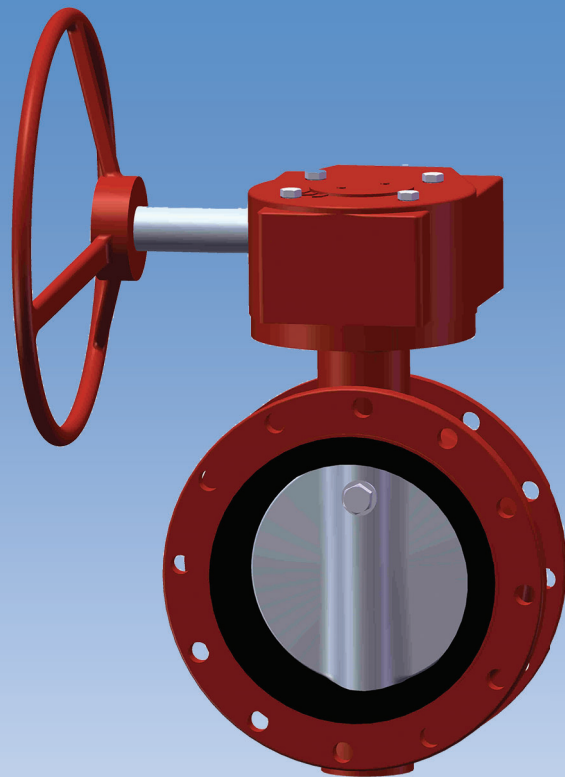


# UNITED

**Flange & Mechanical Joint Butterfly Valves  
Manually Gear Operated  
MODELS 3900F & 3900M**

## **INSTALLATION & MAINTENANCE MANUAL**



AWWA C504

Series 3900F - Flanged with Handwheel or Lever Handle

Series 3900MJ - Mechanical Joint with Handwheel or Lever Handle

# UNITED

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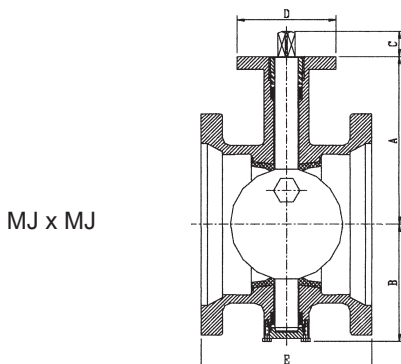
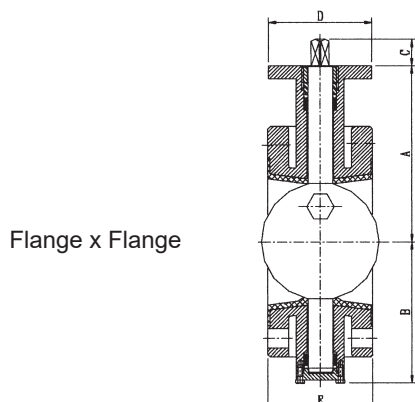


# MODELS 3900F & 3900M - Butterfly Valve with Manual Gear Operator

## 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:



No.	Part Name	Material	ASTM Spec.
1	Shaft	Stainless Steel	AISI 420 or 630
2	Spacer	Brass	ASTM B16 C36000
3	Packing	EPDM or NBR	-
4	Bushing	Brass	ASTM B16 C36000
5	Body	Ductile Iron	ASTM A536 65-45-12
6	Bearing	Teflon	-
7	Seat	EPDM or NBR	-
8	Disc	Ductile Iron (with SS316 Edge)	ASTM A536 65-45-12
9	Cover Plate	Stainless Steel	AISI 420
10	Lock Washer	Carbon Steel	AISI 1045

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

## 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 16 in. (400mm), 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 these valves with eye bolts or rods through the flange holes.

## 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.

## 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. Where practical, valves in buried installations should be located in unpaved areas, unless otherwise indicated in plans and specifications.
4. 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.
5. 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.
6. Concentrically center the valve disc between the mating flanges.
7. 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 required for clearance.
8. 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.
9. 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.

## 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 a rotational shift in the position of the disc with relation to the body seat. Readjust the closing stop in the valve actuator assembly.

## 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.

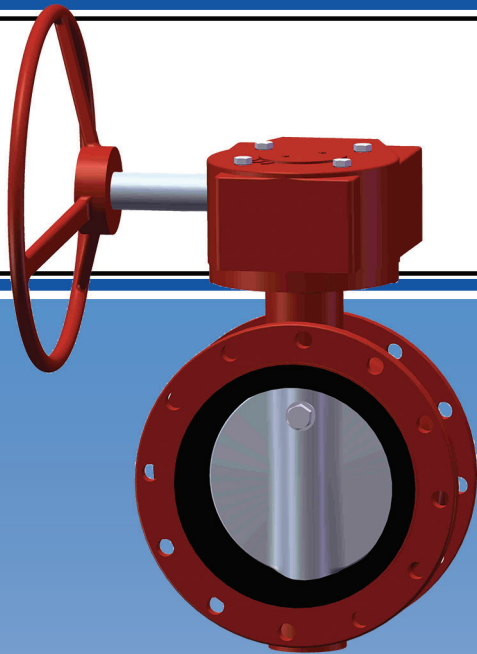
## **OPERATION**

1. Do not permit the use or operation of any valve at pressures above the rated pressure of the valve.
2. 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.
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.



**UNITED** Water  
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