

Installation, Operation and Maintenance Manual



DEMCO[®]
Resilient Seated
Butterfly
Valve

DEMCO
P R O D U C T S

Publication TC1512 Published May 2000

DEMCO® is a trademark of Cooper Cameron Corporation
©Cooper Cameron Corporation, Cooper Cameron Valves Division, 2000.
All rights reserved.

Table of Contents

Bill of Materials	4
Scope	6
Nameplate Information	6
Storage	6
Installation	7
Disc to Pipe Clearance	8
Flange Bolts	8
Procedure	9
Operation	9
Trouble Shooting	10

Bill of Materials

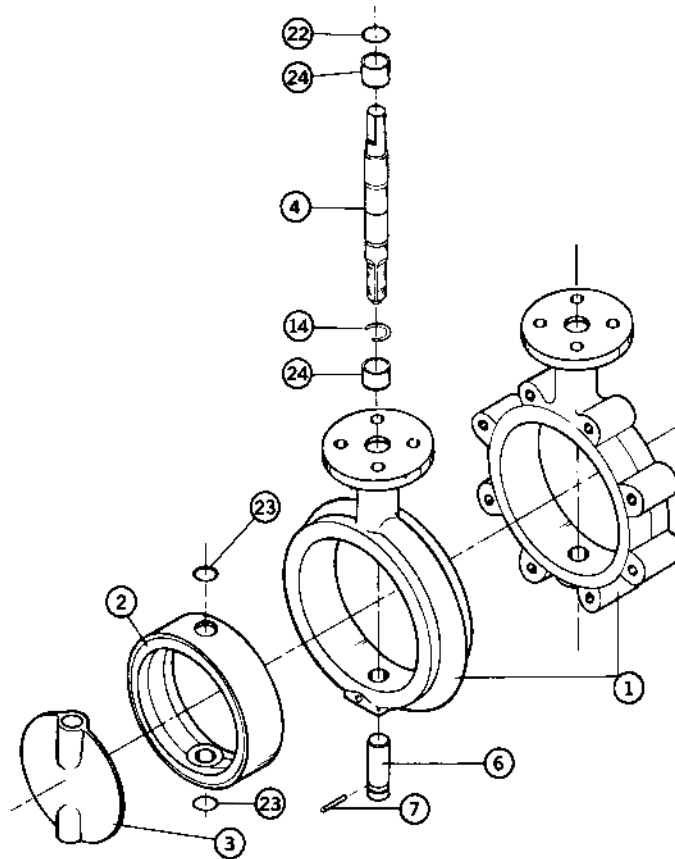


Figure 1 - Demco 2" thru 12" Resilient Seated Butterfly Valve

Demco 2" thru 12" Parts List

ITEM	REQ'D	DESCRIPTION
1.	1	Body
2.	1	Seat
3.	1	Disc
4.	1	Upper Stem
6.	1	Lower Stem
7.	2	Spring Pin
14.	1	Retainer
22.	1	Top O-Ring
23.	*	Stem O-Ring
24.	2	Bearing

* 4 Req'd for throttling valves only.

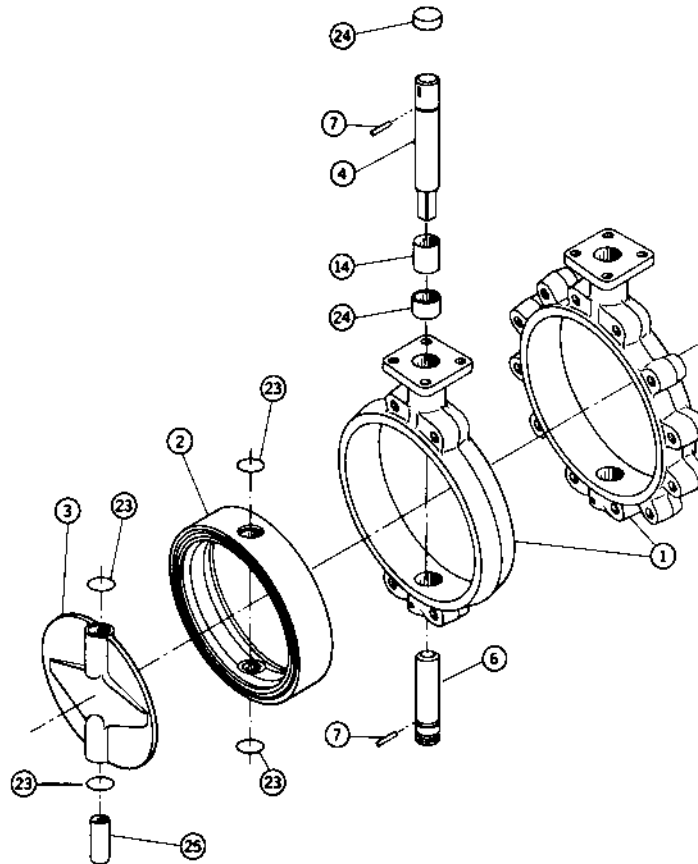


Figure 2 - Demco 14" thru 36" Resilient Seated Butterfly Valve

Demco 14" thru 36" Parts List

ITEM	REQ'D	DESCRIPTION
1.	1	Body
2.	1	Seat
3.	1	Disc
4.	1	Upper Stem
6.	1	Lower Stem
7.	2	Spring Pin
14.	1	Retainer**
23.	*	Stem O-Ring
24.	2	Upper bearing
25.	1	Lower bearing

* 4 Req'd for throttling valves only.

** 24" - 36" Spacer

Scope

Demco resilient seated butterfly valves are an economical alternative to ball, gate or plug valves in many applications. They are light weight quarter turn devices with few parts. They are designed for bubble tight sealing up to rated

pressure and are capable of throttling service. They are easily adapted to automatic actuators. The Demco butterfly valve is available in flangeless wafer design or single flange tapped lug configuration.

Nameplate Information

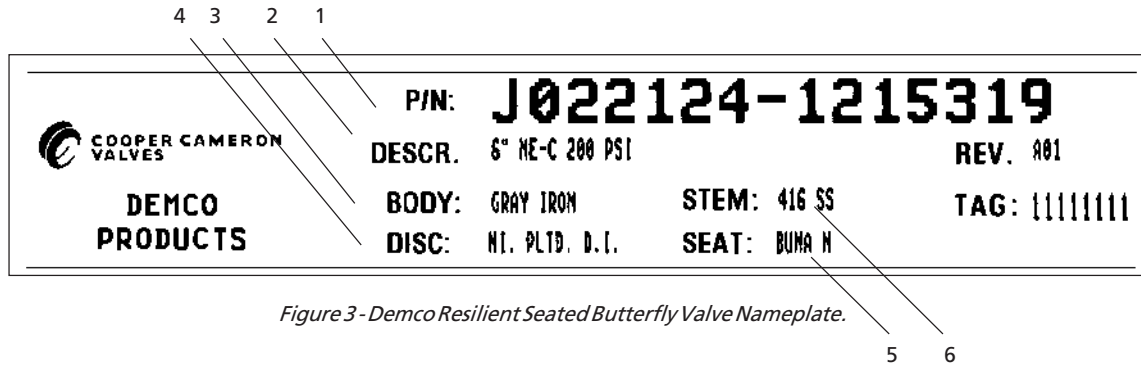


Figure 3 - Demco Resilient Seated Butterfly Valve Nameplate.

ITEM	STAMP
1	Product ID Number
2	Product Description
3	Body Material
4	Disc Material
5	Seat Material
6	Stem Material

Storage

Demco butterfly valves are shipped in the partial open position to minimize permanent deformation of the resilient seat. The disc edge is contained within the flange faces of the valve to prevent damage to the sealing area (Figure 4).

Caution: Valves with fail open or closed actuators are shipped with the disc in the fail position, and extra care should be given to prevent damage to the disc edges.

Valves should be stored in a clean dry area away from extremes of heat. The resilient seat surfaces should be protected from sunlight and physical abuse.

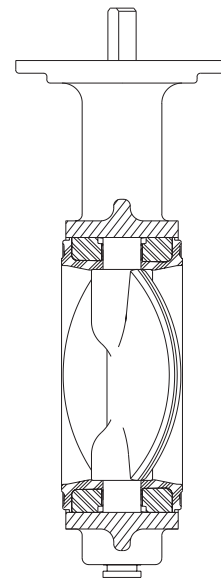


Figure 4

Installation

Direction -

Demco butterfly valves are bi-directional and will operate in any position. Normally the valve is installed with the upper stem pointing upward (Figure 5). Elevated valves with gear operators and chainwheels should be installed with the upper stem pointing down (Figure 6) so the open-closed indicator is visible from the ground and the chain does not drag on the pipe.

End-of-Line Service -

Demco tapped lug butterfly valves are suitable for liquid service end-of-line applications with downstream piping removed (Figure 7). Only weld neck or socket weld flanges can be used for this service. Since the upstream pressure is excluded between the flange and the seat face by the exclusive Demco flange seal, there is no effective force to slide the seat downstream.

Caution: The valve must not be opened or closed with the downstream piping removed as the seat might be shifted breaking the flange seal and allowing pressure to slide the seat downstream.

Gaskets -

Flange gaskets are not required nor recommended for use with **positive shut-off** Demco butterfly valves. An integral flange seal is molded into the edge of the rubber seat eliminating the need for flange gaskets.

Throttling Valves, only, utilize an o-ring stem seal that must be assisted with flange gaskets for a proper seal.

Flanges -

Steel Class 150 ANSI (or MSS SP-44) weld neck, slip-on, threaded and socket weld as well as "stub end" type C flanges are suitable for use with 2" thru 24" Demco butterfly valves. 30" and 36" Demco butterfly valves fit between ANSI 125 flanges (or MSS SP-44).

Other flange types may be applicable also, but should be thoroughly checked to assure proper seal makeup. Plastic flanges are subject to damage at installation by over-tightening the bolting and may deflect or "cup" resulting in flange leaks.

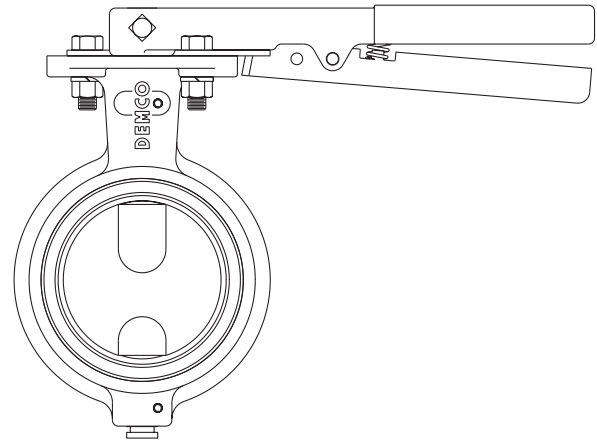


Figure 5

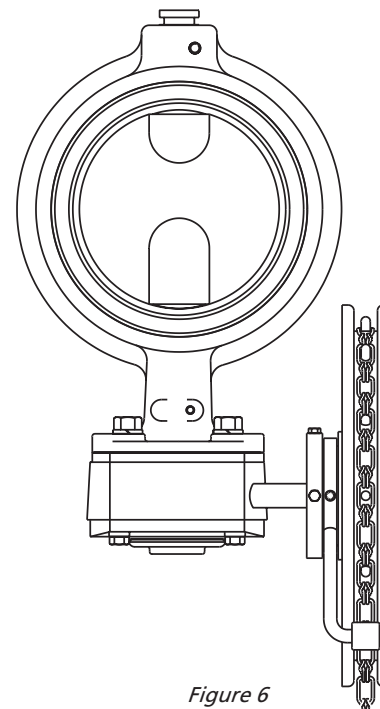


Figure 6

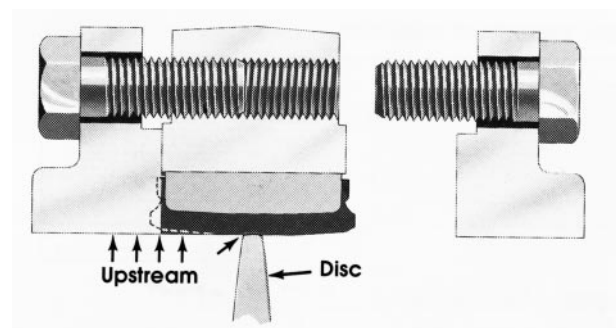


Figure 7

Disc to Pipe Clearance -

Before beginning installation, disc/pipe clearance should be checked to avoid the possibility of scraping the disc edge on the pipe ID and damaging the sealing surface. Minimum pipe ID requirements are given in Table 1.

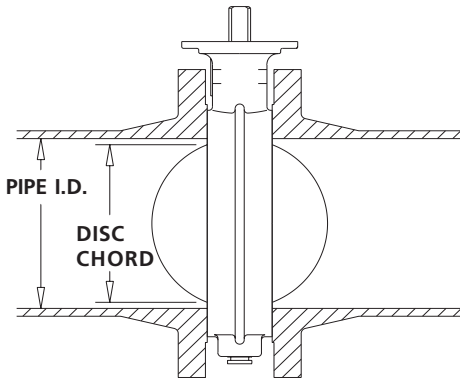


Figure 8

Valve Size	Disc Swing Clearance	Opens into:		
		Std Pipe	Sch 40	Sch 80
2"	1.467"	x	x	x
2-1/2"	2.144"	x	x	x
3"	2.743"	x	x	x
4"	3.601"	x	x	x
5"	4.582"	x	x	x
6"	5.624"	x	x	x
8"	7.428"	x	x	x
10"	9.382"	x	x	x
12"	11.35"	x	x	x
14"	12.86"	x	x	
16"	14.72"	x	x	
18"	16.61"	x	x	
20"	18.53"	x	x	
24"	22.57"	x	x	
30"	28.67"	x		
36"	34.70"	x		

Table 1 - Disc Clearance

Flange Bolts -

Recommended bolt and stud lengths for installation in ANSI flanges are provided in Table 2. MSS flanges require longer bolts.

Valve Size	Bolt Size	Wafer Body			Lug Body	
		Qty	Stud Length "A"(in.)	Screw Length "B"(in.)	Qty.	Screw Length "B"(in.)
2"	5/8"-11	4	5"	-	8	1-1/2"
2-1/2"	5/8"-11	4	5-1/2"	-	8	1-1/2"
3"	5/8"-11	4	5-1/2"	-	8	1-1/2"
4"	5/8"-11	8	5-3/4"	-	16	1-3/4"
5"	3/4"-10	8	6-1/2"	-	16	1-3/4"
6"	3/4"-10	8	6-1/2"	-	16	2"
8"	3/4"-10	8	7"	-	16	2-1/4"
10"	7/8"-9	12	7-1/2"	-	24	2-1/4"
12"	7/8"-9	12	8-1/4"	-	24	2-1/2"
14"	1"-8	12	8-1/4"	-	24	2-1/2"
16"	1"-8	16	10"	-	32	3-1/4"
18"	1-1/8"-7	16	10-1/2"	-	32	3-1/2"
20"	1-1/8"-7	20	11-3/4"	-	40	4"
24"	1-1/4"-7	20	12-1/2"	-	40	4"
30"	1-1/4"-7	24 (8)	13-1/2"	(4")	56	4"
36"	1-1/2"-6	28 (16)	16"	(4")	64	4"

Table 2 - Flange Bolt Size

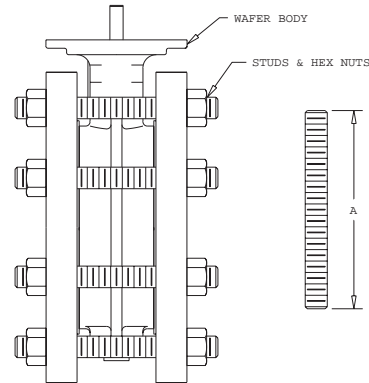


Figure 9

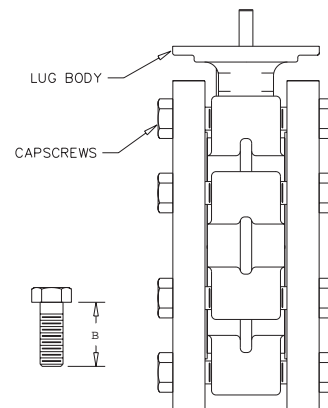


Figure 10

Procedure –

The following procedure applies to new installation between standard ANSI pipe flanges. When replacing a valve from an existing installation, clean flange faces and check for excessive corrosion or other damage to the sealing face of the flange.

1. Remove the valve from any packaging material. Close the valve disc so that it is contained within the flange faces. It is not necessary to fully close the valve; the disc must be contained within the confines of the valve body so it will slip between the mating flanges without contact with the flanges.
2. When installing wafer valves, install the lower flange bolts without tightening. Position the valve between the flanges, within the pocket formed by the flange bolts. (The OD of the wafer body is equal to the inside of the bolt circle of the flanges, so the valves are self-centering.) Install the remaining flange bolts.
3. Lug bodies have tapped holes coinciding with those in the flanges. They should be positioned between the flanges and the capscrews inserted through the flange holes into the threaded lug holes.
4. Tighten all bolts or capscrews in a crossover or star pattern to assure even sealing. Tighten sufficiently to assure metal-to-metal contact between the flange face and the metal butterfly valve body. No further tightening is required.
5. Carefully check disc clearance by placing the valve in the full open position. Any binding or scraping should be investigated and corrections made.

Operation

Demco butterfly valves should never be operated without a handle or other means of controlling the disc.

Caution: Failure to restrain the disc under flow conditions can result in the disc slamming closed and possible damaged or broken parts.

2" thru 12" Demco butterfly valves have flats on the upper stem. 14" and larger valves have a single square key. Stem flats or the square key indicate valve position. When they are in line with the flow stream, the valve is open. When perpendicular, the valve is closed.

Manually operated –

Demco butterfly valves operate from fully open to fully closed by a 90° turn of the handle. The handle is marked with a flow arrow. When this arrow is in line with the pipe axis, the valve is

open (Figure 11). When perpendicular to the pipe, the valve is closed (Figure 12).

Worm gear operated –

Worm gear operators are recommended for valves larger than 6 inches. Clockwise rotation of the handwheel closes the butterfly valve. Counter-clockwise rotation opens the valve. Gear operators are always mounted with the input shaft perpendicular to the pipe axis for handwheel clearance. Each operator has an arrow on the top of the gear, which indicates the "OPEN – CLOSED" position of the valve (Figure 13).

Automated valves –

Butterfly valves with their quarter turn operation are easily adapted to automatic actuators for remote operation. To prevent water hammer, actuators should close the valve slower than 6 to 8 seconds, open-to-close. Rapid closure causes water hammer which can break or otherwise damage valve parts.

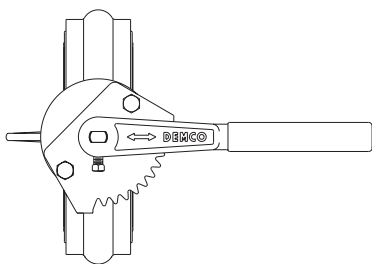


Figure 11 - Valve shown open

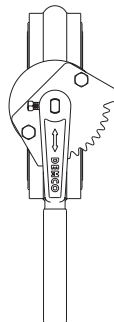


Figure 12 - Valve shown closed

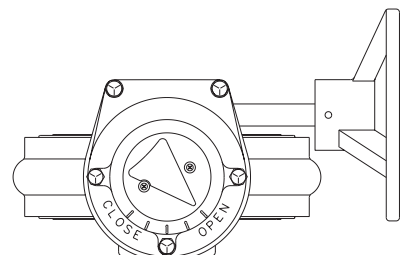


Figure 13 - Valve with gear operator

Troubleshooting

Trouble	Probable Cause	Remedy
The valve will not seal properly.	The seat and/or disc is worn or damaged.	Replace worn parts.*
	Foreign matter is present between seat and disc.	Operate several times to wipe clean.
	Operator stops are not set properly.	Adjust stops to proper setting.
The valve is hard to operate.	Build up of solids or roughness is on edge of disc.	Operate several times to wipe clean or disassemble valve and clean disc edge.*
	Operator is not installed properly.	Reinstall operator in proper alignment with valve stem.
The valve will not open.	Disc hits on side of pipe.	Check for proper pipe clearance.
The valve is leaking around stem.	Seat is damaged or worn.	Replace Seat.*
	Disc is bent.	Replace disc, stems and seat as required.*
	Flange seal is leaking.	Correct flange seal leak to prevent fluid from migrating behind seat and out stem.
The valve closes with line flow.	Handle or actuator does not provide proper restraint.	Restrain disc with handle or actuator.
	Line flow too great.	Choose larger valve or slow down flow.
Flange leaks.	Flange seal surface on seat is damaged.	Replace seat.*
	Flange surfaces are damaged or corroded.	Clean, repair or replace flanges.
	Flange bore is too large.	Replace with proper flanges.
Clockwise rotation of Gear Operator handwheel opens valve. Open-Shut indicators do not coincide with valve disc position.	Gear operator has been rotated 90° on valve top. Hand-wheel shaft aligns with pipe (should be perpendicular).	Rotate gear operator 90° on valve top to put input shaft perpendicular with pipe axis.
Automatic actuator slams valve shut or open.	Speed control valves missing or not adjusted.	Install and/or adjust speed control valves.
Hard, soft or cracked seat damage is present.	Heat or chemical damage to seat.	Replace elastomer seat with compatible material and/or correct offending fluid conditions.

*Contact your CCV representative for repair manual

NOTES



COOPER CAMERON VALVES

Headquarters

Cooper Cameron Valves
16500 South Main Street, Missouri City, TX 77489-1300
Phone: 281-499-8511, 800-323-9160, Fax: 281-499-6965

Manufacturing

Cooper Cameron Valves
Demco Products
P.O. Box 94700
Oklahoma City, OK 73143
Phone: 405-631-1321, Fax: 405-631-0420

<http://www.ccvalve.com>