

# PRATT

INDUSTRIAL

## **BF Series Wafer/Lug Butterfly Valves**



**Engineering Creative Solutions  
for Fluid Systems Since 1901**

## About Pratt Industrial

Pratt Industrial specializes in the design, engineering, and worldwide distribution of technologically advanced, industrial-use valves and actuators. Henry Pratt Company's investment in Pratt Industrial combines the innovative resources of a century old company with the know-how of experts in industrial valve markets.

Pratt Industrial offers solutions that optimize manufacturing processes by creating truly high-performance valves for all industrial applications.

Centrally located in Emporia, Kansas, Pratt Industrial has over 35,000 sq. feet of manufacturing and warehouse space, including a full-service machine shop for custom assemblies. Based on customers' specific needs, Pratt Industrial's knowledgeable and experienced staff of engineers and representatives can help to increase manufacturing productivity and efficiency by providing the right valve for the application.

Pratt Industrial serves the following markets:

- Mining
- Food/Beverage
- Power
- OEM's
- Chemical/Pharmaceutical
- Desalination
- Petroleum/Oilfield
- Ultra Pure Water
- Transportation
- Marine
- Irrigation
- HVAC



**Through experience, commitment and creative engineering, Pratt Industrial is uniquely suited to provide superior products for our customers' special needs. For more information, contact our corporate headquarters in Emporia, Kansas.**



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## Construction Specification: Pratt BF Series Butterfly Valves



Valve with Electric Operator



Valve with Gear Operator

**Sizes:** 2" through 48"

**Body:** Ductile Iron (65-45-12)

**Disc:** Ductile Iron Nickel Plated, Ductile Iron Nylon 11,  
CF8M Stainless Steel, Aluminum Bronze

**Stem:** 416 S.S. Heat Treated

**Resilient Seat:** EPDM, Buna-N, Viton

**Actuation Options:** Worm Gear, Lever,  
Pneumatic, Electric

**Pressure Ratings:** 2" – 12" 230psi  
14" – 48" 150psi

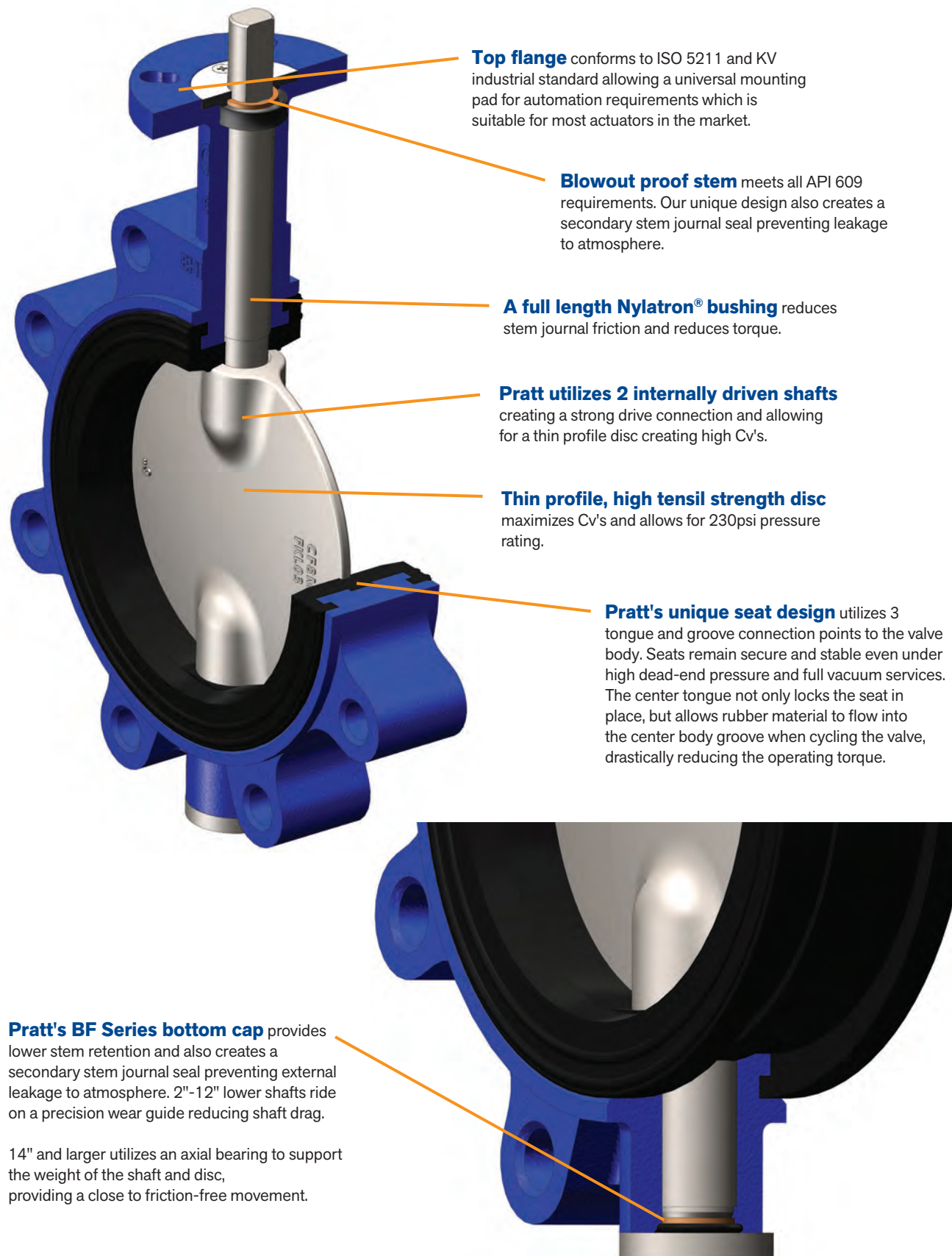
\* For installation between ANSI 125/150

\*\* Substitute material may result in pressure  
rating change. Contact factory for details.

### Features:

- Innovative 3 point connection, tongue and groove seat allows for higher pressure rating and full Vacuum service
- Unique secondary shaft seals prevent leakage from shaft.
- Our two piece shaft design provides maximum strength and a high flow characteristic disc.

## Pratt BF Series Butterfly Valve Design Details: Butterfly Valve, sizes 2" through 48" 2"-12" 230psi, 14"-48" 150psi



**Top flange** conforms to ISO 5211 and KV industrial standard allowing a universal mounting pad for automation requirements which is suitable for most actuators in the market.

**Blowout proof stem** meets all API 609 requirements. Our unique design also creates a secondary stem journal seal preventing leakage to atmosphere.

**A full length Nylatron® bushing** reduces stem journal friction and reduces torque.

**Pratt utilizes 2 internally driven shafts** creating a strong drive connection and allowing for a thin profile disc creating high Cv's.

**Thin profile, high tensile strength disc** maximizes Cv's and allows for 230psi pressure rating.

**Pratt's unique seat design** utilizes 3 tongue and groove connection points to the valve body. Seats remain secure and stable even under high dead-end pressure and full vacuum services. The center tongue not only locks the seat in place, but allows rubber material to flow into the center body groove when cycling the valve, drastically reducing the operating torque.

**Pratt's BF Series bottom cap** provides lower stem retention and also creates a secondary stem journal seal preventing external leakage to atmosphere. 2"-12" lower shafts ride on a precision wear guide reducing shaft drag.

14" and larger utilizes an axial bearing to support the weight of the shaft and disc, providing a close to friction-free movement.

# Suggested Specifications: Pratt BF Series Wafer/Lug Butterfly Valve, Sizes 2" through 48" 2"-12" 230psi, 14"-48" 150psi

## General

Lug valves shall be design for installation between ANSI 125/150 flanges. Wafer valves shall be design for installation between ANSI 125 / 150, PN 10, and PN 16 flanges. All valves shall be capable of bi-directional, end of line, bubble tight service to rated pressure. Valves are also rated to full vacuum service. Design Standards: API 609 category A.

## Pressure Rating

2" – 12" – 230psi to fit between ANSI 125/150 flanges

14" – 48" – 150psi to fit between ANSI 125/250 flanges

## Body

Valve body shall be a 1 piece Ductile Iron ASTM A-536 (65-45-12) construction with a laying length conforming to the latest revision of ISO 5752 and a flange connection B16.1/B16.5.

## Disc

Valve disc shall be Ductile iron ASTM A-536 Grade 65-45-12 with ENP plating or Nylon 11 coating, CF8M Stainless Steel, or Aluminum Bronze. Disc shall be designed to accommodate an upper and lower shaft with a thin center profile giving higher Cv values combined with strength.

## Shaft

Valve shaft shall be constructed of Heat Treated 416 Stainless Steel. Valve shall be designed to accommodate (2) shafts (1 upper and 1 lower). The upper shaft shall have a positive engagement in the disc utilizing an internal square drive and shall be retained by the body Top Cap and End Cap.

## Seat

Seat shall be EPDM, Buna-N or Viton. Seat design shall consist of 3 Tongues (2 located on the side walls and 1 located in the center bore) that engage into 3 grooves in the body. These 3 tongue and groove connection points prevent seat movement in a radial and axial direction. Seats shall be field replaceable.

## Shaft Seals

Upper Shaft Seal shall be self-adjusting V-type and shall be suitable for Pressure or Vacuum service. Packing shall be located above the bushing and shall create a positive seal against the Top Cap. Bottom end cap contains a captive o-ring creating a positive seal against external leakage.

## Bushings

Valve shall consist of (2) full length Nylatron® bushings (upper and lower) offering superior protection against friction, corrosion and impacts. Pratt's unique bushings design provide protection against shaft side loading.

## Testing

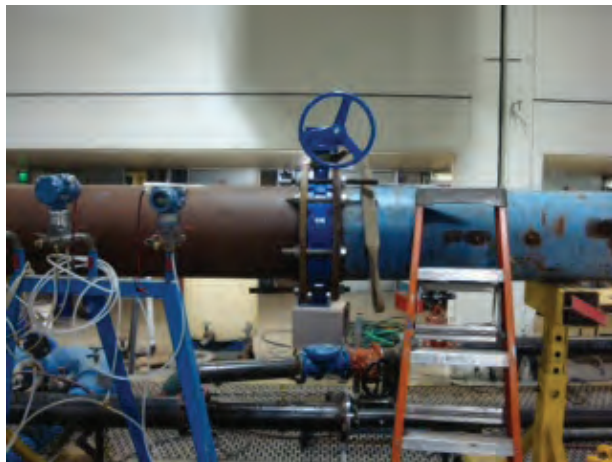
All valves shall be leak tested in the factory at their rated pressure per API 598.

## CV Flow Data: BF Series BFV

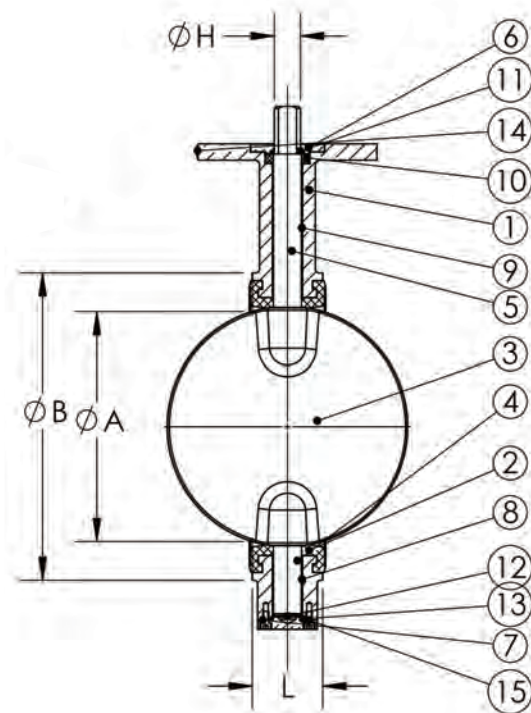
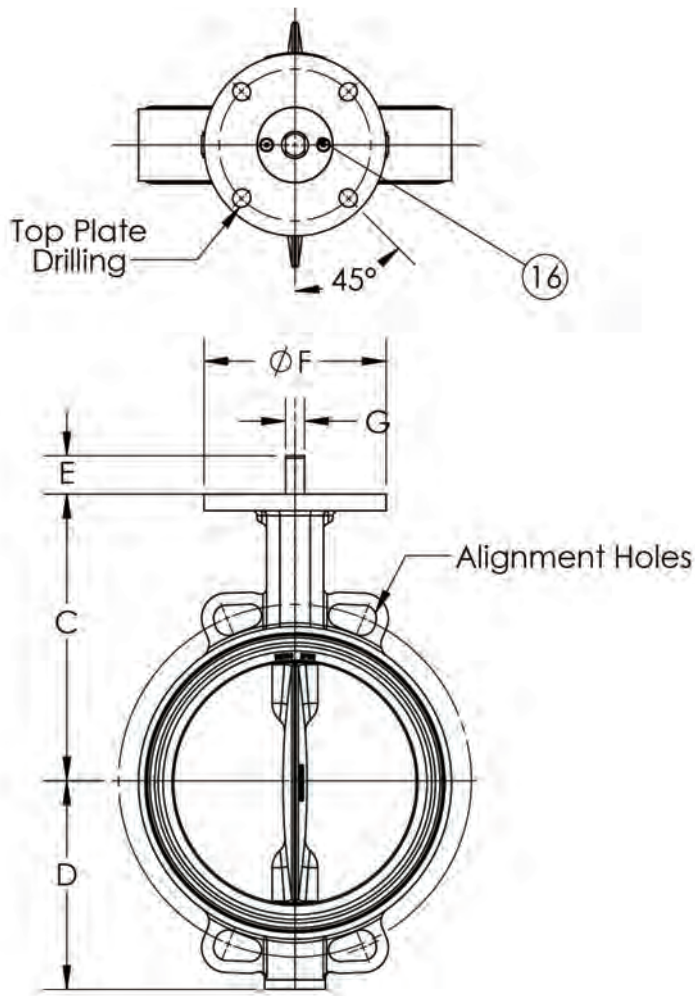
During its product development phase, the BF Series Wafer/Lug Butterfly Valve was tested to ensure that it met our own rigorous standards for flow capacity. Throughout testing, the BF Series valve has consistently produced high Cv values which translates to lower flow resistance, and in turn, lowering system operating costs to the user over the life of the valve. The following Cv chart represents the flow characteristics for all sizes available.

Valve Opening (deg)	Cv by Valve Size													
	2"	2.5"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
10	1	2	3.5	6	8.5	14	18	28.1	40.5	55.1	72	91.1	112.5	162
20	1.8	2.9	4.1	7.4	11.5	16.5	29.4	185.5	267.1	363.6	474.9	601.1	742.1	1069
30	10.8	16.9	24.3	43.2	67.5	97.1	172.7	381.5	549.4	747.8	976.7	1236	1526	2198
40	22.1	34.5	49.7	88.4	138.1	198.8	353.4	683.1	983.6	1339	1749	2213	2732	3935
50	38.5	60.2	86.7	154.2	240.9	346.9	616.8	1161	1671	2275	2971	3761	4643	6685
60	65.3	102	146.9	261.1	408	587.6	1045	1944	2799	3810	4976	6298	7775	11196
70	111	173.5	249.8	444.1	693.9	999.2	1776	3232	4654	6335	8274	10472	12928	18617
80	176.2	275.2	396.3	704.6	1101	1585	2818	6215	8950	12182	15911	20138	24862	35801
90	206.4	322.5	464.4	825.6	1290	1858	3302	6420	9245	12583	16435	20801	25680	36979

**BF Series Wafer / Lug Butterfly Valves being tested at an independent research laboratory**

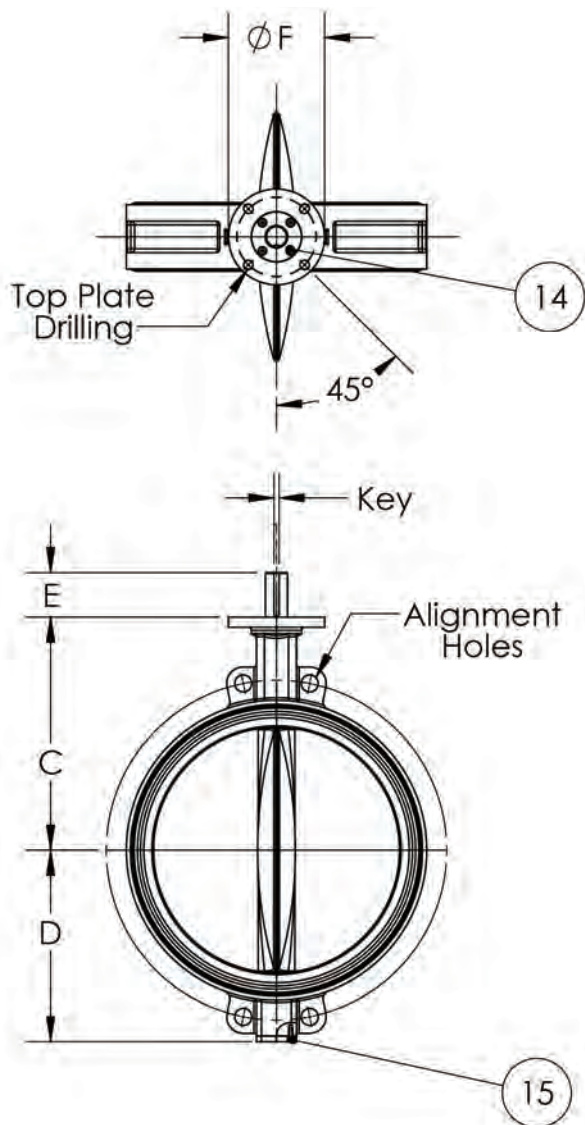


## Dimensional Data: BF Series BFV, Wafer

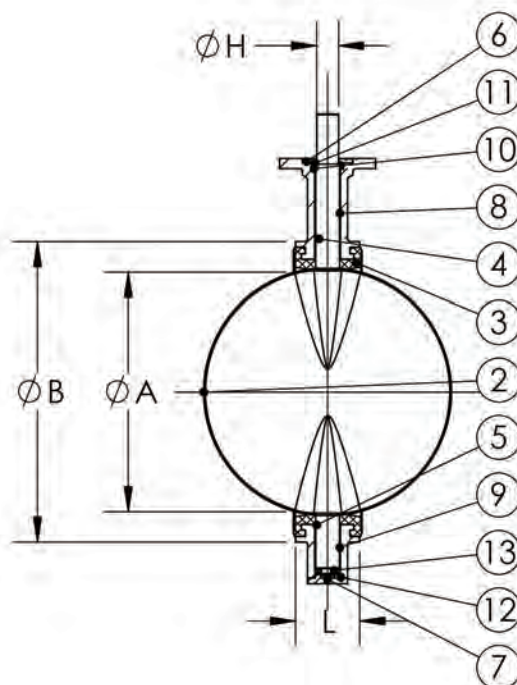


Part No.	Part Name	Material	Qty.
1	Wafer Body	DI	1
2	Seat	EPDM/NBR/Viton	1
3	Disc	SS316/DI/C954/Nylon 11	1
4	Lower Stem	SS416/SS316/SS630	1
5	Upper Stem	SS416/SS316/SS630	1
6	Top Cap	1020 Steel	1
7	End Cap	1020 Steel	1
8	Lower Bushing	Nylatron®	1
9	Upper Bushing	Nylatron®	1
10	V-packing	NBR	1
11	Washer	SS304	1
12	Wear Shim	SS304	1
13	O-ring	NBR	1
14	Data Plate	SS304	1
15	End Cap Bolt	SS304	2
16	Top Cap Bolt	SS304	2

Size	lbs	Pratt Standard Top Plate Drilling			ISO 5211 Top Plate Drilling			Alignment Holes			Key	Pratt Standard Top Plate Drilling			ISO 5211 Top Plate Drilling			Alignment Holes					
		ΦA	ΦB	C	Bolt Circle	No. of Holes	Hole Dia.	Bolt Circle	No. of Holes	Hole Dia.		Bolt Circle	No. of Holes	Hole Dia.	Bolt Circle	No. of Holes	Hole Dia.						
2"	5.51	1.079	3.500	5.000	3.25	4	0.437	2.760	4	0.402	4.75	4	0.75	-	3.25	4	0.437	2.760	4	0.402	4.75	4	0.75
2.5"	6.39	1.862	4.094	5.500	3.25	4	0.437	2.760	4	0.402	5.5	4	0.75	-	3.25	4	0.437	2.760	4	0.402	5.5	4	0.75
3"	7.49	2.429	4.646	5.709	3.25	4	0.437	2.760	4	0.402	6	4	0.75	-	3.25	4	0.437	2.760	4	0.402	6	4	0.75
4"	10.58	3.500	5.827	6.496	3.25	4	0.437	2.760	4	0.402	7.5	4	0.75	-	3.25	4	0.437	2.760	4	0.402	7.5	4	0.75
5"	15.65	4.567	7.205	7.500	3.25	4	0.437	2.760	4	0.402	8.5	4	0.88	-	3.25	4	0.437	2.760	4	0.402	8.5	4	0.88
6"	17.63	5.433	7.992	7.874	3.25	4	0.437	2.760	4	0.402	9.5	4	0.88	-	3.25	4	0.437	2.760	4	0.402	9.5	4	0.88
8"	31.52	7.744	10.315	9.500	5	4	0.563	4.921	4	0.563	11.75	4	0.88	-	5	4	0.563	4.921	4	0.563	11.75	4	0.88
10"	50.03	9.646	12.598	10.866	5	4	0.563	4.921	4	0.563	14.25	4	1	1/4" * 1/4"	5	4	0.563	4.921	4	0.563	14.25	4	1
12"	67.00	11.339	14.567	12.205	5	4	0.563	4.921	4	0.563	17	4	1	1/4" * 1/4"	5	4	0.563	4.921	4	0.563	17	4	1



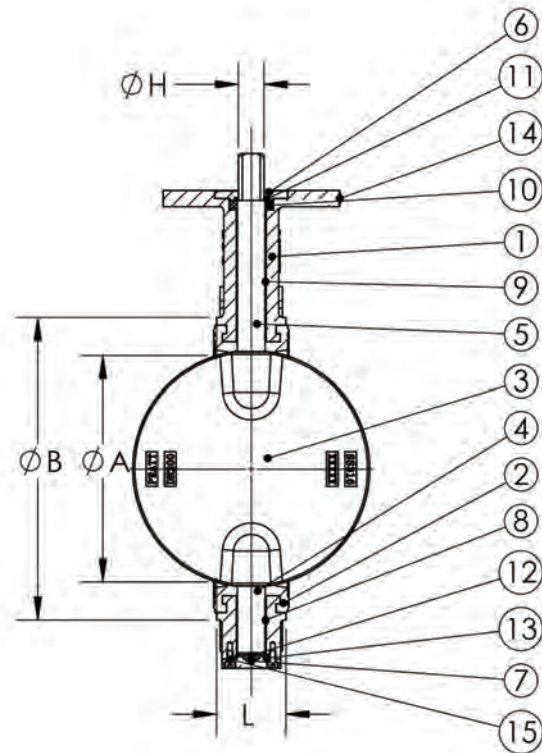
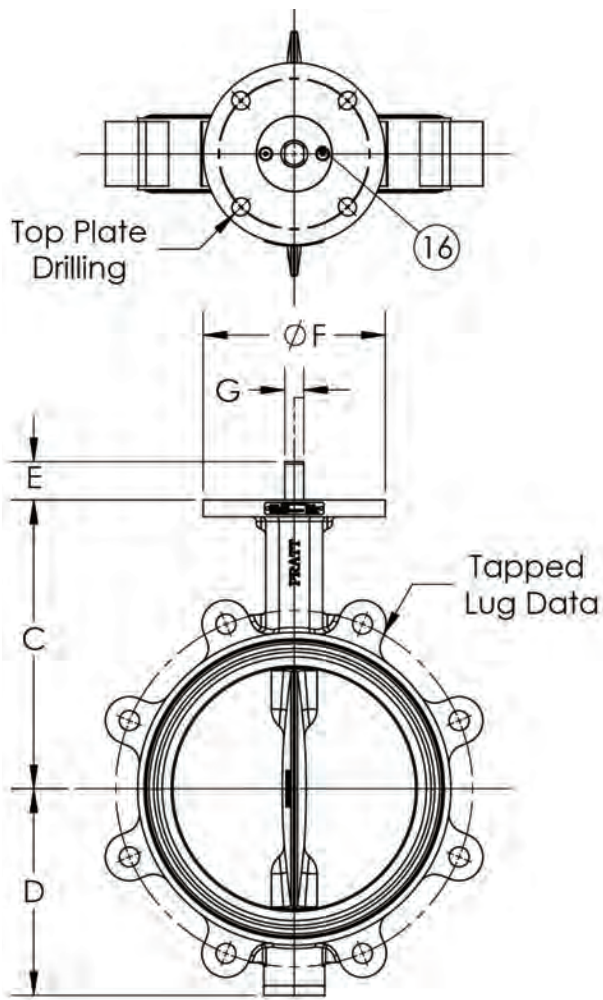
SECTION B-B



Part No.	Part Name	Material	Qty.
1	Wafer Body	DI	1
2	Disc	SS316/DI/C954/Nylon 11	1
3	Seat	EPDM/NBR/Viton	1
4	Upper Stem	SS416/SS316/SS630	1
5	Lower Stem	SS416/SS316/SS630	1
6	Top Cap	1020 Steel	1
7	End Cap	1020 Steel	1
8	Upper Bushing	Nylatron®	1
9	Lower Bushing	Nylatron®	1
10	V-packing	NBR	1
11	Washer	SS304	1
12	O-ring	NBR	1
13	Bearing	Steel	1
14	Top Cap Bolt	SS304	4
15	End Cap Bolt	SS304	4

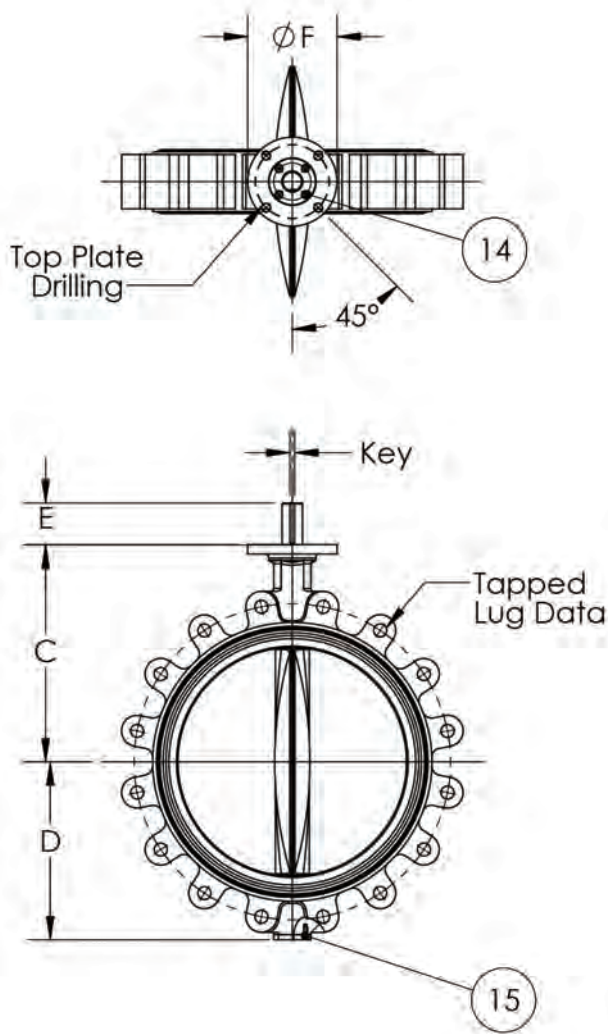
Size	Lbs	$\phi A$	$\phi B$	C	D	E	$\phi F$	$\phi H$	L	Key	Pratt Standard Top Plate Drilling			ISO 5211 Top Plate Drilling			Alignment Holes		
											Bolt Circle	No. of Holes	Hole Dia.	Bolt Circle	No. of Holes	Hole Dia.	Bolt Circle	No. of Holes	Hole Dia.
14"	80.01	12.677	16.772	12.992	10.984	2.760	6.000	1.374	3.071	5/16" * 5/16"	5	4	0.563	4.92	4	0.563	18.75	4	1.122
16"	110.20	14.921	18.748	14.567	11.969	2.760	6.000	1.374	4.016	5/16" * 5/16"	5	4	0.563	4.92	4	0.563	21.25	4	1.122
18"	160.89	16.693	20.945	15.551	13.189	3.000	8.000	1.626	4.488	3/8" * 3/8"	6.5	4	0.811	6.5	4	0.811	22.75	4	1.26
20"	207.18	18.504	23.189	16.850	14.528	3.500	8.000	1.874	5.000	1/2" * 1/2"	6.5	4	0.811	6.5	4	0.811	25	4	1.26
24"	317.38	22.480	27.008	19.685	16.693	3.500	8.000	1.874	6.063	1/2" * 1/2"	6.5	4	0.811	6.5	4	0.811	29.5	4	1.378

## Dimensional Data: BF Series BFV, Lug

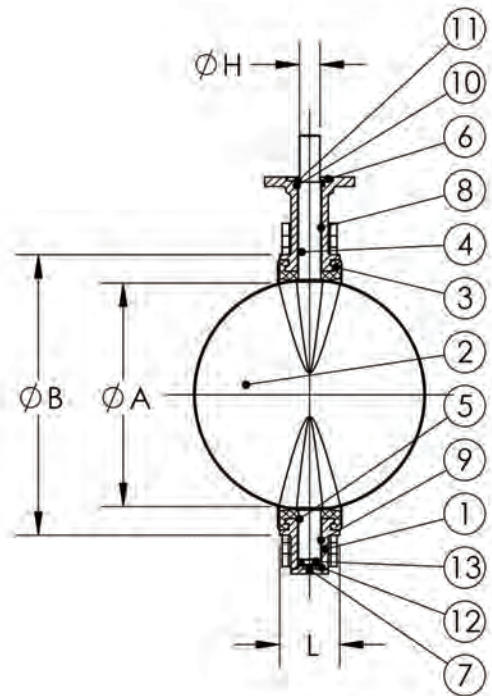


Part No.	Part Name	Material	Qty.
1	Lug Body	DI	1
2	Seat	EPDM/NBR/Viton	1
3	Disc	SS316/DI/C954/Nylon 11	1
4	Lower Stem	SS416/SS316/SS630	1
5	Upper Stem	SS416/SS316/SS630	1
6	Top Cap	1020 Steel	1
7	End Cap	1020 Steel	1
8	Lower Bushing	Nylatron®	1
9	Upper Bushing	Nylatron®	1
10	V-packing	NBR	1
11	Washer	SS304	1
12	Wear Shim	SS304	1
13	O-ring	NBR	1
14	Data Plate	SS304	1
15	End Cap Bolt	SS304	2
16	Top Cap Bolt	SS304	2

Size	Lbs	ΦA	ΦB	C	D	E	ΦF	G	ΦH	L	Key	Pratt Standard Top Plate Drilling			ISO 5211 Top Plate Drilling			Tapped Lug Data		
												Bolt Circle	No. of Holes	Hole Dia.	Bolt Circle	No. of Holes	Hole Dia.	Bolt Circle	No. of Holes	Tapped
2"	7.05	1.079	3.500	5.000	2.579	1.260	4.000	0.375	0.563	1.693	-	3.25	4	0.437	2.760	4	0.402	4.75	4	5/8"
2.5"	8.15	1.862	4.094	5.500	2.854	1.260	4.000	0.375	0.563	1.811	-	3.25	4	0.437	2.760	4	0.402	5.5	4	5/8"
3"	11.24	2.429	4.646	5.709	3.642	1.260	4.000	0.375	0.563	1.811	-	3.25	4	0.437	2.760	4	0.402	6	4	5/8"
4"	14.55	3.500	5.827	6.496	4.429	1.260	4.000	0.437	0.625	2.047	-	3.25	4	0.437	2.760	4	0.402	7.5	8	5/8"
5"	20.72	4.567	7.205	7.500	4.921	1.260	4.000	0.500	0.750	2.205	-	3.25	4	0.437	2.760	4	0.402	8.5	8	3/4"
6"	22.92	5.433	7.992	7.874	5.433	1.260	4.000	0.500	0.750	2.205	-	3.25	4	0.437	2.760	4	0.402	9.5	8	3/4"
8"	38.35	7.744	10.315	9.500	6.811	1.260	6.000	0.625	0.875	2.362	-	5	4	0.563	4.921	4	0.563	11.75	8	3/4"
10"	62.59	9.646	12.598	10.866	8.110	2.000	6.000	-	1.125	2.677	1/4" * 1/4"	5	4	0.563	4.921	4	0.563	14.25	12	7/8"
12"	83.53	11.339	14.567	12.205	9.713	2.000	6.000	-	1.125	3.071	1/4" * 1/4"	5	4	0.563	4.921	4	0.563	17	12	7/8"



SECTION A-A



Part No.	Part Name	Material	Qty.
1	Lug Body	DI	1
2	Disc	SS316/DI/C954/Nylon 11	1
3	Seat	EPDM/NBR/Viton	1
4	Upper Stem	SS416/SS316/SS630	1
5	Lower Stem	SS416/SS316/SS630	1
6	Top Cap	1020 Steel	1
7	End Cap	1020 Steel	1
8	Upper Bushing	Nylatron®	1
9	Lower Bushing	Nylatron®	1
10	V-packing	NBR	1
11	Washer	SS304	1
12	O-ring	NBR	1
13	Bearing	Steel	1
14	Top Cap Bolt	SS304	4
15	End Cap Bolt	SS304	4

Size	Lbs	ΦA	ΦB	C	D	E	ΦF	ΦH	L	Key	Pratt Standard Top Plate Drilling			ISO 5211 Top Plate Drilling			Tapped Lug Data		
											Bolt Circle	No. of Holes	Hole Dia.	Bolt Circle	No. of Holes	Hole Dia.	Bolt Circle	No. of Holes	Tapped
14"	110.20	12.677	16.772	12.992	10.984	2.760	6.000	1.374	3.071	5/16" * 5/16"	5	4	0.563	4.92	4	0.563	18.75	12	1"
16"	160.89	14.921	18.748	14.567	11.969	2.760	6.000	1.374	4.016	5/16" * 5/16"	5	4	0.563	4.92	4	0.563	21.25	16	1"
18"	222.60	16.693	20.945	15.551	13.189	3.000	8.000	1.626	4.488	3/8" * 3/8"	6.5	4	0.811	6.5	4	0.811	22.75	16	1 1/8"
20"	275.50	18.504	23.189	16.850	14.528	3.500	8.000	1.874	5.000	1/2" * 1/2"	6.5	4	0.811	6.5	4	0.811	25	20	1 1/8"
24"	407.74	22.480	27.008	19.685	16.693	3.500	8.000	1.874	6.063	1/2" * 1/2"	6.5	4	0.811	6.5	4	0.811	29.5	20	1 1/4"

## BF Series Part Number Ordering Information

Valve Model		ANSI Class		Size		Body		Disc		Stem		Seat		Options	
XXX		XXX		XXX		X		X		X		X		XX	
BF1	Wafer	125	Class 125	020	2"	8	Ductile Iron	9	DI/ENP	9	Steel	9	Buna	01	UC Disc
BF2	Lug	P10	PN10	025	2 1/2"	7	316SS/CF8M	8	DI/Nylon-11	8	416	8	EPDM	02	Silicone Free
		P16	PN16	030	3"			7	Al. BRONZE	7	Duplex	7	Viton	03	O2 Cleaned
				040	4"			6	CF8M	6	316	6	White Buna	04	Special Painting
				050	5"			4	Monel	5	Monel	2	Nat. Rubber	05	Special Bolting
				060	6"			3	HAST C 276	4	HAST C 276	1	Neoprene	06	Antistatic
				080	8"			2	17/4 PH	3	17/4			07	Special Packing
				100	10"			1	Alloy 20	2	Alloy 20			12	NACE
				120	12"			0	Duplex 2205					13	Grease Injector
				140	14"			H	SMO255						
				160	16"										
				180	18"										
				200	20"										
				240	24"										
				300	30"										
				360	36"										
				400	40"										
				420	42"										
				480	48"										
				540	54"										
				600	60"										
				720	72"										
				D05	DN50										
				D06	DN65										
				D08	DN80										
				D10	DN100										
				D12	DN125										
				D15	DN150										
				D20	DN200										
				D25	DN250										
				D30	DN300										
				D35	DN350										
				D40	DN400										
				D45	DN450										
				D50	DN500										
				D60	DN600										

Standard Product

Special Order Product

Options only show in the figure number if there is an option

\* Other material and options available upon request

Example Part #: BF1-125-020-8888

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