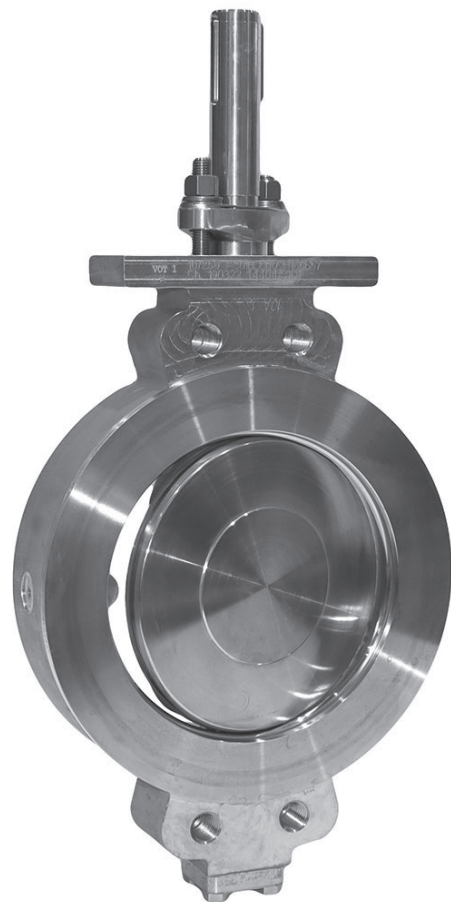


# Jamesbury™ Wafer-Sphere™ Soft seated high performance butterfly valve Series 800 Model D

Installation, maintenance and  
operating instructions



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This product meets the requirements set by the Customs Union of the Republic of Belarus, the Republic of Kazakhstan and the Russian Federation.

## **READ THESE INSTRUCTIONS FIRST!**

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

## **SAVE THESE INSTRUCTIONS!**

Addresses and phone numbers are printed on the back cover.

# Jamesbury™ Wafer-Sphere™ soft seated high performance butterfly valves

THESE INSTRUCTIONS PROVIDE THE CUSTOMER/OPERATOR WITH IMPORTANT INFORMATION IN ADDITION TO THE CUSTOMER/OPERATOR'S NORMAL OPERATION AND MAINTENANCE PROCEDURES. SINCE OPERATION AND MAINTENANCE PHILOSOPHIES VARY, VALMET DOES NOT ATTEMPT TO DICTATE SPECIFIC PROCEDURES, BUT TO PROVIDE BASIC LIMITATIONS AND REQUIREMENTS CREATED BY THE TYPE OF EQUIPMENT PROVIDED.

THESE INSTRUCTIONS ASSUME THAT OPERATORS ALREADY HAVE A GENERAL UNDERSTANDING OF THE REQUIREMENTS FOR SAFE OPERATION OF MECHANICAL AND ELECTRICAL EQUIPMENT IN POTENTIALLY HAZARDOUS ENVIRONMENTS. THEREFORE, THESE INSTRUCTIONS SHOULD BE INTERPRETED AND APPLIED IN CONJUNCTION WITH THE SAFETY RULES AND REGULATIONS APPLICABLE AT THE SITE AND THE PARTICULAR REQUIREMENTS FOR OPERATION OF OTHER EQUIPMENT AT THE SITE.

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# INTRODUCTION

## READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve. If you require additional assistance, please contact the manufacturer or manufacturer's representative. Addresses and phone numbers are printed on the back cover. See at [www.valmet.com/flowcontrol/valves](http://www.valmet.com/flowcontrol/valves) for the latest documentation.

## SAVE THESE INSTRUCTIONS!

The following instructions should be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment. Throughout the text, safety and/or caution notes will appear and must be strictly adhered to, otherwise, serious injury or equipment malfunction could result.

Valmet has highly skilled personnel available for startup, maintenance and repair of our valves and component parts. Arrangements for this service can be made through your local Valmet representative or sales department. When performing maintenance use only Valmet replacement parts. Parts are obtainable through your local representative or spare parts department.

When ordering parts, always include Model and Serial Number of the unit being repaired.

## 1. GENERAL

These installation and maintenance instructions apply to 3"-12" (DN 80-300), pressure class 150 and 300 Model D 800 series valves regardless of the type of material used. The 800 series valves are designed with built in versatility making them well suited to handle a wide variety of process applications.

Recommended spare parts required for maintenance refer to section 9. The model number, size, rating and serial number of the valve are shown on the identification tag located on the valve.

### 1.1 Scope of this manual

This installation, operation and maintenance manual provides essential information on the Wafer-Sphere 800 series soft seated valves. The actuators and instrumentation to be used with the 800 series valves are also discussed briefly. Refer to the separate actuator and control equipment instruction manuals for further information.

For valves in oxygen service, please see also the separate installation, maintenance and operating instructions for oxygen service (see Neles document id:10O270EN.pdf).

### 1.2 Description

The Wafer-Sphere 800 series is a soft seated double eccentric high performance butterfly valve available in wafer, lugged and double flanged styles. The valve operates both in control and shut-off applications.

## Offset Design

One of the design features of the Wafer-Sphere valve that is responsible for its superior performance is the valve's offset shaft design. The shaft is offset in two planes: (1) away from the valve disc centerline and (2) behind the disc sealing plane (See Figure 1). Offset shaft design makes the rotating disc "cam" back and away from the seat, completely eliminating the usual wear points at the top and bottom of the seat. Because the disc rotates off the seat in an eccentric arc, it operates in one quadrant only (See Figure 1).

The disc is connected to the shafts with pins and there are no holes through the disc. Construction details of individual valves are included in the type code shown on the valve identification plate. To interpret the type code, please refer to Section 12.

## Positive Stop Feature

To prevent seat damage from over-travel of the disc beyond the closed position (usually during field mounting of a handle or actuator), a "positive stop" feature has been designed into the valve. The location of this feature is shown in (Figure 1).

**IMPORTANT NOTE:** Maximum shut-off pressure rating depends on the materials chosen. Refer to the tag attached to each valve for this rating. Do not use a valve at service conditions that exceed the rating of the tag.

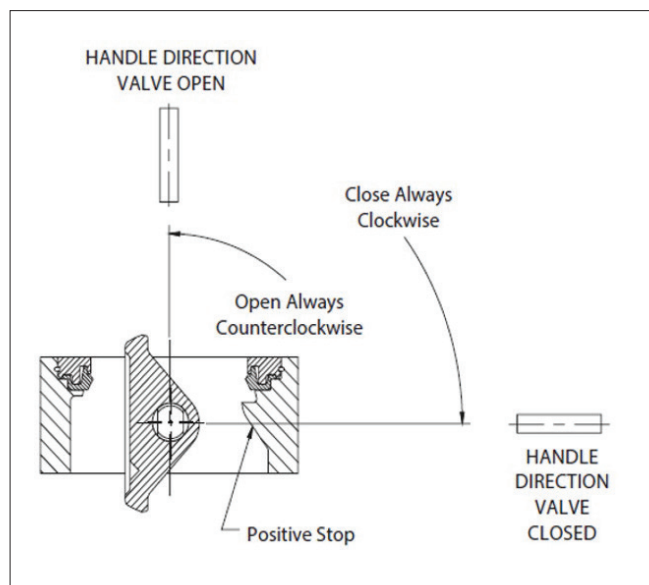


Fig. 1 Wafer-Sphere sealing principle/Positive Stop Feature

### 1.3 Valve Markings

Body markings are cast on the body. The valve also has an identification plate attached to it (see Figure 2).

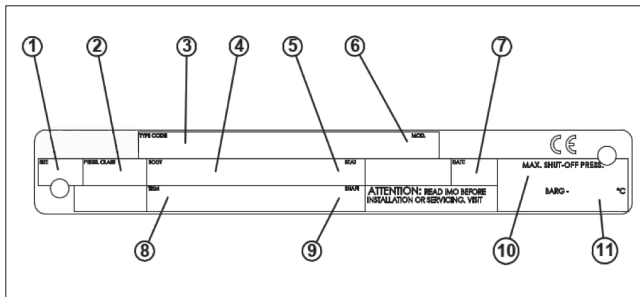


Fig. 2 Identification plate

Identification plate marking:

1. Size
2. Pressure class
3. Type code
4. Body material
5. Seat material
6. Model number
7. Date
8. Trim material
9. Shaft material
10. Maximum shut-off pressure
11. Maximum temperature
12. Certification and approvals, eg. CE, Atex etc.

### 1.4 Technical Specifications

The following designs are available in sizes 3”–12” (DN 80–300):

	Wafer	Lugged	Double Flanged
Design	API 609	API 609	API 609
	ASME B16.34	ASME B16.34	ASME B16.34
	EN 593	EN 593	EN 593
Pressure Class	ASME Class 150 & 300	ASME Class 150 & 300	ASME Class 150 & 300
	PN10-40	PN10-40	PN10-40
Face to Face	API 609 EN 558 Part 1, Table 5 Basic Series 16, 20 & 25	API 609 EN 558 Part 1, Table 5 Basic Series 16, 20 & 25	API 609 Cat B Short Pattern EN 558 Part 1, Table 5 Basic Series 13 ISO 5752 Series 13
Flange Connection/Drilling	ASME B16.5 EN 1092-1	ASME B16.5 EN 1092-1	ASME B16.5 EN 1092-1
Temp Range	-46 to 260°C (-50°F to 500°F)		

### 1.5 Valve Approvals

ISO 15848 INDUSTRIAL VALVES. MEASUREMENT, TEST AND QUALIFICATION PROCEDURES FOR FUGITIVE EMISSIONS Group II Category 2 according to directive 2014/34/EU (ATEX). NACE MR0103 & MR0175

### 1.6 CE Marking

The valve meets the requirements of the European Directive 2014/68/EU relating to pressure equipment and has been marked according to the Directive.

### 1.7 Recycling and Disposal

Most valve parts can be recycled if sorted according to material. Most parts have material marking. A material list is supplied with the valve. In addition, separate recycling and disposal instructions are available from the manufacturer. A valve can also be returned to the manufacturer for recycling and disposal against a fee.

### 1.8 Safety Precautions

**WARNING:**

**DO NOT EXCEED THE VALVE PERFORMANCE LIMITATIONS!**

EXCEEDING THE PRESSURE OR TEMPERATURE LIMITATIONS MARKED ON THE VALVE IDENTIFICATION PLATE MAY CAUSE DAMAGE AND LEAD TO UNCONTROLLED PRESSURE RELEASE. DAMAGE OR PERSONAL INJURY MAY RESULT.

**WARNING:**

**SEAT AND BODY RATINGS!**

THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE SEAT AND BODY RATINGS. READ THE IDENTIFICATION PLATE AND CHECK BOTH RATINGS. THIS PRODUCT IS AVAILABLE WITH A VARIETY OF SEAT MATERIALS. SOME OF THE SEAT MATERIALS HAVE PRESSURE RATINGS THAT ARE LESS THAN THE BODY RATINGS. ALL OF THE BODY AND SEAT RATINGS ARE DEPENDENT ON VALVE TYPE AND SIZE, SEAT MATERIAL, AND TEMPERATURE. DO NOT EXCEED THESE RATINGS!

**WARNING:**

**DO NOT DISMANTLE THE VALVE OR REMOVE IT FROM THE PIPELINE WHILE THE VALVE IS PRESSURIZED!**

DISMANTLING OR REMOVING A PRESSURIZED VALVE WILL RESULT IN UNCONTROLLED PRESSURE RELEASE. ALWAYS ISOLATE THE RELEVANT PART OF THE PIPELINE, RELEASE THE PRESSURE FROM THE VALVE AND REMOVE THE MEDIUM BEFORE DISMANTLING THE VALVE.

BE AWARE OF THE TYPE OF MEDIUM INVOLVED. PROTECT PEOPLE AND THE ENVIRONMENT FROM ANY HARMFUL OR POISONOUS SUBSTANCES. MAKE SURE THAT NO MEDIUM CAN ENTER THE PIPELINE DURING VALVE MAINTENANCE. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY.

**WARNING:**

**BEWARE OF DISC MOVEMENT!**

KEEP HANDS, OTHER PARTS OF THE BODY, TOOLS AND OTHER OBJECTS OUT OF THE OPEN FLOW PORT. LEAVE NO FOREIGN OBJECTS INSIDE THE PIPELINE. WHEN THE VALVE IS ACTUATED, THE DISC FUNCTIONS AS A CUTTING DEVICE. DISCONNECT ANY PNEUMATIC SUPPLY LINES, ANY ELECTRICAL POWER SOURCES AND MAKE SURE SPRINGS IN SPRING-RETURN ACTUATORS ARE IN THE FULL EXTENDED/RELAXED STATE BEFORE PERFORMING ANY VALVE MAINTENANCE. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY!

**WARNING:**

**WHEN HANDLING THE VALVE OR VALVE/ACTUATOR ASSEMBLY, TAKE ITS WEIGHT INTO ACCOUNT!**

Never lift the valve or valve/actuator assembly by the actuator, positioner, limit switch or their piping. Place lifting devices securely around the valve body. Failure to follow these instructions may result in damage or personal injury from falling parts .

Please consult separate document: instructions for lifting Valmet products. (See Valmet document id: 10LIFT70EN.PDF).

**CAUTION:**

**BEWARE OF NOISE EMISSIONS!**

THE VALVE MAY PRODUCE NOISE IN THE PIPELINE. THE NOISE LEVEL DEPENDS ON THE APPLICATION. OBSERVE THE RELEVANT WORK ENVIRONMENT REGULATIONS ON NOISE EMISSION. THIS CAN BE MEASURED OR CALCULATED USING NELES NELPROF SOFTWARE.

**CAUTION:**

**BEWARE OF A VERY COLD OR HOT VALVE!**

THE VALVE BODY MAY BE VERY COLD OR VERY HOT DURING USE. PROTECT YOURSELF AGAINST COLD INJURIES OR BURNS.

**NOTE:**

Do not turn the disc more than 90° as this could damage the seat. The valve is so constructed that the disc operates only between 0-90°.

## ATEX/Ex Safety

**CAUTION!**

Potential electrostatic hazard, ensure the protection (grounding, etc.) in the process.

**CAUTION!**

The actual surface temperature of valve is depended on the process temperature. The protection from high or low temperature must be considered by the end user before valve is put into service.

**CAUTION!**

Ensure the general process and worker protection from static electricity in the facilities.

**Note!** Within series there is possibility to Category 2, Category 3 and non-ATEX valve.

## 1.9 Welding notes

**WARNING:**

Welding and/or grinding stainless steel and other alloys containing chromium metal may cause the release of hexavalent chromium. Hexavalent chromium(VI) or Cr(VI), is known to cause cancer. Be sure to use all appropriate personal protective equipment (PPE) when welding metals containing chromium.

**NOTE:**

A qualified welder must do the installation welding. The welder and welding procedure should be qualified in accordance with the ASME Boiler and Pressure Vessel Code Section IX or other applicable regulation.

**CAUTION:**

To prevent damage to the seat and seals, do not allow the temperature of the seat and body seal area to exceed 94 °C (200 °F).

It is recommended that thermal chinks be used to check the temperature in these areas during welding.

**CAUTION:**

Ensure that any weld splatter does not fall onto the valve closing members eg. trim or seats. This may damage critical seating surfaces and cause leaks.

## 2. TRANSPORTATION, RECEPTION AND STORAGE

Check the valve and the accompanying devices for any damage that may have occurred during transport.

Store the valve carefully before installation, preferably indoors in a dry place.

Do not remove the flow port protectors until installing the valve. Move the valve to its intended location just before installation. The valve is usually delivered in the closed position. A valve equipped with a spring-return actuator is delivered in a position determined by the spring. During storage the valve must be lightly closed. If the valve(s) are to be stored for a long duration, follow the recommendations of M-1147-En.

### 2.1 Unpacking

Care must be exercised when unpacking the valve to prevent damage to the accessories and component parts. Contact the local Valmet Sales office or Service Center with any issues or problems. Be sure to note the valve model number and serial number in all correspondence.

## 3. INSTALLATION

1. **Read all WARNINGS!**
2. **IMPORTANT:** Only operating handle stops or actuator stop screws must be used to stop the disc position. DO NOT use the "positive stop" by itself to limit travel.
3. Before installing a closed valve in the pipeline, be sure that the handle or actuator is attached so that a counter-clockwise rotation, viewed from above, opens the valve (See Figure 2). Fully close the valve again before installing in the pipeline.
4. The valve must be centered between flanges to avoid disc-pipe contact which could damage the disc and shaft. Any flange or pipeline welding should be done prior to installation of the valves. If this is impossible, protective covering or shields must be placed in the pipeline between the valve and the area being welded prior to welding. Not only must the valve be protected against weld slag, but also against any excessive heat, which could cause seat damage. It is essential that all weld slag, rods, debris, tools, etc., be removed from the pipeline before valves are installed or cycled.
5. It is not recommended to install the valve with the stem on the underneath side because dirt in the pipeline may then enter the body cavity and potentially damage the stem packing (see Figure 3).
6. For installation of the cryogenic extension to the valve, the extension and the valve should be typically in vertical position. For installation of the valve in cryogenic applications, the valve package as a whole should be typically in vertical position.

### 3.1 General

Remove the flow port protectors and check that the valve is undamaged and clean inside.

Before installing the valve in the line, clean piping and valve of all foreign material such as welding chips, scale, oil, grease or dirt. Gasket surfaces should be thoroughly cleaned to ensure leak-proof joints.

### 3.2 Installing in the Pipeline

#### WARNING:

THE VALVE SHOULD BE TIGHTENED BETWEEN FLANGES USING APPROPRIATE GASKETS AND FASTENERS COMPATIBLE WITH THE APPLICATION, AND IN COMPLIANCE WITH APPLICABLE PIPING CODES AND STANDARDS. CENTER THE FLANGE GASKETS CAREFULLY WHEN FITTING THE VALVE BETWEEN FLANGES. DO NOT ATTEMPT TO CORRECT PIPELINE MISALIGNMENT BY MEANS OF FLANGE BOLTING!

Flush or blow the pipeline carefully before installing the valve. Foreign particles, such as sand or pieces of welding electrode, will damage the disc sealing surface and seat.

The valve may be installed in any position and offers tightness in both directions. For lowest operating torque it is recommended that the valve is installed with the clamp ring towards the higher pressure (shaft downstream).

Install the valve in the pipeline so that the shaft is horizontal if possible. However, Valmet does not recommend installing the valve with the actuator on the underside (Figure 3) because dirt in the pipeline may damage the gland packing.

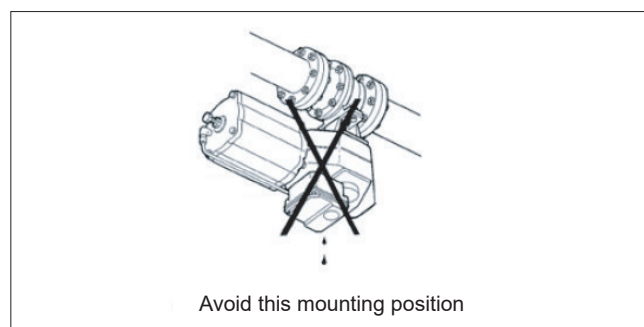


Fig. 3 Avoid this mounting position

Select flange gaskets according to the operating conditions.

Do not attempt to correct pipeline misalignment by means of flange bolting.

It may be necessary to firmly support the pipeline to protect the valve from excess stress. Sufficient support will also reduce pipeline vibrations and this ensures proper functioning of the positioner. Do not fasten supports to the flange bolting or to the actuator.

It is recommended that the length of any straight pipe preceding the control valve is at least 2 x pipe diameter.

The flow causes a so-called dynamic torque against the valve disc which attempts to open the valve. In a pipe elbow the pressure on the outer edge is higher than on the inner edge.

When installing the double eccentric disc valve immediately after a pipe elbow, the valve shaft must be directed toward the center point of the pipe (see Figure 4). This is especially important when the valve is used as a control valve.

The shaft of a valve mounted after the centrifugal pump must be perpendicular to the pump shaft (see Figure 5).

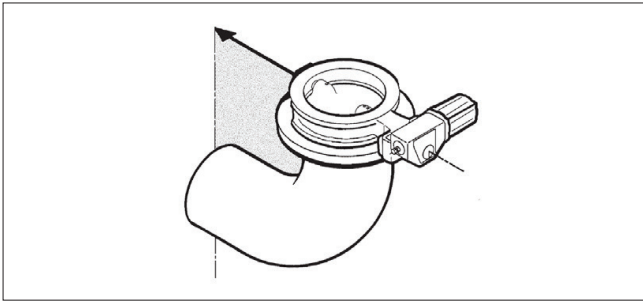


Fig. 4 Mounting after a pipe elbow

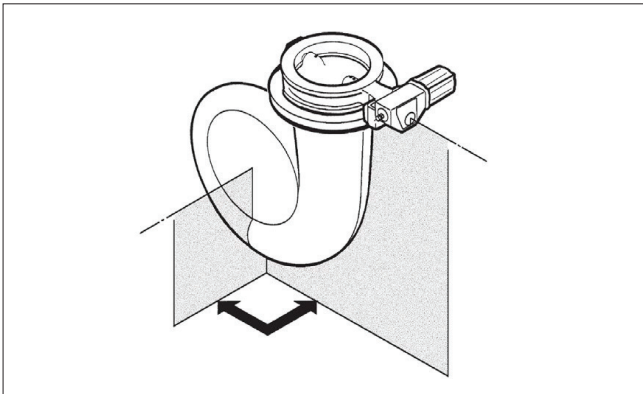


Fig. 5 Mounting after the centrifugal pump

When thus installed, the valve disc will be more evenly loaded and vibrations otherwise possible in the intermediate positions will be eliminated.

When mounting the valve it must be in a closed position and be carefully centered between the pipe flanges so that the turning disc does not touch the pipe edge or flange gaskets, see Figure 6 and Table 1.

Use caution when installing valve with Spring-to-open actuator.

In case of sudden shutdown of the energy supply the valve will open unexpectedly due to pre-stressed spring package. This may cause significant harm to people and material around the valve.

In valves with certain nominal sizes some flange bolts do not pass the valve body. The valve body is thus equipped with holes, see Figure 7 and Tables 2...4.

Ensure that the disc can turn to the open position after preliminary tightening of the flange bolts. The actuators of control valves can be equipped with position stops to limit the allowable travel of the disc. Per Fig. 8 and Tables 2 through 4, length of stud bolts are based on:

- gasket thickness of 3 mm
- heavy nuts with washers
- flange thickness of weldneck flanges per DIN or ISO

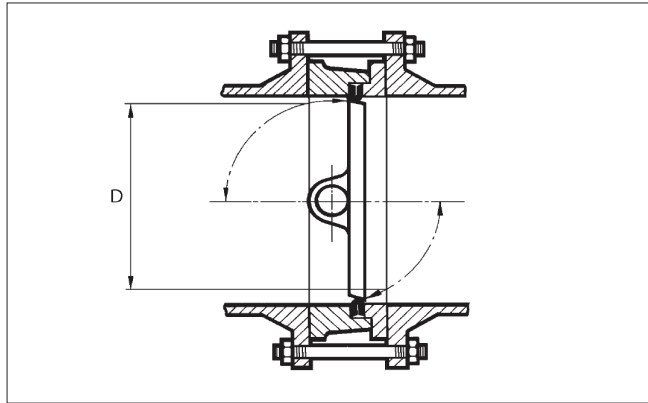


Fig. 6 Minimum pipe inside dimensions

Table 1 Minimum pipe inside dimensions (as in API 609)

Valve size [NPS]	Class 150	Class 300
	EN PN10-16	EN PN25-40
3	Standard weight	Extra strong
4	Standard weight	Extra strong
6	Standard weight	Extra strong
8	Standard weight	Extra strong
10	Standard weight	Extra strong
12	Standard weight	Extra strong



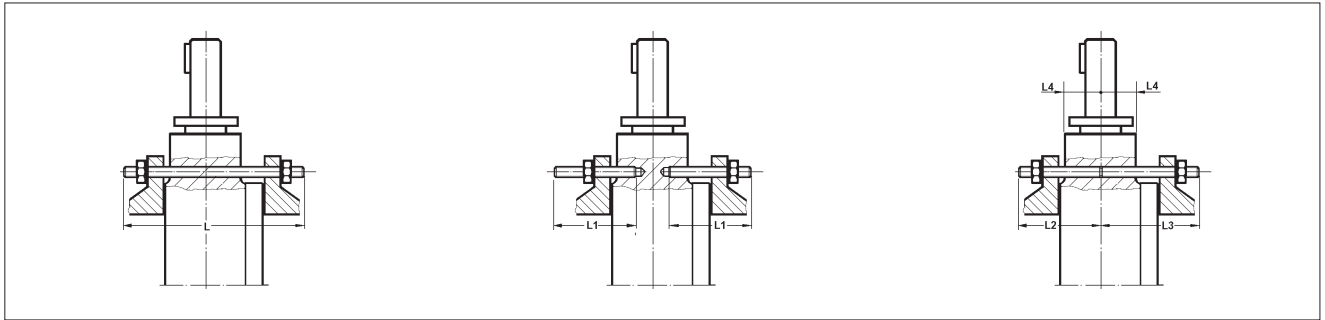


Fig. 7 Stud bolt length

Below are presented the minimum dimensions for the stud bolts. Next size standard length bolt can be used.

Table 2 Minimum stud bolt dimensions, 800W

815W, 818W		ASME 150	
DN / NPS	Thread	L	Qty
80 / 3	5/8-UNC	150	4
100 / 4	5/8-UNC	160	8
150 / 6	3/4-UNC	180	8
200 / 8	3/4-UNC	190	8
250 / 10	7/8-UNC	220	12
300 / 12	7/8-UNC	240	12

810W		PN10	
DN / NPS	Thread	L	Qty
80 / 3	M16	150	8
100 / 4	M16	150	8
150 / 6	M20	170	8
200 / 8	M20	190	8
250 / 10	M20	200	12
300 / 12	M20	220	12

816W		PN16	
DN / NPS	Thread	L	Qty
80 / 3	M16	150	8
100 / 4	M16	150	8
150 / 6	M20	180	8
200 / 8	M20	190	12
250 / 10	M24	220	12
300 / 12	M24	220	12

830W, 838W		ASME 300			
DN / NPS	Thread	L	Qty	L1	Qty
80 / 3	3/4-UNC	180	8		
100 / 4	3/4-UNC	190	8		
150 / 6	3/4-UNC	220	12		
200 / 8	7/8-UNC	240	12		
250 / 10	1-UNC	280	12	150	8
300 / 12	1 1/8-UNC	300	12	140	8

825W		PN25			
DN / NPS	Thread	L	Qty	L1	Qty
80 / 3	M16	170	8		
100 / 4	M20	180	8		
150 / 6	M24	220	8		
200 / 8	M24	240	12		
250 / 10	M27	280	12		
300 / 12	M27	280	12	140	8

840W		PN40			
DN / NPS	Thread	L	Qty	L1	Qty
80 / 3	M16	170	8		
100 / 4	M20	180	8		
150 / 6	M24	220	8		
200 / 8	M27	260	12		
250 / 10	M30	300	12		
300 / 12	M30	300	12	150	8

Table 3 Stud bolt dimensions, 800L

815L, 818L		ASME 150				
DN / NPS	Thread	L3	Qty	L2	Qty	L4
80 / 3	5/8-UNC	80	4	70	4	17
100 / 4	5/8-UNC	80	8	80	8	24
150 / 6	3/4-UNC	90	8	90	8	22
200 / 8	3/4-UNC	100	8	90	8	22
250 / 10	7/8-UNC	110	12	100	12	26
300 / 12	7/8-UNC	120	12	110	12	26

810L		PN10				
DN / NPS	Thread	L3	Qty	L2	Qty	L4
80 / 3	M16	80	8	80	8	17
100 / 4	M16	80	8	80	8	24
150 / 6	M20	90	8	90	8	22
200 / 8	M20	110	8	90	8	22
250 / 10	M20	110	12	90	12	26
300 / 12	M20	110	12	100	12	26

816L		PN16				
DN / NPS	Thread	L3	Qty	L2	Qty	L4
80 / 3	M16	80	8	80	8	17
100 / 4	M16	80	8	80	8	24
150 / 6	M20	100	8	90	8	22
200 / 8	M20	110	12	90	12	22
250 / 10	M24	120	12	100	12	26
300 / 12	M24	120	12	110	12	26

830L		ASME 300				
DN / NPS	Thread	L3	Qty	L2	Qty	L4
80 / 3	3/4-UNC	90	8	90	8	20
100 / 4	3/4-UNC	100	8	100	8	24
150 / 6	3/4-UNC	110	12	100	12	26
200 / 8	7/8-UNC	130	12	120	12	29
250 / 10	1-UNC	140	16	130	16	32
300 / 12	1 1/8-UNC	160	16	140	16	38

825L		PN25				
DN / NPS	Thread	L3	Qty	L2	Qty	L4
80 / 3	M16	100	8	80	8	20
100 / 4	M20	100	8	90	8	24
150 / 6	M24	120	8	100	8	26
200 / 8	M24	130	12	110	12	29
250 / 10	M27	160	12	120	12	32
300 / 12	M27	150	16	120	16	38

840L		PN40				
DN / NPS	Thread	L3	Qty	L2	Qty	L4
80 / 3	M16	100	8	80	8	20
100 / 4	M20	100	8	90	8	24
150 / 6	M24	120	8	100	8	26
200 / 8	M27	140	12	110	12	29
250 / 10	M30	170	12	130	12	32
300 / 12	M30	170	16	140	16	38

Table 4 Stud bolt dimensions, 800F

815F, 818F		ASME 150			
DN / NPS	Thread	L	Qty	L1	Qty
80 / 3	5/8-UNC	100	4	65	4
100 / 4	5/8-UNC	110	12	75	4
150 / 6	3/4-UNC	120	12	90	4
200 / 8	3/4-UNC	120	12	100	4
250 / 10	7/8-UNC	140	20	100	4
300 / 12	7/8-UNC	140	20	110	4

810F		PN10			
DN / NPS	Thread	L	Qty	L1	Qty
80 / 3	M16	100	12	70	4
100 / 4	M16	100	8	70	8
150 / 6	M20	110	12	80	4
200 / 8	M20	120	12	90	4
250 / 10	M20	120	20	90	4
300 / 12	M20	120	20	90	4

816F		PN16			
DN / NPS	Thread	L	Qty	L1	Qty
80 / 3	M16	100	12	70	4
100 / 4	M16	100	8	70	8
150 / 6	M20	110	12	80	4
200 / 8	M20	120	20	90	4
250 / 10	M24	130	20	100	4
300 / 12	M24	140	20	100	4

830F, 838F		ASME 300			
DN / NPS	Thread	L	Qty	L1	Qty
80 / 3	3/4-UNC	120	12	90	4
100 / 4	3/4-UNC	130	12	80	4
150 / 6	3/4-UNC	140	20	90	4
200 / 8	7/8-UNC	160	20	100	4
250 / 10	1-UNC	180	24	140	8
300 / 12	1 1/8-UNC	200	24	120	8

825F		PN25			
DN / NPS	Thread	L	Qty	L1	Qty
80 / 3	M16	100	16	75	4
100 / 4	M20	120	16	75	4
150 / 6	M24	140	16	100	4
200 / 8	M24	140	24	90	4
250 / 10	M27	150	24	100	4
300 / 12	M27	160	24	100	8

840F		PN40			
DN / NPS	Thread	L	Qty	L1	Qty
80 / 3	M16	100	12	75	4
100 / 4	M20	120	12	75	4
150 / 6	M24	140	12	100	4
200 / 8	M27	160	20	100	4
250 / 10	M30	170	20	110	4
300 / 12	M30	180	24	120	8

### 3.3 Valve Insulation

If necessary, the valve may be insulated. Insulation must not continue above the upper level of the valve (see Figures 8 and 9).

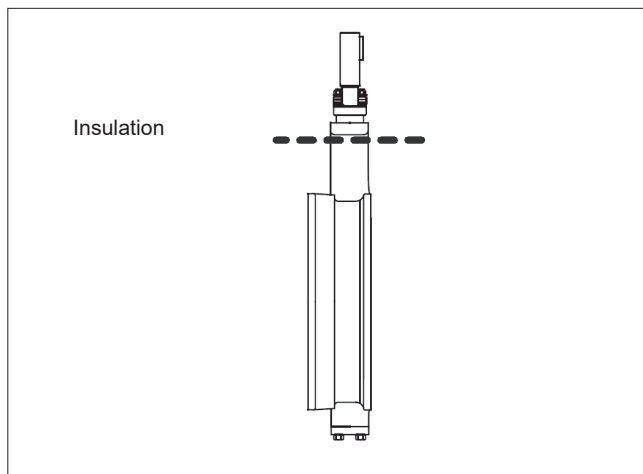


Fig. 8 Insulation of the valve

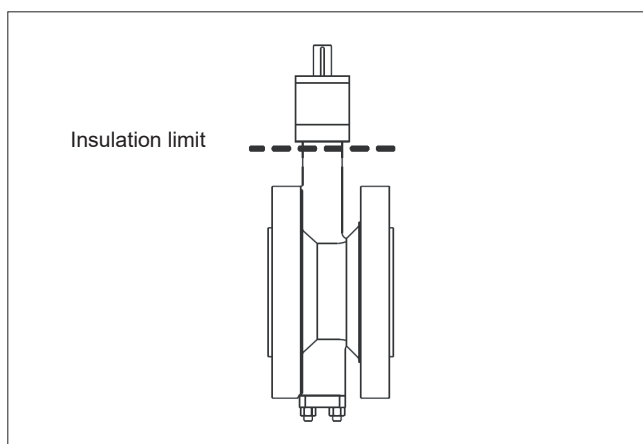


Fig. 9 Insulation of the valve

### 3.4 Actuator

**CAUTION:**

**The actuator must not touch the pipeline, because pipeline vibration may damage it or interfere with its operation. In some certain cases, when a large-size actuator is used, extended stems are required or when the pipeline vibrates heavily, supporting the actuator is recommended.**

When installing the actuator on the valve, make sure that the valve package functions properly. See instructions for installing in Section 6.

Observe the space needed for removal of the actuator. The actuator should be installed in a manner that allows plenty of room for its removal.

The upright position is recommended for the actuator cylinder.

In some cases, e.g. when a large-size actuator is used or when the pipeline vibrates heavily, supporting the actuator is recommended.

Please contact Valmet for further information.

## 4. COMMISSIONING

Ensure that no dirt or foreign objects are left inside the valve or pipeline. Flush the pipeline carefully. Keep the valve 30-40° open during flushing.

When starting up the pump, ensure that the valve in the pipeline is closed or, at the very most, 20° open.

A waterhammer, which follows the start-up of high-capacity pumps, creates a torque peak in the disc. This can damage the pin connection between disc and shaft when the valve is 30-90° open.

## 5. MAINTENANCE

**WARNING:**

**Observe the safety precautions mentioned in Section 1.8 before maintenance!**

**CAUTION:**

**When handling the valve or the valve package as a whole, be mindful of the weight of the valve or the entire package.**

**WARNING:**

**For safety reasons the retaining plates MUST always be installed according to Section 5.3.**

### 5.1 General

Although Jamesbury valves are designed to work under severe conditions, proper preventative maintenance can significantly help to prevent unplanned downtime and in real terms reduce the total cost of ownership. Valmet recommends inspecting valves at least every five (5) years. The inspection and maintenance frequency depend on the actual application and process condition. The inspection and maintenance intervals can be specified together with your local Valmet experts. During this periodic inspection the parts detailed in the Spare Part Set should be replaced. Time in storage should be included in the inspection interval.

Maintenance can be performed as presented below. For maintenance assistance, please contact your local Valmet office. The part numbers in the text refer to the exploded view and to the parts list in Section 9, unless otherwise stated.

Overhaul maintenance consists of replacing seats and seals. A standard spare part set consisting of these parts may be obtained through Valmet or your authorized Valmet Distributor.

**NOTE:** Spare part set include body gasket (32), blind flange gasket (31) and packing ring set (22). Refer to section 10.

**WARNING:**

**FOR YOUR SAFETY IT IS IMPORTANT THE FOLLOWING PRECAUTIONS BE TAKEN PRIOR TO REMOVAL OF THE VALVE FROM THE PIPELINE OR BEFORE ANY DISASSEMBLY:**

1. Wear any protective clothing or equipment normally required when working with the fluid involved.
2. Depressurize the pipeline by placing the valve in the open position and draining the pipeline.

After removal and before any disassembly, cycle the valve again several times.

**WARNING:**

**FOR YOUR SAFETY IT IS IMPORTANT THE FOLLOWING PRECAUTIONS BE TAKEN PRIOR TO REMOVAL OF THE VALVE FROM THE PIPELINE OR BEFORE ANY DISASSEMBLY:**

1. WEAR ANY PROTECTIVE CLOTHING OR EQUIPMENT NORMALLY REQUIRED WHEN WORKING WITH THE FLUID INVOLVED.
2. DEPRESSURIZE THE PIPELINE AND CYCLE THE VALVE AS FOLLOWS:
  - PLACE THE VALVE IN THE OPEN POSITION AND DRAIN THE PIPELINE.
  - CYCLE THE VALVE TO RELIEVE RESIDUAL PRESSURE IN THE BODY CAVITY BEFORE REMOVAL FROM THE PIPELINE.

AFTER REMOVAL AND BEFORE ANY DISASSEMBLY, CYCLE THE VALVE AGAIN SEVERAL TIMES.

**NOTE:**

When sending goods to the manufacturer for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. For safety reasons, inform the manufacturer of the type of medium used in the valve (include material safety datasheets (MSDS)).

**NOTE:**

In order to ensure safe and effective operation, always use original spare parts to make sure that the valve functions as intended.

**NOTE:**

For safety reasons, replace pressure retaining bolting if the threads are damaged, have been heated, stretched or corroded.

## 5.2 Removing the valve from the pipeline

It is generally most convenient to detach the actuator and its auxiliary devices before removing the valve from the pipeline. If the valve package is small or if it is difficult to access, it may be more practical to remove the entire assembly.

**NOTE:**

To ensure proper reassembly, observe the position of the actuator and positioner/limit switch with respect to the valve before detaching the actuator.

**WARNING:**

ALWAYS DISCONNECT THE ACTUATOR FROM ITS POWER SOURCE, PNEUMATIC, HYDRAULIC OR ELECTRICAL, BEFORE ATTEMPTING TO REMOVE IT FROM THE VALVE!

**WARNING:**

DO NOT REMOVE A SPRING-RETURN ACTUATOR UNLESS A STOP-SCREW IS CARRYING THE SPRING FORCE!

1. Detach the air supply, electrical supply, hydraulic supply and control signal cables or pipes from their connectors.
2. Unscrew the actuator mounting bracket screws.
3. Lift the actuator straight up in line with the valve stem until the coupling between actuator drive and valve stem is completely disengaged.
4. Place actuator in a safe location to avoid damage or personal injury.

**WARNING:**

Do not dismantle the valve or remove it from pipeline while the valve is pressurized.

**CAUTION:**

Valve must be fully closed before removing it from the pipeline.

**CAUTION:**

Valves equipped with spring-to-open (air-to-close) actuators must be disconnected from the actuators and then closed.

Ensure that the valve is not pressurized and the pipeline is empty. Ensure that the medium cannot flow into the section where servicing is to take place. Support the valve carefully with a hoist. Place ropes carefully and unscrew the pipe flange bolts. Ensure that the ropes are positioned correctly.

## 5.3 Replacing the gland packing

**WARNING:**

DO NOT DISMANTLE THE VALVE OR REMOVE IT FROM PIPELINE WHILE THE VALVE IS PRESSURIZED.

PTFE V-rings are used as a standard gland packing and graphite rings for high temperature constructions. The packing construction is live loaded as standard.

The gland packing (23) must be changed if leakage occurs even after the hex nuts (43) have been tightened as recommended.

- Make sure the valve is not pressurized.
- Unfasten the nuts (43) and remove the disc spring sets (21), the retaining plates (24) and the gland (9).
- Remove old packing rings (22). Do not damage the surfaces of the packing ring counterbore and shaft. It is not necessary to change anti-extrusion ring (23).
- Ensure that there are no burrs in the keyway groove which could damage the packing. Clean the gland packing and packing ring counterbore. Install new set of packings (V-ring or graphite). Slip the rings onto the shaft.
- The installation order of packing is to first slide in one anti-extrusion ring with chamfer downward, then the packing rings, finally the other anti-extrusion ring with chamfer upward. For graphite packing rings make sure the seam in the ring is in 90 degree angle compared with the ring below it.
- Install the gland.
- Install one stud
- Install the retainer plates, one on top of another on the stud and the opposite another way around (Figure 10). Once the retainer plates are in the right place, install the other stud.

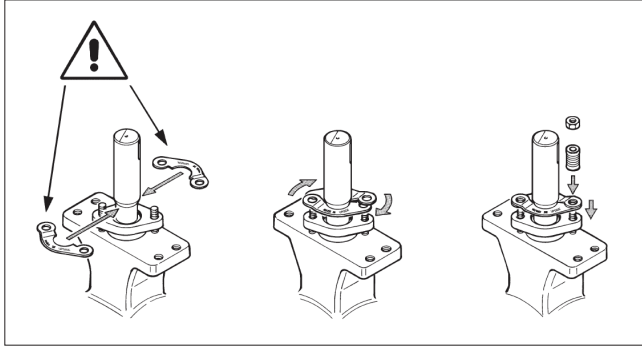


Fig. 10 Mounting the retainer

- Mount the disc spring sets.
- Place the nuts on the studs.
- For the standard live-loading option (Figure 11), please refer to Table 5 for the tightening torques. Install the disc springs one at a time, in opposite orientations, make sure the first installed disc spring has its wider area pointing down.
- For the high performance live-loading option (Figure 12), pre compress the gland packing by length X until the top cap reaches the shell holder (housing) to ensure proper force in use.
- Carry out 3...5 operation cycles with the valve. Suitable range of movement is about 80 %. It is not necessary to fully close or open the valve during the operation.

Fasten the nuts and disc springs.

Table 5 Tightening of gland packing

TORQUE FOR B8M CL2 & 8M	
Thread size (mm)	Torque (Nm)
M5	7.5
M6	13
M8	31
M10	60
M12	100
M14	170
M16	260

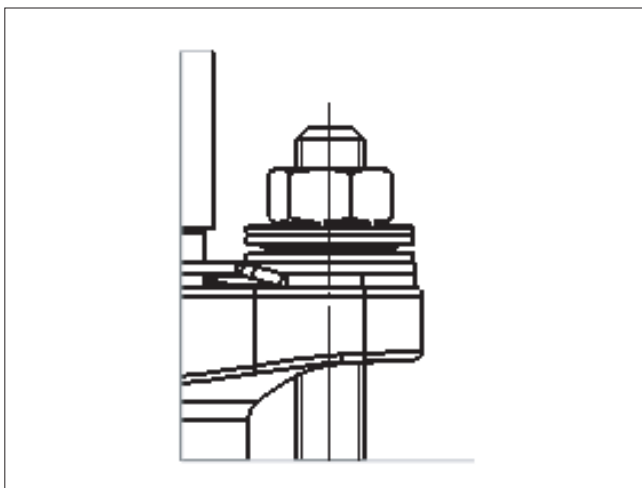


Fig. 11 Standard live-loading

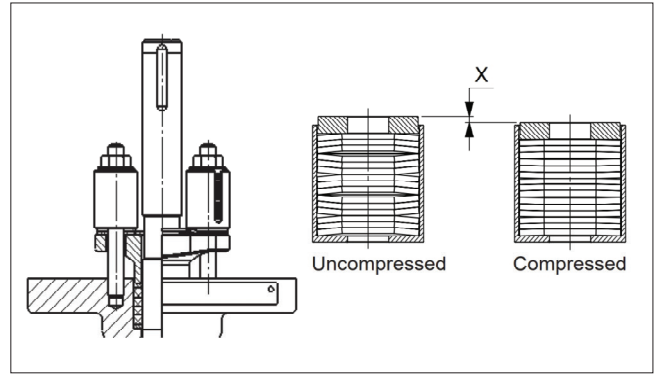


Fig. 12 High performance live-loading

- If the leakage still occurs when the valve is pressurized, re-tighten the nuts but don't exceed the values in the Table 5 by 50 % or do not fully compress the disc springs.

## 5.4 Valve leakage

Valve leakage is not always caused by a damaged seat ring or disc. The reason can also be that the disc is not in the closed position.

- Check the position of the actuator relative to the valve. The screws may be loose or the bracket damaged.
- Check the adjustment in the closed position (see Section 6.5).

The marking line parallel to the disc on the valve shaft head shows roughly the closed position of the disc (see Fig. 13). Pressure shocks can cause loosening of the pin connection between disc and shaft; consequently the shaft moves while the disc remains in place and this prevents full closing of the disc. If the reason for the leakage does not become apparent after doing the above, the valve must be disassembled for replacing the parts.

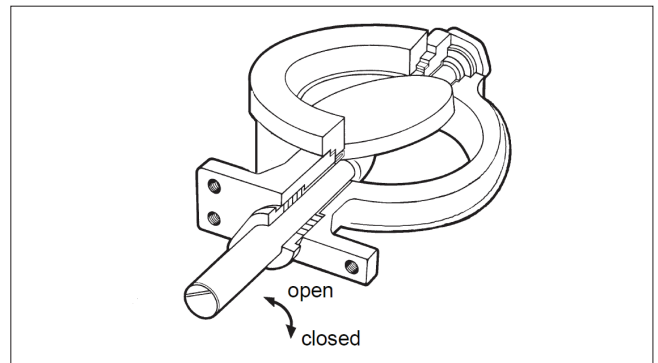


Fig. 13 Open and closed positions of the valve

## 5.5 Replacing the seat ring

### WARNING:

Do not dismantle the valve or remove it from pipeline while the valve is pressurized.

- Ensure that the valve is not pressurized.
- Remove the valve from the pipeline. The valve must be in a closed position during removal. Follow the lifting methods shown in Section 3.
- After removing the valve from the line, take care not to damage the sealing edge of the valve disc.
- Remove the clamp ring (2) by untightening the screws (45).

- Remove the old body gasket (32) and the seat ring (4). Change the seat ring if it is damaged.
- Clean all the surfaces of the seats and check the surface of the seat ring.
- Check also the condition of the disc. A damaged disc must be changed (see Section 5.6).
- Check the condition of the pin connection. Repair it if necessary (see Section 5.6).
- Install the graphite gasket (32) carefully.
- Close the disc to the level position
- Install the seat ring (4) into the clamp ring (2)
- With the valve in the closed position, replace the clamp ring and seat together and tighten the screws (27) lightly
- Tighten the screws (27) crosswise and evenly. Recommended torque values for screws are listed in Table 6. An unevenly tightened flange may damage the seat ring.

Table 6 Clamp ring / blind flange screw torque, Nm  $\pm$  10 %

TORQUE FOR B8M CL2 & 8M		TORQUE FOR L7M		TORQUE FOR B16 & 16		TORQUE FOR INC625	
Thread size (mm)	Torque (Nm)	Thread size (mm)	Torque (Nm)	Thread size (mm)	Torque (Nm)	Thread size (mm)	Torque (Nm)
M5	7.5	M5	6	M5	8	M5	5
M6	13	M6	10	M6	14	M6	8
M8	31	M8	25	M8	33	M8	19
M10	60	M10	50	M10	66	M10	38
M12	100	M12	85	M12	110	M12	65

## 5.6 Replacing the disc, shafts and bearings

### Disassembling the valve

The pin connection of the disc must be opened by drilling for changing the disc (3), shafts (5) and bearings (11).

- Remove the valve from the pipeline and the actuator from the valve.
- Remove the clamp ring (2) and seat ring (4) according to section 5.
- Set the valve horizontally on a sturdy surface so that the flat side of the disc lays against the surface (see Fig. 14).

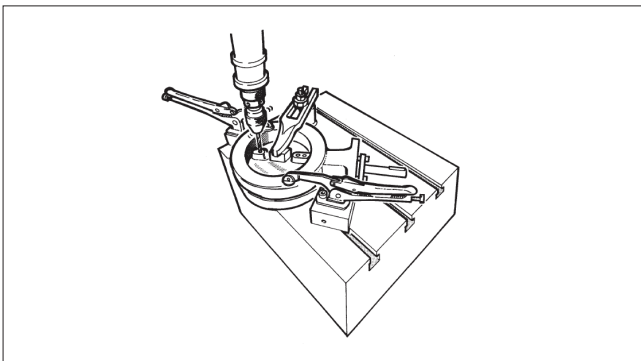


Fig. 14 Pressing the pins

- Drill the holes carefully to the center of the pins (16). Choose a drill 0.2-0.5 mm smaller than the diameter of the pin.
- Drill the holes deep, but not enough to reach the disc.
- Pull the pins out.
- Dismantle the gland packing including anti-extrusion ring (23) according to Section 5.3.

- Detach the screws (44) and the blind flange (8) and remove the gasket (31).
- Place rubber strips or other protection between the disc edge and the body and remove the shafts (see Fig. 14).
- Remove the bearings (11).
- Clean and check all parts carefully.

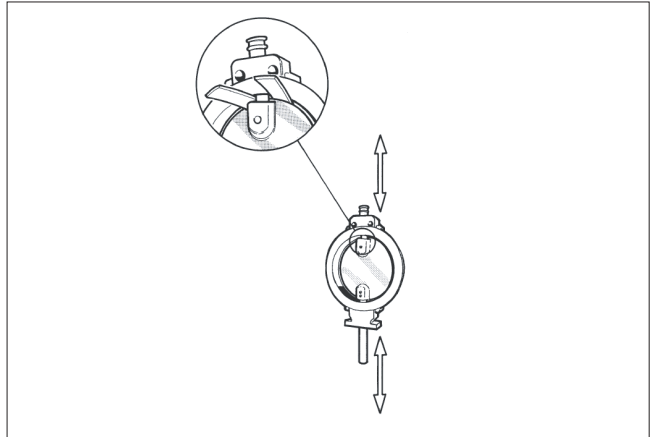


Fig. 15 Protecting the disc during disassembly and assembly

### Checking Parts

1. Clean all disassembled parts.
2. Check the shaft (5, 6) and disc (3) for damage. Pay particular attention to the sealing areas.
3. Check all sealing and gasket surfaces of the body (1) and clamp ring (2).
4. Replace any damaged parts.

**NOTE:** When ordering spare parts, always include the following information:

- Valve catalog code from Identification plate,
- If the valve is serialized – the serial number (stamped on the valve body),

### Assembling the valve

- Replace damaged parts with new ones.
- Set the disc (3) and the shaft (5 & 6) together beforehand. In case the pin holes have been damaged during removal of the old pins the holes can be drilled to a larger pin size. File off any burrs from the shafts.
- Mount the bearings (11) into the body (1) from flow port side.
- Place thrust bearings (12) at the end of the shaft
- Place the disc horizontally on a surface so that the flat side of the disc lays against the surface. Lift the body around the disc so that the shaft bores are aligned with the bores in the disc. Protect the disc (see Fig. 15).
- Press the shafts into the disc drillings. Align the pin holes. The shaft (5) position against the disc must be according to Figure 15.

**NOTE:**

Use only pins supplied by the manufacturer!

**NOTE:**

The pins must be pressed with enough force to deform them so that the connection will be free from backlash.

- Support the disc well in a horizontal position during mounting of the pins. Push the new pins into the holes and press them in a press to final form (see Fig. 16). Use slightly larger tool than the pin diameter. See Table 7 for forces.

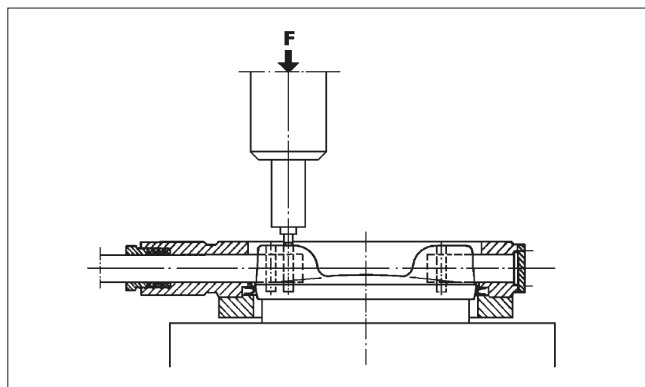


Fig. 16 Pressing the pins

Table 7 Pin Pressing force, kN

PIN material	DIAMETER OF PIN (mm)											
	5.1	6.9	8.4	10.2	11.9	13.4	15.4	16.9	18.9	23.9	28.9	32.4
	DIA OF PRESSING TOOL (TOOL MUST BE SAME AS PIN OR SIZE BIGGER)											
	6	8	10	12	12	15	20	20	20	25	30	35
PIN PRESSING FORCE (kN)												
AISI316 strain hardened	25	45	67	99	135	171	226	272	340	544	795	1000
Nimonic80A	47	87	129	190	259	328	433	522	652	1043	1525	1917
XM-19HS, Nitronic 50	51	93	139	204	278	353	466	561	701	1122	1640	2061
Inconel 718	65	119	177	260	355	450	594	715	894	1430	2091	2628
UNS S31254, SMO 254	35	64	94	139	189	240	317	381	477	763	1115	1402
MONEL K 500	49	90	134	197	268	340	449	541	677	1082	1583	1989
17-4PH H1150D	44	80	119	176	239	303	400	482	603	965	1410	1773

- Install the gasket (31) and the blind flange (8). Screws of the blind flange must be tightened evenly. An unevenly tightened flange will damage the seat.
- Install the seat ring. See details in Section 5.5.
- Install the body gasket (32) and the clamp ring (2). See details in Section 5.5.
- Install the gland packing (see Section 5.3).
- Check the contact line between the seat ring and the disc (see Fig. 13).

## 6. INSTALLING AND DETACHING THE ACTUATOR

### 6.1 General

#### WARNING:

BEFORE INSTALLING THE VALVE AND ACTUATOR, BE SURE THAT THE INDICATOR POINTER ON TOP OF THE ACTUATOR IS CORRECTLY INDICATING THE VALVE POSITION. FAILURE TO ASSEMBLE THESE PRODUCTS TO INDICATE CORRECT VALVE POSITION COULD RESULT IN DAMAGE OR PERSONAL INJURY.

#### CAUTION:

WHEN INSTALLING A LINKAGE OR SERVICING A VALVE/ACTUATOR ASSEMBLY, THE BEST PRACTICE IS TO REMOVE THE ENTIRE ASSEMBLY FROM SERVICE.

#### CAUTION:

AN ACTUATOR SHOULD BE REMOUNTED ON THE VALVE FROM WHICH IT WAS REMOVED. THE ACTUATOR MUST BE READJUSTED FOR PROPER OPEN AND CLOSE POSITION EACH TIME IT IS REMOUNTED.

#### WARNING:

THE LINKAGE HAS BEEN DESIGNED TO SUPPORT THE WEIGHT OF THE NELES ACTUATORS AND RECOMMENDED ACCESSORIES. USE OF THIS LINKAGE TO SUPPORT ADDITIONAL EQUIPMENT SUCH AS PEOPLE, LADDERS, ETC. MAY RESULT IN THE FAILURE OF THE LINKAGE, VALVE OR ACTUATOR AND MAY CAUSE PERSONAL INJURY.

#### CAUTION:

BEFORE DISMANTLING, CAREFULLY OBSERVE THE POSITION OF THE VALVE WITH RESPECT TO THE ACTUATOR AND POSITIONER/LIMIT SWITCH SO AS TO ENSURE THAT THE PACKAGE CAN BE PROPERLY REASSEMBLED. MOUNTING AN OPEN ACTUATOR TO A CLOSED VALVE MAY RESULT IN VALVE STEM DAMAGE.

#### CAUTION:

WHEN HANDLING THE VALVE OR THE VALVE PACKAGE, BEAR IN MIND ITS WEIGHT!

#### WARNING:

THE ACTUATOR MUST NOT BE REMOVED FROM THE VALVE IN A PIPELINE UNDER PRESSURE AS RESULT OF DYNAMIC TORQUE!

#### WARNING:

DO NOT DETACH A SPRING-RETURN ACTUATOR UNLESS A STOPSCREW IS CARRYING THE SPRING FORCE!

#### CAUTION:

DO NOT TURN THE DISC MORE THAN 90° AS THIS COULD DAMAGE THE SEAT. THE VALVE IS SO CONSTRUCTED THAT THE DISC OPERATES ONLY BETWEEN 0-90°.

#### NOTE:

When Valmet supplies whole valve-actuator assembly, the actuator is mounted at Valmet factory on the valve and the stroke limit stops are adjusted by Valmet.

### 6.2 Installing the B1 series actuator

- Turn the valve to the closed position before mounting the actuator.
- Clean the shaft and the shaft bore and file off any burrs which could interfere with mounting. Protect the joint surfaces from corrosion, e.g. with Cortec VCI 369.

- If a bushing is required between the actuator shaft bore and the valve shaft, mount it first in the actuator shaft bore.
- The valve keyway is on the side opposite the flat side of the disc. The actuator shaft bore has two keyways set 90° apart.
- For double-acting cylinder actuator, B1C, and spring return cylinder actuator, B1J (spring-to-close), choose the keyway which establishes the piston in its upper position (at the top end of the cylinder) when the valve is closed.
- In the spring-return cylinder actuator B1JA (spring to-open), choose the keyway which establishes the piston in its lower position when the valve is open.
- Check visually that the actuator is correctly positioned relative to the valve. Tighten all the fastening screws as tightly as possible.
- Adjust the stop screws to the closed position (see Section 6.5).
- The opening angle in a control valve can be limited by a stop screw to 80°. The opening angle of a shutoff valve is 90°.
- When a shaft extension is required, the sizing of the shaft extension must be discussed with the valve manufacturer

### 6.3 Detaching the B1 series actuator

- Disconnect the actuator from its power source; detach the air supply pipe and control signal cables or pipes from their connectors.
- Unscrew the bracket screws.
- Detach the actuator using a suitable extractor. The correct tool can be ordered from the manufacturer (see Fig. 17).
- Remove the bracket and coupling, if any.

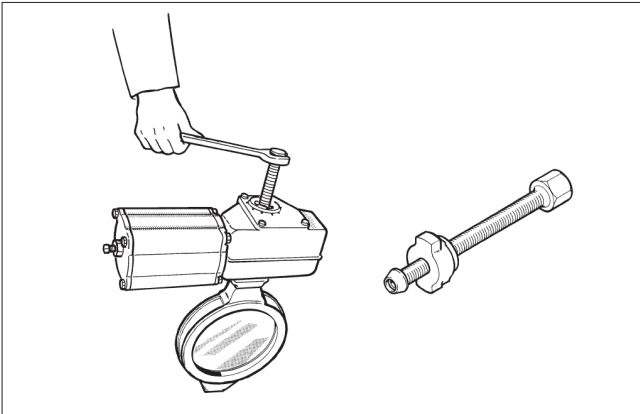


Fig. 17 Actuator removal, B1 series

### 6.4 Detaching and installing other actuator types

See actuator's manual for details.

### 6.5 Stop screw adjustment

#### General

When a spring-return actuator is being mounted, the valve should be in the closed position for spring-to-close operation or in the open position for the spring-to-open operation. When an electric or double-acting pneumatic actuator is being mounted, the valve position should correspond to the indicated actuator position. Always readjust the stop screw after changing the seat and after mounting the actuator.

Adjust the actuator travel stops as described in the actuator instructions to these proper valve open and closed positions:

#### Valve Open:

Disc face perpendicular with the flange face.

#### Valve Closed:

Disc face parallel to flange face within 1/32" (0.79 mm).

#### NOTE:

Valmet accepts no responsibility for compatibility of actuators not installed by Valmet.

### Changing the mounting position

#### WARNING:

THE ACTUATOR MUST NOT BE REMOVED FROM THE VALVE IN A PIPELINE UNDER PRESSURE AS RESULT OF DYNAMIC TORQUE!

Always remove the actuator from the valve shaft before mounting it into another key groove. Readjust the closed position limit as instructed.

If manually operated, the valve should close when the handwheel is turned clockwise. In a double-action cylinder, the piston must be in the upper position of the cylinder when the valve is closed. In this position the actuator creates maximum torque. Do not turn the disc more than 90° as this could damage the seat.

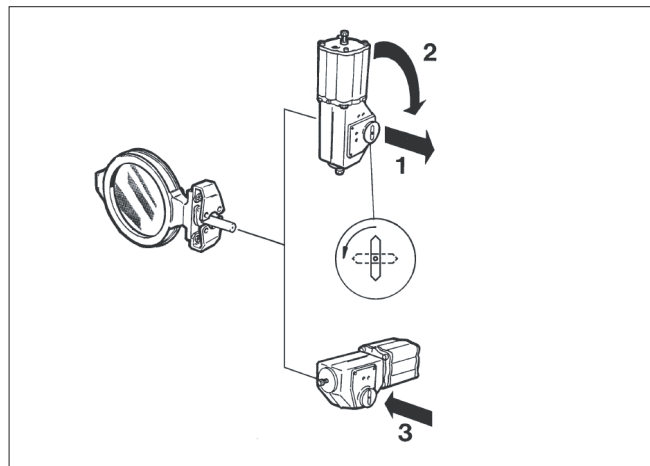


Fig. 18 Changing the mounting position



## 7. TROUBLESHOOTING TABLE

Table 8 Troubleshooting

Symptom	Possible fault	Recommended action
Leakage through a closed valve	Wrong stop screw adjustment of the actuator	Adjust the stop screw for closed position
	Faulty zero setting of the positioner	Adjust the positioner
	Damaged seat	Replace the seat
	Damaged closing member	Replace the closing member
	Closing member in a wrong position relative to the actuator	Select the correct keyway in the actuator
Leakage through body joint	Damaged gasket	Replace the gasket
	Loose body joint	Tighten the nuts or screws
Irregular valve movements	Actuator or positioner malfunction	Check the operation of the actuator and positioner
	Process medium accumulated on the sealing surface	Clean the sealing surface
	Closing member or seat damaged	Replace the closing member or seat
	Crystallizing medium has entered the bearing spaces	Flush the bearing spaces
Gland packing leaking	Gland packing worn or damaged	Replace the gland packing
	Loose packing	Tighten the packing nuts

## 8. TOOLS

No special tools are needed for servicing the valve. However, we recommend an extractor tool (ID-code table in actuator's IMO) for removing the actuator from the valve. The tool can be ordered from the manufacturer.

## 9. ORDERING SPARE PARTS

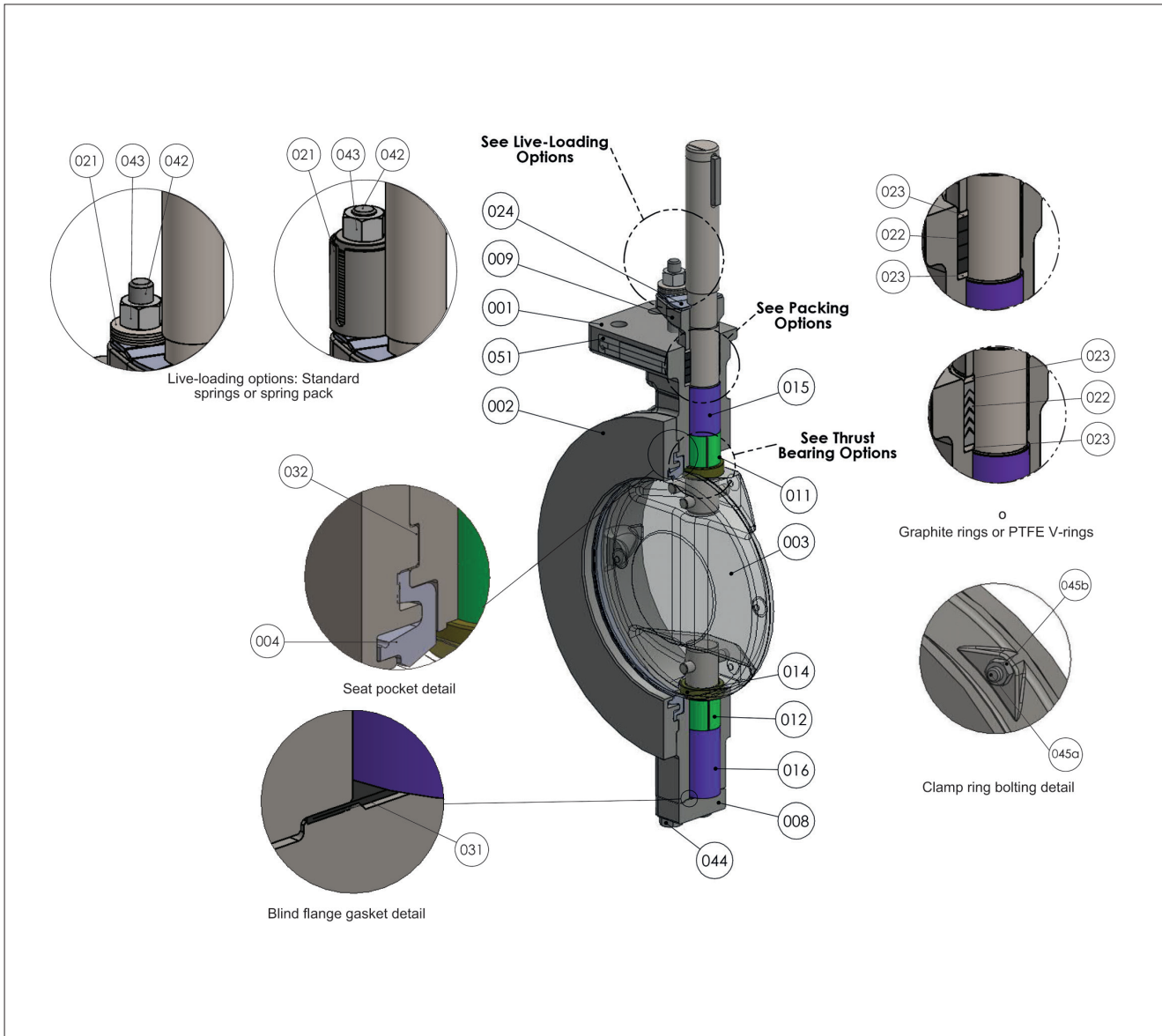
When ordering spare parts, always include the following information:

- type code, sales order number, serial number (stamped on a valve body)
- number of the parts list, part number, name of the part and quantity required

This information can be found from the identification plate or documents.

# 10. ASSEMBLY AND PARTS LIST

Assembly drawing, series 800W Mod D



## Parts list, series 800W Mod D

Item	Qty	Description	Material	Spare part category
1	1	BODY	ASTM A216 gr. WCB/1.0619	
2	1	CLAMP RING	A351 gr. CF8M/1.4408	
3	1	DISC	ASTM A351 gr. CF8M	3
4	1	SEAT	Xtreme®	2
5	1	DRIVE SHAFT	A564 gr. 630 H1150D	3
6	1	TRUNNION	A564 gr. 630 H1150D	3
8	1	BLIND FLANGE	A351 gr. CF8M/1.4408	
9	1	GLAND	A351 gr. CF8M/1.4408	
11	1	BEARING	316L+RPTFE	3
12	1	BEARING	316L+RPTFE	3
13	1	THRUST BEARING	ASTM A269 gr.316+HCr	3
14	1	THRUST BEARING	ASTM A269 gr.316+HCr	3
15	1	BEARING SPACER	AISI 316	
16	1	BEARING SPACER	AISI 316	
17	1	KEY	EN 10088-1.4460	3
18	3	PIN	ASTM A479 gr. 316	3
21	6	DISC SPRING	AISI 304	
22	1	V-RING SET	PTFE	1
23	2	ANTI EXTRUSION RING	AISI 316	
24	2	RETAINER	AISI 316	
31	1	GASKET	GRAPHITE	1
32	1	BODY GASKET	GRAPHITE	1
42	2	STUD	ASTM A193 gr. B8M cl. 2	
43	2	HEXAGON NUT	ASTM A194 gr. 8M	
44	4	HEXAGON SCREW	ASTM A193 gr. B8M cl. 2	
045a	4	STUD	ASTM A193 gr. B8M cl. 2	
045b	4	HEXAGON NUT	ASTM A194 gr. 8M	
51	1	IDENTIFICATION PLATE	AISI 316	
55	1	ANTI-STATIC SPRING	UNS N08825	

Spare part set category 1: Recommended soft parts, always needed for the repair. Delivered as a set.

### Spare part sets

When ordering spare part sets for your valve refer to Section 1.3, Valve Markings and check area "5" on your valve's identification plate to determine the correct seat material for your valve. Please provide the full type code from the identification plate.

### Service / spare part

Valmet recommends that valves be directed to our service centers for maintenance. The service centers are equipped to provide rapid turn-around at a reasonable cost and offer new valve warranty with all reconditioned valves.

**NOTE:** When sending goods to the service center for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. Include the material safety datasheet(s) (MSDS) for all media flowing through the valve. Valves sent to the service center without MSDS datasheet(s) will not be accepted.

For further information on spare parts and service or assistance visit our website at [www.valmet.com/flowcontrol](http://www.valmet.com/flowcontrol).

**NOTE:** When ordering spare parts, always include the following information:

- Valve type code from identification plate
- If the valve is serialized – the serial number (from identification plate)

Table 9

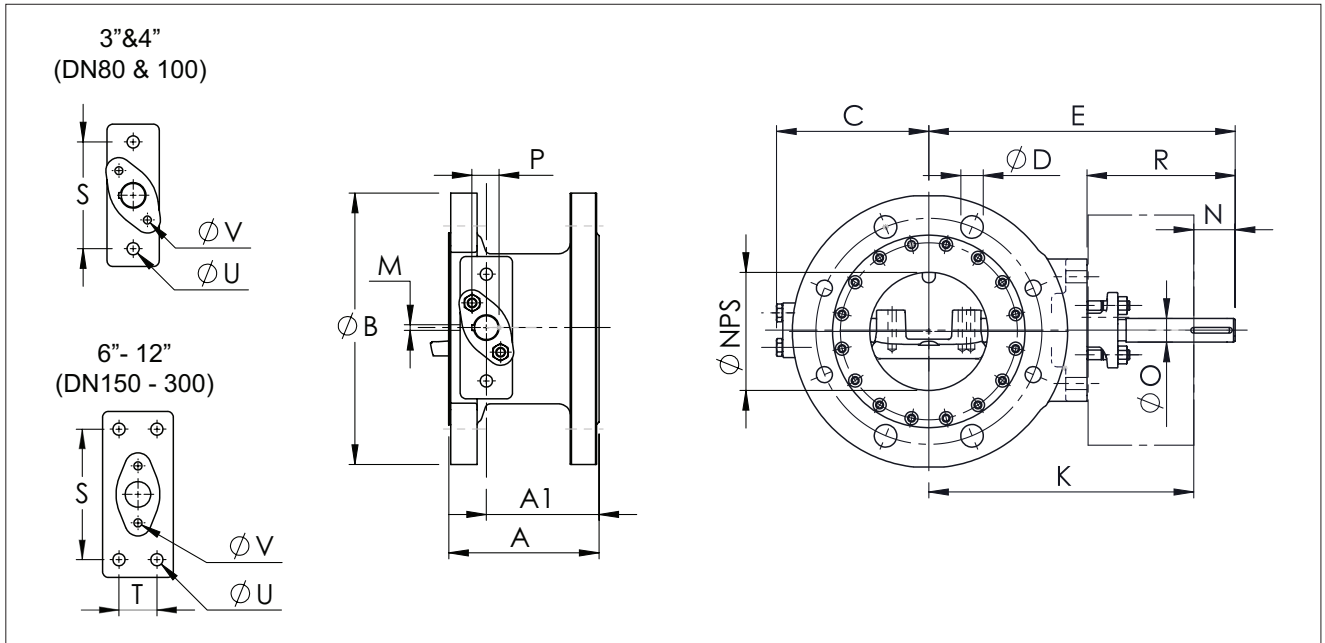
Torque – Series 815, 810 and 816							
Valve size		Shaft downstream; T & X seats					
		Shut-off differential pressure					
Inches	DN	Nm @ 6.9 bar	Ft•lbs @ 100 psi	Nm @ 13.8 bar	Ft•lbs @ 200 psi	Nm @ 19.7 bar	Ft•lbs @ 285 psi
3	80	34	25	37	27	39	29
4	100	47	35	53	39	58	43
6	150	97	72	113	83	126	93
8	200	164	121	193	142	217	160
10	250	222	163	274	202	318	234
12	300	290	214	390	287	475	350

Table 10

Torque – Series 830, 825 and 840													
Valve size		Shaft downstream; T & X seats											
		Shut-off differential pressure											
Inches	DN	Nm @ 20.7 bar	Ft•lbs @ 300 psi	Nm @ 27.6 bar	Ft•lbs @ 400 psi	Nm @ 34.5 bar	Ft•lbs @ 500 psi	Nm @ 41.4 bar	Ft•lbs @ 600 psi	Nm @ 48.3 bar	Ft•lbs @ 700 psi	Nm @ 51 bar	Ft•lbs @ 740 psi
3	80	42	31	46	34	51	38	55	41	60	44	62	45
4	100	70	52	79	58	88	65	97	72	106	78	110	81
6	150	161	119	188	138	214	158	241	178	267	197	278	205
8	200	313	231	368	271	422	312	477	352	532	392	554	408
10	250	480	354	572	422	664	490	756	557	848	625	885	652
12	300	667	492	790	582	913	673	1035	764	1158	854	1207	890

# 11. DIMENSIONS AND WEIGHTS

## Double flange type



## Double Flange (ASME 150)

DN	NPS	Dimensions (mm)															Weight (kg)
		A (API/SERIES 13)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	114	86	190	115	226	201	4.8	25.0	15	17.0	105	70	-	M10	M8	10
100	4	127	95	230	135	258	223	4.8	35.0	20	22.2	125	90	-	M12	M8	18
150	6	140	107	280	165	277	242	4.8	35.0	20	22.2	125	110	32	M12	M8	26
200	8	152	115	345	195	323	277	6.4	46.0	25	27.8	136	110	32	M12	M10	43
250	10	165	125	405	230	393	342	6.4	51.0	30	32.9	161	130	32	M12	M12	61
300	12	178	134	485	265	428	370	9.5	58.0	35	39.1	168	130	32	M12	M12	94

## Double Flange (PN10)

DN	NPS	Dimensions (mm)															Weight (kg)
		A (API/SERIES 13)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	114	86	200	115	226	201	4.8	25.0	15	17.0	105	70	-	M10	M8	12
100	4	127	95	220	135	258	223	4.8	35.0	20	22.2	125	90	-	M12	M8	16
150	6	140	107	285	165	277	242	4.8	35.0	20	22.2	125	110	32	M12	M8	25
200	8	152	115	340	195	323	277	6.4	46.0	25	27.8	136	110	32	M12	M10	39
250	10	165	125	395	230	393	342	6.4	51.0	30	32.9	161	130	32	M12	M12	57
300	12	178	134	445	265	428	370	9.5	58.0	35	39.1	168	130	32	M12	M12	76

## Double Flange (PN16)

DN	NPS	Dimensions (mm)															Weight (kg)
		A (API/SERIES 13)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	114	86	200	115	226	201	4.8	25.0	15	17.0	105	70	-	M10	M8	12
100	4	127	95	220	135	258	223	4.8	35.0	20	22.2	125	90	-	M12	M8	16
150	6	140	107	285	165	277	242	4.8	35.0	20	22.2	125	110	32	M12	M8	25
200	8	152	115	340	195	323	277	6.4	46.0	25	27.8	136	110	32	M12	M10	39
250	10	165	125	405	230	393	342	6.4	51.0	30	32.9	161	130	32	M12	M12	57
300	12	178	134	460	265	428	370	9.5	58.0	35	39.1	168	130	32	M12	M12	81

## Double Flange (ASME 300)

DN	NPS	Dimensions (mm)															Weight (kg)
		A (API/SERIES 13)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	114	86	210	115	226	201	4.8	25.0	15	17.0	105	70	-	M10	M8	15
100	4	127	95	255	135	258	223	4.8	35.0	20	22.2	125	90	-	M12	M8	25
150	6	140	104	320	185	321	275	6.4	46.0	25	27.8	136	110	32	M12	M10	47
200	8	152	108	380	220	381	323	9.5	58.0	35	39.1	168	130	32	M12	M12	71
250	10	165	117	445	260	442	374	9.5	68.0	40	44.2	188	160	40	M16	M12	108
300	12	178	124	520	305	535	445	12.7	90.0	50	55.5	230	160	55	M20	M16	169

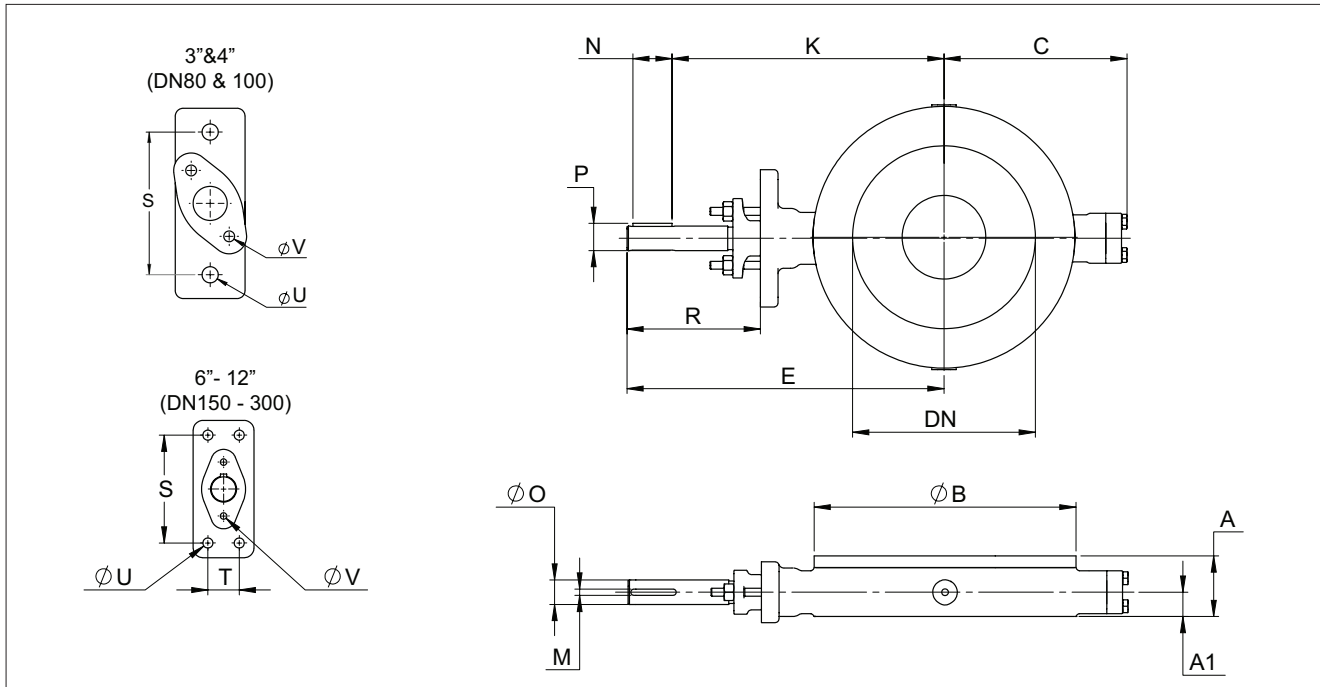
## Double Flange (PN25)

DN	NPS	Dimensions (mm)															Weight (kg)
		A (API/SERIES 13)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	114	86	200	115	226	201	4.8	25.0	15	17.0	105	70	-	M10	M8	13
100	4	127	95	235	135	258	223	4.8	35.0	20	22.2	125	90	-	M12	M8	20
150	6	140	104	300	185	321	275	6.4	46.0	25	27.8	136	110	32	M12	M10	35
200	8	152	108	360	220	381	323	9.5	58.0	35	39.1	168	130	32	M12	M12	53
250	10	165	117	425	260	442	374	9.5	68.0	40	44.2	188	160	40	M16	M12	80
300	12	178	124	485	305	535	445	12.7	90.0	50	55.5	230	160	55	M20	M16	118

## Double Flange (PN40)

DN	NPS	Dimensions (mm)															Weight (kg)
		A (API/SERIES 13)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	114	86	200	115	226	201	4.8	25.0	15	17.0	105	70	-	M10	M8	13
100	4	127	95	235	135	258	223	4.8	35.0	20	22.2	125	90	-	M12	M8	20
150	6	140	104	300	185	321	275	6.4	46.0	25	27.8	136	110	32	M12	M10	37
200	8	152	108	375	220	381	323	9.5	58.0	35	39.1	168	130	32	M12	M12	63
250	10	165	117	450	260	442	374	9.5	68.0	40	44.2	188	160	40	M16	M12	101
300	12	178	124	515	305	535	445	12.7	90.0	50	55.5	230	160	55	M20	M16	155

## Wafer type



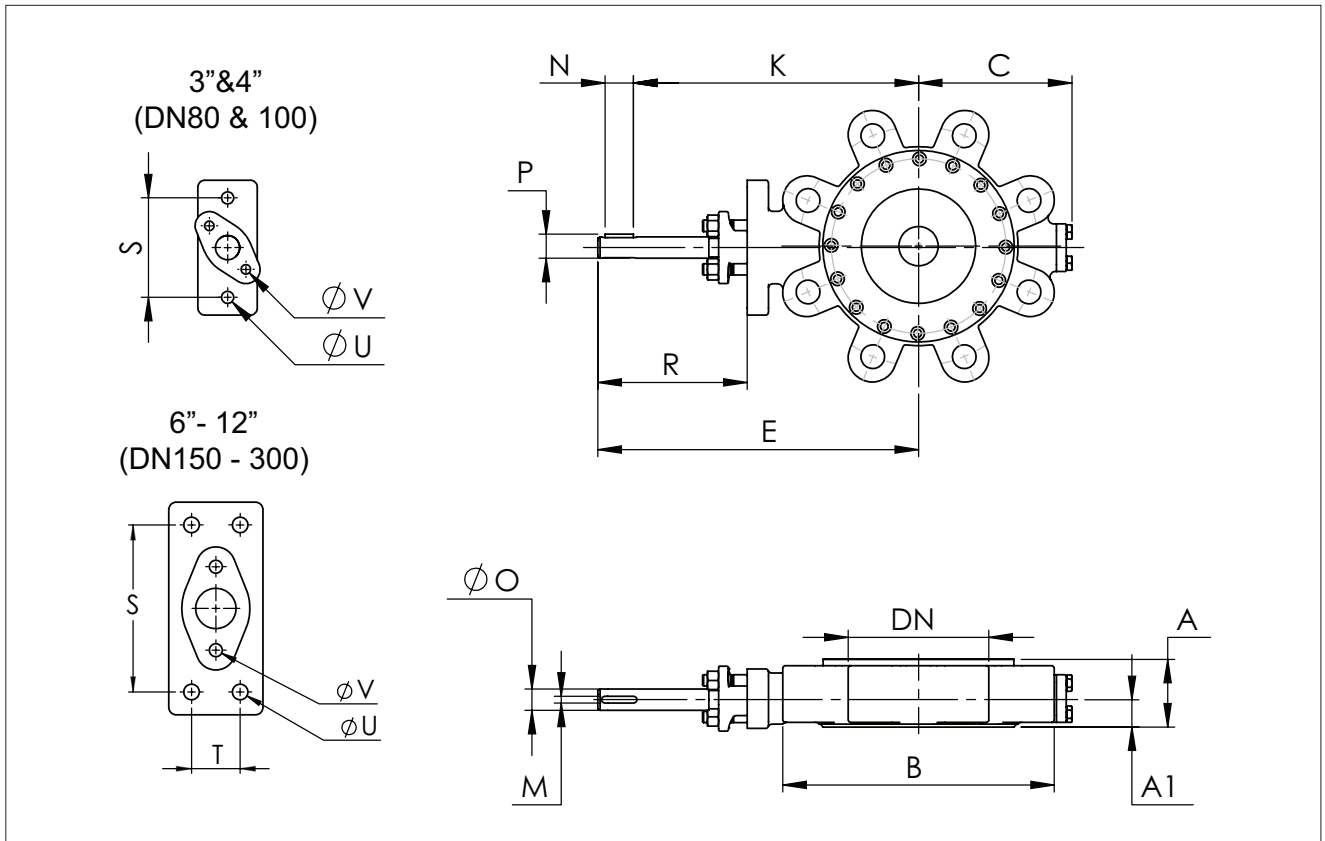
## Wafer (ASME 150, PN10-16)

DN	NPS	Dimensions (mm)															Weight (kg)	
		A (API)	A (Series 25)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U		V
80	3	48	49	20	131	115	226	201	4.8	25	15	17.0	105	70	-	M10	M8	6
100	4	54	56	22	156	135	258	223	4.8	35	20	22.2	125	90	-	M12	M8	8
150	6	57	70	24	217	165	277	242	4.8	35	20	22.2	125	110	32	M12	M8	15
200	8	64	71	25	267	195	323	277	6.4	46	25	27.8	136	110	32	M12	M10	25
250	10	71	76	30	328	230	393	342	6.4	51	30	32.9	161	130	32	M12	M12	44
300	12	81	83	37	375	265	428	370	9.5	58	35	39.1	168	130	32	M12	M12	56

## Wafer (ASME 300, PN25-40)

DN	NPS	Dimensions (mm)															Weight (kg)	
		A (API)	A (Series 16)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U		V
80	3	48	64	20	131	115	226	201	4.8	25	15	17.0	105	70	-	M10	M8	6
100	4	54	64	22	156	135	258	223	4.8	35	20	22.2	125	90	-	M12	M8	8
150	6	59	76	25	217	185	321	275	6.4	46	25	27.8	136	110	32	M12	M10	19
200	8	73	89	32	280	220	381	323	9.5	58	35	39.1	168	130	32	M12	M12	35
250	10	83	114	38	340	260	442	374	9.5	68	40	44.2	188	160	40	M16	M12	60
300	12	92	114	41	400	305	535	445	12.7	90	50	55.5	230	160	55	M20	M16	91

## Lug type



## Lug (ASME 150, PN10-16)

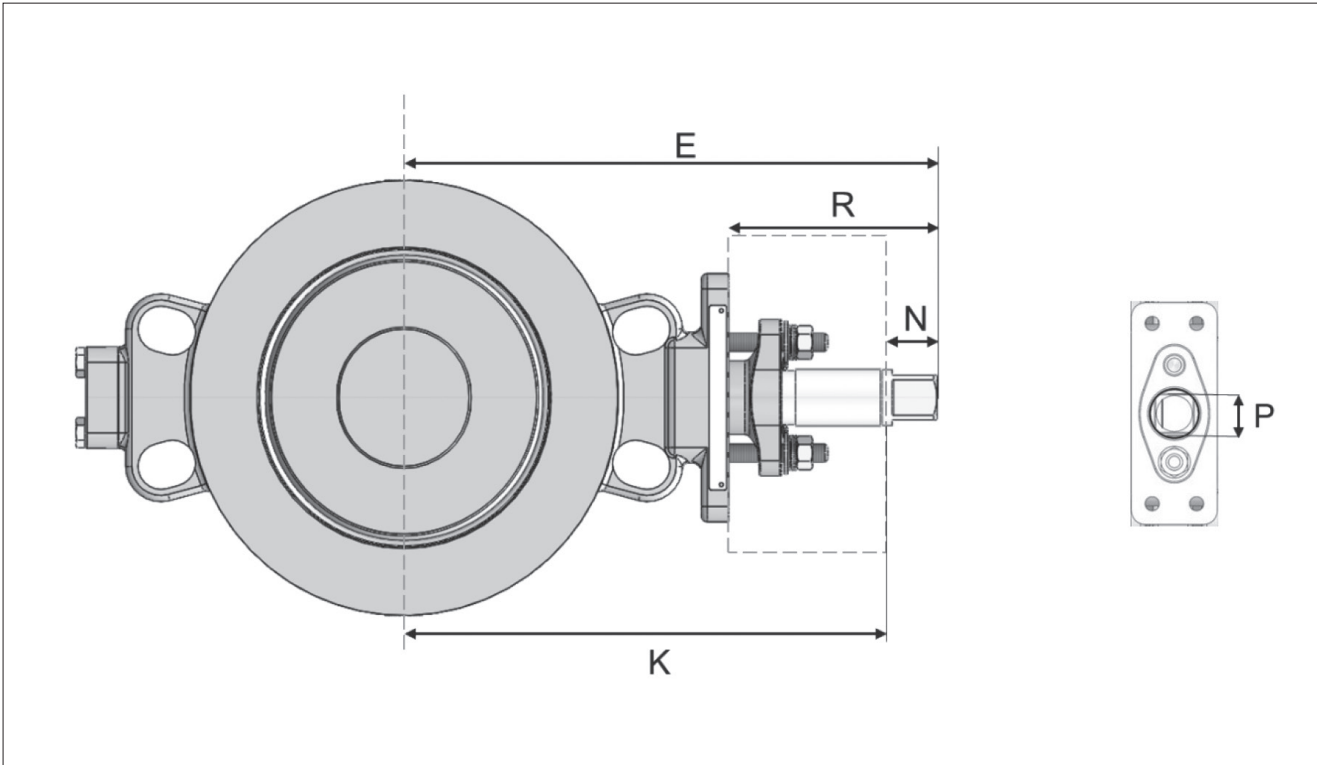
DN	NPS	Dimensions (mm)																Weight (kg)
		A (API)	A (Series 25)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	48	49	20	180	115	226	201	4.8	25	15	17.0	105	70	-	M10	M8	10
100	4	54	56	22	240	135	258	223	4.8	35	20	22.2	125	90	-	M12	M8	14
150	6	57	70	24	280	165	277	242	4.8	35	20	22.2	125	110	32	M12	M8	19
200	8	64	71	25	335	195	323	277	6.4	46	25	27.8	136	110	32	M12	M10	34
250	10	71	76	30	405	230	393	342	6.4	51	30	32.9	161	130	32	M12	M12	53
300	12	81	83	37	475	265	428	370	9.5	58	35	39.1	168	130	32	M12	M12	70

## Lug (ASME 300, PN25-40)

DN	NPS	Dimensions (mm)																Weight (kg)
		A (API)	A (Series 16)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	48	64	20	205	115	226	201	4.8	25	15	17.0	105	70	-	M10	M8	10
100	4	54	64	22	240	135	258	223	4.8	35	20	22.2	125	90	-	M12	M8	14
150	6	59	76	25	320	185	321	275	6.4	46	25	27.8	136	110	32	M12	M10	31
200	8	73	89	31	380	220	381	323	9.5	58	35	39.1	168	130	32	M12	M12	46
250	10	83	114	37	445	260	442	374	9.5	68	40	44.2	188	160	40	M16	M12	84
300	12	92	114	40	505	305	535	445	12.7	90	50	55.5	230	160	55	M20	M16	113

## Dimensions for valves with square shaft connection

Same dimensions apply for all body types. Other dimensions as in above tables.



### ASME 150, PN10-16

Size		E	K	N	P	R
DN	Inch					
80	3	211	201	10	11	90
100	4	237	223	14	14	104
150	6	256	242	14	14	104
200	8	296	277	19	19	109
250	10	364	342	22	22	132
300	12	397	370	27	27	136

### ASME 300, PN25-40

Size		E	K	N	P	R
DN	Inch					
80	3	211	201	10	11	90
100	4	237	223	14	14	104
150	6	294	275	19	19	109
200	8	349	323	26	27	137
250	10	404	374	30	30	150
300	12	480	445	35	36	175



## 12. TYPE CODE

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
6	-	8	15	W	-	19	22	36	XT	D	-

1. sign	VALVE SIZE (inches / mm)
ASME	3, 4, 6, 8, 10, 12
PN	80, 100, 150, 200, 250, 300

\*) After size code leave one space before construction code.

2. sign	VALVE CONSTRUCTION
-	Standard

3. sign	VALVE SERIES
8	Wafer Sphere butterfly valve

4. sign	PRESSURE CLASS & FACE TO FACE
15	ASME Class 150, API 609 face to face
18	ASME Class 150 w/CE Marking and Documentation, API 609 face to face
30	ASME Class 300, API 609 face to face
38	ASME Class 300 w/CE Marking and Documentation, API 609 face to face
10	PN10, EN 558-part 1, table 5 / basic series 25 (DIN 3202-K2) face to face
16	PN16, EN 558-part 1, table 5 / basic series 25 (DIN 3202-K2) face to face
25	PN25, EN 558-part 1, table 5 / basic series 16 (DIN 3202-K3) face to face
40	PN40, EN 558-part 1, table 5 / basic series 16 (DIN 3202-K3) face to face

5. sign	BODY STYLE
W	Wafer
L	Lugged
F	Double flanged

6. sign	CONSTRUCTION
-	<b>STANDARD</b> (mac +260 °C) Bearings 316 + PTFE-based coating Body and blind flange gaskets graphite Fulfills NACE MR0175 for Wafer (sign 5 W) Anti-static device (ATEX II 3 G c)
O	<b>OXYGEN SERVICE</b> (max. +140 °C) • BAM/WHA approved soft parts • T = -30 °C ... +140 °C • Max pressure = 26 bar • Oxygen cleaning acc. to our internal procedure FC-M-1360-En Note! No carbon steel body material allowed. Note! Only "O" construction available for oxygen flow media. Not to be used with other flow medias.
B	<b>BEARING PROTECTION</b> PTFE bearing protection Otherwise as standard
N	<b>NACE</b> Fulfills NACE MR0175 for Lug and Double flange (sign 5 L and F) NACE compliant clamp ring bolting Otherwise as Standard

7. sign	SHAFT DESIGN
19	Through shaft, keyway shaft connection, compatible with harmonized Neles bracket
24	Drive shaft + trunnion, square shaft connection, compatible with harmonized Neles bracket
29	High Flow (Drive shaft + trunnion, keyway shaft connection, compatible with harmonized Neles bracket.)

8. & 9. sign	BODY MATERIAL	DISC AND SHAFT
2236 <sup>3)</sup>	WCB (1.0619)	CF8M (1.4408) / AISI 316, strain hardened
22HB <sup>1,3)</sup>	WCB (1.0619)	CF8M (1.4408) / Gr. 630 (17-4PH)
28HB	ASTM A352 gr. LCC	CF8M (1.4408) / Gr. 630 (17-4PH)
25HB	ASTM A352 gr. LCB	CF8M (1.4408) / Gr. 630 (17-4PH)
3400	ASTM A351 gr. CF8 / AISI 304	ASTM A351 gr. CF8 (AISI 304) / AISI 316, strain hardened
34HB	ASTM A351 gr. CF8 / AISI 304	CF8M (1.4408) / Gr. 630 (17-4PH)
3600	CF8M (1.4408)	CF8M (1.4408) / AISI 316, strain hardened
36HB <sup>1)</sup>	CF8M (1.4408)	CF8M (1.4408) / Gr. 630 (17-4PH)
3700	ASTM A351 gr. CG8M / AISI 317	ASTM A351 gr. CG8M (AISI 317) / AISI 316, strain hardened
37HB <sup>1)</sup>	ASTM A351 gr. CG8M / AISI 317	CF8M (1.4408) / Gr. 630 (17-4PH)
3900	ASTM A351 gr. CF3 / AISI 304L	ASTM A351 gr. CF3 (AISI 304L) / AISI 316, strain hardened
39HB	ASTM A351 gr. CF3 / AISI 304L	CF8M (1.4408) / Gr. 630 (17-4PH)
6E00	ASTM A351 gr. CF3M / AISI 316L	ASTM A351 gr. CF3M (AISI 316L) / AISI 316, strain hardened
6EHB	ASTM A351 gr. CF3M / AISI 316L	CF8M (1.4408) / Gr. 630 (17-4PH)
7100 <sup>1,2)</sup>	ASTM A494 gr. M-35-1 (Monel 400)	ASTM A494 gr. M-35-1 (Monel 400)
4J00	ASTM A995 gr. 4A / EN 10213 - 1.4517	ASTM A995 gr. 4A / EN 10213 - 1.4517 / UNS 32750
4L00	ASTM A995 gr. 5A / EN 10213 - 1.4469	ASTM A995 gr. 5A / EN 10213 - 1.4469 / UNS 32750

10. sign	SEAT AND SEAL COMBINATION	
	SEAT	SEAL
XT	Xtreme®	Virgin PTFE V-ring set
XL	Xtreme®	Graphite
TT	Virgin Teflon (PTFE)	Virgin PTFE V-ring set

11. sign	MODEL CODE
D	Mod D, modular butterfly valve platform

12. sign	MODIFIER CODE
-	Standard live loaded packing (ISO15848-1 certified)
QY	High performance live loaded (ISO15848-1 certified)

- 1 Material meets NACE MR0103 requirements for sour environments. For valves to be in full compliance with NACE MR0103, both the body (sign #8) and trim (sign #9) must meet the NACE MR0103 requirement.
- 2 Valves with the Disc & Shaft Material Code "00" (sign #9) meet the NACE MR0103 requirement for sour environments if the body code (sign #8) is 71.
- 3 Disc & Shaft Material Code "00" (sign #9) is not available with 22 body material.

Consult factory regarding other materials of construction that are not listed.

# 13. GENERAL SAFETY WARNINGS AND DISCLAIMERS

## General safety warnings

### Lifting

1. Always use a lifting plan created by a qualified person to lift this equipment. Lifting guidance is provided in this IMO (Installation, Maintenance and Operation manual) to assist in lifting plan development. Think about the center of gravity (CG) of the equipment being lifted. Make sure the CG is always under the central lifting point.
2. Valves may be equipped with lifting threads on the body or on the flanges. These are intended to be used with the lifting plan.
3. Use only correct and approved lifting devices. Ensure that lifting devices and straps are securely attached to the equipment prior to lifting.
4. Check, that lifting devices are not damaged and in good condition with a valid check stamp prior to use.
5. Workers must be trained for lifting and handling valves.
6. Never lift an assembly by the instrumentation (solenoid, positioner, limit switch, etc.) or by the instrumentation piping. Straps and lifting devices should be fitted to prevent damage to instrumentation and instrumentation piping. Failure to follow the lifting guidance provided may result in damage and personal injury from falling objects.

### Work activities on the valve

1. Wear your personal safety equipment. Personal safety equipment includes but is not limited to protective shoes, protective clothing, safety glasses, helmet, hearing protection and working gloves.
2. Always follow the local safety instructions in addition to the Valmet instructions. If Valmet instructions conflict with local safety instructions, stop work and contact Valmet for more information.
3. Before beginning service on the equipment, make sure that the actuator is disconnected from any kind of power source (pneumatic, hydraulic, and/or electric), and no stored energy is applied on the actuator (compressed spring, compressed air volumes, etc.). Do not attempt to remove a spring return actuator unless the stop screw is carrying the spring force.
4. Make sure that there is a LOTOTO (Lock Out / Tag Out / Try Out) procedure in place for the system in which the valve is installed and strictly follow it.
5. Always make sure that the pipeline is depressurized and in ambient temperature condition before maintenance work is started.
6. Keep hands and other body parts out of the flow port when the valve is being serviced and the actuator is connected to the valve. There is a high risk of serious injury to hands and/or fingers due to malfunction if the valve suddenly starts to operate.
7. Beware of Trim (Disc, Ball or Plug) movement even when the valve is disassembled. Trim may move simply due to the weight of the part or change in position of the valve. Keep hands or other body parts away from locations where they may be injured by movement of the trim. Do not leave objects near or in the valve port which may fall in and need to be retrieved.

## General disclaimers

### Receiving, handling and unpacking.

1. Respect the safety warnings above!
2. Valves are critical components for pipelines to control high pressure fluids and must therefore be handled with care.

3. Store valves and equipment in a dry and protected area until the equipment is installed.
4. Do not exceed the maximum storage temperatures given in the IMO (installation, maintenance, and operating instructions).
5. Keep the original packaging on the valve as long as possible to avoid environmental contamination by dust, water, dirt, etc.
6. Remove the valve endcaps just before mounting into the pipeline.
7. FOR YOUR SAFETY IT IS IMPORTANT TO FOLLOW THESE PRECAUTIONS BEFORE REMOVAL OF THE VALVE FROM THE PIPELINE OR ANY DISASSEMBLY:
  - Be sure you know what flow medium is in the pipeline. If there is any doubt, confirm with the proper supervisor.
  - Wear any personal protective equipment (PPE) required for working with the flow medium involved in addition to any other PPE normally required.
  - Depressurize the pipeline, bring to ambient temperature, and drain the pipeline flow medium.
  - Cycle the valve to relieve any residual pressure in the body cavity.
  - After removal but before disassembly, cycle the valve again until no evidence of trapped pressure remains.
  - The valves with offset shaft (Butterfly, eccentric rotary plug) have greater trim area on one side of the shaft. This will cause the valve to open when pressurized from the preferred direction without a locking handle or an actuator installed.
  - **WARNING:** DO NOT PRESSURIZE THE ECCENTRIC VALVE WITHOUT A HANDLE OR AN ACTUATOR MOUNTED ON IT!
  - **WARNING:** DO NOT REMOVE A HANDLE OR AN ACTUATOR FROM AN ECCENTRIC VALVE WHILE PRESSURIZED!
  - Before installing the eccentric valve in or remove it from the pipeline, cycle the valve closed. Eccentric valves must be in the closed position to bring the trim within the face to face of the valve. Failure to follow these instructions will cause damage to the valve and may result in personal injury.

### Operating

8. The identification plate (ID-plate, type plate, nameplate, or engraved markings) on the valve gives the information of max. process conditions to the valve.
9. (For soft seats) The practical and safe use of this product is determined by both the temperature and pressure ratings of the seat and body. Read the identification plate and check both ratings. This product is available with a variety of seat materials. Some seat materials have pressure ratings that are lower than the body ratings. All body and seat ratings are dependent on the valve type, size and material of the body and seat. Never exceed the marked rating.
10. Temperatures and pressures must never exceed values marked on the valve. Exceeding these values may cause uncontrolled release of pressure and process medium. Damage or personal injury may result.
11. The operating torque of the valve may rise over time due to wear, particles or other damage of the seat. Never exceed the actuator torque preset values (air supply, position). Application of excessive torque may cause damage to the valve.
12. Valmet valves typically are designed to be used in atmospheric conditions. Do not use valves under external pressurized conditions unless specifically designed and explicitly marked for this service.

13. Avoid Pressure shocks or water hammer. Systems with high pressure valves should be equipped with a bypass to reduce the differential pressure before opening the valve to avoid pressure shock.
14. Avoid thermal shock. High temperature, Low temperature and cryogenic valves should be operated in a way that limits the rate of increase or decrease in temperature. The valve should be thermally stabilized before being pressurized.
15. Materials of the valve are carefully selected for the process conditions. Changes to the process media can have a major impact on function and safety of the valve. Always confirm the materials are suitable for the service prior to installation.
16. As the use of the valve is application specific, several factors should be considered when selecting a valve for a given application. Therefore, some situations in which the valves are used are outside the scope of this manual.
17. It is the end user's responsibility to confirm compatibility of the valve materials with the intended service, however if you have questions concerning the use, application, or compatibility of the valve for the intended service, contact Valmet for more information.
18. Never use a valve with enriched or pure oxygen if the valve is not explicitly designed and cleaned for oxygen. Selected materials and design have a major impact on the safety to operate the valve with oxygen.
19. Valves intended for use in or with explosive atmospheres must be equipped with a grounding device and marked according ATEX (or equivalent international standards).
20. Manual handles are available for specific butterfly valve sizes and maximum line pressures. Do not operate a valve with a handle or wrench outside the size and pressure limits stated in the IMO. High line pressure may create a large enough force to pull the handle from the operator's hands. Damage or personal injury may result.
29. Do not use sharp tools, grinding machines, or files to work on functional surfaces such as sealing, seating or bearing surfaces as this can damage these surfaces.
30. Check the condition of sealing surfaces on the seats, trim (disc, ball, plug, etc.), body and body cap. Replace parts if there are significant wear, scratches, or damage.
31. Check the wear of bearings and bearing contact surfaces on the shaft and replace damaged parts if necessary.
32. Do not weld on pressure retaining parts without an ASME and PED qualified procedure and personnel.
33. Pressure retaining parts of valves in high temperature applications must be carefully examined for the effects of material creep and fatigue.
34. Make sure that the valve is positioned in the correct flow direction into the pipeline.
35. If the valves are marked to be suitable for explosive atmospheres, the correct function of the discharging device must be tested before returning to service.
36. Always work in a clean environment. Avoid getting particles inside the valve due to machining, grinding, or welding nearby.
37. Never store a valve in maintenance without flow port protection.
38. When pressure testing valve seats, never exceed the maximum operating pressure of the system or the maximum shut-off pressure marked on the valve identification plate.
39. Actuator mounting and unmounting:
  - Before installing the actuator on to the valve, be sure the actuator is properly indicating the valve position. Failure to assemble these to indicate correct valve position may result in damage or personal injury.
  - When installing or removing a linkage kit, best practice is to remove the entire linkage assembly, including couplings which may fall off the valve during lifting or when position changes.
  - Mounting sets have been designed to support the weight of the Valmet actuator and recommended accessories either as is or with additional actuator support. Use of the linkage to support additional equipment or additional weight such as people, ladders, etc. may result in equipment damage or personal injury.

#### **Maintenance**

21. Respect the safety warnings above!
22. Plan service and maintenance actions, that spare parts, lifting devices and service personnel is available.
23. Maintain the valve within the recommended minimum maintenance intervals or within the recommended maximum operating cycles.
24. Always make sure that the valve and the pipeline is depressurized before starting any kind of maintenance work at a valve.
25. Always check the position of the valve before starting maintenance work. Follow the Lock out /tag out (LOTO) rules at the site before starting any maintenance activity.
  - See IMO for the correct stem position.
  - Consider that the positioner may give the wrong signals.
26. Sealing materials (soft sealing parts) should be changed when the valve in maintenance. Always use original equipment manufacturers (OEM) spare parts to ensure proper performance of the repaired valve.
27. All pressure containing parts must be inspected visually for damage or corrosion. Damaged parts must be replaced.
28. Valve pressure retaining parts and all internals must be inspected for corrosion or erosion which may result in reduced wall thickness on pressure retaining parts. Damaged pressure retaining parts must be replaced with original equipment manufacturer's (OEM) replacement parts or repaired to factory specifications by an authorized Valmet service partner in order to maintain the warranty.
40. The valve should be installed between flanges using appropriate gaskets and fasteners that are compatible with the application, and in compliance with applicable piping codes and standards. Center the gaskets carefully when fitting the valve between the flanges. Do not attempt to correct pipeline misalignment by means of the flange bolting.
41. Repairs on valves for special service like Oxygen, Chlorine, and Peroxide, have special requirements.
  - Parts must be cleaned appropriate to the service and protected from contamination prior to assembly.
  - Assembly areas and tools must be clean and dry to prevent contamination of the parts during assembly.
  - Test equipment must be clean and dry to prevent contamination during testing. This includes the test equipment internals that may allow particles or other contamination into the test medium during the test.
  - Lubrication shall be used only if specifically required in the instructions. Where lubrication is required, the lubricant must be approved for the service by the end user.

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