

KENNEDY VALVE
2” – 96” SOLID WEDGE GATE VALVE

OPERATION & MAINTENANCE
MANUAL



TABLE OF CONTENTS

3	General
3	Receipt & Inspection
4	Gate Valve Storage & Handling
5 – 6	Installation
7	Operation
8	Field Testing Procedure
8	Safety
9 – 10	Maintenance & Inspection
11	Records
12 – 16	Disassembly/ Reassembly
17	Troubleshooting
17	Spare Parts



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 nuts and bolts 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, Kennedy Valve 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. Valves for horizontal installations in vertical pipelines must be installed with disc face tracking in the “down” location. Reference approved submittal drawings for verification. Contact Kennedy Valve 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.

EMERGENCY OPERATION:

Not applicable.

SEASONAL OPERATION

When valves are exposed to freezing temperatures, valves should remain partially open to allow flow to prevent freezing.



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.



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.

VALVE SIZE	VALVE STEM TURNS TO OPEN ($\pm 2\%$)	STANDARD BEVEL GEAR INPUT TURNS TO OPEN ($\pm 2\%$)	STANDARD SPUR GEAR INPUT TURNS TO OPEN ($\pm 2\%$)
2	5	10	10
3	11	22	22
4	14	28	28
6	20	40	40
8	26	52	52
10	33	66	66
12	39	78	78
14	46	92	92
16	53	212	212
18	59	236	236
20	61	244	488
24	73	438	438
30	61	1000	732
36	73	1796	1095
42	85	2788	2805
48	97	4734	4753

Note: 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.

For valves larger than 48", contact Kennedy Valve for additional information.



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 or 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 Bolts and Bonnet Bolts 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 as a minimum. 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 pertinent information that should be recorded by the end user.

1. **Equipment Item:** _____
2. **Model Number:** _____
3. **Manufacturer:** Kennedy Valve
Address: 1021 East Water St, Elmira, NY 14901 **Tel:** 607-734-2211
4. **Tag Number(s):** _____
5. **Weight of Individual Components (over 100 lbs):** _____
6. **Nameplate Date: (hp, voltage, speed, etc):** _____
7. **Manufacturer's Local Representative:** _____
Name: _____ **Tel:** _____
Address: _____
8. **Maintenance Requirements:** _____



DISASSEMBLY & REASSEMBLY INSTRUCTIONS

DISASSEMBLY INSTRUCTIONS FOR 2" – 12" OS&Y Solid Wedge Gate Valve:

1. Remove hand wheel retaining nut and washer.
2. Remove hand wheel.
3. Remove packing gland/ follower.
4. Remove fasteners between yoke and bonnet.
5. Remove yoke.
6. Remove bonnet flange fasteners.
7. Lift bonnet from body flange, use caution not to damage stem.
8. Carefully remove stem and wedge assembly.



EXERCISE CAUTION AS STEM NUT CAN BECOME DISLOCATED FROM WEDGE CAUSING UNEXPECTED DROPPING OF WEDGE.



DISASSEMBLY INSTRUCTIONS FOR 2” – 96” Actuated OS&Y Solid Wedge Gate Valve:

1. Remove all fasteners that attach the gear to the yoke flange.

While holding the actuator/ gear stationary, rotate the hand wheel or input op-nut to decouple from the stem threads.

2. Remove fasteners between yoke and bonnet.
3. Remove yoke.
4. Remove packing gland/ follower fasteners
5. Remove packing gland/ follower.
6. Remove bonnet flange fasteners.
7. Lift bonnet from body flange, use caution not to damage stem.
8. Carefully remove stem and wedge assembly (straps and overhead lifting apparatuses may be required)



EXERCISE CAUTION AS STEM NUT CAN BECOME DISLOCATED FROM WEDGE CAUSING UNEXPECTED DROPPING OF WEDGE.



DISASSEMBLY INSTRUCTIONS FOR 2" – 12" NRS Solid Wedge Gate Valve:

1. Remove retaining fasteners on operating nut or hand wheel.
2. Remove hand wheel or operating nut.
3. Removal of Packing/ Stuffing box:

VALVES WITH PACKING STEM SEALS:

- a) Remove packing gland/ follower fasteners.
- b) Remove packing gland/ follower.
- c) Remove packing seal plate fasteners.
- d) Remove packing seal plate.

VALVES WITH O-RING STEM SEALS:

- a) Remove stuffing box fasteners.
 - b) Remove stuffing box.
4. Remove stem (rotate stem in the opposite direction of valve opening direction).
 5. Remove bonnet flange fasteners.
 6. Lift bonnet from body flange.
 7. Grasp stem nut and lift out wedge.

Note: *Threading stem back into stem nut may make removal of wedge easier.*



DISASSEMBLY INSTRUCTIONS FOR 2" – 96" Actuated NRS Solid Wedge Gate Valve:

1. Remove fasteners between gear stand/ adapter plate and gear.
2. Carefully remove actuator assembly from stem, & retain key(s).
3. Removal of Stand/ Packing Stuffing box:

VALVES WITH STAND/ INTEGRAL PACKING BOX (ONE PIECE):

- a) Remove packing follower fasteners.
- b) Remove packing follower.
- c) Remove stand/ packing box to bonnet fasteners.
- d) Remove stand/ packing box.

VALVES WITH STAND & PACKING BOX (TWO PIECES):

- a) Remove stand to bonnet fasteners.
 - b) Remove stand.
 - c) Remove packing follower fasteners.
 - d) Remove packing follower.
 - e) Remove packing box to bonnet fasteners.
 - f) Remove packing box.
4. Remove stem (rotate stem in the opposite direction of valve opening direction).
 5. Remove bonnet flange fasteners.
 6. Lift bonnet from body flange.
 7. Grasp stem nut and lift out wedge.

Note: 1) Threading stem back into stem nut may make removal of wedge easier.
2) Larger sized valves may require special handling due to size/ weight.



*1021 East Water Street
Elmira, New York 14901
Telephone (607) 734-2211
Fax (607) 734-3288*

REASSEMBLY INSTRUCTIONS:

1. Always replace bonnet to body gasket or O-Rings as needed.
2. Reassemble in reverse order.
3. Cycle valve and test for leakage, tighten bolts until leakage stops if any exists.

NOTE: Limit switches on actuated valves will need to be reset.



TROUBLESHOOTING SOLID WEDGE GATE VALVES

POSSIBLE MALFUNCTION	SYMPTOMS - CAUSES	CORRECTIVE ACTION
Joint Leakage	Fastener Tension Relaxing	Tighten Fastener
Seat Leakage	Foreign Material caught in seat	Operate valve to flush out debris
	Seats Dirty/ Corroded	Flush or dis-assemble & clean
	Seats Damaged	Inspect-repair or Replace
Leak Past Stem	Fastener Loose	Tighten Fastener
	O-rings worn/ damaged (NRS)	Inspect/ Replace
	Packing worn/ damaged (OS&Y, & NRS)	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 manufacturer's representative.