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4100 Series Standard Port

Class 150 & 300 ANSI Unibody Ball Valve

USER'S MANUAL

Installation & Maintenance

Assured Automation • 19 Walnut Avenue, Clark, New Jersey 07066 • Tel: 732-381-2255 • Fax: 732-381-2383

Valve & Actuator Engineering Specification

Number: IOM- 11

Date: 7/24/2004

Title: Unibody Flanged-End Ball Valve IOM for: 4100

I. Initial Inspection

A. Remove valve from packaging; remove flange protectors and discard, if so equipped.
B. Inspect flange faces for any damage caused in shipment or handling.
C. Confirm Valve Size and Class is correct for installation.

II. Installation

A. Confirm flanges installed on adjacent piping are correct pressure class and match valve flange pattern.
B. Confirm “lay-length” between piping flanges matches valve “lay-length”.
C. Slide valve between piping flanges, then insert first spiral-wound flange gasket between one valve flange and piping flange.
D. Insert flange bolts and hand-tighten flange nuts on first side.
E. Insert second spiral-wound flange gasket between opposite valve flange and piping flange.
F. Insert flange bolts, and hand-tighten flange nuts on second side.
G. With a torque wrench having capacity to apply torque as recommended by flange gasket manufacturer, start to torque first side flange bolts to 25% of recommended final torque, using an alternating “across flange” torqueing sequence to insure correct gasket compression.
H. Using same “across-flange” torqueing sequence, increase torque to 50% of recommended flange bolt final torque.
I. Using same “across-flange” torqueing sequence, increase torque to 75% of recommended flange bolt final torque.
J. Using same “across-flange” torqueing sequence, increase torque to recommended flange bolt final torque.
K. Perform steps “G” through “J” on opposite flange connection.

III. 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!

IV. 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"-1" Sizes. On 1-1/2" to 6" sizes, evenly tighten the two "Packing Nuts", Part #12, to 30-40 In-Lbs.

V. 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.

VI. Repair & Reconditioning- F1 Series Unibody Flanged-End Ball Valves

NOTE: Refer to Assembly Drawings and Parts Lists as shown in Quadrant Folder F1-CS/F1-SS- this can be downloaded at www.QUADRANTVALVE.com or see Quadrant Engineering Binder under "Flanged-End Ball valves".

A. Depressurize line, drain fluid.
B. Remove flange bolting, slide valve from between piping flanges, discard spiral-wound flange gaskets.
C. Place valve assembly on a secure table surface with Part #2 "Insert" facing up, and opposite body flange contacting table surface. Table or bench must be equipped with "studs" or bolts to engage body flange holes, and must have a protective surface to prevent damage to body flange face.
D. Note: Significant torques are required to be applied to Part #2 "Insert" to disassemble & reassemble valve- secure table or bench to floor or wall.
E. Obtain "male" hexagon drivers of the following sizes:

Valve Size	Hexagon Driver (Across-Flats)	Valve Size	Hexagon Driver (Across-Flats)
½"	10.4MM (13/32")	3"	64.5MM (2-17/32")
¾"	15.8MM (5/8")	4"	86.5MM (3-13/32")
1"	20.8MM (13/16")	6"	131.0MM (5-5/32")
1-1/2"	31.7MM (1-1/4")		
2"	42.7MM (1-11/16")		

F. Engage “male” hexagon driver into female hexagon drive in Part #2 “Insert”.
G. Using “six-point” sockets of ¾” or 1” drive size to engage “male” drivers, or large pipe wrench, apply counter-clockwise torque to drivers to remove Part #2 “Insert”.
H. Move handle to “closed” position, and remove ball and seats from body cavity. Handle ball carefully to prevent damage.
I. For ½” to 1” sizes:
    a. Remove Handle (#12).
    b. Remove Packing Nut (#9).
    c. Push Stem (#4) down into body cavity and remove from body bore.
    d. Remove Packing (#8) with packing hook- DO NOT DAMAGE PACKING BORE.
J. For 1-1/2” to 6” sizes:
    a. Remove Handle (#15)
    b. Remove Snap Ring (#14) and Stop Plate (#13)
    c. Remove Packing Nuts (#12), Belleville Washers (#11), Packing Bolts (#10) and Packing Plate (#9).
    d. Push Stem (#4) down into body cavity and remove from body bore.
    e. Remove Packing (#8) with packing hook- DO NOT DAMAGE PACKING BORE.

Reassembly:

A. Inspect Ball (#3) and Stem (#4) for any damage or wear- replace if required.
B. Apply lubricant to (1) new Seat (#5) and install in Body (#1)- press into seat recess.
C. Install new Thrust washer (#6) on Stem (#4) and insert through body bore and up through stem bore- seat thrust washer against recess face.
D. Move stem to “closed” position so that internal stem “tang” is parallel to body length centerline and install Ball (#3).
E. Apply lubricant to second Seat (#5) and install into Insert (#2)- press into seat recess.
F. Install new Body Seal (#7) onto Insert (#2), and apply anti-seize compound to Insert threads and/or Body threads.
G. Hand-tighten Insert into Body using caution to protect Body Seal (#7) and to insure Seat (#5) stays in seat recess.
H. Install new Stem Packing (#8) using caution to prevent damage to packing rings. NOTE: for PTFE Packing, the “chevron” (^) points upwards toward handle, and upper & lower rings are “flat” on one side.
I. For ½” to 1” Sizes:
    a. Install Packing Nut (#9), torque to 20-25 In-Lbs.
    b. Install Handle (#12), Lock washer (#10) and Handle Nut (#11).
J. For 1-1/2” to 6” Sizes:
    a. Install Packing Plate (#9), Packing Bolts (#10), Belleville Washers (#11) and Packing Nuts (#12)- torque evenly to 30-40 In-Lbs.
    b. Install Stop Plate (#13), Snap Ring (#14) and Handle (#15).
K. Place valve assembly on table or bench with Insert (#2) facing up and opposite body flange engaged with studs or bolts- protect flange surfaces.

L. Using a torque wrench capable of producing the required final torques listed below, torque Insert (#2) into Body (#1) using “male” hexagon drivers noted in VI. Section E.

ASSEMBLY TORQUES

Valve Size	Assembly Torque (Ft-Lbs)
½”	140
¾”	150
1”	150
1-1/2”	500
2”	800
3”	1200
4”	1800
6”	3000

M. Retest valve assembly per API 598 or ASME B16.34.
N. Re-install per Section II.

ASSURED AUTOMATION

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4200 Series Standard Port

Class 150 & 300 ANSI Two-Piece Ball Valve

USER'S MANUAL

Installation & Maintenance

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Valve & Actuator Engineering Specification

Number: IOM- 12

Date: 7/24/2004

Title: Split Body Flanged-End Ball Valve IOM for: 4200

I. Initial Inspection

A. Remove valve from packaging; remove flange protectors and discard, if so equipped.
B. Inspect flange faces for any damage caused in shipment or handling.
C. Confirm Valve Size and Class is correct for installation.

II. Installation

A. Confirm flanges installed on adjacent piping are correct pressure class and match valve flange pattern.
B. Confirm “lay-length” between piping flanges matches valve “lay-length”.
C. Slide valve between piping flanges, then insert first spiral-wound flange gasket between one valve flange and piping flange.
D. Insert flange bolts and hand-tighten flange nuts on first side.
E. Insert second spiral-wound flange gasket between opposite valve flange and piping flange.
F. Insert flange bolts, and hand-tighten flange nuts on second side.
G. With a torque wrench having capacity to apply torque as recommended by flange gasket manufacturer, start to torque first side flange bolts to 25% of recommended final torque, using an alternating “across flange” torqueing sequence to insure correct gasket compression.
H. Using same “across-flange” torqueing sequence, increase torque to 50% of recommended flange bolt final torque.
I. Using same “across-flange” torqueing sequence, increase torque to 75% of recommended flange bolt final torque.
J. Using same “across-flange” torqueing sequence, increase torque to recommended flange bolt final torque.
K. Perform steps “G” through “J” on opposite flange connection.

III. 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!

IV. 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. Evenly tighten the two "Packing Nuts", Part #16, to 30-40 In-Lbs.

V. 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.

VI. Repair & Reconditioning- F2 Series Split Body Flanged-End Ball Valves

NOTE: Refer to Assembly Drawings and Parts Lists as shown in Quadrant Folder F2-CS/F2-SS- this can be downloaded at www.QUADRANTVALVE.com or see Quadrant Engineering Binder under "Flanged-End Ball valves".

A. Depressurize line, drain fluid.
B. Remove flange bolting, slide valve from between piping flanges, discard spiral-wound flange gaskets.
C. Place valve assembly on a secure table surface with Part #2 "Adaptor" facing up, and opposite body flange contacting table surface. Table or bench must be equipped with "studs" or bolts to engage body flange holes, and must have a protective surface to prevent damage to body flange face.
D. Note: Significant torques are required to be applied to "Body Nuts" (#13) to disassemble & reassemble valve- secure table or bench to floor or wall.
E. Using "six-point" sockets, loosen "Body Nuts" (#13) and remove.
F. Carefully lift "Adaptor" (#2) upward away from "Body" (#1).
G. Move handle to "closed" position, and remove "Ball" (#4) and "Seat" (#3) from body cavity. Handle ball carefully to prevent damage.
H. Remove second "Seat" (#3) from Adaptor (#2)
I. For 1" to 10" sizes:
    a. Remove Handle (#20)
    b. Remove Snap Ring (#19) and Stop Plate (#18)

c. Remove Packing Nuts (#16), Belleville Washers (#17), Packing Bolts (#15) and Gland Flange (#14).
d. Remove Gland (#11)
e. Push Stem (#5) down into body cavity and remove from body bore.
f. Remove Packing (#8) and Packing Washer (#9) with packing hook- DO NOT DAMAGE PACKING BORE.
g. Remove Stem Bushing (#10) from Gland (#11).
h. Discard: Seats (#3), Packing (#8), Packing Washer (#9), Thrust Washer (#7), and Body Seal (#6). New parts are included in repair kit.

Reassembly:

A. Inspect Ball (#4) and Stem (#5) for any damage or wear- replace if required.
B. Apply lubricant to (1) new Seat (#3) and install in Body (#1)- press into seat recess.
C. Install new Thrust washer (#7) on Stem (#5) and insert through body bore and up through stem bore- seat thrust washer against recess face.
D. Move stem to "closed" position so that internal stem "tang" is parallel to body length centerline and install Ball (#4).
E. Apply lubricant to second Seat (#3) and install into Adaptor (#2)- press into seat recess.
F. Install new Body Seal (#6) onto Body counterbore, and apply anti-seize compound to Stud Bolts (#12).
G. Lift "Adaptor" (#2) and align flange bolting with opposite body flange, while aligning cast stiffening ribs on "Adaptor" to be located aligned with stem and body base. Use caution to protect Body Seal (#6) and to insure Seat (#3) stays in seat recess.
H. Hand-tighten Body Nuts (#13) to Studs (#12).
I. Install new Stem Packing (#8) using caution to prevent damage to packing rings. NOTE: for PTFE Packing, the "chevron" (^) points upwards toward handle, and upper & lower rings are "flat" on one side.
J. Install new Packing Washer (#9) using caution to prevent damage.
K. Install new Stem Bushing (#10) into recess in Gland (#11).
L. For 1" to 10" Sizes:
    a. Install Gland Flange (#14), Packing Bolts (#15), Belleville Washers (#17) and Packing Nuts (#16)- torque evenly to 30-40 In-Lbs.
    b. Install Stop Plate (#18), Snap Ring (#19) and Handle (#20).
M. Place valve assembly on table or bench with Adaptor (#2) facing up and opposite body flange engaged with studs or bolts- protect flange surfaces.
N. Using a torque wrench capable of producing the required final torques listed below, torque Body Nuts (#13) to Studs (#12) as follows:
    a. Using an alternating "across-flange" torque sequence, torque Body Nuts to 25% of final recommended torque.
    b. Using same procedure, torque to 50% of final torque.
    c. Using same procedure, torque to 75% of final torque.
    d. Using same procedure, torque to final torque.

BODY NUT ASSEMBLY TORQUES

	Assembly Torque (Ft-Lbs)	Assembly Torque (Ft-Lbs)	Assembly Torque (Ft-Lbs)
Valve Size	Class 150	Class 300	Class 600
1”	5/16”-18 UNC: 101	3/8”-16 UNC: 180	3/8”-16 UNC: 180
1-1/2”	3/8”-16 UNC: 180	7/16”-14 UNC: 288	½”-13 UNC: 439
2”	7/16”-14 UNC: 288	3/8”-16 UNC: 180	½”-13 UNC: 439
2-1/2”	7/16”-14 UNC: 288	n/a	n/a
3”	7/16”-14 UNC: 288	9/16”-12 UNC: 636	¾”-10 UNC: 1548
4”	½”-13 UNC: 439	¾”-10 UNC: 1548	7/8”-9 UNC: 2200
6”	5/8”-11 UNC: 876	7/8”-9 UNC: 2200	n/a
8”	¾”-10 UNC: 1548	1”-8 UNC: 3600	n/a
10”	7/8”-9 UNC: 2200	n/a	n/a

O. Retest valve assembly per API 598 or ASME B16.34.
P. Re-install per Section II.