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Installation, Operation,  
and Maintenance Manual

# SX Seal Welded High Pressure Ball Valve

1/4" - 4" SX-CS & SX-SS

SX QVA



IOM 004  
February 2018

## INSTALLATION, OPERATING, & MAINTENANCE INSTRUCTIONS

SX Seal Welded High Pressure Ball Valve IOM for:  
1/4" - 4" SX-CS & SX-SS

Read these entire instructions carefully before installation or servicing.

### GENERAL INFORMATION

Safe and efficient operation of industrial installations requires not only complete knowledge of the engineering and functioning of all machinery and equipment but their continuous proper maintenance as well. Improper operation or maintenance of one single valve may affect the whole operation. To help you achieve trouble-free valve performance, general information is provided here for the optimum operation and maintenance of your Quadrant steel ball valves with floating ball design.

#### DESIGN

All Quadrant SX series seal welded ball valves are a two-piece body design that is sealed welded closed. The valves are non-directional and can be installed with either end upstream. These valves are designed and manufactured in accordance with NACE MR-0175. Valves have ends that have a tapered thread in accordance with ANSI/ASME B1.20.1.


### 1. HANDLING VALVES BEFORE MOUNTING/STORAGE

- 1.1 Prior to shipment, every valve is wrapped in a plastic bag that is sealed so that every Quadrant valve is protected from intrusion of dust and other foreign objects into valve bore during transit. Do not remove the valve from the bag until the valve is ready to be mounted.
- 1.2 For valve storage, a dust free place is recommended. Care should always be taken to avoid damaging stems. Placing valves directly

on the ground or concrete floor is not recommended. Under no circumstances should valves be stored outdoors. Valves are shipped in the open position to protect the ball surface.

- 1.3 When moving with a crane, valves should be positively rigged around valve bodies. In no case should the crane wire be in direct contact with valve stems or operational gears.
- 1.4 The valve must never be stored in the partially open position. The soft seat can be damaged if the valve is left partially open for long periods. It is recommended that the valve be stored in the full open position to protect the ball and seats.

## WARNING

NOTICE	
	<b>SAFETY FIRST! FOR YOUR SAFETY, TAKE THE FOLLOWING PRECAUTIONS BEFORE REMOVING THE VALVE ASSEMBLY FROM THE LINE OR BEFORE ANY DISASSEMBLY.</b>

#### WHAT'S IN THE LINE?

Be sure you know what fluid is in the line. If there is any doubt, double check with the proper supervisor.

## ARE YOU PROTECTED?



Wear any protective clothing and equipment normally required to avoid injury from the particular fluid in the line.

## IS THE LINE DEPRESSURIZED?



Depressurize the line and drain the system fluid. Cycle the valve several times to relieve any pressure still inside the valve.

It is important to refer to the valve operation limits that are molded in the body of each valve for maximum pressure ratings and material description. In case there is any question concerning the valve, refer to Quadrant for maximum ratings.

	<b>WARNING</b>
	<b>Warning:</b> AT ALL TIMES KEEP HANDS OUT OF THE BALL CAVITY. A REMOTELY ACTUATED VALVE COULD CLOSE AT ANY TIME AND RESULT IN SERIOUS INJURY.

## 2. VALVE INSTALLATION

	<b>NOTICE</b>
	Handling equipment is required for the weight involved. The Quadrant ball valve catalog furnishes the approximate weight of the specific valve.

### PROCEDURE

2.1 Verify the valve is correct as shown on the piping arrangement. Look at the identification plate, tags, and markings on the valve for size, pressure class, maximum operating pressure and temperature, and materials.

2.2 Remove plastic wrapping.

**NOTE:** As piping sites are usually dusty, be sure not to remove valve plastic wrapping before your valves are ready for mounting.

2.3 Inspect the valve bore for foreign matter and clean them if necessary. Valves are shipped

sealed, but during the transit, foreign material may be introduced into the bore.

2.4 Install valve in line with either end upstream.

2.4.1 If equipped, confirm Male NPT threads on piping to be assembled to the valve meet the gauging specifications of ANSI B1.20.1 or ASME B1.20.3.

2.4.2 Before assembling the pipe and valve, apply pipe dope or PTFE tape to the threads on the pipe. Thread the pipe into the valve end connections using a standard pipe wrench.

**NOTE:** Make sure that the valve and pipeline are aligned accurately. Thread sealant/lubricant is required to establish a seal between the piping threads and valve threads. It will not be possible to establish a leak-free seal without thread sealant.

2.4.3 Valve and pipe interior should be flushed to remove foreign objects which may later cause a fluid leak.

2.4.4 Straightness of pipeline and valve should be assured to avoid uneven piping stresses against the valve.

Care should be taken to assure that general stress of the pipeline is not concentrated on the valve.

2.5 Installation- Socket Weld

2.5.1 Inspect piping to be welded to valve for correct preparation and any damage.

2.5.2 Place handle in the FULL OPEN POSITION.

2.5.3 Wrap a rag that has been soaked with WATER around the center of valve body and secure. Do not wet weld ends.

2.5.4 Insert piping into one socket weld end and "tack" weld in two spots.

- 2.5.5 Wait one minute, then insert piping into opposite weld end and “tack” weld in two spots.
- 2.5.6 Before welding, confirm valve location, orientation and clearance is acceptable.
- 2.5.7 Weld the pipe to one end of the valve using appropriate wire/filler materials as quickly as possible.
- 2.5.8 Allow assembly to cool for at least 5 minutes.
- 2.5.9 Confirm rag is still wet- if not, re-soak rag and re-secure to center of valve body.
- 2.5.10 Repeat steps 2.5.7 through 2.5.9 for the opposite side.

### 3. VALVE OPERATION

- 3.1 Rotation of the valve stem by 90° fully opens or closes the valve. Clockwise rotation closes the valve, and counterclockwise rotation opens it.

**Note:** To prolong the life of the seats, the ball valve should be fully open or closed. Leaving the ball in a half open/closed position could damage the seats.

- 3.2 On the pilot run, be sure to detect fluid leakage from the packing area, or piping/valve threaded connection.
- 3.3 When leakage is detected from packing area. Retighten gland [26] and observe result. Refer to Table 1 and Sketch 1.

**Note:** Care should be taken not to overtighten the packing nut as it would reduce elasticity and consequently sealing performance of packing. If re-tightening does not solve the problem, gland packing should be replaced with new packing.

### 4. DAILY VALVE INSPECTION DURING OPERATION – ON STREAM MAINTENANCE

- 4.1 In order to operate your valve safely and satisfactorily, daily inspection is very important. The following are the main items for your daily inspection.

#### Fluid leakage

- a. leakage from the gland area
- b. leakage from the pipe/valve threads
- c. leakage through the valve body surface

#### Generation of abnormal noise

- a. from the valve itself
- b. from the vibrating pipelines

#### Visual confirmation

- a. correct valve operating position
- b. pipe securely tight in valve

- 4.2 If any of the above problems are detected, remedial measures are to be taken immediately as follows:

#### Fluid leakage

Refer to section 3.3 “Valve Operation” to remedy leakage from the packing area. For the leakage through the valve body surface, a valve repair specialist should be called.

#### Generation of abnormal noise

Abnormal noise can be distinguished easily from normal noise, if your maintenance engineer gets used to it during daily inspection. For the abnormal noise generated from the valve itself or the Pipelines, your piping engineer should be called. Loose connections should be immediately re-tightened.

#### Visual Confirmation

Make sure that the valve is operated in the fully opened or closed position. No intermediate position is recommended.

**CAUTION:** Ball valves are generally not recommended for throttling service, where the fluid flow or the edge of the ball bore may be damaged or deform the plastic ball seats and cause leakage when they are fully closed. You might have an increased concern with the possibility of seat damage or deformation when your ball valves are used for servicing liquid with extremely high fluid velocity and/or high abrasive service such as slurry or a fluid containing many materials.

For this reason, ball valves are basically to be considered as a measure to fully open or shut off the fluid flow. Leaving your ball valves slightly open (intentionally or unintentionally) should be particularly prohibited because of excessive increase of the fluid velocity through the very narrow slit between the seat and edge of the ball bore, which may damage or deform the ball seats.

## PERIODIC VALVE INSPECTION OFF STREAM MAINTENANCE

Inspection should be made periodically to detect wear of the ball stem, corrosion of the body or body cap interior, and wear of the threads. Usually, stem packing is replaced as a part of maintenance operations. For recommended spare parts, contact a Quadrant Valve representative.

### 5. DISASSEMBLY PROCEDURE

(Refer to Assembly Illustration on last page for part identification and location.)

- 5.1 If the valve is in line, isolate the valve from the line pressure.
- 5.2 Release the pressure from the inlet and outlet ports.
- 5.3 It is recommended to cycle the valve four to five times to make sure there is no pressure trapped inside the body cavity.
- 5.4 Before dismantling the valve from the pipeline, mark the ends adequately in their original location and position to avoid confusion or mistake on subsequent re-installation of valve.
- 5.5 Remove the valve from line.

**NOTE: Care should be taken when disassembling to not scratch the stem, ball, or the body interior. All valve components should be kept isolated for easier examination and reassembly.**

- 5.6 Before disassembly, remove and collect residual objects from valves if any, and note their location. Examination of these records and materials will be found useful for better valve maintenance.
- 5.7 Remove the lock nut [28], spring washer [23], handle [30], and gland [26]. [Refer to Sketch 1](#)

- 5.8 Remove the old packing [15] out of the stuffing box without damaging the stem. Clean the stuffing box and stem seal area. [Refer to Sketch 1](#)

**Note:** Care should be taken to not scratch the stem or the body interior. All valve components should be kept isolated for easier examination and reassembly.

## 6. INSPECTION AND CLEANING

- 6.1 Wipe off metal parts with a soft cloth using petroleum solvent, steam, or oil.
- 6.2 Inspect metal parts for damage or burrs on all surfaces. Worn or corroded area of part shall be carefully examined visually or, if necessary, with magnifying glass. Cracks should be carefully detected. Wall thickness should be periodically measured for recording corrosion with the passage of time.
- 6.3 Part replacement. For recommended spare parts list see Quadrant ball valve catalog.  
**NOTE:** Soft goods should never be re-used after the valve has been disassembled. Always replace soft goods after disassembly with new pieces. The soft goods include: seats, packing, body gasket, bearings, and thrust washer.

## 7. RE-ASSEMBLY PROCEDURE

(Refer to Assembly Illustration on last page for part identification and location.)

Valve should be assembled in the following sequence after all the component parts have been cleaned and new spare parts have been prepared

- 7.1 Replace new packing in the stuffing box. Careful not to damage the packing when sliding it over the stem into the body. [Refer to Sketch 1](#)
- 7.2 Install the gland [26] over the stem [8]. Torque down the gland to the values listed in table 1. [Refer to table 1 and Sketch 1](#)
- 7.3 Re-install the handle [30], spring washer [23], and lock nut [28]. [Refer to Sketch 1](#)

## 8. TEST AND INSPECTION

- 8.1 Check the valve operating condition by fully opening and closing several times. Make sure

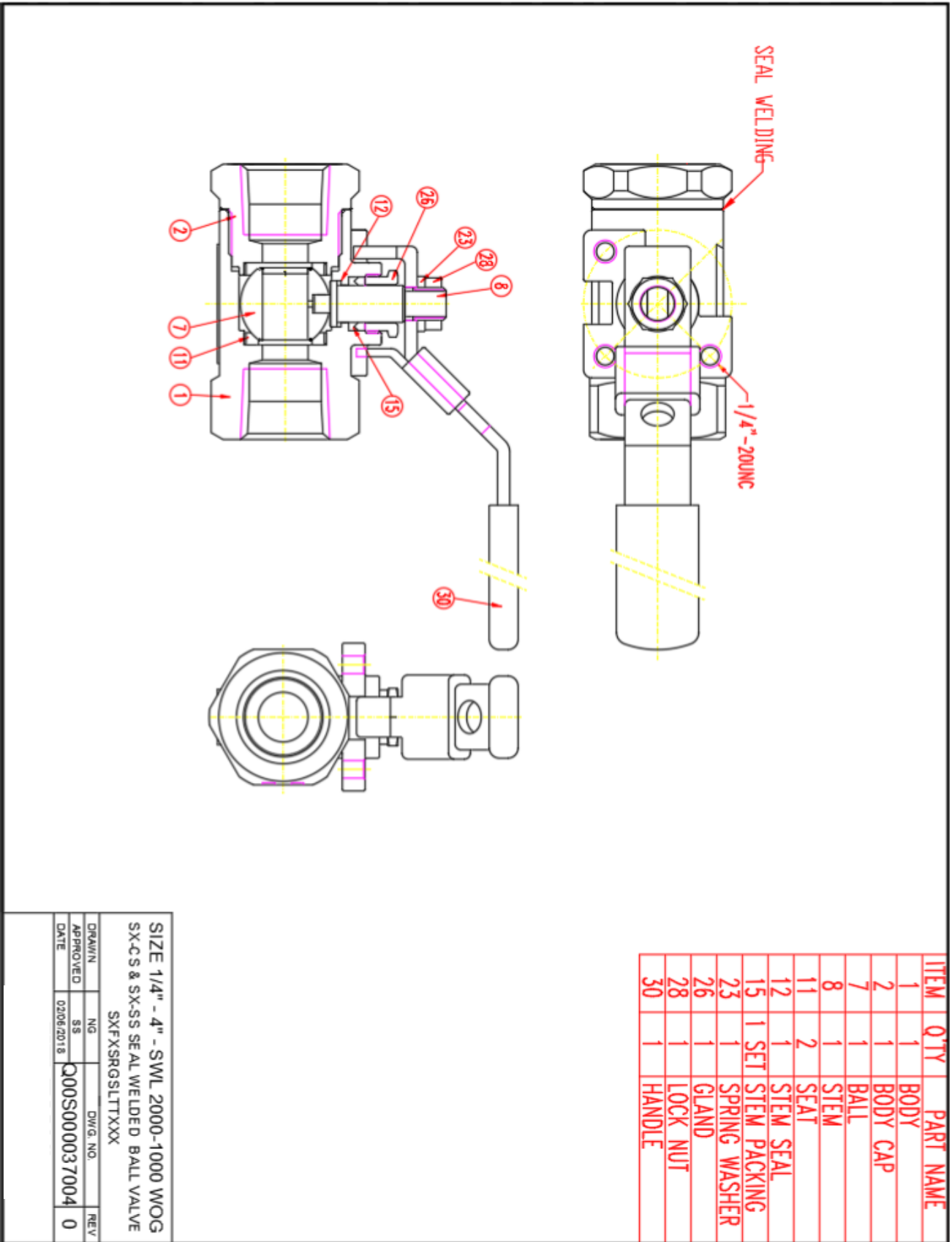
that lock plate matches extreme operating position of the valve.

8.2 All valves, after reassembly, should be subjected to hydrostatic or pneumatic seat test to insure valve performance.

**Table 1) Gland Bolting Torque**

<b>Valve Size</b>	<b>Gland Torque</b>
1/4"	55 in-Lbs.
1/2"	55 in-Lbs.
3/4"	148 in-Lbs.
1"	148 in-Lbs.
1-1/4"	20Ft.-Lbs.
1-1/2"	20Ft.-Lbs.
2"	38 Ft.-Lbs.
2-1/2"	48 Ft.-Lbs.
3"	48 Ft.-Lbs.
4"	213 Ft.-Lbs.

# Assembly Illustrations



ITEM	QTY	PART NAME
1	1	BODY
2	1	BODY CAP
7	1	BALL
8	1	STEM
11	2	SEAT
12	1	STEM SEAL
15	1 SET	STEM PACKING
23	1	SPRING WASHER
26	1	GLAND
28	1	LOCK NUT
30	1	HANDLE

SIZE 1/4" - 4" - SWL 2000-1000 WOG SX-CS & SX-SS SEAL WELDED BALL VALVE SXFXSRGSLTXXX			
DRAWN	NG	DWG. NO.	REV.
APPROVED	SS	Q00S000037004	0
DATE	02/06/2018		

Sketch 1

### **About ASC Engineered Solutions**

ASC Engineered Solutions is defined by quality—in its products, services and support. With more than 1,400 employees, the company's portfolio of precision-engineered piping support, valves and connections provides products to more than 4,000 customers across industries, such as mechanical, industrial, fire protection, oil and gas, and commercial and residential construction. Its portfolio of leading brands includes ABZ Valve®, AFCON®, Anvil®, Anvil EPS, Anvil Services, Basic-PSA, Beck®, Catawissa, Cooplet®, FlexHead®, FPPI®, Gruklok®, J.B. Smith, Merit®, North Alabama Pipe, Quadrant®, SCI®, Sharpe®, SlideLOK®, SPF® and SprinkFLEX®. With headquarters in Commerce, CA, and Exeter, NH, ASC also has ISO 9001:2015 certified production facilities in PA, TN, IL, TX, AL, LA, KS, and RI.



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FC-IOM-SX QVA-v01 20210617

