

# PRATT<sup>®</sup> INDUSTRIAL

a **MUELLER** brand

## HP SERIES HIGH PERFORMANCE DOUBLE OFFSET BUTTERFLY VALVE

Engineering Creative Solutions for Fluid Systems Since 1901



**MUELLER**

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# CONSTRUCTION SPECIFICATION

## Pratt Industrial® HP Series Butterfly Valves

**SIZES 2" THROUGH 72" (2" - 72": ANSI 150; 2" - 48" ANSI 300; 3" - 24" ANSI 600)**



**Wafer Type Butterfly Valve – Bare Stem**



**Lug Type Butterfly Valve with Gear Operator**

**Sizes:** 2" through 72"

**Body:** WCB A-216 Carbon Steel, CF8M A351 Stainless Steel

**Disc:** CF8M A351 Stainless Steel

**Stem:** 17-4 PH Stainless Steel

**Seat:** PTFE, RTFE, 316 SS, Inconel, Fire Safe, MTFE

**Bearing Material:** Graphite Reinforced Teflon, 316 SS

**Packing Material:** PTFE Cup & Cone, Graphite

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

**Pressure Ratings:** CL.150 - 2 - 72"; CL. 300 - 2" - 48"; CL.600 - 3" - 24"

**Note: Many alloys & seat materials are available to accommodate virtually any service condition.**

### Features:

- Double offset disc & shaft
- Blowout proof shaft design
- Bi-Directional (soft seat only)
- Vacuum rated dead end & double dead end service (lug type only)
- Fire safe certified (metal seat and fire safe seat, API 607)
- Spherical sealing surface

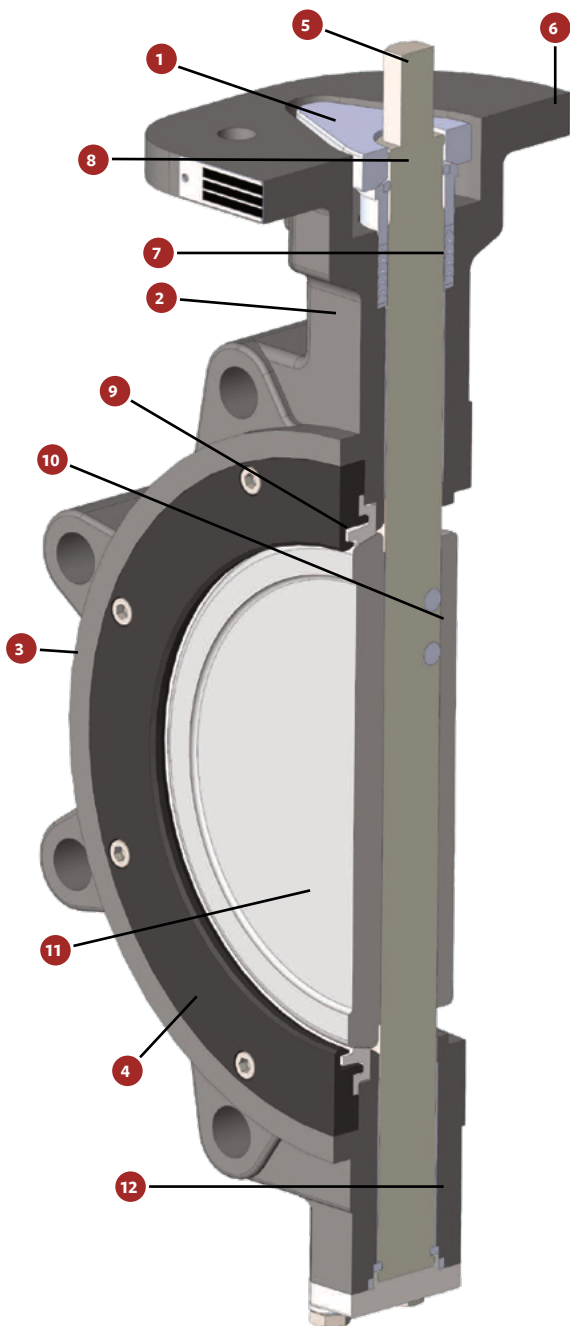
### Optional Features:

- Live loaded packing
- O<sub>2</sub> cleaning
- Steam jacket
- Bonnet extension
- Oil free cleaning
- Anti static
- Customized option designs are available upon request

# DESIGN DETAILS

## Pratt Industrial® HP Series Butterfly Valves

SIZES 2" THROUGH 72" (2" - 72": ANSI 150; 2" - 48" ANSI 300; 3" - 24" ANSI 600)



**1. Below Bonnet Gland Packing:** Our recessed gland packing eliminates the requirement for mounting kit and reduces overall package height. Our cup and cone design gland flange and packing compression guide allows an even compression of packing even if field adjustments are made incorrectly.

**2. Extended Neck:** Bonnet to flange clearance is a minimum of 2" allowing for piping insulation on all sizes of valves.

**3. Body:** Precision cast bodies in virtually any alloy allows customers to utilize proper materials for virtually any application. Castings conform to all applicable ASME codes. Certified independent testing can be performed when requested or required such as RT and PT. Bodies are available in Wafer, Lug, Double Flanges and Butt-weld.

**4. Seat Retention Ring:** Our highly engineered retainer plate assures customer of proper seat stability and allows for full rated bi-directional, dead end service. The HP Series seat retention ring conforms to the latest revisions of API 609 accommodating spiral wound gasket sealing elements to fall outside the bolting area.

**5. Shaft:** Our hardened 17-4 PH one piece design provides shaft strength and integrity under the most severe conditions. Other shaft materials are available depending upon application.

**6. Bonnet:** Allows for direct mounting of all types of actuation. Standard drilling conforms to Kv industrial standards. ISO drilling is also available upon request.

**7. Packing:** Multi-layered "Cup and Cone" PTFE packing allows for even compression against shaft and shaft journal area providing a positive seal even under high cycles. Multi layered graphite packing is available for metal seated and fire safe valves.

**8. Blowout Proof Shaft Retention:** Engineered to be one of the safest valves in the market our shaft retention system meets API requirements. Shaft retention system allows the gland flange and follower to slide up and down a machined recessed portion of the shaft. If a shaft were to shear our system prevents hydraulic force from projecting the shaft keeping it safely retained above the packing.

**9. Seat:** The HP Series seat is machined to lock between the body and retention ring but is allowed to move under pressure. This allows us to utilize solid seats giving maximum disc edge coverage, high cycle life and very low torque without the requirement for rubber O-ring energizers or metal back up support.

**10. Disc to Shaft Pins:** A tangential tapered hole is machined on the leading edge of the valve shaft and through the shaft journal of the disc placing the pins in a compression mode. Taper pins are spot welded in place after final assembly.

**11. Disc:** Disc is designed to have minimal deflection and movement under pressure which reduces torque and improves cycle life. The discs tapered edge and offset shaft journal generates a "camming" motion allowing for a release from the seat within the first few degrees of opening.

**12. Bearings:** Full length upper and lower bearing materials are constructed of 316 SS. impregnated with either PTFE or Graphite depending on Service conditions.

# SUGGESTED SPECIFICATIONS

## Pratt Industrial® HP Series Butterfly Valves

### SIZES 2" THROUGH 72" (2" - 72": ANSI 150; 2" - 48" ANSI 300; 3" - 24" ANSI 600)

#### General

Valves shall be of Wafer, Lug or Double Flanged design for installation between ANSI 150, 300 or 600 flanges. Design Standards: API 609, ANSI/ASME B16.34, soft seated and metal seated, and API 607 (Fire Safe Test)

#### Pressure Rating

ANSI 150 – 285psi

ANSI 300 – 740psi

ANSI 600 – 1440psi

#### Body

Standard valve body shall be 1 piece Carbon Steel (ASTM 216) or CF8M (ASTM A351) construction conforming to the following. Many other materials available upon request including high alloys.

API 609 Category B

MSS-SP-68 Table 1

ANSI/ASME B 16.10 Table 8

ISO 5752 Table 1 & BS 5155

ANSI/ASME B 16.5 Class 150, 300, 600

ANSI/ASME B 16.47 Series A Class 150, 300

MSS-SP-44 Class 150, 300, 600

#### Disc

Standard valve disc shall be CF8M (ASTM 351) with other materials available upon request. The angled sealing surface allows for quick release from seat which reduces torque and seat wear.

#### Integrally Cast Travel Position Stop

Designed to prevent over travel of disc and provides a set point when calibrating automation.

#### Blow Out Proof Shaft

Standard valve shaft shall be constructed of 17-4 PH Stainless Steel to provide maximum strength and stability for high torque applications. Other materials available upon request.

#### Seat

Valve seat shall be PTFE, RTFE or MTFE as standard offering. Seat design is free floating and pressure assisted to provide an interference and pressure assisted seal to achieve a positive seal under both low and high pressures in both directions. Fire safe and Metal Seats are also available.

#### Seat Retainer Plate

Shall follow body material and shall conform to the latest revisions of API accommodating Spiral wound gaskets to seal with no special requirements. Bolting is located outside the sealing element.

#### Packing

Soft seated valve shall use Teflon "Cup and Cone" packing. Metal Seated and Fire Safe valves shall use Die-formed Graphite packing. Either arrangement shall be easily adjustable with no special tools required.

#### Gland Packing

Pratt Industrial's below bonnet gland packing allows for automation to direct mount with no brackets and couplers which can allow hysteresis on valve shaft. Pratt's overall package remains low profile reducing overall space requirements.

#### Bearings

Pratt Industrial utilizes a Stainless Steel/Teflon bearing material for soft seated valves and Stainless Steel/Graphite for Fire Safe and Metal Seated valves. Both materials are superior in reducing friction and side thrust and are suitable for corrosive applications.

#### Testing

All valves are 100% tested per API 598 and documented. Standard Testing reports and MTR's can be supplied at any time at no charge. Customized testing can also be performed based on customer's requirements.

Additional materials are available. Contact Pratt Industrial or your local Pratt distributor for more information.

# CV FLOW DATA

## Pratt Industrial® HP Series Butterfly Valves, ANSI 150

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

**Cv VALUE OF HIGH PERFORMANCE BUTTERFLY VALVE CLASS 150**

SIZE		DEGREE OF OPENING									
inch	mm	10°	20°	30°	40°	50°	60°	70°	80°	90°	
2	50	2	5	12	19	32	45	65	81	88	
2.5	65	3	9	21	33	54	77	111	138	150	
3	80	5	14	32	50	82	116	168	209	227	
4	100	9	25	57	90	148	209	303	377	410	
5	125	16	44	104	163	266	377	548	681	740	
6	150	25	65	150	235	380	540	785	975	1060	
8	200	55	130	305	480	785	1110	1615	2005	2200	
10	250	85	205	475	750	1225	1735	2520	3135	3400	
12	300	115	280	655	1025	1680	2380	3450	4290	4700	
14	350	150	355	830	1305	2140	3030	4395	5465	5900	
16	400	200	475	1115	1750	2860	4055	5880	7310	7900	
18	450	265	630	1475	2315	3790	5365	7790	9680	10500	
20	500	345	830	1935	3040	4975	7050	10230	12715	13800	
22	550	375	975	2275	3580	5855	8295	12035	14960	16300	
24	600	485	1265	2955	4640	7590	10755	15605	19405	21100	
26	650	550	1450	3350	5300	8650	12250	17800	22100	24000	
28	700	650	1750	4050	6350	10350	14650	21300	26450	28800	
30	750	750	2000	4600	7250	11900	16850	24400	30350	33000	
32	800	850	2350	5450	8600	14050	19900	28850	35850	39000	
34	850	1000	2750	6450	10150	16650	23550	34200	42500	46200	
36	900	1100	2950	6900	10900	17800	25200	36600	45500	49400	
40	1000	1550	4000	9300	14650	23950	33900	49200	60500	66500	
42	1050	1650	4350	10100	15900	26000	36850	53450	65000	72200	
48	1200	2350	6100	14200	22350	36550	51800	75150	91450	101600	

**Cv VALUE OF HIGH PERFORMANCE BUTTERFLY VALVE CLASS 300**

SIZE		DEGREE OF OPENING									
inch	mm	10°	20°	30°	40°	50°	60°	70°	80°	90°	
2	50	2	5	12	19	32	45	65	81	88	
2.5	65	3	9	21	33	54	77	111	138	150	
3	80	5	14	32	50	82	116	168	209	227	
4	100	9	25	57	90	148	209	303	377	410	
5	125	16	44	104	163	266	377	548	681	740	
6	150	24	60	139	218	357	506	735	914	995	
8	200	45	110	260	410	670	945	1375	1710	1900	
10	250	75	175	415	650	1065	1505	2185	2720	3000	
12	300	105	250	580	910	1495	2115	3070	3815	4100	
14	350	135	325	755	1185	1940	2750	3985	4955	5400	
16	400	175	415	970	1520	2490	3525	5120	6365	6900	
18	450	245	590	1375	2165	3540	5015	7275	9045	9800	
20	500	315	760	1770	2780	4555	6450	9360	11635	12600	
24	600	435	1135	2645	4155	6800	9635	13980	17380	18900	
30	750	650	1750	4050	6400	10450	14800	21500	26700	29000	
36	900	1000	2700	6300	9900	16200	22900	33250	41350	44900	
40	1000	1450	3800	8900	13950	22850	32400	47000	57800	63500	
42	1050	1500	3950	9250	14550	23850	33750	49000	59600	66200	
48	1200	2100	5450	12750	20050	32850	46550	67500	82100	91200	

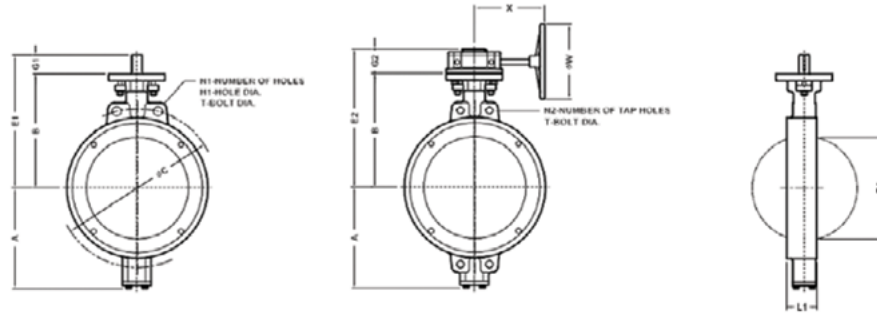
**Cv VALUE OF HIGH PERFORMANCE BUTTERFLY VALVE CLASS 600**

SIZE		DEGREE OF OPENING									
inch	mm	10°	20°	30°	40°	50°	60°	70°	80°	90°	
3	80	3	9	21	33	54	77	112	139	151	
4	100	5	15	34	53	87	124	180	224	243	
6	150	15	38	88	139	228	322	468	581	630	
8	200	30	70	160	250	410	580	845	1050	1100	
10	250	50	120	285	450	735	1040	1510	1875	2000	
12	300	70	165	380	600	980	1390	2015	2505	2700	
14	350	90	220	515	810	1330	1880	2730	3395	3700	
16	400	125	305	705	1110	1820	2575	3735	4645	5100	
18	450	135	325	765	1200	1965	2780	4035	5015	5500	
20	500	195	470	1095	1715	2810	3980	5775	7180	7800	
24	600	300	750	1750	2750	4500	6400	9250	11500	12500	

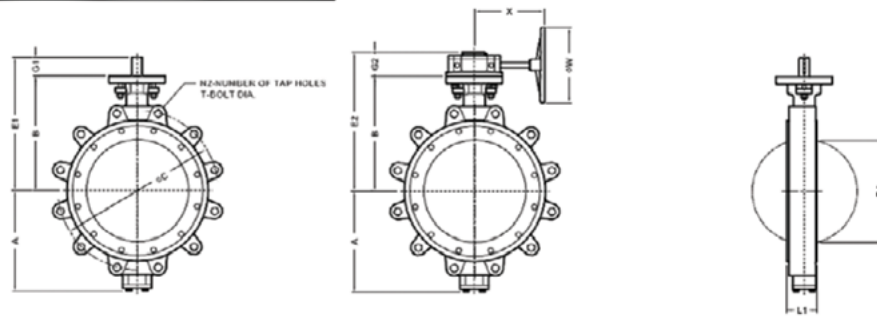
# DIMENSIONAL DATA

## Pratt Industrial® HP Series Butterfly Valves, ANSI 150

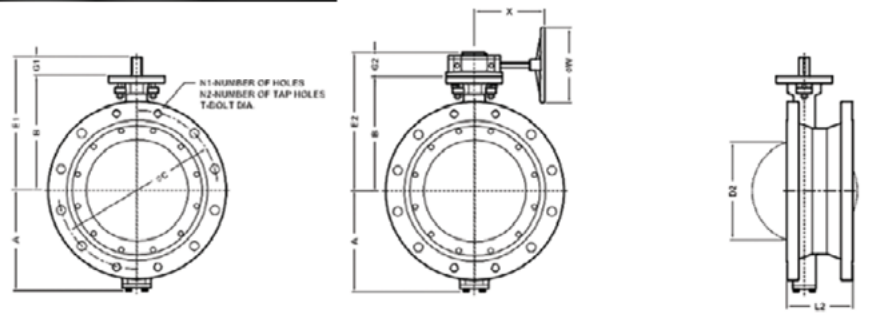
### WAFFER STYLE



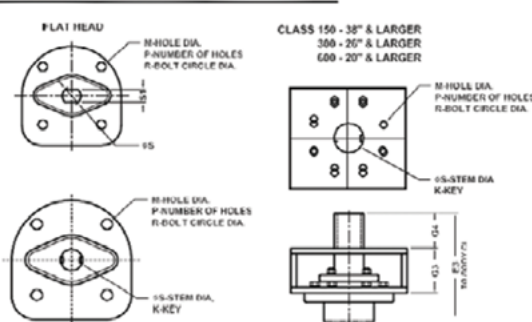
### LUGGED STYLE



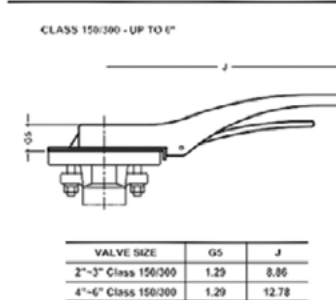
### FLANGED STYLE



### TOP WORKS



### HAND LEVER



VALVE SIZE	G5	J
2"-3" Class 150/300	1.29	8.86
4"-6" Class 150/300	1.29	12.78

## HP SERIES WEIGHTS

SIZE	CLASS 150		CLASS 300		CLASS 600	
	WAFER	LUG	WAFER	LUG	WAFER	LUG
2"	9	10	9	10		
2.5"	12	14	12	15		
3"	13	15	18	22	40	53
4"	18	24	20	24	51	68
5"	24	30	26	40	73	114
6"	29	37	33	48	134	163
8"	51	63	57	81	220	260
10"	72	99	132	178	293	438
12"	103	140	150	196	561	667
14"	130	175	215	328	719	920
16"	190	265	345	464	829	1,122
18"	270	325	464	605	944	1,415
20"	350	450	579	662	1,144	1,617
24"	557	763	904	1,005	1,437	2,110
26"	651	840	1,078	1,322		
28"	689	895	1,212	1,516		
30"	862	1,014	1,368	1,712		
32"	909	1,129	1,503	1,881		
36"	1,384	1,560	1,808	2,262		
40"	1,674	2,125	2,200	2,750		
42"	2,009	2,363				
48"	2,268	2,537				

## DIMENSIONS: CLASS 150

SIZE (inch)	A	B	G1	G2	G3	G4	E1	E2	E3	X	W	D1	D2	L1	L2	C	T	FLANGED DRILLING						TOP WORKS					
																		WAFER		LUG		FLANGE	R	P	M	S1	S	KEY	
																		N1	N2	H1	N2	N1							N2
2	4.18	4.92	1.26	2.36	-	-	6.18	7.28	-	7.00	6.00	1.52	0.98	1.73	-	4.75	5/8"x11UNC	2	-	3/4	4	-	-	3.25	4	0.43	0.374	0.551	-
2.5	4.26	5.87	1.26	2.36	-	-	7.13	8.23	-	7.00	6.00	2.18	1.63	1.89	-	5.50	5/8"x11UNC	2	-	3/4	4	-	-	3.25	4	0.43	0.437	0.624	-
3	4.65	6.30	1.26	2.36	-	-	7.56	8.66	-	7.00	6.00	2.71	2.14	1.93	-	6.00	5/8"x11UNC	2	-	3/4	4	-	-	3.25	4	0.43	0.437	0.624	-
4	5.12	7.01	1.26	2.36	-	-	8.27	9.37	-	7.00	6.00	3.54	3.03	2.13	5.00	7.50	5/8"x11UNC	2	-	3/4	8	4	4	3.25	4	0.43	0.500	0.748	-
5	5.79	7.60	1.26	2.36	-	-	8.86	9.96	-	7.00	6.00	4.50	4.05	2.24	5.51	8.50	3/4"x10UNC	2	-	7/8	8	4	4	3.25	4	0.43	0.500	0.748	-
6	6.81	8.39	1.26	2.36	-	-	9.65	10.75	-	7.00	6.00	5.39	4.98	2.24	5.51	9.50	3/4"x10UNC	2	-	7/8	8	4	4	3.25	4	0.43	0.500	0.748	-
8	7.99	9.45	1.26	2.73	-	-	10.71	12.18	-	10.07	12.00	7.24	6.93	2.56	5.98	11.75	3/4"x10UNC	2	-	7/8	8	4	4	5.00	4	0.55	0.626	0.874	-
10	8.97	11.02	2.05	2.73	-	-	13.07	13.75	-	10.07	12.00	9.13	8.81	2.83	6.50	14.25	7/8"x9UNC	2	-	1	12	8	4	5.00	4	0.55	-	1.124	0.25x0.25
12	10.74	12.20	2.01	2.73	-	-	14.21	14.93	-	10.07	12.00	10.90	10.50	3.19	7.01	17.00	7/8"x9UNC	2	-	1	12	8	4	5.00	4	0.55	-	1.124	0.25x0.25
14	12.12	13.19	2.24	3.44	-	-	15.43	16.63	-	12.00	12.00	12.31	11.95	3.62	7.48	18.75	1"x8UNC	2	-	1-1/8	12	8	4	5.00	4	0.55	-	1.374	0.31x0.31
16	13.70	15.47	2.99	3.44	-	-	18.46	18.91	-	12.00	12.00	14.08	13.78	4.02	8.50	21.25	1"x8UNC	2	-	1-1/8	16	12	4	6.50	4	0.83	-	1.874	0.50x0.50
18	15.07	16.54	2.99	4.03	-	-	19.53	20.57	-	12.09	16.00	16.22	15.86	4.49	8.74	22.75	1 1/8"x8UN	-	4	-	16	12	4	6.50	4	0.83	-	1.874	0.50x0.50
20	16.26	17.72	2.99	4.03	-	-	20.71	21.75	-	12.09	16.00	17.84	17.51	5.00	9.02	25.00	1 1/8"x8UN	-	4	-	20	16	4	6.50	4	0.83	-	2.124	0.50x0.50
22	17.71	19.29	4.02	5.12	-	-	23.31	24.41	-	16.93	23.62	19.53	19.28	6.06	10.51	27.25	1 1/4"x8UN	-	4	-	20	16	4	10.00	8	0.75	-	2.555	0.75x0.50
24	19.09	20.87	4.02	5.12	-	-	24.89	25.99	-	16.93	23.62	21.24	21.02	6.06	10.51	29.50	1 1/4"x8UN	-	4	-	20	16	4	10.00	8	0.75	-	2.555	0.75x0.50
26	20.27	22.24	4.02	5.12	-	-	26.26	27.36	-	16.93	23.62	22.71	22.36	6.50	11.50	31.75	1 1/4"x8UN	-	4	-	24	20	4	10.00	8	0.75	-	2.555	0.75x0.50
28	21.65	23.62	4.02	5.12	-	-	27.64	28.74	-	16.93	23.62	24.76	24.49	6.50	11.50	34.00	1 1/4"x8UN	-	4	-	28	24	4	10.00	8	0.75	-	2.555	0.75x0.50
30	23.42	25.39	4.45	6.81	-	-	29.84	32.20	-	18.82	27.56	26.45	26.18	7.48	12.52	36.00	1 1/4"x8UN	-	4	-	28	24	4	10.00	8	0.75	-	3.146	0.87x0.55
32	24.60	26.38	4.45	6.81	-	-	30.83	33.19	-	18.82	27.56	28.42	28.19	7.48	12.52	38.50	1 1/2"x8UN	-	4	-	28	24	4	10.00	8	0.75	-	3.146	0.87x0.55
34	26.57	27.56	4.45	6.81	-	-	32.01	34.37	-	18.82	27.56	30.16	29.96	7.99	12.99	40.50	1 1/2"x8UN	-	4	-	32	28	4	10.00	8	0.75	-	3.146	0.87x0.55
36	26.77	28.74	4.45	6.81	-	-	33.19	35.55	-	18.82	27.56	32.16	31.93	7.99	12.99	42.75	1 1/2"x8UN	-	4	-	32	28	4	10.00	8	0.75	-	3.146	0.87x0.55
38	27.56	27.56	-	6.69	5.91	4.72	-	40.16	38.19	22.83	27.56	33.93	33.66	8.50	16.14	45.25	1 1/2"x8UN	-	4	-	32	28	4	11.73	8	0.91	-	3.933	1.10x0.63
40	29.84	30.12	-	6.69	5.91	4.72	-	42.72	40.75	22.83	27.56	36.33	35.98	8.50	16.14	47.25	1 1/2"x8UN	-	4	-	36	32	4	11.73	8	0.91	-	3.933	1.10x0.63
42	31.10	30.71	-	6.69	6.30	4.72	-	43.70	41.73	22.83	27.56	37.91	37.76	9.49	16.93	49.50	1 1/2"x8UN	-	4	-	36	28	8	11.73	8	0.91	-	3.933	1.10x0.63
48	35.43	34.65	-	6.69	6.30	5.31	-	47.64	46.26	22.83	27.56	43.93	43.46	10.00	18.50	56.00	1 1/2"x8UN	-	8	-	44	36	8	11.73	8	0.91	-	4.720	1.26x0.71







# PART NUMBER ORDERING INFORMATION

## Pratt Industrial® HP Series Butterfly Valves

Valve Model		ANSI Class		Size		Body		Disc		Stem		Seat		OPTIONS	
XXX		XXX		XXX		X		X		X		X		XX	
HP1	WAFER	150	CLASS 150	020	2"	7	316 SS / CF8M (NACE)	6	CF8M	7	DUPLEX	0	PTFE	02	SILICONE FREE
HP2	LUG	300	CLASS 300	025	2 1/2"	6	WCB	4	MONEL	6	316	A	RTFE	03	O <sub>2</sub> CLEANED
HP3	SHORT FLANGED	600	CLASS 600	030	3"	5	INCOLLOY	3	HAST C 276	5	MONEL	B	MTFE	04	SPECIAL PAINTING
HP4	LONG FLANGED			040	4"	4	MONEL	2	17-4 PH	4	HAST C 276	C	RMTFE	05	SPECIAL BOLTING
HP5	BUTTWELD			050	5"	3	HASTELLOY C	1	ALLOY 20	3	17-4	D	UHMWPE	06	ANTISTATIC
				060	6"	2	SMO254	0	DUPLEX 2205	2	ALLOY 20	E	316 SS.	07	SPECIAL PACKING
				080	8"	1	A20	B	SUPER DUPLEX	1	NITRONIC 50	F	INCONEL	08	CRYOGENIC
				100	10"	0	DUPLEX 2205	H	SMO255			G	RTFE/316SS	12	NACE
				120	12"	A	SUPER DUPLEX 2507					H	MRTFE/316		
				140	14"	F	SMO255					I	MRTFE/INCONEL		
				160	16"	G	WC6					K	DUPLEX + RTFE		
				180	18"	H	WC9					L	DUPLEX		
				200	20"	I	C5					M	SUPER DUPLEX		
				240	24"	J	C12					N	ALLOY 20		
				260	26"	K	C12A					O	MONEL		
				280	28"	L	INCONEL								
				300	30"										
				320	32"										
				340	34"										
				360	36"										
				400	40"										
				420	42"										
				480	48"										
				540	54"										
				600	60"										
				720	72"										

Example Part #: HP1-150-020-663A-00



Standard Product



Special Order Product

## About Pratt Industrial®

Pratt Industrial specializes in the design, engineering, and worldwide distribution of technologically advanced, industrial-use valves and actuators. 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 65,000 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:

- Chemical / Pharmaceutical
- Desalination
- Food and Beverage
- HVAC
- Irrigation
- Mining
- Marine
- OEMs
- Petroleum / Oilfield
- Power
- Transportation
- Ultra Pure Water

**Discover the Right Industrial-use Valves and Actuators for your Market Needs.**

**Scan the QR Code to Get Started**



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