

# Hygiene, Food and Beverage Valves

## Series 191400

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## 1 USING FLOWSERVE VALVES, ACTUATORS AND ACCESSORIES CORRECTLY

### 1.1 Using

The following instructions are designed to assist in unpacking, installing and performing maintenance as required on FLOWSERVE products. Product users and maintenance personnel should thoroughly review this bulletin prior to installing, operating or performing any maintenance.

In most cases FLOWSERVE valves, actuators and accessories are designed for specific applications (e.g. with regard to medium, pressure, temperature). For this reason they should not be used in other applications without first contacting the manufacturer.

### 1.2 Terms concerning safety

The safety terms **DANGER**, **WARNING**, **CAUTION** and **NOTE** are used in these instructions to highlight particular dangers and/or to provide additional information on aspects that may not be readily apparent.

**DANGER:** indicates that death, severe personal injury and/or substantial property damage will occur if proper precautions are not taken.

**WARNING:** indicates that death, severe personal injury and/or substantial property damage can occur if proper precautions are not taken.



**CAUTION:** indicates that minor personal injury and/or property damage can occur if proper precautions are not taken.



**NOTE:** indicates and provides additional technical information, which may not be very obvious even to qualified personnel.

Compliance with other, not particularly emphasised notes, with regard to transport, assembly, operation and maintenance and with regard to technical documentation (e.g. in the operating instruction, product documentation or on the product itself) is essential, in order to avoid faults, which in themselves might directly or indirectly cause severe personal injury or property damage.

### 1.3 Protective clothing

FLOWSERVE products are often used in problematic applications (e.g. extremely high pressures, dangerous, toxic or corrosive mediums). In particular valves with bellows seals point to such applications. When performing service, inspection or repair operations always ensure, that the valve and actuator are depressurised and that the valve has been cleaned and is free from harmful substances. In such cases pay particular attention to personal protection (protective clothing, gloves, glasses etc.).

### 1.4 Qualified personnel

Qualified personnel are people who, on account of their training, experience and instruction and their knowledge of relevant standards, specifications, accident prevention regulations and operating conditions, have been authorised by those responsible for the safety of the plant to perform the necessary work and who can recognise and avoid possible dangers.

## 1.5 Installation



**DANGER:** *Before installation check the order-no, serial-no. and/or the tag-no. to ensure that the valve/actuator is correct for the intended application.*

Do not insulate extensions that are provided for hot or cold services.

Pipelines must be correctly aligned to ensure that the valve is not fitted under tension.

Fire protection must be provided by the user.

## 1.6 Spare parts

Use only FLOWSERVE original spare parts. FLOWSERVE cannot accept responsibility for any damages that occur from using spare parts or fastening materials from other manufactures. If FLOWSERVE products (especially sealing materials) have been on store for longer periods check these for corrosion or deterioration before using these products. Fire protection for FLOWSERVE products must be provided by the end user.

## 1.7 Service / repair

To avoid possible injury to personnel or damage to products, safety terms must be strictly adhered to. Modifying this product, substituting nonfactory parts, or using maintenance procedures other than outlined in this instruction could drastically affect performance and be hazardous to personnel and equipment, and may void existing warranties. Between actuator and valve there are moving parts. To avoid injury FLOWSERVE provides pinch-point-protection in the form of cover plates, especially where side-mounted positioners are fitted. If these plates are removed for inspection, service or repair special attention is required. After completing work the cover plates must be refitted.

Apart from the operating instructions and the obligatory accident prevention directives valid in the country of use, all recognised regulations for safety and good engineering practices must be followed.



**WARNING:** *Before products are returned to FLOWSERVE for repair or service FLOWSERVE must be provided previously with a certificate which confirms that the product has been decontaminated and is clean. FLOWSERVE will not accept deliveries if a certificate has not been provided (a form can be obtained from FLOWSERVE).*

## 1.8 Storage

In most cases FLOWSERVE products are manufactured from stainless steel. Products not manufactured from stainless steel are provided with an epoxy resin coating. This means that FLOWSERVE products are well protected from corrosion. Nevertheless FLOWSERVE products must be stored adequately in a clean, dry environment. Plastic caps are fitted to protect the flange faces to prevent the ingress of foreign materials. These caps should not be removed until the valve is actually mounted into the system.

## 1.9 Valve and actuator variations

These instructions cannot claim to cover all details of all possible product variations, nor in particular can they provide information for every possible example of installation, operation or maintenance. This means that the instructions normally include only the directions to be followed by qualified personal where the product is being used for is defined purpose. If there are any uncertainties in this respect particularly in the event of missing product-related information, clarification must be obtained via the appropriate FLOWSERVE sales office.

## 2 UNPACKING

Each delivery includes a packing slip. When unpacking, check all delivered valves and accessories using this packing slip.

Report transport damage to the carrier immediately.

In case of discrepancies, contact your nearest FLOWSERVE location.

### 3 TECHNICAL DATA

Dimensions (mm) and weights (kg)

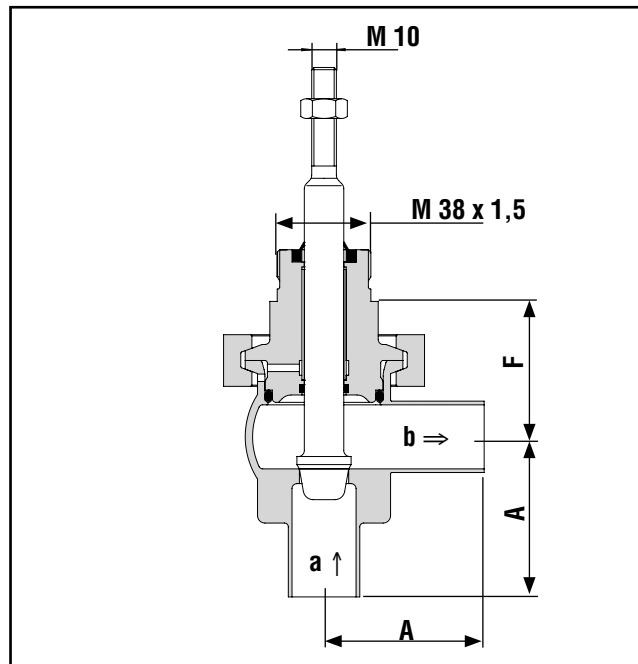


Fig. 1

Valve size		Dim. A DIN 11850 Weld ends	Dim. A ISO 2037 BS 4825 Part 1 Weld ends	Dim. A DIN EN ISO 1127/ DIN 2463 Reihe 1 Weld ends	Dim. A DIN 11851 Screwed ends	Dim. A 11864 Form GS-A Screwed ends	Dim. A DIN 32676 Clamp ends	Dim. A ISO 2852 Clamp ends	Dim. A ASME BPE-97
<b>DN 10 - 15</b>	<b>½"</b>	60	60	60	80	78	77	-	80
<b>DN 20</b>	<b>¾"</b>	60	60	60	83	80	77	-	80
<b>DN 25</b>	<b>1"</b>	65	65	65	93	90	85	85-NS25	-
<b>DN 32</b>	<b>1¼"</b>	70	70	70	101	99	90	-	-
<b>DN 40</b>	<b>1½"</b>	75	75	75	107	105	95	95-NS38	-
<b>DN 50</b>	<b>2"</b>	85	85	85	120	116	105	105-NS51	-
<b>DN 65</b>	<b>2½"</b>	100	100	100	140	136	128	120-NS63,5	-
<b>DN 80</b>	<b>3"</b>	110	110	110	155	152	138	128-NS76,1	-
<b>DN 100</b>	<b>4"</b>	120	120	120	173	169	148	140-NS101,6	-

Valve size		Dimension F 191400	Dimension F 191700 und 800	Weight without actuator
<b>DN 10 - 15</b>	<b>½"</b>	56	81	Upon request
<b>DN 20</b>	<b>¾"</b>	56	81	
<b>DN 25</b>	<b>1"</b>	56	81	
<b>DN 32</b>	<b>1¼"</b>	56	81	
<b>DN 40</b>	<b>1½"</b>	63	82	
<b>DN 50</b>	<b>2"</b>	70	84	
<b>DN 65</b>	<b>2½"</b>	77	105	
<b>DN 80</b>	<b>3"</b>	90	109	
<b>DN 100</b>	<b>4"</b>	100	115	

- 3.1 Application** Control Valve
- 3.2 Pressure rating** PN 25 ( depending on body connection)
- 3.3 Temperature range** 0 °C to 100 °C
- 3.4 Valve function**

To ensure optimum valve function, observe the flow direction from connection **a** to connection **b**.

**3.4.1 Function: air-to-open – spring-to-close**

Product flow direction **a** → **b** (see fig. 1)  
Product flow direction closed by spring force.

**3.4.2 Function: spring-to-open – air-to-close**

Product flow direction **a** → **b** (see fig. 1)  
Product flow direction closed by air force.

**3.5 Material data**

**Seals in contact with the medium**

Valve plug	1.4435
Operating temperature	max. 100° C
Sterilisation temperature	130° C
Operating pressure	max.25 bar

**Seals not in contact with the medium**

O-Rings	Silicon
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**Stainless steels**

In contact with the medium	1.4404 / 1.4435 (316L)
Not in contact with the medium	1.4301

**3.6 CIP cleaning agents**

Nitric acid 3% / Temperature 80° C
Soda lye 3% / Temperature 80° C

**3.7 SIP sterilisation agents**

Hot water / Temperature 130° C
Steam / Temperature 130° C

**3.8 Surfaces**

In contact with medium	Ra ≤ 0,6 µm Ra ≤ 0,5 µm Elec.-polished (opt.) Ra ≤ 0,4 µm Elec.-polished (opt.)
Not in contact with medium	Metal, turned bright

**3.9 Valve connection piping**

**Installation position**

Vertical, to ensure valve and line drain free.

**3.10 Connection types**

DIN 11850 series 2 (DN10 - 100) weld ends  
ISO 2037 / BS 4825 weld ends  
DIN EN ISO 1127 weld ends  
DIN 11851 threaded connection  
DIN 11864 Form A threaded connection  
DIN 11864 Form A flange connection  
DIN 2526 flange connection PN 10  
DIN 32676 clamp connection  
ISO 2852 clamp connection

**3.11 Pipe connection**

Separable (for disassembly).

**3.12 Welding instruction**

See *welding instructions (sec. 5.4)*.

**3.13 Installation**

See *assembly and disassembly instructions (sec. 6)*.

**3.14 Electrical and pneumatic connections**

Assemble after fitting the valve.

**3.14.1 Electrical connections**



**WARNING:** *Electrical connections to be made by a qualified electrician only.*

- Observe valid VDE-EVU and other local regulations.
- Check operating voltage and amperage of specific parts before connection.

**3.15 Quality of supply air**

Pressure	6 bar
Solid particles	Particle size max. 5 mm (0.4inch) Particle density max. 5 mg/m <sup>3</sup> (quality class 3)
Water content	Dew point +2° C (quality class 3)
Oil content	Oil free, max. oil content 25 mg/m <sup>3</sup> (quality class 3)

## 4 SAFETY

The valves described in this documentation are designed and produced so that they do not present any hazard for the operating and service personnel or for the system, in which the valves are installed, when handled properly observing all important instructions and safety precautions.

All installation and removal work, performed within the scope of maintenance or repair to the valves, should be accomplished only by trained personnel. When assembling or disassembling, observe the installation instructions. Proceed precisely as specified in the installation and removal instructions to prevent severe injury to the operating and service personnel.

The operator of the system is responsible for ensuring that the installation, operating and maintenance personnel assigned have the required qualifications. The operator is also responsible for ensuring that the personnel in question are familiar with the documentation and safety regulations.

The values listed in the chapter “*Technical Data*”, such as pressure, temperature, installation locations, etc., should be observed under all circumstances.

All materials and sealing elements must be suitable for these operating conditions and the media, with which the valves come into contact. The system operator is solely responsible for all risks and consequences resulting from failure to observe these operating parameters. Unauthorized modifications to the valves have an effect on the intended application and are not permissible.

In addition to these instructions, all local safety and accident prevention regulations apply.

## 5 INSTALLATION

### 5.1 General Instructions

We urgently recommend having the installation work accomplished by trained, expert personnel.

### 5.2 Delivery Status

The valves are tested at the factory and ready for installation when shipped. The valve can be connected to the product line with weld ends or selected pipe connections.

### 5.3 Installation Guidelines

#### 5.3.1 Installation Space

Before starting installation determine and define the connection axes. Take installation dimensions from dimension drawings. Provide for space for operation as well as service.

#### 5.3.2 Installation

Do not subject to pressure or tension.

#### 5.3.3 Installation Position

Vertical, to ensure that valve and line run empty.

### 5.4 Welding Guidelines

Range of application	Welding between weld connections and piping acc. to DIN 11850 Series 2
Welding procedure	TIG (tungsten Inert gas welding)
Type of weld	<ul style="list-style-type: none"> <li>• Prepare weld acc to DIN 2559 (joint shape I / for I-welds)</li> <li>• Welds conforming to EN 25817 ⇒ evaluation group B (high) butt weld I-joint acc. to DIN 8532</li> </ul>

#### 5.4.1 Welding in valves

Installation state	Single-piece body
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**CAUTION:** To prevent damage to sealing materials and functioning parts, always weld the body in a disassembled state. Disassemble according to disassemble instructions.

#### 5.4.2 Preparation of weld

Cut off ends of pipe even and deburr. Adjust welding ends on housing so that they make radially and axially level contact with the piping (centering tool). Ensure that no gap is present at the welding ends in contact with each other, because otherwise the forming gas would flow out reducing the corrosion resistance of the weld.

#### 5.4.3 Welding

Connect forming gas. Tack 3-4 points. TIG welding, manual or orbital (machine welding).

#### 5.4.4 Welding fillers

Filler match-up table

Material to be welded	Suitable welding filler			
	1.4316	1.4430	1.4440	1.4519
1.4301	x			
1.4306	x			
1.4401		x		
1.4404		x		
1.4435		x	x	x
1.4571		x	x	

#### 5.4.5 Final treatment of weld

##### Interior area

Final treatment of weld not required. Surface quality can be improved at accessible points by grinding.

##### Exterior areas

Final treatment process:

Pickling– brushing– grinding– polishing

#### 5.5 Cleaning

Clean entire valve thoroughly before installing.

#### 5.6 Installation

Install according to installation instructions.

## 6 DISASSEMBLY AND ASSEMBLY

(see fig. 2)

### 6.1 Installation

To remove the complete valve, separable connections must be provided in the vicinity of the valve connections **a** and **b**.

We recommend following distances from the valve:

Product inlet (**a**) : 1 x diameter

Product outlet (**b**) : 6 x diameter

### 7 DISASSEMBLY

Please observe separate documentation for disassembly of the actuator.



#### CAUTION:

*Before disassembly:*

*depressurise the line to atmospheric pressure and drain all fluid from the valve, close-off the supply air.*

**Valves with air-to-open actuators:** *tension the actuator springs using top handwheel or by applying supply air under the membrane.*



**WARNING:** *Failure to do this will cause the valve bonnet to spring-out when the clamp is released due to the spring pressure acting between the plug and seat. Observe electrical connection voltage, as necessary switch off power supply.*

7.1 Disconnect pneumatic and electrical feed lines.

7.2 On **air-to-open / spring-to-close** actuators tension actuator springs.

7.3 Remove actuator

Remove the coupling between the actuator stem and the plug stem (3). Loosen the slotted nut (M38x1.5) on the valve bonnet (2) and remove the actuator.

7.4 Release the tension on actuator springs.

7.5 Loosen and remove the TC clamp (4).

7.6 Remove the bonnet assy (2) from the body (1).



**CAUTION:** *To avoid damage to the O-ring (6) do not turn the bonnet.*

7.7 Pull the plug/stem (3) out of the bonnet (2).

7.8 Carefully remove the wiper (5).

7.9 Remove the O-Ring (7) which serves as the stem seal.

7.10 Remove the body O-Ring (6)

7.11 Remove the PTFE-guide (8) from the bonnet (2).

## 8 ASSEMBLY

Please observe separate documentation for assembly of the actuator.

#### Before assembly:

Thoroughly clean all surfaces.

8.1 Place O-Ring (7) in the bonnet (2).

8.2 Place the wiper (5) in the bonnet (2).

8.3 Place the housing gasket O-Ring (6) in the shoulder provided on the bonnet (2).

8.4 Insert the PTFE-guide (8) carefully in the bonnet (2) and ensure it is seated correctly to prevent damage to the guide.

8.5 Insert the plug/stem (3) into the bonnet (2).

8.6 Place the bonnet assy. (2) on the body (1).



**CAUTION:** *Insert the body straight. Ensure that the O-Ring (6) is seated correctly in the groove in the bonnet. To avoid damage to the O-ring (6) do not rotate the bonnet.*

8.7 Ensure that the bonnet is seated correctly on the body without a gap between the two. Replace the TC clamp (3) and tighten securely.

8.8 On **air-to-open /spring-to-close** apply supply pressure to move actuator to half stroke.



**WARNING:** If the actuator is not moved to half stroke the plug can contact the body when assembling and damage the seating faces and/or the valve body.

8.9 Mount the actuator on the valve and secure with slotted nut (M38x1,5).

8.10 Attach the coupling between valve and actuator.

8.11 Release tension on the actuator springs.

8.12 Reconnect pneumatic and electrical feed lines and prepare the valve for cleaning.

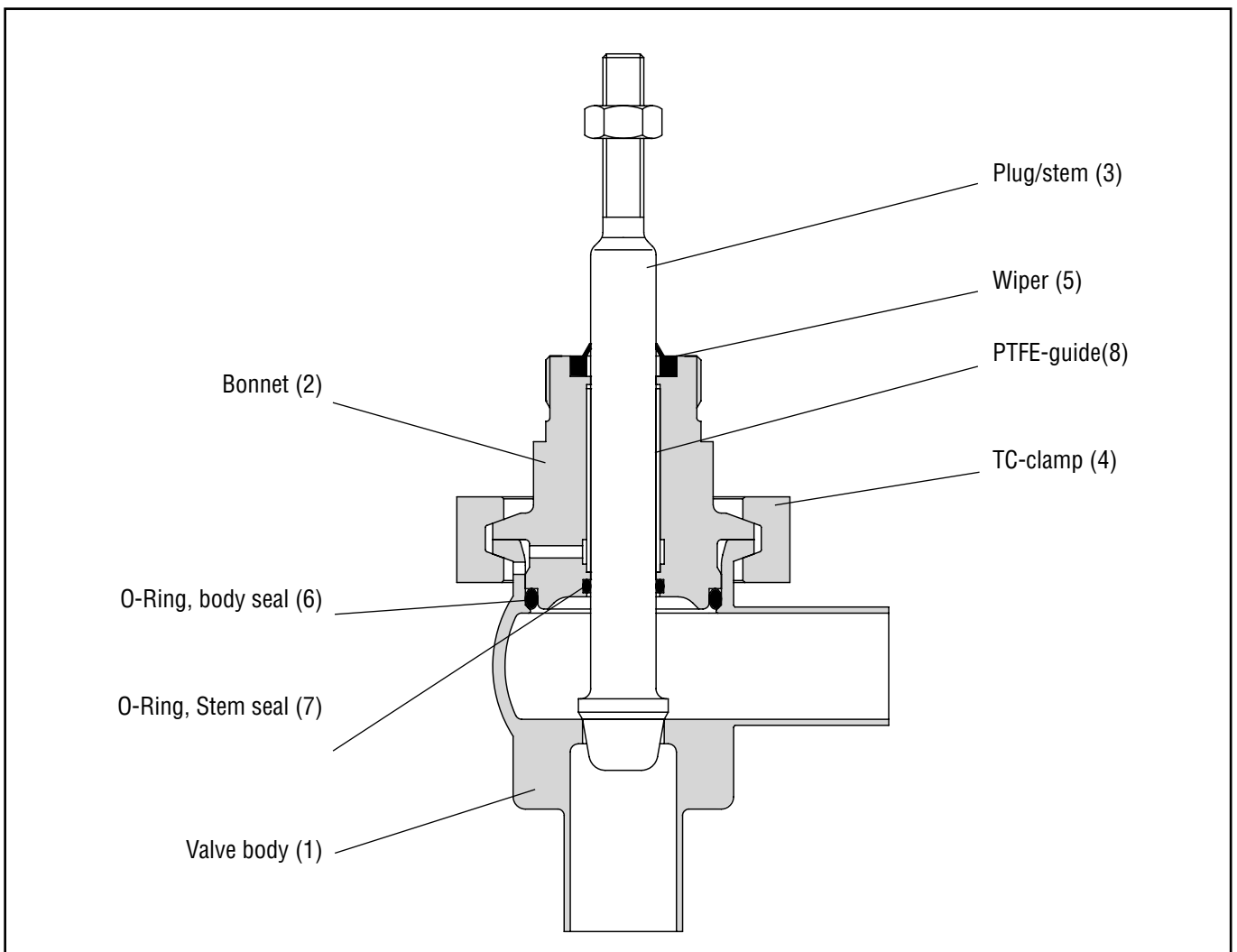


Figure 2

## 9 COMMISSIONING



**CAUTION:** Ensure that no foreign particles are present in the line system

### 9.1 Idle test

Operate valve once by actuating with compressed air, while checking mechanical function of valve.

- TC clamp (4) seated tightly
- Check air pressure and air connections for leakage
- Check stroke path; valve spindle (3) should open and close without jerking

Check function of the actuator based on documentation for actuator.

Clean system before operating with product for the first time.

### 9.2 Test Run under Operating Conditions

Check sealing elements for leakage.

Replace defective seals as described in installation and removal instructions.

Check mechanical functions (see idle test).

Check function of control drive (see idle test).

### 9.3 Initial Operation

Check valve function analog to test criteria for test run.

### 9.4 Malfunctions

Eliminate any malfunctions, which occur immediately according to installation and removal instructions.

### 9.5 Malfunctions

Eliminate any malfunctions, which occur immediately according to installation and removal instructions.

## 10 MAINTENANCE

### Before maintenance



#### CAUTION:

**Valves with air-to-open actuators:** tension the actuator springs using top handwheel or by applying supply air under the membrane.

Failure to do this will cause the valve bonnet to spring-out when the clamp is released due to the spring pressure acting between the plug and seat. Observe electrical connection voltage, as necessary switch off power supply.

Have repair work performed only by trained personnel authorised by the operator.

## 10.1 Inspection

FLOWSERVE valves do not require any special service. However perform a visual check for leakage and proper function between the maintenance intervals.

## 10.2 Maintenance

Maintenance intervals based on the actual operating conditions can only be determined by the user/operator, because they depend on the following application parameters:

- Operating time per day
  - Switching intervals
  - Type of product
- Type of cleaning (CIP / SIP)

We recommend the following data as guide values:

- For liquids with solid constituents and temperatures of 80° C to 100° C:  
approx. every 3 – 6 months
- For liquids with solid constituents and temperatures of approx. 60° C:  
approx. every 12 months
- For liquids without solid constituents and temperatures of max. 95° C:  
approx. every 24 months

Intervals of 12 months are recommended for cleaning systems.

Naturally, the specified values assume that the sealing material is resistant to any chemicals used in cleaning.

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