MPI MCWANE PLANT & INDUSTRIAL

ROTATING DISC GATE VALVE
2″-66″

OPERATION & MAINTENANCE MANUAL

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GENERAL

This manual is issued as a recommendation to the customer concerning the proper use of gate valves. Valves should always be installed and operated by authorized personnel. For additional information on these valves, please reference the AWWA C500 standard.

RECEIPT & INSPECTION

Valves should be inspected for damage before being removed from the delivery vehicle or signing the delivery receipt

Care should be taken to ensure proper rigging of the valve for lifting and appropriate lifting equipment is being used. Valves should never be lifted by the stem, hand wheel, 2" operating nut, gearing, electric motor operator, and/or bypass valve.

We recommend that you make the following checks before installing this valve:

- Recheck the valve for damage.
- Check all fasteners to make sure they are properly tightened.
- Check direction of opening for compliance with other valves in the system.
- Check to see that the valve end-joints are clean.
- Check inside the valve to remove all contaminants that may affect water system purity, cause the valve to not operate properly or seal tightly.
- Open and close the valve to make sure it works properly.

Keep the valve closed when placing it in the trench. Do not backfill around the valve prior to completion of the hydrostatic system test. Check to see that all valve joints and pressure containing bolting are tight. Leave the valve exposed while the pipeline is being pressurized.

GATE VALVE RECOMMENDED STORAGE & HANDLING

INDOOR STORAGE:
Whenever possible, MPIs metal seated gate valves should be stored inside. If stored inside, the valves should be in the fully closed position and may be stored with the flanges in the horizontal orientation. In order to reduce the risk of damage to the flanged surfaces and the valve internals, the valves should be kept in the original crating and covered with a tarp to mitigate damage from dirt and debris. Special care should be taken to store the valves in a location where they will not be damaged by collision from vehicles, lift trucks or falling items.

OUTDOOR STORAGE:
Should indoor storage not be possible or feasible, some outdoor protection must be provided. The valves must be stored in such a manner to protect them from weather, blowing dirt and debris. A tarp covering will minimize exterior coating damage from these elements and reduce fading or chalking due to exposure to the sun. The valves should also be placed in a location where they will not be damaged by collision from vehicles, lift trucks or falling items. Valves should be stored with the end flanges vertical so that water does not stand on or between the discs. If valves are received in crates with the flanges horizontal, they should be placed with the flanges vertical before storage. In cold climates, if water is allowed to freeze in the valve, severe damage to the valve components could result. The valves are shipped in the closed position and should remain in the closed position during long term storage. Any packaging removed for inspection of the valves should be replaced prior to placing the valves into long term storage.

HANDLING:
Proper slinging and handling methods should be used when moving valves. The valves should be handled only with an apparatus that will safely support the full valve weight. Do not place slings or other devices around operating stem, around the actuator or through the valve port opening.

INSTALLATION

1. Verify correct valve orientation prior to installation. Valves for horizontal installations in horizontal pipelines must be installed with tracks, and scrapers in the "down" location. Reference approved submittal drawings for verification. Contact McWane Plant & Industrial immediately for clarification of proper installation orientation.
2. Tighten any loose fasteners.
3. Open the valve and check the seating surfaces to make sure they are clean and not damaged. Remove any foreign material inside the valve body. Close the valve before installation.
4. Clean all foreign material from the line such as cement, tools, sand, dirt, wire, etc.
5. Handle the valve carefully into position.
6. Make sure the valve and the line are adequately supported and in line to prevent strain on the valve.
Do not use the valve as final joint to correct any error in alignment or spacing of piping.
7. Proper gasket material, size/ type of fasteners and torque shall be selected and coordinated by the installing contractor.
8. Only like flange types should be joined together. Bolting different types of flanges configurations or materials of construction together requires special consideration by the contractor or owner.
9. If a valve box is used over the valve, make sure the box does not transmit traffic load or other stress to the valve. Also make sure the box is centered over the valve stem and parallel to the valve stem axis.
10. Be sure any valve installed at the end of the line or a stub is restrained to prevent blow off.
11. Check for proper operating/maintenance clearance around the valve when it is installed.
12. On valves with wrench nuts and valve boxes, be sure operating key is kept vertical during operation.

13. Keep the valve closed when placing it in the trench. Do not backfill around the valve prior to completion of the hydrostatic system test. Leave the valve exposed while the pipeline is being pressurized. Check to see that all valve joints and pressure containing bolting are tight.
14. We recommend that protection of some sort be utilized to protect the stem and keep debris from being packed against it on buried valves. Failure to do this may result in problems with operation.
Refer to AWWA C500 and AWWA M44 for additional installation guidelines and information.

OPERATION

START-UP AND BREAK-IN PROCEDURES:
1. Operate the valve from closed to full open and back to the closed position before applying pressure. Check and record number of turns to open.
2. The direction to open valve is indicated by an arrow cast on the wrench nut or hand wheel.
3. Slowly open and close valves against pressure to avoid damage from surge or water hammer.
4. Never force a valve open or closed. If there is difficulty, contact the manufacturer.
SHUT DOWN:
1. Close the valve in the proper direction based on indication on the wrench nut or the hand wheel.
2. Slowly close the valve against pressure to avoid damage from surge or water hammer.
3. Verify the valve is completely closed by counting number of turns as recorded during initial start-up.

Geared valves should not be operated with RPMs greater than 100 RPM. Operating torque at the gear should not exceed 50% of specified value stated on job specific submittal documentation

EMERGENCY OPERATION:
Not applicable.
SEASONAL OPERATION:
When valves are exposed to freezing temperatures, suitable precautions need to be taken to avoid freeze damage.

FIELD TESTING PROCEDURE

1. The trench may only be backfilled up to the area between joints, leaving the joints exposed so that leaks can be easily seen. Do this before testing to prevent pipe movement and permit joint inspection during test.
2. The system should be stabilized for the test 24 hours prior to testing by filling it with water. The system shall have provisions to vent off all air and for pressurizing to test pressure. This should minimize losses due to entrapped air, changes in water temperature, distension of components under pressure, movement of gaskets, absorption of air by water or water by pipe wall and filling of gate valves.
3. After stabilization and at the time of test, raise pressure in 50 PSI increments to the desired test pressure. After each pressure increment, observe stability of the joints looking for gasket extrusion, joint movement, gasket movement and leakage.
4. Seat leakage shall be evaluated per AWWA C500 allowable leakage requirements.

SAFETY

1. The valve body is a rugged structure but is not intended to be a means of aligning pipe. Care must be taken to ensure that any stresses caused by improper alignment are relieved elsewhere in the piping system. Large valves should be independently supported.
2. The following general rules should be followed when installing the valve in the pipeline.
a) Handle valve only with an apparatus that will adequately support it, using safe and proper techniques.
b) Install the valve using good piping practices as governed by the applicable code or specification.
c) The pipeline and valve must be cleaned of all foreign materials.
d) Do not tighten bolts in sequence. They must be tightened in a crossover, star pattern to load the bolts evenly.

To avoid personal injury, prior to troubleshooting or disassembling, isolate valve and purge all internal pressure

VALVE SIZE	VALVE STEM TURNS TO OPEN (±2%)	STANDARD BEVEL GEAR INPUT TURNS TO OPEN (±2%)	STANDARD SPUR GEAR INPUT TURNS TO OPEN (±2%)
3	11	22	22
4	14	27	28
6	20	40	41
8	26	53	54
10	33	65	67
12	39	77	79
14	46	92	94
16	53	211	216
18	59	234	240
20	65	261	522
24	68	466	466
30	65	390	290
36	76	1877	1119
42	89	2141	2141
48	102	3264	3264
54	57	2736	2736
60	63	3024	3024
66	69	4448	4448

MAINTENANCE & INSPECTION

During inspection, the valve should be open and closed on a filled and pressurized pipeline. The valve should function freely with no binding or vibration. Count the number of turns to full closed, this will reveal an obstruction if correct number of turns are not achieved.

Notes:
1) Turns shown above may differ from customer specified requirements. *** Refer to job specific submittal documentation as needed.
2) For valves with motors, refer to the actuator data sheet included with wiring diagrams. Attached actuators should be inspected per the manufacturers recommendations
provided with those units.

RECOMMENDED MAINTENANCE & INSPECTION

1. Operate the gate valve from full open to full close at regular intervals. The length of time between operations depends on the service conditions.
2. On OS&Y valves, lubricate the valve stem with food grade anti-seize lubricant. Stems should be wiped clean of any foreign debris prior to operation.
3. On valves with stem seal packing, check regularly for packing leakage and lubricate packing with food grade lubricant. If leakage is detected, tighten packing gland bolts evenly. Should leakage persist, replace packing.
4. When repacking valve, be sure to use proper packing for the service. Should replacement packing be needed, contact Kennedy and include the valve type, size and year of manufacture.
5. When replacing valve packing, operate the valve to the full open position (wedge should be positioned firmly against the interior of the bonnet). It will then be possible to repack with only slight or no leakage even under pressure.

PERIODIC INSPECTIONS:

1. End Flange fasteners and Bonnet fasteners should be inspected on a quarterly basis.
2. For OS&Y valves, stem threads should be inspected for foreign matter, cleaned and then lubricated with food-grade grease. Lubrication should be performed as required or per annum as a minimum.
3. All valves should be operated on a quarterly basis if possible. Record any unusual conditions during cycling and maintain record of operation.
4. Inspect packing or O-ring seals if exposed at a quarterly basis.

RECORDS

A permanent inspection record should be kept for each valve. Below is an example of suggested information that should be recorded by the end user at time of installation.

1. Model / Series Number(s): _____
2. Manufacturer: McWane Plant & Industrial
   Address: 1201 Vanderbilt Road, Birmingham, AL 35051
3. Valve Tag Number(s): _____
4. Actuation Tag Information (supplier, model, hp, voltage, speed, etc.):
_____
_____
_____
5. Manufacturer's Local Representative: _____
Name: _____
Address: _____
Tel: _____
6. Special Maintenance Requirements (if any): _____
_____
_____
_____
_____

DISASSEMBLY & REASSEMBLY INSTRUCTIONS

DISASSEMBLY INSTRUCTIONS FOR REPLACING DISC:

1. Isolate the valve from line pressure and assure no internal pressure is contained between the disc assembly.
2. Position the valve in an approximate midpoint of travel position, starting from the fully closed position.
3. Match mark the ends of the bonnet flange and the body flange to assure proper reassembly of the components.
4. Remove the bonnet fasteners and set them aside. Lift the bonnet assembly until the discs center is level with body flange. Match mark the disc faces to assure proper reassembly. Place two vise grip clamps, on opposite sides of the disc, to prevent them from dislodging from the wedges. *Use vise grip clamps, such as Matco Tools Model# V18R.*
5. Continue to lift the bonnet assembly until the discs clear the body completely. Set the disc assembly on secure worktable as this unit weighs in excess of 500lbs. When handling the discs, use only nylon strapping to prevent scratching of disc face.
6. Remove the vise grip clamps and replace the discs with new discs as required. Reposition the vise grip clamps on the discs and secure.

REASSEMBLY INSTRUCTIONS:
1. Remove the old gasket and position the new gasket on the body flange.
2. Lift the bonnet assembly and position over the valve body. Confirm the position of the bonnet by the match marks on the body and bonnet flanges.
3. Lower the bonnet assembly into the body assembly, until the clamps are above the body flange. Carefully remove the vise grip clamps and lower the bonnet assembly onto the body.
4. Re-install the bonnet fasteners. Tighten by hand all bonnet fasteners. Torque all fasteners to 100 [ft. lbs.] all around the body and bonnet flange, making sure to do so in a star pattern.
5. Operate the electric motor or gear and test valve and inspect for leaks around body to
bonnet flange. Tighten fasteners if any leaks exist.

TROUBLESHOOTING ROTATING DISC GATE VALVES

POSSIBLE MALFUNCTION	SYSTEMS CAUSES	CORRECTIVE ACTION
Joint Leakage	Faster Tension Relaxing	Tighten Fasteners
Seat Leakage	Foreign Material caught in seat	Operate valve to flush out debris
	Seats Dirty/Corroded	Flush or disassemble & clean
	Seats Damaged	Inspect, repair or replace
Leak Past Stem	Fasteners Loose	Tighten Fasteners
	O-rings worn/damaged(NRS)	Inspect/Replae
	Packing worn/damages (OS&Y)	Inspect/Replace

For service contact the local manufacturer's representative.

SPARE PARTS

In normal operating conditions, no spare parts are needed. The only spare parts for a gate
valve would be a bonnet gasket and packing or O-rings.

*** For parts contact the local McWane Plant & Industrial representative.