Series WSSE, LSSE, USSE & CBFV2103 Butterfly Valve DN350 - DN600

CHALLENGER VALVES AND ACTUATORS

Installation

Operation

Maintenance

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Index

1. INTRODUCTION

1.1 DESIGN FEATURES

Available in wafer, lugged or double flanged body.
Flange holes comply with AS2129 E & ANSI Class 125/150 dimensions.
Cast-in top plate with ISO5211 mounting dimensions provides direct-mounting of Challenger HQ, HP actuators and manual operators.
The face-to-face dimensions are designed to comply with ISO5752, BS5155.
Wafer body features two alignment holes for ease of installation.
Through-shaft design.
Disc-to-seat interface provides bubble-tight shut-off with reduced torque and extended service life. Factory tested to 110% of full rated pressure in both directions before shipping.

1.2 FLANGE AND PIPE COMPATIBILITY

Challenger" Butterfly Valves are designed to fit between the following piping flanges:
AS2129 Table E
AS4087 B5
ANSI 125 Cast iron flanges
ANSI 150 Steel flanges
*Special requirements can be accommodated

Note: When installing valves in schedule 80 piping, make sure the valve is properly centered between the pipe flanges to prevent disc edge damage since the clearance between the disc O.D. and the pipe I.D. is reduced. If there is a compatibility question, compare the minimum pipe I.D.

1.3 OPERATING PRESSURES & TEMPERATURE

DN NOMINAL DIAMETER		50 (2") - 2000 (80")	50 (2") - 2000 (80")	Mm (inch)
PN NOMINAL PRESSURE		10	16	bar
TESTING PRESSURE	BODY	15	24	
	SEALING	11	17.6	
°C WORKING TEMPERATURE		EPDM –20°C - 110°C NITRILE –10°C - 80°C		
SUITABLE MEDIUM		Water, Sewage, Sea Water, Air etc		

1.4 PRODUCT STORAGE

The valves should be stored with the disc in the partially open position. The valves should be stored indoors in a clean, dry, well-ventilated place away from corrosive materials and protected from excessive dust and dirt.
The valves should be stored on a rack or pallet off the floor and arranged to prevent damage during handling.
Keep valves out of direct sunlight and in a cool location to prolong elastomer life.
Valves should be protected to prevent damage to the flange faces, disc sealing edge and operator.

1.5 PRODUCT MARKING

All "Challenger" Butterfly Valves are equipped with an identification tag attached to the valve neck. This tag provides the model number, max pressure rating and valve materials. The valve neck also provides the size of the valve.

2. INSTALLATION INFORMATION

"Challenger" butterfly valves are designed for use between the faces of the following flanges, flat, raised face, slip-on or weld-neck flanges at the pressure indicated on the nameplate. **Flange gaskets should not be used**. Consideration should be given to the proper piping alignment prior to the installation of any cast iron lug bodied valve. All "Challenger" butterfly valves are bi-directional with the ability to control flow equally in either direction.

NOTE: All valves require a flange installed either side of the valve for correct alignment. Failure to do this could result in damage to the valve.

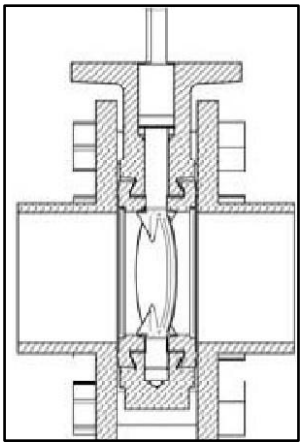
2.1 INSTALLATION INSTRUCTIONS

Step 1. Check to make sure that the pipe flange and valve sealing faces are clean and free from any debris (pipe scale, welding slag, etc.).
Step 2. Check the valve nameplate to ensure that the pressure and valve materials are correct for the application.

WARNING! Butterfly valves should never be installed where service conditions could exceed the valve ratings. Failure to heed warning may result in personal injury or property damage.

Step 3. The seat sealing face on the butterfly valves is wider than the valve body providing a leak proof seal when compressed between pipe flanges. Therefore, no flange gaskets are required when installing any butterfly valve.
Step 4. To prevent damage to the disc sealing edge before installation, position the disc in the "partially open" position (Figure 1) so that the disc is still contained within the valve body.

FIGURE 1. VALVE IN PARTIALLY OPEN POSITION



2.1 INSTALLATION INSTRUCTIONS

Step 5. Spread the pipe flanges apart allowing the valve to be slipped easily in between the flanges.

Step 6. Centre the valve between the flanges and loosely install all flange bolts. On the wafer valve, the flange bolts that pass through the alignment lugs should be installed first.

Step 7. Slowly open the valve to the full open position (see figure 2) and back to the partially open position ensuring that the disc moves freely without any obstruction. If no obstruction is encountered, return the valve to full open position and hand tighten all flange bolts using the bolt tightening sequence shown in figure 3.

When fastening flange bolts be sure to tighten both flanges simultaneouslyand tension evenly to avoid damage to the valve.

FIGURE 2. VALVE IN FULL OPEN POSITION

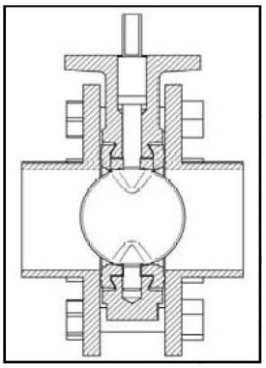
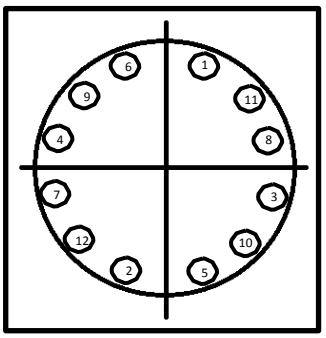


FIGURE 3. BOLTING SEQUENCE



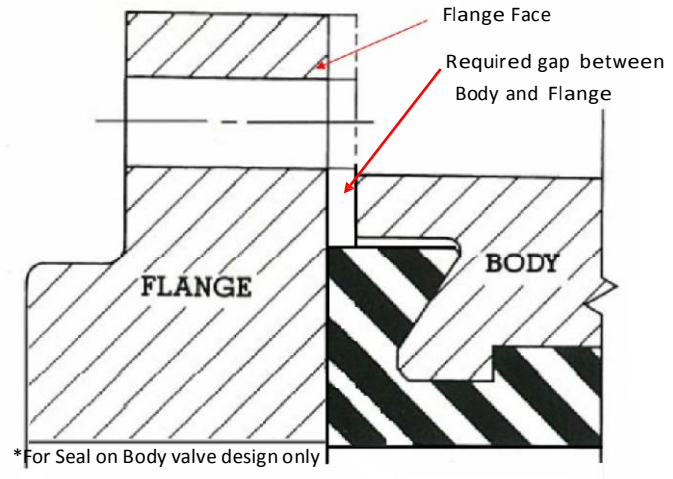
*Continue following this pattern for larger valves

Step 8. Rotate the disc from the fully open position to the fully closed position and make sure that the valve is properly centred and the disc edge does not make contact with the pipe ID.
Return the disc to the full open position and tighten the flange bolts following the bolt tightening sequence shown in Figure 3. Do not fully tighten each flange bolt all at once. Tighten each bolt incrementally . several times. Continually cycle the valve from fully open to fully closed to ensure that there is proper disc clearance.

Step 9. Bolts on flanges are not to be tightened to the extent where the flange is in contact with the body of the valve. The unique O-Ring sealing design allows positive sealing without the over tightening of the bolts. Over tightening of the bolts results in excessive valve torques restricting operation of the valve and potentially damaging the rubber seal. A gap should be visible after the bolts are tightened. (See figure 4)

Each side of the flange must be tightened equally to ensure correct sear alignment.

FIGURE 4. SEALING DESIGN



*For Seal on Body valve design only

Flange Loading - The surface area has been calculated to provide sufficient compression to firmly lock and secure liner into mechanical dovetail joint, ensuring effective sealing and reduced torques.

2.2 MANUAL OPERATOR INSTALLATION

LEVER HANDLE MOUNTING PROCEDURE

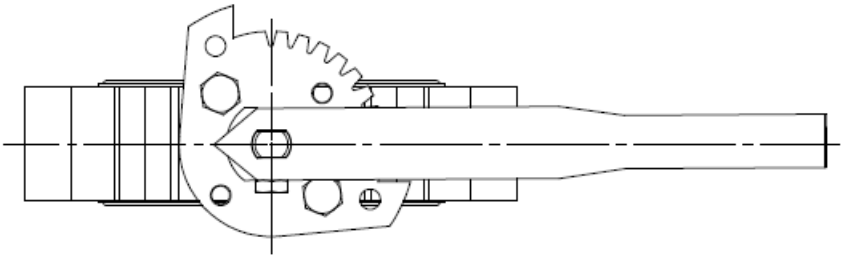
Step 1. First, start by loosely assembling the notch plate on the valve top plate. The notch plate should be installed with the notches in the first quadrant of the valve top plate with the stop tabs at the 12 o'clock and 3 o'clock position. The notch plate should be installed with the stop tabs pointing upward (Figure 5).

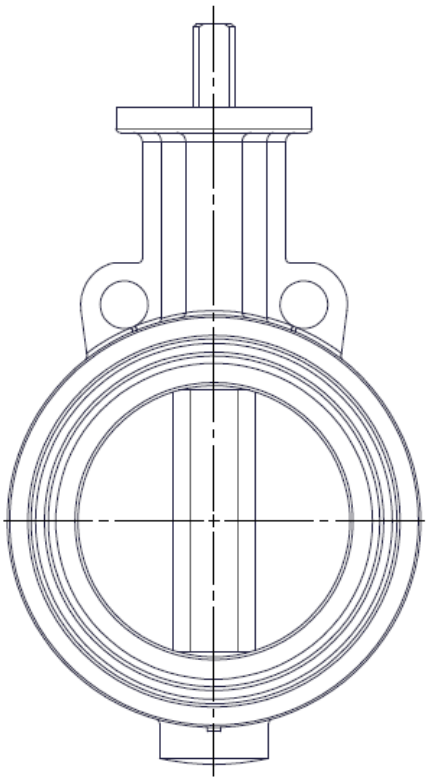
Step 2. Next, install the handle so that the lever fully engages in the notches when the lever is released and tighten the handle set screw.

Step 3. Compress the handle lever and position the disc so that the valve is in the fully closed position. Align the last notch on the notch plate at the 3 o'clock position with the handle lever and tighten the notch plate screws.

Step 4. Compress the handle lever and position the disc so that the valve is in the fully open position and release the lever. The lever should line-up with the first notch on the notch plate at the 12 o'clock position.

FIGURE 5. NOTCH PLATE INSTALLATION POSITION

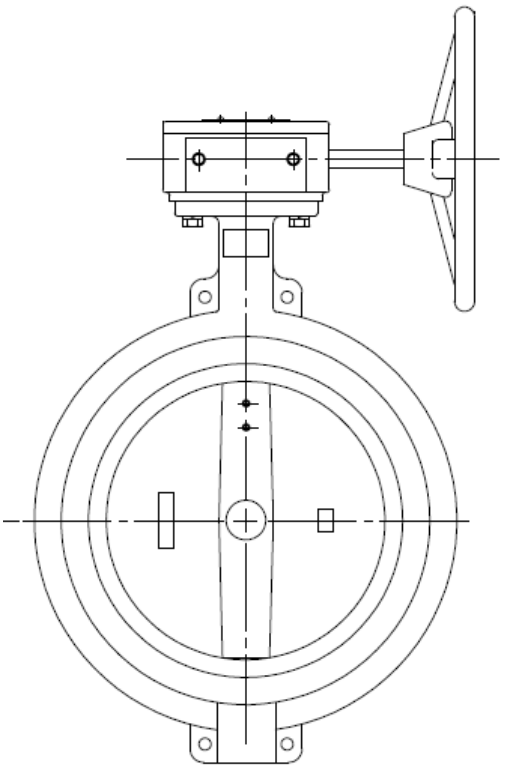




MANUAL GEAR OPERATOR MOUNTING PROCEDURE

Step 1. First, rotate the valve disc to the fully open position.
Step 2. Next, slide the hand wheel onto the end of the gear operator shaft. Line-up the hole in the hand wheel with the hole in the gear operator shaft. Install the shear pin and rotate the gear operator to the open position.
Step 3. Next, line-up the valve stem with the gear operator bore and slide the gear operator onto the valve with the hand wheel pointing to the right of the valve. (See Fig 6.)
Step 4. Make sure before sliding gear operator onto valve shaft, the indicator on the operator is indicating the same position as the valve shaft.
Step 5. Position the gear operator so that the tapped holes in the bottom of the gear operator line-up with the valve top-plate mounting holes and install the mounting screws with lock washers.
Step 6. Loosen the gear operator travel stops and rotate the hand wheel until the valve is in the fully closed position. Tighten the gear operator stop on the right-hand side of the gear operator. (Note: There are two hex head set screws in tandem that represent the gear operator travel stops. Ensure that the first hex head screw is fully removed before loosening the travel stops.)
Step 7. Rotate the hand wheel until the valve is in the fully open position. Tighten the gear operator stop on the left-hand side of the gear operator.
Step 8. Cycle the valve from the fully open position to the fully closed position to make sure that the stops are set correctly.

FIGURE 6. GEAR OPERATOR INSTALLATION POSITION



2.3 RECOMMENDED FLANGE BOLT TORQUE VALUES

Bolt Size	Torque Ft-lbs
M16 x 2.0	41
M20 x 2.5	81
M22 x 2.5	110
M24 x 3.0	139
M27 x 3.0	194
M30 x 3.5	281
M33 x 3.5	358
M36 x 4.0	481
M45 x 4.5	1050

The torque figures contained within this table are based on maximum pressure differentials listed for the product as noted, using standard discs, stems, body and materials of construction at ambient temperatures. Torque figures have reasonable safety factors for normal service, but for valves poorly handled, stored, installed or In service for extended periods of time, may have a dramatic effect on actual torque ratings, additionally for severe or special applications consult Challenger Valves and Actuators.

3. MAINTENANCE AND REPAIR

Challenger" butterfly valves are designed for extended service with minimal wear and servicing. No regular lubrication is required. Prior to any replacement or repair, the valve must be removed from the line following these precautions:
The pipeline on either side of the valve must be depressurized and drained.
Ensure that the disc is in the partially open or full closed position before removing the valve from the line.
DO NOT remove an actuator or operator from the valve while the line is still pressurized.