



# **INSTALLATION, OPERATION and MAINTENANCE MANUAL**

## **TRUNNION – MOUNTED BALL VALVE NEXTECH I**

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After ValvTechnologies NEXTECH valves are assembled and tested, the valves are left in the full open position and end protectors are installed. The valves are crated or boxed to prevent damage during shipment.

## Receiving and Preparation for Installation

1. Remove shipping protection and check that the serrations on flange faces are not damaged.
2. Inspect valve/actuator for transportation damage.
3. Inspect valve bore and remove any debris.
4. Cycle the valve and inspect the ball for coating damage.
5. Reinstall the end protectors immediately after inspection.



**IMPORTANT: Actuators are not to be mounted, removed, adjusted or reinstalled from the valve except by trained ValvTechnologies service technicians. Notify ValvTechnologies or nearest representative when such operations need to be performed.**

## Storage

The following measures should be taken when storing valves for short term:

1. Make sure the valve end connection covers remain in place during storage.
2. It is recommended that valves be stored indoors. If the valve has no actuator and will be stored outdoors, the exposed stem or drive sleeve should be covered to avoid accumulation of water and debris.

For long term storage preservation, refer to WHSEWI 235. A copy of the document can be obtained from ValvTechnologies.

## Installation



**CAUTION: Ensure that the pipeline is fully clean before installing the valve in the line. Foreign matter and debris will cause damage to the ball and seat seal surfaces resulting in seat leakage during commissioning. Ensure during commissioning and pipeline flushing the valve is kept in the fully open position.**

Nextech valves are bi-directional and may be installed in horizontal (with the stem upwards) or vertical position with flow from either direction. It is not recommended to install the valve such that the actuator is underneath the valve. Dirt or debris from the pipeline could enter the body cavity and cause damage to the stem packing.

During handling, lifting, or installing a valve, keep the valve in the full open position whenever possible. This will prevent foreign objects from damaging the ball. The end protectors should be kept in place until final installation to protect the end connection faces. Protect any fittings against damage from the lifting devices.



**IMPORTANT: NEVER use hand wheels, gearbox, actuator or any other protruding part of the valve as a support for lifting the valve.**

1. The valve should be lifted such that the body and end cap support the load. The end connection necks are suitable places for attaching lifting slings.
2. If the valve is equipped with lifting lugs, these should be used for handling.



**NOTE: Lifting lugs, if provided, are attached to balance the weight. Never use just one lifting lug for lifting.**

### ***Flanged End Valves***

1. Don't attempt to correct pipeline misalignments with flange bolting. This will transfer piping stress to the valve.
2. Use only approved gaskets (not supplied).
3. The bolts and nuts used to bolt the valve into the line should be lubricated to obtain proper loading on the valve.
4. When tightening bolts, use the crisscross method and gradually tighten each nut, repeating several times, to ANSI or gasket manufactures specification. Excessive tightening can cause damage and/or leakage to the end flanges or body-to-body end joint.

### ***Weld End Valves***





**NOTE: The following DOES NOT APPLY to valves manufactured and certified to the PED directive.**

1. Use solvent to clean grease or dirt from the ball and/or bore of the valve.
2. Electric welding equipment is preferred. However, if only oxygen-acetylene welding equipment is available, extreme caution should be taken to prevent excess welding temperature. The use of radiation shields is advised if heat damage to the actuator is a concern.
3. Care is to be taken to minimize weld slag and splatter within the valve bore. The ball should be in the "Full Open" position during welding.
4. Make sure the temperature of the body/seat area does not exceed 600° F. (Check with Tempil stick or thermal chalks.)
5. Avoid rapid application of excess welding material.

6. Localized stress relief is acceptable. Do not furnace stress relieve without consulting Valvtechnologies Engineering.
7. Thoroughly flush the pipeline after welding to remove the weld slag and splatter, before cycling the valve.

	<b>CAUTION: Valve insulation is prohibited during stress relieving.</b>
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	<b>CAUTION: Never perform any welding with the ball in the closed position without pipe pups.</b>
	<b>NOTE: Welding must be done by qualified welders using approved ASME Code Section IX procedures.</b>

## Operation




### Normal Operation

NEXTECH metal-seated valves require no lubrication.

ValvTechnologies NEXTECH I valves operate from full – open to full – close by a 90° turn of the stem. The valve closes in the clockwise direction. The keys on the stem or drive sleeve going into a gearbox are in-line with the bore of the valve and can be used to indicate ball position.

	<b>IMPORTANT: Valves should be insulated when temperature differentials greater than 400° F (205° C) are expected.</b>
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For gear operated valves, **the gearbox Open – Close adjustment has been done prior to shipment and must not be disturbed.** Valve position is determined by arrows on top of the gear unit that indicate the “OPEN” or “CLOSE” positions.

	<b>NOTE: Handwheel rotation in the clockwise direction (Looking from the handwheel end) closes the valve, and counter clockwise rotation opens the valve</b>
	<b>CAUTION: DO NOT apply extra force or leverage after the end stops of the gear unit have reached their final setting position.</b>
	<b>CAUTION: Intermediate positions of the valve should be avoided, as high velocities produced by the narrow opening will produce erosion of the seats and ball.</b>

For actuated valves, **the actuators should be operated and maintained as per their manufacturer's written instructions.**

The actuators have "OPEN" and "CLOSE" indicators on the top of the unit.

Limit switch and position indicator operation should be observed as the valve is cycled several times



**IMPORTANT: In the event that maintenance is necessary, obtain the part number from the actuator nameplate and contact ValvTechnologies or nearest representative.**

### ***Block and Bleed Applications***

ValvTechnologies NEXTECH valves can be optionally fitted to provide double block and bleed capability of line pressurization. This means that body cavity pressure can be relieved to atmosphere while pressure is coming from both directions in either the full open or full close positions. This feature allows for:

1. Verifying integrity of both seats.
2. Allow draining and flushing of the body center cavity
3. Prevention of downstream leakage to assure safety of downstream activities.

### ***Block and Bleed Procedure***

NEXTECH valves having the block and bleed feature are normally equipped with a ½" flanged vent port for attaching vent lines, and bleed valves (not supplied), or a ½" NPT vent fitting.

Operate the valve to the full open or closed position as desired. Carefully open the valve attached to the ½" vent line, or NPT vent fitting to release body cavity pressure.



**CAUTION: Care should be taken to ensure that the exhaust is directed away from personnel.**

Continuing venting until body cavity pressure reaches atmosphere. The length of time to vent the body will vary depending on the pressure, compressibility, and size of the valve.

### ***Body Flushing and Draining***

Draining can be accomplished by using the drain plug, if so equipped, at the bottom of the valve.



**CAUTION: NEVER remove the plug without verifying that the body cavity is not pressurized.**

Flushing is merely a combination of the double block and bleed, and drain procedures. Once the body cavity has been de-pressurized and drained, the ½" flanged connection can be used for supplying the flushing media.

## Routine Maintenance

Nextech I valves require no lubrication. These valves should provide years of trouble-free operation with very little maintenance. The self-cleaning ball will provide reliable leak-free performance.

## Preventive Maintenance

The only preventative maintenance recommended is to periodically inspect the valve for leaks around the stem/gland and check for tightness of bolting between the body/end cap & body/stem retainer joints.

## Stem Packing Adjustment

The live loaded stem packing system is designed to eliminate frequent adjustments. If leakage should occur in this area, the following procedures should be used.

1. Tighten each packing nut a quarter of a turn and check for leakage.
2. If leakage persists, increase torque to each packing nut by 10% increments until leakage stops. Do not exceed the specified values in EChart 1200 by more than 20%.



**CAUTION: Ensure that valve operation is satisfactory. Increased torque values are an indication that the packing is worn and may need replacement. Excessive tightening will cause an increase in valve stem torque.**

## Body/End Cap and Body/Stem Retainer Joints

Re-tightening of the bolting is allowed only when the line has been de-pressurized. Refer to EChart 1091 for maximum torque values. If leakage persists, the gaskets are worn or damaged and need replacement. Contact ValvTechnologies or your nearest representative for service instructions.



**NOTE: The use of Copper-Based or Nickel-Based Anti-Seize Grease for stud and bolt lubrication and Molybdenum Disulfide Anti-Seize Grease for packing is recommended.**



**IMPORTANT:** For extreme applications, such as high cycles, or if solids or highly corrosive materials are present, more frequent inspections are recommended.

## Gear/Actuator Maintenance

The gear lubrication should be checked every three months and replenished or replaced as needed.



**IMPORTANT:** In the event that actuator maintenance is necessary, obtain the part number from the actuator nameplate and contact ValvTechnologies or representative.



**WARNING:** Disassembly and repair of ValvTechnologies valve by unauthorized personnel may be hazardous and can also void the warranty. Contact ValvTechnologies or representative for any major repairs.

Table I: Troubleshooting Guides

Symptom	Possible Cause	Actions
Valve hard to operate	1. Foreign particles or debris in valve. 2. Gear or Actuator bolting loose. 3. Actuator or gear failure. 4. Stem or Drive sleeve key sheared.	1. Cycle and flush valve to remove debris. 2. Tighten bolting. 3. Replace or repair actuator. 4. Determine cause of shearing & correct/replace keys
Leakage through a closed ball	1. Valve not fully closed. 2. Debris trapped in valve. 3. Damaged Ball or Seat.	1. Close the valve fully. 2. Cycle and flush valve to remove debris. 3. Call Factory or nearest representative.
Leakage through stem	1. Loose stem packing. 2. Worn packing.	1. Tighten gland nuts. 2. Replace packing. *
Body/Retainer Gasket Leaking	1. Body nut/retainer bolt loose. 2. Damaged gaskets	1. Tighten body nut or retainer bolt 2. Replace gasket. *

\* Contact Factory or nearest representative.



## Engineering Chart EChart 1200

### NEXTECH CHESTERTON 1601 PACKING TORQUE CHART

Valve	Pressure Class	Packing Size	Qty/Studs	Packing Gland Torque
2"	300#/600#	1.250 x 1.625	4/.375	60 in-lbs (5 ft-lbs)
	900#	1.250 x 1.625	4/.375	72 in-lbs (6 ft-lbs)
3"	300#/600#	1.500 x 1.875	4/.375	72 in-lbs (6 ft-lbs)
	900#	2.000 x 2.375	4/.500	144 in-lbs (12 ft-lbs)
4"	300#/600#	2.000 x 2.375	4/.500	132 in-lbs (11 ft-lbs)
	900#	2.000 x 2.375	4/.500	144 in-lbs (12 ft-lbs)
6"	300#/600#	2.500 x 3.000	4/.500	216 in-lbs (18 ft-lbs)
	900#	2.500 x 3.000	4/.500	240 in-lbs (20 ft-lbs)
8"	300#/600#	3.000 x 3.500	4/.625	312 in-lbs (26 ft-lbs)
	900#	3.000 x 3.500	4/.625	348 in-lbs (29 ft-lbs)
10"	300#/600#	3.500 x 4.000	4/.625	360 in-lbs (30 ft-lbs)
	900#	3.500 x 4.000	4/.625	408 in-lbs (34 ft-lbs)
12"	300#	3.500 x 4.000	4/.625	360 in-lbs (30 ft-lbs)
	600#	4.000 x 4.500	4/.625	408 in-lbs (34 ft-lbs)
	900#	4.000 x 4.500	4/.625	456 in-lbs (38 ft-lbs)

## ECHART 1091 BODY BOLT TORQUE VALUES

BOLT SIZE IN INCHES	TORQUE (ft/lbs)			
	B7 OR EQUAL		B8M OR EQUAL	
	Minimum	Maximum	Minimum	Maximum
5/16	12	21.6	4	12
3/8	18	32.4	6	18
7/16"	29	52.2	9	29
1/2	45	81.0	13	45
9/16	50	90.0	19	50
5/8	85	153.0	26	85
3/4	150	270.0	45	150
7/8	240	432.0	70	240
1	355	639.0	110	355
1-1/8	510	918.0	155	510
1-1/4	700	1260.0	210	700
1-3/8	950	1710.0	290	950
1-1/2	1250	2250.0	370	1250
1-5/8	1600	2880.0	480	1600
1-3/4	2060	3708.0	500	2060
1-7/8	2500	4500.0	750	2500
2	3000	5400.0	900	3000
3	10300	18540.0	3100	10350
3-1/2	16500	29700.0	5000	16650

Note: Torque values are based on Sweeney 505 (or Valvtechnologies, Inc. Engineering approved equivalent) lubricant on all threads and V nut faces. Without lube there is a risk of stripping the threads before reaching adequate bolt tension.

\*\*\*In the event metal to metal contact is not made when maximum torque value is achieved, contact Engineering.

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3	10/27/2010	1. Corrected reference to WHSEWI 235 2. Added EChart 1201 and EChart1091 3. Updated Rev # to 3.
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