

The background of the entire page is a technical drawing of various industrial valves and components, rendered in a light yellow/gold color on a dark blue background. The drawing includes cross-sections, side views, and detailed mechanical parts of valves, providing a technical and industrial context for the company name.

# **POWELL VALVES**

**HIGH PERFORMANCE DOUBLE OFFSET BUTTERFLY VALVES**

**CARBON AND STAINLESS ALLOYS**

**WAFER BODY AND LUG BODY**

**SOFT SEAT / FIRE SAFE SEAT / METAL SEAT**

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## **The Wm. Powell Company - Profile**

The Wm. Powell Company is very proud of our achievements and our evolution in the past 166 years. We like to refer to ourselves as 166 years young due to our flexibility in changing quickly to our customer and the industry's needs. Our business strategy is to maintain excellent customer service. We will continue to focus on manufacturing the best of class products both in design features and quality, at competitive prices.

The Wm. Powell Company's products include a wide variety of valves in bronze, iron, steel, and corrosion resistant alloys for class 125 to class 4500 pressure service. Our experience as pioneer in the development of industrial valves encompasses over a century and a half of craftsmanship and valve know-how. Through modern engineering, laboratory, research and testing facilities, the Wm. Powell Company has been a leader in changes in our industry. Our on-going program is a long-term commitment to the valve industry and is poised for significant future growth.

Powell Valves has endured a Civil War, World Wars I and II, and the Korean and Vietnam Wars. Powell rebuilt after floods, U.S. economic disaster in the Great Depression, and fierce foreign competition to help put men on the moon. Whether it was the "Manhattan Project", projects on U.S. Nuclear Submarines, Titan or Atlas rockets, in Nuclear Power plants, at Chemical or Petroleum plants, Pulp and Paper mills, or the harshness of cryogenic use, Powell Valve has a long tradition of quality in temperatures from – 425°F to 1500°F and pressures from Class 125 to 4500.

Powell's market base is the Industrial Users: Petrochemical, Industrial Gas, Pulp & Paper, Pharmaceutical, Hydrocarbon processing, Food processing, Mining, Power Generation, Pipeline, Chemical, and Mechanical construction. Powell has formed business partnerships with industrial end-users, contractors, distributors and A&E's in the United States and around the World. Business partnerships formed on competitively priced product, on-time delivery, service and our tradition of product reliability.

Powell's network of support and product availability is unmatched. Powell offers the most complete multi-turn product line from a single source manufacturer. Powell's products are of the highest quality standards, are competitively priced and are produced with modern manufacturing technology and astute materials sourcing, with strategic purchasing & financial ventures in place.

Powell's diverse products and services, industry knowledge, project capabilities and reputation, coupled with our high quality distribution network, create a win-win arrangement where the end-user, contractor, distributor and manufacturer can benefit.

The Wm. Powell Company has made a commitment to our industry to increase growth and market share, with quality competitive products and services and on-time delivery. This is a global commitment.

Powell's end user customers have to react quickly to the demands that are on them to expand their businesses by implementing increased capacity and introducing new products into the market place at low costs and fast turn around times. Powell has addressed our customer's needs by increasing finished product inventory to over \$35,000,000 USD in the U.S.A. and with inventory hubs in Asia and Europe. As an additional advantage to our domestic and global customers, The Wm. Powell Company's Manning, SC facility is a Registered Free Trade Zone.

Powell also used its valve knowledge and expertise to construct a modification facility in the U.S.A. to assist customers with their needs, such as, automation, trim changes, end connection changes, additional quality inspections and special service pressure testing requirements, field service, etc...

The Wm. Powell Company is a closely held private corporation that has been in business since 1846. In fact, only nine presidents have led the Company through its 166, plus, years. The fact that we have been a healthy corporation during this period of time, having survived wars, depressions and natural disasters – in a very competitive marketplace – speaks well for itself.

We look forward to further discussing ways that The Wm. Powell Company can capture current and future opportunities together.

Again, The Wm. Powell Company thanks you for your interest in our company, our products and services. Powell looks forward to discussing ways to be your Preferred Valve Supplier. If you should have any questions, or comments, please contact us.

Sincerely,

A handwritten signature in black ink, appearing to read "Randy Cowart", with a stylized flourish at the end.

Randy Cowart

President, CEO & Chairman

The Wm. Powell Company

# How to order Double Offset High Performance Butterfly Valves

The figure number system outlined below is designed to cover the most common configurations. If special features are required which are not listed below please advise the detailed description for accurate processing.

## Digit

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Size			Blank	Base Figure Number				End Code	Material Code	Trim	Packing/Gasket	Option Code		
6	.	0		1	5	7	2	Q	C	R	T	G	L	V

Example Code for 6" Class 150 Double Offset Butterfly, Lug Style, A216 WCB Carbon Steel, 17-4 PH Stem, 316 sst Disc, PTFE Seat, PTFE Packing, lever Operated

Size Code	
Code	Size
2.0	2"
2.5	2-1/2"
3.0	3"
4.0	4"
5.0	5"
6.0	6"
8.0	8"
10.	10"
12.	12"
14.	14"
16.	16"
18.	18"
20.	20"
24.	24"
etc.	etc.

End Code	
Code	Type
Q	LUG
Y	Wafer
Z	Special ends

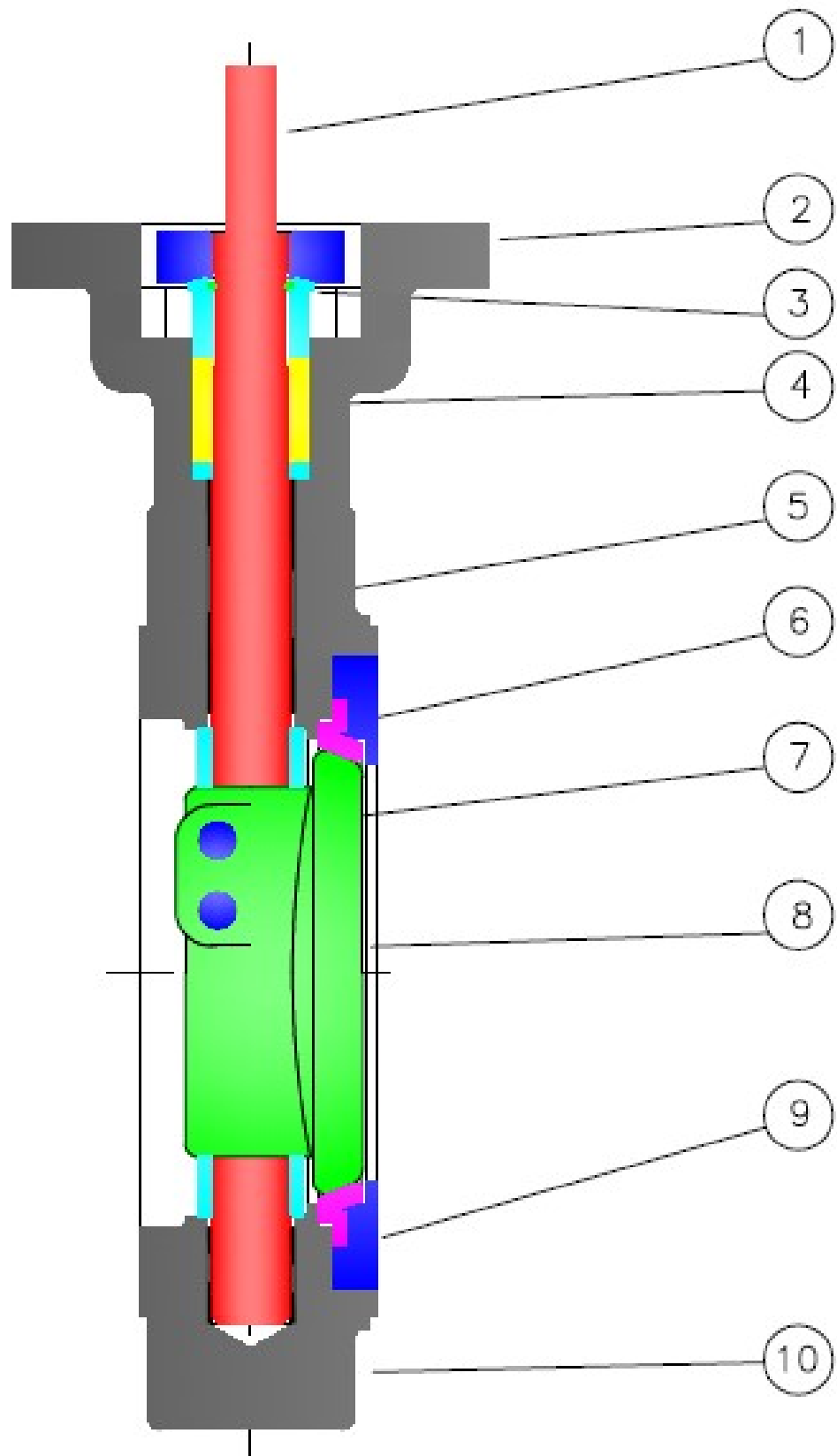
Packing/Gasket	
Code	Option
T	PTFE Packing
G	Graphite Packing
Z	Special Packing

Material Codes	
Code	ASTM
C	A216 WCB
D	A217 WC6
E	A217 WC9
J	A352 LCB
A	A351 CF8 (304)
M	A351 CF8M (316)
P	A351 CG8M (317)
S	A351 CN7M (Alloy 20)
Z	Special Material

Option Codes	
Code	Option
XXX	No Options
GLV	Lever Operator
GXX	Gear Operator
NXX	NACE
FA3	PMI

Base Figure Number	
No	Class
1572	150
3072	300
6072	600

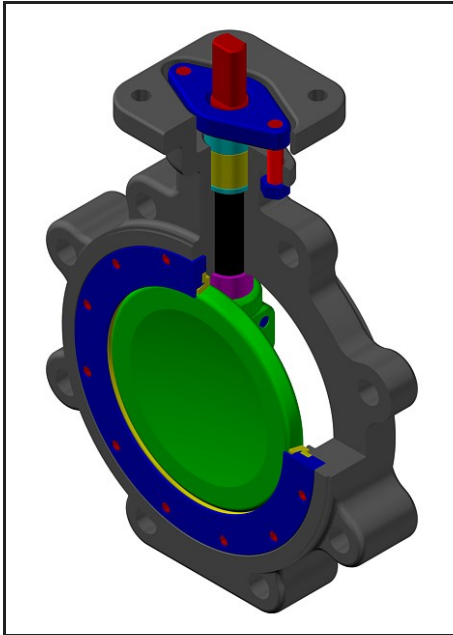
Trim	
Code	Description
R	17-4 PH Stem, 316 Disc, PTFE Seat
W	17-4 PH Stem, 316 Disc, RTFE Seat
Y	17-4 PH Stem, 316 Disc, UHMWPE Seat
Z	Special Trim



## **POWELL VALVE DESIGN FEATURES:**

1. **Stem** – Standard 17-4PH material to handle high torque loads. Other materials available.
2. **Flange** – Standard integral ISO mounting flange cast directly on the body to provide easy mounting of levers and actuators
3. **Packing Gland** – Blow out proof design Per API 609. Packing retained top and bottom with packing gland flange. Underneath draw down gland packing adjustment allows for packing adjustment without removal of operator.
4. **Packing** - PTFE or Graphite packing for low emissions
5. **Top and bottom bearings** - Made from PTFE or Graphite impregnated 316 stainless for maximum valve life. The non-galling design provides high wear resistance and low friction.
6. **Seat** – Designed to be easily changed out for fast switching between seat designs.
7. **Taper Pins** – Double taper pins to securely attach disc and stem and designed to handle high torque applications.
8. **Disc** – CF8M 316 stainless casting standard for all carbon steel and 316 stainless valves. Available in other materials. Provide full 360 degree sealing surface.
9. **Seat Retainer** – solid material to match body, positively held to body with multiple bolts providing easy removal for seat replacement. Design protects the seat when valve is installed with the retainer in the upstream flow.
10. **Body** - One piece casting available in a variety of materials. Wafer and lug designs

**API 609 CATEGORY B HIGH PERFORMANCE DOUBLE  
OFFSET BUTTERFLY VALVES**  
ASME CLASSES 150 TO 600  
CAST CARBON, STAINLESS STEEL OR ALLOY STEEL  
WAFER, LUG, OR DOUBLE FLANGED



Class	Fig. No.	Item	Applicable Specification
150	1572	Wall Thickness	API 609
		Pressure - Temperature Ratings	ASME B16.34 & API 609
300	3072	General Valve Design	API 609 (Cat. B) & ASME B16.34
		End to End Dimensions	ASME 609
		Flange Design	ASME B16.5
		Materials	ASTM

**DESIGN FEATURES:**

- **Upper and Lower Bearings** to maximize valve life
- **Integral ISO mounting pad** for easy valve operation no bracket needed
- **Each valve** is shell and seat pressure tested per industry standard API 598
- **Available** in Wafer and Lug styles
- **Each valve** has a unique certification number that is traceable to the valve certification sheet which includes MTR data, pressure test report, inspection report and certificate of conformance.
- **Seat Materials:** Multiple seat materials available.

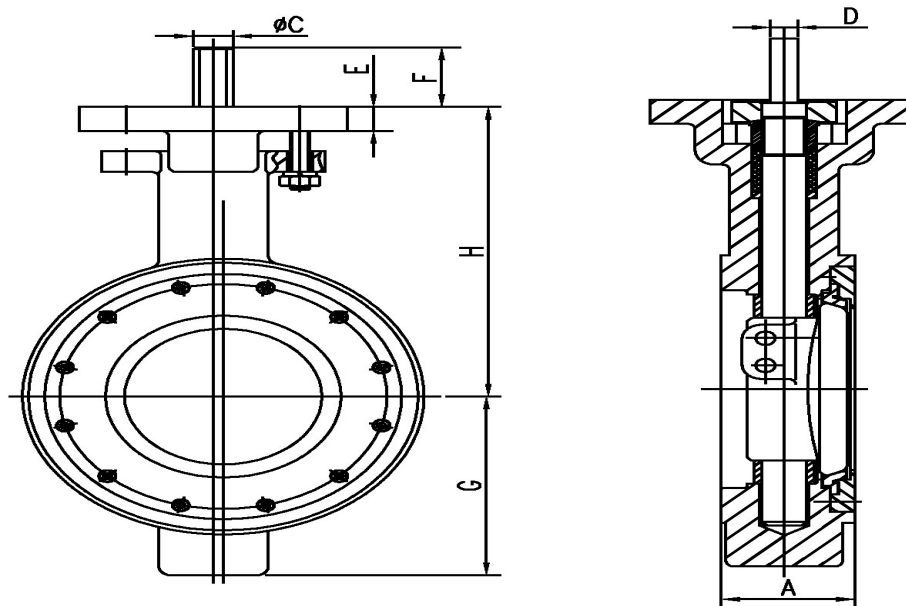
PART	COMMON MATERIAL COMBINATIONS	
Body	A216 WCB	A351 CF8M
Seat Ring	PTFE/RTFE/UHMWPE	PTFE/RTFE/UHMWPE
Disc	A351 CF8M	A351 CF8M
Stem	17-4 PH	17-4 PH
Seat Retainer	Carbon Steel	316 SST
Seat Bolts	A193 B8	A193 B8M
Lower Bearing	316 SST + PTFE	316 SST + PTFE
Disc Spacers	304 SST	316 SST
Disc Pins	17-4 PH	17-4 PH
Upper Bearing	316 SS + PTFE	316 SS + PTFE
Packing Washer	304 SST	316 SST
Packing	PTFE	PTFE
Gland	304 SST	316 SS
Gland Flange	A216 WCB	A351 CF8
Gland Bolts	A193 B8	A193 B8
Gland Nuts	A194 8	A194 8
Retainer Plate*	Carbon Steel	316 SST
Gasket*	316 SST + PTFE	316 SST + PTFE
Bolts*	A193 B8	A193 B8

\*Sizes 8" and up only

OTHER MATERIALS AND TRIMS AVAILABLE



# HIGH PERFORMANCE DOUBLE OFFSET BUTTERFLY VALVE (WAFER STYLE) DIMENSIONS

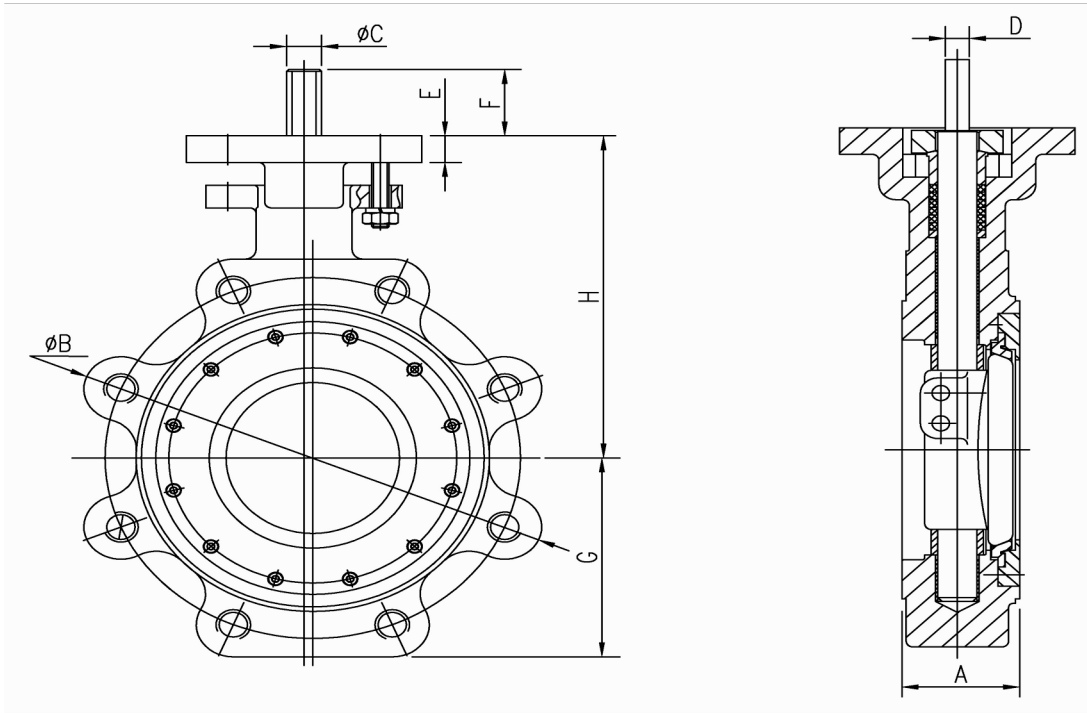


Class 150										
Size	A	C	D	E	F	G	H	M.F.L.	Cv	Weight
NPS	In	In	In	In	In	In	In	ISO		lbs
DN	mm	mm	mm	mm	mm	mm	mm			Kg
2	1.69	0.55	0.37	0.55	1.34	2.8	4.72	F10	85	11
50	43	14	9.5	14	34	72	120			5
2.5	1.88	0.55	0.37	0.55	1.34	3.2	4.96	F10	160	12
65	48	14	9.5	14	34	80	126			5.4
3	1.88	0.63	0.43	0.55	1.34	3.4	5.31	F10	200	14
80	48	16	11	14	34	86	135			6.4
4	2.12	0.63	0.43	0.55	1.42	4.13	6.7	F10	390	22
100	54	16	11	14	36	105	170			10
6	2.25	0.79	0.55	0.63	1.42	5.14	7.88	F10	960	37
150	57	20	14	16	36	130.5	200			16.8
8	2.5	0.94	0.67	0.7	1.57	6.18	9.21	F12	1600	61
200	64	24	17	18	40	157	234			27.6
10	2.81	1.1	0.79	0.7	1.57	8.4	11.1	F12	3130	95
250	71	28	20	18	40	213	282			43
12	3.19	1.42	0.98	0.87	1.57	9.9	12.72	F14	4280	150
300	81	36	25	22	40	251	323			68

Class 300										
Size	A	C	D	E	F	G	H	M.F.L.	Cv	Weight
NPS	In	In	In	In	In	In	In	ISO		lbs
DN	mm	mm	mm	mm	mm	mm	mm			Kg
3	1.88	0.63	0.43	0.55	1.34	3.78	6.3	F10	200	15
80	48	16	11	14	34	96	160			6.8
4	2.12	0.63	0.43	0.55	1.42	4.33	6.93	F10	390	23
100	54	16	11	14	36	110	176			10.5
6	2.31	0.79	0.55	0.63	1.42	5.85	8.58	F10	960	42
150	59	20	14	16	36	148.5	218			19.1
8	2.88	1.1	0.79	0.71	1.57	7.15	10.24	F12	1600	76
200	73	28	20	18	40	181.5	260			34.5
10	3.25	1.42	0.98	0.87	1.97	9.33	12.13	F14	3130	130
250	83	36	25	22	50	237	308			59
12	3.62	1.58	1.1	0.87	1.97	11.22	13.78	F14	4280	190
300	92	40	28	22	50	285	350			56.5

ADDITIONAL SIZES, MATERIALS AND CLASSES AVAILABLE UPON REQUEST.

# HIGH PERFORMANCE DOUBLE OFFSET BUTTERFLY VALVE (LUG STYLE) DIMENSIONS



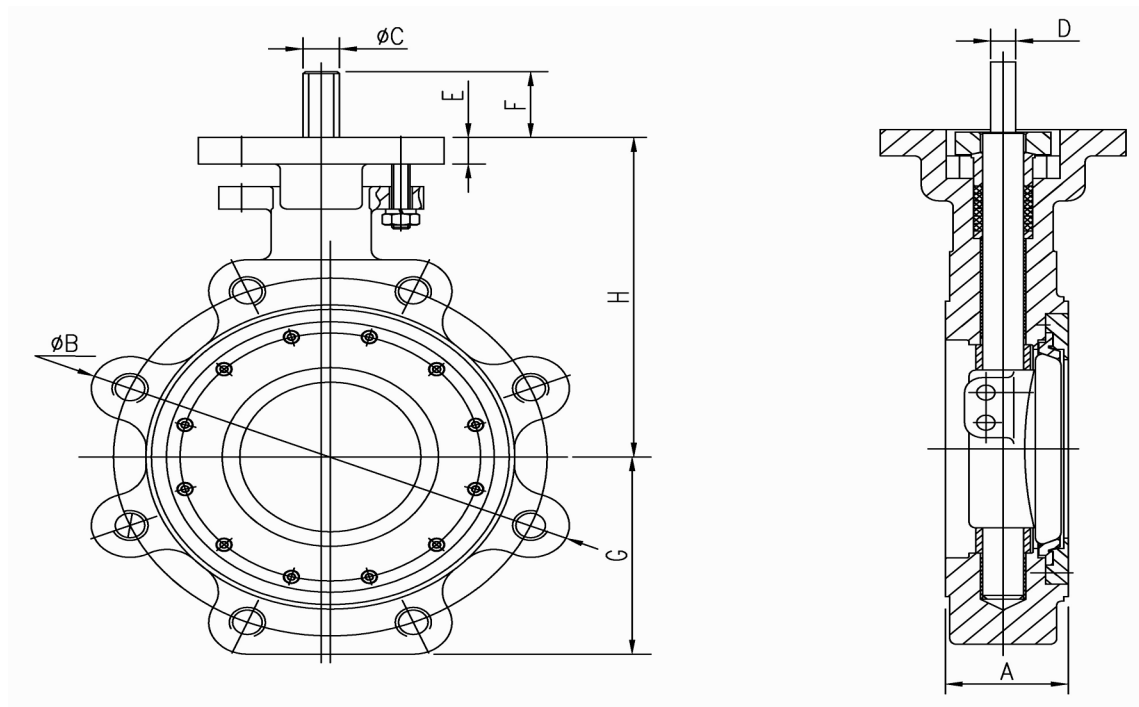
\* Double key stem

## Class 150

Size	A	B	C	D	E	F	G	H	M.F.L.	Cv	Weight
NPS	In	In	In	In	In	In	In	In	ISO		lbs
DN	mm	mm	mm	mm	mm	mm	mm	mm			Kg
2	1.69	6	0.55	0.37	0.55	1.34	2.8	4.72	F10	85	12
50	43	153	14	9.5	14	34	72	120			5.4
2.5	1.88	6.9	0.55	0.37	0.55	1.34	3.2	4.96	F10	160	12.8
65	48	174	14	9.5	14	34	80	126			5.8
3	1.88	7.4	0.63	0.43	0.55	1.34	3.4	5.31	F10	200	15
80	48	187	16	11	14	34	86	135			6.8
4	2.12	8.9	0.63	0.43	0.55	1.42	4.13	6.7	F10	390	26
100	54	225	16	11	14	36	105	170			11.8
6	2.25	11	0.79	0.55	0.63	1.42	5.14	7.88	F10	960	42
150	57	280	20	14	16	36	130.5	200			19.1
8	2.5	13.3	0.94	0.67	0.7	1.57	6.18	9.21	F12	1600	67
200	64	337	24	17	18	40	157	234			30.4
10	2.81	16	1.1	0.79	0.7	1.57	8.4	11.1	F12	3130	105
250	71	406	28	20	18	40	213	282			48
12	3.19	18.7	1.42	0.98	0.87	1.57	9.9	12.72	F14	4280	160
300	81	476	36	25	22	40	251	323			72.5
14	3.62	20.7	1.57	1.1	0.95	1.97	10.9	14	F14	5250	225
350	92	527	40	28	24	50	277	355			102
16	4	23.2	1.77	0.47x0.31*	1.1	3	12.75	15.75	F16	8150	345
400	102	590	45	12x8*	28	76	324	400			156.5
18	4.5	25.1	1.97	0.63x0.39*	1.1	3.35	13.6	16.7	F16	10900	460
450	114	638	50	16x10*	28	85	345	424			209
20	5	27.4	2.17	0.71x0.43*	1.26	3.75	15.1	18.7	F25	13350	640
500	127	695	55	18x11*	32	95	383	476			290
24	6.06	32	2.56	0.78x0.47*	1.34	3.95	17	21.5	F25	20150	960
600	154	814	65	20x12*	34	100	432	546			435
30	7.5	38.5	3.39	0.87x0.55*	1.65	4.75	22.45	26.4	F30	32550	1890
750	191	978	86	22x14*	42	120	570	670			857
36	8	45.7	3.94	1.10x0.63*	1.5	5.9	27.1	35.35	F30	45200	2970
900	203	1161	100	28x16*	38	150	688	898			1347

ADDITIONAL SIZES, MATERIALS AND CLASSES AVAILABLE UPON REQUEST.

# HIGH PERFORMANCE DOUBLE OFFSET BUTTERFLY VALVE (LUG STYLE) DIMENSIONS



Class 300											
Size	A	B	C	D	E	F	G	H	M.FL.	Cv	Weight
NPS	In	In	In	In	In	In	In	In	ISO		lbs
DN	mm	mm	mm	mm	mm	mm	mm	mm			Kg
2	1.69	6.3	0.55	0.37	0.55	1.34	2.95	5.35	F10	85	13.7
50	43	159	14	9.5	14	34	75	136			6.2
2.5	1.88	7.3	0.55	0.37	0.55	1.34	3.4	5.91	F10	160	14.3
65	48	186	14	9.5	14	34	87	150			6.5
3	1.88	8.1	0.63	0.43	0.55	1.34	3.78	6.3	F10	200	19
80	48	205	16	11	14	34	96	160			8.6
4	2.12	9.3	0.63	0.43	0.55	1.42	4.33	6.93	F10	390	28
100	54	236	16	11	14	36	110	176			12.7
6	2.31	12	0.79	0.55	0.63	1.42	5.85	8.58	F10	960	50
150	59	306	20	14	16	36	148.5	218			22.7
8	2.88	14.8	1.1	0.79	0.71	1.57	7.15	10.24	F12	1600	90
200	73	375	28	20	18	40	181.5	260			40.8
10	3.25	17.2	1.42	0.98	0.87	1.97	9.33	12.13	F14	3130	160
250	83	438	36	25	22	50	237	308			72.5
12	3.62	20.1	1.58	1.1	0.87	1.97	11.22	13.78	F14	4280	235
300	92	511	40	28	22	50	285	350			106.5

ADDITIONAL SIZES, MATERIALS AND CLASSES AVAILABLE UPON REQUEST.

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NOTE: DATA PROVIDED IN THIS SECTION IS FOR REFERENCE PURPOSES AND IS SUBJECT TO CHANGE. CONSULT CURRENT STANDARDS AND SPECIFICATIONS FOR THE LATEST DATA AND FOR SPECIFIC DETAILS WHICH MAY BE BEYOND THE SCOPE OF THIS CATALOG.

## VALVE STANDARDS AND RELATED INFORMATION

### 1. Steel and Corrosion Resistant Designs

- (A) ASME B16.34 → Valves – Flanged, Threaded, and Welded End

This is the basic ASME valve standard for steel and corrosion resistant alloys. This standard contains requirements such as minimum shell wall thickness, pressure/temperature ratings, and pressure testing requirements.

- (B) API Standard 609 → Butterfly Valves: Double-flanged, Lug, and Wafer-type

This is the basic API valve standard and contains end to end dimensions and limited ratings for soft seated valves

- (C) API Standard 598 → Valve Inspection and Testing

This standard is referenced by both ASME B16.34 and API 600 and contains minimum inspection and pressure test requirements.

- (D) API Standard 607 → Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats

- (E) ASME B16.5 → Pipe Flanges and Flange Fittings

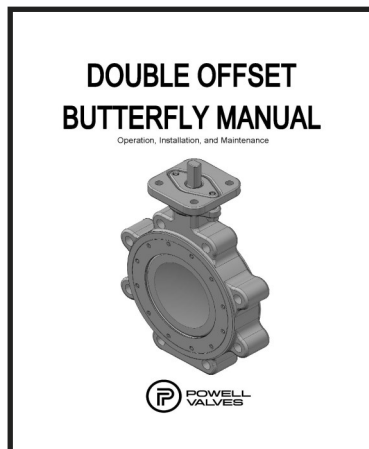
- (G) MSS SP-25 → Standard Marking System for Valves, Fittings, Flanges and Unions

- (H) MSS SP-55 → Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components

### 2. Powell Publications and Miscellaneous Information

*Double Offset Butterfly Manual* contains operation, installation, and maintenance information specifically pertaining to Powell High Performance Double Offset Butterfly Valves

NOTE: Prior to any installation or maintenance, appropriate precautions must be followed. For example, all pressure must be relieved from the valve and affected piping prior to servicing and proper protective clothing and equipment must be worn.



Soft Seat Torque Data

Class 150 Soft Seated Torque Chart (ft-lb)													
Pressure (psi)	Size (in)												
	2	2.5	3	4	6	8	10	12	14	16	18	20	24
0	7	7	9	9	13	13	29	55	66	101	126	179	239
50	9	9	12	14	26	37	69	120	148	215	284	386	553
100	10	11	15	20	40	61	109	185	230	330	442	594	867
150	12	14	19	26	53	85	148	251	312	444	600	801	1182
200	13	16	22	32	67	109	188	316	394	559	759	1009	1496
250	14	18	25	38	80	133	228	381	476	673	917	1216	1810
285	16	20	27	42	90	150	256	427	534	753	1027	1361	2030

Class 300 Soft Seated Torque Chart (ft-lb)													
Pressure (psi)	Size (in)												
	2	2.5	3	4	6	8	10	12	14	16	18	20	24
0	7	7	9	9	13	29	55	66	101	126	179	239	354
100	10	11	15	20	40	80	139	200	271	363	505	675	1030
200	13	16	22	32	67	131	224	333	441	599	831	1111	1707
300	16	20	28	43	94	182	308	467	610	835	1158	1547	2384
400	19	25	35	55	121	233	392	601	780	1072	1484	1982	3060
500	22	29	41	67	148	284	476	734	950	1308	1811	2418	3737
600	25	33	48	78	175	335	561	868	1120	1545	2137	2854	4414
700	28	38	55	90	202	386	645	1001	1289	1781	2463	3290	5090
740	29	40	57	94	213	406	679	1055	1357	1876	2594	3464	5361

NOTE: Contact Powell Engineering Department for sizes greater than 24"

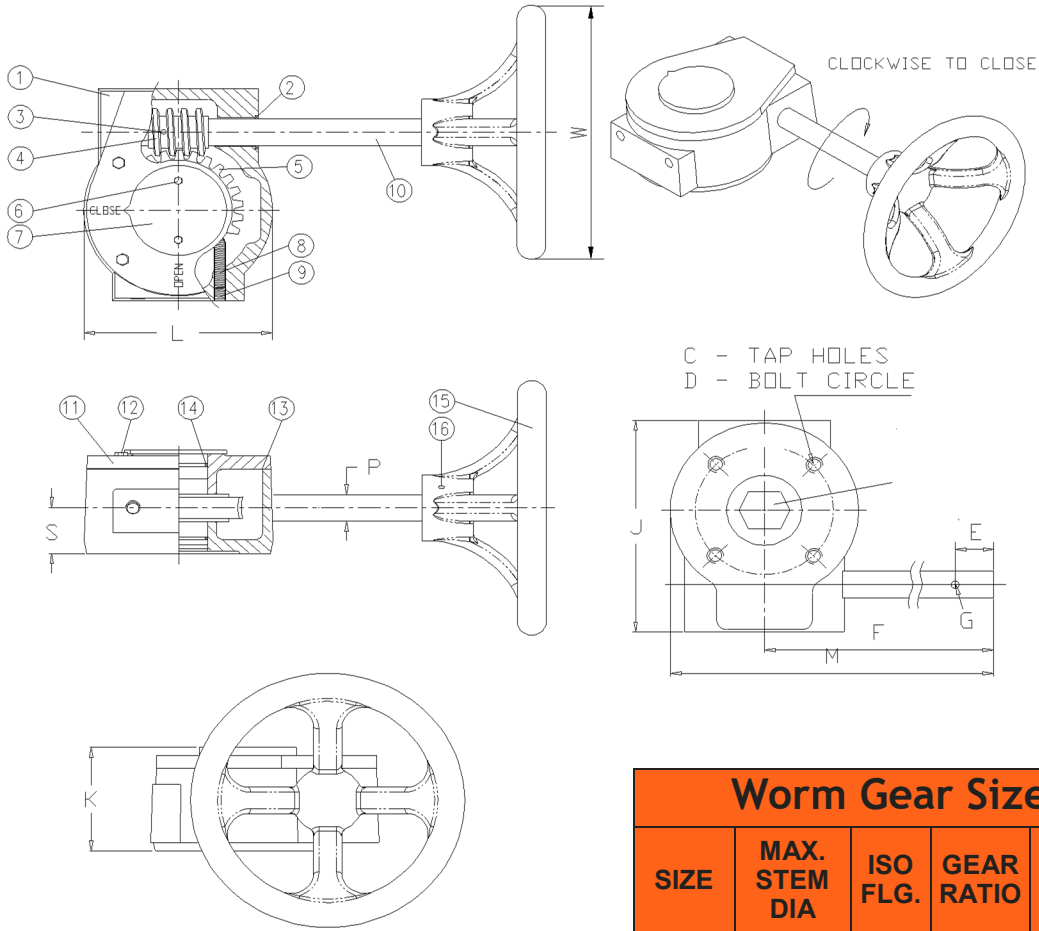
POWELL HPBV GEAR AND LEVERS

**POWELL HPBV GEAR AND LEVER SIZING CHART**

POWELL PART #	DESCRIPTION	FITS SIZES	
		1572	3072
Lever-32014	12.6" Lever assembly for 14mm stem	2", 2.5"	2", 2.5"
Lever-32016	12.6" Lever assembly for 16mm stem	3", 4"	3", 4"
Lever-32020	12.6" Lever assembly for 20mm stem	6"	6"
A-1014	A-10 Worm Gear for 14 mm stem	2", 2.5"	2", 2.5"
A-1016	A-10 Worm Gear for 16 mm stem	3", 4"	3", 4"
A-1020	A-10 Worm Gear for 20 mm stem	6"	6"
A-2024	A-20 Worm Gear for 24 mm stem	8"	
A-2028	A-20 Worm Gear for 28 mm stem	10"	8"
A-3036	A-30 Worm Gear for 36 mm stem	12"	10"
A-3040	A-30 Worm Gear for 40 mm stem	14"	12"
A-4045	A-40 Worm Gear for 45 mm stem	16"	14"
A-4050	A-40 Worm Gear for 50 mm stem	18"	16"
A-5055	A-50 Worm Gear for 55 mm stem	20"	18"
A-5065	A-50 Worm Gear for 65 mm stem	24"	20, 24"
A-6086	A-60 Worm Gear for 86 mm stem	30"	
A-70100	A-70 Worm Gear for 100 mm stem	36"	

**Note:** Hand levers and gear operators are priced separately (see Lever & Gear pricing section).  
 Hand levers are not recommended for use with 8" and larger Class 150 and Class 300.  
 Hand levers are not recommended for use with valves class 600 and higher.

## POWELL A SERIES QUARTER TURN WORM GEARS



### Worm Gear Size Chart

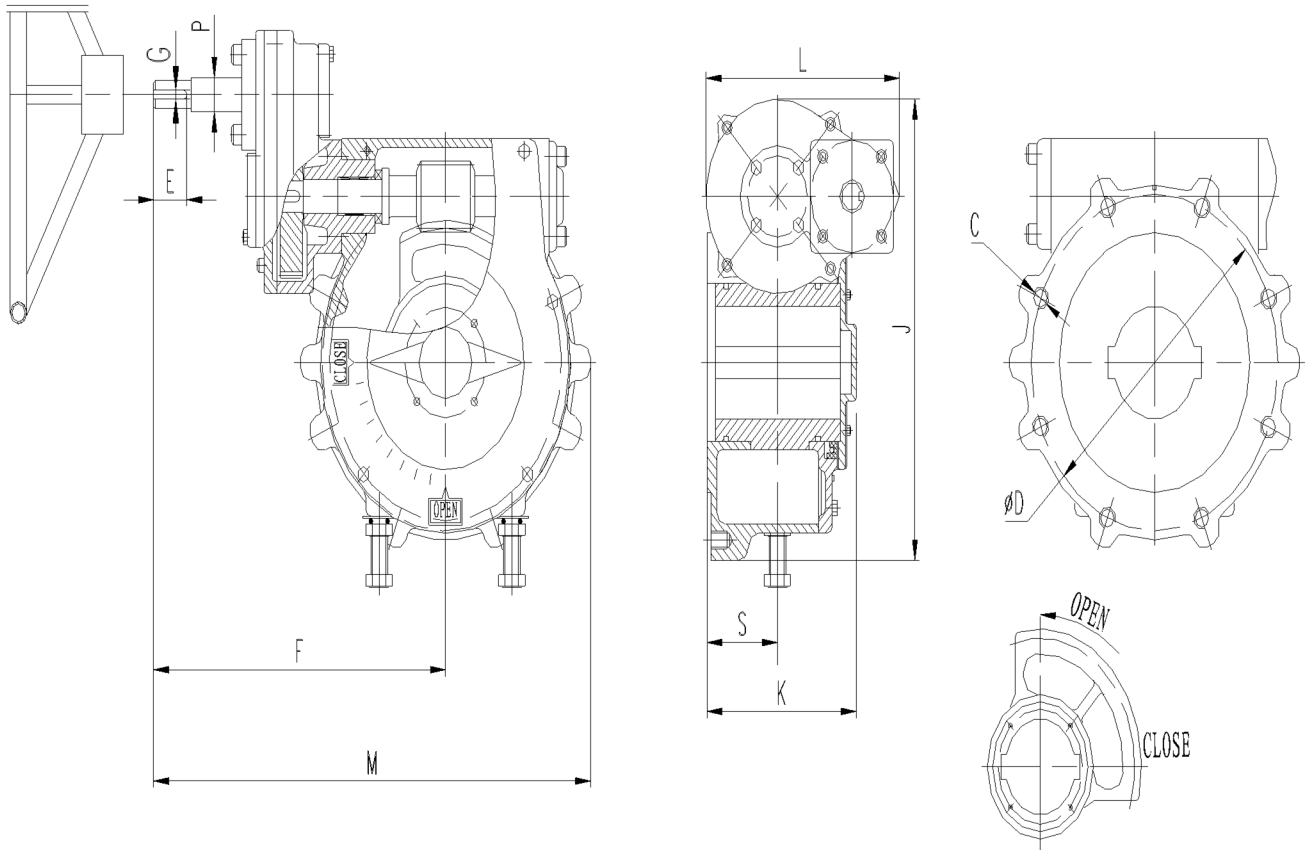
SIZE	MAX. STEM DIA	ISO FLG.	GEAR RATIO	MECH ADV (±15%)	MAX. TORQUE (ft-lbs)
A-10	1	F10	24	4.48	225
	25				
A-20	1 3/8	F12	30	5.68	570
	35				
A-30	1 5/8	F14	50	8.82	885
	42				
A-40	2 1/8	F16	80	18.38	1845
	55				

### Worm Gear Size Chart

SIZE	C	D	E	G	F	M	J	L	K	P	S	W
A-10	M10	4	5/8	1/4	4 7/8	7	4 7/8	4	3 3/8	5/8	1 1/4	6
		102	16	6	124	176	123	104	59	16	33	150
A-20	M12	5	7/8	1/4	8 5/8	11 1/2	6 3/4	5 3/4	2 3/4	3/4	1 7/16	11 13/16
		125	22	6	220	292	170	145	70	19	36	300
A-30	M16	5 1/2	1 1/8	1/4	10 1/8	13 1/4	7 3/8	6 1/8	3	3/4	1 5/8	11 13/16
		140	29	6	258	336	186	155	77	19	41	300
A-40	M20	6 1/2	1 5/16	1/4	11	16	11 1/8	10	4 1/2	1	2 1/2	15 3/4
		165	33	6	278	405	283	254	114	25	64	400



## POWELL A SERIES QUARTER TURN WORM GEARS



### Worm Gear Size Chart

SIZE	MAX. STEM DIA	ISO FLG.	GEAR RATIO	MECH ADV (±15%)	MAX. TORQUE (ft-lbs)
A-50	3 3/8	F25	70	20.30	2950
	85				
A-60	4 3/8	F30	238	52.00	5755
	110				
A-70	4 3/8	F30	303	65.96	6860
	110				

### Worm Gear Size Chart

SIZE	C	D	E	G	F	M	J	L	K	P	S	H.W.
A-50	M16	10	1 9/16	5/16	10 5/16	16 1/8	12 1/4	/	5 3/4	1	2 11/16	23 5/8
		254	40	8	262	409	311	/	145	25	68	600
A-60	M20	11 3/4	1 9/16	5/16	13 7/8	20 3/4	16 1/16	9 3/16	7 1/8	1 3/16	3 3/8	27 9/16
		298	40	8	352	527	408	233	180	30	85	700
A-70	M20	11 3/4	1 9/16	5/16	13 7/8	20 3/4	16 1/16	9 3/16	7 1/8	1 3/16	3 3/8	27 9/16
		298	40	8	352	527	408	233	180	30	85	700

**PRESSURE/TEMPERATURE RATINGS**

**TABLE 1**

**PTFE AND RTFE SEATED DESIGN**

**ASTM A216 Grade WCB**

Not to be used over 400° F.

**STANDARD CLASS**

Working Pressures by Classes, psig					
Temperature, °F	150		300		600
	PTFE	RTFE	PTFE	RTFE	RTFE
-50 to 100	285	285	740	740	1480
150	273	273	708	708	1300
200	260	260	550	675	900
250	245	245	425	530	700
300	230	230	300	390	550
350	140	215	175	250	400
400	50	100	50	100	250

**TABLE 2**

**PTFE AND RTFE SEATED DESIGN**

**ASTM A351 Grade CF3M (1)**

**ASTM A351 Grade CF8M (2)**

Not to be used over 400° F.

Working Pressures by Classes, psig					
Temperature, °F	150		300		600
	PTFE	RTFE	PTFE	RTFE	RTFE
-50 to 100	275	275	720	720	1440
150	255	255	708	670	1300
200	235	235	550	620	900
250	225	225	425	530	700
300	215	215	300	390	550
350	140	205	175	250	400
400	50	100	50	100	250

**CHEMICAL AND PHYSICAL PROPERTIES**  
**CAST CARBON, ALLOY, AND STAINLESS STEELS**

**TABLE 5**

ASTM STANDARD GRADE		A216 WCB	A351 CF3M 316L	A351 CF8M 316
CARBON (C)	(Min)	-	-	-
	(Max)	0.30	0.03	0.08
MANGANESE (Mn)	(Min)	-	-	-
	(Max)	1.00**	1.50	1.50
PHOSPHOROUS (P)	(Min)	-	-	-
	(Max)	0.04	0.040	0.040
SULFUR (S)	(Min)	-	-	-
	(Max)	0.045	0.040	0.040
SILICON (Si)	(Min)	-	-	-
	(Max)	0.60	1.50	1.50
COPPER (Cu)	(Min)	-	-	-
	(Max)	0.30*	-	-
NICKEL (Ni)	(Min)	-	9.0	9.0
	(Max)	0.50*	13.0	12.0
CHROMIUM (Cr)	(Min)	-	17.0	18.0
	(Max)	0.50*	21.0	21.0
MOLYBDENUM (Mo)	(Min)	-	2.0	2.0
	(Max)	0.20*	3.0	3.0
VANADIUM (V)	(Min)	-	-	-
	(Max)	0.03*	-	-
TUNGSTEN (W)	(Min)	-	-	-
	(Max)	-	-	-
COLUMBIUM (Cb)	(Min)	-	-	-
	(Max)	-	-	-
TENSILE STRENGTH	(Min)	70 Ksi	70 Ksi	70 Ksi
	(Max)	95	-	-
YIELD STRENGTH	(Min)	36 Ksi	30 Ksi	30 Ksi
	(Max)	-	-	-
ELONGATION	(Min)	22%	30%	30%
	(Max)	-	-	-
REDUCTION OF AREA	(Min)	35%	-	-
	(Max)	-	-	-
TEMPERATURE	(Min)	-20F	-425F	-425F
	(Max)	800F	850F	1500F <sup>T</sup>

\*RESIDUAL ELEMENTS – Total must not exceed 1.00 maximum.

\*\*The maximum MANGANESE may increase 0.04%, up to 1.28% maximum, for each reduction of 0.01% below the specified maximum CARBON content.

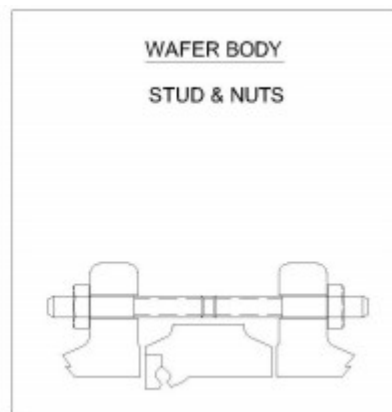
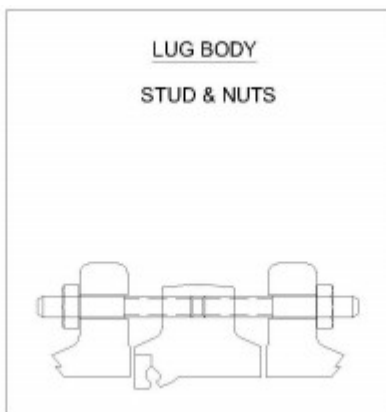
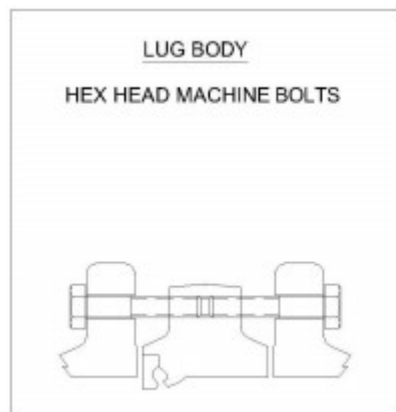
\*\*\* For temperatures below -50°F special cryogenic cleaning may be required. For temperatures below -100°F, special cryogenic extensions may be required. See cryogenic catalog for more information.

<sup>T</sup> For temperatures over 1000° F, minimum CARBON is 0.04. Customer must specify if temperature is over 1000° F and this minimum CARBON is required.

NOTE: Chemical compositions are in units of p ercent.

## INSTALLATION BOLTING REQUIREMENTS

**TABLE 6**



Pressure Class	Valve Size	Thread Size	LUG BODY								WAFER BODY			
			BOLTS				STUDS				STUDS			
			QTY	LG	QTY	LG	QTY	LG	QTY	LG	QTY	LG	QTY	LG
150	2	5/8-11 UNC	4	1.75	4	1.5	4	2.5	4	2.25	4	5		
150	2.5	5/8-11 UNC	4	2	4	1.75	4	2.75	4	2.5	4	5.5		
150	3	5/8-11 UNC	4	2	4	1.75	4	2.75	4	2.5	4	5.5		
150	4	5/8-11 UNC	8	2	8	1.75	8	2.75	8	2.5	8	5.75		
150	6	3/4-10 UNC	8	2.25	8	2	8	3.25	8	3	8	6.25		
150	8	3/4-10 UNC	8	2.5	8	2	8	3.5	8	3	8	6.75		
150	10	7/8-9 UNC	12	2.75	12	2.25	12	4	12	3.5	12	7.5		
150	12	7/8-9 UNC	12	3	12	2.5	12	4.25	12	3.75	12	8		
150	14	1-8 UN	12	3	12	2.75	12	4.5	12	4.25	12	9		
150	16	1-8 UN	16	3	16	2.75	16	4.5	16	4.25	16	9.5		
150	18	1 1/8-8 UN	16	3.75	16	3	16	5.25	16	4.5	16	10.5		
150	20	1 1/8-8 UN	16	3.75	16	3	16	5.25	16	4.5	16	11.3		
			4	3.25	4	2.75	4	4.75	4	4.25	4	4.75	4	4.25
150	24	1 1/4-8 UN	16	4	16	4	16	5.75	16	5.75	16	12.5		
			4	3.5	4	3.5	4	5.25	4	5.25	4	5.25	4	5.25
150	30	1 1/4-8 UN	24	5.25	24	5	24	7	24	6.75	24	16.5		
			4	5	4	4.5	4	6.75	4	6.25	4	6.75	4	6.25
150	36	1 1/2-8 UN	28	6.25	28	5.75	28	8.25	28	7.75	28	18.8		
			4	5.75	4	5.25	4	7.75	4	7.25	4	7.75	4	7.25
300	2	5/8-11 UNC	8	2	8	1.75	8	2.75	8	2.5				
300	2.5	3/4-10 UNC	8	2.25	8	2	8	3.25	8	3				
300	3	3/4-10 UNC	8	2.25	8	2	8	3.25	8	3				
300	4	3/4-10 UNC	8	2.25	8	2	8	3.25	8	3				
300	6	3/4-10 UNC	12	2.75	12	2.5	12	3.5	12	3.5				
300	8	7/8-9 UNC	12	3.25	12	2.75	12	4.25	12	4				
300	10	1-8 UN	12	3.5	12	3.25	12	4.75	12	4.5				
			4	3.25	4	3	4	4.5	4	4.25				
300	12	1 1/8-8 UN	12	4	12	3.5	12	5.5	12	5				
			4	3.5	12	3	4	5	4	4.5				

## FLOW DESIGN AND MAINTENANCE RECOMMENDATIONS

- (1) SWING CHECK VALVES- Minimum ½ psi differential pressure across valve to maintain proper “full open position.
- (2) LIFT CHECK AND NON-RETURN VALVES-  
Minimum 2 psi differential pressure across valve to maintain proper “full open position”
- (3) Recommended length of straight pipe before and after check valves to be 10 times pipe diameter to avoid flow turbulence at valve.
- (4) For metal seated check valves at low pressure applications (approximately 50 psi or less), seat leakage may be significantly greater than normal seat test allowable limit.
- (5) RECOMMENDED MAXIMUM FLOW VELOCITIES (APPROXIMATE):

<u>VALVE SIZE</u>	<u>WATER</u> (FT/MIN)	<u>SATURATED STEAM</u> (FT/MIN)	<u>SUPERHEATED STEAM</u> (FT/MIN)
3" and UNDER	1200	7200	9000
4	1200	8800	11000
6	1620	10400	13000
8	1860	12000	15000
10	2100	14400	18000
12	2220	15200	19000
14	2400	16000	20000
16	2400	17600	22000
18	2400	19200	24000
20" and LARGER	2400	20800	26000

- (6) GATE VALVES — Not to be used in throttling services. Open and closed services only.
- (7) GLOBE VALVES— Not to be throttled under 20% open.

**FOR MAINTENANCE AND SAFETY INFORMATION, SEE THE POWELL  
HIGH PERFORMANCE BUTTERFLY MANUAL,  
AS DESCRIBED ON PAGE 15.**

**COMPARISON CHART OF VALVE SIZE/NOMINAL PIPE SIZE**

**TABLE 7**

<b><u>METRIC NOMINAL SIZE</u></b> <b>(DN)</b>	<b><u>ENGLISH NOMINAL SIZE</u></b> <b>(NPS)</b>
8	1/4
10	3/8
15	1/2
20	3/4
25	1
32	1-1/4
40	1-1/2
50	2
65	2-1/2
80	3
100	4
150	6
200	8
250	10
300	12
350	14
400	16
450	18
500	20
600	24

**CONVERSION FACTORS**

	<b>TO CONVERT FROM</b>	<b>TO</b>	<b>MULTIPLY BY</b>
<b>LENGTH</b>	INCHES(IN)	MILLIMETERS(MM)	25.4
	INCHES(IN)	CENTIMETERS(CM)	2.54
	FEET(FT)	INCHES(IN)	12
<b>WEIGHT</b>	POUNDS(LB)	KILOGRAMS(KG)	0.4536
	POUNDS(LB)	NEWTONS(N)	4.448
<b>PRESSURE*</b>	PSI	KILOGRAMS/M <sup>2</sup>	703
	PSI	KILOGRAMS/CM <sup>2</sup>	0.0703
	PSI	KILOGRAMS/MM <sup>2</sup>	0.000703
	PSI	BAR	0.0689
	PSI	ATMOSPHERE	0.068
	PSI	KILOPASCAL	6.895
	PSI	MEGAPASCAL	0.006895
	PSI	NEWTON/MM <sup>2</sup>	0.006895
	PSI	IN.WATER**	27.68
	PSI	FT.WATER**	2.307
	PSI	IN.MERCURY**	2.036
	PSI	PSF	144
<b>AREA</b>	SQ.INCH(IN <sup>2</sup> )	SQ.CENTIMETERS(CM <sup>2</sup> )	6.452

**TEMPERATURE**

TO CONVERT FROM DEGREES CENTIGRADE (C) TO DEGREES FAHRENHEIT (F):  $F = 1.8 * C + 32$

TO CONVERT FROM FAHRENHEIT (F) TO DEGREES CENTIGRADE (C):  $C = 0.556 * (F - 32)$

NOTE: MOST FACTORS ARE ROUNDED OFF AND NOT EXACT CONVERSIONS.

\*- PSI = POUNDS PER SQUARE INCH AND PSF = POUNDS PER SQUARE FOOT.

\*\* - WATER AT 60F. MERCURY AT 32F.

# MEASUREMENT EQUIVALENTS

FRACTION				DECIMAL	MILLIMETERS
			1/64	0.0156	0.3969
		1/32		0.0313	0.7938
				0.0394	1.0000
			3/64	0.0469	1.1906
	1/16			0.0625	1.5875
			5/64	0.0781	1.9844
				0.0787	2.0000
		3/32		0.0938	2.3813
			7/64	0.1094	2.7781
				0.1181	3.0000
1/8				0.1250	3.1750
			9/64	0.1406	3.5719
		5/32		0.1563	3.9688
				0.1575	4.0000
			11/64	0.1719	4.3656
	3/16			0.1875	4.7625
				0.1969	5.0000
			13/64	0.2031	5.1594
		7/32		0.2188	5.5563
			15/64	0.2344	5.9531
				0.2362	6.0000
1/4				0.2500	6.3500
			17/64	0.2656	6.7469
				0.2756	7.0000
		9/32		0.2813	7.1438
			19/64	0.2969	7.5406
	5/16			0.3125	7.9375
				0.3150	8.0000
			21/64	0.3281	8.3344
		11/32		0.3438	8.7313
				0.3543	9.0000
			23/64	0.3594	9.1281
3/8				0.3750	9.5250
			25/64	0.3906	9.9219
				0.3937	10.0000
		13/32		0.4063	10.3188
			27/64	0.4219	10.7156
				0.4331	11.0000
	7/16			0.4375	11.1125
			29/64	0.4531	11.5094
		15/32		0.4688	11.9063
				0.4724	12.0000
			31/64	0.4844	12.3031
1/2				0.5000	12.7000

FRACTION				DECIMAL	MILLIMETERS
				0.5118	13.0000
			33/64	0.5156	13.0969
		17/32		0.5313	13.4938
			35/64	0.5469	13.8906
				0.5512	14.0000
	9/16			0.5625	14.2875
			37/64	0.5781	13.6844
				0.5906	15.0000
		19/32		0.5938	15.0813
			39/64	0.6094	15.4781
5/8				0.6250	15.8750
				0.6299	16.0000
			41/64	0.6406	16.2719
		21/32		0.6563	16.6688
				0.6693	17.0000
			43/64	0.6719	17.0656
	11/16			0.6875	17.4625
			45/64	0.7031	17.8594
				0.7087	18.0000
		23/32		0.7188	18.2563
			47/64	0.7344	18.6531
				0.7480	19.0000
3/4				0.7500	19.0500
			49/64	0.7656	19.4469
		25/32		0.7813	19.8438
				0.7874	20.0000
			51/64	0.7969	20.2406
	13/16			0.8125	20.6375
				0.8268	21.0000
			53/64	0.8281	21.0344
		27/32		0.8438	21.4313
			55/64	0.8594	21.8281
				0.8661	22.0000
7/8				0.8750	22.2250
			57/64	0.8906	22.6219
				0.9055	23.0000
		29/32		0.9063	23.0188
			59/64	0.9219	23.4156
	15/16			0.9375	23.8125
				0.9449	24.0000
			61/64	0.9531	24.2094
		31/32		0.9688	24.6063
				0.9843	25.0000
			63/64	0.9844	25.0031
1				1.0000	25.4000

## **March, 2011 THE WILLIAM POWELL COMPANY GENERAL TERMS AND CONDITIONS OF SALE**

**1. TERMS EXCLUSIVE:** The terms and conditions of the purchase order or requisition to which these GENERAL TERMS AND CONDITIONS OF SALE (these "Terms and Conditions") relate or are attached (each, an "Order"), are exclusive and represent the full and final agreement of The William Powell Company, an Ohio corporation ("Powell") and the purchaser ("Purchaser") as they relate to the goods, materials, services or labor covered in the Order (all, whether or not tangible property or goods, the "Products"), and may not be added to, modified, superseded or altered except by written agreement or modification signed by Powell's authorized representative, notwithstanding any additional or other proposals, terms and conditions which may now or in the future appear on Purchaser's Orders or other forms (notification of objection thereto being given hereby), in whatever form transmitted, and notwithstanding any shipment of Products, acceptance of payments or other similar acts of Powell.

**2. SALE BY AGENT OR REPRESENTATIVE:** These Terms and Conditions shall govern the liability and obligations of Powell in regard to the transaction in Products, whether the sale was procured directly by Powell or indirectly through an authorized sales representative.

**3. CONTRACT:** Orders may be submitted to Powell in writing (which will include via an electronic transmission) or orally, provided, however, that if Purchaser fails to provide a detailed, formal written Order (a) within ten (10) days of an oral Order or (b) before shipment of the Order, whichever is earlier, then Product descriptions, quantities, specifications, etc., as set forth in Powell's acknowledgement, acceptance and/or invoice, shall be conclusive and binding on both parties, and discrepancies shall be for Purchaser's account. All Orders are subject to credit approval and acceptance by Powell. An Order shall be deemed to have been accepted by Powell upon the first to occur of the following: (i) Powell's first shipment or other tender of the Order or (ii) acceptance thereof by Powell in writing.

**4. PERMISSIBLE VARIATIONS:** Powell has the right, prior to the delivery of Products to Purchaser and without the giving of notice to Purchaser, to make any changes in the composition, fabrication or design of the Products which, in the opinion of Powell, do not affect the general characteristics or properties of the Products. In addition, Powell may make any change or any variation in the Products, whether of quality or quantity, which is within governmental or professional standards or specifications applicable at the time of manufacture without giving notice to Purchaser. Purchaser will accept any Products which may incorporate any changes in the composition, fabrication or design.

**5. PRICES:** Prices for Products are quoted and payable in U.S. dollars ("USD"). Prices stated in general price lists are subject to change without prior notice, at Powell's sole discretion. Prices that are provided in a specific quotation will remain firm for thirty (30) days of the issued date of the written quotation. All prices are exclusive of freight costs, taxes and duties. All taxes (including, without limitation, sales, use, stamp, value added and other taxes) duties, fees, charges and assessments by whomsoever levied on or with respect to the Products, and whether levied against Purchaser or Powell, are for Purchaser's account and, unless invoiced, shall be paid by Purchaser directly to the appropriate governmental agency.

**6. SHIPPING TERMS:** Delivery of Products to Canada, the United States and Mexico shall be F.O.B. (as defined in the Uniform Commercial Code as in effect in the State of Ohio) Powell's plant of manufacture. Delivery of Products outside of Canada, United States and Mexico shall be Ex Works (as defined by INCOTERMS 2000) Powell's plant of manufacture. All transportation expenses, freight and insurance shall be paid by Purchaser, and risk of delay, loss or damage incurred in transit shall be borne by Purchaser, who shall be responsible to file any such claims with the relevant carrier(s) or insurers.

Upon tender of delivery, title shall pass to Purchaser, subject to Powell's right of stoppage in transit and to Powell's security interest in the Products, as set forth in Section 8.

If the Products are held by Powell subject to receiving instructions from Purchaser or in any case where Powell, in its sole discretion, determines any part of the Products should be held for Purchaser's account, Powell may invoice the Products, and Purchaser agrees to make payment in accordance with these Terms and Conditions. Products invoiced and held at any location by Powell will be held at Purchaser's risk, and Powell may charge for (but is not obligated to carry) insurance and storage.

If Purchaser has declared or manifested an intention not to accept delivery in accordance with these Terms and Conditions, no tender will be necessary, but Powell may, at its option, give notice to Purchaser that Powell is ready and willing to deliver and such notice will constitute a valid tender of delivery.

**7. INSPECTION AND ACCEPTANCE:** Each shipment shall be inspected by Purchaser for observable damage and/or non-conformity at the time of delivery of the Products. Failure to so inspect shall constitute a waiver of Purchaser's rights of inspection and shall constitute an unqualified acceptance of the Products. If, after such inspection, Purchaser attempts to reject any Products, Purchaser shall fully specify all claimed damage or non-conformity in writing in a notice of rejection sent to Powell within five (5) days of delivery of the Products. Purchaser's failure to so specify shall constitute a waiver of that damage or non-conformity. Partial deliveries shall be accepted by Purchaser and paid for according to these Terms and Conditions.

**8. PAYMENT TERMS:** Payment shall be due net thirty (30) days from the date of invoice. Overdue accounts shall be subject to a carrying charge of one and one-half percent (1.5%) per month or portion of a month on the unpaid balance until paid in full. In the event Purchaser shall default on its obligations hereunder, Purchaser shall be liable for all of Powell's costs and expenses of collection, including reasonable attorneys' fees. Powell may, at its option, cancel and/or sell any unshipped Products should Purchaser fail to fulfill the complete terms of payment. Purchaser will have no right to offset any amounts against any payment or other obligation which Powell may owe to Purchaser. Powell hereby reserves a security interest in the Products to secure Purchaser's payment of the purchase price and any other amounts owed by Purchaser, and Purchaser agrees that Powell may (but is not obligated to) take such action as Powell deems advisable to evidence and perfect such interest and that Purchaser will cooperate with Powell in the taking of such actions.

**9. CREDIT APPROVAL:** Notwithstanding the provisions of Section 8, Powell may at any time decline to make any shipment or delivery or perform any work except upon receipt of payment or upon terms and conditions or security satisfactory to Powell, including, but not limited to, requiring that Purchaser provide Powell one or more letters of credit.

**10. LEAD TIMES:** Estimated lead times, if specified, are approximate only and are not guaranteed. Failure to ship on or near the estimated date shall not entitle Purchaser to any remedy or to cancel the Order without charge. Estimated lead times are provided Ex Works Powell's plant in weeks after receipt of Order. Estimated lead times are stated on a net basis and do not include any additional lead time due to scheduled and/or unscheduled plant shutdowns. Scheduled plant shutdowns include a two (2) week shutdown each winter and each summer. Estimated lead times are quoted on the basis of material availability and plant loading at the time of quotation, which are subject to change. Purchaser should confirm any estimated lead times at time of Order.

**11. MINIMUM ORDER CHARGE:** With respect to any Order that includes spare, replacement or component parts ("Parts") as Products, a minimum Order charge of One Hundred USD (\$100) shall apply. With respect to any Order that includes valves ("Valves") as Products, a minimum Order charge of Three Hundred Fifty USD (\$350) shall apply.

**12. RETURN OF PRODUCTS:** No Products shall be returned to Powell without Powell's prior written agreement. Products returned by Purchaser shall be returned in the same condition as when delivery was affected by Powell. Only Products that are new, unused and in a condition suitable for immediate resale shall be considered for return. Powell reserves the right to assess a minimum thirty-five percent (35%) restocking charge for Products returned for reasons other than defects or non-conformity.

**13. CANCELLATION/SUSPENSION:** Purchaser shall not cancel or suspend an Order without Powell's prior written consent, which such consent Powell shall be under no obligation to provide. In the event of cancellation or suspension of an Order without Powell's prior written consent, in addition to Powell's other rights and remedies available hereunder and under applicable law, Purchaser shall pay cancellation charges as follows: (a) Order entered in Powell's system, but no engineering yet initiated, 5%, (b) Engineering work has begun and orders for casings and/or outside purchased parts have been placed, 25%, (c) Castings poured and/or components made, but not yet received at Powell's location, 75%, (d) Castings poured and/or components made and received at Powell's location, 85%, (e) Manufacturing process started, 95% and (f) Components finished, 100%.

Powell may cancel all or part of an Order immediately upon the happening of any of the following: Purchaser is delinquent on any of its obligations hereunder or under any order or transaction with Powell, insolvency of Purchaser; the appointment of a custodian as that term is defined in Title 11 U.S.C., as amended (the "Bankruptcy Code"), or the commencement of a case under any chapter of the Bankruptcy Code or the bankruptcy, receivership, insolvency or similar laws of any country for, by or against Purchaser; Purchaser's suspension or termination of business or assignment for the benefit of creditors; or any event, whether or not similar to the foregoing, which materially impairs Purchaser's ability to perform hereunder. Powell's rights to cancel or postpone set forth herein may be exercised by Powell without liability.

**14. CORRECTIONS:** Powell reserves the right to make corrections to price lists, quotations, invoices or other contract documents in the event of clerical or typographical errors.

**15. COUNTRY OF ORIGIN:** Powell reserves the right to furnish Products from any of its plants at its sole discretion and does not represent that the Products listed herein originate from any specific country. Any costs affected by country of origin, including, but not limited to, customs duties, are not included in the purchase price and are for Purchaser's account.

**16. INFORMATION REGARDING PRODUCTS:** Purchaser acknowledges that it has received and is familiar with Powell's and any other manufacturer's labeling and literature concerning the Products and will forward such information to its employees, agents and customers.

**17. POWELL PRODUCT WARRANTY:** For a period of (a) ninety (90) days from tender of delivery with respect to Parts and (b) the earlier of (i) eighteen (18) months from tender of delivery or (ii) twelve (12) months from installation with respect to Valves, Powell warrants to Purchaser that the Parts and/or Valves, as applicable, of its



own manufacture are free of defects in material and workmanship, under normal use and proper operation. If any such Products fail to comply with such warranty, Powell, at Powell's option, shall either: (i) replace such defective Products; (ii) furnish replacement parts for repairing Products (iii) issue written authorization for Purchaser or others to replace or repair, without charge to Purchaser, at costs comparable to Powell's normal manufacturing costs, those parts proven defective; or (iv) refund all monies paid by Purchaser to Powell for such Products and, at the sole discretion of Powell, have the Products returned to Powell at Powell's expense. Finished materials and accessories purchased from other manufacturers are warranted only to the extent of the manufacturer's warranty to Powell (to the extent transferable by Powell to Purchaser). Any alteration in material or design of the Products or component parts thereof by Purchaser or others and/or the undertaking of repairs or replacement by Purchaser or its agents without Powell's written consent shall relieve Powell of all responsibility herewith.

Powell's obligations under this warranty shall be conditioned upon (a) Purchaser's notifying Powell of any alleged defect(s) in a writing that references Purchaser's Order number and provides complete identification of any allegedly defective Products within ten (10) days of the discovery of the damage or defect, and (b) Powell's satisfying itself upon inspection that its warranty has been breached. Purchaser may not bring any action under or arising from an Order or these Terms and Conditions unless such action is commenced within one year after the cause of action accrues.

EXCEPT AS SET FORTH IN THIS SECTION 17, POWELL MAKES NO WARRANTY CONCERNING THE PRODUCTS WHATSOEVER; POWELL DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF NON-INFRINGEMENT AND THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE OBLIGATIONS SET FORTH IN THIS SECTION 17 ARE POWELL'S SOLE OBLIGATIONS AND PURCHASER'S EXCLUSIVE REMEDY. POWELL SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, AND PURCHASER HEREBY WAIVES, FOR ITSELF AND ITS SUCCESSORS AND ASSIGNS, (A) ANY AND ALL CLAIMS FOR PUNITIVE DAMAGES AND (B) ALL CLAIMS OF NEGLIGENCE OR STRICT LIABILITY OR BOTH. WITHOUT LIMITATION TO THE FOREGOING, IN NO EVENT SHALL POWELL BE LIABLE FOR THE LOSS OF USE OF THE PRODUCT OR FOR THE LOSS OF USE OF ANY OTHER PRODUCT, PROCESS, EQUIPMENT, OR FACILITIES OF PURCHASER OR OF THE END-USER, WHETHER PARTIALLY OR WHOLLY DUE TO DEFECTS IN MATERIAL AND/OR WORKMANSHIP AND/OR DESIGN OF POWELL'S PRODUCT, AND IN NO EVENT SHALL POWELL BE LIABLE FOR REMOVAL OF APPURTENANCES OR INCIDENTALS SUCH AS CONNECTIONS, PIPE WORK AND SIMILAR ITEMS OF OBSTRUCTION OR FOR ANY COSTS BROUGHT ABOUT BY NECESSITY OF REMOVING THE PRODUCT FROM ITS POINT OF INSTALLATION.

Purchaser (a) recognizes that the limitations contained in this Section 17 are material factors in Powell's sale of the Products at the price(s) specified, and (b) agrees that any accommodation to Purchaser by Powell, whether for sales policy reasons or otherwise, shall not be taken to establish any liability of Powell or any contract term inconsistent with this Agreement.

Purchaser shall neither make nor purport to make (a) any warranty to any person by or on behalf of Powell or (b) any warranty or representation inconsistent with this Section 17.

**18. COMPLIANCE WITH LAWS:** Powell certifies that the Products produced by it, if any, were produced in compliance with all applicable requirements of Sections 6, 7 and 12 of the Fair Labor Standards Act of 1938, as amended, and the Regulations and Orders of the Administrator of the Wage and Hour Division issued under Section 14 thereof.

Powell shall endeavor to comply with all applicable Ohio and United States federal laws. Powell is not responsible for compliance with any other laws or regulations, or with any Product standard or specification, whether of general or particular application, unless Purchaser has furnished specific written notice thereof prior to Powell's entry of Purchaser's Order.

All sales of Products are conditioned upon and subject to strict compliance with United States export control laws, rules and regulations, including, without limitation, the Export Administration Act, the Export Administration Regulations, the Arms Control Act, the International Traffic in Arms Regulations, the Trading With the Enemy Act, the International Economic Powers Act and the Foreign Assets Control Regulations, as they may be amended and supplemented from time to time (each, an "Export Law" and collectively, the "Export Laws"). For any sale of Products requiring a license, permit or other approval under any Export Law ("Restricted Products"), Powell shall determine the feasibility of obtaining such license, permit or other approval ("Export Approval") and whether it will fill the order for the Restricted Products in light of required Export Approval. In the event Powell applies for Export Approval for the Restricted Products, it shall do so at Purchaser's cost and expense and Purchaser agrees to reimburse Powell for any cost or expenses (including Powell's reasonable attorneys' fees) incurred by Powell in pursuing Export Approval. Powell shall not be under any obligation to ship any such Restricted Products unless and until such Export Approval is granted, and only in strict compliance with the terms and conditions of such Export Approval. Purchaser shall be responsible for timely obtaining and maintaining any required import license, permit or approval necessary to import any Restricted Products into Purchaser's country and any other required governmental authorization ("Import Approval"). Powell shall not be liable if any Export Approval or Import Approval is delayed, denied, revoked, restricted or not renewed, and Purchaser shall not be relieved thereby of its obligations to pay Powell for the Restricted Products or Powell's costs and expenses of obtaining Export Approval in respect of Restricted Products under the Export Laws.

For Products other than Restricted Products, Purchaser (or its designated export agent) shall be responsible for the timely application for any required export authorization and the payment of any required fees, duties, taxes, tariffs, levies or other charges necessary to export the Products out the United States of America and shall be responsible for timely obtaining and maintaining any required Import Approval and the payment of any required fees, duties, taxes, tariffs, levies or other charges necessary to import the Products into Purchaser's country. Powell shall not be liable if any export authorization or Import Approval is delayed, denied, revoked, restricted or not renewed, and Purchaser shall not be relieved thereby of its obligations to pay Powell for the Products.

Purchaser shall not make any disposition of any Products purchased hereunder, by way of transshipment, reexport, diversion or otherwise, other than in and to the ultimate end user and country of destination specified on Purchaser's order or declared as the ultimate end user and country of ultimate destination on Powell's invoices, except as the Export Laws or Export Approval may expressly permit. Purchaser shall not distribute or resell any Product to or within any country or to any individual, government authority or other entity that is presently or at any time in the future subject to sanctions of the United States government, or is in violation of any Export Laws or other United States federal laws, statutes, codes, Executive Orders, decrees, rules or regulations relating to terrorism, drug trafficking or money laundering, or is designated under any such authority as being subject to sanctions or connected in any way to terrorism, drug trafficking or money laundering, including, without limitation, on the Specially Designated Nationals List and Block Persons List maintained by the Office of Foreign Assets Control (OFAC), United States Department of the Treasury, and the Denied Persons List, the Entity List and the Unverified List maintained by the Bureau of Industry and Security, United States Department of Commerce.

Purchaser shall indemnify and hold harmless Powell from and against any damages, liabilities or expenses of any kind incurred by Powell as a result of Purchaser's direct or indirect breach of any term or condition related to the Export Laws.

**19. SAFETY:** Purchaser warrants that it will comply with all laws, regulations, standards and requirements which are applicable to the use of the Products and Purchaser's business.

**20. CONFIDENTIALITY:** Purchaser will not disclose or otherwise disseminate, directly or indirectly, any of the terms of these Terms and Conditions or any other information of Powell given to or received by Purchaser or its associates or agents, unless Purchaser received Powell's written permission or such information is required to be disclosed by law or becomes part of the public domain through no fault of Purchaser, its associates or agents.

**21. GOVERNING LAW; JURISDICTION AND VENUE:** These Terms and Conditions shall be governed by and construed in accordance with the internal laws of the State of Ohio, without regard to such state's choice of law principles. These Terms and Conditions shall not be governed by or construed in accordance with the United Nations Convention on the International Sale of Goods, 1980, for any purpose. Customer and Powell hereby submit to the jurisdiction and venue of the state and federal courts in Cincinnati, Hamilton County, Ohio over any controversy relating to or arising from these Terms and Conditions. Notwithstanding the foregoing, Powell's right to institute or defend any proceedings in any jurisdiction, in or out of the United States of America, shall not be limited.

**22. SEVERABILITY:** If any of the provisions of these Terms and Conditions are deemed invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions will in no way be affected or impaired thereby.

**23. FORCE MAJEURE:** Delivery of all or any part of the Products is contingent upon Powell's ability to obtain supplies, raw materials and services through its regular and usual sources of supply. If by reason of any contingency beyond Powell's reasonable control, including (but not limited to) war, governmental requests, restrictions or regulations, fire, flood, casualty, accident, or other acts of God, strikes or other difficulties with employees, delay or inability to obtain labor, equipment, material and services through Powell's usual sources, failure or refusal of any carrier to transport materials, delay in transport thereof, or any other similar occurrence, Powell is not able to meet anticipated deliveries, Powell shall not be liable therefore and may, in its discretion without prior notice to Purchaser, postpone the delivery date(s) under this document for a time which is reasonable under all the circumstances. If during the occurrence of any of the foregoing contingencies, Powell holds any of the Products, Powell may invoice and hold the same for the account of Purchaser and Purchaser agrees to make payment at the maturity of the invoice so rendered.

**24. ASSIGNMENT:** No right or interest in the contract arising from these Terms and Conditions shall be assigned by Purchaser and no delegation of any obligation owed by Purchaser shall be made without the prior written permission of Powell. As used herein, "Purchaser" and "Powell" include the respective heirs, executors, personal representatives, successors and permitted assigns of each.

**25. REMEDIES CUMULATIVE; NO WAIVER:** The individual rights and remedies of Powell reserved herein shall be cumulative and additional to any other or further remedies provided in law or equity or in this document. Waiver by Powell of performance or breach of any provision hereof by Purchaser, or failure of Powell to enforce any provision hereof which may establish a defense or limitation of liability, shall not be deemed a waiver of future compliance therewith or a course of performance modifying

such provision, and such provision shall remain in full force and effect as written.

**26. LIMITATION OF LIABILITY:** UNDER NO CIRCUMSTANCES SHALL POWELL BE LIABLE TO PURCHASER UNDER OR IN CONNECTION WITH ORDERS FOR PRODUCTS AND THESE TERMS AND CONDITIONS, WHETHER ANY CLAIM FOR RECOVERY IS BASED UPON OR ARISES OUT OF THEORIES OF BREACH OF CONTRACT, BREACH OF WARRANTY, INDEMNIFICATION, NEGLIGENCE, TORT (INCLUDING STRICT LIABILITY) OR OTHERWISE, IN EXCESS OF AN AMOUNT EQUAL TO THE NET CONTRACT VALUE OF THE PRODUCTS PROVIDED BY POWELL TO PURCHASER DURING THE MOST RECENTLY ENDED CALENDAR QUARTER.



The background of the entire page is a technical drawing of various industrial valves and components, rendered in a light yellow/gold color on a dark blue background. The drawings show cross-sections and side views of different valve types, including gate valves, ball valves, and butterfly valves, with various internal mechanisms and external flanges visible.

# **POWELL VALVES**

2503 SPRING GROVE AVENUE, CINCINNATI, OHIO 45214-1771, U.S.A.

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