



INSTRUCTION MANUAL

Anchor Darling 800 Globe Valves

Sizes 1/2" through 2"

FCD ADENIM0008-00

*Installation
Operation
Maintenance*





Revision Record

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1.0 Physical Description And Operation Of Equipment

1.1 Globe Valves

These valves are primarily designed for tight-shutoff and throttling service where control of the velocity of the fluid is necessary. If required, they can also serve as a means of isolating a portion of a system. Their use however, is limited to those systems where head losses are not critical as the internal flow passage creates a pressure drop across the valve. With the disc in the full open or any intermediate position, the fluid is allowed to flow through seat area at a rate determined by the position of the disc. With the disc in the closed position, the force of the stem provides a mechanical seal between the disc and seat and effects a shutoff at the valve.

The Series 800 globe valve is a precision cast body and yoke assembly. It is an investment casting and offers smooth flow passages for minimum pressure drop and minimum turbulence.

Series 800 globe valves are provided with a quick-open style disc to provide throttling flow characteristics.

Series 800 globe valves are supplied with handwheel actuators. To operate these manual valves, turn the handwheel in a clockwise direction for closure and counter clockwise for opening.

2.0 Design Conditions

Refer to the applicable drawings in Section 11 of this manual.

3.0 Operating Conditions

Refer to the applicable drawings in Section 11 of this manual.

4.0 Test Conditions

4.1 Each valve covered by this manual has received the following hydrostatic tests:

4.1.1 Shell hydrostatic test at 1.5 times the 100°F pressure rating.

4.1.2 A disc closure test at 110% of the 100°F pressure rating.

4.0 **Test Conditions** (Continued)

- 4.1.3 A seat leakage test at 110% of the valves specified maximum "delta P".
- 4.1.4 A backseat leakage test at 110% of the 100°F pressure rating.
- 4.1.5 A packing test at 110% of the 100°F pressure rating.

5.0 **Operating Precautions And Limitations**

- 5.1 Maximum hydrostatic test pressure shall not exceed the values imposed by the ASME Code, Section III.

6.0 **Installation Instructions**

6.1 Lifting and Handling Requirements and Limitations

- 6.1.1 Good judgment should be exercised in selecting a lifting device that will safely support the unit's weight.

6.2 Installation

- 6.2.1 Although the valves have been shipped in a clean condition, prior to installing the valves, examine the lines and the valve ports for foreign matter and clean them thoroughly if they have been exposed to the elements. (BEFORE CLEANING IN THIS FASHION, CHECK AT THE SITE TO SEE IF A SPECIFIC CLEANING PROCEDURE SHOULD BE FOLLOWED.) Open the valves fully and flush them out with water if possible; otherwise blow them out with air or steam.

In performing this cleaning procedure, the ports should be vertical, the stem horizontal to assure complete removal of all matter which might have accumulated during storage.

- 6.2.2 Ensure that there is no line sag at the point of installation. Eliminate any pipeline deviation by the proper use of pipeline hangers or similar device.
- 6.2.3 Where possible, install the valves with the stem vertical.

6.0 **Installation Instructions** (Continued)

6.2 Installation (Continued)

6.2.4 The valves should then be blocked or slung into position with apparatus that is sufficient to hold the valve assembly weight while the valve is being welded into the line. It is NOT necessary to disassemble the valve prior to welding in the line; however, WELDING SHOULD TAKE PLACE WITH THE DISC IN THE OPEN POSITION. Care should be taken during welding to ensure that foreign material or dirt does not enter the valve and cause interference with subsequent operation. For valves with resilient seats - caution should be exercised so that the resilient seat material is not subjected to temperatures greater than 400 °F.

6.2.5 Valves are normally shipped pre-packed; if specified otherwise, the packing is shipped loose with the valve, and should be installed at this time.

Install the packing, carefully placing the joint of each ring approximately 180° from the preceding piece. It will probably be necessary to slightly flatten each packing ring prior to installation to allow easy insertion within the stuffing box. The flange gland can be used to seat the packing in position, one ring at a time. Upon completely filling the stuffing box, replace the gland stud nuts and very carefully draw the packing down. Stroke the valve several times and then retighten the nuts.

Special attention should be observed to assure the flange is drawn evenly and that the bore of the flange is concentric with the valve stem. If the flange is drawn unevenly, scoring of the stem may result.

6.3 Pre-operational Checks

6.3.1 After installation the operation of manual valves should be verified by closing the valve. The valve should seat tightly with less than 40 lbs. of push/pull force on the handwheel. If the valve does not close tightly do not apply extra leverage; instead refer to Para. 9.4 A and B.

6.4 Operation

6.4.1 After the valves are heated and run in, it may be necessary to draw the packing to eliminate leakage. In adjusting the packing, the flange gland should be drawn in as evenly as possible. This can be accomplished by alternately tightening the gland stud nuts one-half turn until the packing is tight.

7.0 Maintenance Requirements

7.1 Preventative Maintenance

- 7.1.1 Check all nuts and bolts periodically to ensure tightness and to forestall possible leaks.
- 7.1.2 Keep the valve stem clean and properly lubricated.
- 7.1.3 Check condition of the packing and replace as necessary.

7.2 Recommended Spare Parts

7.2.1 Recommended spare parts are packing rings (110,112), disc (004), stem (024), gland studs (205) and gland stud nuts (234). The recommended quantity is 1 set of packing for every 2 valves of a particular type but not less than 1 set of each type. One complete set of the other parts is recommended for every 10 valves of a particular type.

7.2.2 For consolidating spare parts (See 7.2.1), use the following guidelines:

- 1/2" thru 3/4" Globe Valves

Recommended spare parts are interchangeable throughout this size range. Note that some valves may have discs and lower stems made of high temperature tolerant materials, make note of this prior to ordering spare parts.

- 1"

Recommended spare parts are only interchangeable with other 1" Globe Valves. Same material restrictions stated above apply.

- 1-1/2"

Recommended spare parts are only interchangeable with other 1-1/2" Globe Valves. Same material restrictions stated above apply.

- 2"

Recommended spare parts are only interchangeable with other 2" Globe Valves. Same material restrictions stated above apply.

7.0 *Maintenance Requirements* (Continued)

7.3 Lubrication

- 7.3.1 The Series 800 globe valve stem threads have been coated with Everlube^(R) to minimize friction. A light coating of lubricant should also be applied (i.e. Nuclear Grade Anti-Seize lubricant, Corning Molykote 111 and Molykote 505 paste are acceptable.) Before lubricating in this fashion, check at the site to see if a special lubrication procedure should be followed.

8.0 *Periodic In-service Testing Recommendations And Procedures*

- 8.1 It is recommended that the valve be operated from full open to full close at least once every six months.

9.0 *Maintenance Instructions*

9.1 Disassembly and Reassembly

The following instructions cover the disassembly and reassembly of Series 800 globe valves. Typical valve configuration is shown in Section 11.0.

WARNING

Prior to performing disassembly, close off the line pressure to the valve, and release all pressure in the valve.

Disassembly

After removal of the disc from the valve, care should be taken to protect the seating surface from damage. The disc should be placed in a clean area until it is ready for replacement. **THE SLIGHTEST NICK OR SCRATCH ON A SEATING SURFACE MAY PREVENT COMPLETE SHUTOFF AND NECESSITATE EXTENSIVE REWORK OR REPLACEMENT.**

- (1) Relieve pressure from valve.
- (2) Place the valve in the closed position and then open the handwheel (136) 1-2 revolutions.
- (3) Remove the handwheel nut (240) from the stem (024).
- (4) Remove the handwheel (136) from the stem.
- (5) Remove the yoke nuts (231), and then remove the corresponding yoke stud (201).

9.0 Maintenance Instructions (Continued)

Disassembly

- (6) Rotate the yoke (011) in a counterclockwise direction to remove it from the body (001). At the same time, the yoke bushing (016) will turn off of the stem (024). Lift the yoke and yoke bushing up over the stem.
- (7) Remove the gland stud nuts (234), allowing removal of the gland studs (205).
- (8) Lift the flange gland (133) upward and remove the packing (110, 112) from the stuffing box. Removal of the packing is best accomplished with a packing hook or similar device.
- (9) Loosen the gland retainer setscrews (220) until they do not make contact with the gasket retainer (033). Then turn the gland retainer (131) counterclockwise off the bonnet (002). Turn the gasket retainer (033) out of the body (001). If the bonnet (002) drops and turns with the gland retainer, grasp the stem (024) and lift to hold the bonnet, thus preventing it from rotating.
- (10) Remove the pressure seal gasket (030) by carefully lifting the bonnet (002). It is imperative that the bonnet be lifted over the stem as straight as possible to eliminate the possible scoring of the stem. If the bonnet is wedged into position, carefully lift up on the stem until the gasket and bonnet come free.
- (11) The stem (024) and disc assembly (004, 142, 245) can now be lifted from the valve body.

WARNING

Be careful when removing the assembly from the valve body. After removal from the valve, care should be taken to protect the seating surface of the disc from damage. The disc should be placed in a clean area until ready to replace in the valve. THE SLIGHTEST NICK OR SCRATCH ON A SEATING SURFACE MAY PREVENT COMPLETE SHUTOFF AND NECESSITATE EXTENSIVE REWORK OR REPLACEMENT

- (12) Remove the retaining ring (245) from the disc (004). Remove the stem retainer nut (142) from the disc (004) and then slide it up and over the stem (024). Place the disc (004) where it won't become damaged or scratched.
- (13) At this time, the disc and seat ring may be lapped if required. The seating surface should be inspected to determine if scratches or minor imperfections may be corrected by lapping and/or if replacement parts are necessary. (refer to Para. 9.3 for lapping instructions).

9.0 **Maintenance Instructions** (Continued)

Reassembly

REASSEMBLY OF THE VALVES is simply the reverse of the disassembly task; also, read the following special instructions.

First, all dirt, scale and foreign matter should be removed from inside the valve body and bonnet.

Before reassembling the valve, check the seating surfaces to determine that no scratches or minor imperfections are on the disc or seat ring. If any are evident - lap these surfaces until none are visible. (Reference Para. 9.3).

9.2 Replacement of Packing (Reference Section 11)

(Refer to Section 11 for referenced part designations.)

- (1) Remove the two gland nuts (234) and raise flange gland (133).
- (2) Lift the gland flange (133) upward and away from the stuffing box area.
- (3) Use a packing hook or similar device to remove the old packing.
- (4) Install the packing (110, 112) one ring at a time - carefully placing the joint of each ring approximately 180° from the preceding piece to prevent a leakage path. It might be necessary to slightly flatten each packing ring prior to installation to allow easy insertion within the stuffing box. Do not use a pointed instrument to push the rings into position. The flange gland (133) can be used for this purpose.
- (5) Upon completely filling the stuffing box, lubricate the bolt threads, replace the nuts and very carefully draw the packing to assure that the gland flange is even and that the bore of the gland flange is concentric with the valve stem. (If the flange gland (133) is drawn unevenly, scoring the stem may result; or the gland might be tilted which could cause binding.)
- (6) Operating conditions will determine how much to tighten gland bolt nuts. It should be noted that specific torque values for gland stud nuts (234) usually apply only to live-load spring packages. For live-loaded valves please consult the live-load spring package supplier, valve assembly or package assembly drawings.

After tightening the gland stud nuts, stroke the stem and retighten the nuts as required.

- (7) Check the packing periodically (6-month intervals), replacing it as needed.

9.0 **Maintenance Instructions** (Continued)

9.3 Refinishing Sealing Surfaces

Minor discontinuities in the seat sealing surface, which may cause leakage, can, in many cases, be removed by lapping. Major defects such as cracks or deep gouges will generally require replacement of the part.

Minor discontinuities on the valve disc sealing surface may be removed by re-machining the surface to remove a few thousandths of material. Major defects will generally require replacement of the disc.

(NOTE: Lapping is a polishing process where a sealing surface is ground with an abrasive held in place by a special fixture. The abrasive is commonly found in paste form or bonded to a paper backing. Detailed instructions on the use of lapping abrasives and fixtures, normally supplied with such equipment, should be adhered to.)

In order to maintain seat tightness in globe valves, the sealing surface angles on both the disc and seat ring must be kept within close tolerance ($30^{\circ} [+1/2^{\circ}]$ for the seat - $29^{\circ} [-1/2^{\circ}]$ for the disc) it is important when lapping to use fixtures that will maintain these angles. Flowserve does not recommend lapping the disc directly to the seat. A good seal is dependent on line contact. Direct contact lapping will result in excessive seat widths.

9.4 Troubleshooting

A. Excessive Handwheel (136) Effort or Binding

Excessive handwheel effort or binding would indicate that the stem threads (024) or yoke bushing (016) needs to be lubricated; or the flange gland (133) is too tight as a result of the gland nuts being tightened unevenly. Lubrication (Para. 7.3) should be checked at regular intervals of 6-months. To tighten the gland nuts evenly, they should be loosened and retightened in even increments while checking concentricity between the stem and gland bore.

B. Leakage Between the Disc (004) and Seat (013)

This could be an indication that there is foreign matter on the seating surfaces in which case the valve should be opened and closed ONE TIME in an attempt to dislodge any matter that may have inadvertently lodged there. DO NOT OPEN AND CLOSE THE VALVE MORE THAN ONCE AS THIS MAY TEND TO CAUSE PERMANENT DAMAGE TO THE SEATING SURFACES IF THE FOREIGN MATTER IS SECURELY LODGED IN PLACE. Instead, disassemble the valve and remove the source of the trouble. If no foreign matter is found, inspect the seating surfaces of the valve for signs of a scarred or damaged seat - in which case the seating surfaces of the disc (004) and seat ring (013) should be refinished until no visible defects remain. (Refer to Para. 9.3)

C. Leakage Around Stem (024) and thru the Stuffing Box

Worn packing (110, 112). Replace following the instructions set forth in Para. 9.2.

10.0 Storage Requirements

The valves have been shipped in the closed position. Upon receipt of the valves at destination, the crates should be examined thoroughly for signs of mishandling or damage during shipment. With the valves strapped to the shipping skids, all bolting should be checked to ensure that the joints are secure. Bolting on occasion, may become loosened during shipment and handling.

The valves should then be stored in a sheltered area to protect them from the elements, dirt and foreign material. They should not be exposed to the atmosphere, uncrated or removed from the shipping skids except in a clean area just prior to installation.

If the valves are not to be installed within a short period of time after receipt, and will require long-term storage, the following guideline should be adhered to:

- (a) In their storage condition, the valves should be wrapped in polyethylene to prevent accumulation of dust or foreign matter.
- (b) The shelf life for grafoil and graphite filament packing is indefinite.



SECTION 11.0

CUSTOMER CERTIFIED ASSEMBLY DRAWING(S)



SECTION 12.0

BOLTING TORQUE VALUES

Refer to the applicable Customer Certified Assembly Drawing(s)
for any specific torque requirements



BOLTING TORQUE VALUES
600-800 SERIES GLOBE VALVES

DESCRIPTION	PART NO.	VALVE SIZE	FASTNER SIZE	TORQUE (in.-lb.)
Yoke Stud / Nuts	201 / 231	1/2"	1/4"-20	48 - 60
	201 / 231	3/4"	1/4"-20	48 - 60
	201 / 231	1"	1/4"-20	48 - 60
	201 / 231	1 1/2"	3/8"-16	180 - 240
	201 / 231	2"	3/8"-16	180 - 240
Gland Studs	205	1/2"	1/4"-20	24 - 36
(Setscrews)	205	3/4"	1/4"-20	24 - 36
	205	1"	5/16"-18	60 - 78
	205	1 1/2"	3/8"-16	108 - 144
	205	2"	3/8"-16	108 - 144
Setscrews	220	1/2"	1/4"-20	24 - 36
(Gland Retainer)	220	3/4"	1/4"-20	24 - 36
	220	1"	5/16"-18	60 - 78
	220	1 1/2"	3/8 - 16	108 - 144
	220	2"	3/8"-16	108 - 144
Gland Stud Nuts	234	1/2"	1/4"-20	18 - 23
	234	3/4"	1/4"-20	18 - 23
	234	1"	5/16"-18	26 - 31
	234	1 1/2"	3/8"-16	70 - 82
	234	2"	3/8"-16	70 - 82



United States
Flowserve Corporation
Flow Control Division
1900 S. Saunders Street
Raleigh, NC 27603
Phone: (919) 832-0525
Fax: (919) 831-3369

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To find your local Flowserve representative:

For more information about Flowserve Corporation, visit
www.flowserve.com or call USA 1 800 225 6989

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