PRATT®
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HE Series Butterfly Valve

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 engineering 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:

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

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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

Valve with Lever Operator

Sizes: 2" through 12"

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

Disc: CF8M A351 Stainless Steel

Stem: 17-4 PH Stainless Steel

Seat: RMTFE

Bearing Material: 316 Impregnated with RTFE

Packing Material: PTFE Cup & Cone

Actuation Options: Worm Gear, Lever, Pneumatic, Electric

Pressure Ratings: CL 150 - 2" - 12", CL 300 - 2"-12"

Valve with Gear Operator

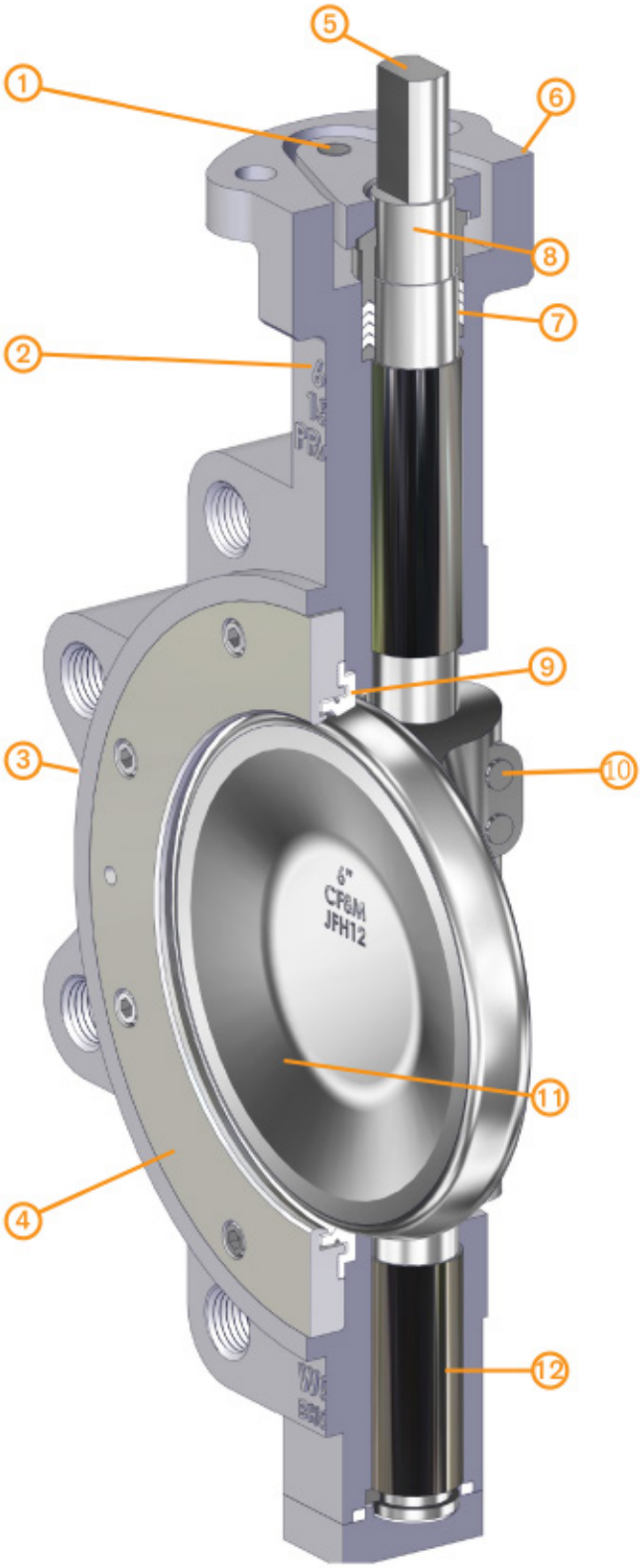
Features:

- Double offset disc & shaft
- Blowout proof shaft design
- Bi-Directional (Soft Seat only)
- Dead End & Double Dead End Service (Lug Type only)
- Spherical Sealing Surface with Live Loaded Springwire

Optional Features:

- Live loaded packing
- O2 Cleaning
- Bonnet extension
- Oil free cleaning
- Anti static
- Customized option designs are available upon request

DESIGN DETAILS



1. **Below Bonnet Gland Packing:** Our recessed gland packing eliminates the requirement for mounting kit and reduces overall package height allowing for the direct mounting of ISO actuator. 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 WCB, CF8M. 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 and lug.
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 HE 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 one piece design provides shaft strength and integrity under the most severe conditions.
6. **Bonnet:** Allows for direct mounting of all types of actuation. Standard drilling conforms to ISO 5211.
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.
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 HE 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. A spring wire is placed behind the seat to create addtional loading seal against the disc edge.
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 S.S. impregnated with RTFE.

SUGGESTED SPECIFICATIONS

General:
Valves shall be of Wafer or Lug design for installation between ANSI 150 or 300. Design Standards: API 609, ANSI/ASME B16.34, soft seated.

Pressure Rating:
ANSI 150 – 285 PSI
ANSI 300 – 740 PSI

Body:
Standard valve body shall be 1 piece Carbon Steel (ASTM 216) or CF8M (ASTM A351) construction conforming to the following:

- 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
- ANSI/ASME B 16.47 Series A Class 150, 300
- MSS-SP-44 Class 150, 300

Disc:
Standard valve disc shall be CF8M (ASTM 351). 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.

Seat:
Valve seat shall be RMTFE 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.

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. This arrangement shall be easily adjustable with no special tools required.

Gland Packing:
Pratt'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.

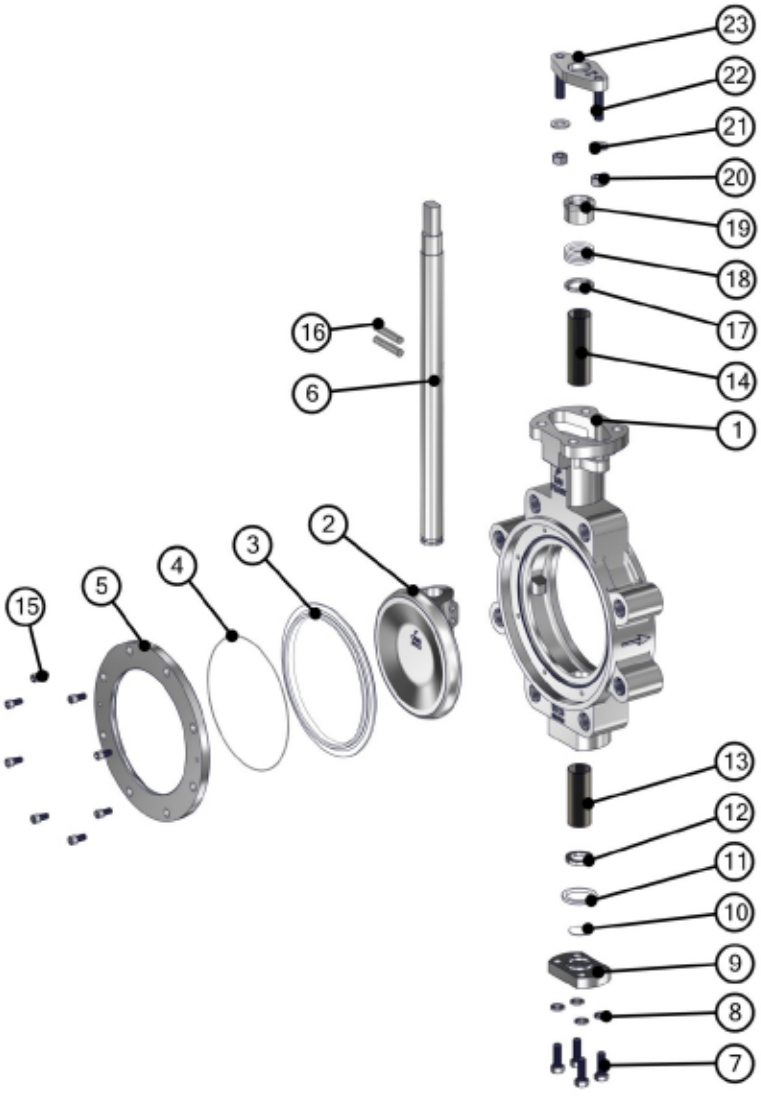
Bearings:
Pratt utilizes a Stainless Steel/Teflon bearing material for soft seated valves. This material is superior in reducing friction and side thrust and suitable for corrosive applications.

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.

MATERIAL LIST

No.	Name	Material
1	Body	A351 CF8M/A216 WCB
2	Disc	WCB A351 CF8M
3	Seat	MRTFE
4	Spring Ring	ASTM A313-SS
5	Seat Retainer	A351 CF8M/A216 WCB
6	Stem	17-4PH
7	Bolt	Steel/Stainless Steel
8	Washer	Steel/Stainless Steel
9	End Cap	Steel/Stainless Steel
10	Spacer	PTFE
11	Bottom Packing	PTFE
12	Retainer Ring	Stainless Steel

No.	Name	Material
13	Lower Bearing	SS316+PTFE
14	Upper Bearing	SS316+PTFE
15	Retainer Bolt	Stainless Steel
16	Pin	17-4PH
17	Packing Retainer	Stainless Steel
18	Packing Stack	PTFE
19	Packing Gland	Stainless Steel
20	Gland Nut	Stainless Steel
21	Washer	Stainless Steel
22	Gland Bolt	Stainless Steel
23	Gland Flange	A351---CF8M/A216---WCB



WEIGHT

Body Size		Body Type	
inch	DN	Wafer	Lug
2	50	5.80	6.77
2.5	65	7.39	8.69
3	80	7.72	9.26
4	100	11.07	16.09
5	125	13.38	19.18
9	150	16.34	22.71
8	200	24.91	32.19
10	250	32.63	47.84
12	300	47.40	71.65
14	350	58.64	97.00
16	400	87.30	144.18
18	450	125.44	178.79
20	500	154.32	228.62
24	600	257.94	370.38

CV FLOW DATA

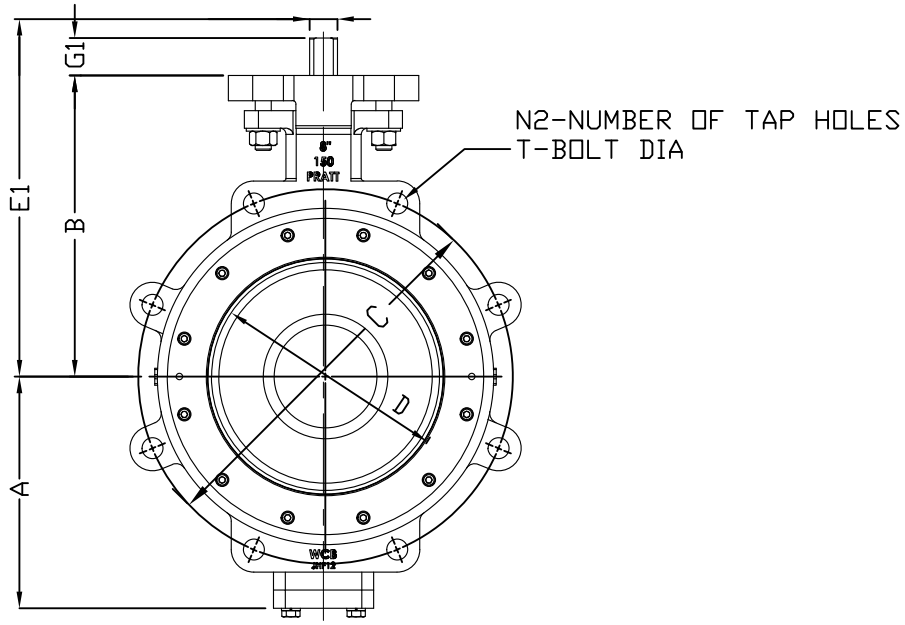
During its product development phase, the HE Series Wafer/Lug Butterfly Valve was tested to ensure that it met our own rigorous standards for flow capacity. Throughout testing, the HE Series valve has consistently produced high Cv values which translates to lower flow resistance, and low system operating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

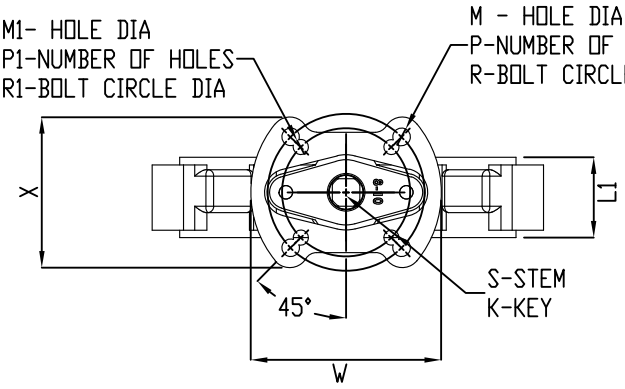
Cv Value of Class 150										
Size		Degree of Opening								
inch	mm	10°	20°	30°	40°	50°	60°	70°	80°	90°
2	50	2	5	12	19	32	45	65	81	88
2.5	65	3	9	21	33	54	77	111	138	150
3	80	5	14	32	50	82	116	168	209	227
4	100	9	25	57	90	148	209	303	377	410
5	125	16	44	104	163	266	377	578	681	740
6	150	25	65	150	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

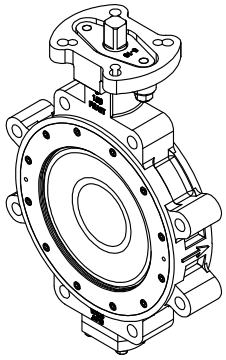
Cv Value of Class 300										
Size		Degree of Opening								
inch	mm	10°	20°	30°	40°	50°	60°	70°	80°	90°
2	50	2	5	12	19	32	45	65	81	88
2.5	65	3	9	21	33	54	77	111	138	150
3	80	5	14	32	50	82	116	168	209	227
4	100	9	25	57	90	148	209	303	377	410
5	125	16	44	104	163	266	377	548	681	740
6	150	24	60	139	278	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

DIMENSIONAL DATA

Class 150





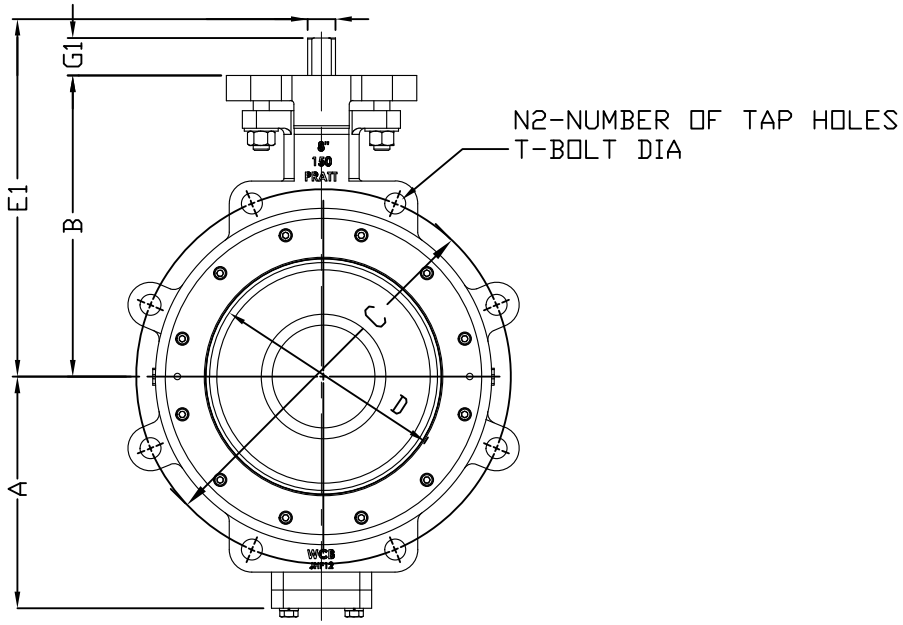


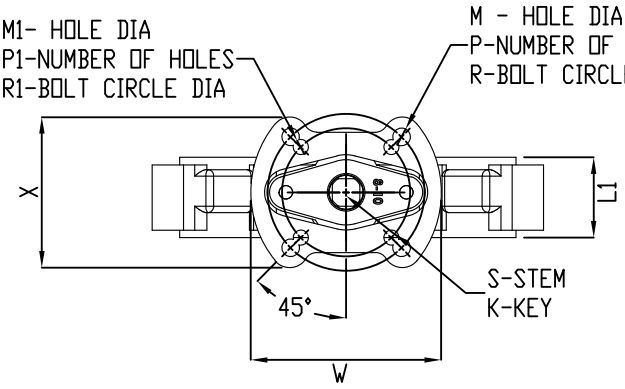
Dimensional Data of Class 150

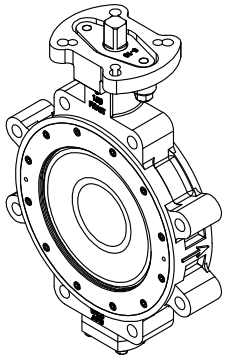
	A	B	C	D	E1	G1	N2	T	M	P	R	M1	P1	R1	S	K	L1	X	W
2″	3.80	5.28	4.75	1.89	6.22	0.94	4.00	4*5/8-11 UNC - 2B	0.47	4.00	4.02	0.39	4	2.76	0,433*0,433	-	1.69	3.90	4.30
2.5″	4.15	5.79	5.50	2.36	6.73	0.94	4.00	4*5/8-11 UNC - 2B	0.47	4.00	4.02	0.39	4	2.76	0,433*0,433	-	1.85	3.90	4.30
3″	4.51	6.14	6.00	2.74	7.08	0.94	4.00	4*5/8-11 UNC - 2B	0.47	4.00	4.02	0.39	4	2.76	0,433*0,433	-	1.89	3.90	4.30
4″	4.94	7.01	7.50	3.59	7.95	0.94	8.00	8*5/8-11 UNC - 2B	0.47	4.00	4.02	0.39	4	2.76	0,551*0,551	-	2.13	3.90	4.30
5″	5.61	7.60	8.50	4.61	8.54	0.94	8.00	8*3/4-10 UNC - 2B	0.47	4.00	4.02	0.39	4	276	0,669*0,669	-	2.24	3.90	4.30
6″	6.59	8.39	9.50	5.51	9.33	0.94	8.00	8*3/4-10 UNC - 2B	0.47	4.00	4.02	0.39	4	2.76	0,669*0,669	-	2.24	3.90	4.30
8″	7.26	9.45	11.75	7.40	10.63	1.18	8.00	8*3/4-10 UNC - 2B	0.55	4.00	4.92	0.47	4	4.02	0,866*0,866	-	2.52	4.80	6.00
10″	8.41	10.83	14.25	9.25	12.01	1.18	12.00	12*7/8-9 UNC - 2B	0.71	4.00	5.51	0.55	4	4.92	0,866*0,866	-	2.80	5.50	6.30
12″	10.24	12.28	17.00	10.83	13.46	1.18	12.00	12*7/8-9 UNC - 2B	0.71	4.00	5.51	0.55	4	4.92	1,063*1,063	-	3.19	5.50	6.30

DIMENSIONAL DATA

Class 300







Dimensional Data of Class 300

	A	B	C	D	E1	G1	N2	T	M	P	R	M1	P1	R1	S	K	L1	X	W
2″	3.80	5.28	5.00	1.89	6.22	0.94	8.00	8*5/8-11 UNC - 2B	0.47	4	4.02	0.39	4	2.76	0,433*0,433	-	1.69	3.90	4.30
2.5″	4.15	5.79	5.88	2.36	6.73	0.94	8.00	8*3/4-10 UNC - 2B	0.47	4	4.02	0.39	4	2.76	0,433*0,433	-	1.85	3.90	4.30
3″	4.51	6.14	6.62	2.74	7.08	0.91	8.00	8*3/4-10 UNC - 2B	0.47	4	4.02	0.39	4	2.76	0,433*0,433	-	1.89	3.90	4.30
4″	4.94	7.01	7.88	3.59	7.95	0.94	8.00	8*3/4-10 UNC - 2B	0.47	4	4.02	0.39	4	2.76	0,551*0,551	-	2.13	3.90	4.30
5″	5.61	7.60	9.25	4.61	8.54	0.94	8.00	8*3/4-10 UNC - 2B	0.47	4	4.02	0.39	4	2.76	0,669*0,669	-	2.24	3.90	4.30
6″	6.59	8.39	1062	5.51	9.33	0.94	12.00	12*3/4-10 UNC - 2B	0.47	4	4.02	0.39	4	2.76	0,669*0,669	-	2.32	3.86	4.30
8″	8.29	10.16	13.00	7.32	10.63	1.18	12.00	12*7/8-9 UNC - 2B	0.55	4	4.92	0.47	4	4.02	0,866*0,866	-	2.87	4.80	6.00
10″	9.45	11.42	15.25	9.06	12.01	1.18	16.00	16*1-8 UNC - 2B	0.71	4	5.51	0.55	4	4.92	1,063*1,063	-	3.27	5.50	6.30
12″	10.65	12.80	17.75	10.81	14.09	2.01	16.00	16*1-1/8-8UN-2B	0.71	4	5.51	0.55	4	4.92	1.374	0.313	3.62	5.50	-

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HE SERIES ORDERING INFORMATION

Valve Model			ANSI Class			Size			Body			Disc			Stem			Seat			Options	
XX		–	XXX		–	XXX		-	X			X			X			X		-	XX	
HE1	Wafer		150	150#		020	2″		7	316SS / CF8M		6	CF8M		3	17/4		C	RMTFE		00	NO REQUIREMENTS
HE2	Lug		300	300#		025	2 ½″		6	WCB											02	SILICONE FREE
						030	3″														03	O2 CLEANED
						040	4″														04	SPECIAL PAINTING
						050	5″														05	SPECIAL BOLTING
						060	6″														06	ANTISTATIC
						080	8″														07	SPECIAL PACKING
						100	10″														12	NACE
						120	12″															
						140	14″															
						160	16″															
						180	18″															
						200	20″															
						240	24″															

HE Series Butterfly Valve Ordering Example

Example Part: HE2-150-020-663A

Standard Product

Options only show in part number if there is an option

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