



Factory Direct Pipeline Products, Inc.

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FACTORY DIRECT PIPELINE PRODUCTS, INC. BUTTERFLY VALVE INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

PLEASE READ THE FOLLOWING INFORMATION PRIOR TO INSTALLING AND USING FACTORY DIRECT PIPELINE PRODUCTS, INC. VALVES, STRAINERS, FILTERS, AND OTHER ASSOCIATED PRODUCTS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS INJURY.

1. Factory Direct Pipeline Products, Inc. guarantees its products against defective material and workmanship only. Factory Direct Pipeline Products, Inc. assumes no responsibility for damage or injuries resulting from improper installation, misapplication, or abuse of any product.
2. Factory Direct Pipeline Products, Inc. assumes no responsibility for damage or injury resulting from chemical incompatibility between its products and the process fluids to which they are subjected. Compatibility charts provided in Factory Direct Pipeline Products, Inc. literature are based on ambient temperatures of 70F and are for reference only. Customer should always test to determine application suitability.
3. Consult Factory Direct Pipeline Products, Inc. literature to determine operating pressure and temperature limitations before installing any Factory Direct Pipeline Products, Inc. product. Note that the maximum recommended fluid velocity through any Factory Direct Pipeline Products, Inc. product is eight feet per second. Higher flow rates can result in possible damage due to the water hammer effect. Also note that maximum operating pressure is dependent upon material selection as well as operating temperature.
4. Factory Direct Pipeline Products, Inc. products are designed primarily for use with non-compressible liquids. They should NEVER be used or tested with compressible fluids such as compressed air or nitrogen.
5. Systems should always be depressurized and drained prior to installing or maintaining Factory Direct Pipeline Products, Inc. products.
6. Temperature effect on piping systems should always be considered when the systems are initially designed. Piping systems must be designed and supported to prevent excess mechanical loading on Factory Direct Pipeline Products, Inc. equipment due to system misalignment, weight, shock, vibration, and the effects of thermal expansion and contraction.
7. Because PVC and CPVC plastic products become brittle below 40F, Factory Direct Pipeline Products, Inc. recommends caution in their installation and use below this temperature.
8. Published operating torque requirements are based upon testing of new valves using clean water at 70F. Valve torque is affected by many factors including fluid chemistry, viscosity, flow rate, and temperature. These should be considered when sizing electric or pneumatic actuators.
9. Due to differential thermal expansion rates between metal and plastic, transmittal of pipe vibration, and pipe loading forces **DIRECT INSTALLATION OF METAL PIPE INTO PLASTIC CONNECTIONS IS NOT RECOMMENDED.** Wherever installation of plastic valves into metal piping systems is necessary, it is recommended that at least 10 pipe diameter in length of plastic pipe be installed upstream and downstream of the plastic valve to compensate for the factors mentioned above.

INSTALLATION

Factory Direct Pipeline Products, Inc. Butterfly Valves should be installed between two pipe flanges. In dead end service, it is recommended they be installed between one pipe flange and a downstream companion or blind flange. The use of additional gaskets are not necessary and not recommended.

The "LUG" design can be installed on one pipe flange with a maximum upstream pressure of 75 PSI.. Flow must be in the direction of the arrow on the body.

When installed between two existing flanges, the flanges should be separated to provide clearance on the face to face of the valve. This will prevent the valve sealing surfaces from distortion during installation. Pipe flanges should be clean and, free of debris including old gasket material. A light coating of a lubricant such as "Non-Fluid Oil" #666 applied to the flange sealing surface will aid in installation.

Factory Direct Pipeline Products, Inc. Butterfly Valves are designed for use with all pipe flanges that have bores equal to or larger than Schedule 80 pipe as listed below. The inside of the pipe flange must be chamfered at a 45 degree angle to a diameter listed if the inside bore is smaller than listed. Sharp edges and burrs must be removed.

Valves can be opened to approximately 15° when installed. Do not open fully during installation to prevent damage to the edge of the disc by the mating flanges.

Install the valves using well lubricated studs or bolts and nuts. For plastic flanges metal washers are recommended between nut/bolt head and pipe flange. With a torque wrench, uniformly tighten nut to approximately 10 foot pounds in an alternating sequence, diametrically opposed to the previously tightened nut. Final tightening should be performed in the same sequence following the recommended torque in the following chart.

For plastic Schedule 80 pipe the maximum allowable displacement is 1/8" off center in any direction. Maximum angular misalignment of 1/16" is allowable.

Normal pipe hanger spacing is recommended. *Do not allow valve to support the weight of pipe.* When using pneumatic or electric actuators, additional support directly to the actuator is recommended.

Manual Butterfly Valves are shipped without the lever installed. The lever is installed by aligning the point of the lever with the arrow stamped on the shaft and carefully engaging the mating hexes. Install the flat washer, the lock washer and the 1/4" screw. Push the "H" black cap into the lever.

RECOMMENDED FLANGE BOLT TORQUE FOR BUTTERFLY VALVES

Size Nominal	Minimum Pipe / Flange Bore (in.)	Stud Dia (In.) x Length (in)	Bolt Dia (In.) Thread	Flat Face Type Flange Torque Ft * Lb.	Van-Stone Type Flange Torque Ft * Lb.
1 1/2"	1.450	1/2 x 4.5	1/2-13 UNC	10-15	5-10
2"	1.880	5/8 x 4.5	5/8 11 UNC	15-25	10-20
3"	2.830	5/8 x 5.5	5/8 11 UNC	20-25	10-20
4"	3.750	5/8 x 6.0	5/8 11 UNC	20-25	10-20
6"	5.680	3/4 x 6.5	3/4-10 UNC	30-40	10-20
8"	7.540	3/4 x 7.0	3/4-10 UNC	30-40	20-30
10"	9.470	7/8 x 9.5	7/8- 9 UNC	50-60	40-50
12"	11.270	7/8 x 10.0	7/8- 9 UNC	50-60	40-50



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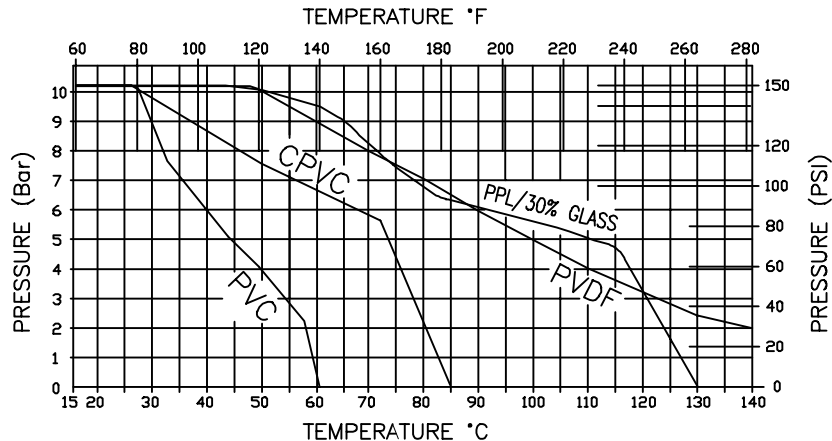
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OPERATION

When installation is complete, check for proper alignment. Fully open and close the valve 3 or 4 times. With a lever installed, fully squeeze the handle and hold in for the full stroke 90° stroke of the lever. For optimum operation the lever handle should be held up until full stroke of valve is reached. The handle should be relaxed only at end of stroke.

Maximum operation pressure at ambient temperature is 150 PSI.

See Chart Below for pressure in PSI derating at temperature



MAINTENANCE & DISASSEMBLY OF VALVE

- I. Minimal valve maintenance is required. The valve is field repairable.
- II. Actuator Assembly: Actuators can be removed and installed without removing valve from the line. The line should be depressurized before any actuator is removed.
 - A. Handle Assembly: remove black logo bezel by lifting with a thin bladed screwdriver or knife. Remove exposed slotted head screw and flat washer. Lift the handle off.
 - B. Gear Actuators: remove four (4) hex nuts and the washers that hold the actuator to the body.
 - C. Pneumatic / Electric Actuator: removed by unscrewing either four (4) socket head cap screws or hex nuts which hold the actuator to the valve.
- III. VALVE DISASSEMBLY
 1. Depressurize and drain line.
 2. Remove valve from line and wash thoroughly.
 3. For 8" and smaller valves remove cap plug from valve bottom (use a 1/2" drive ratchet). For 10" and 12" remove wedge from body utilizing a small punch to drive wedge out of body.
 4. Remove shaft by pushing down on shaft from top, out through bottom of valve body. Note placement of O-ring around plug removed.
 5. Remove upper elastomeric moisture seal.
 6. Remove upper bearing or 3 bearings on 10" and 12" valves, (use the shaft to twist out).
 7. Remove lower bearing (use the shaft to twist out).
 8. To remove seal retainers, place shaft through one seal retainer and approximately 3/4 through the disc. Rotate disc approximately 30°, push shaft through disc against opposite seal retainer. Corner of shaft will push against flats of seal retainer. Remove shaft, and insert from opposite side of disc. Rotate disc approximately 30° and push out remaining seal retainer.
 9. Slide disc out of liner.
 10. Inspect all parts for wear and replace as required. NOTE: The liner is not a replaceable part of the valve.
 11. **To reassemble:** lightly lubricate all moving parts and seals (using a lubricant such as "Non-Fluid Oil" #666) and reverse above procedure.