



Quadrant Valve & Actuator Engineering Specification

Number: IOM- 6 Date: 7/22/2005 Rev #2

Title: Three-Piece Maintenance Design Ball Valve NPT & Socket Weld IOM, for: M2-CS & M2-SS

I. Initial Inspection

- A. Remove valve from packaging; remove thread protectors and discard.
- B. Inspect pipe threads for any damage caused in shipment or handling.
- C. Confirm Valve Size is correct for installation.

II. Installation- NPT Ends

- A. Confirm Male NPT threads on piping to be assembled to valve meet gauging specifications of ASME B1.20.1 (NPT) or B1.20.3 (NPTF).
- B. Thread sealant/lubricant is required to establish a bubble-tight seal between piping threads and valve threads. It will not be possible to establish a leak-free seal without thread sealant.
- C. Hand-engage piping to each side of valve, and hand tighten.
- D. Attach a pipe wrench to the Hexagon shape of the valve tailpiece having the NPT thread being engaged. **DO NOT** hold the body or opposite tailpiece while torquing pipe into tailpiece.
- E. Tighten piping into valve thread using reasonable torque to seal - **DO NOT OVER-TORQUE.**
- F. Use same method to install piping into alternate valve NPT port.

III. Installation- Standard Length Socket Weld or Butt Weld Ends

- A. CAUTION: NEVER ATTEMPT TO WELD INTO PIPING WHILE ASSEMBLED!!**
- B. Remove the Socket head cap screws that attach each tailpiece to the valve body.
- C. Carefully remove body seals from tailpieces-DO NOT DAMAGE SEAL FACE.
- D. Inspect Socket Weld and Buttweld ends for any damage.
- E. Weld pipe to tailpiece using appropriate wire/filler materials.
- F. Allow assembly to cool.
- G. Repeat for opposite side.
- H. Allow piping to cool to room temperature, then install body seals into tailpiece grooves, carefully slide body assembly between tailpieces (keep seats in place), and hand tighten all socket head cap screws that attach tailpieces to body.

Torque socket-head cap screws on each side of valve using an Across- Tailpiece torquing sequence, increasing bolt torque on each sequence.
Final bolt torque:

Size- Full Port	Size-Reduced Port	Final Torque
1/4" & 3/8"	1/2"	110 In-Lbs
1/2"	3/4"	110 In-Lbs
3/4"	1"	220 In-Lbs
1"	1-1/4"	400 In-Lbs
1-1/4"	1-1/2"	400 In-Lbs
1-1/2"	2"	625 In-Lbs
2"	2-1/2"	400 In-Lbs

III. Installation- EXTENDED Length Socket Weld or Butt Weld Ends

- A. Quadrant's Extended Length Socket Weld Ends are specifically designed to allow complete valve to be welded into piping system without disassembly.
- B. Clean each weld end tailpiece & adjoining piping.
- C. Slide piping into socket-weld end until it "bottoms" on bore shelf.
- D. Place valve handle in full open position.
- E. Wrap a wet rag (use water only) around valve body.
- F. "Tack" weld the piping to each tailpiece to positively retain piping to valve assembly.
- G. Weld first side of valve to piping.
- H. Allow valve assembly to cool, replace wet rag with second cool wet rag.
- I. Weld second side of valve to piping.
- J. Allow to cool.

IV. Operation:

- A. After Installation, confirm handle has adequate clearance by rotating 90 degrees from open to closed position and back to open.
- B. All Quadrant ball valves are designed for on-off operation only. DO NOT attempt to "throttle" with Quadrant ball valves, unless they are specifically designed for and tagged "FOR THROTTLING SERVICE".
- C. If application is in STEAM PIPING, be cautious when operating valve- handle will be HOT!

V. Initial Pressurization of System

- A. Upon initial pressurization of piping system, check all connections for leaks and correct if required.
- B. Once system reaches "Steady State" conditions of operating pressure and operating temperature, it will be necessary to make initial stem packing adjustment. Tighten Part #9, "Stem Packing Nut" to 20-25 in-lbs on ¼"-3/4" sizes, and 35-40 in-lbs on 1"-2" sizes.

VI. Maintenance

- A. Quadrant 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.
- B. In high-cycle applications, check stem packing area regularly to confirm there is no leakage from stem packing. If leakage occurs, follow step #IV-B to correct.

VII. Repair & Reconditioning- M2-CS & M2-SS Three-Piece Ball Valves

- A. Depressurize line, drain fluid.
- B. Hold valve body, remove socket head cap screws that retain tailpieces, remove valve body assembly.
- C. Remove Body Seals (#8) from Tailpieces (#2)
- D. Put valve body in a vise with protective jaw covers.
- E. Move handle to closed position, and remove Ball (#3) and Seats (#5) from body cavity.
- F. Remove Handle (#11).
- G. Remove Packing Nut (#9).
- H. Push Stem (#4) down into body cavity.
- I. Remove Packing (#7) with packing hook- DO NOT DAMAGE PACKING BORE.

Re-assembly:

- A. Install new Packing (#7)
- B. Install new Thrust Washer (#6) and insert stem into body cavity and up through Packing. Push up until Thrust Washer contacts body. Align stem flats with body bore.
- C. Install Packing Nut (#9). Torque To 30 in-lbs.
- D. Install one new Seat (#5) into one side of body cavity.
- E. Inspect ball for damage. If no defects on spherical surface, align stem slot with stem flats and push into body cavity until it contacts Seat (#5).
- F. Install new Seat (#5) on opposite side of ball.
- G. Install new Body Seals (#8) into grooves in Tailpieces (#2).
- H. Reinstall Body Assembly into piping, spreading piping slightly to prevent damage to body seals and taking care to keep Seats (#5) in place during installation.
- I. Hand tighten socket head cap screws that attach tailpiece to body.
- I. Torque socket-head cap screws on each side of valve using an Across- Tailpiece torqueing sequence, increasing bolt torque on each sequence. Final bolt torque to be as noted above in Section III.