

## **DESCRIPTION:**

The Valtorc series 4100 is a bonnetless knife gate valve. It has a metal-to-metal, uni-directional seat, meaning there is a preferred seating direction. Four rows of packing are used to seal between the gate and body. The standard pressure rating of the valve is 150 PSI CWP (Cold Working Pressure). Customized pressure ratings are available.

## **SHIPPING AND STORAGE:**

The valves will be in the closed position for shipment. Small valves (2" through 6") may be shipped in individual boxes. Larger valves and large quantities will be shipped on pallets, skids, or in boxes. Storage should be in a clean dry environment such as a warehouse.

## **INSTALLATION:**

When lifting the valve, never lift the valve by the hand wheel or actuator. Remove any foreign materials from the inside of the connecting pipes such as dirt, sand, scale, and metal chips, to prevent damage to the valve seat.

Find the marking on the valve body near the top flange that says, "**SEAT.**" This is the downstream side of the valve. Be sure to install the valve so that pressure enters the upstream side of the valve and flows out of the downstream side of the valve. Failure to install the valve properly can result in excessive seat leakage and/or damage to the valve gate.

Install the valve to the mating pipe flange using proper size bolts. See "**CHART 1**" for bolt size. Bolt length is not included on Chart 1, since different flanges will require different length bolts. It is very important to choose the proper length of bolt for the bolt holes in the chest of the valve. These are bottom drilled and tapped holes and in some cases contain less than a bolt's diameter of threads. Be careful not to bottom out bolts during installation; however, depending on the type of gaskets being used, the required torques may be higher or lower. Use the cross torque pattern method for tightening the bolts. Mating flanges must be parallel, and true with each other and the valve. Do not use the valve to pull together or force apart the two mating pipes.

After installation, open and close the valve once to assure smooth operation.

## MAINTENANCE:

The items requiring maintenance on the metal seated knife gate valve are the packing and lubrication of the stem. Separate maintenance instructions will be added for uni-directional O-ring seals. The packing gland may require adjustment during startup. Four or more packing gland bolts are used on valves greater than 8 inches. When adjusting packing on valves with four or more bolts, it is best to tighten the bolts on the side opposite the “SEAT” side, first. Normally, just a small amount of tightening per bolt is required. Do not tighten the bolts more than is necessary to stop the leaks. Try to adjust the packing gland down evenly to avoid the possibility of the gland rubbing on the gate as it moves. Generally, the more a valve is operated, the more maintenance will be required to keep packing leaks in control.

Lubricated the stem nut and stem by using a grease gun on the grease fitting at the top of the yoke.

CHART 1		
VALVE SIZE (INCHES)	BOLT SIZE (INCHES)	NUMBER OF BOLTS
2	5/8-11	4
3	5/8-11	4
4	5/8-11	8
6	3/4-10	8
8	3/4-10	8
10	7/8-9	12
12	7/8-9	12
14	1-8	12
16	1-8	16
18	1-1/8-7	16
20	1-1/8-7	20
24	1-1/4-7	20
30	1-1/4-7	28
36	1-1/2-6	32
42	1-1/2-6	36
48	1-1/2-6	44

CHART 2	
VALVE SIZE (INCHES)	RECOMMENDED TIGHTENING TORQUE (FT - LB's)
2 - 3	55 +/- 5
4 - 8	65 +/- 5
10 - 12	110 +/- 10
14 - 16	135 +/- 10
18- 24	150 +/- 10
30	200 +/- 10
36 - 48	250 +/- 10

*Drawing 1: We recommend using Chevron's Ulti-Plex EP grease.*

## **O-RING REPLACEMENT PROCEDURE FOR KNIFE GATE VALVE**

**NOTE: TO CHANGE THE O-RING SEAT SEAL, ACCESS TO THE VALVE SEAT IS REQUIRED EITHER BY REMOVING THE VALVE FROM THE LINE OR BY ACCESS TO THE VALVE SEAT IN THE LINE.**

- 1. Stroke the valve to the full open position.**
- 2. Remove old o-ring and scrape out any residue that has accumulated in the o-ring groove in the seat. Be sure the o-ring groove is completely cleaned out before proceeding.**
- 3. Install the new o-ring as follows:**
  - a. Note that the new o-ring diameter is somewhat smaller than the o-ring groove diameter. This allows the o-ring to be slightly stretched when it is installed in the groove. Lubricate the groove with some light oil. The o-ring will have a bonded joint. Be sure the joint is installed at about the 6:00 o'clock position.**
  - b. Push an approximate 1" to 2" section of the o-ring into the groove at the 12:00 o'clock position. The groove is a dovetail shape so it is wider at the bottom of the groove than at the top. The o-ring may be a little tight at the top.**
  - c. Gently stretch out the o-ring, and find the point on the o-ring that is exactly one half the distances from the 12:00 o'clock position. Push approximately 1" to 2" of the o-ring into the groove at the 6:00 o'clock position. Be sure that there are equal lengths of the o-ring between 12:00 and 6:00 o'clock positions, on both sides.**
  - d. Now do the same at the 3:00 o'clock positions and the 9:00 o'clock position, always being sure that the lengths are equal on both sides of the points where the o-ring is pushed into the seat.**
  - e. Keep doing this by pushing the o-ring into the groove, half way between the two points where the o-ring has already been installed.**
  - f. After the o-ring has been completely installed, check that it is evenly distributed in the groove. If there are places where the o-ring seems thicker than in others, then use like a smooth round piece of wood or plastic, to even out the inconsistencies.**
  - g. Lubricate the face of the seat and the o-ring with silicone grease.**

# REPLACEMENT PACKING PROCEDURE

## WITH NO PRESSURE IN VALVE:

1. Remove packing gland nuts and bolts.
2. Raise gate to full open position.
3. Pull up the packing gland to the top of the gate and secure it to the top of the gate.
4. Using a packing hook, (or screw driver), remove all the old packing.
5. Carefully clean the packing box.
6. Using pre-cut packing kit, insert packing one row at a time into packing box. Tap down each row of packing into place using a flat bar tool. Packing joints should be located 180° apart.
7. Pull down packing gland and tighten nuts and bolts using cross torque method.

### DO NOT OVER TIGHTEN.

8. Bring valve up to working pressure and tighten the packing gland just enough to stop any leaks or drips. Over tightening of the gland will result in reduced packing life.

## **SCHEDULE OF PREVENTATIVE MAINTENANCE**

1. It is recommended that the packing be adjusted once per month. However, based on service and operating conditions, it may be necessary to adjust the packing more or less often.
2. Lubrication should be done according to the lubrication schedule.

### **LUBRICATION SCHEDULE**

1. It is recommended to lubricate the stem and stem nut every three (3) months.

### **TROUBLE SHOOTING PROCEDURE**

#### **1) LEAKAGE FROM STEM PACKING:**

##### **SOLUTION:**

Tighten the packing gland bolts/nuts evenly and slowly. Usually only 1/8 to 1/4 turn on the bolts/nuts will stop the leakage. Only tighten bolts/nuts enough to stop the leak.

#### **2) SEAT LEAKAGE:**

##### **SOLUTION:**

The gate may not be completely closed due to an obstruction between the gate and the seat. Open the gate to 1/4 open and then close to fully closed position. Check for seat leakage.

#### **3) VALVE DIFFICULT TO OPERATE**

##### **SOLUTION:**

- a. Lubricate stem and stem nut. Check for improvement.
- b. Loosen packing gland bolts a small amount (not enough to cause a leak around the stem packing). Check for improvement.
- c. If problem persists consult the factory.