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**BUTTERFLY VALVE 411N Series
INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS**

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

1. Colonial Valve warrants its products against defective material and workmanship only. Colonial Valve does not assume responsibility for damage or injuries resulting from improper installation, misapplication, or abuse of any product.
2. Colonial Valve does not assume 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 Colonial Valve literature are based on ambient temperatures of 73° F. The charts are based on information provided by raw material suppliers, and are for reference only. The installer should always test to determine application suitability.
3. The maximum recommended fluid velocity through any Colonial Valve product is eight feet per second. Higher flow rates can result in possible damage due to water hammer effect. Also note that maximum operating pressure is dependent upon material selection as well as operating temperature. Consult Colonial Valve literature to determine operating pressure and temperature limitations before installing any Colonial Valve product.
4. Colonial Valve 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 gas.
5. Systems should always be depressurized and drained prior to maintenance on butterfly valves.
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 Colonial Valve 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 34F, Colonial Valve 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. Wherever installation of plastic valves into metal piping systems is necessary, it is recommended that at least 10 x pipe diameter in length of plastic pipe be installed upstream and downstream of the plastic valve to compensate for the factors mentioned above.

INSTALLATION

1. Colonial Valve 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.
2. 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.

3. Colonial Valve Butterfly Valves are designed for use with all pipe flanges that have bores equal to or larger than Schedule 80 pipe. 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.
4. 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.
5. 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 the foot pounds specified in the chart below, in an alternating sequence, diametrically opposed to the previously tightened nut. Final tightening should be performed in the same sequence following the recommended torque.**
6. 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.
7. 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.

OPERATION

1. 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. If the valve is actuated by a gear operator, then slowly cycle the valve to the open and closed positions 3 or 4 times after installing.
2. If an operating nut has been installed on the gear operator, note that the valve is “right – to – close”
3. Maximum operation pressure at ambient temperature is 150 PSI for 2 - 10", 100 PSI for 12"

MAINTENANCE & DISASSEMBLY OF VALVE

- I. Minimal valve maintenance is required. The valve is field repairable.
 - A. Handle Assembly: Remove nut on handle and lift handle off of valve.
 - B. Gear Operator: 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.
- II. VALVE DISASSEMBLY
Once Handle, Gear Operator, or Actuator has been removed, the shaft is accessible. Shaft must be pulled out of body through the top in order to remove the disc and boot seal. Prior to re-assembly, clean and re-lubricate o-ring seals.

Pressure Rating:

2 & 10"	150 psi non-shock water @ 73°F
12"	100 psi non-shock water @ 73°F

FLANGE ASSEMBLY INFORMATION

Torque Recommendations
Flange: ANSI / ASME B16.5 Class 150

Size(“)	No. of Bolt Holes	Bolt Hole Ø	Rec. Torque ft-lbs
2 & 2-1/2	4	5/8	10-15
3	4	5/8	15-20
4	8	5/8	15-20
5 & 6	8	3/4	25-35
8	8	3/4	35-40
10 & 12	12	7/8	45-55