



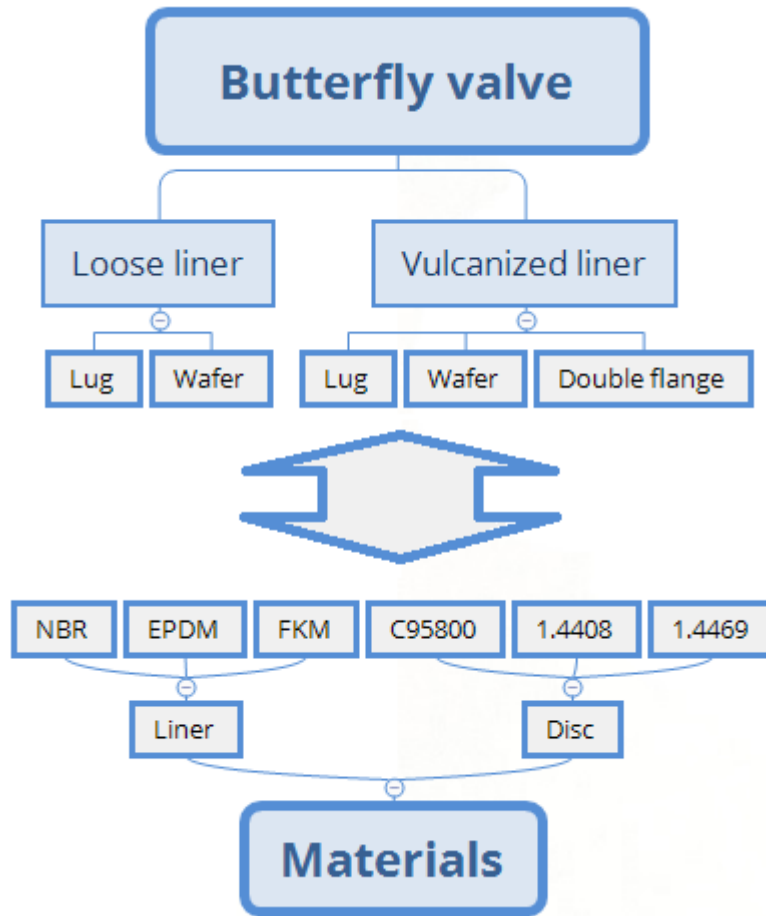
THE VALVE SPECIALISTS  
OF SCANDINAVIA

# Installation and operation manual

## Butterfly valves lug, wafer and double flanged type



This manual is valid for the following products:



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## 1. General information

This manual shall serve as an instruction for installation and operation of Meson butterfly valves. For technical specifications please see valid data sheet found on Meson website ([www.mesongroup.com](http://www.mesongroup.com)).

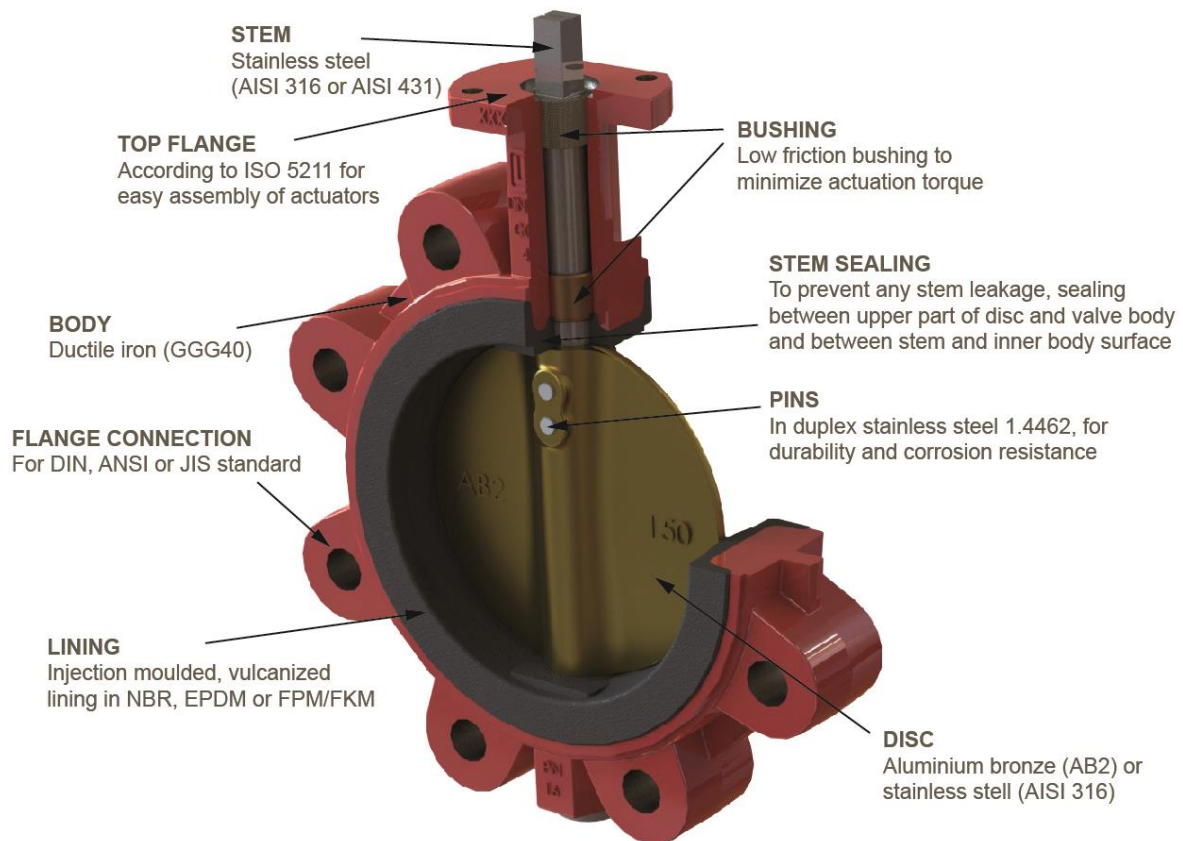
It is the responsibility of the installer to ensure that approved materials are used and that the installation and maintenance work meets applicable rules, regulations and requirements.

In case of problems which cannot be solved from information in this manual, Meson shall be contacted for support.

Note that most of the information in this manual concerns safety, so please read carefully before installation of the valve.

## 2 Valve parts

This section outlines the general structure of the valve.



### 3. Product marking

Each valve supplied by Meson is marked with a name plate and a serial number.



**Diameter (DN):** Shows the DN rating of valve and corresponding pipes. Please refer to the valid datasheet at Meson website ([www.mesongroup.com](http://www.mesongroup.com)) for a detailed description of the dimensions.

**Pressure class (PN):** This indicates the maximum working pressure of the system. It is very important that the valve is not installed with a system which operates at higher pressure than this.

**FLGE:** Shows the flange drilling of the body. Please refer to the valid datasheet at Meson website ([www.mesongroup.com](http://www.mesongroup.com)) for a detailed description of the dimensions.

**Body:** Shows material of the casted body.

**Seat:** Shows rubber material used in liner. Please consider system media as well as minimum and maximum temperature.

**Shaft:** Shows the material of the stem.

**Disc:** Shows the material of the disc.

**Serial number:** Each valve has a stamped serial number, in format NNNN00, located close to the top flange. This is used for traceability and quality assurance.

## 4 Storage and handling instruction

### 4.1 Storage

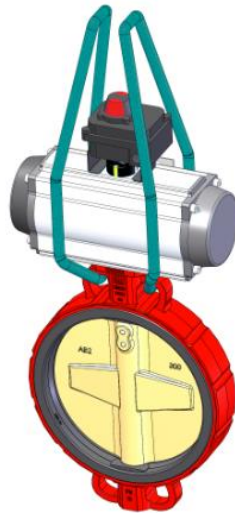
Store the valves indoors in a clean and dry place. Corrosion that occurs during storage will significantly reduce the life span of the valve.

High temperature and direct sunlight will shorten the service life of the rubber liner. Optimal storage condition is in covered pallets with ambient temperature of 5-20°C.

Butterfly valves shall be stored with the disc slightly opened to prevent permanent disc setting deformation.

### 4.2 Lifting and handling

Be careful when lifting the valve. Never lift by the valve handle, gear operator, hand wheel or actuator. Securely place the rope or hoist around the valve body while handling – see picture below. Consider centre of gravity and prevent tilting and rotational forces.



Please consider the following advices in order to prevent damage to the valve:

**Scratch to disc edge:** The edge of the butterfly valve is hand polished and very easily scratched. If carelessly handled, the valve will leak at the position of the scratch.

**Scratches to the rubber liner:** Sharp object might scratch the sealing surface inside the valve or on the flanges. If carelessly handled, the valve will leak at the position of the scratch.

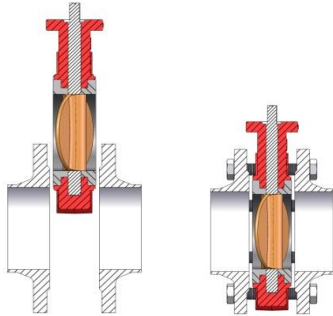
**Force applied to top of stem:** Mounting a lever, gearbox or actuator onto the butterfly valve is easily made, in case any force is needed be careful not to hit the stem. Great force applied to the top of the stem might cause a permanent imprint in the rubber. Bumping the valve into a hard object might cause the same damage.

## 5. Installation

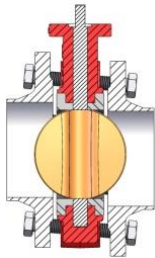
The valves shall never be installed where service conditions could exceed the valve ratings concerning pressure, temperature or operating media. Failure to comply with this warning may result in personal injury or property damage.

### 5.1 Installation procedure

1. Check the valve identification tag to make sure the pressure and valve materials are correct for the application.
2. Make sure the pipe line has sufficient support in order to prevent vibrations and load weight from damaging the valve.
3. Make sure pipes are aligned
4. Make sure the pipe flanges and valve sealing faces are clean from any debris.
5. Spread the flanges enough to allow the butterfly valve to fit with **partly opened disc (5-10 degrees)**.



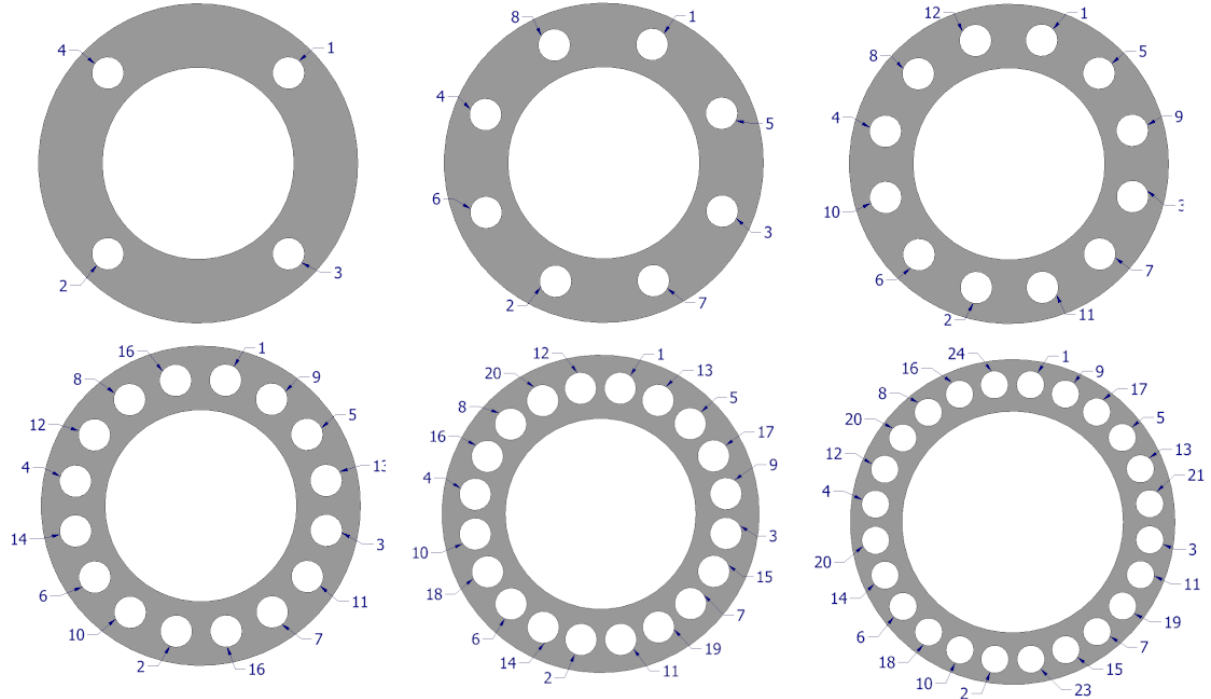
6. Fix the valve (without any gaskets) with the bolts - without tighten them - open the disc to a fully open position and make sure it will not be in contact with the pipe.



7. Tighten each bolt crosswise according to figure on next page.

## 5.2 Bolt tightening sequence

Crosswise bolt tightening to ensure a fixed installation, other bolt tightening may affect the installation. Bolt torque is given in chapter 8.





### 5.3 Bolt tightening torque

To obtain a satisfactory seal in any application it is important that basic procedures are followed no matter what style of gasket or material is used.

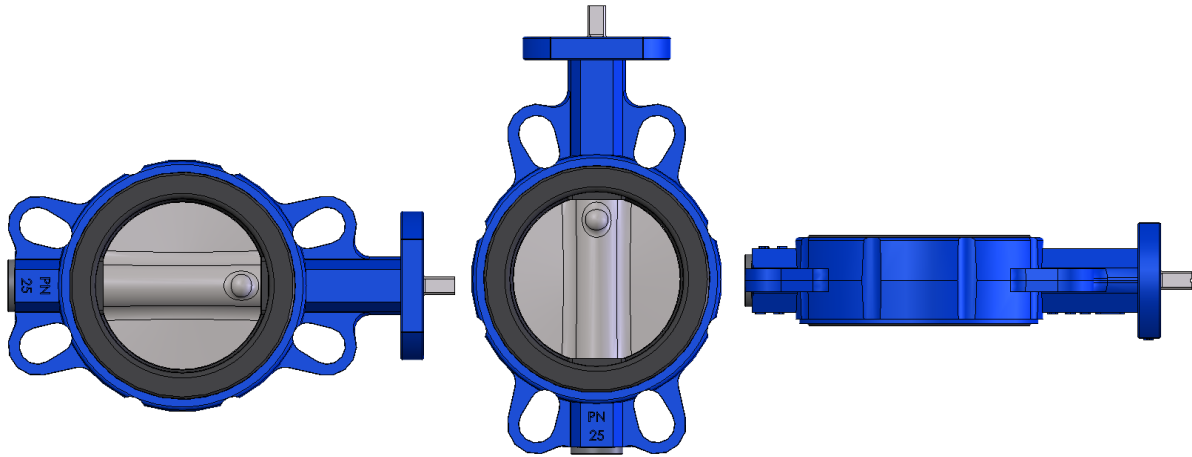
1. Inspect the flange sealing surfaces. Check for tool marks, dents or scratches. Radial tool marks on the sealing surface are difficult to seal against regardless of the style of gasket. Ensure that the finish is adequate for the style of gasket being used.
2. Examine the lined surface or the gasket if one is used. Verify that the material is compatible with the fluid being used in the pipeline. Check for tool marks, shipping and storage damage.
3. Tighten the bolts approximately 30% of final torque following the sequence as shown above. Number the bolts to facilitate following the tightening sequence. If the correct tightening sequence is not followed, the flanges may be misaligned making it impossible to obtain a uniform seating of the gasket which may result in leaks during pressure testing, possible blow-out of the gasket later in service or even damage of sealing surfaces.
4. Repeat step 5 elevating the torque to 50% – 60% of the final value.
5. Continue tightening in the recommended sequence until the final torque value is reached. Each bolt will need to be tightened more than once.
6. If gaskets have been used, all gaskets relax after seating. Retightening the flange bolts is recommended to compensate for the relaxation. Upon initial successful (leak-free) completion of the flange joint, the system should be operated at normal operating conditions (pressure, temperature, vibration, expansion/contraction) for 24-48 hours and the bolt torques checked and re-tightened to the specified value if any changes have occurred.
7. If leakage still occurs after reaching the nominal flange bolt torque, bolt torque may be increased by **10%** and the bolts tightened to the new torque in the same sequence as noted above. A **maximum of 20% increase** above the nominal torque may be used. If leakage still occurs, the connections should be disassembled, all parts examined for defects, replaced, if necessary and reassembled as noted above. If leakage is still present it is possible to tighten bolt torque in elevating steps up to maximum allowed torque. Do note that liner and seal gasket will take harm of this high torque and inspection of the liner surface or gasket is needed with regular intervals.

Torque in Nm

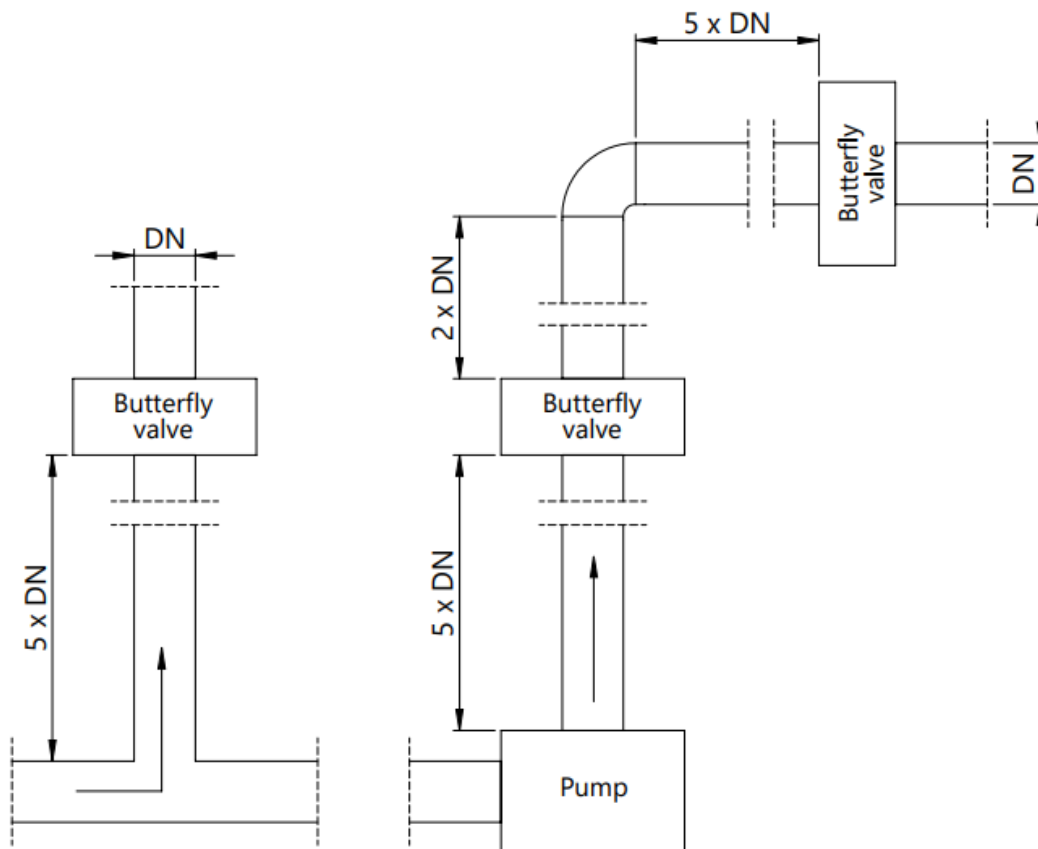
	Min	Nom.	Max
M16	30	95	190
M20	40	160	370
M24	95	325	640
M27	135	515	930
M30	190	705	1270

### 5.4 Installation positions

The valves can be installed in any of the position shown in the image figure below. Do not install the valve with the stem pointing down.



The valves should be installed at a distance of at least five times the DN size of the valve away from tees, elbows or pumps, as shown in the figure below.



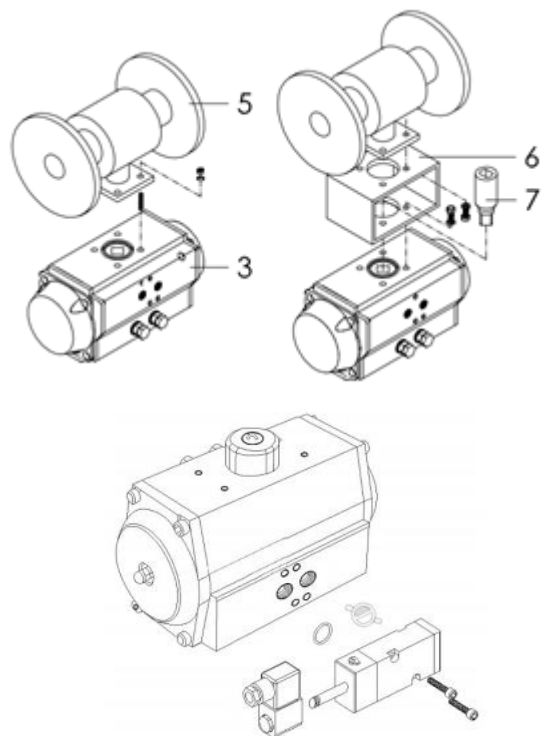
## 5.5 Pneumatic Actuator installation

### Operating conditions

1. Operating media  
Dry or lubricated air, or a non-corrosive gas.  
Maximum particle diameter must less than 30µm.
2. Air supply pressure  
Minimum supply pressure is 2 Bar  
Maximum supply pressure is 8 Bar
3. Operating temperature  
Standard(NBR O-ring): -20°C~+80°C  
Low temperature(L NBR O-ring): -35°C~+80°C  
High temperature(Viton O-ring): -15°C~+150°C
4. Travel adjustment  
Actuators come with an adjustment range of  $\pm 5^\circ$  for the rotation at 0° and 90°
5. Application  
Suitable both for indoor and outdoor, IP-range 65-68

### Assembly steps

1. Remove any manual opening device from the valve, leaving the valve stem clear.
2. Make sure that the shape of the stem fit the actuator output and that the rotation is not hindered in any way. Use adaptors (square or diamond) if needed to achieve the correct size integration between shaft and output hole of the actuator. Also verify that correct rotation is achieved
3. Mount the actuator onto the valve.  
Verify correct placement and integration on the stem.  
There are 2 types of valve assembly onto actuator:  
Direct mount: fit the valve directly onto the top flange of the valve  
Bracket mount: The bracket is bolted onto the valve, the actuator is then bolted onto the bracket with coupling/adaptor to drive the shaft.  
Tightening bolts to torque as per 8.1
4. Make sure that the rotation direction is correct, in any case do not insert your hands inside the valve.
5. Verify stop screw adjustments, if needed adjust screws so that valve is correctly aligned in the open and closed positions.
6. We strongly suggest checking the cleanness of the air-supply pipes, especially when the plant is not provided with filter.
7. Verify assembly as per specific model and make.
8. Installation of solenoid valve, if required adjust the orings, align the solenoid valve towards the actuator and assemble the bolts.



**NOTE! If media of high temperature is used it may be needed to have a spacer between valve and actuator to lower the heat dispersion.**

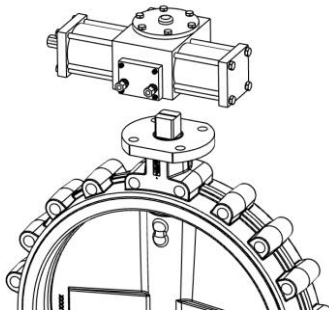
## 5.6 Hydraulic Actuator installation

### Operating conditions

1. Operating media  
Hydraulic oil, viscosity range 15 to 64 cSt, use relevant viscosity as per thermal environment.
2. Hydraulic oil supply pressure  
Minimum supply pressure is 60 Bar  
Maximum supply pressure is 130 Bar
3. Operating temperature  
Standard: -10°C~+70°C  
Extended range (Viton O-ring): -40°C~+145°C
4. Travel adjustment  
Actuators come with an adjustment range of  $\pm 4^\circ$  for the rotation at 0° and 90°
5. Application  
Suitable both for indoor and outdoor, IP-range 65-68

### Assembly steps

1. Remove any manual opening device from the valve, leaving the valve stem clear.
2. Make sure that the shape of the stem fit the actuator output and that the rotation is not hindered in any way. Use adaptors (square or diamond) if needed to achieve the correct size integration between shaft and output hole of the actuator. Also verify that correct rotation is achieved
3. Mount the actuator onto the valve.  
Verify correct placement and integration on the stem.  
Tightening bolts to torque as per 8.1



4. Make sure that the rotation direction is correct, in any case do not insert your hands inside the valve.
5. Verify stop screw adjustments, if needed adjust screws so that valve is correctly aligned in the open and closed positions.
6. Before connecting hydraulic pipes to the actuator flush them to obtain correct cleanliness level.
7. After connection of the pipes to the actuator, vent the system as per standard hydraulic rules.
8. Verify assembly as per specific instruction of model and make.

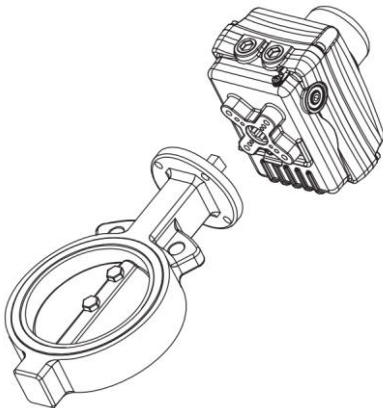
## 5.7 Electric Actuator installation

### Operating conditions

1. Operating media  
DC12V, DC24V, AC24V or AC110 / 230V 50/60Hz
2. Operating temperature  
Standard: -20°C~+70°C  
Max temperature: +120°C for 1 hour
3. Travel adjustment  
Actuators come with an adjustment range of  $\pm 5^\circ$  for the rotation at 0° and 90°
4. Application  
Suitable both for indoor and outdoor, IP-range 67-68

### Assembly steps

1. Remove any manual opening device from the valve, leaving the valve stem clear.
2. Make sure that the shape of the stem fit the actuator output and that the rotation is not hindered in any way. Use adaptors (square or diamond) if needed to achieve the correct size integration between shaft and output hole of the actuator. Also verify that correct rotation is achieved
3. Make sure that that the valve mounting dimensions fit onto the actuator ISO mounting.
4. Manually adjust the valve to optimal closed position
5. Manually adjust the actuator to closed position by removing the manual over ride lever provided on the actuator base, with power off, close the actuator clockwise.
6. Mount the actuator onto the valve, make sure to apply a thin layer of grease valve stem and actuator drive. Verify correct placement and integration on the stem.  
Tightening bolts to torque as per 8.1



7. Make sure that the rotation direction is correct by using the manual over ride, in any case do not insert your hands inside the valve.
8. Verify stop screw adjustments, if needed adjust screws so that valve is correctly aligned in the open and closed positions.
9. Adjust limit switches as needed.
10. Connect cabling as per instruction for specific actuator model and make.

## 6. Maintenance and repair

### Valve

Meson butterfly valves are designed to be maintenance free, but to guarantee the function it is important for the valve to be in regular use to avoid the disc sticking in the seating. Recommended frequency of use is at least once a week.

If a valve for any reason is removed from the pipe, you need to inspect it before re-installation. If the lining or disc is damaged due to wear and tear or for other reasons, a replacement is necessary.

### Actuator

Under normal operating conditions the actuator only requires periodic observation to ensure proper adjustments. Always follow the specific instructions by the manufacturer for the specific actuator model.

## 7. Removing the valve

Prior to any replacement, the valves must be dismantled from the pipe system as follows:

1. Drain and depressurize the pipe on each side of the valve.
2. Ensure that the disc is partially opened (5-10 degrees) before removing the valve.
3. Before removing an automatic actuator ensure that the operating system is not pressurized.

Before re-installation of the valve please look through the installation instructions.

## 8. Bolt dimensions

Bolt dimensions Lug and double flange valves				
	PN 10		PN 16	
DN	Bolts	Qty.	Bolts	Qty.
40	-	-	M16x30	8
50	-	-	M16x35	8
65	-	-	M16x40	8
80	-	-	M16x40	16
100	-	-	M16x40	16
125	-	-	M16x45	16
150	-	-	M20x45	16
200	M20x50	16	-	-
250	M20x55	24	-	-
300	M20x60	24	-	-
350	M20x60	32	-	-
400	M24x70	32	-	-
450	M24x80	40	-	-
500	M24x80	40	-	-
600	M27x90	40	-	-

## 8.1 Bolt torques, maximum values

Note recommended torques for flange connections under point 5.3

Thread size	8.8	10.9	12.9
M5	5,7	8,1	9,7
M6	9,8	14	17
M8	24	33	40
M10	47	65	79
M12	81	114	136
M16	197	277	333
M20	385	541	649
M24	665	935	1120
M30	1310	1840	2210
M36	2280	3210	3850

UNC	8.8	10.9	12.9
1/4 - 20	11	15	19
5/16 - 18	22	31	38
3/8 - 16	38	54	68
7/16 - 14	61	87	108
1/2 - 13	93	131	163
9/16 - 12	133	187	234
5/8 - 11	183	259	323
3/4 - 10	322	455	568
7/8 - 9	516	729	909
1 - 8	772	1090	1360
1 1/8 - 7	1090	1550	1930
1 1/4 - 7	1530	2160	2690
1 1/2 - 6	2650	3750	4680

## 9. Contact information

These butterfly valves are designed and manufactured by Meson AB with head office in Sweden where you can also get technical and commercial support.

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