Model BFV-300 Butterfly Valve Wafer Style

IMPORTANT
Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

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General Description

The TYCO Model BFV-300 Wafer Style Butterfly Valves are indicating type valves designed for use in fire protection systems where a visual indication of open valve condition is required. They are used, for example, as system, sectional and pump water control valves, and are suitable for installation between ANSI Class 125/150 flanges as well as PN10/16 flanges without the need for flange gaskets.

For applications requiring supervision of the open state of the valve, the gear operators for the Model BFV-300 Butterfly Valves feature two sets of factory installed internal switches each having single-pole double-throw (SPDT) contacts as shown in Figure 3. The supervisory switches transfer their electrical contacts when there is movement from the open or closed disc position during the first two revolutions of the handwheel.

Note: *If the butterfly valve is required in a foam system, verify the valve is compatible by referring to the foam concentrate manufacturer technical literature for information about foam compatibility, and acceptable system equipment materials of construction.*

NOTICE

The Model BFV-300 Wafer Style Butterfly Valves described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

Technical Data

Approvals

UL and ULC Listed
FM Approved
CE Certified
VdS Approved
CNPP Certified 63.23.221
Listed by California State Fire Marshall

Note: *For specific information about approvals, see Tables A, B, and C.*

Note: *All laboratory listings and approvals are for indoor and outdoor use.*

Sizes

2 in. to 12 in. (DN50 to DN300)

UL/ULC/FM Maximum Working Pressure

2 in.–8 in. (DN50–DN200) . . . . 300 psi (20,7 bar)
10 in.–12 in. (DN250–DN300) . . 175 psi (12,1 bar)

VdS Maximum Working Pressure

2 in.–8 in. (DN50–DN200) . . . . 300 psi (20,7 bar)
10 in. (DN250) . . . . . 232 psi (16,0 bar)
12 in. (DN300) . . . . . 175 psi (12,1 bar)

Note: *The permissible flow velocity in relation to the nominal cross-section (at least 6 m/s).*



Certified CNPP 63.23.221

Maximum Working Temperature

212°F (100°C) in accordance with UL 1091

Materials of Construction

Body . . . . . Ductile Iron
Body Coating . . . . . RILSAN PA11 Black
Disc . . . . . Ductile Iron
Disc Seal . . . . . .EPDM Encapsulated
Upper & Lower Stem. . . . . Stainless Steel
Handwheel . . . . . Ductile Iron

Actuator, 2 in.–6 in. (DN50–DN150):
- IP65, bronze traveling nut gearbox, ductile iron housing

Actuator, 8 in.–12 in. (DN200–DN300):
- IP65, brass segmented gearbox, ductile iron housing

Silicone Free Model Availability

Silicone free models are available. Contact TYCO sales for information.

Control Valve Seat Leakage Class IEC 60534-4

CLASS VI (Type C) Control Valve Seat Leakage according to ANSI/FCI 70-2-2006 (ASME B16.104)

Nominal Valve Size in. (DN)	Nominal Dimensions in. (mm)								Weight lb (kg)
	A	B	C	D	E	F	G	H	
2 (DN50)	1.50 (38)	10.63 (270)	2.85 (72,5)	4.90 (124,5)	4.92 (125)	4.28 (108,6)	1.99 (50,5)	1.34 (34)	13.45 (6,1)
2-1/2 (DN65)	1.81 (46)	11.67 (296,5)	3.35 (85)	5.45 (138,5)	4.92 (125)	4.28 (108,6)	1.99 (50,5)	1.65 (41,9)	13.4 (6,1)
3 (DN80)	1.81 (46)	12.27 (311,7)	3.58 (91)	5.81 (147,7)	4.92 (125)	4.28 (108,6)	1.99 (50,5)	2.34 (59,5)	14.1 (6,4)
— (DN80)	1.81 (46)	12.27 (311,7)	3.58 (91)	5.81 (147,7)	4.92 (125)	4.28 (108,6)	1.99 (50,5)	2.34 (59,5)	14.1 (6,4)
4 (DN100)	2.16 (55)	13.92 (353,5)	4.29 (109)	6.75 (171,5)	4.92 (125)	4.28 (108,6)	1.99 (50,5)	3.25 (82,6)	15 (6,8)
5 (DN125)	2.4 (61)	16 (406,6)	5.16 (131)	7.93 (201,5)	5.91 (150)	5.79 (147)	2.32 (58,9)	4 (101,6)	26.2 (11,9)
6 (DN150)	2.4 (61)	17.07 (433,6)	5.71 (145)	8.44 (214,5)	5.91 (150)	5.79 (147)	2.32 (58,9)	5.22 (132,6)	24.5 (11,1)
8 (DN200)	2.48 (63)	19.63 (498,5)	6.69 (170)	9.29 (236)	8.86 (225)	8.19 (208)	2.76 (70)	7.3 (185,4)	44.1 (20)
— (DN200)	2.48 (63)	19.63 (498,5)	6.69 (170)	9.29 (236)	8.86 (225)	8.19 (208)	2.76 (70)	7.3 (185,4)	44.1 (20)
10 (DN250)	2.91 (74)	23.01 (584,5)	8.27 (210)	11.1 (282)	11.14 (283)	8.19 (208)	2.91 (74)	9.05 (230)	63.9 (29)
12 (DN300)	3.03 (77)	25.16 (639)	9.5 (241,5)	12.2 (310)	11.14 (283)	8.19 (208)	2.91 (74)	11.53 (292,8)	86.42 (39,2)

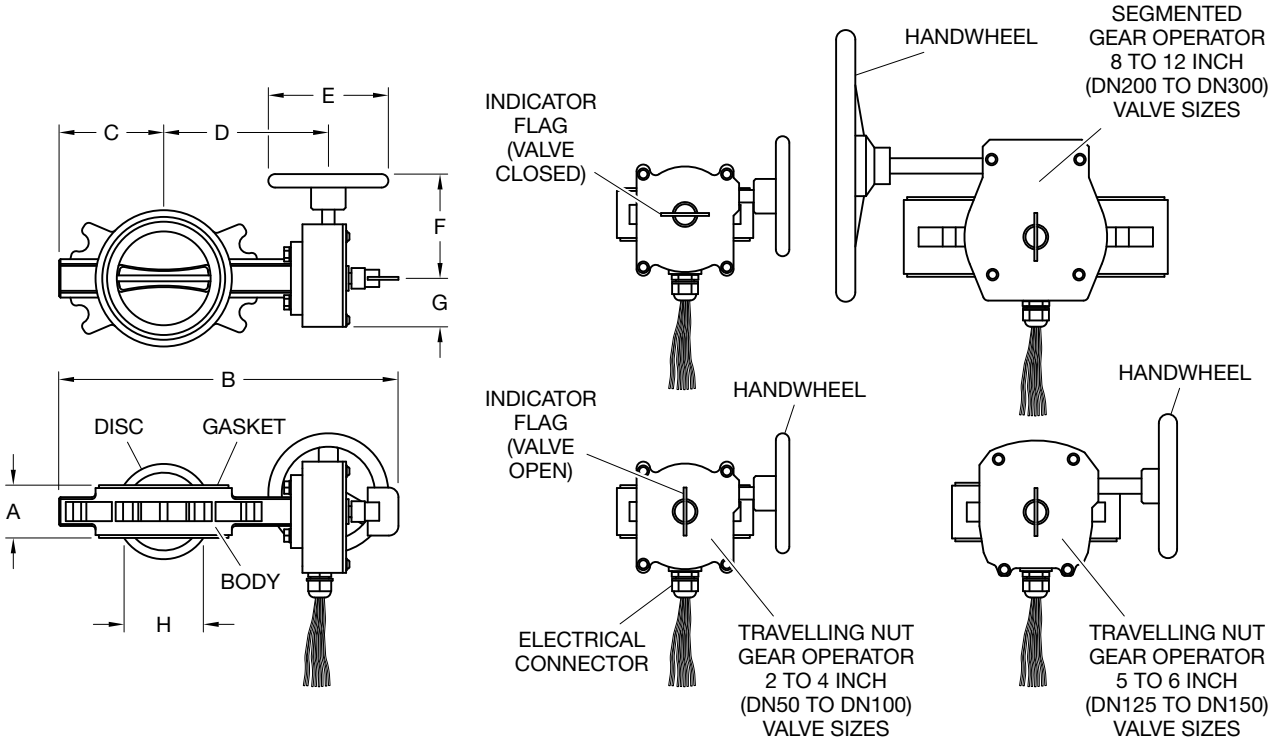


FIGURE 1
MODEL BFV-300 WAFER STYLE BUTTERFLY VALVE
NOMINAL DIMENSIONS

No.	Part	Material	Qty.
01	Body	ASTM A-536	1
02	Upper Stem	AISI 410	1
03	Lower Stem	AISI 410	1
04	Disc	EPDM	1
05	O-Ring (P12)	EPDM	4
06	Oiless B/R (MB1410)	—	4
07	End Cap 2-1/2–4 in.	EPDM	1
08	Gear Box	ASTM A-536	1
09	Traveling Nut 2–6 in.	Bronze	1
	Segment Gear 8 – 12 in.	C3604BD	1
10	Bushing (2)	FD-0205-45	1
11	Cover	ASTM A-619	1
12	Bushing	Fe	1
13	Headless Wrench Bolt M5 x 7L	ASTM A-307	1

No.	Part	Material	Qty.
14	Stem Housing	Fe	1
15	Spring Pin	ASTM A-228	1
16	Indicator	ASTM A-619	1
17	O-Ring	NBR	1
18	Cover Gasket	Paper	1
19	Spring Pin Ø5 x 1T x 25	ASTM A-228	1
20	O-Ring (P10)	EPDM	1
21	Worm Shaft	AISI 410	1
22	Bushing (1)	FD-0205-45	1
23	Collar	FD-0205-45	1
24	Spring Washer	ASTM A-167	4
25	Hex Bolt M8 x 20L	ASTM A-167	2
26	Hex Bolt M8 x 25L	ASTM A-167	2
27	Gasket	Paper	1

No.	Part	Material	Qty.
28	Spring Pin Ø4 x 0.8t x 35	ASTM A-228	1
29	Handwheel	ASTM A-536	1
30	Bolt (Round)	ASTM A-167	3
31	Plate Washer	ASTM A-167	4
32	Switch Assembly	—	1
33	T/R Bolt	ASTM A-307	2
34	Tapping Screw ST3.5 x 7.5	S10C	1
35	Tooth Washer 4#	S10C	1
36	Lever	ASTM A-619	1
37	Connector	—	1
38	Sticker	—	1
39	Sticker	—	1
40	Gasket	EPDM	2
41	Spring Pin Ø3 x 0.6T x 25	ASTM A-228	1

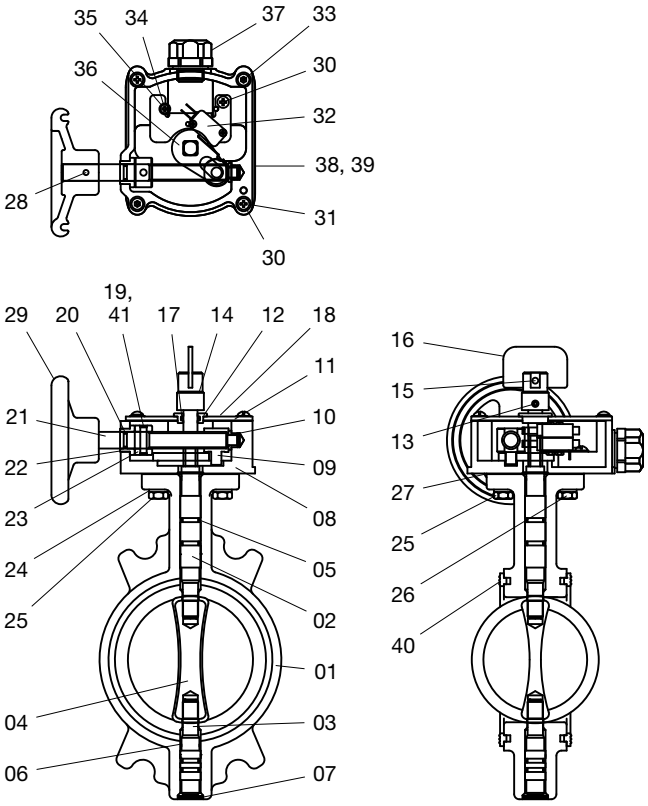
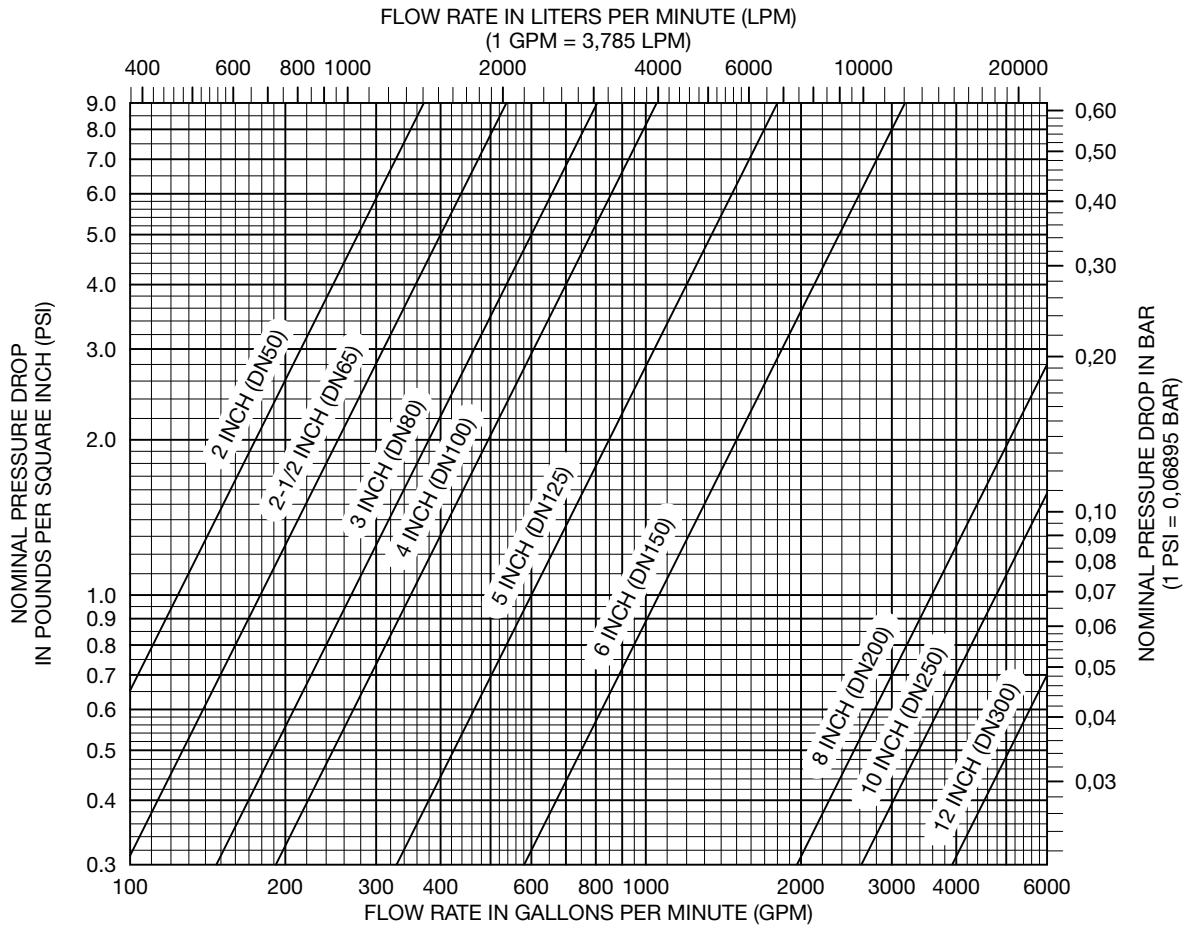


FIGURE 2
MODEL BFV-300 WAFER STYLE BUTTERFLY VALVE ASSEMBLY



GRAPH A
MODEL BFV-300 WAFER STYLE BUTTERFLY VALVE
NOMINAL PRESSURE DROP VERSUS FLOW

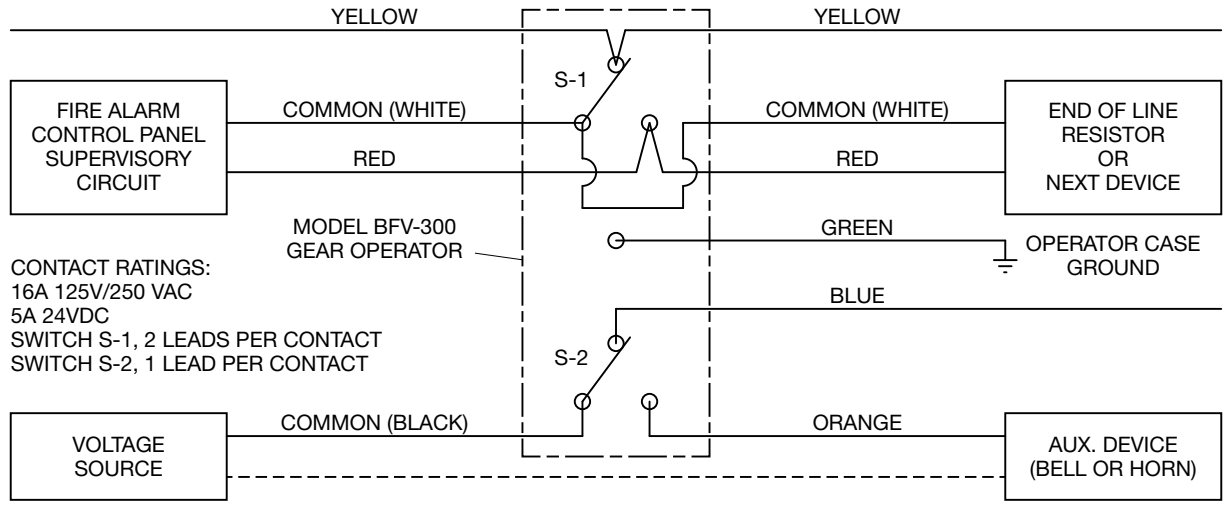


FIGURE 3
MODEL BFV-300 BUTTERFLY VALVE OPEN POSITION — SUPERVISORY SWITCH OPEN POSITION
INTERNAL SWITCH WIRING DIAGRAM

Nominal Valve Size in. (DN)	Max. psi (bar)	Flange Face	Part Number		Agency Listing/Approval							
			BFV-300 with Internal Switch	BFV-300 without Internal Switch[1]	CE	UL	ULC	FM	VdS	CA Fire Marshall	CNPP Certified	PAVUS
2 (DN50)	300 (20,7)	ANSI 16.5, BS PN16	59300W020WS	59300W020NS	✓	✓	✓		✓			✓
2-1/2 (DN65)	300 (20,7)	ANSI 16.5, BS PN16	59300W025WS	59300W025NS	✓	✓	✓	✓	✓	✓		✓
3 (DN80)	300 (20,7)	ANSI 16.5	59300W030WS	59300W030NS	✓	✓	✓	✓	✓	✓		✓
— DN80	300 (20,7)	BS PN16	59300W036WS	59300W036NS	✓	✓	✓	✓	✓			✓
4 (DN100)	300 (20,7)	ANSI 16.5, BS PN16, AS 2129 Table F	59300W040WS	59300W040NS	✓	✓	✓	✓	✓	✓		✓
5 (DN125)	300 (20,7)	ANSI 16.5, BS PN16	59300W050WS	59300W050NS	✓	✓	✓	✓	✓	✓		✓
6 (DN150)	300 (20,7)	ANSI 16.5, BS PN16, AS 2129 Table F	59300W060WS	59300W060NS	✓	✓	✓	✓	✓	✓		✓
8 (DN200)	300 (20,7)	ANSI 16.5, BS PN10	59300W080WS	59300W080NS	✓	✓	✓	✓	✓	✓		✓
— DN200	300 (20,7)	BS PN16	59300W086WS	59300W086NS	✓	✓	✓	✓	✓			✓
10 (DN250)	175 (12,1)	ANSI 16.5, BS PN10/16	59300W100WS	59300W100NS	✓	✓	✓	✓	✓	✓		✓
12 (DN300)	175 (12,1)	ANSI 16.5, BS PN10/16	59300W120WS	59300W120NS	✓	✓	✓		✓			✓

Note:
1. BFV-300 without Internal Switch (NS) versions are only available in EMEA

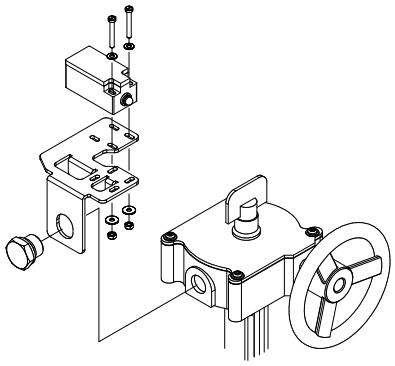
TABLE A
MODEL BFV-300 WAFER STYLE BUTTERFLY VALVE
WITH OR WITHOUT INTERNAL SUPERVISORY SWITCHES
PART NUMBER SELECTION AND AGENCY LISTINGS/APPROVALS

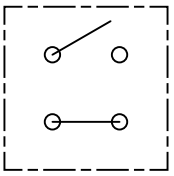
Nominal Valve Size in. (DN)	Max. psi (bar)	Flange Face	Part Number		Agency Listing/Approval		
			BFV-300 Supv. Switch OPEN	BFV-300C Supv. Switch CLOSED	CE	VdS	CNPP Certified
2 (DN50)	300 (20,7)	ANSI 16.5, BS PN16	59300W020AWS	59300W020AWSC	✓	✓	✓
2-1/2 (DN65)	300 (20,7)	ANSI 16.5, BS PN16	59300W025AWS	59300W025AWSC	✓	✓	✓
3 (DN80)	300 (20,7)	ANSI 16.5	59300W030AWS	59300W030AWSC	✓	✓	✓
— DN80	300 (20,7)	BS PN16	59300W036AWS	59300W036AWSC	✓	✓	✓
4 (DN100)	300 (20,7)	ANSI 16.5, BS PN16, AS 2129 Table F	59300W040AWS	59300W040AWSC	✓	✓	✓
5 (DN125)	300 (20,7)	ANSI 16.5, BS PN16	59300W050AWS	59300W050AWSC	✓	✓	✓
6 (DN150)	300 (20,7)	ANSI 16.5, BS PN16, AS 2129 Table F	59300W060AWS	59300W060AWSC	✓	✓	✓
8 (DN200)	300 (20,7)	ANSI 16.5, BS PN10	59300W080AWS	59300W080AWSC	✓	✓	✓
— DN200	300 (20,7)	BS PN16	59300W086AWS	59300W086AWSC	✓	✓	✓
10 (DN250)	175 (12,1)	ANSI 16.5, BS PN10/16	59300W100AWS	59300W100AWSC	✓	✓	✓
12 (DN300)	175 (12,1)	ANSI 16.5, BS PN10/16	59300W120AWS	59300W120AWSC	✓	✓	✓

TABLE B
MODEL BFV-300 WAFER STYLE BUTTERFLY VALVE
WITH LARGE 100 X 100 MM FLAG AND INTERNAL OPEN AND CLOSED SUPERVISORY SWITCHES
PART NUMBER SELECTION AND AGENCY LISTINGS/APPROVALS

Nominal Valve Size in. (DN)	Gear Operator Type	Part Number			
		Mounting Bracket with Mounting Bolts	Bernstein i88-IP65 Regular Switch	Bernstein i88-IP65 LED Switch 24V	Bernstein GC-SU1Z Ex IP-66/67 ATEX (Ex II2G Ex dIIC T6 Gb) Switch
2–4 (DN50–DN100)	Travelling Nut	59300SPBRACKET10	59300SPSW	59300SPSWLED	59300SPSWATEX
5–6 (DN125–DN200)		59300SPBRACKET20			
8 (DN200)	Segmented Gear	59300SPBRACKET25			
10–12 (DN250–DN300)		59300SPBRACKET30			

Notes:
1. Install a single switch in either bracket mounting position to monitor Open or Closed valve condition





Bernstein Switch Wiring Diagram

TABLE C
MODEL BFV-300 WAFER STYLE BUTTERFLY VALVE WITHOUT INTERNAL SUPERVISORY SWITCHES ACCESSORY EXTERNAL SUPERVISORY SWITCHES AND MOUNTING BRACKETS PART NUMBER SELECTION

Installation

The TYCO Model BFV-300 Wafer Style Butterfly Valves may be installed with flow in either direction and can be positioned either horizontally or vertically. They are designed for installation between the faces of ANSI Class 125 and 150 flanges as well as PN10/16 flanges without the need for flange gaskets. The Series BFV-300 are self-sealing between mating flanges; therefore, they do not require the use of additional gaskets.

The Model BFV-300 may be installed with any pressure class or schedule of pipe or tubing no greater than schedule 40 that is listed or approved for fire protection service and installed in accordance with the manufacturers instructions.

The wafer bodies have locating lugs to ensure proper centering of the valve body when flange bolts are installed. For bolt diameter information, see Figure 2. Bolts and studs must meet the minimum strength requirements of ASTM A307 (Grade B), and the nuts must meet the minimum strength requirements of ASTM A563 (Grade A).

Prior to installation, close the valve. Spread the flanges apart to allow the valve to slip easily between the flanges. Make sure the pipe flange faces are clean of any foreign material such as scale, metal shavings, or welding slag. Insert the valve between the flanges (without flange gaskets). Do not apply lubricant to the seat faces as this may damage the seat material. Be sure to center the valve and do not damage the liner. Relax the separation of the flanges, install, and hand-tighten all flange bolts. Slowly open the valve, checking for free movement of the disc. If valve opens freely, leave the valve in the open position, and using a cross-draw sequence, tighten all flange bolts until the valve is metal-to-metal with both mating flanges. Recommended tightening torques are listed in Table F. Be certain to keep flange faces as parallel as possible during and after tightening bolts or studs. After final tightening, again check the valve for full opening and closing.

As applicable, see Figure 3 for the internal switch wiring diagram.

Conduit and electrical connections are to be made in accordance with the authority having jurisdiction and/or the National Electrical Code. With reference to Figure 3, the supervisory switch is intended for connection to the supervisory circuit of a fire alarm control panel in accordance with NFPA 72. The auxiliary switch is intended for the unsupervised connection to auxiliary equipment in accordance with NFPA 70, National Electric Code.

Note: *For outdoor applications with internal supervisory switches, it is recommended that wiring connections be made at a temperature above 15°F (-9°C), in order to insure sufficient flexibility of the wire lead insulation.*

Nominal Valve Size in. (DN)	Part Number
2–4 (DN50–DN100)	59300SPHWHEEL10
5–6 (DN125–DN150)	59300SPHWHEEL20
8 (DN200)	59300SPHWHEEL30
10–12 (DN250–DN300)	59300SPHWHEEL40

TABLE D
BFV-300 WAFER STYLE BUTTERFLY VALVE
REPLACEMENT HANDWHEEL
PART NUMBER SELECTION

Nominal Valve Size in. (DN)	Part Number
2–4 (DN50–DN100)	59300SPFLAG10
5–6 (DN125–DN150)	59300SPFLAG20
8–12 (DN200–DN300)	59300SPFLAG30

TABLE E
BFV-300 WAFER STYLE BUTTERFLY VALVE
REPLACEMENT INDICATOR FLAG
PART NUMBER SELECTION

Item	Description
A	Gear Operator
B	Wiring Gland
C	Adjustment Screw - Left, Valve Open
D	Adjustment Screw - Right, Valve Closed
E	Indicator Flag - Valve Open
F	Indicator Flag - Valve Closed
G	Disc - Valve Open
H	Disc - Valve Closed

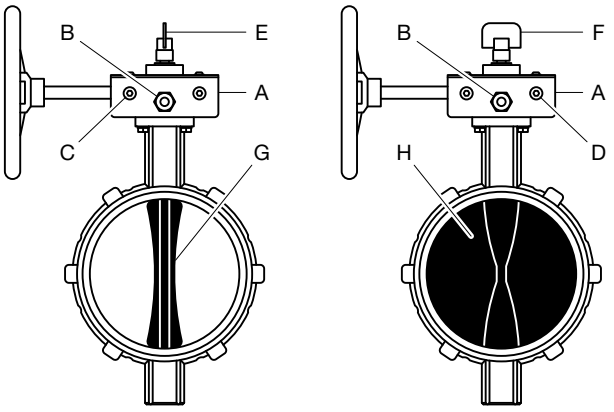


FIGURE 4
BFV-300 WAFER STYLE BUTTERFLY VALVE
SEGMENTED GEAR OPERATOR ADJUSTMENT
(8 IN. (DN200) AND LARGER VALVES ONLY)

Nominal Flange Size ANSI in. (DN)	Recommended Minimum Torque lb-ft (N·m)
2–4 (DN50–DN100)	20–30 (27,1–40,7)
5–8 (DN125–DN200)	33–50 (44,7–67,8)
10–12 (DN250–DN300)	53–75 (71,8–101,7)

TABLE F
RECOMMENDED MATING FLANGE BOLT TORQUES

Care and Maintenance

The TYCO Model BFV-300 Wafer Style Butterfly Valves must be maintained and serviced in accordance with this section.

Before closing a fire protection system control valve for maintenance or inspection work on either the valve or fire protection system which it controls, permission to shut down the affected fire protection systems must be obtained from the proper authorities and all personnel who may be affected by this decision must be notified.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in accordance with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION, for example, NFPA 25, in addition to the standards of any authority having jurisdiction. Contact the installing contractor or product manufacturer with any questions. Any impairment must be immediately corrected.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified inspection service.

Adjusting the Disc Open or Closed Position

The disc position may need adjustment or realignment while in the disc open (parallel) or disc closed (perpendicular) positions. Adjustment scenarios may include the following:

- Disc open left offset
- Disc open right offset
- Disc closed shortfall offset
- Disc closed overreach offset

Adjustment guidelines:
This procedure applies to 8 in. (DN200) and larger valves that are equipped with segmented gear operators.

The adjustments must be made only while the position of the valve disc can be observed—either prior to valve installation, or when the valve is removed for the purpose of adjusting disc position limits.

Note the access ports for the adjustment screws located on the gear operator housing to the left and right sides of the electrical cable gland as shown in Figure 4:

- Use the left screw to adjust the disc open (parallel) position.
- Use the right screw to adjust the disc closed stop (perpendicular) position.

Tools required:
M5 size Allen key.

Adjusting a disc open left or right offset
If the disc is not fully parallel in the open position, and is offset to the left or right – perform the following steps to re-align the disc.

Adjust the disc according to the relevant offset as follows:

- If the disc is offset to the left of the open position, use the M5 Allen key to turn the left side screw counter-clockwise. Rotate the screw until the disc is fully parallel.
- If the disc is offset to the right of the open position, use the M5 Allen key to turn the left side screw clockwise. Rotate the screw until the disc is fully parallel.

Adjusting a disc closed shortfall or overreach offset
If the disc is not fully perpendicular in the closed position, by not reaching the position (shortfall) or exceeding the position (overreach) – perform the following adjustment to re-align the disc.

Adjust the disc according to the relevant offset as follows:

- If there is a disc shortfall offset or the disc is not reaching the closed position, use an M5 Allen key to turn the right side screw counter-clockwise. Rotate the screw until the disc is fully perpendicular.
- If there is a disc overreach offset or the disc is exceeding the closed position, use an M5 Allen key to turn the right side screw clockwise. Rotate the screw until the disc is fully perpendicular.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and part number (P/N).

Butterfly Valves

Model BFV-300 with Internal Open Supervisory Switches
Specify: (specify size) Model BFV-300 Wafer Style Butterfly Valve, Internal Open Supervisory Switches, P/N (specify, see Table A)

Model BFV-300 without Supervisory Switches
Specify: (specify size) Model BFV-300 Wafer Style Butterfly Valve, P/N (specify, see Table A)

Model BFV-300 with Internal Open Supervisory Switches, CNPP Certified
Specify: (specify size) Model BFV-300 Wafer Style Butterfly Valve, Internal Open Supervisory Switches, CNPP Certified, P/N (specify, see Table B)

Model BFV-300 with Internal Closed Supervisory Switches, CNPP Certified
Specify: (specify size) Model BFV-300 Wafer Style Butterfly Valve, Internal Open Supervisory Switches, CNPP Certified, P/N (specify, see Table B)

Accessories

External Supervisory Switch and Mounting Bracket
Note: *Accessory external supervisory switches and mounting brackets are applicable only to valves without factory-installed internal supervisory switches.*

See Table C for switch models and part numbers.

Specify: (specify size) Model BFV-300 Wafer Style Butterfly Valve External Switch Mounting Bracket, P/N (specify), with (specify quantity) Bernstein External Switch (specify model), P/N (specify)

Replacement Parts

Note: *Only items described in this section are offered as replacement parts.*

Handwheel
Replacement handwheel includes pin.

Specify: Handwheel, (specify size) Model BFV-300 Wafer Style Butterfly Valve, P/N (specify, see Table D)

Indicator Flag
Specify: Indicator Flag, (specify size) Model BFV-300, P/N (specify, see Table E)

Shaft Pin
Specify: Shaft Pin, 8-10 in., Model BFV-300, P/N 59300SHAFTPIN8-10

Specify: Shaft Pin, 12 in., Model BFV-300, P/N 59300SHAFTPIN12

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