

## ARGUS Multi-Way Ball Valve MW 2, 8, 22, 76, 76 M

High Performance Ball Valves

VAIOM001027

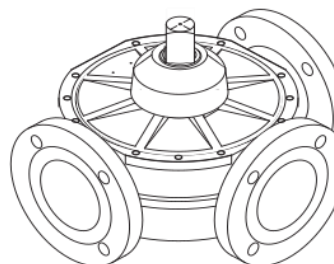
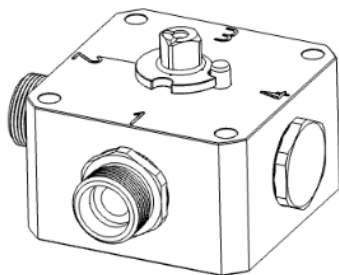
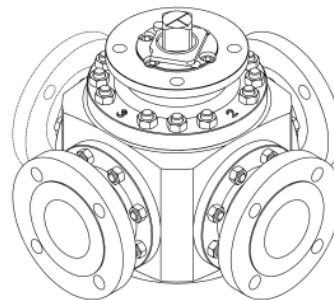
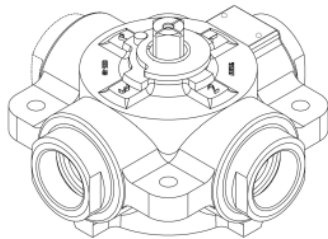
## Installation Operation Maintenance

Translation of the Original Instructions



**These instructions must be read and observed before using an ARGUS multi-way ball valve.**

**Also read and observe the superior instructions VAIOM001028 before using an ARGUS multi-way ball valve automated by Flowserve Flow Control GmbH.**





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### **Document Version**

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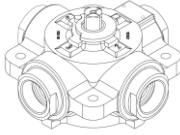
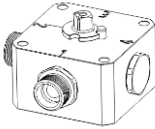
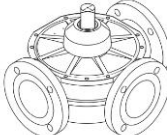

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## Overview of ARGUS multi-way ball valve Standard Types

Brand		ARGUS			
					
Series		MW 2	MW 8	MW 22	MW 76 / MW 76M
Design		Shaft bearing			Trunnion-mounted ball
Size Range		DN 25 – 40 1" – 1 1/2"	DN 5 – 20 1/8" – 3/4"	DN 50 – 100 2" – 4"	DN 15 – 600 1/2" – 24"
Pressure Classes	PN	10 – 100	6 – 500	10 – 40	6 – 250
	ANSI/ASME Class	150 – 600	150 – 2500	—	150 – 1500
Connections		Threaded connection	Threaded connection	Flange connection	Flange connection
Body Material		<ul style="list-style-type: none"> <li>– Fine grain steel (cast)</li> <li>– Stainless steel</li> </ul>	<ul style="list-style-type: none"> <li>– Fine grain steel (forged)</li> <li>– Stainless steel</li> </ul>	<ul style="list-style-type: none"> <li>– Fine grain steel (cast)</li> </ul>	<ul style="list-style-type: none"> <li>– Fine grain steel (forged or cast)</li> <li>– Stainless steel</li> <li>– Special steel, e.g., Duplex SS</li> <li>– Monel</li> <li>– Inconel</li> <li>– Hastelloy</li> <li>– Alloy 20</li> </ul>
Ball Seat Material		<ul style="list-style-type: none"> <li>– NBR</li> <li>– PTFE</li> <li>– POM</li> <li>– PA</li> <li>– FPM</li> </ul>	<ul style="list-style-type: none"> <li>– NBR</li> <li>– PTFE</li> <li>– POM</li> <li>– PEEK</li> </ul>	<ul style="list-style-type: none"> <li>– PTFE</li> </ul>	<ul style="list-style-type: none"> <li>– PTFE</li> <li>– POM</li> <li>– PEEK</li> <li>– Graphit</li> </ul>
Special Design & Accessories		Refer to Flowserve catalogues and data sheets or contact Flowserve Flow Control GmbH.			




## 1 General Information

### 1.1 Aim of These Instructions

These instructions are intended to familiarise the reader with the ARGUS multi-way ball valve and its proper use. Use of the ARGUS multi-way ball valve in compliance with these instructions is important to ensure its functionality and to avoid hazards.

These instructions contains information for qualified personnel for using the ARGUS multi-way ball valve for its intended purpose.

	<p><b>Read these instructions before using the ARGUS multi-way ball valve in any region world-wide and pay particular attention to the safety-relevant warnings, information and notes.</b></p> <p><b>Do not put the ARGUS multi-way ball valve into operation until all the safe conditions referred to in these instructions are satisfied.</b></p> <p><b>Failure to observe the information contained in these instructions will be considered as misuse of the product. Personal injury, product damages, holdups in operation or product failure due to misuse of the product are not covered by the Flowserve guarantee.</b></p> <p><b>Observe all the relevant local health and work safety regulations at the place of work – even when these are not explicitly referred to in these instructions.</b></p> <p><b>Coordinate all repair work with the operating personnel and observe all safety regulations of the industrial plant and applicable health and safety laws.</b></p> <p><b>Inform Flowserve Flow Control GmbH if documents are missing or incomplete. You will then receive replacements in electronic form.</b></p> <p><b>Provide these instructions at all workplaces near the production site.</b></p>
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### 1.2 Exclusion of Liability

The information in these instructions can be considered as complete and reliable. Despite all efforts of Flowserve Flow Control GmbH to supply comprehensible information and instructions, good engineering and safety practice must be applied at all times. Please consult a qualified engineer if in doubt.

Flowserve Flow Control GmbH manufacturers products according to applicable international quality management standards which are audited by external quality assurance organisations. Original spare parts and original accessories have been designed, tested and incorporated into Flowserve products to ensure continuous product quality and product performance in use. Since Flowserve Flow Control GmbH cannot test the spare parts and accessories of other manufacturers, (incorrect) installation of these parts can have a detrimental effect on the performance and safety properties of the product. The wrong choice or incorrect installation or failure to use approved Flowserve spare parts and accessories will be considered as misuse of the product. Damage or failure due to product misuse is not covered by the Flowserve guarantee. Moreover, any modifications to Flowserve products or the removal of original components can impair the safety of the products in use.

### 1.3 Safety Information

This safety section contains detailed explanations of the different types of safety messages that are used in these instructions.

In accordance with ANSI standard Z535.6, safety information is classified in:

- *Supplemental Directives*
- *Grouped Safety Messages*
- *Section Safety Messages*
- *Embedded Safety Messages*

*Supplemental Directives* are complementary safety messages containing one or more safety-relevant actions to ensure safe use of the ARGUS multi-way ball valve. *Supplemental Directives* are usually found at the beginning of a chapter in these instructions.

*Grouped Safety Messages* contain grouped general safety information to ensure safe use of the ARGUS multi-way ball valve. *Grouped Safety Messages* can be found in section 2.1 Grouped Safety Messages and in several safety sections of a chapter.

*Section and Embedded Safety Messages* warn against residual hazards which might possibly occur during proper use and improper use (reasonably foreseeable misuse) of the ARGUS multi-way ball valve.

In addition, *Section and Embedded Safety Messages* offer safety information for avoiding hazards resulting from various work situations and danger areas within the scope of the product life cycle.

*Section Safety Messages* can be found in the safety section of a chapter.

*Embedded Safety Messages* can be found in front of a potentially very dangerous action.



### 1.3.1 Safety Symbols and Description

These instructions contain specific safety messages with signal word fields which, if unheeded, could constitute a hazard. The specific signal word fields are:

Table 1: Explanation of the signal word fields

















Signal word field	Description
	<b>DANGER</b> This signal word field indicates an immediate dangerous activity which can result in death or severe injury. Observe all safety messages with this signal word field to avoid the danger.
	<b>WARNING</b> This signal word field indicates a potentially dangerous activity which can result in death or severe injury. Observe all safety messages with this signal word field to avoid the danger.
	<b>CAUTION</b> This signal word field indicates a potentially dangerous activity which can result in slight or minor injury. Observe all safety messages with this signal word field to avoid the danger.
	<b>NOTICE</b> This signal word field indicates an activity which can lead to material damage. Observe all safety messages with this signal word field to avoid the danger.

Table 2: Additional symbols


Symbol/Warning Sign	Description
	<b>GENERAL DANGER</b> Indicates a danger which can lead to danger for the safety of persons and/or material damage if not heeded.
	<b>DANGER FROM HEAVY OBJECTS</b> Indicates danger from a heavy object which can lead to danger for the safety of persons and/or material damage if not heeded.
	<b>DANGER FROM EXPLOSIVE MATERIAL</b> Indicates danger from explosive material which can lead to danger for the safety of persons and/or material damage if not heeded.

Symbol/Warning Sign	Description
	<p><b>DANGER FROM MOVING PARTS</b> Indicates danger from moving parts which can lead to danger for the safety of persons and/or material damage if not heeded.</p>
	<p><b>DANGER FROM SUSPENDED LOADS</b> Indicates danger from a suspended load which can lead to danger for the safety of persons and/or material damage if not heeded.</p>
	<p><b>DANGER FROM TOXIC SUBSTANCES</b> Indicates danger from toxic substances which can lead to danger for the safety of persons and/or material damage if not heeded.</p>
	<p><b>DANGER FROM HOT SURFACES</b> Indicates danger from a hot surface which can lead to danger for the safety of persons and/or material damage if not heeded.</p>
	<p><b>DANGER FROM INFLAMMABLE MATERIALS</b> Indicates danger from inflammable materials which can lead to danger for the safety of persons and/or material damage if not heeded.</p>
	<p><b>DANGER FROM MEDIA UNDER PRESSURE</b> Indicates danger from media under pressure which can lead to danger for the safety of persons and/or material damage if not heeded.</p>
	<p><b>DANGER HIGH VOLTAGE</b> Indicates danger from high voltage which can lead to danger for the safety of persons and/or material damage if not heeded.</p>
	<p><b>DANGER FROM AN EXPLOSIVE ATMOSPHERE</b> Indicates danger from an explosive atmosphere in accordance with ATEX which can lead to danger for the safety of persons and/or material damage if not heeded.</p>
	<p><b>ENVIRONMENT HAZARD</b> Indicates an environment hazard from environmentally harmful hazardous materials.</p>

Symbol/Warning Sign	Description
	<b>HEALTH HAZARD</b> Indicates a health hazard from irritant hazardous substances.
	<b>HEALTH HAZARD</b> Indicates a health hazard from inflammable hazardous materials.
	<b>HEALTH HAZARD</b> Indicates a health hazard from explosive hazardous materials.
	Indicates a potential danger of personal injury and/or material damage. Please observe all the supplemental directives with this warning sign.
	Indicates particularly important information. Observe all general information with this symbol.
1. 2. 3.	Introduces an action.
	Indicates a prerequisite for an action referring to a subsequent action.
	Indicates a secondary action or an action within a safety directive.
	Indicates the result of previous actions.
■	Indicates a list entry.

### 1.3.2 Graphic Convention and Content Structure of the General Information

The following graphic conventions and content structure apply for general information:

 General information

**Example:**




These instructions contain further information about the use of the ARGUS multi-way ball valve.


### 1.3.3 Graphic Convention and Content Structure of Safety Directives

#### Supplemental Directives

The following graphic convention and content structure apply for Supplemental Directives:

	<b>Action</b>
---	---------------

**Example:**

	<b>Provide these instructions at all workplaces near the production site.</b>
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#### Grouped Safety Messages

The following graphic convention and content structure apply for *Grouped Safety Messages*:

<p>Signal word field</p> <p><b>Type and source of danger!</b></p> <p>Consequences of failure to heed.</p> <p>▶ Action for avoiding the hazard.</p>
--

**Example:**

<div style="background-color: #0056b3; color: white; padding: 2px 5px; display: inline-block;"><b>NOTICE</b></div> <p><b>Danger of material damage due to inadequately qualified personnel!</b></p> <p>Inadequate qualification of the personnel can lead to material damage on the ARGUS multi-way ball valve.</p> <ul style="list-style-type: none"> <li>▶ Make sure that only qualified personnel with suitable personal protective equipment (PPE) and suitable tools are deployed. <ul style="list-style-type: none"> <li>↳ See chapter 2 Safety Information.</li> </ul> </li> <li>▶ Make sure that no unauthorised persons have access to the ARGUS multi-way ball valve.</li> </ul>
--

### Section Safety Messages

The following graphic convention and content structure apply for *Section Safety Messages*:

Warning sign	<p>Signal word field</p> <p><b>Type and source of danger!</b></p> <p>Consequences of failure to heed.</p> <p>▶ Action for avoiding the hazard.</p>
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<p>Signal word field</p> <p><b>Type and source of danger!</b></p> <p>Consequences of failure to heed.</p> <p>▶ Action for avoiding the hazard.</p>
--

### Example:

	<p><b>WARNING</b></p> <p><b>Danger of injury due to inadequately secured loads during transport!</b></p> <p>Inadequate securing of transported loads can lead to severe injuries.</p> <p>▶ Secure the ARGUS multi-way ball valve against turning and tipping.</p>
--	---

<p><b>NOTICE</b></p>	<p><b>Danger of material damage due to inadequately secured loads during transport!</b></p> <p>Inadequate securing of transported loads can lead to material damage.</p> <p>▶ Secure the ARGUS multi-way ball valve against turning and tipping.</p>
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### Embedded Safety Messages

The following graphic convention and content structure apply for *Embedded Safety Messages*:

<p>Signal word field</p> <p><b>Type and source of danger!</b></p> <p>Consequences of failure to heed.</p> <p>▶ Action for avoiding the hazard.</p>
--

**Example:****⚠ DANGER****Danger of injury from falling loads!**

Falling of suspended loads can lead to severe injury or death.

- ▶ Never stand beneath suspended loads.

## 1.4 Units

The metric unit system (SI) is used in these instructions.

## 1.5 Graphic Conventions for Special Designations

The following graphic conventions apply for special designations:

- For better legibility, some special English designations consisting of two or more parts are written in *italics*.
- For better legibility, object designations (for example, buttons, text fields, switches, levers, knobs) of a product (machine or software) are written in CAPITALS.

## 1.6 ARGUS multi-way ball valve as Pressure Equipment

The careful selection, design and calculation of materials as well as quality assurance performed during materials procurement, in production and on finished products ensure the elimination of pressure-related hazards when the ARGUS multi-way ball valves are used as intended.

As a manufacturer, Flowserve Flow Control GmbH applies the conformity assessment procedure according to module H (Article 14 of European Pressure Equipment Directive 2014/68/EU), i.e., “Comprehensive Quality Assurance” as described in Appendix III, Paragraph 11.

ARGUS multi-way ball valves are marked according to the provisions of the European Pressure Equipment Directive with the CE mark as well as the identification number of the notified conformity assessment body.

For the ARGUS multi-way ball valves, which are covered by the provisions of the European Pressure Equipment Directive 2014/68/EU, the EU declaration of conformity is part of these instructions.

## 1.7 ARGUS multi-way ball valve as “Partly Completed Machinery”

The automated ARGUS multi-way ball valve, i.e., an assembly consisting of an ARGUS multi-way ball valve and a mounted pneumatic, hydraulic, or electric actuator with the corresponding control components for an automated operating of the complete automated unit, can be considered to be “machinery” in the sense of the European Machinery Directive 2006/46/EC. An ARGUS multi-way ball valve prepared for assembly with an actuator is thus regarded as “partly completed machinery” in the sense of the European Machinery Directive 2006/46/EC.

The European Machinery Directive 2006/46/EC requires that any hazards for persons and for the environment must be excluded when using the machinery.

Flowserve Flow Control GmbH certifies by the “Declaration of Incorporation” delivered with each ARGUS multi-way ball valve prepared for automation that the ARGUS multi-way ball

valve poses no risks during assembly, installation into the industrial plant and during operation of the automated unit.

These instructions for the ARGUS multi-way ball valve are part of the complete documentation of the automated unit (ARGUS multi-way ball valve and actuator).

### 1.8 Operating Parameters/Limits of the ARGUS multi-way ball valve

ARGUS multi-way ball valves are designed for special applications. Series (Type), material selection, nominal size, special features, attachments, accessories, and valve qualification are adapted to the specified operating conditions. This results in operating parameters/limits concerning fluids (media), pressure, temperature, and environmental conditions for each ARGUS multi-way ball valve.

The metallic nameplate attached to the ARGUS multi-way ball valve provides information on these operating parameters/limits:

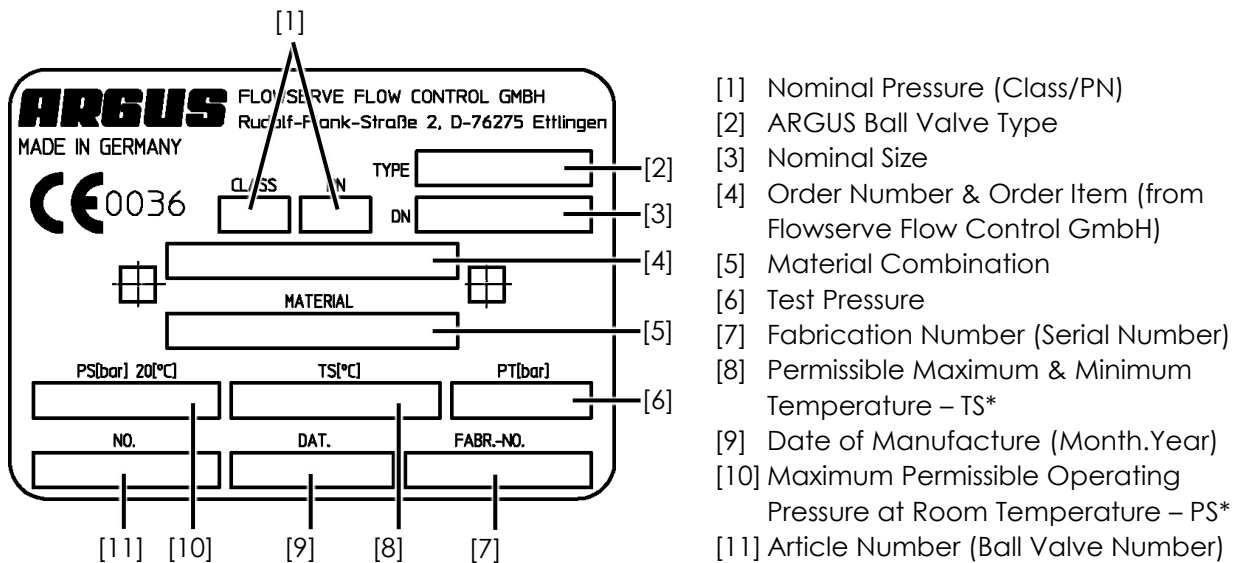
↳ See Section 1.9 Nameplate: Identification of the ARGUS Multi-Way Ball Valve.

**i** The nameplate permanently attached to the ARGUS multi-way ball valve body indicates the operating parameters/limits of the equipment. The maximum permissible operating pressure and the maximum permissible operating temperature must never be exceeded.

### 1.9 Nameplate: Identification of the ARGUS Multi-Way Ball Valve

The nameplate permanently affixed to the ball valve body provides the most important information regarding the design and use of the ARGUS multi-way ball valve.

**i** If the nameplate is missing or illegible, do not put the ARGUS multi-way ball valve into operation. Instead, contact the *Quick Response Center (QRC)* at Flowserve Flow Control GmbH for support.



**i** \*Observe temperature-dependent limit values for the pressure load for non-metallic sealing material. Refer to ↳ Annex C: Pressure-Temperature Diagram for Ball Seats.



CE marking according to European Pressure Equipment Directive 2014/68/EU (PED): According to the provisions of European Pressure Equipment Directive 2014/68/EU, ARGUS multi-way ball valves and equipment classified in Category II and above are marked with the CE symbol and the identification number of the notified body ("0036"). ARGUS multi-way ball valves in Category I are marked with "CE" only. ARGUS multi-way ball valves which, due to their design, are not covered by the Directive do not bear the CE marking.

The attached EU conformity declaration according to 2014/68/EU certifies that the provisions from the Directive have been fulfilled for the affected ARGUS multi-way ball valves and equipment.



## 2 Safety Information

### 2.1 Grouped Safety Messages

The following sections contain *Grouped Safety Messages* for the qualification of personnel and for the important life cycle phases of the ARGUS multi-way ball valve.

#### 2.1.1 Qualification of Personnel

##### **⚠ WARNING**

##### **Danger of injury due to inadequately qualified personnel!**

Inadequate qualification of the personnel can lead to severe injury.

- ▶ Make sure that only qualified personnel with suitable personal protective equipment (PPE) and suitable tools are deployed.  
↳ See Sections 2.2 to 2.5.
- ▶ Make sure that no unauthorised persons have access to the ARGUS multi-way ball valve.

##### **NOTICE**

##### **Danger of material damage due to inadequately qualified personnel!**

Inadequate qualification of the personnel can lead to material damage on the ARGUS multi-way ball valve.

- ▶ Make sure that only qualified personnel with suitable personal protective equipment (PPE) and suitable tools are deployed.  
↳ See Sections 2.2 to 2.5.
- ▶ Make sure that no unauthorised persons have access to the ARGUS multi-way ball valve.

## 2.1.2 ARGUS Multi-Way Ball Valve Life Cycle Stages

### Installation

#### **⚠ WARNING**

##### **Risk of injury due to improper installation works!**

Improper installation works may cause severe injury or death.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Ensure that unauthorized persons do not have any access to the ARGUS multi-way ball valve.
- ▶ Use appropriate safety measures in the workplace to ensure that parts cannot fall off.
- ▶ Ensure that the ARGUS multi-way ball valve is designed for the special operating conditions.
- ▶ Ensure that the connections, in particular the welding parameters, comply with the design specifications of the ARGUS multi-way ball valve.
- ▶ Monitor the temperature of the valve body in the seat area by using the temperature-sensing strips during welding.
- ▶ Provide safety instructions relating the piping (including the ARGUS multi-way ball valve).
- ▶ When installing the ARGUS multi-way ball valve via flange connection, determine the required tightening torques of the bolts.
- ▶ After completing the installation and before actuating the ARGUS multi-way ball valve, make sure to flush out the piping system.

If the ARGUS multi-way ball valve is intended to serve as permanent shut-off from the atmosphere, provide a blind flange or equivalent end.

### NOTICE

#### **Risk of property damage due to improper installation works!**

Improper installation works may cause property damage.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Ensure that unauthorized persons do not have any access to the ARGUS multi-way ball valve.
- ▶ Use appropriate safety measures in the workplace to ensure that parts cannot fall off.
- ▶ Ensure that the ARGUS multi-way ball valve is designed for the special operating conditions.
- ▶ Ensure that the connections, in particular the welding parameters, comply with the design specifications of the ARGUS multi-way ball valve.
- ▶ Monitor the temperature of the valve body in the seat area by using the temperature-sensing strips during welding.
- ▶ Provide safety instructions relating the piping (including the ARGUS multi-way ball valve).
- ▶ When installing the ARGUS multi-way ball valve via flange connection, determine the required tightening torques of the bolts.
- ▶ After completing the installation and before actuating the ARGUS multi-way ball valve, make sure to flush out the piping system.
- ▶ If the ARGUS multi-way ball valve is intended to serve as permanent shut-off from the atmosphere, provide a blind flange or equivalent end.

### NOTICE

#### **Risk of environmental pollution due to fluid residues!**

Fluid residues may harm the environment.

- ▶ Handle fluid residues with care.
- ▶ Temporarily place the ARGUS multi-way ball valve in the half-open position to let fluid residues escape.
- ▶ Use a vessel to collect any fluid residues and properly dispose of them.

## Commissioning/Decommissioning and Disassembly

### **⚠ WARNING**

#### **Risk of injury due to improper commissioning/decommissioning and disassembly!**

Improper commissioning/decommissioning and disassembly may cause severe injury or death.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Ensure that unauthorized persons do not have any access to the ARGUS multi-way ball valve.
- ▶ Use appropriate safety measures in the workplace to ensure that parts cannot fall off.

### **NOTICE**

#### **Risk of property damage due to improper commissioning/decommissioning and disassembly!**

Improper commissioning/decommissioning and disassembly may cause property damage.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Ensure that unauthorized persons do not have any access to the ARGUS multi-way ball valve.
- ▶ Use appropriate safety measures in the workplace to ensure that parts cannot fall off.

### **NOTICE**

#### **Risk of property damage due to flushing!**

Pressure from flushing may damage the sealing elements.

- ▶ Operate the ARGUS multi-way ball valve in the fully open or fully closed (90°) position.
- ▶ After flushing, check the tightness of the flange connections.
- ▶ If necessary, retighten the screws of the flange connection.

### **NOTICE**

#### **Risk of environmental pollution due to fluid residues!**

Fluid residues may harm the environment.

- ▶ Operate the ARGUS multi-way ball valve several times so that fluid residues and trapped pressure can escape.
- ▶ Use a vessel to collect any fluid residues and properly dispose of them.

## Maintenance/Troubleshooting

### **⚠ WARNING**

#### **Risk of injury due to improper maintenance/repair works!**

Improper maintenance/repair works may cause severe injury or death.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Ensure that unauthorized persons do not have any access to the ARGUS multi-way ball valve.
- ▶ Observe the maximum permissible tightening torque of the stuffing box:  
↳ See Annex D: Max. Permissible Screw Tightening Torques for Stuffing Box.
- ▶ Only use original spare parts provided by Flowserve Flow Control GmbH.
- ▶ Provide all necessary and appropriate tools and equipment for the maintenance/repair works.
- ▶ Use appropriate safety measures in the workplace to ensure that parts cannot fall off.
- ▶ Do not attempt to carry out repair/maintenance works on the ARGUS multi-way ball valve while in operation or under pressure.
- ▶ Contact the *Quick Response Center (QRC)* at Flowserve Flow Control GmbH for support if any repairs have to be carried out.

### **NOTICE**

#### **Risk of property damage due to improper maintenance/repair works!**

Improper maintenance/repair works may cause property damage.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Ensure that unauthorized persons do not have any access to the ARGUS multi-way ball valve.
- ▶ Observe the maximum permissible tightening torque of the stuffing box:  
↳ See Annex D: Max. Permissible Screw Tightening Torques for Stuffing Box.
- ▶ Only use original spare parts provided by Flowserve Flow Control GmbH.
- ▶ Provide all necessary and appropriate tools and equipment for the maintenance/repair works.
- ▶ Use appropriate safety measures in the workplace to ensure that parts cannot fall off.
- ▶ Do not attempt to carry out repair/maintenance works on the ARGUS multi-way ball valve while in operation or under pressure.
- ▶ Contact the *Quick Response Center (QRC)* at Flowserve Flow Control GmbH for support if any repairs have to be carried out.

### NOTICE

#### Risk of environmental pollution due to fluid residues!

Fluid residues may harm the environment.

- ▶ Operate the ARGUS multi-way ball valve several times so that fluid residues and trapped pressure can escape.
- ▶ Use a vessel to collect any fluid residues and properly dispose of them.

## Storage

### ⚠ WARNING

#### Risk of injury due to improper storage!

Improper storage may cause severe injury or death.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Ensure that unauthorized persons do not have any access to the ARGUS multi-way ball valve.

### NOTICE

#### Risk of property damage due to improper storage!

Improper storage may cause property damage.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Ensure that unauthorized persons do not have any access to the ARGUS multi-way ball valve.
- ▶ Ensure that the ARGUS multi-way ball valve is in a fully open position.

## Packaging

### ⚠ WARNING

#### Risk of injury due to improper packaging!

Improper packaging may cause severe injury.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Ensure that unauthorized persons do not have any access to the ARGUS multi-way ball valve.

### NOTICE

#### Risk of property damage due to improper packaging!

Improper packaging may cause property damage.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Ensure that unauthorized persons do not have any access to the ARGUS multi-way ball valve.
- ▶ Ensure that the ARGUS multi-way ball valve is in open position.

## Transport

### ⚠ WARNING NOTICE

#### Danger of injury and material damage due to improper transport work!

Improper transport work can lead to severe injuries and material damage.

- ▶ Only deploy qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.  
↳ See Sections 2.2 to 2.5.
- ▶ Make sure that no unauthorised persons have access to the ARGUS multi-way ball valve.
- ▶ Secure the ARGUS multi-way ball valve against turning and tipping.
- ▶ Properly attach slings to the ARGUS multi-way ball valve.
- ▶ If the lifting gear is only attached to the ARGUS multi-way ball valve, never lift the entire unit of ball valve and pneumatic actuator.
- ▶ Protect the ARGUS multi-way ball valve against damage with a suitable transport protection (e.g. a packing blanket).
- ▶ Observe all transport securing regulations.

## 2.2 Responsibility of the Owner Company

ARGUS multi-way ball valves are frequently used as safety-relevant components in industrial plants and pipeline systems. The owner company is responsible for the intended use or intended operation of the ARGUS multi-way ball valve and all the necessary work during the Pneumatic Actuator's life cycle. They will take all the necessary preventive safety measures to protect the personnel and the environment.

The owner company is responsible for taking the following preventive safety measures:

- All applicable laws, technical safety regulations and standards, rules for avoiding accidents and protecting the environment as well as company regulations shall be observed and enforced.
- Correct use of the ARGUS multi-way ball valve shall be ensured.
- The operating conditions and limits of the ARGUS multi-way ball valve shall be continuously monitored and all risks ensuing from operation of the ARGUS multi-way ball valve shall be eliminated.

- Only personnel qualified for the necessary work in the life cycle of the ARGUS multi-way ball valve shall be deployed.
- The personnel shall be provided with extensive personal protective equipment (PPE) and suitable tools.
- A risk assessment of the company premises on which the ARGUS multi-way ball valves are operated shall be carried out.
- Company-specific work instructions shall be compiled for operation of the ARGUS multi-way ball valve.
- It shall be continuously monitored that the personnel have read and understood all the pertinent instructions and these instructions.
- The personnel shall be kept up to date with the latest knowledge by regular training courses.



### 2.3 Qualified Personnel

Qualified personnel are authorised by an individual who is responsible for the operational safety of the industrial plant or the pipeline system. He/she is empowered to perform all the necessary activities within the scope of his/her experience, knowledge of all applicable laws, technical safety regulations and standards, rules for avoiding accidents and protecting the environment as well as company regulations and operating conditions. Qualified personnel are capable of recognising and avoiding dangers. The owner company shall ensure that only qualified personnel are deployed for the necessary work within the ARGUS multi-way ball valve life cycle.





### 2.4 Personal Protective Equipment

It is the owner company's responsibility to provide the operating personnel with high-quality personal protective equipment (PPE). This personal protective equipment must also be suitable for work on the ARGUS multi-way ball valve within the scope of the life cycle. The following personal protective equipment must be provided by the owner company:

Table 3: Personal protective equipment

Personal Protective Equipment	
	Protective helmet
	Protective goggles



Personal Protective Equipment	
	Protective clothing
	Protective gloves
	Protective shoes
	Protective respiratory mask

## 2.5 Personnel Qualification

Any personnel of the operating company that works with the ARGUS multi-way ball valve must have appropriate knowledge and skills and fulfill the following conditions:

- Sufficient qualification and personal suitability for the respective activity.
- Successfully completed user training for supervised or unsupervised work with the ARGUS multi-way ball valve.
- Knowledge of the personal protective equipment (PPE) and the way this equipment functions.
- Knowledge of these instructions, particularly of safety messages and sections relevant to the activities to be performed.
- Knowledge of fundamental regulations regarding health and safety and accident prevention.

## 2.6 Target Groups

These instructions addresses the following target groups:

### 2.6.1 Management of the Operating Company

The operating company's management carries out the compliance and organizational management activities and can be held responsible for their decisions.

### 2.6.2 Specialist Staff

Thanks to their completed specialist training, experience and knowledge of the relevant specifications and appropriate working equipment, specialist staff are able to perform the task assigned to them and recognize and eliminate any possible work-related dangers by themselves.

### 2.6.3 Trained Persons

Trained persons have received training provided by the operating company about the tasks they are to perform and work-related dangers.

### 2.6.4 Working Activities of the Target Groups

The table below contains work activities assigned to the target groups.


	<p><b><i>In order to prevent personal injury and/or property damage, ensure that only suitably qualified target groups are allowed to perform the work activities specified in the table below.</i></b></p>
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Table 4: Target groups with assigned work activities

Target Groups	Work Activities
Management and executives of the operating company	<ul style="list-style-type: none"> <li>■ Compliance and organizational management (this includes initially reading and observing these instructions before personnel do)</li> <li>■ Creation of training materials and conducting of training courses</li> </ul>
Specialist staff	<ul style="list-style-type: none"> <li>■ Installation</li> <li>■ Commissioning/decommissioning</li> <li>■ Maintenance</li> <li>■ Repairs (fault rectification)</li> <li>■ Returns and disposal</li> <li>■ Other kind of related work activities</li> </ul>
Trained persons	<ul style="list-style-type: none"> <li>■ Unpacking</li> <li>■ Packaging</li> <li>■ Transportation</li> <li>■ Storage</li> <li>■ Other kind of related work activities</li> </ul>

## 2.7 Notes on Product Warranty

Any non-intended use of the ARGUS multi-way ball valve may compromise its function. This leads to invalidation of any product warranty claims!




Note that the operating company shall be liable in the following cases:



- The ARGUS multi-way ball valve is operated in a manner which is not consistent with these instructions, particularly safety instructions, handling instructions and Section 2.8 Intended Use.
- Personnel operate the ARGUS multi-way ball valve who are not sufficiently qualified to carry out their respective activities.
- No original spare parts or accessories of Flowserve Flow Control GmbH are used.
- Unauthorized changes are made to the ARGUS multi-way ball valve.

## 2.8 Intended Use

The ARGUS multi-way ball valve is used as a shut-off device within its operating parameters/limits appropriate for the application, e.g., in piping or on containers in the areas of processing, transport and treatment of liquids, gases and solid-containing fluids. It is either operated manually or its function is automated using an actuator and the corresponding control system.

	<p><b><i>In order to prevent personal injury and/or property damage, ensure that the operating parameters on the nameplate and the design of the ARGUS multi-way ball valve match the specified application.</i></b></p> <p><b><i>☞ See Section 1.9 Nameplate.</i></b></p> <p><b><i>Observe all labels on the ARGUS multi-way ball valve and keep them in a legible condition.</i></b></p> <p><b><i>If necessary, immediately replace any damaged and/or illegible labels.</i></b></p>
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ARGUS multi-way ball valves are generally suitable for operation in potentially explosive atmospheres. When used as intended, the ARGUS multi-way ball valves do not have their own potential sources of ignition and are therefore not "equipment" as defined by Article 1 of Directive 2014/34/EU ("ATEX Directive").


	<div style="background-color: red; color: white; padding: 5px; text-align: center; font-weight: bold; font-size: 1.2em;">  <b>DANGER</b> </div> <p><b>Risk of injury due to "Ex Area"!</b></p> <p>The explosion of an explosive atmosphere ("Ex Area") may cause severe injury or death.</p> <ul style="list-style-type: none"> <li>▶ Observe the intended use of the ARGUS multi-way ball valve.</li> <li>▶ Observe the specific limit values applicable to the hazardous area.</li> <li>▶ Observe the permissible fluid temperature and valve surface temperature.</li> <li>▶ Only assign sufficiently qualified personnel to do work in potentially explosive atmospheres.</li> <li>▶ Only use appropriate safe accessory components.</li> </ul>
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## 2.9 Non-intended Use

A non-intended use (only reasonably foreseeable misuse) is present in the following cases:

- The ARGUS multi-way ball valve is operated as a control valve.
- The ARGUS multi-way ball valve is operated outside its operating parameters/limits stated on the ARGUS multi-way ball valve nameplate.
- The ARGUS multi-way ball valve is installed, commissioned, maintained, repaired or worked on in any way that is not in compliance with these instructions.
- The ARGUS multi-way ball valve is operated without regard to the labels, such as arrows designating the installation orientation, warning signs, etc.

- The ARGUS multi-way ball valve is modified or used with spare parts not supplied by Flowserve Flow Control GmbH.
- The ARGUS multi-way ball valve is operated without having successfully passed all inspection acceptance criteria.
- The ARGUS multi-way ball valve is operated in a partially assembled condition.

 If there is any doubt as to the suitability of the ARGUS multi-way ball valve for the application intended, contact the *Quick Response Center (QRC)* at Flowserve Flow Control GmbH for advice, quoting the serial number or article number of the ARGUS multi-way ball valve as stated on the nameplate.

 If the application conditions change (e. g., fluid, temperature or pressures) contact the *Quick Response Center (QRC)* at Flowserve Flow Control GmbH for support before putting the ARGUS multi-way ball valve in operation again.

## 2.10 General Sources of Danger/Residual Risks

This section points out general sources of danger/residual risks that exist during intended and non-intended use (only reasonably foreseeable misuse).

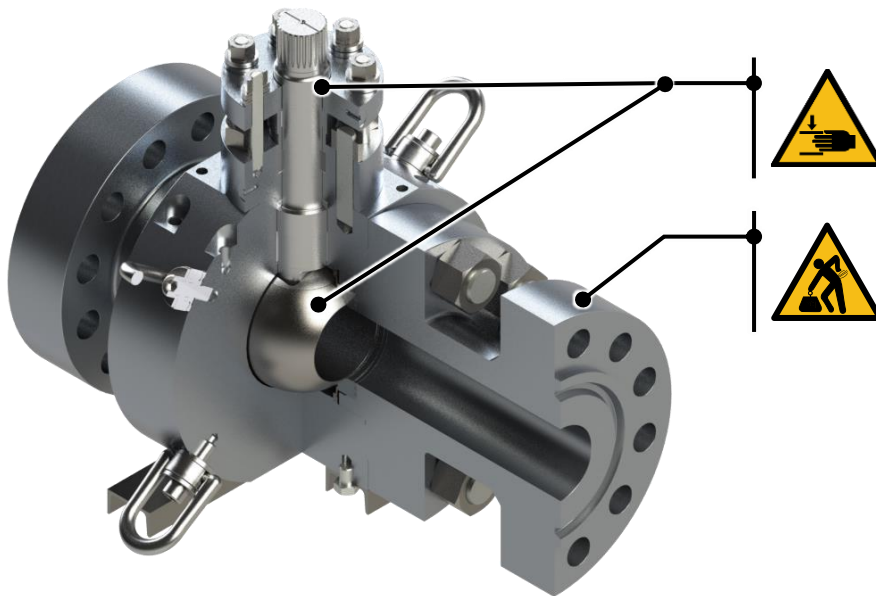





Figure 1: General sources of danger/residual risks on a ball valve

 This figure shows the main components of a ball valve to illustrate general sources of danger. The delivered ball valve may be a different model.

	<p><b>⚠ WARNING</b></p> <p><b>Risk of injury due to ball valve parts in motion!</b></p> <p>A ball valve wrench and ball which are in motion may cause crushing and/or amputate limbs.</p> <ul style="list-style-type: none"> <li>▶ Do not reach between the ball valve wrench and the ball valve guide washer.</li> <li>▶ Do not reach into the bore of the ARGUS multi-way ball valve.</li> <li>▶ Wear appropriate safety gloves.</li> </ul>
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	<p><b>⚠ WARNING</b></p> <p><b>Risk of injury due to a heavy ARGUS multi-way ball valve (≥ 15 kg)!</b></p> <p>A heavy ARGUS multi-way ball valve (≥ 15 kg) can cause back injuries when lifted without suitable lifting gear and slings.</p> <ul style="list-style-type: none"> <li>▶ Lift the ARGUS multi-way ball valve only in accordance with the operator's work instructions, industry standards and current legislation.</li> <li>▶ Before lifting the ARGUS multi-way ball valve, first find out the approximate ball valve weight.</li> <li>▶ Only lift the ARGUS multi-way ball valve with ≥ 15 kg with suitable lifting gear and slings.</li> <li>▶ Always wear an appropriate personal protective equipment (PPE).</li> </ul>
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Furthermore, in case of a non-intended use (only reasonably foreseeable misuse) the following may occur:

- Failure of the ARGUS multi-way ball valve's primary functions.
- Damage to the industrial plant or piping system.
- Failure of required maintenance and repair methods.
- General risk of injury to personnel.
- Environment pollution caused by substances leaking from the ARGUS multi-way ball valve.

## 3 Product description

### 3.1 General product description

The ARGUS multi-way ball valve has many innovative design features that satisfy the highest standards in ball valve technology.

The ARGUS multi-way ball valve types MW 2, 8, 22, 76, 76 M are used as bubble-tight shut-off devices or shut-off valves in piping or on pressure vessels in the fields of processing, transport and treatment of liquid and gaseous fluids as well as fluids with solid contents.

ARGUS multi-way ball valves consist of a body in which a cylindrically bored ball is embedded for coarse flow control. The ball is inserted into the body via a trunnion bearing or shaft bearing. Depending on its size, the ARGUS multi-way ball valve can be opened or closed manually with a valve wrench or handwheel, or automatically using a hydraulic, pneumatic or electric actuator.

ARGUS multi-way ball valves are durable, operate reliably even after many switching cycles and close bubble-tight even after long periods of non-use. These characteristics make ARGUS multi-way ball valves an excellent choice for shut-off devices and control applications where ARGUS multi-way ball valves are often preferred over valves.

ARGUS multi-way ball valves are used in the chemical, petrochemical, refining and gas industries as well in other fields.

### 3.2 Design features

The ARGUS multi-way ball valves MW 2, 8, 22, 76, 76 M may have the following design features:

- Designed as three-way or four-way ball valves with any bore and as an ARGUS multi-way ball valve combination for 6-8-way valves.
- One-piece body design with nozzle or flange connection
- Soft or metallic ball seal
- Shaft-mounted ball (MW 2 and 8)
- Trunnion mounted ball (MW 76 and 76M)
- Anti-blowout and anti-static stem
- Belleville washer supported ball seal (up to DN 300) with cavity pressure relief
- Spiral spring supported ball seal (from DN 350) with cavity pressure relief
- Long-life stem double sealing system
- Connecting plate design according to EN ISO 5211 for easy actuator mounting (MW 76 and 76M)
- Available sizes from DN 5 (1/8") to DN 600 (24") with full or reduced bore
- Supported pressure classes from PN 10 to PN 500 (ASME classes 150 to 2500)
- Standard temperature range from -10 °C to +200 °C (except for special versions of the ARGUS multi-way ball valves)



Note that the actual design features of the ARGUS multi-way ball valve are specified in the delivery documents.

### 3.3 Scope of delivery

The scope of delivery generally includes the following components:

- ARGUS multi-way ball valve (normally switched to open position)
- Ball valve wrench (only up to DN 200)
- Connection protective caps
- instructions including EU declaration of conformity and installation declaration
- Other related documents (e.g. material certificates)
- Documents required by law




Note that the actual scope of delivery is specified in the delivery note.



## 4 Receipt of goods

### 4.1 Safety instructions

	<p><b>To avoid personal injury and/or material damage, ensure that inspection and unpacking are performed only by qualified personnel wearing appropriate personal protective equipment (PPE) and using suitable work tools.</b></p> <p>🔗 See chapter 2 Safety Information.</p>
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### 4.2 Checking the receipt of goods


1. Immediately after the receipt of goods, check the ARGUS multi-way ball valve against the delivery note for completeness.
    - ① A delivery note is included with every delivery.  
The information on the nameplate of the ARGUS multi-way ball valve allows clear identification and must match the information on the delivery note.
  2. Check the ARGUS multi-way ball valve for any transport damage.
  3. Immediately report any defect and/or material damage to the carrier and Flowserve Flow Control GmbH.
    - ① Flowserve Flow Control GmbH must receive any claims in written form within one month of receipt of the ARGUS multi-way ball valve.  
Note that Flowserve Flow Control GmbH cannot accept any claims that are made later.
- ✓ Checking the receipt of goods is complete.


### 4.3 Unpacking the ARGUS multi-way ball valve

1. Open the packing.
  2. Loosen and remove all of the load securing material.
  3. Carefully lift the ARGUS multi-way ball valve out of the packing.  
🔗 See chapter 12 Transport.
  4. If necessary, take apart the packing.
  5. Dispose of the packing and load securing materials that are no longer needed.  
🔗 See chapter 13 Disposal and recycling.
  6. Carefully transport the ARGUS multi-way ball valve to the place of use.  
🔗 See chapter 12 Transport.
- ✓ Unpacking the ARGUS multi-way ball valve is complete.

## 5 Installation

### 5.1 Safety instructions

	<p><b>To avoid personal injury and/or material damage, ensure that installation work is performed only by qualified personnel wearing appropriate personal protective equipment (PPE) and using suitable work tools.</b></p> <p>🔗 See chapter 2 Safety Information.</p>
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	<p style="background-color: orange; color: black; padding: 5px;"><b>⚠️ WARNING</b></p> <p><b>Risk of injury due to incorrect ball valve installation!</b></p> <p>Incorrect ball valve installation (installation direction of unidirectional ball valves contrary to specified flow direction or pressure direction) can result in death or serious injury due to leakage of the ball valve.</p> <ul style="list-style-type: none"> <li>▶ Install the ARGUS multi-way ball valve according to the specified flow direction or pressure direction.</li> <li>▶ Observe the following preparations for the flange installation.</li> </ul>
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<p style="background-color: blue; color: white; padding: 10px; font-weight: bold; font-size: 1.2em;">NOTICE</p>	<p><b>Risk of material damage due to incorrect ball valve installation!</b></p> <p>Incorrect ball valve installation (installation direction of unidirectional ball valves contrary to specified flow direction or pressure direction) can cause leakage of the ball valve.</p> <ul style="list-style-type: none"> <li>▶ Install the ARGUS multi-way ball valve according to the specified flow direction or pressure direction.</li> <li>▶ Observe the following preparations for the flange installation.</li> </ul>
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### 5.2 Preparations for flange installation

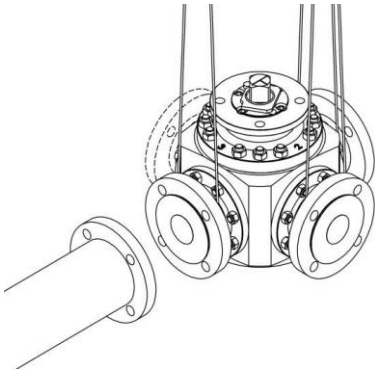
Observe the following safety measures before installing the ARGUS multi-way ball valve on the piping:

- Ensure that the installation direction for a unidirectional ARGUS multi-way ball valve corresponds to the specified flow direction or pressure direction.  
On an ARGUS multi-way ball valve with a valve wrench, the valve wrench should point in the flow direction.
- Ensure that the load-bearing capacity of the piping is sufficient to support the ARGUS multi-way ball valve and its accessories.
- Before installing the ARGUS multi-way ball valve, ensure that the piping is clean and free of any fluid residues and other substances.

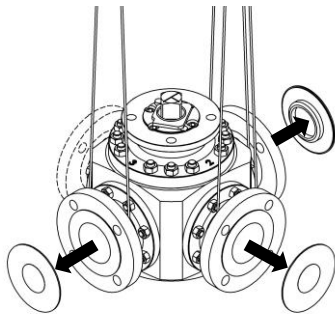
- Ensure that there is sufficient clearance around the ARGUS multi-way ball valve and its accessories to allow maintenance and/or repair work to be performed without any risk.
- If the ARGUS multi-way ball valve is intended for regular manual operation, provide an area where the operator can safely apply the required switching forces.

### 5.3 Mounting the ARGUS multi-way ball valve with flange connection to the piping (MW 76 and MW 76M)

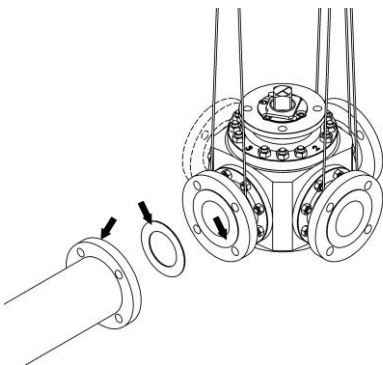
1. Transport the ARGUS multi-way ball valve to the installation site using lifting equipment that is appropriate for the weight and size of the ARGUS multi-way ball valve.  
↳ See chapter 12 Transport.



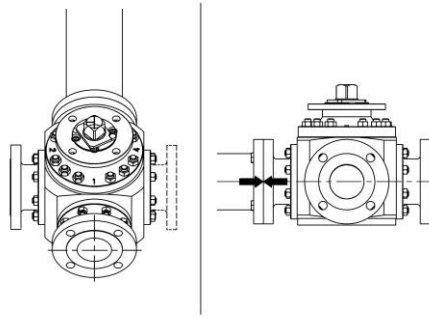
2. Remove the connection protective caps.



3. Clean the piping ends, flange connections and sealing surfaces.



4. Mount the ARGUS multi-way ball valve on the first flange:
  - ▶ Connect the ARGUS multi-way ball valve to the flange and position the gasket.
  - ▶ Check for correct positioning of the ARGUS multi-way ball valve and the gasket.



**5.** Tighten the screws crosswise.

**i** Use the correct tightening torques as specified by the industrial plant operator.



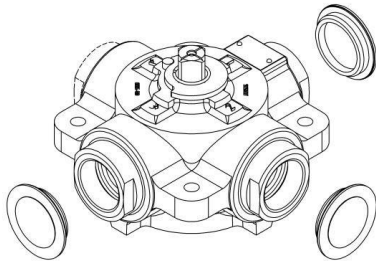
**6.** Mount the ARGUS multi-way ball valve on the other flanges:  
Proceed as described for the first flange.

**7.** Check the leak tightness of the entire flange connection with leak detection spray.

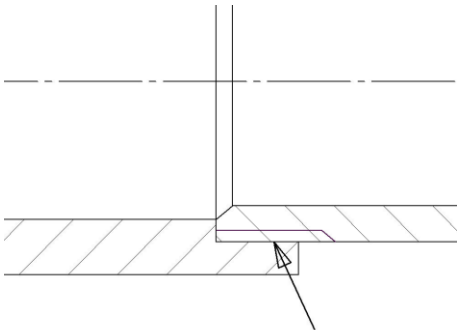
✓ Mounting the ARGUS multi-way ball valve on the piping is complete.

## 5.4 Mounting the ARGUS multi-way ball valve with threaded connection to the piping (MW 2, MW 8 and MW 22)

1. Transport the ARGUS multi-way ball valve to the installation site using lifting equipment that is appropriate for the weight and size of the ARGUS multi-way ball valve.  
↳ See chapter 12 Transport.
2. Remove the connection protective caps.



3. Clean the piping ends, threaded connections and sealing surfaces.
4. Seal the threaded parts with thread sealant.



### NOTICE

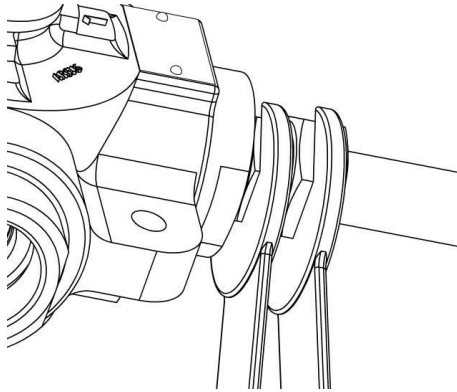
#### Risk of material damage due to improper bolting!

Improper bolting on the ARGUS multi-way ball valve can result in material damage to the thread.

- ▶ Use a torque wrench to bolt the ARGUS multi-way ball valve and observe the turning indication.

5. Bolt the ARGUS multi-way ball valve to the first thread:
  - ▶ Use an open-end wrench to hold against the inner nut of the bolting.

- ▶ Use a second open-end wrench to screw the outer nut onto the piping.



6. Mount the ARGUS multi-way ball valve on the other boltings: Proceed as described for the first threaded connection.
  7. Check the leak tightness of the entire threaded connection with leak detection spray.
- ✓ Mounting of the ARGUS multi-way ball valve on the piping is complete.

### 5.5 Mounting an actuator/aligning the actuator


Actuators are usually installed above the ARGUS multi-way ball valve when the stem is aligned in a vertical position. Other installation types can also be possible after evaluation of the specific application conditions.


- i** In case of heavy and/or asymmetrical actuators or actuators that are not mounted vertically, critical bending or torsional forces can occur especially in case of extended stems with a stuffing box. Obtain on-site assistance for the installation of such actuators.


In case of critical vibrations or shocks during operation, it may also be useful to provide additional reinforcements or shock absorption on the actuator.

## 6 Commissioning

### 6.1 Safety instructions

	<p><b>To avoid personal injury and/or material damage, ensure that commissioning, flushing and pressure testing are performed exclusively by qualified personnel wearing appropriate personal protective equipment (PPE) and using suitable work tools.</b></p> <p>🔗 See chapter 2 Safety Information.</p>
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	<p><b>⚠️ WARNING</b></p> <p><b>Risk of injury due to exceeding the operating parameters/operating limits!</b></p> <p>Exceeding the operating parameters/operating limits can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Never exceed the operating parameters/operating limits on the ball valve nameplate.</li> </ul>
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	<p><b>⚠️ WARNING</b></p> <p><b>Risk of injury due to automated operation!</b></p> <p>Automated operation (ball valve with actuator) can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Do not bring hands, hair or clothing near the moving parts.</li> <li>▶ Observe the instructions for the actuator.</li> </ul>
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<p><b>NOTICE</b></p>	<p><b>Risk of material damage due to flushing and/or pressure testing!</b></p> <p>Flushing water pressure and/or a (hydrostatic) pressure test can result in material damage to the sealing elements (e.g. on the stem and the stuffing box).</p> <ul style="list-style-type: none"> <li>▶ Never exceed the operating parameters/operating limits on the ball valve nameplate.</li> <li>▶ Switch the ARGUS multi-way ball valve to a fully open position.</li> <li>▶ After the flushing process and/or the pressure test, recheck the flange connection.</li> <li>▶ If necessary, retighten the screws on the flange connection according to the torque specifications of the plant operator.</li> </ul>
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## 6.2 Commissioning prerequisites

Ensure that the following prerequisites are carried out before commissioning:

- Flushing the piping
- Pressure test of the piping

## 6.3 Flushing the piping and performing pressure testing on the piping

### **⚠ WARNING**

#### **Risk of injury due to exceeding the operating parameters/operating limits!**

Exceeding the operating parameters/operating limits can result in death or serious injury.

- ▶ Never exceed the operating parameters/operating limits on the ball valve nameplate.

1. Flush the piping to remove all fluid residues, dirt or other foreign particles.
  2. Perform the pressure test on the piping to confirm the leak tightness and strength of the industrial plant part.
- ✓ Flushing and pressure testing of the piping are complete.

## 6.4 Switching the ARGUS multi-way ball valve

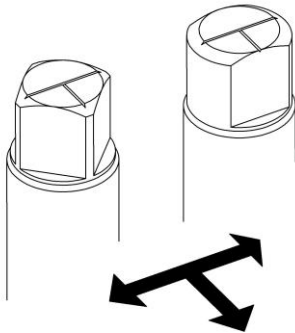
The ARGUS multi-way ball valve can be switched manually or automatically via an actuator.

ARGUS multi-way ball valves can have different switching diagrams, switching paths and bores. To operate the ARGUS multi-way ball valve, the switching diagram, the bore of the ball and the switching path must therefore be checked prior to switching. You can find this information in the delivery documents.

Possible values for switching paths are:

- 90°, 120°, 180° and 360°

The ARGUS multi-way ball valve is open by default or in the defined open position for ARGUS multi-way ball valves when the flat sides of a stem head or the groove of a square stem head are parallel to the flow direction.



For safety reasons, the switching position and ball bore can be identified via the ball valve wrench of the ARGUS multi-way ball valve.

Ball bores are designated with a so-called form letter. The most common bores have the form letters "L", "T" and "X", but other ball bores are also available for special applications.

Control scheme	Form letter	Number of bores
	L	2
	T	3
	X	4

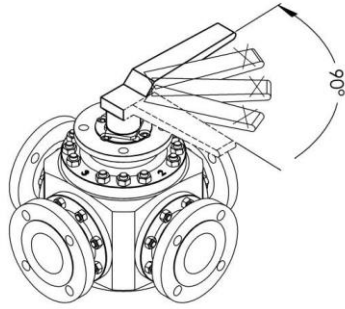
Table 1: Most frequent ball bores



The following describes the opening and closing of an ARGUS multi-way ball valve with a switching path of 90°. Prior to switching the ARGUS multi-way ball valve, check for the correct switching path and ball bore.

#### 6.4.1 Manually switching the ARGUS multi-way ball valve to open position

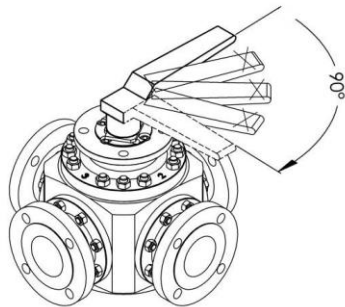
1. Turn the ball valve wrench by 90° anti-clockwise so that the ball valve wrench points towards ball valve opening 1.



- ✓ The ARGUS multi-way ball valve is open.

#### 6.4.2 Manually switching the ARGUS multi-way ball valve to closed position


1. Turn the ball valve wrench by 90° clockwise so that the ball valve wrench points towards ball valve opening 2.





- ✓ The ARGUS multi-way ball valve is closed.

## 7 Maintenance

### 7.1 Safety instructions

	<p><b>To avoid personal injury and/or material damage, ensure that maintenance work is performed exclusively by qualified personnel wearing appropriate personal protective equipment (PPE) and using suitable work tools.</b></p> <p>🔗 See chapter 2 Safety Information.</p>
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	<p><b>⚠️ WARNING</b></p> <p><b>Risk of injury due to automated ARGUS multi-way ball valve!</b></p> <p>Moving parts of an automated ARGUS multi-way ball valve can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Keep hands, hair or clothing away from moving parts.</li> <li>▶ Observe the instructions and their safety instructions for the automation components.</li> </ul>
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	<p><b>⚠️ WARNING</b></p> <p><b>Risk of injury due to fluid residues and trapped pressure!</b></p> <p>Fluid residues and trapped pressure can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Switch the ARGUS multi-way ball valve several times so that fluid residues and trapped pressure can escape.</li> <li>▶ Collect the fluid residues with a collection container and dispose of them properly.</li> </ul>
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## 7.2 Required maintenance spare parts

Under particularly stressful operating conditions, wear and tear can occur on the sealing elements of the ARGUS multi-way ball valve after a certain period of time. Furthermore, very critical or difficult operating conditions may make it necessary to periodically replace components of the ARGUS multi-way ball valve.



For maintenance work, suitable spare parts are required.

Flowserve Flow Control GmbH offers repair kits or spare parts kits for every ARGUS multi-way ball valve.

To allow Flowserve Flow Control GmbH to offer suitable repair kits or spare parts kits for the ARGUS multi-way ball valve, the ARGUS multi-way ball valve must be correctly identified.

This technical identification is possible either via the customer order documents (e.g. delivery note or invoice) or via the information on the nameplate.

↪ See chapter 1.9 Nameplate: Identification of the ARGUS Multi-Way Ball Valve.

### 7.3 Maintenance plan




The following inspections/maintenance work can be carried out in the installed state. As a general rule, normal industrial plant operation does not have to be interrupted.

In the event of leakage, damage and/or a faulty operating condition:


↳ See chapter 8 Repair.


Table 5: Recommended maintenance work for the piping section


No.	Inspections/maintenance work	Interval
1	Check the flange and welded joint for leaks.	Every 6 months
2	Check the outer ARGUS multi-way ball valve gaskets for leaks and retighten the stuffing box if necessary (see section 8.4 Retightening the stuffing box nuts and replacing the stuffing box packing (seal packing)).	
3	Test connection (leakage detector on stem seal).	
4	Check the ARGUS multi-way ball valve for external damage due to corrosive influences or mechanical defects.	
5	Clean the ARGUS multi-way ball valve and repaint if necessary.	
6	If possible, open and close the ARGUS multi-way ball valve during industrial plant operation and check whether the ball valve stem runs smoothly.  Uneven running of the ball valve stem may indicate increased torque. In case of graphite stem seals, it is possible for the stem to not run entirely evenly although no defect is present.	
7	Check the actuator for secure mounting and functioning.	
8	Check all accessories for secure seating and functioning.	

## 8 Repair

### 8.1 Safety instructions

	<p><b>To avoid personal injury and/or material damage, ensure that repair work is performed exclusively by qualified personnel wearing appropriate personal protective equipment (PPE) and using suitable work tools.</b></p> <p>🔗 See chapter 2 Safety Information.</p>
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	<p><b>⚠️ WARNING</b></p> <p><b>Risk of injury due to repair work on the ARGUS multi-way ball valve during operation!</b></p> <p>Repair work on the ARGUS multi-way ball valve during operation or under pressure can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Do not perform any repair work on an ARGUS multi-way ball valve that is in operation or under pressure.</li> <li>▶ Observe the measures listed in the warnings that are embedded/integrated below.</li> <li>▶ Contact the service teams at Flowserve Flow Control GmbH or the <i>Flowserve Quick Response Centers</i> if repair work needs to be performed.</li> </ul>
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	<p><b>⚠️ WARNING</b></p> <p><b>Risk of injury due to repair or joint welding on the ARGUS multi-way ball valve!</b></p> <p>Non-metallic inclusions in the metal body of the ARGUS multi-way ball valve can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Do not perform any repair or joint welding.</li> <li>▶ Contact the service teams at Flowserve Flow Control GmbH or the <i>Flowserve Quick Response Centers</i> if repair or joint welding needs to be performed.</li> </ul>
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## 8.2 Spare parts required for repair work



For repair work, suitable spare parts are required. Flowserve Flow Control GmbH offers repair kits or spare parts kits for every ARGUS multi-way ball valve. To allow Flowserve Flow Control GmbH to offer suitable repair kits or spare parts kits for the ARGUS multi-way ball valve, the ARGUS multi-way ball valve must be correctly identified. This technical identification is possible either via the customer order documents (e.g. delivery note or invoice) or via the information on the nameplate.  
 ↳ See chapter 1.9 Nameplate: Identification of the ARGUS Multi-Way Ball Valve.

## 8.3 Troubleshooting table



Due to the many different ARGUS multi-way ball valve variants, mounted actuators and their uses, it is not possible to describe all of the types of faults along with their causes and remedies in the following troubleshooting table. For any type of fault, it is recommended to contact the service teams at Flowserve Flow Control GmbH or the *Flowserve Quick Response Centers* for appropriate support.

Table 6: Troubleshooting table

No.	Problem description	Possible causes	Remedies/ recommended measures
1	Leakage to outside	Stem seal or stuffing box packing are worn	Replace the stem seal or stuffing box packing ↳ Contact the <i>Quick Response Center (QRC)</i> at Flowserve Flow Control GmbH for this purpose
		Nuts on stuffing box are loose (stem seal has settled)	Retighten stuffing box nuts ↳ see section 8.4 Retightening the stuffing box nuts and replacing the stuffing box packing (seal packing)
		Body gasket worn	Replace the body gasket ↳ Contact the <i>Quick Response Center (QRC)</i> at Flowserve Flow Control GmbH for this purpose
		ARGUS multi-way ball valve incorrectly installed in piping	Check installation of ball valve ↳ see chapter 4 Installation
		The piping is not laid with stress relief	Lay the piping with stress relief
2	Leakage into piping	Ball seal worn	Replace the ball seal ↳ Contact the <i>Quick Response</i>



No.	Problem description	Possible causes	Remedies/ recommended measures
			Center (QRC) at Flowserve Flow Control GmbH for this purpose
3	ARGUS multi-way ball valve is sluggish	The ball valve interior is dirty	Clean the ball/ball valve ↪ Contact the Quick Response Center (QRC) at Flowserve Flow Control GmbH for this purpose

### 8.4 Retightening the stuffing box nuts and replacing the stuffing box packing (seal packing) (MW 76M)

For use at high temperatures (> 250 °C), ARGUS multi-way ball valves can be equipped with an extended stem and a stuffing box attachment. To eliminate a stem leak of the ARGUS multi-way ball valve, you must retighten the stuffing box nuts or replace the stuffing box packing (stem packing).

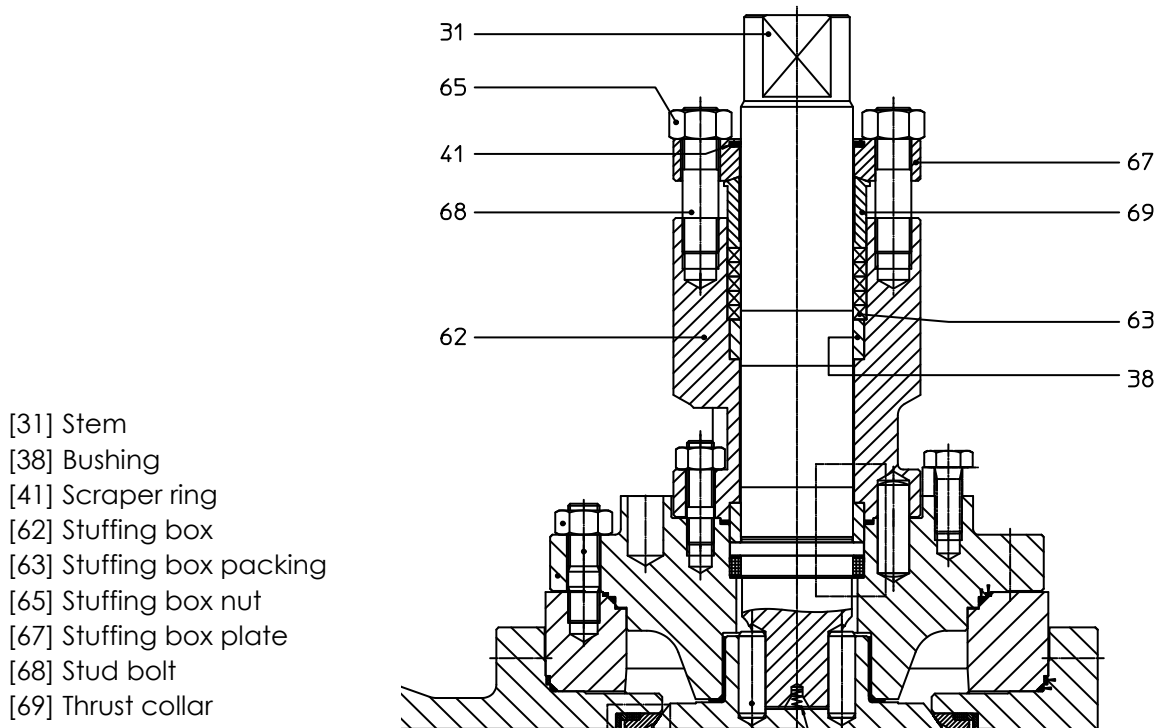
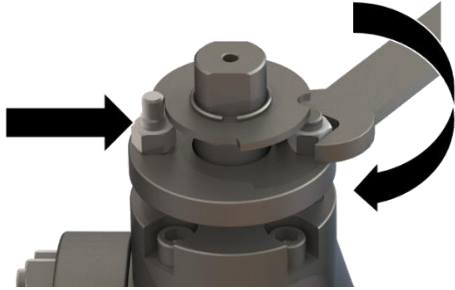


Figure 2: Stuffing box attachment of the ARGUS multi-way ball valve MW 76M

### Retightening the stuffing box nuts

1. Retighten the stuffing box nuts [65] evenly.



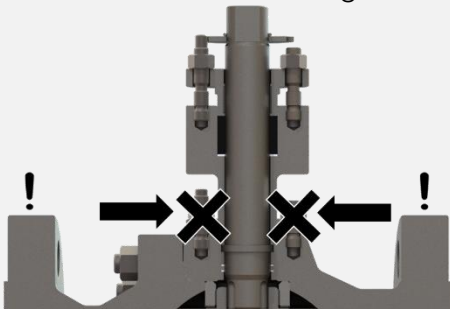
- ⓘ Observe the recommended maximum tightening torques for tightening the stuffing box nuts in Annex D: Max. Permissible Screw Tightening Torques for Stuffing Box.

**⚠ WARNING**

**Risk of injury due to loose fastening nuts on the ball valve body!**

Loose fastening nuts on the ball valve body can result in death or serious injury.



- ▶ Do not loosen the fastening nuts.



- ✓ Retightening of the stuffing box nuts is complete.

- ⓘ If you cannot eliminate a stem leak of the ARGUS multi-way ball valve by retightening the stuffing box nuts, replace the stuffing box packing (see following section).

## Replacing the stuffing box packing

-  Flowserve Flow Control GmbH offers replacement stuffing box packings and special tools (e.g. packing puller and setting bushing) if you quote the order number and item number for the ARGUS multi-way ball valve. You can find these numbers on the ball valve nameplate.
-  See chapter 1.9 Nameplate: Identification of the ARGUS Multi-Way Ball Valve  
Only use original spare parts from Flowserve Flow Control GmbH.

### WARNING

#### Risk of injury due to fluid residues, trapped pressure and high surface temperatures!

Fluid residues, trapped pressure and/or high surface temperatures can result in death or serious injury.

- ▶ Before replacing the stuffing box packing, switch the ARGUS multi-way ball valve several times so that fluid residues and trapped pressure can escape.
- ▶ Do not touch surfaces with high surface temperature. Allow these surfaces to cool down.
- ▶ Collect the fluid residues with a collection container and dispose of them properly.



The ARGUS multi-way ball valve

- is taken out of service.
- is not under pressure (switch the ARGUS multi-way ball valve several times so that trapped fluid residues and trapped pressure can escape).

### WARNING

#### Risk of injury due to pressurised stuffing box packing!

Components of the stuffing box attachment that are ejected due to pressure can result in death or serious injury.

- ▶ If the stuffing box packing is under pressure, do not unscrew the stuffing box nuts from the stud bolts.
- ▶ Allow the stuffing box packing to outgas for 24 hours with the stuffing box plate loosened.

1. If present, dismantle the stop plate and the snap ring.
2. Loosen the stuffing box nuts [65] on the stuffing box plate [67] without unscrewing them completely.
3. To be on the safe side, let the stuffing box packing [63] outgas for 24 hours with the stuffing box plate [67] loosened.
4. Unscrew the loosened stuffing box nuts [65] from the stud bolts [68].
5. Pull the stuffing box plate [67] and the thrust collar [69] from the stem [31].
6. Slowly and carefully remove the old stuffing box packing [63] with a suitable tool (e.g. packing puller).

ⓘ Be careful not to damage the stem and/or the inside of the stuffing box when removing the stuffing box packing since the ARGUS multi-way ball valve may leak if such damage occurs.

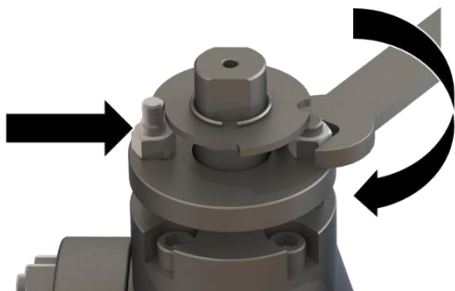
7. Insert a new stuffing box packing [63] into the stuffing box [62].

ⓘ Use a suitable setting bushing for this purpose.

8. Push the thrust collar [69] into the stuffing box [62].

8. Place the stuffing box plate [67] on the stuffing box [62].

9. Evenly retighten the stuffing box nuts [65] crosswise.

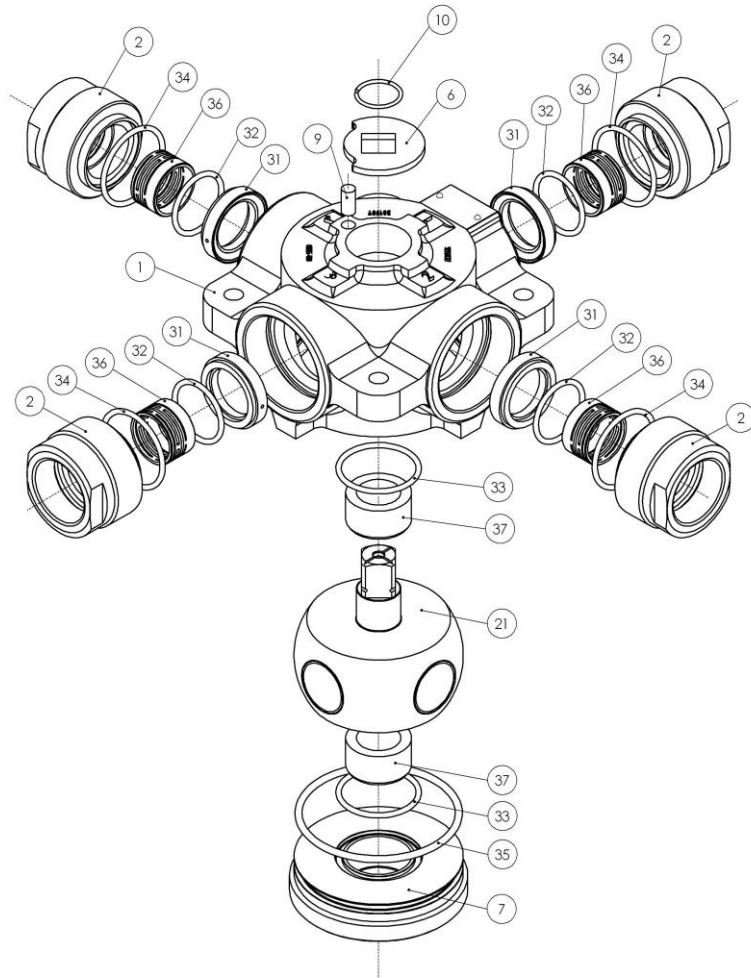


ⓘ Observe the recommended maximum tightening torques for tightening the stuffing box nuts in Annex D: Max. Permissible Screw Tightening Torques for Stuffing Box.

10. If present, mount the stop plate and the snap ring.

✓ Replacement of the stuffing box packing is complete.

## 8.5 Dismantling the ARGUS multi-way ball valve MW 2



- [1] Body
- [2] Connection nozzle
- [3] Dummy plug\*
- [6] Stop plate
- [7] Lock plug
- [9] Slotted piece
- [10] Snap ring
- [21] Plug shaft
- [31] Annular piston
- [32] O-ring
- [33] O-ring
- [34] O-ring
- [35] O-ring
- [36] Spring tube
- [37] Bushing

Figure 3: Components of the ARGUS multi-way ball valve MW 2  
\* Dummy plug not shown in illustration, replaces connection nozzle [2] if required



This figure shows the standard construction of an ARGUS multi-way ball valve 2. This may differ from the actual construction. For the actual construction, consult the sectional drawing and parts list for the corresponding ARGUS multi-way ball valve 2.

**⚠ WARNING**

**Risk of injury due to pressurised ARGUS multi-way ball valve!**

A pressurised ARGUS multi-way ball valve can result in death or serious injury.

- ▶ Prior to dismantling, briefly switch the ARGUS multi-way ball valve to a half-open position so that trapped fluid residues and trapped pressure can escape.

**⚠ WARNING**

**Risk of injury due to fluid residues and high surface temperatures!**

Fluid residues and/or high surface temperatures can result in death or serious injury.

- ▶ Briefly switch the ARGUS multi-way ball valve to a half-open position so that fluid residues and trapped pressure can escape.
- ▶ Do not touch surfaces with high surface temperature. Allow these surfaces to cool down.
- ▶ Collect all of the fluid residues with a collection container and dispose of them properly.



The ARGUS multi-way ball valve

- is taken out of service.
- is not under pressure (switch the ARGUS multi-way ball valve to a half-open position several times so that trapped fluid residues and trapped pressure can escape).

**1.** Dismantle the connection nozzle or dummy plug:

- ▶ Screw out the connection nozzle or dummy plug [2, 3] from the body [1].
- ▶ Remove the O-rings [34, 32] and the spring tube [36] with annular piston [31] from the connection nozzle or dummy plug [2, 3].

**2.** Dismantle the plug shaft:

- ▶ Screw out the lock plug [7] from the lower side of the body [1] using a special tool.
- ▶ Remove the bushing [37] and the O-ring [33] from the lower side of the plug shaft..
- ▶ Remove the O-ring [35] from the lock plug [7].
- ▶ Loosen the snap ring [10] from the plug shaft [21].
- ▶ Remove the stop plate [6] from the plug shaft [21].
- ▶ Pull the plug shaft [21] from below out of the body [1].
- ▶ Remove the bushing [37] and O-ring [33] from the top side of the plug shaft [21].

- ✓ Dismantling of the ARGUS multi-way ball valve is complete.

## 8.6 Mounting the ARGUS multi-way ball valve MW 2

### NOTICE

#### Risk of material damage due to use of unsuitable lubricants!

Lubrication of parts with lubricants that are unsuitable for the temperature classification can result in material damage to the ARGUS multi-way ball valve.

- ▶ Use a suitable lubricant that corresponds to the temperature classification of the ARGUS multi-way ball valve.

**i** During the mounting process, use an assembly grease that is suitable for the temperature range and the application of the corresponding ARGUS multi-way ball valve.

#### 1. Mount the plug shaft:

- ▶ Grease the bushing [37] with assembly grease and fit it onto the top side of the plug shaft [21] with a mounting sleeve.
- ▶ Grease the O-ring [33] with assembly grease and fit it onto the top side of the plug shaft [21] with a mounting sleeve.
- ▶ Press the plug shaft [21] from below into the body [1].
- ▶ Mount the stop plate [6] on the plug shaft [21].
- ▶ Arrange the snap ring [10] on the plug shaft [21].
- ▶ Grease the bushing [37] with assembly grease and fit it onto the bottom side of the plug shaft [21] with a mounting sleeve.
- ▶ Grease the O-ring [33] with assembly grease and fit it onto the bottom side of the plug shaft [21] with a mounting sleeve.
- ▶ Grease the O-ring [35] with assembly grease and fit it onto the lock plug [7].
- ▶ Screw the lock plug [7] into the lower side of the body [1] using a special tool.
- ▶ Loosen the lock plug [7] by approx. 30° so that the plug shaft [21] can move unhindered.

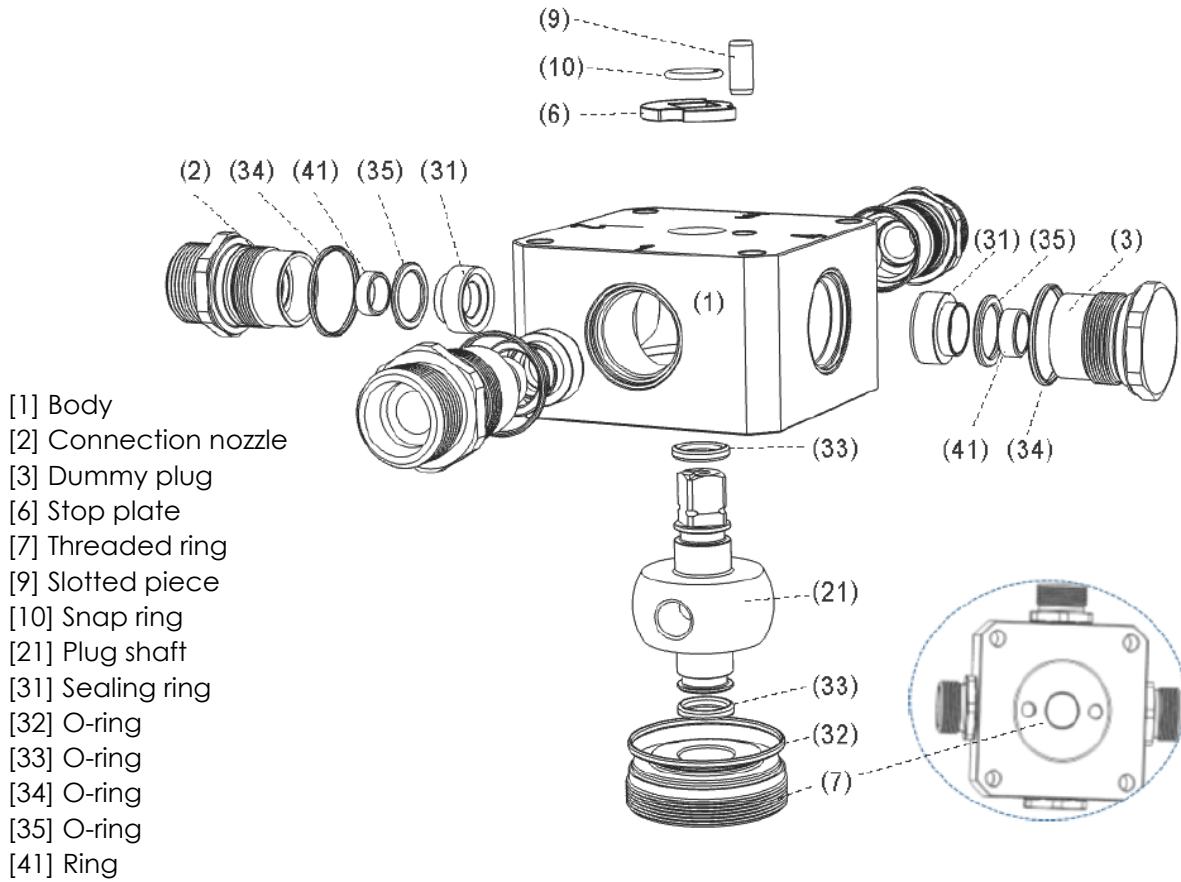
#### 2. Mount the connection nozzle or dummy plug:

- ▶ Grease the O-rings [34, 32] with assembly grease.
- ▶ Fit the O-rings [34] with assembly grease on the inner sides of the connection nozzle or dummy plug [2, 3].
- ▶ Place the spring tubes [36] in the inner sides of the connection nozzle or dummy plug [2, 3].
- ▶ Place the O-rings [32] in the inner sides of the connection nozzle or dummy plug [2, 3].
- ▶ Check the tightening torque that must be used to screw tight the connection nozzle or dummy plug.



- ① The recommended maximum tightening torques for tightening the connection nozzle or dummy plug are contained in Annex F: Tightening Torques Nozzle in Body .
  - ▶ Screw tight the connection nozzle or dummy plug [2, 3] into the body [1] according to the torque specification.
- ✓ Mounting of the ARGUS multi-way ball valve is complete.

### 8.7 Dismantling the ARGUS multi-way ball valve MW 8



- [1] Body
- [2] Connection nozzle
- [3] Dummy plug
- [6] Stop plate
- [7] Threaded ring
- [9] Slotted piece
- [10] Snap ring
- [21] Plug shaft
- [31] Sealing ring
- [32] O-ring
- [33] O-ring
- [34] O-ring
- [35] O-ring
- [41] Ring

Figure 4: Components of the ARGUS multi-way ball valve MW 8



This figure shows the standard construction of an ARGUS multi-way ball valve 8. This may differ from the actual construction. For the actual construction, consult the sectional drawing and parts list for the corresponding ARGUS multi-way ball valve 8.

**⚠ WARNING**

**Risk of injury due to pressurised ARGUS multi-way ball valve!**

A pressurised ARGUS multi-way ball valve can result in death or serious injury.

- ▶ Prior to dismantling, briefly switch the ARGUS multi-way ball valve to a half-open position so that trapped fluid residues and trapped pressure can escape.

**⚠ WARNING**

**Risk of injury due to fluid residues and high surface temperatures!**

Fluid residues and/or high surface temperatures can result in death or serious injury.

- ▶ Briefly switch the ARGUS multi-way ball valve to a half-open position so that fluid residues and trapped pressure can escape.
- ▶ Do not touch surfaces with high surface temperature. Allow these surfaces to cool down.
- ▶ Collect all of the fluid residues with a collection container and dispose of them properly.



The ARGUS multi-way ball valve

- is taken out of service.
- is not under pressure (switch the ARGUS multi-way ball valve to a half-open position several times so that trapped fluid residues and trapped pressure can escape).

**1.** Dismantle the connection nozzle or dummy plug:

- ▶ Screw out the connection nozzle or dummy plug [2, 3].
- ▶ Remove the rings [41] from the connection nozzle or dummy plug [2, 3].
- ▶ Remove the O-rings [35] from the sealing rings [31].
- ▶ Remove the sealing rings [31] from the openings of the body [1].
- ▶ Remove the O-rings [34] from the connection nozzle or dummy plug [2, 3].

**2.** Dismantle the plug shaft:

- ▶ Remove the snap ring [10] from the plug shaft [21].
- ▶ Remove the stop plate [6] from the plug shaft [21].
- ▶ Loosen the threaded ring [7] from the body [1] using a special tool.
- ▶ Remove the plug shaft [21] with threaded ring [7] from the body.
- ▶ Remove the threaded ring [7] from the plug shaft.
- ▶ Remove the O-rings [33] from both sides of the plug shaft [21].
- ▶ Remove the O-ring [32] from the body [1].

- ✓ Dismantling of the ARGUS multi-way ball valve is complete.

## 8.8 Mounting the ARGUS multi-way ball valve MW 8

### NOTICE

#### Risk of material damage due to use of unsuitable lubricants!

Lubrication of parts with lubricants that are unsuitable for the temperature classification can result in material damage to the ARGUS multi-way ball valve.

- ▶ Use a suitable lubricant that corresponds to the temperature classification of the ARGUS multi-way ball valve.

- ① During the mounting process, use an assembly grease that is suitable for the temperature range and the application of the corresponding ARGUS multi-way ball valve.

#### 1. Mount the plug shaft:

- ▶ Grease the O-ring [32] with assembly grease and insert it into the body [1] in the lower opening.
- ▶ Grease the O-rings [33] with assembly grease and fit them on both sides of the plug shaft [21] with a mounting sleeve.
- ▶ Place the plug shaft [21] in the threaded ring [7].
- ▶ Grease the thread in the body [1] with assembly grease.
- ▶ Place the plug shaft [21] with threaded ring [7] in the body.
- ▶ Tighten the threaded ring [7] in the body [1] using a special tool.
- ▶ Place the stop plate [6] on the plug shaft [21].
- ▶ Place the snap ring [10] on the plug shaft [21].

#### 2. Mount the connection nozzles:

- ▶ Grease the O-rings [34] with assembly grease.
- ▶ Fit the O-rings [34] onto the connection nozzle or dummy plug [2, 3].
- ▶ Press the sealing rings [31] by hand into the openings of the body [1].
- ▶ Grease the O-rings [35] with assembly grease and fit them onto the sealing rings [31].
- ▶ Carefully press the rings [41] into the connection nozzle or dummy plug [2, 3].
- ▶ Check the tightening torque that must be used to screw tight the connection nozzle or dummy plug.

- ① The recommended maximum tightening torques for tightening the connection nozzle or dummy plug are contained in Annex F: Tightening Torques Nozzle in Body .

- ▶ Screw tight the connection nozzle or dummy plug [2, 3] into the body [1] according to the torque specification.

- ✓ Mounting of the ARGUS multi-way ball valve is complete.

## 8.9 Dismantling the ARGUS multi-way ball valve MW 22

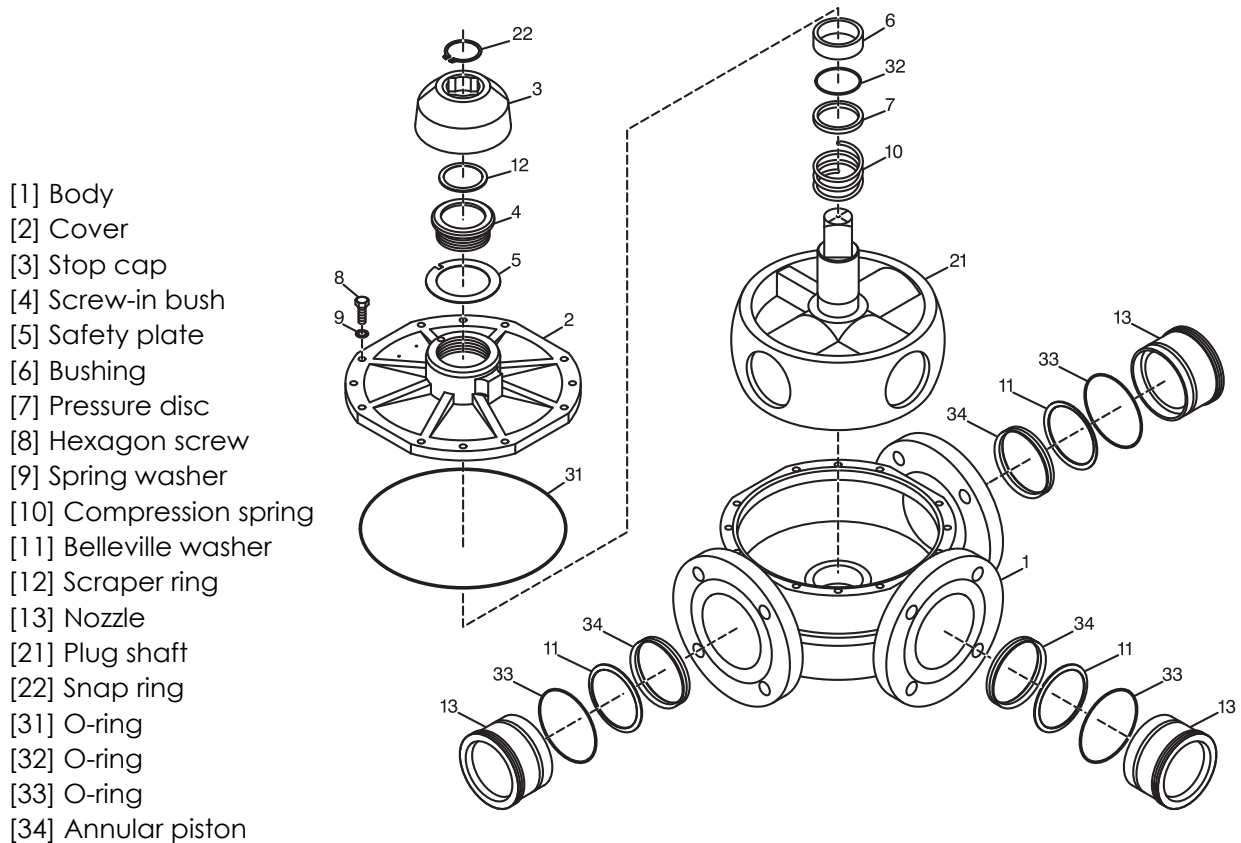


Figure 5: Components of the ARGUS multi-way ball valve MW 22



This figure shows the standard construction of an ARGUS multi-way ball valve 22. This may differ from the actual construction. For the actual construction, consult the sectional drawing and parts list for the corresponding ARGUS multi-way ball valve 22.

### **WARNING**

#### **Risk of injury due to pressurised ARGUS multi-way ball valve!**

A pressurised ARGUS multi-way ball valve can result in death or serious injury.

- ▶ Prior to dismantling, briefly switch the ARGUS multi-way ball valve to a half-open position so that trapped fluid residues can escape.

**⚠ WARNING**

**Risk of injury due to fluid residues and high surface temperatures!**

Fluid residues and/or high surface temperatures can result in death or serious injury.

- ▶ Briefly switch the ARGUS multi-way ball valve to a half-open position so that fluid residues can escape.
- ▶ Do not touch surfaces with high surface temperature. Allow these surfaces to cool down.
- ▶ Collect all of the fluid residues with a collection container and dispose of them properly.



The ARGUS multi-way ball valve

- is taken out of service.
- is not under pressure (switch the ARGUS multi-way ball valve to a half-open position several times so that trapped fluid residues can escape).

**1.** Dismantle the nozzles:

- ▶ Screw the nozzles [13] out of the body [1].
- ▶ Remove the O-rings [33], annular piston [34] and Belleville washers [11].

**2.** Dismantle the cover:

- ▶ Take off the snap ring [22] and the stop cap [3].
- ▶ Bend open the safety plate [5].
- ▶ Unscrew the screw-in bush [4] with scraper ring [12] from the cover [2].
- ▶ Remove the safety plate [5] from the cover [2].
- ▶ Loosen the hexagon screws [8] with the spring washers [9] to release the cover [2] from the body [1].
- ▶ Lift the cover [2] with the O-ring [31] from the body [1].

**3.** Dismantle the plug shaft:

- ▶ Pull off the compression spring [10], pressure disc [7], O-ring [32] and bushing [6] from the plug shaft [21].
- ▶ Lift the plug shaft [21] out of the body [1].

- ✓ Dismantling of the ARGUS multi-way ball valve is complete.

## 8.10 Mounting the ARGUS multi-way ball valve MW 22

### NOTICE

#### Risk of material damage due to use of unsuitable lubricants!

Lubrication of parts with lubricants that are unsuitable for the temperature classification can result in material damage to the ARGUS multi-way ball valve.

- ▶ Use a suitable lubricant that corresponds to the temperature classification of the ARGUS multi-way ball valve.

**i** During the mounting process, use an assembly grease that is suitable for the temperature range and the application of the corresponding ARGUS multi-way ball valve.

1. Mount the plug shaft:
    - ▶ Place the plug shaft [21] into the body [1].
    - ▶ Press the compression spring [10] and pressure disc [7] onto the plug shaft [21].
    - ▶ Grease the O-ring [32] with assembly grease.
    - ▶ Fit the O-ring [32] and the bushing [6] onto the plug shaft [21].
  2. Mount the cover:
    - ▶ Grease the O-ring [31] with assembly grease.
    - ▶ Fit the O-ring [31] onto the body [1].
    - ▶ Place the cover [2] onto the body [1].
    - ▶ Screw tight the cover [2] on the body [1] with the hexagon screws [8] and spring washers [9].
    - ▶ Bend back the safety plate [5] and place it on the cover [2].
    - ▶ Screw the screw-in bush [4] with the scraper ring [12] on the cover [2].
    - ▶ Mount the snap ring [22] and the stop cap [3] on the cover [2] and the plug shaft [21].
  3. Mount the nozzles:
    - ▶ Grease the O-rings [33] with assembly grease and fit them onto the nozzles [13].
    - ▶ Fit the belleville washers [11] and annular piston [34] onto the nozzles [13].
    - ▶ Screw tight the nozzles [13] in the body openings [1].
    - ▶ After screwing tight the nozzles [13], turn them back by  $\frac{1}{4}$  turn.
- ✓ Mounting of the ARGUS multi-way ball valve is complete.

### 8.11 Dismantling the ARGUS multi-way ball valve MW 76

- [1] Body
- [2] Cover
- [3] Flanged nozzle
- [4] Dummy plug\*
- [5] Flanged nozzle
- [10] Stop plate
- [11] Cover plate
- [12] Slotted pin
- [16] Cylindric screw
- [17] Belleville washer
- [18] Thrust collar
- [19] Stud bolt
- [20] Hexagon nut
- [21] Belleville washer
- [22] Snap ring
- [24] Stud bolt
- [25] Hexagon nut
- [30] Ball
- [31] Stem
- [40] Bushing
- [41] Scraper ring
- [44] Disc
- [45] Disc
- [47] O-ring
- [49] Sealing ring
- [50] Annular piston
- [51] O-ring
- [53] O-ring
- [54] O-ring
- [55] Bearing tape
- [57] O-ring
- [59] Bearing tape

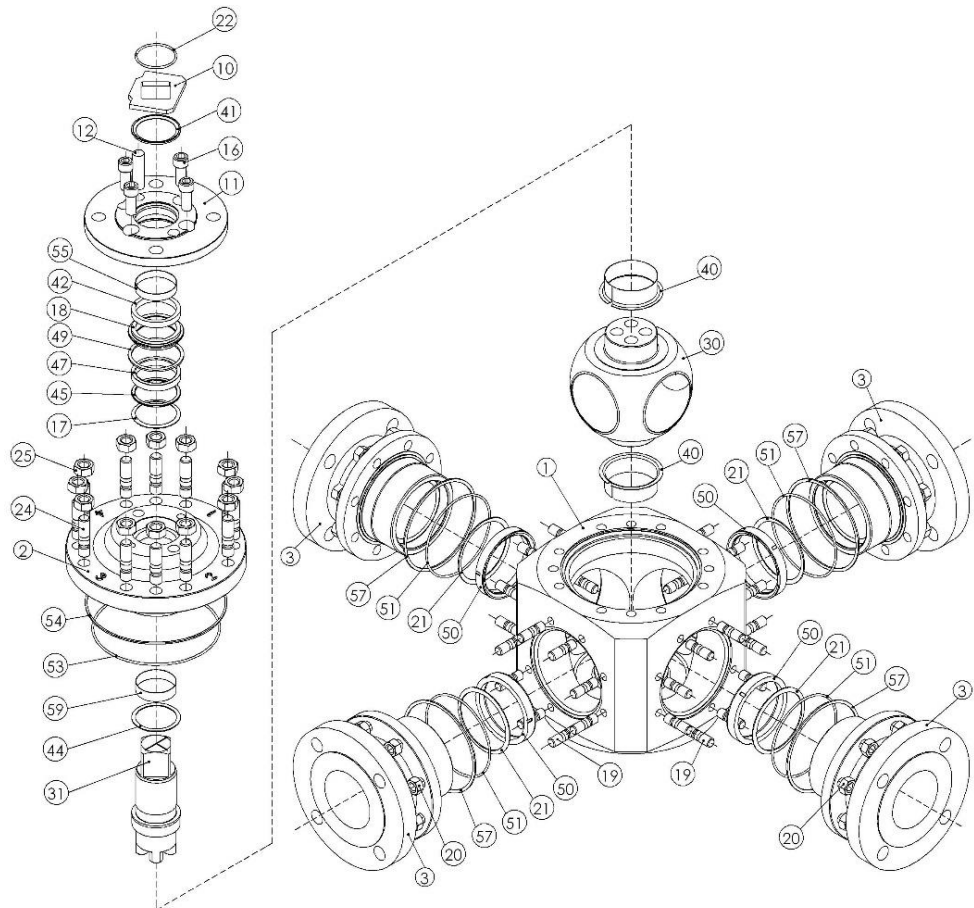


Figure 6: Components of the ARGUS multi-way ball valve MW 76  
\* Dummy plug not shown in illustration, replaces connection nozzle [3] if required



This figure shows the standard construction of an ARGUS multi-way ball valve 76. This may differ from the actual construction. For the actual construction, consult the sectional drawing and parts list for the corresponding ARGUS multi-way ball valve 76.

**⚠ WARNING**

**Risk of injury due to pressurised ARGUS multi-way ball valve!**

A pressurised ARGUS multi-way ball valve can result in death or serious injury.

- ▶ Prior to dismantling, briefly switch the ARGUS multi-way ball valve to a half-open position so that trapped fluid residues can escape.



**⚠ WARNING**

**Risk of injury due to fluid residues and high surface temperatures!**

Fluid residues and/or high surface temperatures can result in death or serious injury.

- ▶ Briefly switch the ARGUS multi-way ball valve to a half-open position so that fluid residues can escape.
- ▶ Do not touch surfaces with high surface temperature. Allow these surfaces to cool down.
- ▶ Collect all of the fluid residues with a collection container and dispose of them properly.



The ARGUS multi-way ball valve

- is taken out of service.
- is not under pressure (switch the ARGUS multi-way ball valve to a half-open position several times so that trapped fluid residues can escape).

**1.** Dismantle the cover plate:

- ▶ Loosen the snap ring [22] from the stem [31].
- ▶ Remove the stop plate [10] from the stem [31].
- ▶ Loosen the cylindrical screws [16] from the cover [2].
- ▶ Remove the scraper ring [41] from the cover [2].
- ▶ Remove the cover plate [11] from the cover [2].

**2.** Dismantle the cover:

- ▶ Loosen the hexagon nuts [25] from the stud bolts [24].
- ▶ Remove the cover [2] from the body [1].
- ▶ Remove the thrust collar [18] and sealing ring [49] from the cover [2].
- ▶ Remove the O-rings [53, 54] from the bottom side of the cover [2].

**3.** Dismantle the stem:

- ▶ Remove the Belleville washer [21], disc [45] and O-ring [47] from above from the mounted stem [31].
- ▶ Press the stem [31] from above out of the cover [2].
- ▶ Remove the bearing tape [59] from the stem [31].
- ▶ Remove the disc [44] from the stem [31].

**4.** Loosen the mounted flanged nozzle or dummy plug from the body:

- ▶ Loosen the hexagon nuts [20] from the stud bolts [19].
- ▶ Remove the flanged nozzle or dummy plug [3, 4] from the body [1].

**5.** Dismantle the flanged nozzle or dummy plug:

- ▶ Remove the annular pistons [50] from the flanged nozzle or dummy plug [3, 4].
- ▶ Remove the Belleville washers [21] from the flanged nozzle or dummy plug [3, 4].

- ▶ Remove the O-rings [57, 51] from the flanged nozzle or dummy plug [3, 4].
- 6. Dismantle the ball:
  - ▶ Pull the ball [30] out of the body [1].
  - ▶ Remove the bushings [40] from both sides of the ball [30].
- ✓ Dismantling of the ARGUS multi-way ball valve is complete.

## 8.12 Mounting the ARGUS multi-way ball valve MW 76

### NOTICE

#### Risk of material damage due to use of unsuitable lubricants!

Lubrication of parts with lubricants that are unsuitable for the temperature classification can result in material damage to the ARGUS multi-way ball valve.

- ▶ Use a suitable lubricant that corresponds to the temperature classification of the ARGUS multi-way ball valve.

**i** During the mounting process, use an assembly grease that is suitable for the temperature range and the application of the corresponding ARGUS multi-way ball valve.

1. Mount the ball:
  - ▶ Mount the bushings [40] on both sides of the ball [30].
  - ▶ Press the pre-assembled ball [30] into the body [1].
2. Mount the flanged nozzle or dummy plug:
  - ▶ Grease the O-rings [57, 51] with assembly grease and fit them onto the flanged nozzle or dummy plug [3, 4].
  - ▶ Place the belleville washers [21] with assembly grease on the flanged nozzle or dummy plug [3, 4].
  - ▶ Place the annular pistons [50] onto the flanged nozzle or dummy plug [3, 4].
3. Fasten the pre-assembled flanged nozzle or dummy plug in the body:
  - ▶ Press the pre-assembled flanged nozzle or dummy plug [3, 4] into the body [1] in the corresponding body openings, aligning the screw openings with the stud bolts [19] protruding from the body [1].
  - ▶ At first, loosely tighten the hexagon nuts [20] on the stud bolts [19].
  - ▶ Check the tightening torque that must be used to screw tight the hexagon nuts [20].

**i** The recommended tightening torques for tightening the hexagon nuts are contained in Annex E: Recommended Tightening Torques .

- ▶ Tighten the hexagon nuts [20] in a crosswise manner with the recommended tightening torques.

**4.** Pre-assemble the stem:

- ▶ Fit the disc [44] onto the stem [31].
- ▶ Fit the bearing tape [59] onto the stem [31].
- ▶ Press the pre-assembled stem [31] from below into the cover [2].
- ▶ Place the belleville washer [17], disc [45] and O-ring [47] from above into the cover [2] and over the pre-assembled stem [31].

**5.** Mount the cover:

- ▶ Grease the O-rings [53, 54] with assembly grease and pull them over the lower side of the cover.
- ▶ Insert the thrust collar [18] and sealing ring [49] into the cover [2] with assembly grease.
- ▶ Press the pre-assembled cover [2] with stem [31] from above into the body [1], aligning the holes in the cover [2] with the stud bolts [24] in the body [1].
- ▶ At first, loosely tighten the hexagon nuts [25] on the stud bolts [24].

**i** The recommended tightening torques for tightening the hexagon nuts are contained in Annex E: Recommended Tightening Torques .

- ▶ Tighten the hexagon nuts [25] in a crosswise manner with the recommended tightening torques.

**6.** Mount the cover plate:

- ▶ Place the cover plate [11] on the cover [2], aligning the holes with those in the cover [2].
- ▶ Place the scraper ring [41] on the cover [2].
- ▶ Tighten the cylindrical screws [16] on the cover [2].
- ▶ Arrange the stop plate [10] on the stem [31].
- ▶ Arrange the snap ring [22] on the stem [31].

✓ Mounting of the ARGUS multi-way ball valve is complete.

### 8.13 Sending in the ARGUS multi-way ball valve for repair

If you are unable to repair the ARGUS multi-way ball valve using this chapter, send the ARGUS multi-way ball valve to Flowserve Flow Control GmbH for repair.



Note that the ARGUS multi-way ball valve must be emptied, cleaned and preserved before you send the ARGUS multi-way ball valve to Flowserve Flow Control GmbH. Flowserve Flow Control GmbH will open and repair the ARGUS multi-way ball valve only if a decontamination certificate and the safety data sheet are enclosed with the ARGUS multi-way ball valve. A decontamination certificate and the safety data sheet are available from Flowserve Flow Control GmbH.



The ARGUS multi-way ball valve to be sent is

- emptied,
- cleaned,
- preserved,
- free from fluid residues and other substances.

1. Pack the ARGUS multi-way ball valve properly for return shipment (see chapter 10 Packing).
2. Enclose the completed and signed decontamination certificate and the safety data sheet with the ARGUS multi-way ball valve.





The decontamination certificate and the safety sheet are used to certify that the ARGUS multi-way ball valve poses no risk to persons or the environment. Flowserve Flow Control GmbH will accept the return shipment only if a completed and signed decontamination certificate and the safety data sheet are included with the return shipment.


3. Send the ARGUS multi-way ball valve with the decontamination certificate and the safety data sheet to Flowserve Flow Control GmbH.
- ✓ The return shipment is complete.

## 9 Decommissioning and dismantling

### 9.1 Safety instructions

	<p><b>To avoid personal injury and/or material damage, ensure that decommissioning work is performed exclusively by qualified personnel wearing appropriate personal protective equipment (PPE) and using suitable work tools.</b></p> <p>↳ See chapter 2 Safety Information.</p>
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	<p><b>⚠ WARNING</b></p> <p><b>Risk of injury due to falling loads!</b></p> <p>Improper fastening of loads can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Properly fasten the ARGUS multi-way ball valve and/or actuator. ↳ See chapter 12 Transport and the main instructions VAIOM001028.</li> <li>▶ Never stand under suspended loads.</li> </ul>
---	--

	<p><b>⚠ WARNING</b></p> <p><b>Risk of injury due to fluid residues and trapped pressure!</b></p> <p>Fluid residues and trapped pressure can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Never dismantle a pressurised ARGUS multi-way ball valve from the piping.</li> <li>▶ Switch the ARGUS multi-way ball valve several times so that fluid residues and trapped pressure can escape.</li> <li>▶ Collect the fluid residues with a collection container and dispose of them properly.</li> <li>▶ Observe the measures listed in the warnings that are embedded/integrated below.</li> </ul>
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## 9.2 Decommissioning and dismantling the ARGUS multi-way ball valve


### 9.2.1 Prerequisites for decommissioning and dismantling

Prior to decommissioning and dismantling, ensure that the following prerequisites are fulfilled:

- The operator specifications for decommissioning and dismantling are observed.
- The piping and the ARGUS multi-way ball valve are depressurised, free of fluid residues and cooled down so there is no risk of injury.

### 9.2.2 Decommissioning and dismantling the ARGUS multi-way ball valve

1. Take the affected piping system out of service.
2. Switch the ARGUS multi-way ball valve several times so that fluid residues and trapped pressure can escape.
3. Flush the piping to remove all fluid residues, dirt or other foreign particles.
4. Switch the ARGUS multi-way ball valve several times so that fluid residues and trapped pressure can escape.
5. Make sure there are no fluid residues, dirt or other foreign particles left in the piping.
6. Disconnect the power supply from the actuator and the control components.
7. Disconnect the actuator and the control components from the ARGUS multi-way ball valve.
8. Dismantle the ARGUS multi-way ball valve from the piping.

 When dismantling the ARGUS multi-way ball valve, follow the instructions in chapter 12 Transport.

- ✓ Decommissioning and dismantling are complete.

## 10 Storage

### 10.1 Safety instructions



**To avoid personal injury and/or material damage, ensure that storage work is performed exclusively by qualified personnel wearing appropriate personal protective equipment (PPE) and using suitable work tools.**  
 ↪ See chapter 2 Safety Information.



#### **⚠ WARNING**

##### **Risk of injury due to falling loads!**

Improper fastening of loads can result in death or serious injury.

- ▶ Properly fasten the ARGUS multi-way ball valve and/or actuator.  
 ↪ See chapter 12 Transport and the main instructions VAIOM001028.
- ▶ Never stand under suspended loads.

#### **NOTICE**

##### **Risk of material damage due to improper storage!**

Improper storage of the ARGUS multi-way ball valve can result in material damage.

- ▶ Observe the measures in the following sections.

## 10.2 Storing the ARGUS multi-way ball valve



The following prerequisites are fulfilled:  
The ARGUS multi-way ball valve

- is not connected to the piping.
- is free of any fluid residues and trapped pressure (observe your national regulations for disposal of harmful substances).
- is switched to the open position (as delivered).
- is free from dirt.
- is dry.
- has attached connection protective caps with protective paper consisting of volatile anti-corrosion agents.

1. In the case of an ARGUS multi-way ball valve ( $\geq 15$  kg), place the round slings of a suitable hoist around the body of the ARGUS multi-way ball valve or attach the round slings to the lifting lugs (if available).  
↳ See chapter 12 Transport.

2. Transport the ARGUS multi-way ball valve to its storage location.

3. For longer service life of the ARGUS multi-way ball valve, ensure the following storage location conditions are met:



Storage location conditions for the ARGUS multi-way ball valve:

Indoor/interior space (long-term storage):

- Dry, free of dust and adequately ventilated
- Storage temperature between +5 °C and +40 °C
- Relative humidity of < 50 %

Outdoor/construction site (short-term storage;  $\leq 7$  days):

- Storage temperature between -10 °C and +50 °C



The preparations for storage of the ARGUS multi-way ball valve are fulfilled.



The usability of the ARGUS multi-way ball valve must be checked by inspecting the ARGUS multi-way ball valve after (longer) storage and prior to commissioning. For this purpose, perform the maintenance work listed in chapter 7 Maintenance (section 7.3) on the ARGUS multi-way ball valve.



## 11 Packing

### 11.1 Safety instructions



**To avoid personal injury and/or material damage, ensure that packing work is performed exclusively by qualified personnel wearing appropriate personal protective equipment (PPE) and using suitable work tools.**  
⚡ See chapter 2 Safety Information.

### NOTICE

#### **Risk of material damage due to unsuitable packaging!**

Improper packing of the ARGUS multi-way ball valve can result in material damage.

- ▶ Observe the measures in the following sections.

### 11.2 Packing the ARGUS multi-way ball valve



The following prerequisites are fulfilled:  
The ARGUS multi-way ball valve

- is not connected to the piping.
- is free of any fluid residues and trapped pressure (observe your national regulations for disposal of harmful substances).
- is switched to the open position (as delivered).
- is free from dirt.
- is dry.

1. Provide the ARGUS multi-way ball valve with attached connection protective caps with protective paper consisting of volatile anti-corrosion agents.



The connection protective caps prevent dirt and other particles from penetrating inside the ARGUS multi-way ball valve. Moreover, they protect the flange sealing surfaces, the welding ends or threads from corrosion and other damage.

2. To ensure that the ARGUS multi-way ball valve reaches its destination without any damage, choose suitable packing.

**i** When selecting suitable packing, take into account the customer specifications, applicable laws, regulations for securing loads, characteristics of the goods to be transported (dimensions and weight), protection requirements and type of transport (road, rail, air and/or sea freight).

3. If necessary, protect the ARGUS multi-way ball valve against tipping over and shifting.
4. If necessary, affix suitable and clearly legible transport symbols to the packing in accordance with ISO 780 and DIN 55402 – especially in case of sea freight.

**i** Transport symbols on the wooden crates are either glued on or sprayed on with weatherproof paint.


Possible transport symbols are (list is not exhaustive):


 Top	 Fragile packaged goods
 Protect from moisture	 Protect from heat (sunlight)
 Centre of gravity	 Do not use hand hooks
 Attach here	


- ✓ Packing of the ARGUS multi-way ball valve is complete.

## 12 Transport

### 12.1 Safety instructions

	<p><b>To avoid personal injury and/or material damage, ensure that transport work is performed exclusively by qualified personnel wearing appropriate personal protective equipment (PPE) and using suitable work tools.</b></p> <p>☞ See chapter 2 Safety Information.</p> <p><b>To avoid personal injury and/or material damage, observe the transport instructions in chapter 4 of the main instructions VAIOM001028.</b></p>
---	--

	<p style="background-color: orange; color: black; padding: 5px;"><b>⚠ WARNING</b></p> <p><b>Risk of injury due to falling loads!</b></p> <p>Improper fastening of loads can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Properly fasten the ARGUS multi-way ball valve and/or actuator. ☞ See the following section 12.2 and the main instructions VAIOM001028.</li> <li>▶ Never stand under suspended loads.</li> </ul>
---	--

	<p style="background-color: orange; color: black; padding: 5px;"><b>⚠ WARNING</b></p> <p><b>Risk of injury due to improper transport!</b></p> <p>Improper transport can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Properly fasten the ARGUS multi-way ball valve and/or actuator. ☞ See the following section 12.2 and the main instructions VAIOM001028.</li> <li>▶ Observe all regulations related to securing loads.</li> </ul>
---	--

<h2 style="margin: 0;">NOTICE</h2>	
<p><b>Risk of material damage due to improper transport!</b></p> <p>Improper transport of the ARGUS multi-way ball valve can result in material damage.</p> <ul style="list-style-type: none"> <li>▶ Protect the ARGUS multi-way ball valve from damage using adequate transport protection (e.g. packing blanket).</li> <li>▶ Observe the measures in the following sections.</li> </ul>	

## 12.2 Transporting the ARGUS multi-way ball valve



The following prerequisites are fulfilled:  
The ARGUS multi-way ball valve

- is not connected to the piping.
- is free of any fluid residues and trapped pressure (observe your national regulations for disposal of harmful substances).
- is switched to the open position (as delivered).
- is free from dirt.
- is dry.

1. Provide the ARGUS multi-way ball valve with attached connection protective caps with protective paper consisting of volatile anti-corrosion agents.



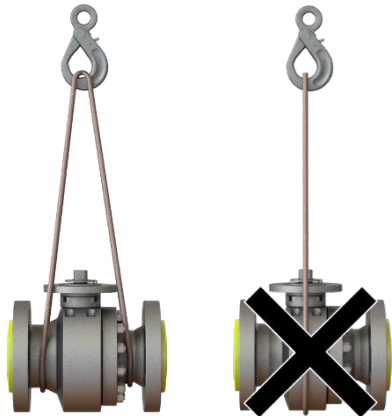
The connection protective caps prevent dirt and other particles from penetrating inside the ARGUS multi-way ball valve. Moreover, they protect the flange sealing surfaces, the welding ends or threads from corrosion and other damage.

2. Protect the ARGUS multi-way ball valve from damage using adequate transport protection (e.g. packing blanket).

3. In the case of a heavy ARGUS multi-way ball valve ( $\geq 15$  kg), place the round slings of a suitable hoist around the body of the ball valve or attach the round slings to the lifting lugs (if available).



Be aware that when using round slings, the centre of gravity may be higher than the attachment points.





4. Place the round slings in the load hook of a suitable hoist.
  5. Transport the ARGUS multi-way ball valve to the desired location and carefully lower it.
  6. Remove the round slings from the ARGUS multi-way ball valve.
- ✓ Transport of the ARGUS multi-way ball valve is complete.

## 13 Disposal and recycling

### 13.1 Safety instructions

	<p><i>To avoid personal injury and/or material damage, ensure that disposal and recycling work is performed exclusively by qualified personnel wearing appropriate personal protective equipment (PPE) and using suitable work tools. See chapter 2 Safety Information.</i></p>
---	---

	<p><b>WARNING</b></p> <p><b>Risk of injury due to fluid residues and trapped pressure!</b></p> <p>Fluid residues and trapped pressure can result in death or serious injury.</p> <ul style="list-style-type: none"> <li>▶ Switch the ARGUS multi-way ball valve several times so that fluid residues and trapped pressure can escape.</li> <li>▶ Collect the fluid residues with a collection container and dispose of them properly.</li> </ul>
--	--

	<p><b>NOTICE</b></p> <p><b>Risk of environmental pollution due to fluid residues!</b></p> <p>Fluid residues can damage the environment.</p> <ul style="list-style-type: none"> <li>▶ Switch the ARGUS multi-way ball valve several times so that fluid residues and trapped pressure can escape.</li> <li>▶ Collect the fluid residues with a collection container and dispose of them properly.</li> </ul>
---	---

## 13.2 Disposing of and recycling the ARGUS multi-way ball valve

At the end of the service life of the ARGUS multi-way ball valve, all relevant materials and parts must be recycled or disposed of in compliance with your local environmental protection laws and regulations. If the ARGUS multi-way ball valve contains hazardous substances or toxic fluid residues that are harmful to the environment or health, dismantling and disposal of the ARGUS multi-way ball valve must be carried out in accordance with your local/regional disposal regulations and laws.



The ARGUS multi-way ball valve

- is taken out of service.
- is disconnected from the piping, actuator and control components.
- is not under pressure.
- is decontaminated (free of hazardous substances or toxic fluid residues).

1. Hand over the ARGUS multi-way ball valve to an authorised disposal and/or recycling company.



An authorised disposal or recycling company will introduce the ARGUS multi-way ball valve into the appropriate disposal or recycling loop.



Disposal or recycling is complete.

## Annex A: Declaration of Conformity



### EU Declaration of Conformity acc. Directive 2014/68/EU

(Translation of AZ1787\_DE)

#### Product:

Argus-Ball Valve-Types

Type	DN	Type	DN
FK 75, FK 75M, FK 75F, FK76, FK 76M, FK78	65 - 1200	KK 8, KK 51	32 - 80
FK79, FK 79FC	15 - 100	MW 8	04 - 25
HK 35	40 - 900	MW 2	32 - 40
BK 8, BK 9, BK 10	04 - 25	MW 22	50 - 100
MK 8, MK10	25 - 50	MW 76, MW 76 (Combination), MW 76M	32 - 300

Note: In compliance with article 4 paragraph 3 of Directive 2014/68/EU, ball valves of nominal size up to DN 25 are "designed and manufactured in accordance with the sound engineering practice ... in order to ensure safe use". Such valves do not bear the CE marking.

#### Manufacturer:

Flowserve Flow Control GmbH  
Rudolf-Plank-Str. 2  
D-76275 Ettlingen

#### Directive:

2014/68/EU of the European Parliament and the Council of 15 May 2014 „Pressure Equipment Directive (PED)“

Flowserve Flow Control GmbH, the manufacturer, hereby declares under sole responsibility that the above listed products are in compliance with the provisions of Directive 2014/68/EU. The equipment is subjected to a conformity assessment procedure according Module H. A Full Quality Assurance System as stipulated in annex III section 11 "Module H" is applied.

The quality assurance system is monitored by the notified body:

**TÜV Süd Industrie Service GmbH**  
**Westendstraße 199, D-80686 München**

Identification code: **0036**

Certificate No.: **DGR-0036-QS-1067-...** (in the valid version)

Technical standards applied:

AD2000 Rulebook, Series A4; EN 12516-2

  
Peter Benien  
Managing Director

  
Thorsten Hecht  
Head of Research & Development

Ettlingen, 01 April 2022

**Experience In Motion**

Flowserve Flow Control GmbH  
argus@flowserve.com  
www.flowserve.com

AZ1787 EN S.1/1  
Rev.: Q

## Annex B: Declaration of Incorporation



### Declaration of Incorporation acc. Directive 2006/42/EC

(Translation of AZ2215\_DE)

#### Product:

Argus-Ball Valve-Types

Type	DN	Type	DN
FK 75, FK 75M, FK 75F, FK76, FK 76M, FK78	65 - 1200	KK 8, KK 51	32 - 80
FK79, FK 79FC	15 - 100	MW 8	04 - 25
HK 35	40 - 900	MW 2	32 - 40
BK 8, BK 9, BK 10	04 - 25	MW 22	50 - 100
MK 8, MK10	25 - 50	MW 76, MW 76 (Combination), MW 76M	32 - 300

#### Manufacturer and Authorized Person for the Compilation of the Technical Documentation:

Flowserve Flow Control GmbH  
Rudolf-Plank-Str. 2  
D-76275 Ettlingen

#### Directive:

2006/42/EC of the European Parliament and the Council of 17. May 2006, „European Machinery Directive“

Flowserve Flow Control GmbH as the manufacturer hereby declares that the above listed ball valve types and their variants, that are intended for automated operation in combination with pneumatic, electric or hydraulic actuation systems fulfill the basic requirements of the Directive 2006/42/EC for "partly completed machinery": Annex I, paragraphs 1.1.2, 1.1.3, 1.1.5, 1.2.1, 1.3.2, 1.3.3, 1.3.4., 1.3.7, 1.3.8, 1.5.2, 1.5.4, 1.5.6, 1.5.7, 1.5.13, 1.6.1, 1.7.1, 1.7.2, 1.7.3 & 1.7.4.

The conformity assessment was carried out in accordance with the harmonized standard EN ISO 12100:2010. Commissioning is prohibited until it has been ensured that the entire machine or system in which the Flowserve ball valves are installed comply with the provisions of Directive 2006/42/EC.

The relevant technical documentation for partly completed machinery in accordance with Annex VII, part B, has been created and can be provided to national authorities in case of justified requirement. The operating manual must be observed.

Applied standard:  

- EN ISO12100:2010

  
Peter Benien  
Managing Director

  
Thorsten Hecht  
Head of Research & Development

Ettlingen, 01 April 2022

**Experience In Motion**

Flowserve Flow Control GmbH  
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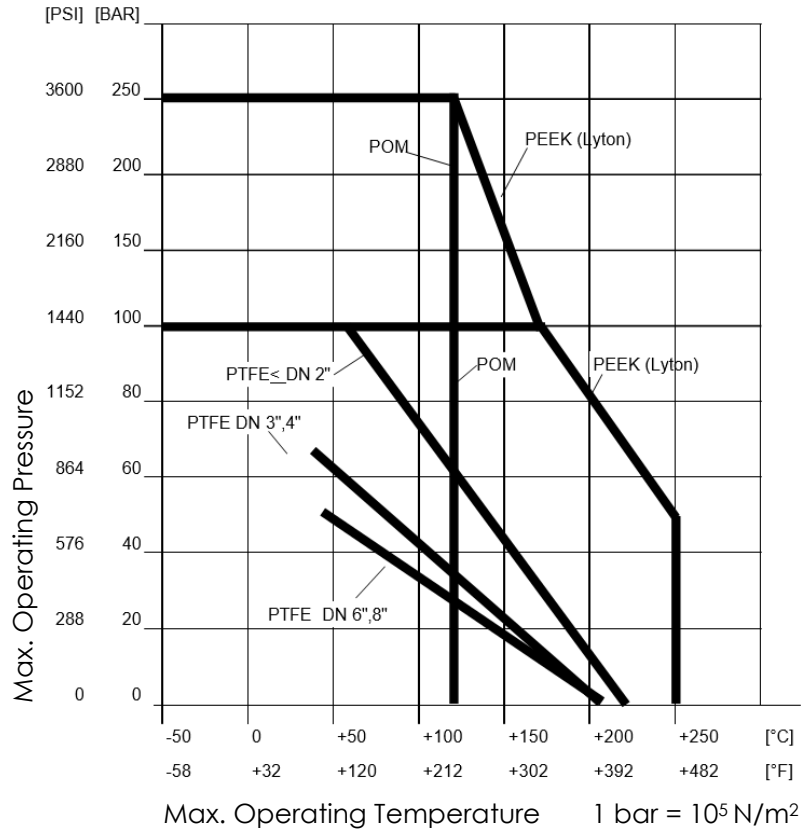
AZ2215 EN S.1/1  
Rev.: C



## Annex C: Pressure-Temperature Diagram for Ball Seats



Observe the operating parameters/limits shown in the diagram.



Annex D: Max. Permissible Screw Tightening Torques for Stuffing Box

**Annex D: Max. Permissible Screw Tightening Torques for Stuffing Box**

ARGUS Type/Valve Series	Nominal Diameter		Class	Stem	Screws			Maximum tightening torques for stuffing boxes**
	DN	NPS			Quantity	Size	Torque Nm	
MW 76M	80-100	3"-4"	150	2FL SW19	2	M12	22	
			300		2		22	
			600		2		29	
			900		2		106	
	150-200	6"-8"	150	2FL SW36	2	M16	54	
			300		2		54	
			600		2		71	
			900		4KT SW55		2	
	250-300	10"-12"	150	4KT SW55	2	M20	93	
			300	4KT SW55	2		93	
			600	4KT SW55	2		121	
			900	W 80	2		239	
	350-400	14"-16"	150	4KT SW55	2	M20	122	
			300	4KT SW55	2		122	
			600	W 80	2		159	
			900	W100	2		M24	

\*\* For ARGUS multi-way ball valves not listed please contact Flowserve Flow Control GmbH.

## Annex E: Recommended Tightening Torques Stud Bolts

Type/ Valve Series	Material Stud Bolt*	Torque in Nm by Size**														
		M8	M10	M12	M14	M16	M20	M22	M24	M27	M30	M33	M36	M39	M42	M48
<b>MW 76/76M</b>	320-L7 193-B16 193-B7	24	49	84	130	205	395	525	675	1000	1340	1850	2360	3030	3750	5650
	193-B7M 320-L7M 21CrMoV57	18	38	65	100	155	300	405	520	760	1050	1400	1800	2300	2900	4300
	5.6	10	21	35	55	85	165	220	285	415	570	760	980	1250	1550	2400
	8.8	21	44	75	115	180	360	485	630	910	1250	1700	2150	2800	3450	5200
	10.9	35	64	110	175	265	520	690	890	1300	1800	2400	3100	-	-	-
	A4-70	16	30	53	81	127	246	330	426	-	-	-	-	-	-	-
	193-B8M	22	45	80	120	185	300	405	520	720	970	1300	1700	2200	2700	4000
	A453-660 CL. A+B	19	40	70	105	165	320	430	550	800	1110	1500	1900	2450	3100	4600
	1.4980	19	41	71	108	170	330	440	570	830	1100	1500	1950	2500	3150	4700
	A2-70	16	30	53	81	127	246	330	426	-	-	-	-	-	-	-

\*The material designation of the stud bolt can be found on the parts list of the ARGUS multi-way ball valves  
\*\*For material-size combinations not listed, please contact Flowserve Flow Control GmbH .

## Annex F: Tightening Torques Nozzle in Body

### Nozzle in Body

DN	Torque (Nm)
05 – 06	90 – 110
08 – 10	110 – 130
12 – 16	150 – 170
20	200 – 220
25	250 – 270
32	280 – 300
40	300 – 330
50	320 – 350

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