

Installation Instructions

Series 90 and Series 94

High Performance BFV

⚠ WARNING



**THINK
SAFETY
FIRST**

Read this Manual **BEFORE** using this equipment.

Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment.

Keep this Manual for future reference.

⚠ DANGER



Electricity, electrocution
and shock hazards.

NOTICE

Warning applies where an actuator is used.

⚠ WARNING

Local building or plumbing codes may require modifications to the information provided. You are required to consult the local building and plumbing codes prior to installation. If the information provided here is not consistent with local building or plumbing codes, the local codes should be followed. This product must be installed by a licensed contractor in accordance with local codes and ordinances.

NOTICE

Follow the guidelines listed here for proper installation, operation, and maintenance.

Inquire with governing authorities for local installation requirements.



**High Performance
Butterfly Valves**



Mueller Steam Specialty™

A WATTS Brand

I. Basic Principle of Operation

A high performance butterfly valve operates by rotating a disc 90 degrees to control flow, with a double-offset design that enhances sealing and reduces wear. The first offset moves the stem behind the disc centerline, and the second offset shifts it from the valve body centerline, allowing the disc to move away from the seat during operation. This design minimizes friction, enabling tight shutoff and extended service life. When closed, the disc presses into the seat to achieve a bubble-tight seal. These valves can be operated manually or with actuators and are suitable for both isolation and throttling applications.

VERSION	SIZE	MAXIMUM OPERATING PRESSURE	MATERIAL OF CONSTRUCTION
Series 90	2" - 40"	300 psi @100°F	Carbon Steel
Series 94	2" - 12"	285 psi @100°F	Stainless Steel

II. Storage

Handling

The boxes and pallets containing the products must be handled by appropriate lifting equipment, respecting the safety rules (limits of use of the lifting equipment, safety measures of the company or site, etc...).

WARNING

Valves over 30 lbs. must be handled by straps attached to drums or lifting holes (or lifting shackles).

NOTICE

Product should be stored in its original packaging until installation. Product should be stored in a manner such that it is not exposed to excessive vibration.

III. Installation

⚠ WARNING

Before installation, the pipes must be depressurized and purged (empty of its fluid) in order to avoid any danger to the operator.

Preparation

The pipe work must be correctly aligned so that no extra stress is exerted on the valve casing.

Check the compatibility of the connection flanges against the operating pressure: the ANSI pressure class of the flanges must be greater or equal to the operating pressure.

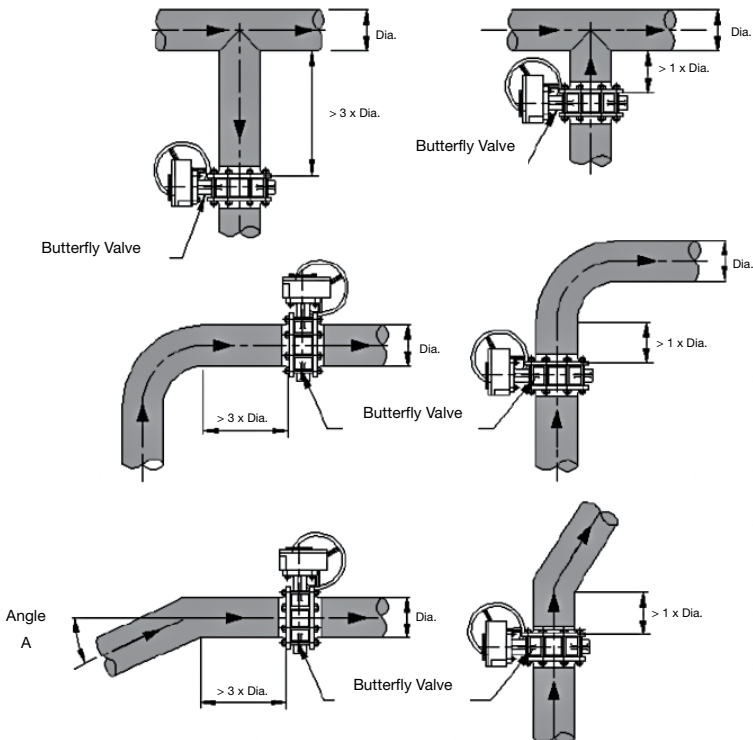
The valve is a precision piece of equipment and must not be used to pry apart the flanges.

Installation Conditions

It is recommended that the distances mentioned below be respected in order to prolong the lifetime of the valve.

Mounting the valve close to pipe work junctions places it in turbulent zones which increase its wear.

Installation Diagrams



Installation

A. Mounting Between Flanges

For details on mounting between flanges, please see ANSI B16.5 for sizes up to 24" and ANSI B16.47 for sizes 26" and above.

WARNING

For safety reasons, the throttle valve used in these mounting conditions, at the end of the pipe, provides only a full flange function. In the closed position, the maneuvering device must be locked in order to avoid any unauthorized maneuver. Opening the valve is only possible after taking all safety measures.

NOTICE

These valves are designed for "dead-end" service. These can be installed at the end of pipelines.

B. Inspection

The valve will be unpacked carefully without shock or fall.

The visual inspection of the valve before assembly is imperative, check the absence of foreign bodies in the valve and the pipe. Clean with water or compressed air if necessary.

Check the surface condition of the valve seat and seals. Clean any dirt and debris if present.

Confirm that the ratings indicated on the name plate comply with your demand and conditions of use.

Check the preferred flow direction according to the type of application.

NOTICE

The corrosion protection treatment of steel parts constitutes temporary protection. A coating by paint is recommended before the valve is put into service.

NOTICE

Beware of weld drops and metal chips that compromise sealing of the valve and flange joints.

C. Assembly

Measurement to be taken before the first commissioning.

Spread the flanges sufficiently to slide the valve freely without causing damage (without contact).

Ensure that flanges are parallel and aligned.

Place the seals next to the flange faces.

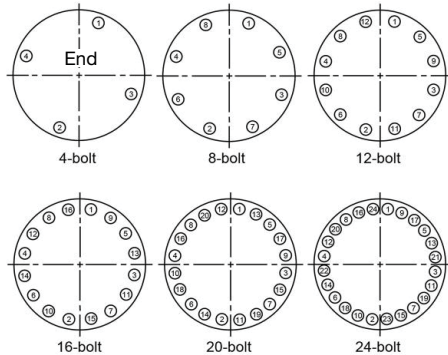
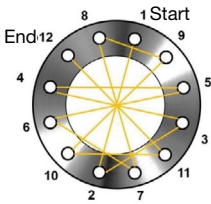
Center the tap by assembling the tie rods trapped in the guidance ears of the body (Butterfly closed).

Gradually tighten the diametrically opposed tie rods alternately until the valve body has contact with the flange faces.

Control after assembly: perform a complete opening and closing of the disc to ensure that nothing opposes its travel.

Mount the valves with diameter > 20" with the horizontal shaft.

D. Bolting Instructions



Bolt Pattern Tightening Sequence

General

1. All cover styles
2. All nuts are to be tightened snug in a pattern shown in figure above.
3. After all nuts are snug, then apply torque per specification below for unit.
4. When adding full torque, nuts should also be tightened in a 90 degree pattern.

For Four and Eight-Bolt Flanges:

1. 1st Round - 30 percent of final torque
2. 2nd Round - 60 percent of final torque
3. 3rd Round - 100 percent of final torque
4. Final Round - Clockwise or Counter-Clockwise around the flange

For Flanges with 12 or More Bolts:

1. 1st Round - 20 percent of final torque
2. 2nd Round - 40 percent of final torque
3. 3rd Round - 80 percent of final torque
4. 4th Round - 100 percent of final torque
5. Final Round - Clockwise or counter-clockwise around the flange

E. Troubleshooting

ISSUE	POTENTIAL CAUSES	RECOMMENDED SOLUTIONS
Leakage at Closed Position (Seat Leakage)	- Damaged or worn seat or disc edge - Debris trapped between seat and disc - Improper torque setting or actuator misalignment - Seat not compatible with media or temperature	- Inspect and clean seating surfaces - Verify actuator stroke and torque - Replace seat if damaged - Confirm seat material compatibility with media and temperature
Hard to Operate / High Torque Requirement	- Debris buildup around disc or shaft - Misalignment between valve and piping - Over-tightened flange bolts deforming valve body - Incorrect actuator sizing or failure	- Clean around disc and stem - Check and correct flange alignment - Loosen and re-torque flange bolts evenly - Verify actuator selection and operation
Valve Will Not Fully Close or Open	- Obstruction in flow path - Excessive flange gasket protrusion - Incorrect mounting of valve in pipeline	- Inspect for and remove obstructions - Use correct gasket type (full-face or ring type as required) - Reinstall valve ensuring centered alignment
External Leakage (Body or Shaft Seals)	- Worn or damaged stem packing - Loose packing gland - Body gasket failure - Corrosion at sealing surfaces	- Tighten or replace packing - Inspect and replace body seals if necessary - Ensure torque sequence and values followed during installation - Replace corroded parts or consult factory
Vibration or Noise During Operation	- Cavitation or turbulent flow - Oversized valve or system operating outside recommended flow range - Flow direction reversed (some valves are unidirectional)	- Evaluate system flow rate and valve sizing - Consider trim change or downstream piping modifications - Verify flow direction matches valve marking
Valve Disc Interference With Pipe or Flanges	- Disc hitting protruding pipe ID or misaligned flanges - Gasket misalignment or excess intrusion - Non-standard flange facing or ID	- Verify pipe ID is compatible with valve clearance requirements - Use proper gasket type and alignment - Inspect flange alignment and dimensions per spec
Seat Wear or Premature Failure	- Excessive throttling at low opening angles - Abrasive or incompatible media - Thermal cycling or pressure surges - Misalignment during install	- Avoid throttling at less than 20° open - Use hardened or coated trim materials if needed - Confirm seat material compatibility - Ensure proper installation and alignment practices

G. Pre-Commissioning Protection

To ensure valve integrity during construction and startup phases:

- Keep valve in original packaging until ready for installation to prevent damage to the seat or disc.
- Avoid exposing valves to sandblasting, welding slag, or paint overspray.
- If in a construction zone, cover the valve ends with clean protective caps or plastic wrap.
- Do not leave the valve open during system flushing or hydrotesting unless specified by the manufacturer.
- When valves are installed prior to system startup, ensure:Internal components are free of debris before commissioning.
- The valve is either fully open or fully closed during flushing based on flow direction and seat type.
- If installed for long periods before use:
 - Exercise (open/close) the valve every 30 days.
 - Inspect for visible corrosion, gasket degradation, or moisture intrusion.

H. Inspection and Maintenance

Routine inspection and service recommendations:

Frequency	Maintenance Activity
Monthly	Exercise valve (open/close fully) to prevent seat memory or build-up
Every 6 Months	Inspect for visible wear, leaks, or signs of corrosion Check stem seal or packing for leaks and adjust/tighten if necessary
Annually	Clean external body and disc if in corrosive or dirty environment Inspect actuator mount and fasteners
As Needed	Retorque body bolts if showing signs of leakage Check actuator calibration or stroke stops

Important Notes:

- Do not disassemble the valve under pressure or when the system is in service.
- Follow all lockout/tagout procedures before maintenance.
- Use only Mueller Steam Specialty replacement parts to maintain valve performance and warranty coverage.

WARNING

Depressurize the pipe before performing any maintenance on the valve.
If this instruction is not respected, this intervention can cause serious accidents of the personnel and / or significant damage to the equipment.

Limited Warranty: Mueller Steam Specialty warrants each product to be free from defects in material and workmanship under normal usage for a period of one year from the date of original shipment. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge. This shall constitute the sole and exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which the Company has no control. This warranty shall be invalidated by any abuse, misuse, misapplication or improper installation of the product. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** Any implied warranties that are imposed by law are limited in duration to one year.

Some States do not allow limitations on how long an implied warranty lasts, and some States do not allow the exclusion or limitation of incidental or consequential damages. Therefore the above limitations may not apply to you. This Limited Warranty gives you specific legal rights, and you may have other rights that vary from State to State. You should consult applicable state laws to determine your rights.



A WATTS Brand

USA: T: (800) 334-6259 • MuellerSteam.com

Latin America: T: (52) 55-4122-0138 • MuellerSteam.com