

# Installation and Maintenance Manual

## Model 3975F Flange Butterfly Valve

AWWA C504  
Double Eccentric

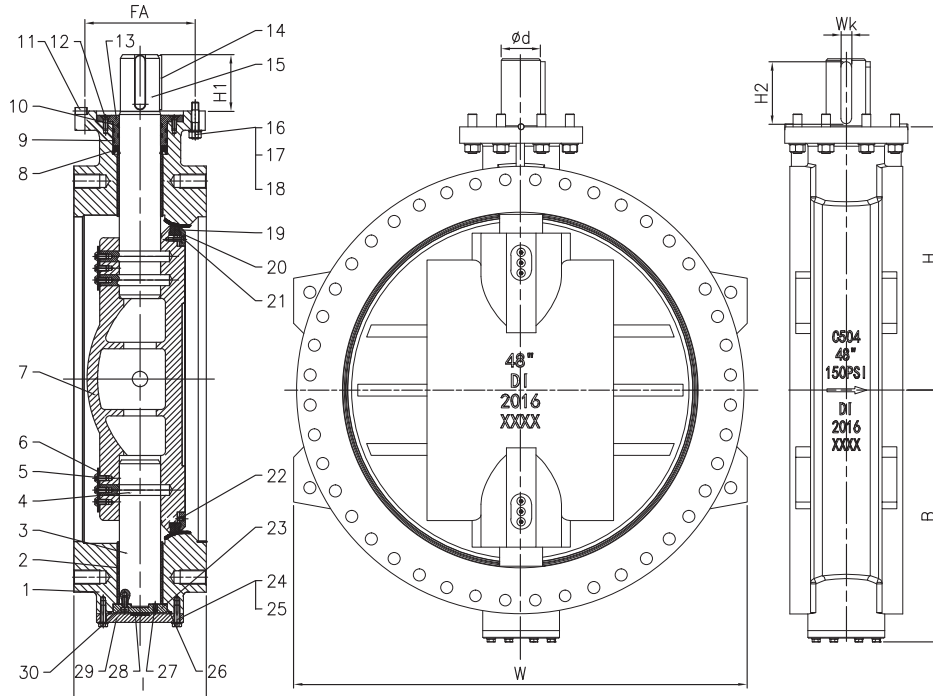


# MODEL 3975F - Butterfly Valve with Manual Gear Operator

## GENERAL

Butterfly valves are a significant component of any water distribution system or treatment plant operation. Valve failure caused by faulty installation, improper operation, or maintenance in these systems could result in damage, downtime, and costly repairs. In buried or underground installations, problems or malfunctions can result in extensive and costly excavation to correct or eliminate the problem. Many problems with butterfly valves can be traced to improper installation, or maintenance procedures.

## MATERIAL LIST/PRESSURE AND TEMPERATURE:



Nominal Pressure	250 Psi
Working Temperature	EPDM: -10°C to 120°C NBR: -10°C to 82°C
Suitable Media	Water, Oil, Gas

Item	Part	Material
1	Body	Ductile Iron
2	Bushing	Bronze
3	Lower Shaft	Stainless Steel 304
4	Pin	Stainless Steel 304
5	Bolts	Stainless Steel 304
6	Plate	Stainless Steel 304
7	Disc	Ductile Iron
8	Y-Ring	NBR
9	O-Ring	NBR
10	O-Ring	NBR
11	Pin	Stainless Steel 304
12	Bolts	Stainless Steel 304
13	Gland	Ductile Iron
14	Key	Carbon Steel
15	Upper Shaft	Stainless Steel 304
16	Stud	Stainless Steel 304
17	Hexagon Nut	Stainless Steel 304
18	Washer	Stainless Steel 304
19	T-Sealing Ring	EPDM
20	Holder Plate	Stainless Steel 304
21	Bolts	Stainless Steel 304
22	Bolts	Stainless Steel 304
23	Shaft Retainer	Stainless Steel 304
24	Bolts	Stainless Steel 304
25	Washer	Stainless Steel 304
26	O-Ring	NBR
27	Adjusting Screw	Stainless Steel 304
28	Bottom Cap	Ductile Iron
29	Adjusting Spacer	Bronze
30	Bolts	Stainless Steel 304

## UNLOADING

Inspect valves on receipt for damage in shipment and conformance with quantity and description of the shipping notice and order. Unload valves carefully to the ground without dropping them. On valves larger than 36 in. (900mm), use forklifts or slings under the skids. On smaller valves, do not lift valves with slings or chain around the operating shaft, actuator, or through the waterway. Lift valves with eye bolts or rods through the flange holes or chain hooks at ends of the valve parts.

## STORAGE

If it is not practical to store a valve indoors, protect the valve and actuators from weather; the accumulation of dirt, rocks and debris. When valves fitted with power actuators and controls are stored, energize electric actuators or otherwise protect electrical-control equipment to prevent corrosion of electrical contacts caused by condensation resulting from temperature variation. Do not expose rubber seats to sunlight or ozone for any extended period. Also, see the manufacturer's specific storage instructions.

## INSPECTION PRIOR TO INSTALLATION

Verify flange faces, joint-sealing surfaces, body seats, and disc seats are clean. Verify the bolts attaching an actuator to a valve are tight, and if loose, tighten firmly. Open and close a valve to verify it operates properly and that stops or limit switches are correctly set so that the valve seats fully. Close a valve before installing it.

## INSTALLATION

It is strongly recommended that instruction manuals supplied by the valve manufacturer be reviewed in detail before installing butterfly valves.

1. Handle valves carefully when positioning, avoiding contact or impact with other equipment, vault walls or trench walls.
2. Valves are to be installed in accordance with the manufacturer's instructions.
3. When valves have adjustable seating, install the seat-adjustment side of a valve for access and adjustment in service.
4. When valves are provided with flanged ends in buried applications, the purchaser is advised to consider providing means to accommodate issues such as differential settlement, capability to remove the valve or actuator for maintenance, access to the valve interior for inspection, support of the valve, and controlling the shear loading on the adjacent pipe flanges. Many types of large buried pipes are designed to deflect 2-5 percent of pipe diameter, which is harmful to valve integrity. Adjacent pipe must be supported or stiffened to provide a round mating connection for the valve in service.
5. Foreign material in a butterfly valve can damage the rubber seat when the valve is operated. Be sure valve interiors and adjacent piping are clean and free of foreign material when making a valve-to-pipe-joint connection.
6. Prepare pipe ends and install valves in accordance with the pipe manufacturer's instructions for the joint used. Do not use a valve as a jack to pull pipe into alignment. The installation procedure should minimize the bending of the valve/pipe connection with pipe loading.
7. In the case of wafer type butterfly valves, concentrically center the valve disc between the mating flanges.
8. Make sure the valve disc, when opened, will not contact the pipe port. This is especially necessary on pipe with linings and when wafer valves are used. Check manufacturer's recommendations for minimum pipe inside diameter require for clearance.
9. Buried valves installed with valve boxes shall be installed so that the valve box does not transmit shock or stress to the valve actuator as a result of shifting soil or traffic load.
10. When valves are installed in vaults, the vault design shall provide space for removal of the valve-actuator assembly for purposes of repair. The possibility of groundwater or surface water entering the valve and the disposal of the water should be considered. The valve operating nut should be accessible from the top opening of the vault with the tee wrench.
11. Buried valves can be installed with the shaft horizontal and the actuator input drive nut upwards.
12. A valve can be buried with the shaft vertical with either a torque tube in a manhole or with an extension bonnet to place the actuator aboveground.
13. Valve box or extension pipe should be installed so that the actuator input drive nut and extension stem turn freely.
14. Valves should be tested for operation and adjusted prior to backfill.

## TESTING

When rubber-seated butterfly valves are used to isolate sections of a line for testing, it is important to realize that these valves are designed or factory adjusted to hold rated pressure only. Test pressures above valve rated pressure may cause leakage past the rubber seat and damage to the valve.

1. In order to prevent time lost searching for leaks, where feasible, it is recommended that excavations for buried valves not be backfilled until after pressure tests have been made.
2. Seat leakage can occur from foreign material in the line. If this occurs, open the valve 5°-10° to obtain high-velocity flushing action, then close. Repeat several times to clear seats for tight shutoff.
3. Seat leakage can result from rotational shift in the position of the disc with relation to the body seat. Re-adjust closing the stop in accordance with the manufacturer's instructions.

## RECORDS

On completion of installation, the valve location, size make, type, date of installation, number of turns to open, direction of opening, and any other information deemed pertinent should be entered on the owner's permanent records.

## **OPERATION**

1. Do not permit the use or operation of any valve at pressures above the rated pressure of the valve.
2. Do not exceed 300 ft-lb (406 N.m) input torque in actuators with wrench nuts and do not exceed 200 ft-lb (890-N.m) rim pull for handwheels or chain wheels. If portable auxiliary actuators are used, size the actuator or use the torque limiting device to prevent application of torque exceeding 300 ft-lb (406 N.m). If an oversize actuator with no means of limiting torque is used, stop the actuator before the valve is fully opened or closed against stops and complete the operation manually. Be sure to check the actuator directional switch against the direction indicated on wrench nut, handwheel , or records before applying opening or closing torque.
3. If a valve is stuck in some intermediate position between open and closed, check first for jamming in the actuator. If nothing is found, the interference is inside the valve. In this case, do not attempt to force the disc open or closed, because excessive torque in this position can severely damage internal parts.

## **MAINTENANCE**

Maintenance of rubber-seated butterfly valves by the owner is generally limited to actuators and shaft seals. In some instances, valve design permits field adjustment when leakage occurs past the disc. Unless the owner has skilled personnel and proper equipment, any major internal problem will probably require the removal of the valve from the line and its return to the manufacturer for repair.

1. Normal maintenance is in the area of shaft seals and actuators. Seal leakage, broken parts, hard operation, and in some cases, seat leakage should be corrected by a repair crew as soon as possible after a defect is reported.
2. If repairs are to be made in the field, repair crews should take a full complement of spare parts to the job site. Be sure to review the valve-manufacturer's drawings prior to any repair work.
3. Provisions should be made to stop line flow and isolate the valve from line pressure prior to performing any corrective maintenance.
4. After completing repairs, cycle the valve through one complete operating cycle and, after line pressure has been restored, inspect for leakage.
5. If major repairs require the removal of the valve for repair, be sure to notify all interested parties in the water department and fire department that the valve and line are out of service, On completion of repair and re-installation, notify the same personnel of the return of the valve and line to service.

## **GEARBOX INSTALLATION STYLE**

1. Horizontal installation , hand wheel side, see attached figure A;
2. Horizontal installation , hand wheel up, see attached figure B;
3. Horizontal installation , driving cap upward, see attached figure C;

(See following page)

Figure A

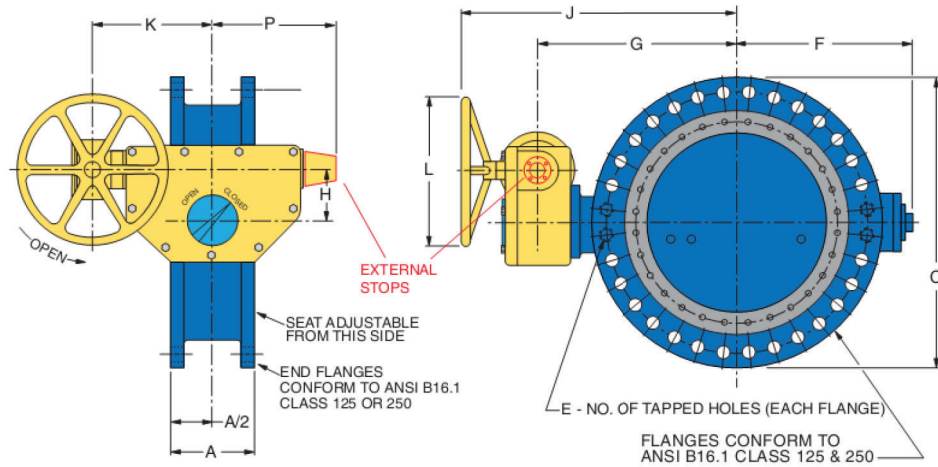


Figure B

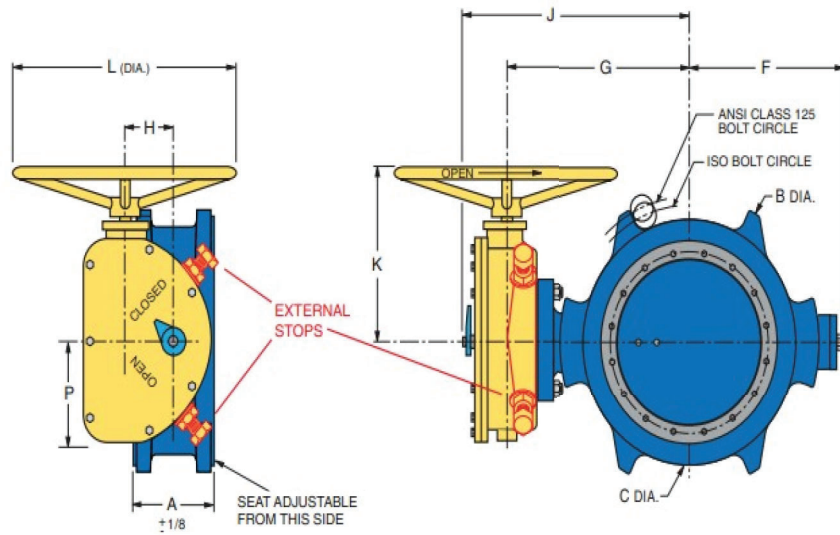


Figure C

