



Installation & Operation Manual Page Index

4E VALVE MAINTENANCE & REPAIR	PAGE 3- 4
4E VALVE INSTALLATION CHECK LIST	PAGE 5
4E BUTTERFLY VALVES	PAGE 6
INSTALLATION - MAINTENANCE & REPAIR	
4E BALL VALVES	PAGE 7
INSTALLATION - MAINTENANCE & REPAIR	
4E CHECK VALVES	PAGE 8
INSTALLATION - MAINTENANCE & REPAIR	

4E VALUE

General Maintenance & Repair

DESIGN: 4E valves are manufactured according to established industrial standards set forth and published by ANSI/ASME, API, MSS, BS and other familiar Industrial & Engineering Association or Societies. These designs are time tested to the general applications for which the valve designs would benefit a range of applications with a minimum of maintenance through out the service life of the valve.

MATERIAL: 4E valves are made in accordance with all applicable ASTM material specifications as prescribed by the design specifications. Material Test Reports(MTR) are delivered with all 4E steel valve products to the original purchaser of the 4E valve product free of charge at the time of purchase. However, any additional issuance of an MTR shall be invoice to the recipient. Any 4E valves alter of modified from stock to special order, such as change of trim, may or may not require a fee for the MTR covering materials used in the modification.

INSTALLATION, MAINTENANCE AND REPAIR: 4E valves are carefully made from selected material to give long trouble free service when properly installed in appropriate applications, but proper care in operation and maintenance can contribute significantly to good performance. Much of the field maintenance is of routine nature and can be readily performed by the user, however, major repairs are discouraged, and it is recommended that valves be inspected and repaired by qualified and experience valve repair shops. Any 4E valves modified, altered, or repaired no longer carry the 4E Warranty. A warranty, if offered by the party responsible for affecting the modification, alteration, or repair shall replace the 4E Warranty and In no event is 4E liable for any special, direct, indirect, or consequential damages however resulting from any cause whatsoever. There are no other warranties of any kind other than those stated herein concerning 4E valve products installation, maintenance and repair. 4E Limited Warranty is published in the 4E brochure.

The following information is offered as an aid to field maintenance of 4E valves, however, 4E valves repaired in the field do not carry the 4E warranty of brand new 4E valves.

INSTALLATION: 1. Only personnel qualified and experienced in valve maintenance and repair should attempted to work on valves. 2. All standard safety precautions should be observed. 3. Use proper tools. 4. Have proper replacement parts. 5. If possible, remove valve from the line so that work can be done in a controlled, clean and well lighted area. 6. Pressure test valve before reinstalling, This is particularly essential on valves intended for critical service.

PACKING: All 4E valves should have sufficiently filled stuffing boxes with graphite ring type packing material. Before repacking valves, be sure to have the proper replacement packing which is readily available at most local valve supply stores or valve repair facilities. Open valve and firmly seat stem against the back seat and remove all old packing. Clean stuffing box and stem before repacking valve. **All 4E valves are tested for back seat tightness, however corrosion and/or erosion may damage the back seat so that re-packing under pressure may be hazardous and should be done only in an extreme emergency and with extreme caution. Relieving Pressure in the line is always the best choice if possible.**



STEMS: Tight stems in OS&Y valves types are caused by either dry worn packing, over-compressed packing or lack of proper lubrication of the yoke nut threads. A tight stem in an NRS valve may also result from worn packing, over-compressed packing which grips the stem; or stem threads may seize from excessive service temperatures, or from corrosive fluids through the valve. If the stem turns freely after all packing is removed, new packing is the remedy. If the stem is still tight, turn the valve to the upright position, fill the stuffing box with penetrating oil, and let soak. If the stem remains tight, new stem may be require or if practical, replace valve with OS&Y to avoid repeating the problem.

BONNET JOINT: On bolted bonnet valves in high temperatures service where creep may occur, it is recommended to periodically check bolt tension. During original installation, bonnet bolts should be check for tension due to possible rough treatment during shipping & handling. While leaks through the Ring Type Joints (RTJ) are rare, erosion and/or corrosion may cause a defect in the ring , in that case a new ring gasket is necessary. Gaskets and rings gaskets.

LUBRICATION: Lubricate as needed. Always check and lubricate all lube points before installation. Stem Bushings and Gear operators are sometimes shipped dry or with protective coat of grease only. Carefully inspect, remove fitting if necessary, lube as needed.

Installation Check List



PLEASE FILL THE FOLLOWING FORM BEFORE INSTALLATION & USAGE

1.	Nominal SIZE of Pipe		Nominal SIZE of Valve	
2.	MOP of the Application		MOP of Valve	
3.	Max Temp. of Application		Temp. Limit of Valve	

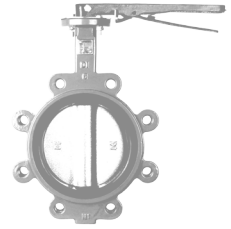
CRITERION		REQUESTED	VALVE
1.	End Connection		
2.	Valve Type		
3.	Body Material		
4.	Trim Material		
5.	Seats		
6.	Seals		
7.	Operator		
8.	Fire Safe Required		
CHECK POINTS		(Circle one)	
MATCH		YES	NO
TOOLS		YES	NO
Torque Wrench		YES	NO
INFO: Torque Setting		YES	NO



Installation & Operation Manual

4E BUTTERFLY VALVES

INSTALLATION - MAINTENANCE & REPAIR



BASIC PRECAUTIONS

1. Only personnel qualified and experienced in valve maintenance and installation should attempted to work on valves.
2. All standard safety precautions should be observed.
3. Use proper tools.
4. Have proper replacement parts.
5. If possible, remove valve from the line so that work can be done in a controlled, clean and well lighted area.

INSTALLATION

1. Butterfly Valves are designed for installation between 125# cast iron flat face flanges or Class 150# Raised Face flanges. Resilient seated butterfly valves do not require gaskets for installation. **CLEAN ALL FLANGE SURFACES THUROUGHLY BEFORE INSTALLING.**
2. Butterfly valves should be centered between the flanges by installing bolts through the alignment lugs and rotating the valve into position. There should be full and even contact between the elastomer and the flange face. The valve should be installed with the disc in the almost closed position Never force the valve into place if flange spacing is too small damage may occur to the elastomer.
3. Prior to tightening any flange bolts, the valve should be carefully cycled to the open position to check for possible disc interference. Always Tighten Bolts in a Criss Cross Pattern. Never over tighten bolts.
4. Tighten the bolts to obtain metal to metal contact between the body and the flange. Never overtighten bolts. Measure Flange Thickness and the Face to Face Thickness of the valve to determine proper bolt length.
5. Verify the gear operator travel stops after installation. Adjust as necessary.

OPERATION

Manual butterfly valves can be operated by a lever handle or a gear operator. It is usually recommended that gear operators be used for valves 8" and larger. The Standard Locking Lever gives an indication of disc position. Gear operators provide position indication with an indicator dial located on the top of the operator. Valves that are used infrequently should be cycled on a regular basis from open to closed to prevent the build-up of material inside the valve.

INSPECTION & MAINTENANCE

Butterfly valves require no routine maintenance. Periodic cycling of the valve is highly recommended.

REPAIR PARTS

Under normal conditions, spare parts are not required. Consult factory for availability of repair parts.

4E BALL VALVES

INSTALLATION - MAINTENANCE & REPAIR



FUNCTION

Ball Valves are designed as 90 Degree Open-Close valves to allow the fluid in the pipe to flow or to stop the flow. The Position of the Port in the Ball should be indicated on the Stem and the Lever Op aligned with the bore of the valve for OPEN and 90 Degrees crossing the Bore for CLOSED. Mechanically Actuated Ball Valves will have an indicator showing the position of the bore of the ball.

4E RECOMMENDS

First, Selection for the application and installation of any valve must be well thought out and executed properly within acceptable industry standards and practices for the application well within the limits of the specified capability of the valve. CHECK Size, Pressure Class, Materials are indeed compatible with the valve's safe intended use and the media that will flow through the valve.

Second, 4E highly recommends that only well qualified personnel trained in and/or experienced with valve installation, repair and maintenance work with 4E valves.

INSTALLATION and USAGE

1. Position of the installation should be well thought out as to flow direction, accessibility, ease of operation, clearance for all moving parts such as lever, hand wheel, or mechanical actuator.
2. Prior to installation all sealing surfaces at end connections must be free of dirt, debris, corrosion and any other contaminants which may compromise making a good seal.
3. Install the 4E Valve and Tighten fasteners in a "Criss Cross" Pattern to the proper torque setting in three steps. Bolting may require re-torquing after valve has experienced several temperature cycles.
4. Usage of 4E Valves shall be confined to the original design parameters of "Open/Close" and at not time be used for regulating (or throttling) flow unless the original design allows.

MAINTENANCE and STORAGE

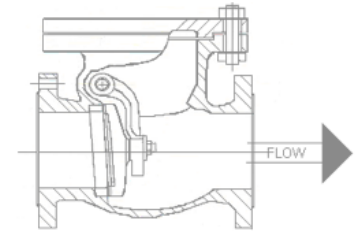
1. Valves in Operation should be periodically examined and maintained at regular intervals to insure the operationally status especially valves that remain static for long intervals without be cycled.
2. Any Leakage found on valves in operation can be mitigated by checking and retorquing fasteners at the end connections, body joints, and packing gland bolts. Leakage at the closure may be mitigated by cycling the valves several times removing contaminants that may be present on the sealing surfaces.
3. Valve leakage that cannot be mitigated while in service may require removal and repair.
4. Naturally, during a maintenance and repair routine it is highly recommend to replace with new material the Packing, Gaskets and Soft Sealing items before re-assembling and returning to service.
5. Storage of uninstalled valves shall be inside a dry warehouse with end protectors installed.



Installation & Operation Manual

4E CHECK VALVES

INSTALLATION - MAINTENANCE & REPAIR



BASIC PRECAUTIONS

1. Only personnel qualified and experienced in valve maintenance and installation should attempted to work on valves.
2. All standard safety precautions should be observed.
3. Use proper tools.
4. Have proper replacement parts.
5. If possible, remove valve from the line so that work can be done in a controlled, clean and well lighted area.

While Swing Check Valves are fairly simply by design and operation, therefore maintenance is also fairly straightforward and relatively simple.

FUNCTION: Swing Check Valves are designed as “one way” valves to allow the fluid in the pipe to flow in one direction, as the port closure disc attached to a hinge pivoting upon a hinge pin “swings” downstream and out of the way. If, and/or when, the flow in the pipe attempts to reverse, the port closure disc returns to the seat to stop the flow from returning upstream. However, 4E recommends:

First, the application and installation of the Swing Check be must be well thought out and executed properly within acceptable industry standards and practices for the application well within the limits of the specified capability of the valve.

Second, it is highly recommended that only well qualified personnel trained in and/or experienced with check valve installation, repair and maintenance work with check valves.

MAINTENANCE of 4E Swing Check Valves after Proper Application and Installation requires only a good and proper application a coating to resist corrosion. The Swing Check should require little or no periodic attention during the life span of the valve.

TROUBLE SHOOTING: If there is excessive actuation of the moving parts and/or wear with your operating 4E Swing Check Valve then review the application and placement of the valve to determine the cause. Then seek consultation with knowledgeable fluid mechanics professionals and/or call your 4E Valve Dealer/Distributor on how to contact us here at 4E Valve.