O&M Manual

Flo-Flex® Swing Check Valve Model 745

Operation, Maintenance and Installation Manual

FAILURE TO FOLLOW THESE INSTRUCTION WILL VOID ANY WARRANTY

Note: Keep this O&M Manual in a safe place for future reference for service and parts.

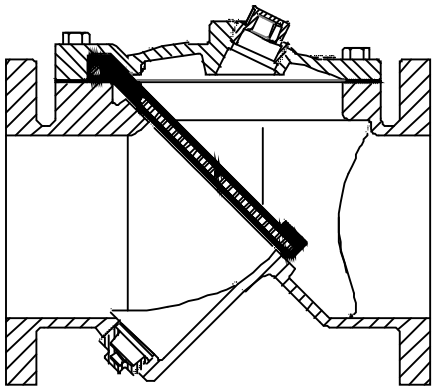
Model: _____ Size: _____ Type: _____

Working Pressure: _____ Installation Date: _____

Flomatic Corp, 15 Pruyn's Island, Glens Falls, New York 12801
Phone: 518-761-9797 Fax: 518-761-9798 www.flomatic.com

745PI-BF-LS-ASC Rev. C
October 12, 2018

Flo-Flex® Swing Check Valve
Model 745



Operation, Maintenance and Installation Manual

List of Contents: **Page:**

Flomatic Corp, 15 Pruyn’s Island, Glens Falls, New York 12801
Phone: 518-761-9797 Fax: 518-761-9798 www.flomatic.com

FLOMATIC'S® FLO-FLEX®

Swing Check Valve
Operation, Maintenance and Installation Manual

INTRODUCTION

The Flomatic® Flo-Flex® Model 745 Swing Check Valve has been designed to give years of trouble-free operation during normal operation. This O&M owners' manual will provide you with the information you need to properly install and maintain the valve and to ensure a long service life. The Flo-Flex® check valve is opened automatically by the fluid flow in one direction and closes automatically to prevent back-flow in the reverse direction (see flow arrow cast into the valve body for flow direction). The Flo-Flex® Model 745 swing check is design to meet the flange to flange laying length according to AWWA C508. The valve angled valve seat and fully encapsulated, resilient disc, is capable of handling a wide range of fluids including flows containing suspended solids.

Standard Max Working Pressure:
2" thru 24" 250 psi
Standard Max Temperature:
140°F (60°C)

Flomatic® can provide an optional manual back-flush device that can be installed on the bottom of the valve to allow manual backflow through the valve in the reverse direction (Option Model 745 "BF"). Optional Position Indicators (Option Model 745 "PI") PI and Limit Switches (Option Model 745 "LS") may also be mounted on the valve access cover to provide position indication.

The Valve Size, Flow Direction, Maximum Working Pressure are cast on to the side of the valve body surface for reference. The "Maximum Working Pressure" is the non-shock pressure rating of the valve at "Max Temperature" of 140°F (60°C). The valve shall not be subjected to any higher pressure or temperature above the valve maximum standard rating.

RECEIVING AND STORAGE

Inspect valves upon receipt for damage in shipment. Unload valve carefully to the ground without dropping. Do not allow lifting slings or chains to come in contact with the seat or flange sealing surface area; use eyebolts or rods through the flange holes on large valves. Valves should remain crated, clean and dry until installed to prevent weather related damage. For long term storage greater than six months, the rubber surfaces of the disc should be coated with a thin film of FDA approved grease such as "Super Lube". Do not expose disc to sunlight or ozone for any extended period as elastomer will get damaged and degraded.

DESCRIPTION OF VALVE OPERATION

The valve is designed to prevent reverse flow automatically. During system flow conditions, the movement of the fluid forces the disc to the open position allowing 100% flow area through the valve. The valves rubber coated steel disc automatically returns to the closed position to prevent reverse flow. Several optional features are a Backflush device, (Model 745 BF), Position Indicator (Model 745PI), Limit Switch (Model 745LS). These valve product options are described in more details below.

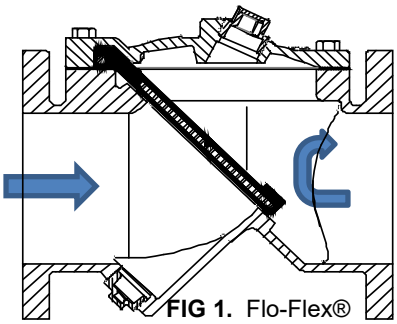


FIG 1. Flo-Flex® Swing Check Valve

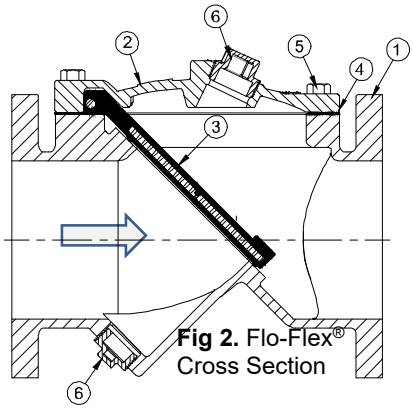


Fig 2. Flo-Flex® Cross Section

VALVE CONSTRUCTION

The Flomatic® Flo-Flex® Swing Check Valve is constructed of rugged Ductile Iron with a rubber encapsulated valve disc. The rubber coated valve disc is the only moving part assuring long life with minimal maintenance. The general details of construction are illustrated in Fig. 2. The body (1) is flanged for connection to the pipeline with an access cover (2). The disc (3) is retained by the cover.

Item #	Qty.	Description	Material	ASTM
1	1	Body	Ductile Iron	A536
2	1	Cover	Ductile Iron	A536
3	1	Disc*	Buna coated Steel	--------
4	1	Gasket	Buna	--------
5	A/R	Cover Bolt	Steel	SAE Grade 5
6	1	Plug	Malleable Iron	--------

*Optional EPRM or Viton Coated Steel

Flomatic Corp, 15 Pruyn's Island, Glens Falls, New York 12801
Phone: 518-761-9797 Fax: 518-761-9798 www.flomatic.com

INSTALLATION

Correct installation of the Flomatic® Flo-Flex® is important for proper operation. It may be installed in either horizontal or vertical flow-up applications. Horizontal installation, with the access port facing up is recommended for waste water application as it will prevent material in the fluid to collect on the valve disc. In all installations, the flow arrow cast in the valve and cover must be pointed in the direction of flow. Make sure there is at least 5 diameters of straight pipe upstream (inlet side).

Dimensions for 150# Class Valves				Max Torque	
Valve Size	Flange Outside Diameter	Number of Bolt Holes	Bolt Diameter	150#	300#
(inches)	(inches)		(inches)	(ft.-lbs.)	(ft.-lbs.)
2	6	4	5/8”	90	90
2-1/2	7	4	5/8”	90	150
3	7-1/2	4	5/8”	90	150
4	9	8	5/8”	90	150
6	11	8	3/4”	150	150
8	13-1/2	8	3/4”	150	240
10	16	12	7/8”	240	368
12	19	12	7/8”	240	533
14	21	12	1”	368	533
16	23-1/2	16	1”	368	750
18	25	16	1-1/8”	533	750
20	27-1/2	20	1-1/8”	533	750
24	32	20	1-1/4”	750	1200

Table 1 Bolt Torque Chart

Flanged valves should only be mated with flat-faced pipe flanges equipped with full-face resilient gaskets. The valve and adjacent piping must be supported and aligned to prevent cantilevered stress on the valve. Once the flange bolts or studs are lubricated and inserted around the flange, tighten them uniformly hand tight. The tightening of the bolts should then be done in graduated steps using the **crossover tightening** method. Recommended lubricated torque values for use with resilient gaskets (75 durometer) are given in Table 1. If leakage occurs, allow gaskets to absorb fluid and check torque and leakage after 24 hours. Do not exceed bolt rating or the flange gasket can get damaged and extrude.

TROUBLESHOOTING

Below are some potential problems with solutions to assist you in troubleshooting the valve assembly in a safe manner.

	Problem	Solution
1	Valve disc leaks-back when closed	Inspect valve seat area for foreign material. Also, inspect disc for damage and replace. Inspect metal seating surface and clean if necessary
2	Leakage at bottom Back-flush device	Remove line pressure and exercise Back-flush device. If leak persists, replace seals in Back-flush device; see the Back-flush device “Seal Replacement Procedure” on page 4.
3	Leakage at Cover or Flanges	Tighten bolts, replace cover seal.
4	Valve does not fully open:	Check for obstruction in valve seat area and/or pipeline; see Disassembly procedure on page 4. Operating pressure may be less than cracking pressure. If less than 0.5 psig, review application with factory.

Also, visit Flomatic® web page www.flomatic.com for technical product references and parts lists or call customer service 1-800-833-2040.

MAINTENANCE

The Flomatic® Flo-Flex® Swing Check Valve requires no scheduled lubrication or maintenance. For service or inspection, the valves internal parts can be accessed and serviced without removal from the line.

WARNING: The line must be drained and de-pressurized before removing the cover or the bottom plug if not this may cause bodily harm.

VALVE INSPECTION: DISASSEMBLY & RE-ASSEMBLY

The valves internal parts can be disassembled and serviced without removing it from the pipeline. All service and repair work performed on the valve shall be performed by a skilled mechanic with proper tools and a power hoist for larger valves. It is recommended that when disassemble the valve to inspect the rubber valve disc for wear or the valve seat for deposits.

DISASSEMBLY	RE-ASSEMBLY
1. Relieve pressure and drain the pipeline. Refer to Figure 2 on page 2. Remove the cover bolts (5) on the top cover. 2. Pry cover (2) loose and lift off valve body. 12” and larger valves have tapped holes in cover for lifting eyes. 3. Remove disc (3) and inspect for cracks, tears or damage in rubber sealing surface. 4. Clean and inspect parts. Replace worn parts as necessary and lubricate parts with FDA/NSF grease such as “Super Lube”.	All parts must be cleaned. Gasket surfaces should be cleaned with a stiff wire brush in the direction of the serrations or machine marks. Worn parts, gaskets and seals should be replaced during reassembly. 1. Lay disc (3) over seat with beaded seating surface directed down. 2. Lay cover gasket (4) and cover (2) over bolt holes and disc hinge. 3. Insert lubricated bolts (5) noting that the bolts in the hinge area are longer than the other cover bolts. 4. Cover bolts should be tightened to the specifications shown in **Table 2** (next page) during re-assembly.

Note: The Valve Cover bolts should be tightened to the specifications shown in **Table 2** below during re-assembly.

Valve Cover Bolt Max Torque		
Valve Size (inches)	Bolt Diameter (inches)	Torque (ft.-lbs.)
2	½"	75
2-1/2	½"	75
3	½"	75
4	½"	75
6	½"	75
8	½"	75
10	⅝"	100
12	⅝"	150
14	⅝"	150
16	¾"	250
18	¾"	250
20	¾"	250
24	1"	500

Table 2

WARNING: **Do not use threaded holes in cover for lifting the valve. Serious injury may result.**

BACKFLUSH DEVICE (Model 745 BF) FIELD INSTALLATION AND MAINTENANCE (OPTIONAL)

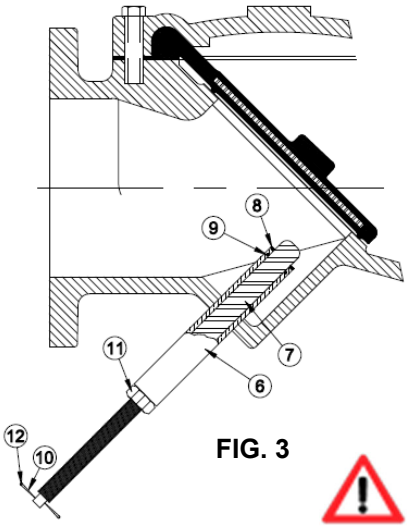


FIG. 3

BACKFLUSH DEVICE OPERATION:
The optional **backflush device** assembly (see Fig. 3) is normally factory installed but is also available for field installation. The **backflush device** assembly works like a screw jack but is not designed to operate during the valve's Maximum Working Pressure rating. This could damage the rubber coated valve disc. Therefore, prior to using the **backflush device** close the pump isolation valve and bleed off any high line pressure. To operate, turn the **backflush device** handle clockwise to move valve disc to and "open" position. This will allow backflow through the valve. The **backflush device** handle should turn easily. When resistance is felt, the disc has reached its "stop" and is in the full "open" valve disc position. Upon completion of the back flushing operation, turn the handle counter-clockwise and the valve disc will automatically return to the "closed" position. It is important to lock the **backflush device** handle in the valve disc "closed" position with the jam nut provided. The system is again ready for normal operation.

WARNING: If the **backflush device** stem is not fully turn back to a valve disc "closed" position the back-flush device shaft/stem could damage the valve disc and prevent the valve from sealing when put into operation.

Item #	Qty.	Description	Material
6	1	Bushing	Brass
7	1	Shaft	Stainless Steel
8	1	Shaft Wiper*	Molythane
9	1	O-Ring*	Buna
10	1	Handle	Stainless Steel
11	1	Jam Nut	Brass
12	2	Handle Cap	Vinyl

*Recommended Spare Parts

BACKFLUSH FIELD INSTALLATION:

When the **backflush device** is supplied separately and as an optional assembly from the factory install as follow:
1. Relief the pipe line pressure and drain the pipeline.
2. Carefully, remove the pipe plug (located on the bottom boss of the valve) to insure that there is no pressure in the line.
3. Inspect the back-flush device and place in the non-extended position. (The stainless steel shaft should extend a maximum 1" past the end of the brass bushing.) Apply Teflon thread sealant to brass threads.
4. Insert the threaded end of the assembly into the valve boss. Slowly turn the assembly into the boss taking care not to cross-thread the bushing. Continue turning the assembly into the valve for a tight fit.

BACKFLUSH DEVICE (Model 745BF) SEAL REPLACEMENT:

There are two parts (8 & 9) on the backflow actuator that are subject to normal wear. To replace the seals, the pipeline must first be depressurized and drained. Next, remove the backflow assembly from the valve by turning the brass bushing (6) counter-clockwise. Disassemble the actuator as follows:
1. Remove one of the vinyl caps (12).
2. Remove the T-Handle (10) and jam nut (11) from the rod (7).
3. Remove the rod (7) from the bushing (6) by screwing in the rod fully clockwise and pull the rod through the valve end of the bushing (6).
4. Lubricate new seals with FDA approved grease such as "Super Lube" and install in the bushing end grooves.
5. Clean, lubricate, and reinstall rod in bushing.
6. Re-install jam nut (11) and T-Handle (10).
7. Place vinyl cap (12) on handle (10).
8. Apply Teflon thread sealant to bushing and carefully thread into valve taking care not to cross-thread the bushing

Flomatic Corp, 15 Pruyn's Island, Glens Falls, New York 12801
Phone: 518-761-9797 Fax: 518-761-9798 www.flomatic.com

POSITION INDICATOR (Model 745PI)

The optional valve disc Position Indicator (PI) mechanical indicator is factory (see Fig 4) installed but can also be installed in the field. The Position Indicator visually indicates to what degree the valve disc is opened or closed. The device is installed on the access cover and can be installed in the field by going through the following steps:

1. Remove pipe line pressure and drain the valve.
2. Carefully, remove the top pipe plug (insuring that there is no water pressure in the line) from the access cover.
3. Apply pipe joint compound to position indicator body (11) threads.
4. Insert the position indicator body (11) and thread in-place.

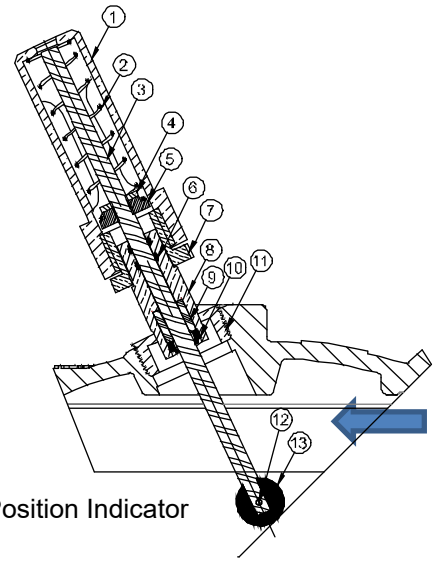


Fig. 4 Position Indicator

Item #	Qty.	Description	Material
1	1	Sight Housing	Bronze
2	1	Spring	Stainless Steel
3	1	Rod	Stainless Steel
4	1	Nut	Stainless Steel
5	1	Spring Seat	Stainless Steel
6	2	O-Rings	EPDM
7	1	Sight Base	Bronze
8	1	Sight Body	Bronze
9	1	Bottom Bushing	Acetal
10	1	Rod Wiper	Molythane
11	1	Body Bushing	Bronze
12	1	Pin	Stainless Steel
13	1	Contact Ball	Acetal

<u>WARNING:</u> Make sure that the position indicator top portion after securely installed pointes in the valves flow direction. This will ensure proper orientation and function of the position indicator assembly. Damage to the device and valve disc will accrue if the position indicator is not correctly and exactly aligned with the valves flow direction.

Limit Switch (Model 745LS)

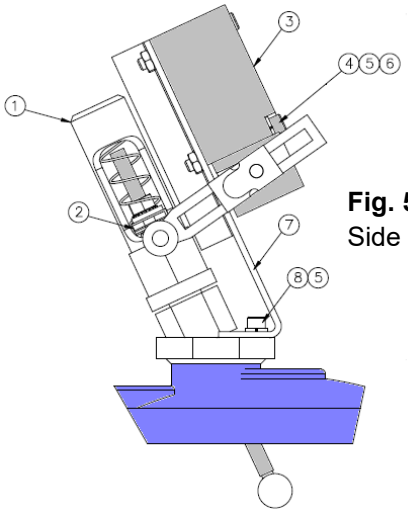


Fig. 5a
Side view

The limit switch option (Model 745LS) is factory installed or field installed (see Fig 5a & 5b) on the valve access cover and is used in conjunction with the Position Indicator (PI). A standard limit switch (Honeywell Model LSH1A or Equal) is mounted on an epoxy coated steel bracket for easy wiring, field adjustments and servicing. The limit switch is SCADA (Supervisory Control and Data Acquisition) compatible for applications requiring open/close indication.

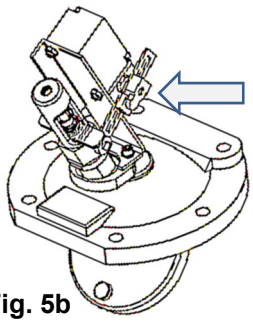
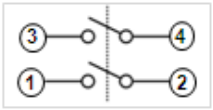


Fig. 5b
Top view

Function: The limit switch when probably adjusted will give an electric "closed" and/or "open" circuit when valve is open and/or in closed position.

NEMA Ratings: 1, 3, 4, 4X, 6, 6P, 12, 13
UL Ratings: 6 A, 120Vac or 250 Vac, DPST



Item #	Qty.	Description	Material	ASTM
1	1	Position Indicator*	Various	--------
2	1	Lever	Stainless Steel	301
3	1	Limit Switch**	Various	--------
4	2	SHCS	Stainless Steel	18-8
5	4	Lock Washer	Stainless Steel	18-8
6	1	Jam Nut	Stainless Steel	18-8
7	1	Bracket	Hot Rolled Steel	A36
8	2	SHCS	Stainless Steel	18-8

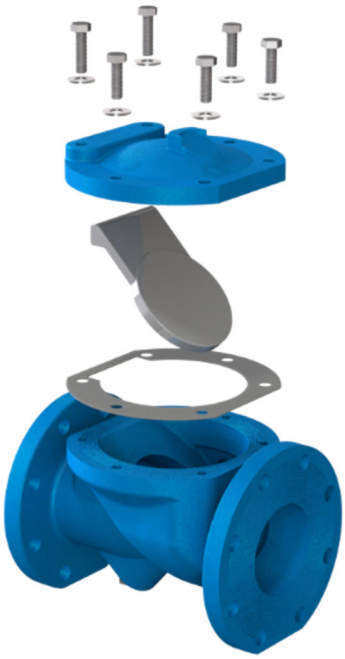
*For Position Indicator details see Fig.4
**Honeywell Model LSH1A or equal

Installation:

1. First, make sure that the valve is equipped with a Position Indicator (PI). Attach limit switch bracket (7) with assembly to Position Indicator (PI).
2. Position the assembly so that the switch trips when the valve is closed.
3. Connect wiring to either the normally open or normally closed contact as shown in the schematic diagram. Follow all local electrical codes.

Electric Switch Replacement Parts: Contact Flomatic® Corporation or contact nearest MICRO SWITCH Authorized distributor or MICRO SWITCH sales office.

Flomatic Corp, 15 Pruyn's Island, Glens Falls, New York 12801
Phone: 518-761-9797 Fax: 518-761-9798 www.flomatic.com



PARTS AND SERVICE

Flomatic® Flo-Flex® Model 745 Swing Check Valve parts and service are available from your local Flomatic® representative or the factory. Please, make note on the front page of this O&M of the valve Model No, Size, Type and Working Pressure located on the valve. Also the installation date and contact:

Flomatic Corporation
15 Pruyn's Island Drive
Glens Falls, NY 12801
Phone: (518) 761-9797 or 1-800-833-2040
Fax: (518) 761-9798
www.flomatic.com

A Flomatic sales representative will quote prices for parts or arrange for service as needed.

FLOMATIC® LIMITED WARRANTY

LIMITED ONE-YEAR WARRANTY (Flo-Flex® Model 745 Swing Check Valves) Flomatic® Corporation warrants that its products are free from defects in materials and workmanship. Flomatic® Corporation will replace any valve covered by this warranty that is found to be defective within one year, unless otherwise stated below, from the time of sale. This warranty will be void if the product has been modified in any way by the purchaser, or is subjected to unreasonable use.

EXCLUSION OF WARRANTIES

Flomatic® Corporation makes no warranties, expressed or implied, with respect to its valves, other than the expressed limited warranties described herein. The implied warranties of merchantability and fitness for a particular purpose are hereby disclaimed by Flomatic® Corporation. There are no warranties that extend beyond the description on the face hereof.

WARNING-NOT DESIGNED, INTENDED OR PERMITTED IN NUCLEAR FACILITY APPLICATIONS. FLOMATIC VALVES ARE NOT DESIGNED OR ENGINEERED FOR USE IN ANY NUCLEAR FACILITY OR IN CONJUNCTION WITH ANY NUCLEAR FACILITY OR SUPPORT FACILITY. USE OF ANY OF FLOMATIC'S PRODUCTS IN ANY SUCH APPLICATION IS MISUSE OF THESE PRODUCTS AND VOIDS ALL WARRANTIES CONTAINED HEREIN, EXPRESSED AND IMPLIED, OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE.

www.flomatic.com

1-800-833-2040