

# BUTTERFLY VALVES

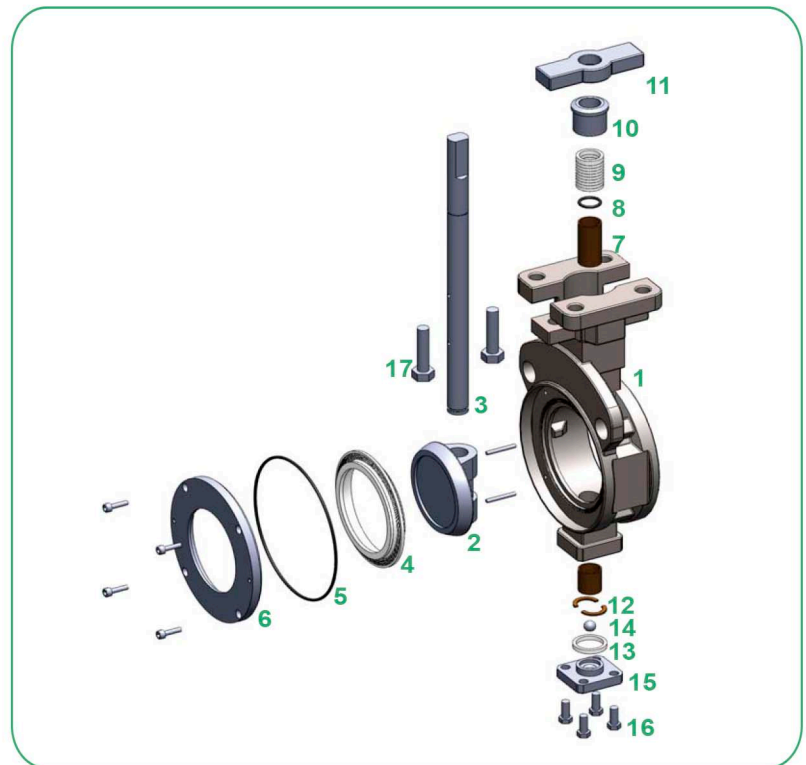
## DIRECT MOUNTED HIGH PERFORMANCE BUTTERFLY VALVE

### Series 9HI



### FEATURES

- Blow Out Stem Proof.
- Flow way direction.
- Valve mounting top flanges are based on ISO 5211 standards for direct mounting.
- The extra long neck provides path for heat dissipation and allows space for insulation.
- Pressure: 150# PSI & 300# PSI.
- The easy access Packing Gland provides means for packing adjustment, even when direct mount actuation and insulation are utilized.
- Retainer cover maintains seat integrity prior to installation and is interchangeable with any seat option.
- Bottom flange cover equalizes pressure under shaft, eliminating piston effect at higher pressure.
- Shaft retainers provide positive stem retention.
- Bottom packing prevent external leakage and simplify valve maintenance.



### STANDARD PARTS

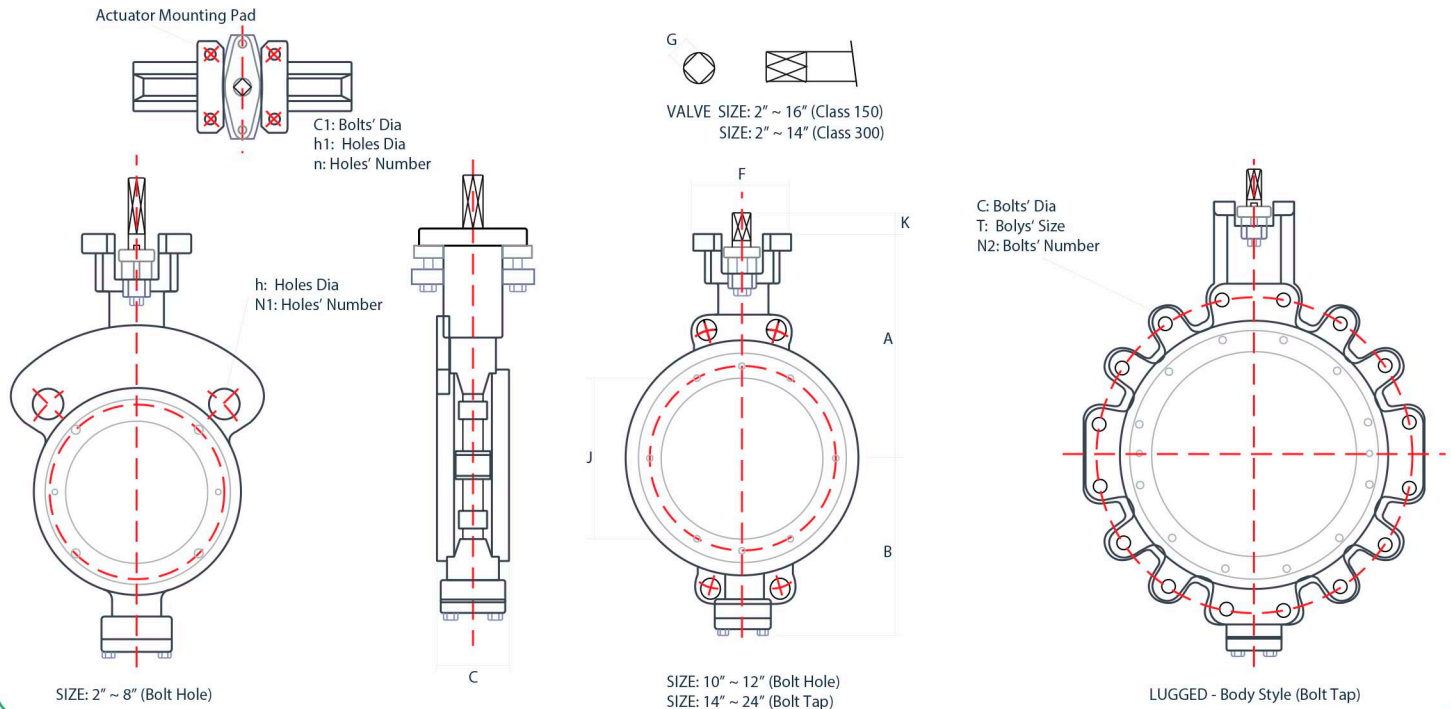
1	Body.....	316 SS	7	Stem Bearing.....	RPTFE + SS	13	Bottom Packing.....	PTFE
2	Disc.....	316 SS	8	Packing Retainer.....	VITON	14	Stem Ball.....	Stainless Steel
3	Stem.....	304 SS	9	Packing.....	PTFE	15	Bottom Cover.....	Carbon Steel
4	Seat.....	PTFE	10	Packing Follower.....	304 SS	16	Bottom Bolt.....	304 SS
5	O-Ring.....	Nitrite	11	Packing Gland.....	304 SS	17	Gland Bolt.....	304 SS
6	Seat Retainer.....	316 SS	12	Shaft Retainer.....	316 SS			



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### BLUEPRINT



### DIMENSION (INCHES)

SIZE	A		B (WAFER)		B (LUG)		C		F		J		K		ISO 5211
	150#	300#	150#	300#	150#	300#	150#	300#	150#	300#	150#	300#	150#	300#	
2"	123	123	83	83	83	83	43	43	70	70	49	49	35	35	F07
2 1/2"	144	144	94	94	95	95	47	47	70	70	62	62	35	35	F07
3"	154	154	102	102	105	105	48	48	70	70	73	73	35	35	F07
4"	174	174	117	117	121	121	54	54	70	70	95	95	35	35	F07
5"	193	193	135	135	140	140	57	57	70	70	122	122	35	35	F07
6"	213	213	155	155	161	161	57	59	70	70	141	141	35	35	F07
8"	250	250	197	210	182	210	64	73	115	115	194	194	50	50	F10
10"	275	280	228	240	228	240	72	83	115	115	238	235	50	50	F12
12"	306	320	260	270	260	270	81	92	130	130	278	276	50	50	F12
14"	330	370	290	320	290	320	92	117	130	165	318	316	50	55	F12
16"	390	420	330	360	330	360	102	133	165	165	360	358	55	80	F16
18"	425	460	360	400	360	400	114	149	165	165	433	430	80	80	F16
20"	450	500	390	450	390	450	127	159	165	165	470	468	80	80	F16
22"	495	~	425	~	425	~	154	~	250	~	520	~	80	~	F16
24"	510	570	440	520	440	520	154	181	250	250	580	578	110	110	F25



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### DIMENSION (INCHES)

SIZE	C		h		T		N1		N2		C1		n		h1	
	150#	300#	150#	300#	150#	300#	150#	300#	150#	300#	150#	300#	150#	300#	150#	300#
2"	120.7	127	19.1	19.1	5/8" - 11unc	5/8" - 11unc	2	2	4	8	70	70	4	4	10	10
2 1/2"	139.7	149.4	19.1	22.2	5/8" - 11unc	3/4" - 10unc	2	2	4	8	70	70	4	4	10	10
3"	152.4	168.1	19.1	22.2	5/8" - 11unc	3/4" - 10unc	2	2	4	8	70	70	4	4	10	10
4"	190.5	200.2	19.1	22.2	5/8" - 11unc	3/4" - 10unc	2	2	8	8	70	70	4	4	10	10
5"	215.9	235	22.2	22.2	3/4" - 10unc	3/4" - 10unc	2	2	8	8	70	70	4	4	10	10
6"	241.3	269.7	22.2	22.2	3/4" - 10unc	3/4" - 10unc	2	2	8	12	70	70	4	4	10	10
8"	298.5	330.2	22.2	25.4	3/4" - 10unc	7/8" - 9unc	2	2	8	12	102	102	4	4	12	12
10"	362	387.4	25.4	28.6	7/8" - 9unc	1" - 8unc	4	4	12	16	125	125	4	4	12	12
12"	431.8	450.9	25.4	31.8	7/8" - 9unc	1.1/8" - 8unc	4	4	12	16	125	125	4	4	17	17
14"	476.3	514.4	1" - 8unc	1.1/8" - 8unc	1" - 8unc	1.1/8" - 8unc	4	4	12	20	125	125	4	4	17	17
16"	539.8	571.5	1" - 8unc	1.1/4" - 8unc	1" - 8unc	1.1/4" - 8unc	4	4	16	20	165	165	4	4	23	23
18"	577.9	628.7	1.1/8" - 8unc	1.1/4" - 8unc	1.1/8" - 8unc	1.1/4" - 8unc	4	4	16	24	165	165	4	4	23	23
20"	635	685.8	1.1/8" - 8unc	1.1/4" - 8unc	1.1/8" - 8unc	1.1/4" - 8unc	4	4	20	24	165	165	4	4	23	23
22"	692.2	~	1.1/4" - 8unc	~	1.1/4" - 8unc	~	4	~	20	~	165	~	4	4	23	~
24"	749.3	812.8	1.1/4" - 8unc	1.1/2" - 8unc	1.1/4" - 8unc	1.1/2" - 8unc	6	6	20	24	254	254	4	4	23	23

### Valves CV Rating

SIZE	INCH	mm	CLASS	OPENING ANGLE							
				90°	70°	60°	50°	40°	30°	10°	
2"	50		150	93	65	46	31	21	13	2	
			300	93	65	46	31	21	13	2	
2 1/2"	65		150	152	106	76	52	35	21	4	
			300	152	106	76	52	35	21	4	
3"	80		150	263	184	133	89	61	36	6	
			300	263	184	133	89	61	36	6	
4"	100		150	465	329	237	164	107	65	14	
			300	465	329	237	164	107	65	14	
5"	125		150	768	545	394	263	177	106	22	
			300	768	545	394	263	177	106	22	
6"	150		150	1162	813	606	404	268	167	40	
			300	1162	813	606	404	268	167	40	
8"	200		150	2121	1505	1091	742	490	293	66	
			300	1919	1364	990	672	444	268	61	
10"	250		150	3232	2293	1697	1131	742	449	101	
			300	2828	2005	1485	990	651	394	91	
12"	300		150	4747	3419	2545	1661	1091	667	152	
			300	4141	2985	2222	1449	954	581	131	
14"	350		150	5858	4101	2879	1970	1384	818	192	
			300	5555	3889	2732	1869	1278	778	182	
16"	400		150	8080	5727	3939	2747	1838	1121	253	
			300	7676	5439	3742	2611	1747	1066	237	
18"	450		150	10605	7474	5353	3555	2288	1475	343	
			300	9999	7050	5050	3353	2192	1389	323	
20"	500		150	14140	9999	7070	4848	3232	1959	434	
			300	13130	9582	6565	4505	3000	1818	404	
24"	600		150	21210	15049	10807	7373	4878	2969	657	
			300	19695	13978	10039	6848	4530	2757	611	

### Valves Torque 150# (Lbs - Ins)

SIZE	INCH	mm	SOFT SEATED				METAL SEATED			
			70 PSI	150 PSI	210 PSI	285 PSI	70 PSI	150 PSI	210 PSI	285 PSI
2"	50		218	244	261	270	435	479	487	496
2 1/2"	65		318	341	365	400	636	671	682	735
3"	80		387	429	456	525	787	829	856	927
4"	100		458	536	615	720	1008	1099	1151	1193
5"	125		785	882	962	1250	1458	1634	1746	2067
6"	150		978	1215	1417	1535	1890	2007	2125	2262
8"	200		1327	1857	1960	2270	2535	2786	3095	3417
10"	250		2099	2657	3200	3700	3599	4199	4956	5549
12"	300		2818	3824	4729	5635	4528	5837	7144	8375
14"	350		4325	5610	7165	9100	7913	10385	12858	13813
16"	400		5624	7652	9734	12775	9464	13248	15614	21523
18"	450		8130	10904	13356	17350	13380	17846	21811	25062
20"	500		1022	15818	17182	2400	17454	22909	29454	37028
24"	600		15195	20894	25117	31340	23268	30391	37513	47009

### Valves Torque 150# (Lbs - Ins)

SIZE	INCH	mm	SOFT SEATED				METAL SEATED			
			150 PSI	350 PSI	600 PSI	740 PSI	150 PSI	350 PSI	600 PSI	740 PSI
2"	50		353	444	466	478	671	727	773	784
2 1/2"	65		444	554	596	610	846	915	970	1025
3"	80		475	601	654	685	894	1006	1048	1160
4"	100		674	980	1072	1180	1379	1608	1900	2007
5"	125		975	1388	1618	1800	1866	2229	2543	2725
6"	150		1138	1611	1862	1965	1891	2438	2777	2999
8"	200		2055	2805	3278	3538	3309	4533	5266	5511
10"	250		2888	4470	5282	5892	4571	6965	7952	8489
12"	300		3992	6666	8039	8627	6092	12604	15237	17856
14"	350		5891	11577	14472	15925	10136	17366	21190	24119
16"	400		8847	16774	20323	22356	14227	25404	33534	35566
18"	450		11749	13447	27769	29904	19225	36313	48060	52874
20"	500		18577	33119	39141	42152	26872	53744	72938	79336
24"	600		24193	41399	51232	54845	35190	65980	89074	98970



# BUTTERFLY VALVES

## DIRECT MOUNTED HIGH PERFORMANCE BUTTERFLY VALVE



### Double Offset Design Seating

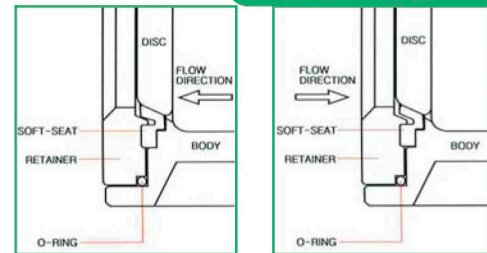
The double offset shaft&disc design ensures bidirectional sealing throughout the full pressure range of the valve. The cam/like action produced by the offset stem and disc, effectively lifts the disc off the seat during the initial opening of the valve, reducing seat wear and eliminating seat deformation at the top and bottom.

When the disc is in the open position, there is no contact between the disc and seat. Operating torques are reduced and seat life is extended.

### Standard Specifications

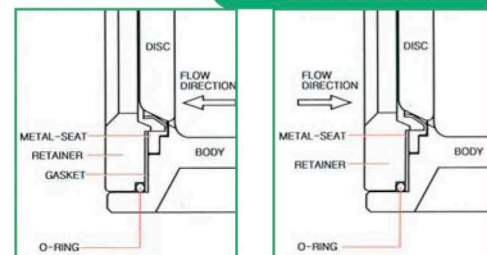
- Body Style: Wafer, Lug
- Valve Size: 3/4" - 48" (20-1200mm)
- Rating: ANSI Class 150, ANSI Class 300
- Applicable Flange Standard: ANSI B16.5
- Face to Face Dimensions: API 609, MSS SP 68, ISO 5752
- Actuator Mounting Flange: ISO 5211
- Valve Design: MSS SP-68
- Valve Design: API 609
- Valve Design: ANSI B16.34
- Valve Testing: API 598 Inspection and Testing
- Valve Testing: MSS SP-61 Testing of Steel Valves
- Valve Marking: MSS SP-25
- Valve to Official API Monogram
- Valve to API Specification Q1
- Valve to API 609

### Soft Seat



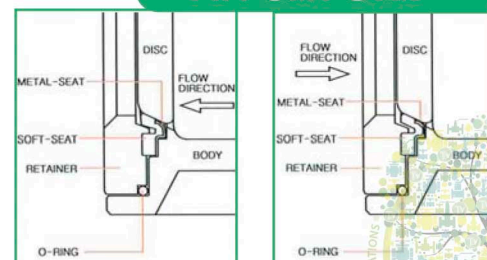
Seat Material Maximum Working Temperature  
PTFE-SEAT 190°C (375 F) TFM-SEAT 246°C (475 F)  
RPTFE-SEAT 230°C (446 F) PEEK-SEAT 270°C (529 F)

### Metal Seat



Seat Material Maximum Working Temperature  
METAL-SEAT 315°C (600 F)  
Class V of ANSI / FCI 70-2 Class V leakage rate

### Fire Safe Seat

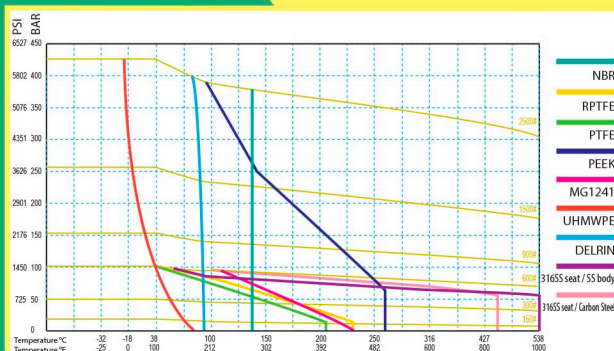


Seat Material Maximum Working Temperature  
SS316L \* RPTFE 230°C (446 F)  
FIRE-SAFE to API 607 5th Edition  
SEAT LEAKAGE-Leakage of soft seated version is Zero

### PRESSURE-TEMPERATURE RATINGS

2" - 24"

9HI BUTTERFLY VALVE



Whole valve rating is defined by the lesser material rating (body or seat).



# BALL VALVES

## DIRECT MOUNTED HIGH PERFORMANCE BUTTERFLY VALVE

### HOW TO ORDER

VALVE BODY DESIGN (SERIES)	SPECIAL FEATURES	MATERIAL			ENDS	CLASS	SIZE <sup>(1)</sup>	OPERATION
		BODY	TRIM	SEAT				
<b>9HI</b> Direct Mounted High Performance Butterfly Valve	<b>F</b> Fire Safe	<b>2</b> WCB	<b>3</b> 316SS	<b>P</b> PTFE	<b>L</b> LUG <b>W</b> WAFER	<b>0</b> ANSI 150# <b>3</b> ANSI 300# <b>6</b> ANSI 600#	<b>01.5</b> 1 1/2" <b>02</b> 2" <b>02.5</b> 2 1/2" <b>03</b> 3" <b>04</b> 4" <b>05</b> 5" <b>06</b> 6" <b>08</b> 8" <b>10</b> 10" <b>12</b> 12" <b>14</b> 14" <b>16</b> 16" <b>18</b> 18" <b>20</b> 20" <b>22</b> 22" <b>24</b> 24"	<b>L</b> Manual Lever Operator <b>G</b> Gear Operator <b>B</b> Bare Shaft <b>P</b> Pneumatic Actuator <b>E</b> Electric Actuator
	<b>N</b> NACE	<b>3</b> CF8M	<b>4</b> 304SS	<b>R</b> RPTFE				
	<b>G</b> Fire Safe & NACE	<b>4</b> CF8	<b>17</b> 17-4 PH	<b>T</b> TFM				
	<b>Y</b> Cryogenic	<b>6</b> A395 DI	<b>8</b> ALLOY 20	<b>K</b> PEEK				
	<b>O</b> Oxygen	<b>8</b> ALLOY 20	<b>9</b> HASTELLOY	<b>W</b> 316L SS + RPTFE				
		<b>9</b> HASTELLOY	<b>0</b> MONEL	<b>X</b> 316SS				
			<b>0</b> MONEL					

Example

Direct Mounted High Performance Butterfly Valve, Body CF8M, Trim 316SS, Seat PEEK, Wafer 300# Size 12" with Gear Operator.

**9HI-33K-W312G**

