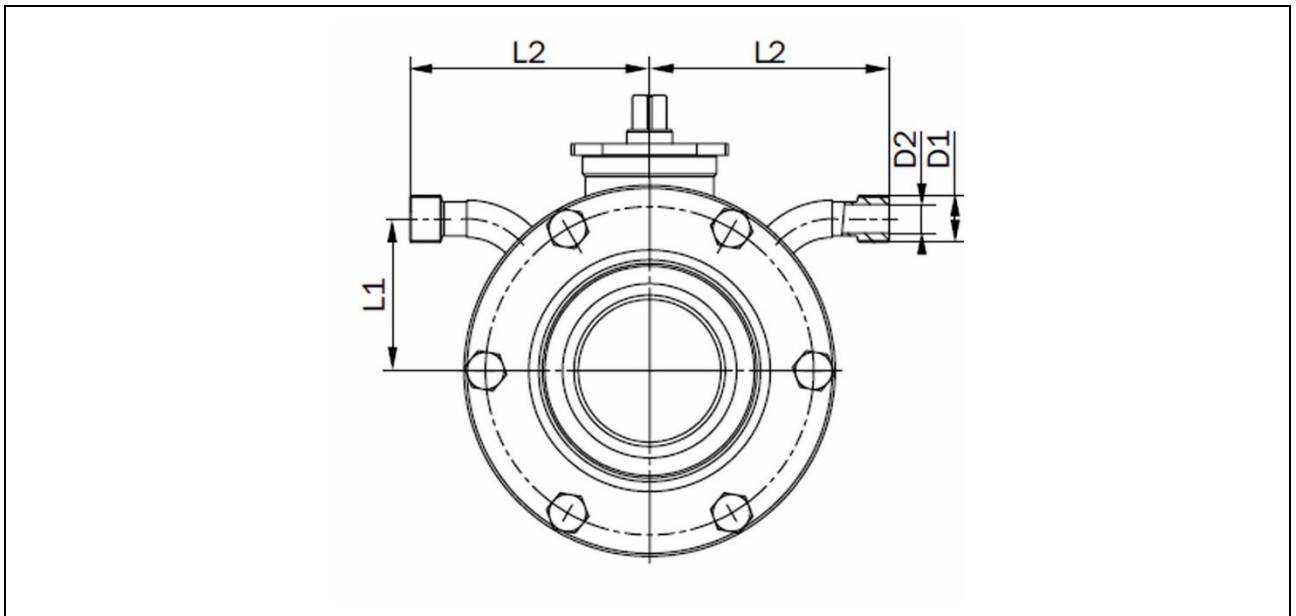


Fig. 4-8: Connections, heatable

DN	L1	L2	D1	D2
40	1 ½"	46.3	G 3/8"	10
50	2"	53.2	G 3/8"	10
65	2 ½"	75.5	G 3/8"	10
80	3"	83.9	G 3/8"	10
100	4"	107.3	G 3/8"	10

5 Installation

5.1 Scope of Delivery



The detailed scope of delivery can also be found in the order confirmation.

5.2 Transport and Packaging

AWH products are carefully checked and packed before shipping. However, it is still possible for the product to become damaged during transport.



CAUTION



When setting down the packaging, there is a risk of minor injury due to crushing.

- When transporting the packaging, proceed with particular care.
- Wear safety shoes and protective gloves (see section “2.7 Personal Protective Equipment”).

5.2.1 Delivery (Including for Spare and Replacement Parts)

Incoming Goods Inspection

- Check the product against the delivery note to ensure that it has been delivered in complete form.
- Check for visible damage to the packaging.

Unpacking

- Remove the protective caps from the pipe connections (where applicable).
- Remove the remaining packaging.

Damage

- Check the delivery for damage (visual inspection).

Complaints

If the delivery has been damaged during transport:

- Contact the last shipping agent immediately.
- Retain the packaging (for possible inspection by the shipping agent or for return delivery).

Packaging for Return Delivery

If possible, use the original packaging and the original packaging material. If neither is available any more, request a packaging company with specialist personnel. Consult AWH if you have any questions regarding packaging and transport safety.

5.2.2 Temporary Storage

Storage in a closed room

Storage conditions:

- Temperature: +10 °C – +40 °C / +50 °F – +104 °F
- Humidity: < 60%

5.3 Installation



WARNING

Risk of serious injury due to leaking flange connections and pipe connections!

- The fitting may be installed only by an expert.
- Make sure that the flange connections and pipe connections do not have any leaks.
- After installation, any tensile and compressive stress must be ruled out.



There are no restrictions on the choice of installation position. When the pneumatic actuator is in a hanging position, take care to ensure that no liquids (water, CIP etc.) can penetrate or be sucked into the holes in the exhaust choke (see Fig. 3-4, R).

The fitting is installed in accordance with the structural layout of the pipe system and the technical data for the connection variants (see section 4.4). See the dimensional drawings for the installation dimensions. Make sure sufficient space is available for operation and maintenance (1 m around the fitting).

Due to the design of the valve, conversion from a manually actuated ball valve to a remotely actuated valve with pneumatic actuator can be done without problems and without having to take the ball valve out of the pipe system.

5.3.1 Installing a Ball Valve with Thread/Thread or Thread/Liner with Nut Connection

NOTE

Risk of damage to the thread during installation!

*The thread could become damaged when using the nut to fasten the fitting.
Use a nut wrench.*



There is no need to remove the valve before doing this.

When installing the pipelines, note that to install the valve, the ends of the pipes must be pushed apart by up to 10 mm in axial direction, depending on the nominal width of the pipes. When installing the ball valve, make sure the connection fittings and nuts conform to the same standard (e.g. DIN 11851). Before installation, check the seal ring on the male for damage and to ensure that it is installed in the correct position. Replace it if necessary.

5.3.2 Installing the Ball Valve with DIN 11864-2 Connection



There is no need to remove the valve before doing this.

For the connection to the ball valve, you require, on the one hand, a liner flange and, on the other hand, a nut flange according to DIN 11864-2 (see fig. 4-4). When installing the ball valve, ensure that the connection fittings of the flanges are to the same standard (e.g. DIN 11864-2 series A). Before assembly, check the O-rings in the slot supports for damage and correct installation position and replace them if necessary. When welding the counter flanges, take care to ensure correct positioning of the fastening holes and correct plane-parallel alignment of the flange connection surface.

5.3.3 Installing the Ball Valve with Weld/Weld or Weld/Thread Connection

Welding Instructions

Welding in pipelines must be carried out to DIN EN 10357, series A.

Welding method: TIG or orbital welding

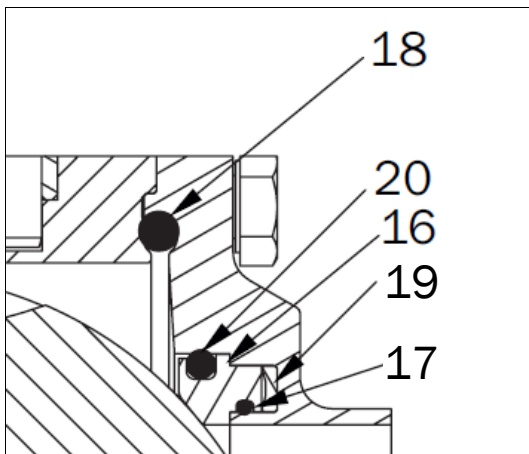
Seam type: Butt weld joint according to DIN EN 29692

Installed Condition



The valve must be removed before welding (see chapter “6 Disassembly/Assembly”).

When installing the pipelines, note that to install the valve, the ends of the pipes must be pushed apart by up to 30 mm in axial direction, depending on the nominal width of the pipes.



- Undo the screws (Fig. 6-1, item 14) on the flanges with weld-on ends (Fig. 6-1, item 3).

NOTE: Proceed carefully and meticulously to avoid damage. Do not use sharp-edged objects.

- Remove the O-rings (18) from the flanges.
- Remove the PTFE seal rings (16) together with the O-rings (17) and (20) and finally the rectangular ring (19).

Fig. 5-1: Ball-flange seal system

Welded Seam Preparation



The weld-on ends must fit flush and be welded without a gap.

- Cut the ends of the pipes level and right-angled.
- Remove burrs from the interfaces.
- Align the housing weld-on ends with the pipeline so they are level radially and axially.

Filler Materials

Base material	Suitable filler material
1.4404	1.4430 / 1.4455 / 1.4576

Welding

- Connect forming gas before welding.
- Affix 3 to 4 tack weld-ons before welding.

Welding Post-Treatment

No treatment is necessary on the interior after welding.

Annealing colors must be removed. Accessible points can be improved by grinding.

Finishing can be applied to the exterior afterwards by staining, brushing, grinding and polishing.

Cleaning

- Clean all welded parts before assembly.

Installation

- Insert the rectangular rings, O-rings and PTFE seal rings in the flange.
- Press the pipe ends approx. 15 mm apart and insert the valve body between the flange. Make sure when doing this that the O-rings are correctly seated.
- Screw the flange to the valve body.

5.3.4 Installing the Ball Valve with Intermediate Flange Connection

Installed Condition



For notes on welding, see section 5.3.3 Installing the ball valve (weld/weld or weld/thread connection).

The valve does not need to be fully removed before welding.

Undo the screws (Fig. 6-1, item 14) from the outer flanges (Fig. 6-1, item 3).

When welding into the piping, take care to ensure correct positioning of the fastening holes and correct plane-parallel alignment of the flange connection surface (Fig. 6-1, item 3).

Position the valve body between the outer flanges. Take care to ensure that the O-rings are not being cut into and fasten the flange tightly to the housing using the screws (Fig. 6-1, item 14).

5.3.5 Installing a Ball Valve with Rinsing Connections



Due to the design of ball valves with rinsing connections, product can enter the rinsing connections when operating pressure is applied and escape if the line is open. Therefore, in addition to 5.3.1-5.3.4, shut-off valves must be installed by the customer as close as possible to the rinsing connections

6 Disassembly/Assembly



WARNING

Risk of serious injury due to incorrect disassembly/assembly!

When using harmful or toxic media, or media which are hazardous in any other way, there is a risk of intoxication or chemical burns!

- The work may be performed only by an expert.
- Always adhere to the shutdown procedures before all assembly, maintenance and repair work (see section 2.3.4).
- Wear protective work clothing, protective gloves and protective goggles when carrying out the work (see section “2.7 Personal Protective Equipment”).
- If in doubt, contact a specialist company or AWH.



WARNING



Risk of burns due to hot media!

There is a risk of burning if flow media has temperatures over +60 °C / +140 °F.

- Let the flow medium cool down prior to work.
- Empty the pipelines prior to installation or disassembly work.

NOTE

Risk of damage to the fitting during disassembly/assembly

- The work may be performed only by an expert.
- Proceed carefully and meticulously.
- Do not use sharp-edged objects.

6.1 Ball Valve with Handle

6.1.1 Design

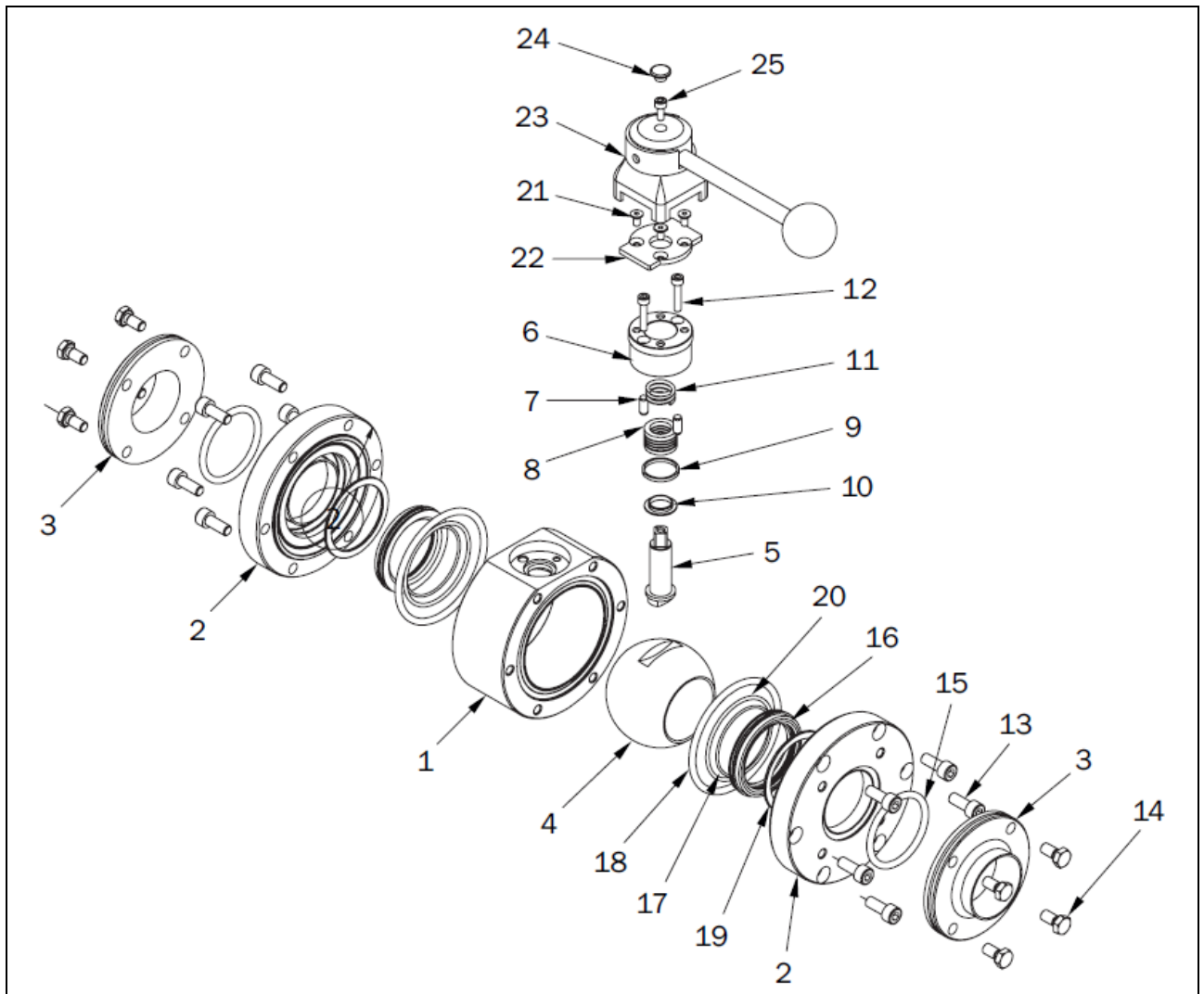


Fig. 6-1: Structure of a ball valve with handle

- | | | | |
|----|-------------------------|----|-----------------------|
| 1 | Housing | 14 | Hexagonal bolt |
| 2 | Ball valve inner flange | 15 | O-ring |
| 3 | Ball valve outer flange | 16 | PTFE seal ring |
| 4 | Ball | 17 | O-ring |
| 5 | Spindle | 18 | O-ring |
| 6 | Spindle dome | 19 | Rectangular ring |
| 7 | Cylindrical pin | 20 | O-ring |
| 8 | V seal ring set | 21 | ISK countersunk screw |
| 9 | Seal ring | 22 | Locking plate |
| 10 | Plain bearing | 23 | Handle |
| 11 | Spring | 24 | Blind plug |
| 12 | ISK socket-head screw | 25 | ISK socket-head screw |
| 13 | ISK socket-head screw | | |

6.1.2 Removal from the Superordinate Plant

- Perform the switch-off procedure (see section 2.3.4).
- Undo the screwed connections directly at the ball valve for the thread/thread, thread/liner with nut versions, or the hexagonal bolts (Fig. 6-1, item 14) for intermediate flange and DIN 11864-2 versions.
With the weld/weld version, release the next nearest flange connection in the line to the ball valve. Alternatively, undo the hexagonal screws (Fig. 6-1, item 14).
- Depending on the nominal width, pull the pipeline up to 30 mm away from the valve.
- Secure the lines so that they do not spring back into position.
- Remove the valve.

6.1.3 Removal from the Superordinate Plant with Gasket Replacement

- Perform the switch-off procedure (see section 2.3.4).
- Remove the blind plug (Fig. 6-2, item 24).
- Unscrew the socket-head screw (Fig. 6-2, item 25).
- Pull off the handle in the direction of the axis (Fig. 6-2, item 23).
- Unscrew the bolt group (Fig. 6-2, item 21).
- Remove the locking plate. (Fig. 6-2, item 22).
- Depending on the version, release the nuts of the screwed connection or release the bolts. (Fig. 6-1, item 14) for intermediate flange, for weld-on ends (Fig. 6-1, item 13).
- Depending on the nominal width, pull the pipeline up to 30 mm away from the valve.
- Secure the lines so that they do not spring back into position.
- Remove the valve.
- Let the flow medium cool down prior to work.
- Empty the pipelines prior to installation or disassembly work.
- Release the screws (Fig. 6-1, item 14, intermediate flange version) and remove the inner flange.
- Turn the ball (Fig. 6-1, item 4) to closed position.
- Remove the ball.
- Remove the PTFE seal rings (Fig. 6-1, item 16), the O-rings (Fig. 6-1, items 17 and 18) and the rectangular ring (Fig. 6-1, item 19).
- Pull the spindle (Fig. 6-1, item 5) downwards and out of the housing.
- Remove the plain bearing (Fig. 6-1, item 10).
- Remove the V seal ring set (Fig. 6-1, item 8) and the seal ring (Fig. 6-1, item 9).

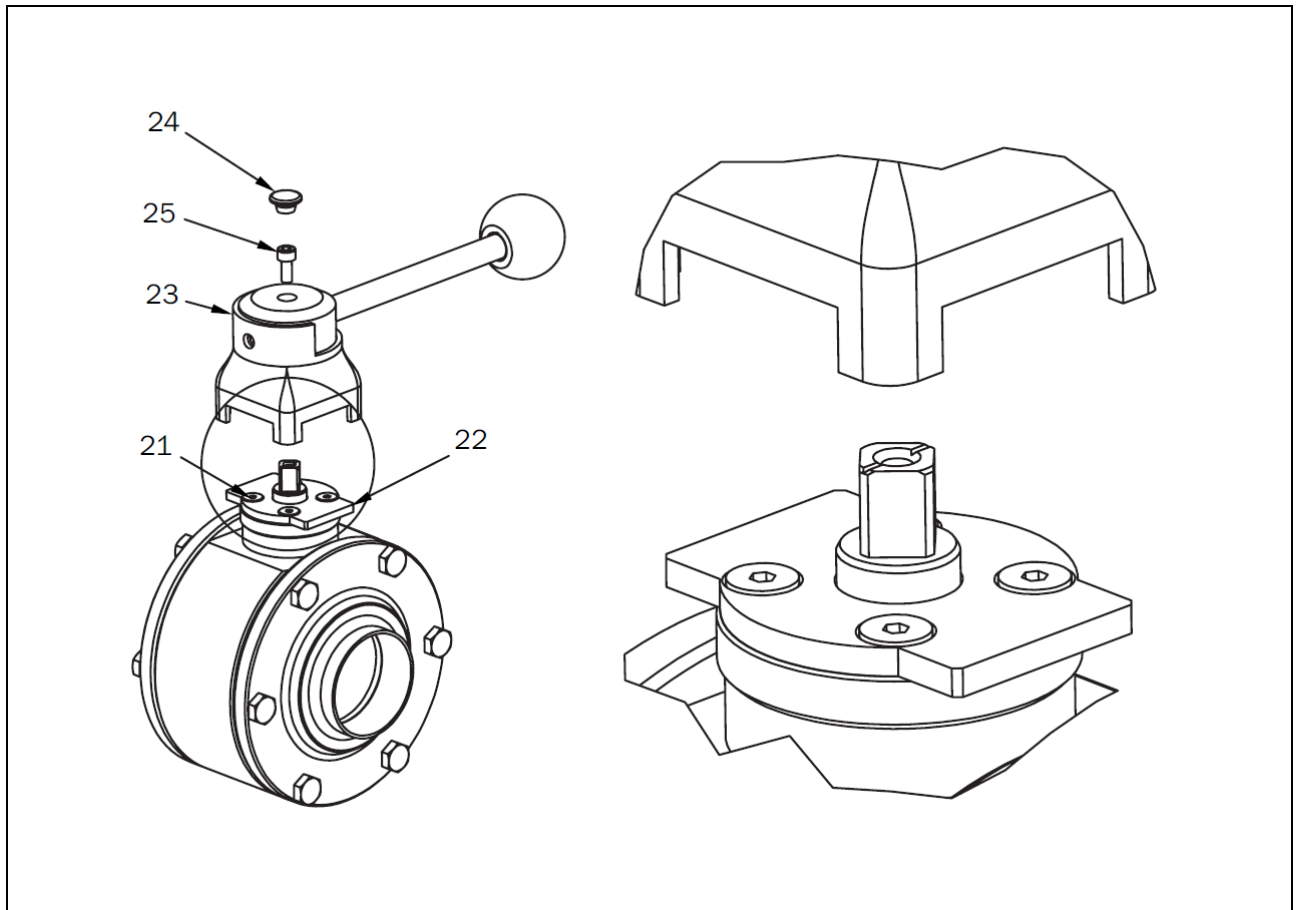


Fig. 6-2: Removal/installation of the handle

6.1.4 Assembly with Gasket Replacement

Original AWH spare part sets are available for replacing the gaskets.

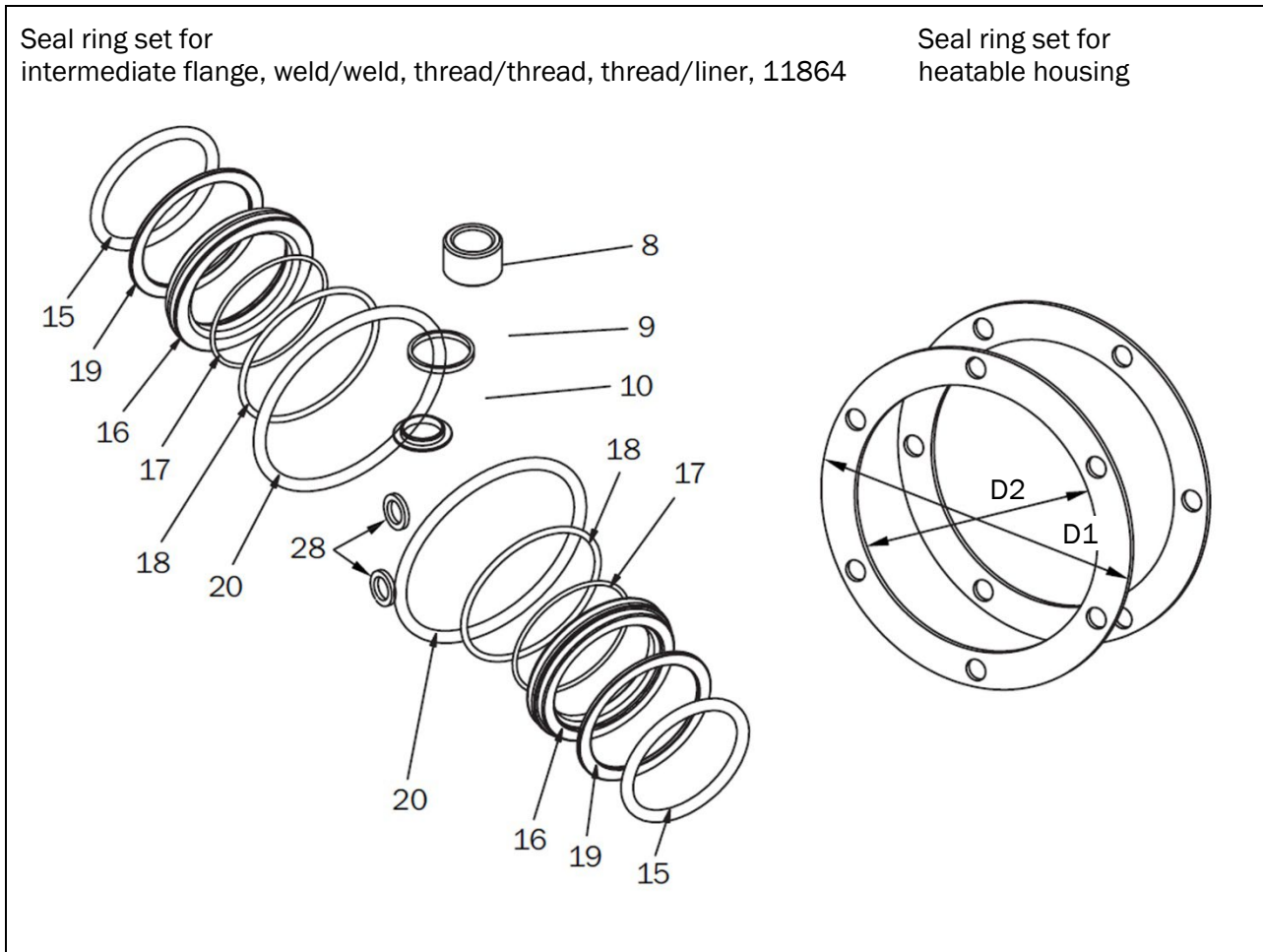


Fig. 6-3: Gasket spare parts set

Design	(8)	(9)	(10)	(15)	(16)	(17)	(18)	(19)	(20)	(28)
Standard	1	1	1	2	2	2	2	2	2	0
Special	1	1	1	2	2	0	0	0	2	0
Heat./flush.	0	0	0	0	0	0	0	0	0	8

DN	D1	D2
40 mm	1 ½"	110
50 mm	2"	128
65 mm	2 ½"	154
80 mm	3"	173
100 mm	4"	208

Specify the valve type, nominal width and O-ring material to allow the appropriate spare seal set to be ordered from Sales. See the catalog for further information.

- Check the seals for damage.
- Clean the installation space and check for any damage.
- Clean the ball and the groove (Fig. 6-1, item 4).
- Lightly grease the seals (Fig. 6-1, item 18, 20) with the approved grease.
- First insert the plain bearing (Fig. 6-1, item 10) and then the spindle (Fig. 6-1, item 5) from the inside, then fit the V seal ring set (Fig. 6-1, item 8) from the outside between the spindle (Fig. 6-1, item 5) and spindle dome (Fig. 6-1, item 6).
- Make sure when doing this that the rings are fitted in the correct order:
 1. Lower pressure ring (Fig. 6-4, item 8a)
 2. V-rings with the opening facing down (Fig. 6-4, item 8b)
 3. Upper pressure ring (Fig. 6-4, item 8c)

**WARNING**

Danger of serious injury due to pre-tensioned spring!

The pre-tensioned compression spring can jump out of the spindle dome. This can cause injuries.

- Fit the compression spring (Fig. 6-4, item 11) above the V seal ring set (Fig. 6-1, item 8).

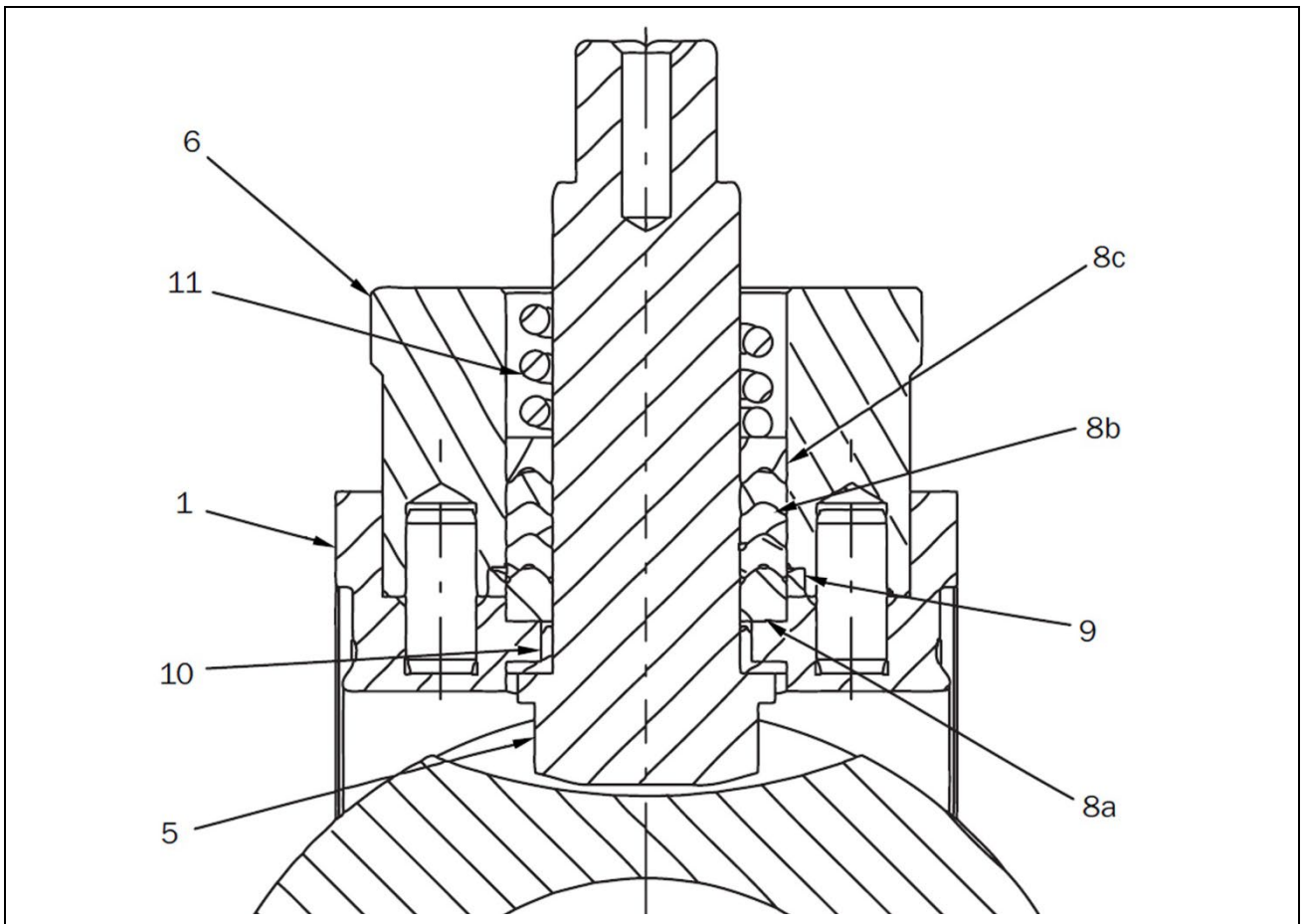


Fig. 6-4: V seal ring set

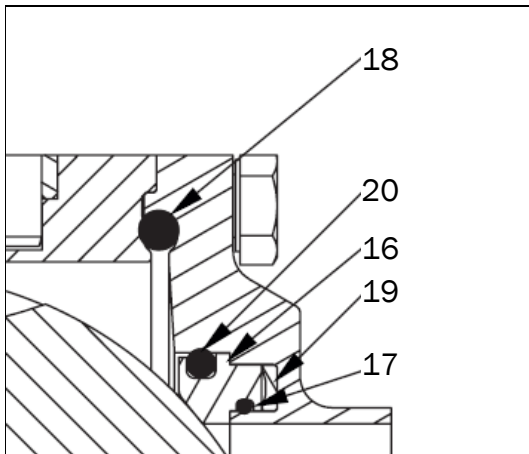


Fig. 6-5: Ball-flange seal system

- Insert the O-ring (item 20) and the rectangular ring (item 19) in the corresponding groove of the ball valve inner flange (Fig. 6-1, item 2).
- Fit the O-rings (item 17, 20) on the PTFE seal ring (item 16).

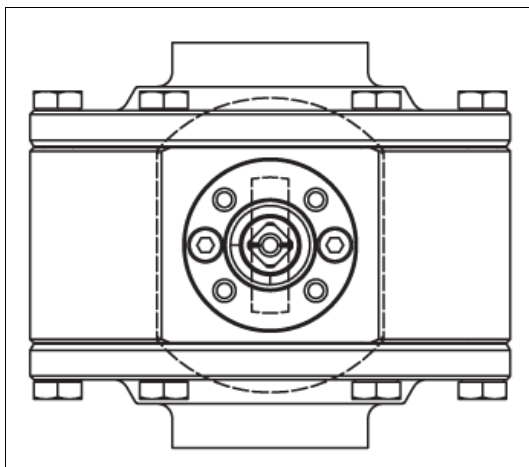


Fig. 6-6: Ball position

- Insert the ball. This is now in the “closed” position.
- Install the second flange as described previously.
- Carefully place the counter flange on the flange without damaging the gasket (Fig. 6-1, item 7).
- Screw on the counter flange.
- Install the handle.

- Install the locking plate (Fig. 6-1, item 22) using the countersunk screws (Fig. 6-1, item 21). The locking plate must be pressed towards the valve to ensure pre-tensioning of the spring.
- Turn the spindle (Fig. 6-4, item 5) as shown in Fig. 6-4 and Fig. 6-6.
- Bolt on a flange with the screws (Fig. 6-1, item 13) evenly, working across diagonals.
- Perform a function test by repeatedly switching to the “open” and “closed” positions (90°). Make sure that the lever on the handle performs a full 90° movement.
- Perform a leak test under operating conditions.

6.2 Ball Valve with Pneumatic Actuator

6.2.1 Design

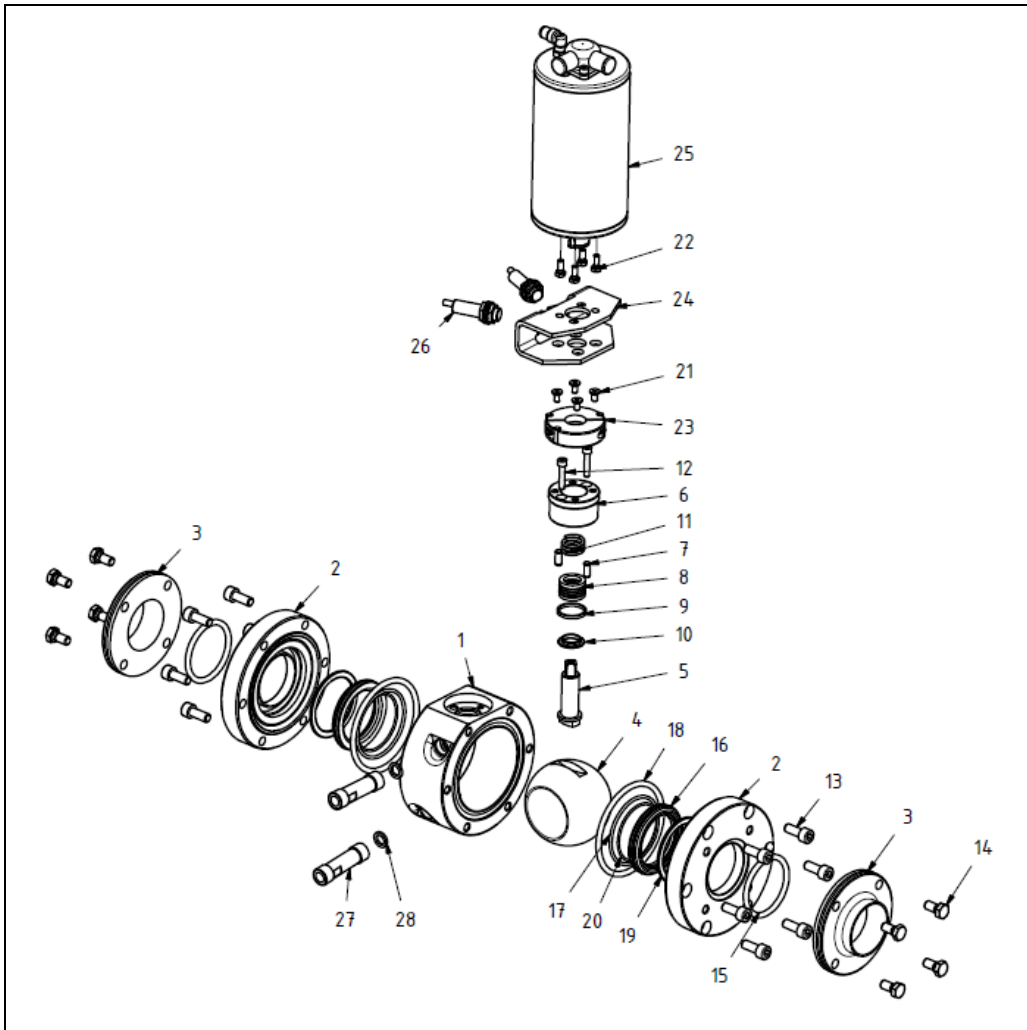


Fig. 6-7: Design of ball valve with pneum. actuator

1	Housing	15	O-ring
2	Ball valve inner flange	16	PTFE seal ring
3	Ball valve outer flange	17	O-ring
4	Ball	18	O-ring
5	Spindle	19	Rectangular ring
6	Spindle dome	20	O-ring
7	Cylindrical pin	21	ISK countersunk screw
8	V seal ring set	22	Hexagonal bolt
9	Seal ring	23	Switch cam*
10	Plain bearing	24	Holding bracket
11	Spring	25	Pneumatic actuator
12	ISK socket-head screw	26	Proximity initiator D = 12 mm *
13	ISK socket-head screw	27	G 3/8" connection fitting for rinsing connection
14	Hexagonal bolt	28	Flat gasket 15 x 10 x 2

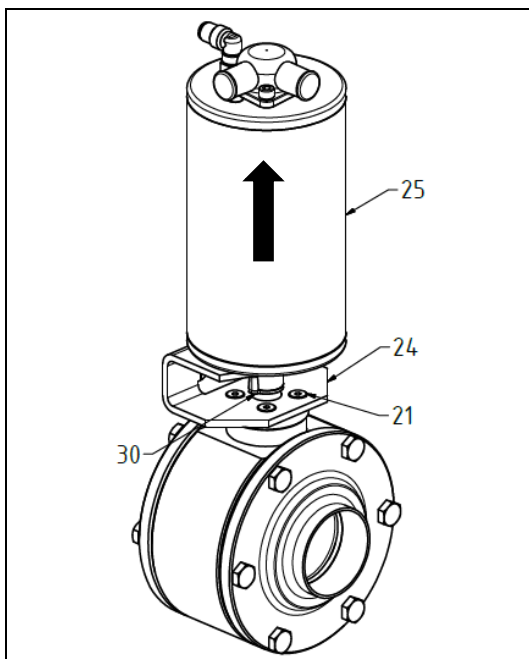
* Optional accessory: not included in the standard scope of delivery of the valves

6.2.2 Removal from the Superordinate Plant

- Perform the switch-off procedure (see section 2.3.4).
- Depressurize the pipe system and the compressed air connection of the pneumatic actuator.
- Drain the pipe system.
- Disconnect the compressed air connection from the pneumatic actuator.
- Undo the screwed connections directly on the ball valve (for the thread/thread, thread/liner with nut version) or the hexagonal bolts (Fig. 6-7, item 14) for the intermediate flange and DIN 11864-2 versions. With the weld/weld version, unfasten if possible the nearest flange connections to the ball valve within the line.
Alternatively, undo the hexagonal screws (Fig. 6-7, item 14).
- Depending on the nominal width, pull the pipeline up to 30 mm away from the valve.
- Secure the lines so that they do not spring back into position.
- Remove the valve.

6.2.3 Removing the Ball Valve from the Superordinate Plant with Gasket Replacement

- Perform the switch-off procedure (see section 2.3.4).
- Depressurize the pipe system and the compressed air connection of the pneumatic actuator.
- Drain the pipe system.
- Disconnect the compressed air connection from the pneumatic actuator.



- Unscrew the bolt group (item 21).
- Proceed with special care with this type of work.
- Pull out the entire “pneumatic actuator with holding bracket” assembly group (items 24 and 25) in the direction of the axis.

Fig. 6-8: Removing the actuator



WARNING

Danger of serious injury due to pre-tensioned spring!

The pre-tensioned compression spring can jump out of the spindle dome when pulling off the drive assembly. This can result in injury.

- Depending on the version, undo the nuts of the screw connections or the screws (Fig. 6-7, item 14) for the intermediate flange version, for weld-on ends (Fig. 6-7, item 13).
- Depending on the nominal width, pull the pipeline up to 30 mm away from the valve.
- Secure the lines so that they do not spring back into position.
- Remove the valve.

 **WARNING**



Risk of burns due to hot media!

There is a risk of burning if flow media has temperatures over +60 °C / +140 °F.

- *Let the flow medium cool down prior to work.*
- *Empty the pipelines prior to installation or disassembly work.*

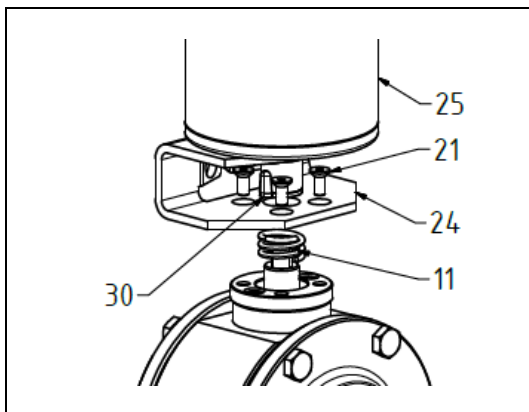
- Undo the screws (Fig. 6-7, item 14) on the intermediate flange version and remove the inner flanges.
- Turn the ball (Fig. 6-7, item 4) to closed position.
- Remove the ball.
- Remove the PTFE seal rings (Fig. 6-7, item 16), the O-rings (Fig. 6-7, items 17 and 18) and the rectangular ring (Fig. 6-7, item 19).
- Pull the spindle (Fig. 6-7, item 5) downwards and out of the housing.
- Remove the plain bearing (Fig. 6-7, item 10).
- Remove the V seal ring set (Fig. 6-7, item 8) and the seal ring (Fig. 6-7, item 9).

6.2.4 Assembly with Gasket Replacement

Original AWH spare part sets are available for replacing the gaskets.

- Install the gasket up to screwing the counter flanges in the same manner as described in section 6.1.4.
- Fit the actuator with the bracket on the valve again.
Ensure that the ball is correctly positioned depending on the type of actuator (A/S or S/A). The cutout in the spindle sits perpendicular to the direction of flow.

NOTE: When installing the retaining bracket with the pneumatic actuator screwed onto the ball valve housing, take care to ensure that the spindle square drive fits correctly into the square socket of the pneumatic actuator.



- Screw the bracket (item 24) tightly to the spindle dome using the countersunk screws (item 21). The bracket must be pressed towards the valve to ensure pre-tensioning of the spring.
- Place the position indicator (item 30) on the spindle square (Fig. 6-7, item 5). When doing this, the position indicator must point in the same direction as the hole in the ball (Fig. 6-7, item 4).
Note the direction of rotation of the actuator when installing the position indicator. With the “air opening” version, it rotates to the right as viewed when looking at the square drive.

Fig. 6-9: Installation of pneum. actuator

- Perform a function test by repeatedly switching to the “open” and “closed” positions (90°). Make sure that the lever on the handle performs a full 90 ° movement.
- Perform a leak test under operating conditions.

NOTE: The pneumatic actuator must be exactly aligned with the spindle.

- Before installation in the pipe system, check to ensure that the ball in the ball valve is set to the desired “open” or “closed” position by conducting a test switching procedure.
- Re-adjust the position of the ball if necessary (see section “6.2.5 Adjusting the Ball Position”).



With “air-opening” and “spring closing” pneumatic actuators (Fig. 6-7, item 25), the ball always rotates to the “closed” position if the compressed air fails.

6.2.5 Adjusting the Ball Position



WARNING



Danger of amputation and crushing of limbs

A danger of amputation and crushing of body parts is posed by switching the valve when removed.

– Never insert fingers, hands or other parts of the body into the valve.

- Close the ball valve
- Slightly loosen the screws(Fig. 6-7, item 22) and turn the actuator so that the ball hole lines up in the “open” position.
- Tighten the screws again and check that the ball hole is correctly aligned when in the “open” position.

When installed:

- Switch the valve to the “open” position.
- Mark the current position on the spindle and bracket, e.g. using two thin lines, one above the other.
- Close the valve.
- Change the actuator.
- Check the alignment of the two lines previously marked in the “open” position.
If these are not exactly aligned, adjust the ball position by turning the actuator, as described above.
- Finally, check that all screws and compressed air hoses are screwed tight and that the initiators are correctly wired.

6.2.6 Installation with Feedback (Optional)

**CAUTION**

When assembling, there is a crushing hazard between the signal contact arm and holding plate.

– Assemble the components carefully in order to avoid your fingers getting crushed.



Use only proximity switches with an M12 thread all the way to the head.

Feedback can be provided in different ways depending on the customer requirements, e.g. via:

- one to two proximity switches or
- one double proximity switch.

NOTE

In order to ensure safe operation, please use only the proximity switches recommended by AWH (see section “**Fehler! Verweisquelle konnte nicht gefunden werden. Fehler! Verweisquelle konnte nicht gefunden werden.**”).

6.2.6.1 Component Layout of the Pneumatic Actuator with Feedback:

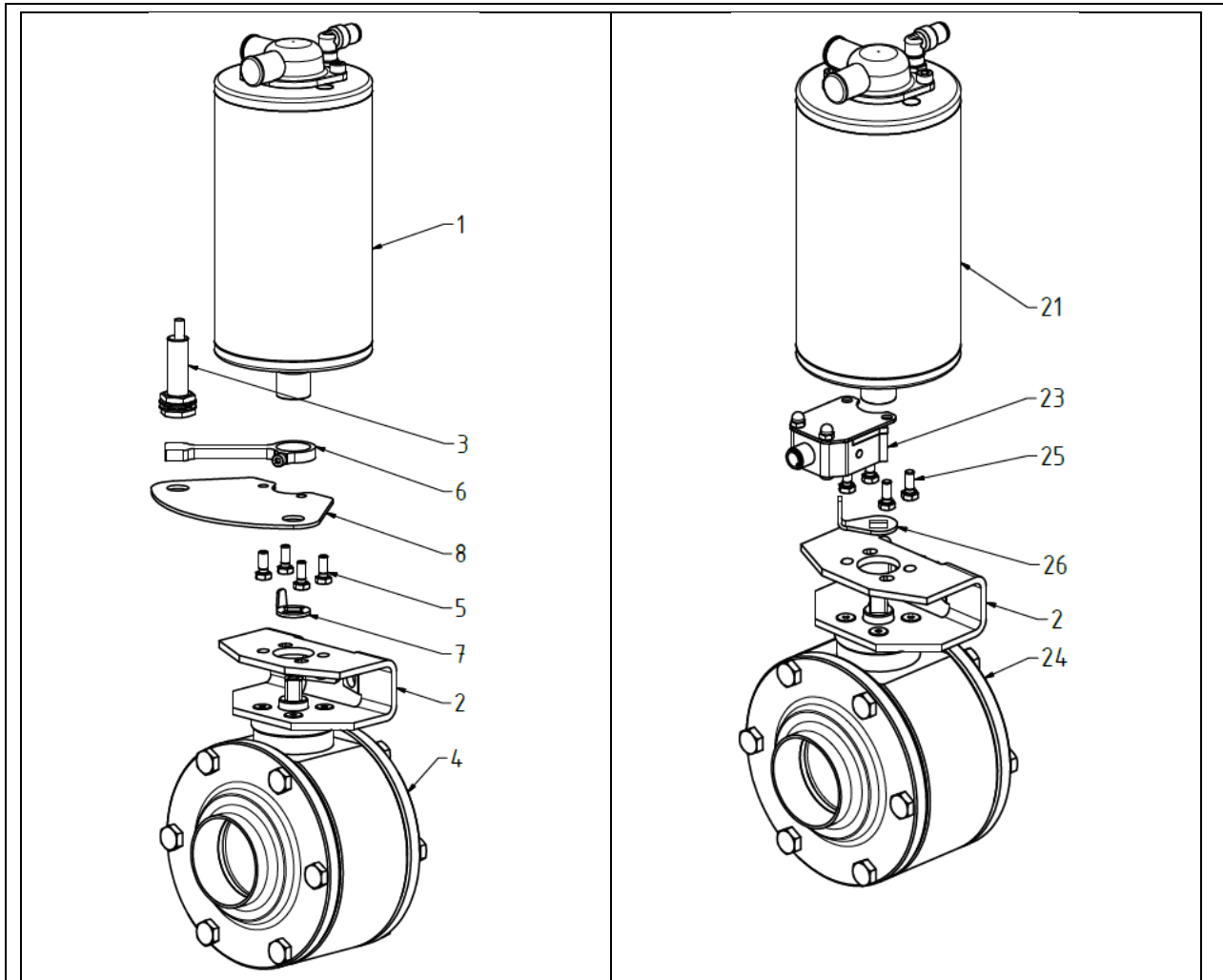


Fig. 6-10: Pneum. actuator with alternative feedback

Single proximity switch with single contact arm

- 1 Pneumatic actuator
- 3 Proximity switch
- 2 Holding bracket
- 4 Ball valve
- 5 Hexagonal bolts M5x12 (M8x14)
- 6 Signal contact arm
- 7 Position indicator
- 8 Support for proximity switch

Double proximity switch

- 2 Holding bracket
- 21 Pneumatic actuator
- 23 Double proximity switch with holding plate
- 24 Ball valve
- 25 Hexagonal bolts M5x12 (M8x14)
- 26 Switch cam

6.2.6.2 Installing Initiators on the Holding Bracket

- Perform the switch-off procedure (see section 2.3.4).
- Depressurize the pipe system and the compressed air connection of the pneumatic actuator.
- Remove the actuator.
- Remove the position indicator from the spindle.
- Re-install the actuator.

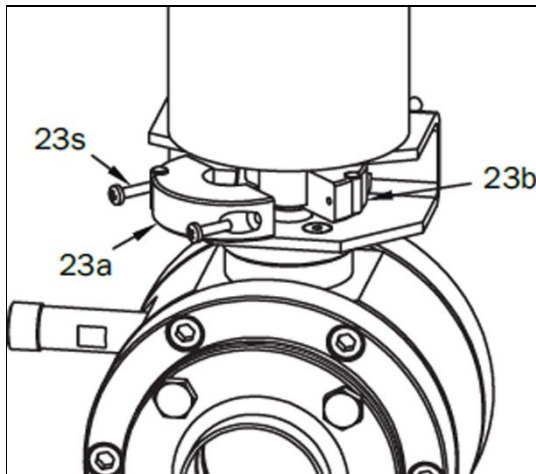


Fig. 6-11: Installation of the switch cams

- Unscrew the screws (item 23s).
- Slide the rear part of the switch cam (item 23b) and the front part of the switch cam (item 23a) into the gap between the actuator shaft and spindle, as shown in the adjacent figure.
- Screw the switch cam in place using the screws (item 23s). Ensure that the position of the square part on the spindle and cam line up with each other.

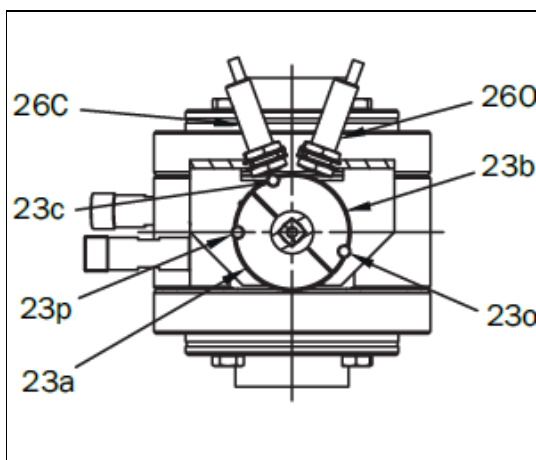


Fig. 6-12: Function of the switch cam

- Install the proximity switches (item 26C+O) for position monitoring.
 - Use the counternuts to fasten with the correcting switching clearance.
- When correctly installed, the position indicator (item 23p) points to the left and the pin (item 23c) sits opposite the proximity switch used to monitor the “closed” position (item 26C). After opening, the position indicator (item 23p) points downwards and the pin (item 23o) sits opposite the initiator for monitoring the “open” position (item 26O).

6.2.6.3 Installation with Single Proximity Switches and Single Contact Arm

- Perform the switch-off procedure (see section 2.3.4).
- Depressurize the pipe system and the compressed air connection of the pneumatic actuator.
- Release the hexagonal bolts (Fig. 6-10, item 5) and pull the pneumatic actuator (Fig. 6-10, item 1) upwards and off.
- Fasten the holding plate (Fig. 6-10, item 8) to the holding bracket (Fig. 6-10, item 2) and pneumatic actuator (Fig. 6-10, item 1) using the hexagonal bolts (Fig. 6-10, item 5).
- When doing this, guide the signal contact arm (Fig. 6-10, item 6) over the actuator shaft of the actuator and clamp it tight.
- Fasten the single proximity switches (Fig. 6-10, item 3) in the holes in the holding plate (Fig. 6-10, item 8).
- Ensure that the end of the control cam (Fig. 6-10, item 6) is exactly under the respective proximity switch when set to “open” or “closed”. Take note of the direction of rotation of the actuator when doing this (see section “3.3.2 Ball Valve with Pneumatic Actuator”). The clearance between the signal contact arm and the face of the proximity switch should not exceed 2 to 3 mm.
- Fasten the position of the proximity switch using the counter-nuts.

6.2.6.4 Installation with Double Proximity Switches

- Perform the switch-off procedure (see section 2.3.4).
- Depressurize the pipe system and the compressed air connection of the pneumatic actuator.
- Release the hexagonal bolts (Fig. 6-10, item 5) and pull the pneumatic actuator (Fig. 6-10, item 1) upwards and off.
- Replace the position indicator (Fig. 6-10, item 7) with the switch cam (Fig. 6-10, item 26).
- Fasten the holding plate with double proximity switch (Fig. 6-10, item 23) to the holding bracket (Fig. 6-10, item 2) and pneumatic actuator (Fig. 6-10, item 1) using the hexagonal bolts (Fig. 6-10, item 5).
- Ensure that the contact vane of the switch cam (Fig. 6-10, item 26) is exactly in front of the respective proximity switch when set to “open” or “closed”. Take note of the direction of rotation of the actuator when doing this (see section “3.3.2 Ball Valve with Pneumatic Actuator”). The clearance between the contact vane and the front face of the initiator should not exceed 1 to 2 mm. The switch cam must not touch the proximity switch in any position.

Removal is the reverse of installation.

6.2.6.5 Installing the Feedback System on the VMove Pneumatic Actuator

Before the installation in the pipe system, check to ensure that the red switch cam of the switching puck of the position display (Fig. 6.13, item 31) points exactly to the desired proximity switch when in “open” or “closed” position.

Before screwing into place, remove the blue blind plugs (Fig. 6.13, item 32).

Screw the proximity switches as far as they will go into the corresponding threaded holes on top of the actuator. (See Fig. 6.13, item 33)

NOTE: Damage to the hood thread when screwing in the proximity switches! Place the proximity switches in a straight position on the fine thread.

Establish the connection to the electrical power supply.

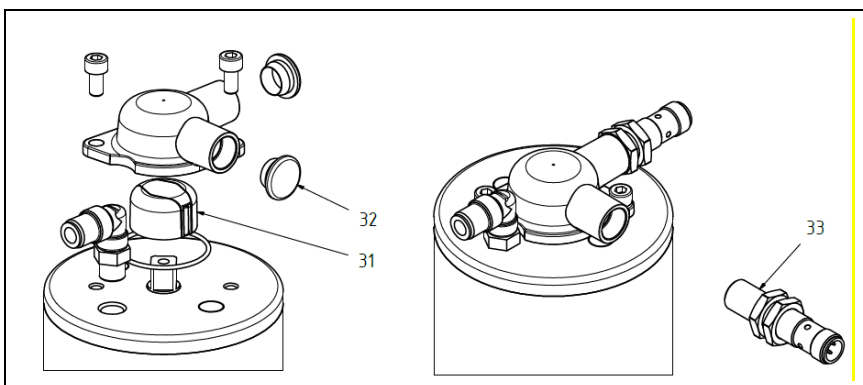


Fig. 6-13: Position indicator and feedback unit with M12 plug connection



No calibration is required.

When using other feedback systems, please proceed as shown in the description. For technical data, see valve technology catalog (available online at <http://www.awh.eu/de/downloads>).

7 Maintenance/Cleaning



WARNING

Risk of serious injury due to incorrect maintenance!

When using harmful or toxic media, or media which are hazardous in any other way, there is a risk of intoxication or chemical burns!

- The work may be performed only by an expert.
- Always adhere to the shutdown procedures before all cleaning, maintenance and repair work (see section 2.3.4).
- Wear protective work clothing, protective gloves and protective goggles when carrying out the work (see section “2.7 Personal Protective Equipment”).
- If in doubt, contact AWH.



WARNING



Risk of burns due to hot media!

There is a risk of burning if flow media has temperatures over +60 °C / +140 °F.

- Let the flow medium cool down prior to work.
- Empty the pipelines prior to cleaning, maintenance or repair work.
- Wear protective work clothing, protective gloves and protective goggles when carrying out the work (see section “2.7 Personal Protective Equipment”).



CAUTION



Risk of minor injury due to crushing.

There is a risk of crushing between individual components during cleaning, maintenance or repair work.

- Proceed with particular care with this type of work.
- Wear safety shoes when working (see section “2.7 Personal Protective Equipment”).

Pneumatic Actuators

- Equip the compressed air line with a maintenance unit (pressure regulator, filter, water separator) as this will prolong the service life of the O-rings.
- Operate the pneumatic actuator using dry, oil-free air.

7.1 Cleaning/Maintenance Intervals

To ensure proper operation of the fitting, it must be cleaned and maintained at regular intervals.

- Define the cleaning intervals depending on the operating environment and the type of flow medium used.

- Define the inspection intervals for gaskets depending on the operating environment and the type of flow medium used.
- The fitting is subject to vibrations during operation, which can loosen the screwed and clamp connections. To prevent damage, check the fitting for loose connections at regular intervals (recommended interval for single-shift operation: 3 months).



Refer to the relevant manufacturer's instructions for details on cleaning and maintenance work for supplier components.

7.2 Notes on Cleaning



WARNING



Risk of injury due to incorrect handling of cleaning agents!

- Store the cleaning agents in accordance with the relevant safety guidelines.
- When handling cleaning agents, follow the safety instructions on the cleaning agent manufacturer's data sheet.
- Always wear rubber gloves and protective goggles when cleaning (see section “2.7 Personal Protective Equipment”).
- Take care not to touch the fitting or pipeline when processing hot media or during the sterilization process.

To clean the product when installed, simply wash the surfaces that come into contact with the media (CIP cleaning).

Cleaning media:	3% nitric acid	Max. +60 °C /+140 °F
	3% caustic soda	Max. +80 °C /+176 °F

Please observe the following:

- Use only clean and chlorine-free water.
- Measure the quantities carefully to avoid overly strong concentrations of cleaning agent.
- Rinse with plenty of clean water after cleaning.

Sterilization

NOTE

Increased wear of the gaskets resulting in leaks.
Avoid actuating the fitting during sterilization.



Sterilization may be carried out only when the fitting is open.

Sealing material

EPDM:	Sterilization temperature: short-term max. 140 °C/284 °F
FKM:	Sterilization temperature: short-term max. 130 °C/266 °F

7.3 Spare Parts Stock

When requesting spare parts, always specify the type of fitting.

The following details are important for all spare part requests or questions:

- Nominal width
- Sealing material
- Housing material
- Connection type (DIN 11851, DIN 11864, welding etc.)
- Handle/pneumatic actuator
- Accessories (feedback etc.)
- Where applicable, the ATEX marking (ATEX design only)



*Use only genuine spare parts, since only these will guarantee perfect functioning.
Spare parts and the associated spare part numbers can be found in the valve technology catalog (available on Internet page <http://www.awh.eu>).*

8 Faults

8.1 Safety Instructions



WARNING

Risk of serious injury due to incorrectly performed repair work!

When using harmful or toxic media, or media which are hazardous in any other way, there is a risk of intoxication or chemical burns!

- Troubleshooting work should be carried out only by specialist personnel.
- Always adhere to the shutdown procedures prior to repair work (see section 2.3.4).
- Wear protective work clothing, protective gloves and protective goggles when carrying out the work (see section “2.7 Personal Protective Equipment”).
- If in doubt, contact AWH.



WARNING

Risk of burns due to hot media!

There is a risk of burning if flow media has temperatures over +60 °C / +140 °F.

- Let the flow medium cool down prior to work.
- Empty the pipelines prior to repair work.
- Wear protective work clothing, protective gloves and protective goggles when carrying out the work (see section “2.7 Personal Protective Equipment”).



8.2 Faults and Remedial Action

8.2.1 Ball Valve with Handle

Fault	Cause	Remedy
Valve does not move.	Product deposits or encrustation in the valve housing	Clean the valve housing
	Gaskets defective	Replace the gaskets
No signals present.	Loose cable connection at the proximity switch	Tighten the cable
	Cable broken	Replace the cable
	Signal contact arm loosened	Secure the signal contact arm
	Proximity switch defective	Replace the proximity switch
	Power supply missing or defective	Check and remedy
Ball not moving fully to the end position.	Product deposits or encrustation in the valve housing	Clean the valve housing
	Gaskets faulty or worn	Replace the gaskets
Valve leaking	Gaskets faulty or worn	Replace the gaskets

8.2.2 Ball Valve with Pneumatic Actuator

Fault	Cause	Remedy
Valve does not move.	Lack of compressed air	Switch on the compressed air supply
	Actuator defective	Check the actuator and replace it if necessary
	Product deposits or encrustation in the valve housing	Clean the valve housing
No signals present.	Loose cable connection at the proximity switch	Tighten the cable
	Cable broken	Replace the cable
	Signal contact arm loosened	Secure the signal contact arm
	Proximity switch defective	Replace the proximity switch
	Power supply missing or defective	Check the electrical power supply and correct any faults
Ball not moving fully to the end position.	Product deposits or encrustation in the valve housing	Clean the valve housing
	Gaskets faulty or worn	Replace the gaskets
	Incorrect ball position	Adjust the ball position
Valve leaking	Gaskets faulty or worn	Replace the gaskets
Valve moves too slowly.	Compressed air pressure too low	Increase air flow or air pressure
	Exhaust port of the actuator blocked	Unblock opening
Valve moves unevenly	Media pressure is too high	Check the media pressure and adjust if necessary
	Compressed air supply too weak	Increase air flow or air pressure
	Electric signals erratic	Identify and correct the cause of the erratic electrical signals
Valve causes excessive mechanical noise	Valve or actuator defective	Replace the valve

8.3 What to Do in an Emergency

- Activate the emergency stop function on the higher-level plant (for example by pressing the emergency stop switch).
- Shut off the media supply.

9 Decommissioning/Disposal

9.1 Decommissioning and Removal

- Perform the switch-off procedures for the higher-level facility (see section 2.3.4).



WARNING

Risk of serious injury due to incorrect disassembly!

When using harmful or toxic media, or media which are hazardous in any other way, there is a risk of intoxication or chemical burns!

- Disassembly work must be carried out only by specialist personnel.
- Always adhere to the shutdown procedures prior to disassembly work (see section 2.3.4).
- Wear protective work clothing, protective gloves and protective goggles when carrying out the work (see section “2.7 Personal Protective Equipment”).
- If in doubt, contact AWH.



WARNING

Risk of burns due to hot media!

There is a risk of burning if flow media has temperatures over +60 °C / +140 °F.



- Let the flow medium cool down prior to work.
- Drain the pipelines prior to disassembly work.
- Wear protective work clothing, protective gloves and protective goggles when carrying out the work (see section “2.7 Personal Protective Equipment”).

9.2 Disposal



CAUTION

Danger of injuries from harmful fluids that are a health hazard

During disposal, there is a risk of injury from contact with harmful fluids.

- Wear appropriate personal protective equipment (e.g. protective goggles, protective gloves, see section “2.7 Personal Protective Equipment”).

NOTE

***Risk of environmental damage as a result of improper disposal!***

- The fitting is mainly made of stainless steel, and should be disposed of in accordance with the applicable local environmental regulations.
- Oils and cleaning agents are **NOT** permitted to flow into ground water, bodies of waters or in the sewer system and must be disposed of in accordance with local regulations and in compliance with the information contained in the cleaning agent manufacturer's safety data sheets.
- Contaminated cleaning tools (such as brushes, cloths etc.) must be disposed of in accordance with the manufacturer's specifications.
- Packaging material must be disposed of in accordance with the environmental regulations and recycled.

10 Declarations

On the following pages, declarations can be found for the following variants:

- Ball valve with handle (standard design) and
- Ball valve with pneumatic actuator (standard design).

Declarations for Fittings pursuant to the Pressure Equipment Directive 2014/68/EU

Fittings that fall within the scope of Directive 2014/68/EC receive an EU Declaration of Conformity and a CE mark pursuant to said Directive.

Fittings that come under article 4 section 3 receive no EU Declaration of Conformity and no CE mark pursuant to that directive (see section 10.1).

Declarations for Fittings pursuant to the Machinery Directive 2006/42/EC

Fittings that come under the application area of Directive 2006/42/EC are incomplete machinery, and receive a declaration for incorporation but no CE mark pursuant to that directive (see section 10.2).

10.1 Ball Valve with Handle DN 40 – DN 100 / PN10

Armaturenwerk Höstensleben GmbH
Schulstraße 5-6
D-39393 Höstensleben, Germany

Declaration (Translation)

In accordance with the

EC Pressure Equipment Directive 2014/68/EU

We hereby declare that the design of

Designation: Ball valve with handle

Type: DN 40 – DN 100 / PN10

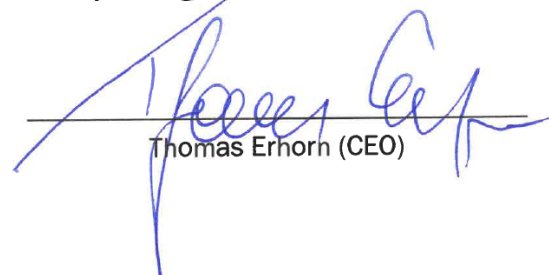
is consistent with the following directives and standards in its delivered version:

Directive/standard	Title	Version	Remarks
2014/68/ EU	EU Pressure Equipment Directive	05/2014	
DIN EN 12516-2	Industrial valves – Shell design strength – Part 2: Calculation method for pressurized shells of steel fittings	10/2004	
AD 2000 information sheets	Regulations for pressure equipment (national standards)		
The fittings are designed for fluids of fluid group 1 and for gases of fluid group 2. Accordingly, the nominal widths DN 40 – 100 are categorized in accordance with Article 4 (3).			

If any modifications are made to the fitting without our agreement, this declaration shall become void.

Commissioning is prohibited until it is determined that the overall facility fulfills the provisions of the directives. For information about proper use of the fittings, see the operating/installation instructions.

Höstensleben, 2. September 2020



Thomas Erhorn (CEO)

Person authorized to compile the technical documentation:

Armaturenwerk Höstensleben GmbH

Mr. Guth, Schulstr. 5/6, 39393 Höstensleben, Germany

10.2 Ball Valve with Pneumatic Actuator DN 40 – DN 100 / PN10

Armaturenwerk Hötensleben GmbH
Schulstraße 5-6
D-39393 Hötensleben, Germany

Declaration for Incorporation (Translation)

In accordance with the

EC Pressure Equipment Directive 2014/68/EU

EC Directive - Machinery 2006/42/EC, Annex II B

We hereby declare that the design of

Designation: Ball valve with pneumatic actuator

Type: DN 40 – DN 100 / PN10

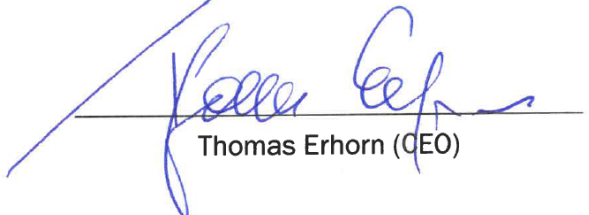
is consistent with the following directives and standards in its delivered version:

Directive/standard	Title	Version	Remarks
2014/68/EU	EC Pressure Equipment Directive	05/2014	
DIN EN 12516-2	Industrial valves – shell design strength – Part 2: Calculation method for pressurized shells of steel fittings	10/2004	
AD 2000 information sheets	Regulations for pressure equipment (national standards)		
The fittings are designed for fluids of fluid group 1 and for gases of fluid group 2. According to this, the nominal widths DN 40 – 100 / PN10 are categorized in accordance with article 4, paragraph 3			
2006/42/EC	EC Machinery Directive	05/2006	
DIN EN ISO 12100	Safety of machinery – General principles for design – Risk assessment and risk reduction	2010	

If any modifications are made to the fitting without our agreement, this declaration shall become void.

Commissioning is prohibited until it is determined that the overall facility fulfills the provisions of the directives. For information about proper use of the fittings, see the operating/installation instructions.

Hötensleben, 2. September 2020



Thomas Erhorn (CEO)

Person authorized to compile the technical documentation:

Armaturenwerk Hötensleben GmbH

Mr. Guth, Schulstr. 5/6, 39393 Hötensleben, Germany

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