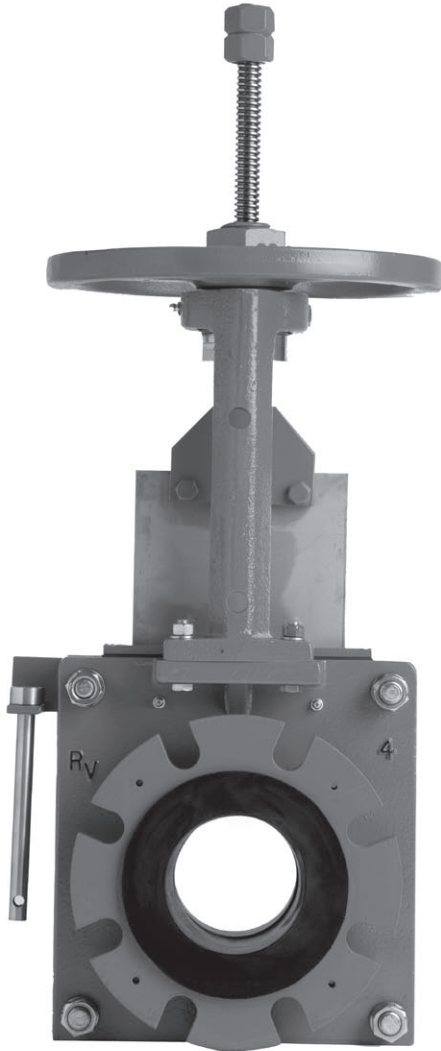




Red Valve Company, Inc.®

SERIES DX SLURRY KNIFE GATE VALVE

Installation, Operation, and Maintenance Manual



The Red Valve Series DX Slurry Knife Gate Valve is a 100% full bore, truly bi-directional valve designed for tough slurry applications. The DX features heavy-duty elastomer slurry sleeves which provide droptight closure and are field replaceable, for ease of maintenance.

The DX incorporates two slurry sleeves that create a bi-directional drop tight seal, eliminating the need for packing. The Series DX is designed to discharge process when the valve has left the full open and full closed position.

A wiper blade mounted on top of the valve prevents external grit and debris from entering the valve body. The wiper blade also minimizes process leaking from the top.

DO NOT INSTALL THE SERIES DX VALVE ABOVE ELECTRICAL PANELS, PUMPS OR PEDESTRIAN WALK WAYS WITHOUT THE USE OF A SPLASH GUARD OR A PIPE-A-WAY SYSTEM. SEVERE DAMAGE TO EQUIPMENT AND/OR PERSONAL INJURY CAN OCCUR.

IMPORTANT

Please take a moment to review this manual. Before performing any maintenance on the valve be sure the pipeline has been de-pressurized. The improper installation or use of this product may result in personal injury, product failure, or reduced product life. Red Valve Co., Inc. can accept NO liability resulting from the improper use or installation of this product. If you have any questions or problems, please call the customer service department at (412) 279-0044. We appreciate your comments. And thank you for choosing Red Valve.

INSTALLATION

* When your Red Valve order arrives, check the contents carefully to assure no damage or loss occurred in transit.

1. Check flange faces of pipe for rough /damaged areas. Pipeline flanges must be flat, properly spaced, and parallel to achieve proper seal. **DO NOT** mate DX valves directly to expansion joints, rubber compressible rubber flange connections.
2. Separate flange gaskets are required on all valves with retaining flanges. A Metal serrated gasket is recommended when mating your retainer flanges to non-serrated PVC, FRP or any slick mating flange.
3. Actuate valve to the full OPEN position for installation. Lubricate sleeves liberally with a grease compatible with the seat material. Silicone grease is recommended for all seat materials.
4. **INSTALLING FLANGE BOLTS:**
CAUTION: Only use flange bolts of the correct length in such manner that the **BOLTS DO NOT BOTTOM OUT ON THE VALVE BODY.** The use of bolts which are too long and bottom out can distort body and cause permanent valve damage. Tighten all bolts uniformly on both sides so as to distribute compression evenly on slurry sleeves. Improper or uneven torquing of flange bolts can cause premature sleeve failure!
5. Standard retainer flange material is UHMW. Valves 10" and larger are shipped with retainer flanges mounted to the valve. Retaining flanges on valves 3" - 8" are optional. Refer to Figure 1 on opposite page.
6. Regardless of valve size, installing Series DX in dead end service requires a retaining ring on downstream flange. Refer to proper bolt size and torque requirements when installing retainer flange.
7. Apply grease liberally to upper stem.
8. Fill out and attach the enclosed VALVE MAINTENANCE CARD to the valve. This has been provided for maintenance convenience.

NOTE: It is recommended that valves with actuators be installed in the vertical position. If actuated knife gates must be installed horizontally, it is recommended that the actuator be supported with a hanger or bracket.

NEVER...

Use bolts which bottom out in body.

DO...

Install with gate in open position.

DO...

Lubricate Sleeves & Gate.

DO...

Tighten bolts evenly.

OPERATION

ATO/ATC:

A single 4-way valve is used to operate this standard cylinder style. The open air supply is connected to the lower cylinder head, and close air source is attached to the upper cylinder. Each side of the cylinder must be vented when the other side of the cylinder is pressurized, in order for the cylinder to function.

FAIL-SAFE CLOSED:

A large diameter spring on the top of the cylinder piston provides the force to close this type of cylinder configuration. Air is only supplied to the BOTTOM cylinder head for valve opening. The top cylinder head must remain vented at all times. When the bottom of the cylinder is pressurized with plant air, the valve opens. The valve will close automatically when the pressure is vented out of the bottom of the cylinder.

FAIL-SAFE OPEN:

A large diameter spring on the bottom of the cylinder piston provides the force to open this type of cylinder configuration. Air is only supplied to the top cylinder head for valve closing. The bottom cylinder head must remain vented at all times. When top of cylinder is pressurized with plant air, valve closes. Valve will open automatically when pressure is vented out through top of cylinder.

CAUTION:

Fail Safe cylinders contain large diameter springs in a compressed state. To avoid risk of serious injury, never attempt to disassemble fail-safe cylinders, NEVER cut, bend, or alter the protruding threads at the top of the cylinder. Fail-safe cylinders will actuate AUTOMATICALLY with an interruption of supply air. To avoid risk of injury from unexpected actuation, always close cylinder supply air prior to inspecting, lubricating, or servicing valve.

WATER HAMMER EFFECT:

Too rapid of closure of any valve can create a forceful and potentially damaging water hammer effect. To minimize the risk of water hammer related damage, Red Valve Co., Inc. recommends that the closure rate of the valve be controlled by restricting the exhaust rate of cylinder pressure. The addition of a needle valve in cylinder head ports will enable you to control closure rate for your service condition.

ACTUATORS:

All actuators are furnished completely assembled and fully operational. All valve accessories and instrumentation are properly set and calibrated at the Red Valve factory.

MANUAL ACTUATORS:

All handwheel, chainwheel, and bevel gear operators turn clockwise to close. The gate stops moving when the valve is fully opened or closed.

BEVEL GEAR:

Bevel gears operate the same as the standard handwheel. The handwheel is turned clockwise to close and counter clockwise to open.

CHAINWHEEL:

Chainwheels can be furnished on both standard valves and valves with bevel gears. The chain must be fed through the guides and over the spokes around the outside diameter of the rim. The ends of the chain are then joined with a connecting link.

ELECTRIC ACTUATORS:

Electric Actuators come completely operational, with limit and torque switches set. Please refer to the individual actuator manuals for additional operation or maintenance information.

LOCK OUT/TAG OUT:

DX Slurry Knife Gates can be furnished with a lock out/tag out which is used to lock the gate in the fully open or fully closed position. Refer to valve technical information sheet regarding lockout/tagout recommendations and practices.

CYLINDER ACTUATORS :

Red Valve Cylinder Actuators operate from clean lubricated plant air. Cylinder Actuators are available in three basic configurations. Air-To-Open / Air-To-Close, Fail-Safe Open, and Fail-Safe Closed.

MAINTENANCE

INSPECTION:

Valves should occasionally be inspected for damage and wear. The inspection period should be determined by the severity of the service and environment. Valves should be inspected every 90 days for normal applications, or more frequently for severe applications. If valves are periodically inspected and preventive maintenance done, the valve will last longer and operate better. Lubricating sleeves and stem is recommended every 600 cycles.

CAUTION:

Do not remove any valve parts or bolting with pressure in the line. It is easy to inspect the valve for obvious problems. Several items should be checked:

- Check the stem for wear and any damaged threads. If threads are damaged, use a small file to remove small burrs on the thread.
- Check the stem bushing for small pieces of bronze which may have worn away. If excess material is noticed the stem bushing should be replaced.
- Check the exposed portion of the gate when it is in the full open position for excessive wear. If the gate is excessively worn, the gate should be replaced. Always keep the valve well lubricated by packing the valve chest with heavy-duty lubricant compatible with the elastomer material and the gate free of excess buildup. We recommend lubricating valve chest every 600 cycles.

SLURRY SEAT REPLACEMENT:

1. Make sure there is no pressure in the pipeline. follow all lockout procedures.
2. Remove the valve out of the line.
3. Replace the slurry sleeves and install the valve as described under installation.

TROUBLESHOOTING GUIDE

SYMPTOM:

VALVE BINDS or DIFFICULTY TURNING HANDWHEEL

- Examine stem & bushing for burrs or wear.
- Clean build-up on gate, flush body
- Lubricate stem & gate
- Remove slurry sleeves & inspect for damage
- Make certain no in-line obstructions exist

SYMPTOM:

VALVE DOES NOT CHECK FLOW WHEN CLOSED

- Check for obstruction in line
- Inspect gate and sleeves for build-up, wear, or damage

SYMPTOM:

SLURRY SLEEVES ARE SOFTENED OR DETERIORATED

- Consult Red Valve for chemical compatibility of resilient seat cartridges.

STORAGE

If your Series DX Slurry Knife Gate Valve is to be stored for a period of time prior to installation, the following storage guidelines will help preserve your valve and assure a trouble free installation.

1. Store resilient slurry seats in a clean, cool and dry location. Avoid exposure to light, electric motors, dirt or chemicals.
2. Store valve in a clean, dry location. Make certain that valve and actuator are well supported. Do not stack other items on valve.
3. Grease stem, gate, and flange holes liberally to inhibit corrosion.

MAKE CERTAIN THAT SLURRY SLEEVES, AND THIS MANUAL ARE STORED AND READILY AVAILABLE AT TIME OF INSTALLATION.

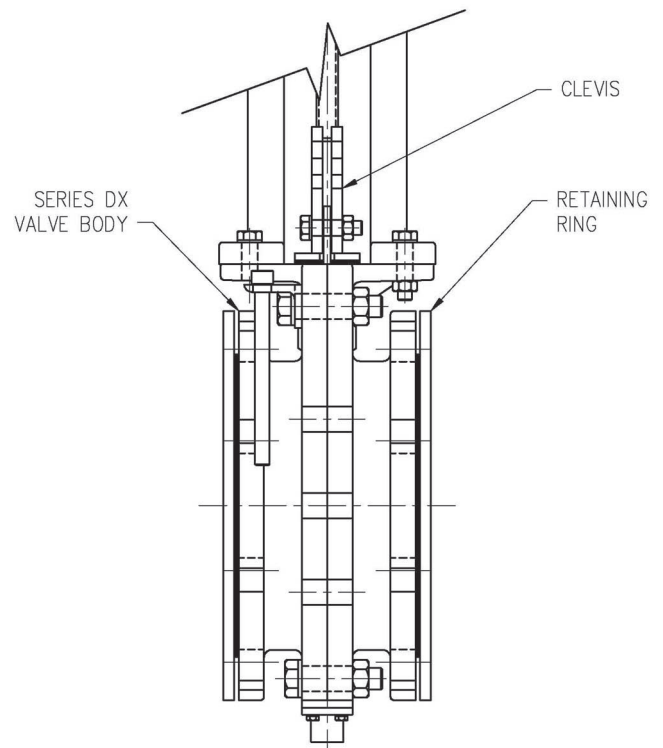


FIGURE 1

INSTALLATION, OPERATION & MAINTENANCE SUPPLEMENT

NOMINAL VALVE SIZE	LENGTH WITHOUT RETAINING FLANGES	LENGTH WITH RETAINING FLANGES	MAXIMUM OPERATING PRESSURE IN PSI	WEIGHT LBS	FLANGE BOLT SIZE	MINIMUM BOLT TORQUE (FT. POUNDS)
3"	5.875"	6.875"	100	49	5/8-11	20
4"	5.875"	6.875"	100	66	5/8-11	20
6"	6"	7"	100	109	3/4-10	20
8"	6.25"	7.25"	100	173	3/4-10	30
10"	-	8.875"	100	222	7/8-9	35
12"	-	10.125"	100	340	7/8-9	50
14"	-	10.125"	100	495	1-8	65
16"	-	11"	100	635	1-8	35
18"	-	12.125"	100	895	1 1/8-7	45
20"	-	14.125"	100	1060	1 1/8-7	55
24"	-	14.625"	100	2250	1 1/4-7	60
30"	-	15.75"	75	2388	-	-

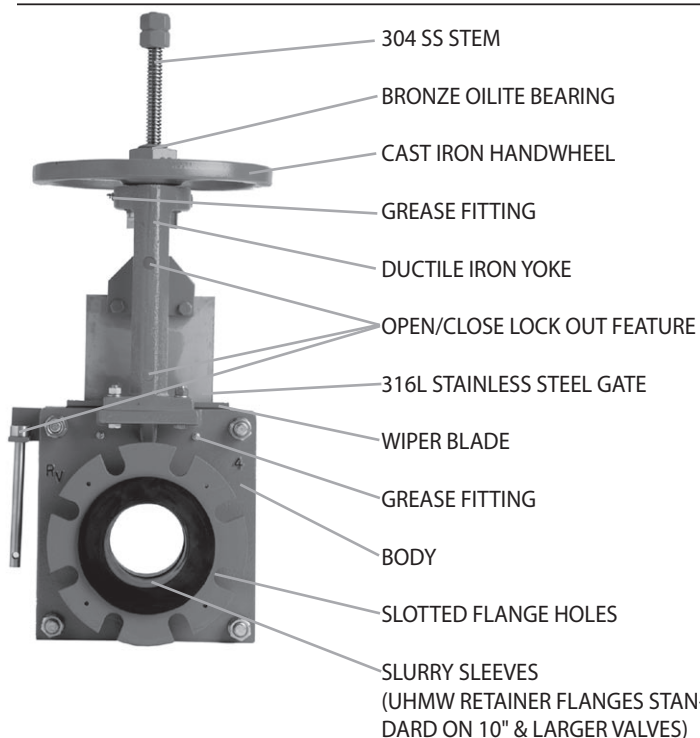
Torque values are suggested minimum values.

Torque all flange bolts in a star pattern. First to 50% of tabulated values, then retorque to 100% of tabulated values. If greater torque is required, continue retorquing in increments of 50% of tabulated values.

Variables such as surface finish on bolt threads, type of anti-sieze compound used, and surface finish of the mating flanges all have an effect on the minimum torque required to obtain a leak tight flange seal.

Use of a high quality anti-sieze compound on all bolt threads is recommended.

PART NOMENCLATURE SERIES DX SLURRY KNIFE GATE



RED VALVE WARRANTY

WARRANTIES - REMEDIES - DISCLAIMERS - LIMITATION OF LIABILITY
 Unless otherwise agreed to in writing signed by Red Valve, all Products supplied by Red Valve will be described in the specifications set forth on the face hereof.

THE WARRANTIES SET FORTH IN THIS PROVISION ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER STATUTORY, EXPRESS OR IMPLIED (INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OR TRADE).

Red Valve Products are guaranteed for a period of one year from date of shipment, against defective workmanship and material only, when properly installed, operated and serviced in accordance with Red Valve's recommendations. Replacement for items of Red Valve's manufacture will be made free of charge if proved to be defective within such year; but not claim for transportation, labor or consequential damages shall be allowed. We shall have the option of requiring the return of the defective product to our factory, with transportation charges prepaid, to establish the claim and our liability shall be limited to the repair or replacement of the defective product, F.O.B. our factory. Red Valve will not assume costs incurred to remove or install defective products nor shall we incur backcharges or liquidated damages as a result of warranty work. Red Valve does not guarantee resistance to corrosion erosion, abrasion or other sources of failure, nor does Red Valve guarantee a minimum length of service, or that the product shall be fit for any particular service. Failure of purchaser to give prompt written notice of any alleged defect under this guarantee forthwith upon its discovery, or use, and possession thereof after an attempt has been made and completed to remedy defects therein, or failure to return product or part for replacement as herein provided, or failure to install and operate said products and parts according to instructions furnished by Red Valve, or failure to pay entire contract price when due, shall be a waiver by purchaser of all rights under these representations. All orders accepted shall be deemed accepted subject to this warranty which shall be exclusive of any other or previous warranty, and shall be the only effective guarantee or warranty binding on Red Valve, anything on the contrary contained in purchaser's order, or represented by any agent or employee of Red Valve in writing or otherwise, notwithstanding implied warranties. RED VALVE MAKES NO WARRANTY THAT THE PRODUCTS, AUXILIARIES AND PARTS ARE MERCHANTABILITY OR FIT FOR ANY PARTICULAR PURPOSE.