Installation-Ready™ Butterfly Valves
Series 121, 122, and 124 for Original Groove System (OGS) Mating Components
Series E125 for Stainless Steel Mating Components

**WARNING**

- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- **DO NOT USE AN INSTALLATION-READY™ BUTTERFLY VALVE IN DEAD-END SERVICE.**
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.
I-120 / Installation-Ready™ Butterfly Valves / Installation and Operator Conversion Instructions

IMPORTANT INFORMATION

Original Groove System (OGS) Groove Profile

Always verify that the correct groove profile is being used. There is a significant difference between the Original Groove System (OGS) groove profile and the STRENGTH™ groove profile.

Series 121, 122, and 124 Installation-Ready™ Butterfly Valves are designed for use ONLY with mating components that are prepared to OGS groove specifications. Refer to Victaulic publication 25.01 for the OGS groove specifications, which can be downloaded at victaulic.com.

Series E125 Installation-Ready™ Butterfly Valves are designed for use ONLY with mating components that are prepared to STRENGTH™ groove specifications. Refer to Victaulic publication 25.13 for the STRENGTH™ groove specifications, which can be downloaded at victaulic.com.

WARNING

• DO NOT USE AN INSTALLATION-READY™ BUTTERFLY VALVE IN DEAD-END SERVICE OR FOR A SYSTEM LEAK TEST IN A DEAD-END SERVICE.

• ALWAYS VERIFY THAT MATING COMPONENTS WITH THE CORRECT GROOVE PROFILE ARE BEING USED WITH THE VALVE.

• DO NOT LOOSEN OR TIGHTEN HARDWARE WHEN THE VALVE IS PRESSURIZED.

The system designer is responsible for verifying suitability of mating component materials with the intended fluid media.

The effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on mating component materials shall be evaluated to confirm system life will be acceptable for the intended service.

Failure to follow these instructions could result in death or serious personal injury.

• DO NOT USE AN INSTALLATION-READY™ BUTTERFLY VALVE IN DEAD-END SERVICE OR FOR A SYSTEM LEAK TEST IN A DEAD-END SERVICE.

• DO NOT install Installation-Ready™ Butterfly Valves into the system with the disc in the fully "open" position. Exposed disc may be damaged and prevent proper function of the valve.

• When using Installation-Ready™ Butterfly Valves for throttling service, Victaulic recommends positioning the disc no less than 30 degrees open. For best results, the disc should be between 30 and 70 degrees open; this is dependent on the flow requirements/characteristics for the piping system. High pipeline velocities and/or throttling with the disc less than 30 degrees open may result in noise, vibration, cavitation, severe gasket erosion/abrasion, and/or loss of control. Contact Victaulic regarding throttling services.

• Victaulic recommends limiting the flow velocities for water service to 13.5 feet/second (4 meters/second). Contact Victaulic before installing this valve when higher flow velocities are necessary or specified.

• Victaulic recommends good piping practices by installing the valve five pipe diameters downstream of sources of irregular flow, such as pumps, elbows, and control valves. If not practical due to space constraints, the system should be designed to locate and orient the valve to minimize the impact of dynamic torque on valve life.

• Installation-Ready™ Butterfly Valves and connected piping shall be supported properly to prevent the joints from being overloaded. Hanger spacing shall comply with the applicable "Rigid System Hanger Spacing" section of the I-100 Field Installation Handbook.

• Welding to Installation-Ready™ Butterfly Valves is not permitted and will void the Victaulic warranty.

INSTALLATION

1. DO NOT DISASSEMBLE THE VALVE: Installation-Ready™ Butterfly Valves are designed so that the installer does not need to remove the bolts and nuts for installation. This facilitates installation by allowing the installer to directly insert the grooved end of mating components into the valve.

2. CHECK MATING COMPONENT ENDS: The outside surface of the mating components, between the groove and the mating component shall, be generally free from indentations, projections, weld seam anomalies, and roll marks to ensure a leak-tight seal. All oil, grease, loose paint, dirt, and cutting particles shall be removed.

The edge of the pipe end, highlighted in white above, shall be free from any burrs and sharp edges that could cut the gasket/pipe stop during assembly.

The mating components’ outside diameter ("OD"), groove dimensions, and maximum allowable flare diameter shall be within the tolerances published in current Victaulic OGS groove specifications (Series 121, 122, and 124), publication 25.01, or Victaulic STRENGTH™ groove specifications (Series E125), publication 25.13. These publications can be downloaded at victaulic.com.

CAUTION

• A thin coat of a compatible lubricant shall be applied only to the sealing lips to help prevent pinching, rolling, or tearing during installation.

Failure to use a compatible lubricant may cause gasket damage, resulting in joint leakage and property damage.
3a. CHECK GASKET: Check the gasket to verify that it is suitable for the intended service. The color code identifies the material grade. Refer to Victaulic publication 05.01 for the color code chart, which can be downloaded at victaulic.com.

3b. LUBRICATE GASKET: Apply a thin coat of a compatible lubricant, such as Victaulic Lubricant or silicone grease, only to the gasket sealing lips (silicone spray is not a compatible lubricant). NOTE: The gasket exterior is supplied with a factory-applied lubricant. Do not add additional lubricant to the outside of the gasket.

4. ASSEMBLE JOINT: Assemble the joint by aligning and inserting a mating component end squarely into each opening of the valve. The grooved mating component ends shall be inserted into the valve until contact with the pipe stop occurs. A visual check is required to verify that the valve housings’ keys align with the groove in each mating component and that the mating components are inserted squarely into each valve opening prior to tightening the nuts in step 5.

5. TIGHTEN NUTS: Using an impact wrench or a standard socket wrench with a deep-well socket, tighten nuts evenly by alternating sides until metal-to-metal contact occurs at the bolt pads. Failure to follow instructions for tightening valve hardware could result in:
   - Personal injury or death
   - Bolt damage or fracture
   - Damaged or broken bolt pads or fractures to housings
   - Joint leakage and property damage
   - A negative impact on system integrity

NOTE: Certain series of valves may not be available in all sizes listed.
WARNING

- Visual inspection of each joint is required.
- Improperly assembled joints shall be corrected before the system is filled, tested, or placed into service.
- Any components that exhibit physical damage due to improper assembly shall be replaced before the system is filled, tested, or placed into service.

Failure to follow these instructions could cause joint failure, resulting in death or serious personal injury and property damage.

6. Visually inspect the bolt pads at each joint to verify that metal-to-metal contact is achieved, in accordance with step 5 on page 3.

IMPACT WRENCH USAGE GUIDELINES

Impact wrenches do not provide the installer with direct "wrench feel" to judge nut torque. Since some impact wrenches are capable of high output speed and torque, it is important to develop a familiarity with the impact wrench to avoid over-torquing, which may damage or fracture the bolts or the valve’s bolt pads during installation.

Assemble valves per these installation instructions. Continue to tighten the nuts until the visual installation requirements are achieved. Visual inspection of each joint is required for verification of proper assembly.

Conditions that may result in over-torquing include, but are not limited to, the following:

- Uneven tightening of hardware – Nuts shall be tightened evenly by alternating sides until metal-to-metal contact occurs at the bolt pads.
- Out-of-specification grooved pipe end dimensions (particularly shallow grooves) – If proper visual assembly is not achieved, remove the valve and confirm that all grooved pipe end dimensions are within Victaulic specifications.
- Continued tightening of nuts after the visual installation requirements are achieved – DO NOT continue to tighten the nuts after visual inspection requirements are achieved
- Pinched gaskets
- Valve was not assembled per these installation instructions – Adherence to these installation instructions will help to avoid the above-listed conditions.

If you suspect that any hardware has been over-torqued, the entire valve assembly shall be replaced immediately (as indicated by a bend in the bolt, bulging of the nut at the bolt pad interface, or damage to the bolt pad, etc.).

If the battery is drained or if the impact wrench is under-powered, a new battery pack or correctly-sized impact wrench shall be used for installation.

Perform trial valve assemblies with the impact wrench. Check the trial valve assemblies with a torque wrench to help determine the suitability of the impact wrench and adjustment settings. Using the same method, periodically check bolt/nut torque on valve assemblies throughout the system installation.

For safe and proper use of impact wrenches, always refer to the impact wrench manufacturer’s operating instructions. In addition, verify that proper impact grade sockets are being used for valve installation.

WARNING

Failure to follow instructions for tightening hardware could result in:

- Bolt damage or fracture
- Damaged or broken bolt pads or fractures to housings
- Joint leakage and property damage
- A negative impact on system integrity
- Personal injury or death
VALVE REMOVAL AND REPLACEMENT

**WARNING**
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.

Failure to follow this instruction could result in death or serious personal injury and property damage.

METHOD 1 – REMOVAL AND REASSEMBLY

The following is the preferred method for removal and replacement of a valve, where the mating component ends are not fixed and can be pulled out of the valve body. These instructions apply to valves installed in any orientation. Mating component ends and the valve shall be supported throughout the following process.

1. Verify that the system is depressurized and drained completely before attempting to remove any valves from the system.

   1a. Place the disc to within approximately 20° from the fully-closed position.

   2. Loosen the nuts of the valve assembly just enough to permit removal of the mating component ends from the valve.

   3. Inspect all components for any damage or wear. If any damage or wear is present, use a new Victaulic-supplied valve assembly.

   4. Follow all steps of the “Installation” section on pages 2 – 4 to reinstall the valve into the system.

METHOD 2 – REMOVAL

The following method shall be used only in cases where the mating component ends are fixed and cannot be pulled out of the valve body.

**NOTE:** There is a higher likelihood that valve damage will occur with this method, which will result in the valve requiring replacement. These instructions apply to valves installed in any orientation. Mating component ends and the valve shall be supported throughout the following process.

1. Verify that the system is depressurized and drained completely before attempting to remove any valves from the system.

   1a. Place the disc to within approximately 20° from the fully-closed position.

   2. Remove the nuts, bolts, and flat washers from the valve assembly to permit removal of the lower housing, as shown above.

   **CAUTION**
   - Use caution to prevent hands and arms from being cut on mating component ends during valve removal. Cut-resistant gloves are recommended.
   - Failure to follow this instruction could result in personal injury.

   3. While supporting the top of the valve assembly securely, squeeze the gasket in between the mating component ends. Continue to work the gasket in between the mating component ends while pushing the valve assembly through the opening between the mating component ends.

   4. After the valve is removed from in between the mating component ends, inspect all components for any damage or wear. If any damage or wear is present, use a new Victaulic-supplied valve assembly.

   5. Apply a thin coat of a compatible lubricant, such as Victaulic Lubricant or silicone grease, to the gasket sealing lips and the bottom exposed portion of the gasket where the lower housing will seat (silicone spray is not a compatible lubricant).

   **NOTICE**
   - Pay close attention to the gasket lips as the valve is inserted between the mating component ends. Mating component ends may be sharp. If the gasket is pulled across mating component ends without protection, it is possible to cut the gasket lip and cause irreparable valve damage. Additional deburring of mating component ends may be required to help prevent the gasket from being damaged during insertion.

   6. While supporting the top of the valve assembly securely, squeeze the gasket in between the mating component ends. Continue to work the gasket in between the mating component ends while pushing the valve assembly through the opening between the upper housing’s keys engage the grooves completely in each mating component end. Verify that the gasket is uniform around the entire circumference of the mating component ends and that no sections are pinched or damaged. If any damage occurs, the entire valve assembly shall be replaced.

   7. Install the lower housing. Verify that the gasket seats completely within the lower and upper housings and that the housings’ keys engage the grooves completely in each mating component end. Install a bolt into each hole location at the bolt pads. Install a flat washer onto the end of each bolt, and thread a nut onto each bolt until finger-tight.

   8. Follow steps 5 – 6 on pages 3 – 4 to complete the assembly.
LEVER LOCK HANDLE TO GEAR OPERATOR CONVERSION

**WARNING**

- Read and understand all instructions before attempting to perform the lever lock handle to gear operator conversion.
- Prevent flow from passing through the valve, and place the disc in the “shut” position during the following procedures.

Failure to follow these instructions could result in death or serious personal injury and property damage.

Removal of the lever lock handle can be performed without removing the valve from the piping system. Prevent flow from passing through the valve during removal of the lever lock handle.

1. Using the lever lock handle, place the valve in the fully “shut” position. **NOTE:** There is a position indicator on top of the stem.

2. Remove the set screw from the side of the lever lock handle.

3. Remove the lever lock handle from the lever lock handle plate.

4. Remove the two cap screws and washers, then remove the lever lock handle plate.

5. Remove the thermal barrier from the flange.

6. Verify that the o-ring and backup ring are still installed in the recess of the flange around the stem, as shown above (o-ring is installed under the backup ring).

7. Place the gear operator adapter plate over the stem. Align the holes of the gear operator adapter plate with the holes in the flange.

**CAUTION**

- DO NOT attempt to operate an Installation-Ready™ Butterfly Valve without a lever lock handle or gear operator installed. Failure to follow this instruction will cause improper valve operation and damage to the stem.
8. Apply thread-locking compound to the four cap screws. Insert the four cap screws to retain the gear operator adapter plate to the flange. Tighten each cap screw to 28 – 30 ft-lbs/38 – 41 N•m.

9. Place the thermal barrier over the stem. Align the holes of the thermal barrier with the holes in the gear operator adapter plate.

10. Turn the handwheel of the gear operator until the arrow on the indicator cap is pointing toward the “SHUT” position, as shown above.

11. Insert the drive bushing into the gear operator, as shown above.

12a. Place the gear operator/drive bushing assembly onto the gear operator adapter plate by aligning the four holes of the gear operator with the four holes in the gear operator adapter plate/thermal barrier. **NOTE:** In certain cases, the handwheel may need to be rotated to position the drive bushing/stem for alignment of the gear operator’s and gear operator adapter plate’s bolt hole patterns. If this is the case, loosen the hex lock nut and internal set screw of the “shut” travel limit stop to permit alignment (refer to the following page).

12b. Thread a bolt with a lock washer up through each hole in the gear operator adapter plate/thermal barrier and into the gear operator.

12c. Tighten the four bolts completely until the lock washers are flattened.

12d. Set the “shut” travel limit stops by following the steps on the following page; this is especially important if the handwheel was rotated in step 12a.

13. After setting the “shut” travel limit stops in step 12d, operate the valve to the fully “open” position (90° from the correctly-adjusted “shut” position). Set the “open” travel limit stops by following the steps on the following page.
Installation-Ready™ Butterfly Valves
Series 121, 122, and 124 for Original Groove System (OGS) Mating Components
Series E125 for STRENGTHIN™100 Stainless Steel Mating Components

ADJUSTING AND SETTING THE “SHUT” TRAVEL LIMIT STOPS OF THE GEAR OPERATOR

1. Remove the dust cap from the right side of the gear operator.

2a. Loosen the hex lock nut (counterclockwise) located on the right side of the gear operator.

2b. Using a hex key wrench, loosen the internal set screw approximately three turns (counterclockwise).

NOTICE
• When using a stem extension kit, additional adjustment may be required to achieve the fully “shut” position.

3. Verify that the valve is in the fully “shut” position. The fully “shut” position can be verified by removing the indicator cap from the top of the gear operator and checking the position indicator on top of the stem, as shown to the left.

4a. Using a hex key wrench, tighten the internal set screw (clockwise) until it contacts the internal quadrant gear.

4b. While holding the internal set screw in position with the hex key wrench, tighten the hex lock nut (clockwise).

5. Verify proper operation of the gear operator by turning the handwheel. Repeat the prior steps of this procedure, if necessary.

6. Replace the dust cap and indicator cap.

ADJUSTING AND SETTING THE “OPEN” TRAVEL LIMIT STOPS OF THE GEAR OPERATOR

1. Remove the dust cap from the left side of the gear operator.

2a. Loosen the hex lock nut (counterclockwise) located on the left side of the gear operator.

2b. Using a hex key wrench, loosen the internal set screw approximately three turns (counterclockwise).

3. Turn the handwheel counterclockwise. Verify that the valve is in the fully “open” position by checking the position indicator on top of the stem, as shown to the left. The position indicator on top of the stem should be 90° from the correctly adjusted “shut” position.

4a. Using a hex key wrench, tighten the internal set screw (clockwise) until it contacts the internal quadrant gear.

4b. While holding the internal set screw in position with the hex key wrench, tighten the hex lock nut (clockwise).

5. Verify proper operation of the gear operator by turning the handwheel. Repeat the prior steps of this procedure, if necessary.

6. Replace the dust cap and indicator cap.