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# Installation, Operation, and Maintenance Manual

## S3 Seal Welded High Pressure Ball Valve

1/4" - 2" S3-CS & S3-SS -  
All Sizes ASME B16.34 Class 1500  
S3 QVA



IOM 005  
March 2018

## INSTALLATION, OPERATING, & MAINTENANCE INSTRUCTIONS

**S3 Seal Welded High Pressure Ball Valve IOM for:  
1/4"- 2" S3-CS & S3-SS – All Sizes ASME B16.34 Class 1500**

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 S3 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 ASME B16.34, API 608, and Nace MR-01-75. 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 valve meet 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 by hand first, and then use a standard pipe wrench to torque the threads. An adjustable wrench should be used on the flats of the valve, not a pipe wrench.

**NOTE:** Make sure that 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 that 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.

2.4.5 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 FULL OPEN POSITION.

2.5.3 Wrap a rag that has been soaked with WATER around 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 pipe to one end of 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 step 2.5.7 for 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 packing nut [5] 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 tailpiece interior, and wear of the threads. Quadrant S3 Seal Welded Ball Valves require no maintenance other than periodic stem packing adjustment in applications where many cycles of on-off operation occur on a weekly basis. In high-cycle applications, check stem packing area regularly to confirm there is no leakage from stem packing.

### 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.

### 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 a magnifying glass. Cracks should be carefully detected. Wall thickness should be periodically measured for recording corrosion with the passage of time.

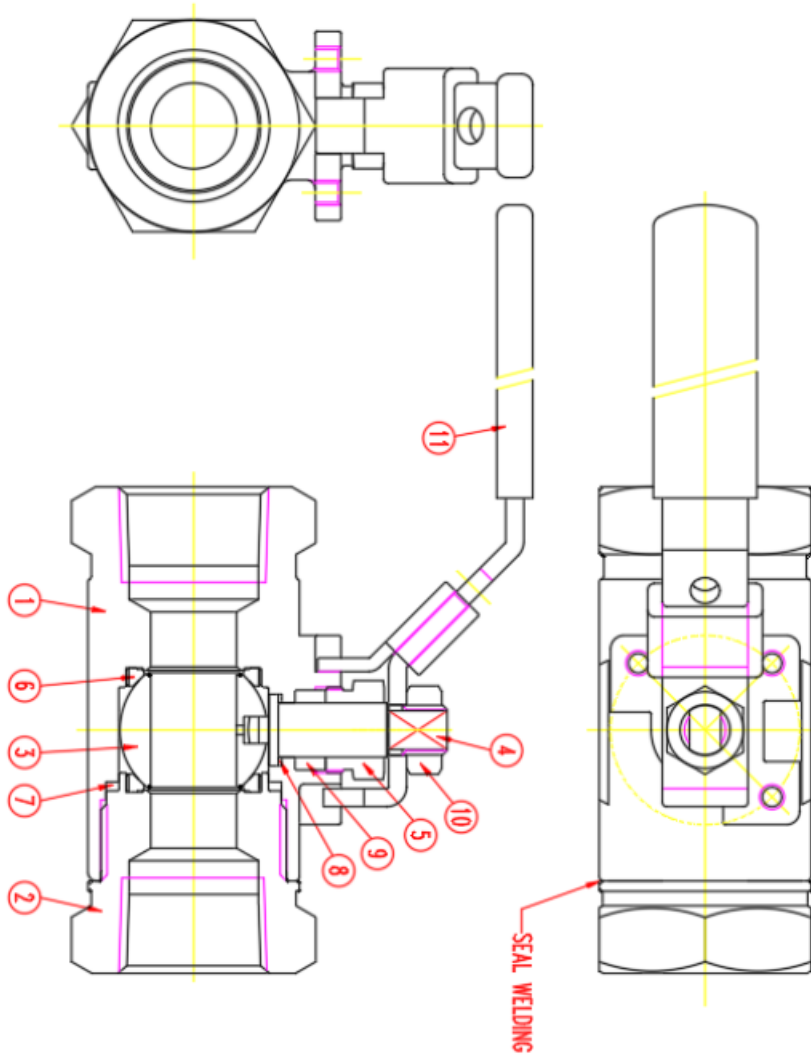
### 7. TEST AND INSPECTION

- 7.1 Check the valve operating condition by fully opening and closing several times. Make sure that locking mechanism/lock tab matches extreme operating position of the valve.

Table 1) Gland Bolting Torque

Valve Size	Minimum Gland Torque
1/4"	130 in-Lbs.
3/8"	130 in-Lbs.
1/2"	130 in-Lbs.
3/4"	174 in-Lbs.
1" Reduced Port	174 in-Lbs.
1" Full Port	217 in-Lbs.
1-1/4"	217 in-Lbs.
1-1/2"	217 in-Lbs.
2"	217 in-Lbs.

# Assembly Illustrations



ITEM	PART NAME
1	BODY
2	TAIL PIECE
3	BALL
4	STEM
5	PACKING NUT
6	SEAT
7	TAIL PIECE SEAL
8	THRUST WASHER
9	STEM PACKING
10	HANDLE NUT
11	HANDLE ASSY.

SIZE 1/4"-2" - CLASS 1500 SEAL WELDED HIGH PRESSURE BALL VALVE SAFSSAFSLTTXXX			
DRAWN	NG	DWG NO.	REV
APPROVED	NG	Q00S000075007	0
DATE	03/12/2018		

### **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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