



**POWELL  
VALVES**

## BALL VALVES

CARBON, STAINLESS AND BRASS  
THREADED, SOCKET WELD, FLANGED  
ONE, TWO & THREE PIECE DESIGNS  
SOFT SEAT / FIRE SAFE



Protect Tomorrow. Today  
Powell Valves  
NextGen Engineering



## **Powell Valves NextGen Engineering**

For decades, Powell Valves has provided reliable and trusted products that not only meets, but exceeds customer confidence and expectations.

## **Expect 100% Customer Satisfaction**

Quality performance is at the heart of every product we sell. We are proud of our long-standing reputation for excellence in our industry and will continue to anticipate and meet the growing needs of consumers.



**SINCE 1846**



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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 171 years. We like to refer to ourselves as 171 years young due to our flexibility in changing quickly to our customer's 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 a 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 Valves 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 an additional inventory hub in Asia. 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 170, 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,



Randy Cowart  
President, CEO & Chairman  
The Wm. Powell Company



## HOW TO ORDER POWELL QUARTER TURN VALVES

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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Size			Blank	Design	Body/Port	Class		End Code	Material Code	Trim (Ball/Seat)	Packing/Gasket	Option Code		

Size Code	
Code	Size
0.1	1/8"
0.2	1/4"
0.4	3/8"
0.5	1/2"
0.8	3/4"
1.0	1"
1.2	1-1/4"
1.5	1-1/2"
2.0	2"
2.5	2-1/2"
3.0	3"
4.0	4"
5.0	5"
6.0	6"
8.0	8"
10.0	10"
12.0	12"
14.0	14"
16.0	16"
18.0	18"
20.0	20"
24.0	24"
etc.	etc.

Design	
Code	Description
B	Ball Valve

Body / Port	
Code	Description
1	1-Pc. Reduced Port
5	1-Pc. Reduced Port, Direct Mount, Fire Safe
2	2-Pc. Full Port
4	2-Pc. Full Port, Direct Mount
6	2-Pc. Full Port, Direct Mount, Fire Safe
8	2-Pc. Full Port, Seal Welded, Nace, Fire Safe
3	3-Pc. Full Port
7	3-Pc. Full Port, Direct Mount
9	3-Pc. Full Port, Enclosed Bolt, Fire Safe
L	Ball 3-Way L Port
T	Ball 3-Way T Port

Class	
Code	Description
01	Class 150
03	Class 300
10	1000 WOG
20	2000 WOG
36	3600 WOG
60	6000 WOG

End Code	
Code	Description
T	Threaded Ends
S	Socket Weld Ends
X	SWE x Threaded
F	Flanged End
Z	Special ends

Material Codes	
Code	Option
M	A351 CF8M
C	A216 Gr. WCB
Z	Special Material

Trim (Ball/Seat)	
Code	Option
P	316SS Ball / PTFE Seat
R	316SS Ball / RTFE Seat
K	316SS Ball / PEEK Seat
M	316SS Ball / TFM 1600 Seat

Packing/Gasket	
Code	Option
G	Std Graphite
T	Std Teflon
X	None
Z	Special Packing or Gasket

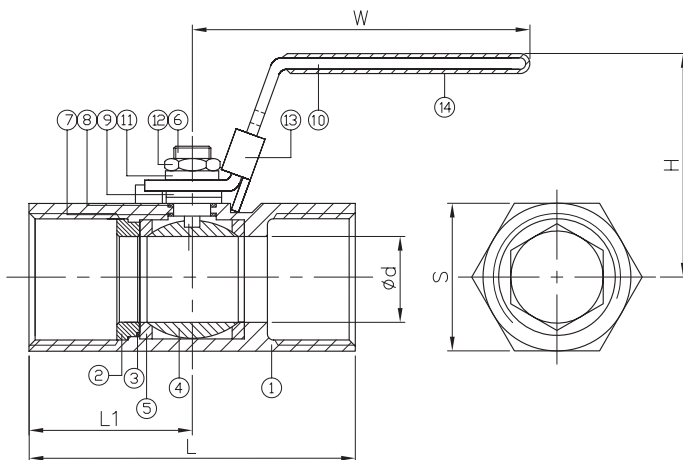
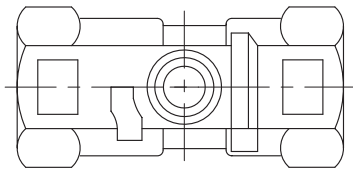
Option Codes	
Code	Option
XXX	No Options
GLV	Lever on Direct Mount Threaded and SWE valves
GXX	Gear Operator
NXX	Nace
GCA	Gear, Locking Device
HEL	Oval Handle
	Tee Handle
	Actuator - Electric
	Actuator - Single Acting
	Actuator - Double Acting



## SERIES: B110TM - STAINLESS STEEL 1-PC. SCREWED END BALL VALVE (1/4" - 2")

### DESIGN FEATURES:

- Reduced port, 1/4"~2" (DN8~DN80)
- **W.P. : 1000 WOG (PN63)**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Locking device
- Thread type:
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL
		<b>B110TMRTXXX</b>
1	BODY	ASTM A351-CF8M
2	RETAINER	AISI 316
3	BODY SEAL (1)	PTFE
4	BALL	AISI 316
5	SEAT	PTFE
6	STEM	AISI 316
7	THRUST WASHER	PTFE
8	PACKING	
9	GLAND WASHER	AISI 304
10	HANDLE	
11	SPRING WASHER	
12	NUT	
13	LOCKING DEVICE	PVC
14	HANDLE SLEEVE	

(1) 1-1/4" - 2" size only

DN	d	L	L1	H	W	S	Torque (N-M)	Weight (kg)
8	5.0	39.0	20.0	38.0	67.0	17.0	0.8	0.1
10	7.0	44.0	23.5	39.4	75.5	21.0	1.3	0.1
15	9.2	55.5	28.5	51.0	90.0	24.5	1.9	0.2
20	12.5	59.0	29.0	51.5	90.0	32.0	2.6	0.3
25	16.0	71.0	36.0	53.5	101.5	38.0	4.5	0.4
32	20.0	78.0	40.0	61.5	101.5	49.0	7.0	0.7
40	25.0	83.0	42.5	65.4	132.0	53.0	8.9	0.9
50	32.0	100.0	51.0	71.0	132.0	65.0	9.6	1.4

unit: mm

NPS	d	L	L1	H	W	S	Torque (in-lb)	Weight (lb)
1/4"	0.20	1.54	0.79	1.50	2.64	0.67	6.7	0.2
3/8"	0.28	1.73	0.93	1.55	2.97	0.83	11.2	0.2
1/2"	0.36	2.19	1.12	2.01	3.54	0.96	16.9	0.4
3/4"	0.49	2.32	1.14	2.03	3.54	1.26	22.6	0.6
1"	0.63	2.80	1.42	2.11	4.00	1.50	39.5	0.9
1-1/4"	0.79	3.07	1.57	2.42	4.00	1.93	62.0	1.6
1-1/2"	0.98	3.27	1.67	2.57	5.20	2.09	78.9	1.9
2"	1.26	3.94	2.01	2.80	5.20	2.56	84.6	3.0

unit: in

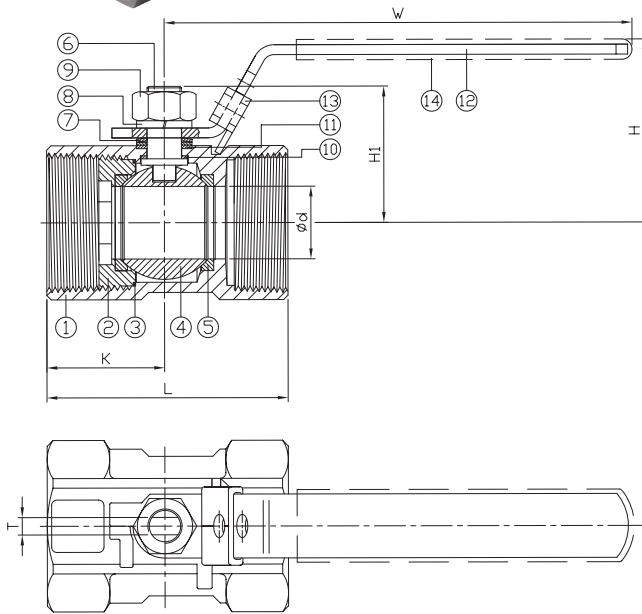




## SERIES: B110TC - CARBON STEEL 1-PC. SCREWED END BALL VALVE (1/4" - 2")

**DESIGN FEATURES:**

- Reduced port, 1/4"~2" (DN8~DN80)
- **W.P. : 1000 WOG (PN63)**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Anti-Static Device
- Silicone Free
- Locking device
- Thread type:
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL
		<b>B110TCPTXXX</b>
1	BODY	ASTM A216-WCB
2	RETAINER	
3	BODY SEAL (1)	PTFE
4	BALL	ASTM A351-CF8M
5	BALL SEAT	PTFE
6	STEM	ASTM A276-316
7	FLAT WASHER	AISI 304
8	SPRING WASHER	
9	STEM NUT	
10	THRUST WASHER	PTFE
11	PACKING	STAINLESS STEEL
12	HANDLE	
13	LATCH LOCK	AISI 304
14	HANDLE SLEEVE	PVC

(1) 1-1/4" - 2" size only

DN	d	L	H	H1	T	W	K	Torque (N-m)	Weight (kg)
8	5.0	39.0	38.0	17.0	3.0	61.7	20.0	0.8	0.1
10	7.0	44.0	41.1	21.4	4.0	73.5	23.0	1.0	0.1
15	9.0	56.5	40.6	26.1	5.0	94.7	29.0	1.2	0.2
20	12.5	59.0	44.1	28.8	5.0	94.7	29.0	1.8	0.3
25	15.0	71.0	56.5	36.5	6.0	111.5	35.0	3.0	0.4
32	20.0	78.0	62.0	40.5	112.5	113.0	38.0	4.9	0.7
40	25.0	83.0	63.2	46.5	160.0	141.0	40.5	7.4	0.9
50	32.0	100.0	68.5	51.0	160.5	141.0	49.0	8.8	1.4

unit: mm

NPS	d	L	H	H1	T	W	K	Torque (in-lb)	Weight (lb)
1/4"	0.20	1.54	1.50	0.67	0.12	2.43	0.79	7.1	0.2
3/8"	0.28	1.73	1.62	0.84	0.16	2.89	0.91	8.9	0.2
1/2"	0.35	2.22	1.60	1.03	0.20	3.73	1.14	10.6	0.4
3/4"	0.49	2.32	1.74	1.13	0.20	3.73	1.14	15.9	0.7
1"	0.59	2.80	2.22	1.44	0.24	4.39	1.38	25.7	0.9
1-1/4"	0.79	3.07	2.44	1.59	4.43	4.45	1.50	43.4	1.5
1-1/2"	0.98	3.27	2.49	1.83	6.30	5.55	1.59	65.1	2.0
2"	1.26	3.94	2.70	2.01	6.32	5.55	1.93	78.1	3.1

unit: in



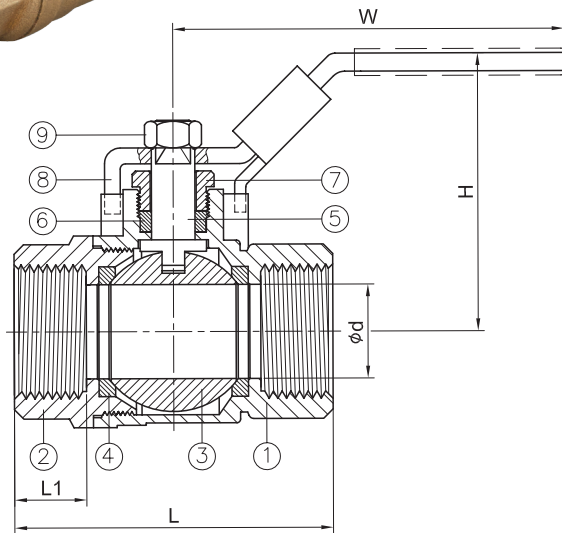
## SERIES: B200T (1/4" - 4")

### 2-PC. SCREWED END BALL VALVE

### Brass

**DESIGN FEATURES:**

- Full port, 1/4"~4" (DN8-DN100)
- **W.P. :**
  - » 1/4" - 2": **600 WOG**
  - » 2-1/2" - 4": **400 WOG**
- U.L. Listed
- Solid Ball
- NSF/ANSI 61-8
- CSA-ANSI Z21.15
- CGA9.1, ASME B16.44, CGA CR91-002
- Thread type:
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226
- Blow-out proof stem
- Locking device (1/4 - 2" only)



ITEM	PARTS	MATERIAL
		B200T
1	BODY	BRASS
2	CAP	
3	BALL	
4	SEAT	PTFE
5	STEM	BRASS
6	PACKING	PTFE
7	GLAND	BRASS
8	HANDLE	NICKEL PLATING STEEL
9	STEM NUT	BRASS PLATING STEEL

DN	d	L	L1	H	W	NPT THREAD	Weight (kg)
8	10.0	44.6	11.6	47.8	90.0	1/4"	0.4
10	10.0	44.6	11.6	47.8	90.0	3/8"	0.4
15	14.8	52.0	13.2	53.1	90.0	1/2"	0.4
20	19.0	60.0	14.3	56.8	96.0	3/4"	0.7
25	24.0	70.0	16.0	67.8	115.0	1"	1.1
32	32.0	84.0	18.0	77.50	115.0	1-1/4"	1.6
40	40.0	93.0	18.2	88.5	140.0	1-1/2"	2.4
50	50.0	106.2	19.0	97.5	140.0	2"	3.4
65	64.0	136.6	26.0	121.0	220.0	2-1/2"	9.0
80	74.0	153.4	28.0	129.0	220.0	3"	12.0
100	99.0	187.6	31.0	149.0	244.0	4"	18.0

unit: mm

NPS	d	L	L1	H	W	NPT THREAD	Weight (lb)
1/4"	0.39	1.76	0.46	1.88	3.54	1/4"	0.7
3/8"	0.39	1.76	0.46	1.88	3.54	3/8"	0.7
1/2"	0.58	2.05	0.52	2.09	3.54	1/2"	1.0
3/4"	0.75	2.36	0.56	2.24	3.78	3/4"	1.5
1"	0.95	2.76	0.63	2.67	4.53	1"	2.4
1-1/4"	1.26	3.31	0.71	3.05	4.53	1-1/4"	3.5
1-1/2"	1.58	3.66	0.72	3.48	5.51	1-1/2"	5.3
2"	1.97	4.18	0.75	3.84	5.51	2"	7.4
2-1/2"	2.52	5.38	1.02	4.76	8.66	2-1/2"	19.8
3"	2.91	6.04	1.10	5.08	8.66	3"	26.0
4"	3.90	7.39	1.22	5.87	9.61	4"	40.0

unit: in



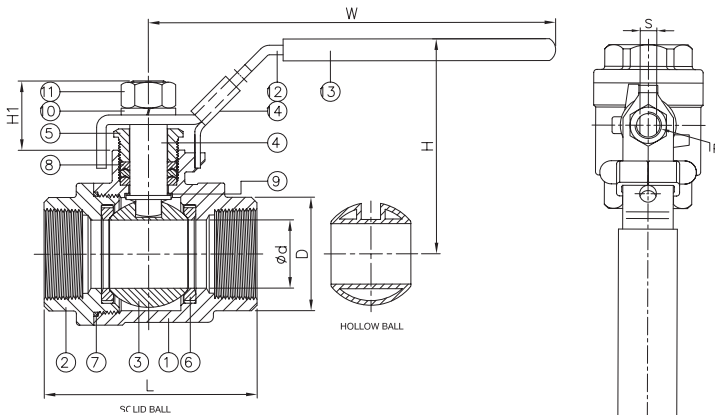
## SERIES: B210TM - B210TC (1/4" - 4")

### 2-PC. SCREWED END BALL VALVE

#### Stainless / Carbon Steel

**DESIGN FEATURES:**

- Full port, 1/4"-4" (DN8-DN80)
- **W.P. : 1000 WOG (PN63)**
- W.T. : -20°C-200°C (-4°F-392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Anti-Static Device
- Locking device
- Tapped & drilled mounting pad (option)
- Thread type:
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL	
		B210TMRTXXX	B210TCRTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	SOLID BALL	ASTM A351-CF8M	
	HOLLOW BALL	ASTM A240-316	
4	STEM	ASTM A276-316	
5	GLAND	AISI 304	
6	SEAT	RTFE	
7	SEAL	PTFE	
8	PACKING		
9	THRUST WASHER	AISI 304	
10	SPRING WASHER		
11	NUT	AISI 304	
12	HANDLE	STAINLESS STEEL	
13	HANDLE SLEEVE	PVC	
14	LOCK DEVICE	STAINLESS STEEL	

DN	d	D	L	H	H1	W	S	P	Torque (N-M)	Weight (kg)
8	11.6	19.0	50.8	58.5	18.5	99.5	5.0	3/8"-24UNF	3.5	SOLID BALL
10	12.5	22.5	50.8	58.5	18.5	99.5	5.0	3/8"-24UNF	4.0	0.2
15	15.0	26.0	58.0	60.5	18.8	99.5	5.0	3/8"-24UNF	5.5	0.2
20	20.0	32.0	65.6	63.0	23.4	123.0	6.5	7/16"-20UNF	7.5	0.3
25	25.0	38.0	78.7	79.5	26.2	149.0	8.0	7/16"-20UNF	11.0	0.5
32	32.0	48.0	90.0	86.0	23.6	149.0	8.0	7/16"-20UNF	15.0	0.8
40	38.0	54.8	105.0	101.7	28.2	190.0	10.0	1/2"-20UNF	20.0	1.1
50	50.0	67.0	124.0	109.3	23.4	190.0	10.0	1/2"-20UNF	40.0	1.8
65	63.0	85.0	146.0	140.0	39.4	247.0	12.0	3/4"-10UNF	60.0	2.7
80	76.0	100.0	163.2	148.5	39.4	247.0	12.0	3/4"-10UNF	85.0	5.6
100	100.0	126.0	240.0	175.0	43.0	300.0	15.0	3/4"-10UNF	90.0	7.5

unit: mm

NPS	d	D	L	H	H1	W	S	P	Torque (in-lb)	Weight (lb)
1/4"	0.46	0.75	2.00	2.30	0.73	3.92	0.20	3/8"-24UNF	31.0	SOLID BALL
3/8"	0.49	0.89	2.00	2.30	0.73	3.92	0.20	3/8"-24UNF	35.4	0.5
1/2"	0.59	1.02	2.28	2.38	0.74	3.92	0.20	3/8"-24UNF	48.7	0.5
3/4"	0.79	1.26	2.58	2.48	0.92	4.84	0.26	7/16"-20UNF	66.4	0.7
1"	0.98	1.50	3.10	3.13	1.03	5.87	0.31	7/16"-20UNF	97.4	1.0
1-1/4"	1.26	1.89	3.54	3.39	0.93	5.87	0.31	7/16"-20UNF	132.8	1.7
1-1/2"	1.50	2.16	4.13	4.00	1.11	7.48	0.39	1/2"-20UNF	177.0	2.5
2"	1.97	2.64	4.88	4.30	0.92	7.48	0.39	1/2"-20UNF	354.0	3.9
2-1/2"	2.48	3.35	5.75	5.51	1.55	9.72	0.47	3/4"-10UNF	531.0	5.9
3"	2.99	3.94	6.43	5.85	1.55	9.72	0.47	3/4"-10UNF	752.3	12.4
4"	3.94	4.96	9.45	6.89	1.69	11.81	0.59	3/4"-10UNF	796.6	16.5

unit: in



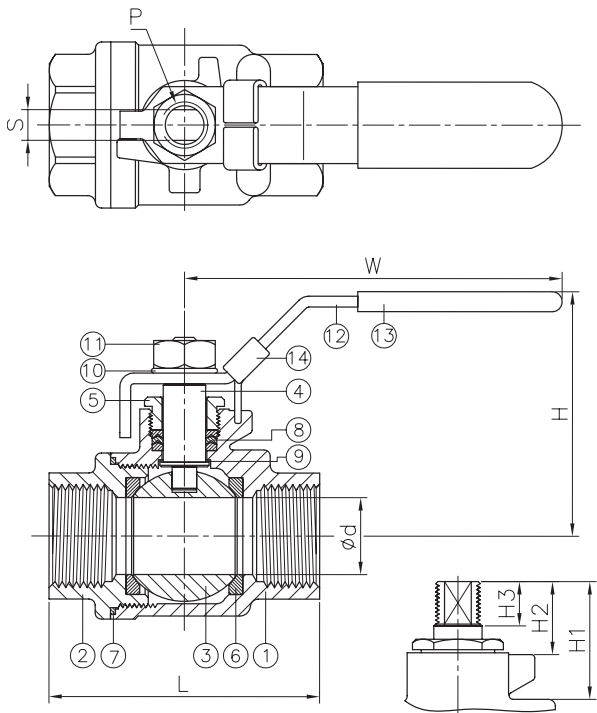
## SERIES: B220TM - B220TC (1/4" - 2")

### 2-PC. SCREWED END BALL VALVE

#### Stainless / Carbon Steel

**DESIGN FEATURES:**

- Full port
- **W.P. :**
  - » 1/4"~1" - 2000 WOG (PN150)
  - » 1-1/4"~2" - 1500 WOG (PN100)
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Silicone Free
- Blow-out proof stem
- Anti-static device
- Locking device
- Thread type :
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL	
		B220TMRTXXX	B220TCRTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	STEM	ASTM A276-316	
5	GLAND NUT	AISI 304	
6	BALL SEAT	RTFE	
7	BODY SEAL	PTFE	
8	PACKING		
9	THRUST WASHER	AISI 304	
10	SPRING WASHER		
11	NUT		
12	HANDLE	STAINLESS STEEL	
13	HANDLE SLEEVE	PVC	
14	LOCK DEVICE	STAINLESS STEEL	

DN	D	L	H	H1	H2	H3	W	S	P	TORQUE (N-M)	WEIGHT (KG)
8	11.6	60.5	54.1	25.0	17.1	11.0	103	5.0	5/16"W	4.1	0.3
10	13.0	60.5	54.1	25.0	17.1	11.0	103	5.0	5/16"W	4.1	0.3
15	15.0	64.0	56.7	26.0	17.7	11.0	103	5.0	5/16"W	4.4	0.3
20	20.0	77.0	63.7	31.7	22.7	13.5	126	6.5	3/8"W	5.9	0.6
25	25.0	90.0	76.7	37.3	26.1	15.7	164	8.0	7/16"W	7.4	0.8
32	32.0	100.0	82.7	37.7	24.9	15.7	164	8.0	7/16"W	8.8	1.3
40	38.0	118.0	95.5	42.1	27.2	17.0	190	9.0	1/2"W	13.2	2.0
50	50.8	138.0	105.3	43.3	28.3	17.0	190	9.0	1/2"W	16.2	3.1

unit: mm

NPS	D	L	H	H1	H2	H3	W	S	P	TORQUE (IN-LB)	WEIGHT (LB)
1/4"	0.46	2.38	2.13	0.98	0.67	0.43	4.06	0.20	5/16"W	36.0	0.6
3/8"	0.51	2.38	2.13	0.98	0.67	0.43	4.06	0.20	5/16"W	36.0	0.6
1/2"	0.59	2.52	2.23	1.02	0.70	0.43	4.06	0.20	5/16"W	39.0	0.7
3/4"	0.79	3.03	2.51	1.25	0.89	0.53	4.96	0.26	3/8"W	52.0	1.2
1"	0.98	3.54	3.02	1.47	1.03	0.62	6.46	0.31	7/16"W	65.1	1.9
1-1/4"	1.26	3.94	3.26	1.48	0.98	0.62	6.46	0.31	7/16"W	78.1	2.8
1-1/2"	1.50	4.65	3.76	1.66	1.07	0.67	7.48	0.35	1/2"W	116.8	4.4
2"	2.00	5.43	4.15	1.70	1.11	0.67	7.48	0.35	1/2"W	143.4	6.9

unit: in



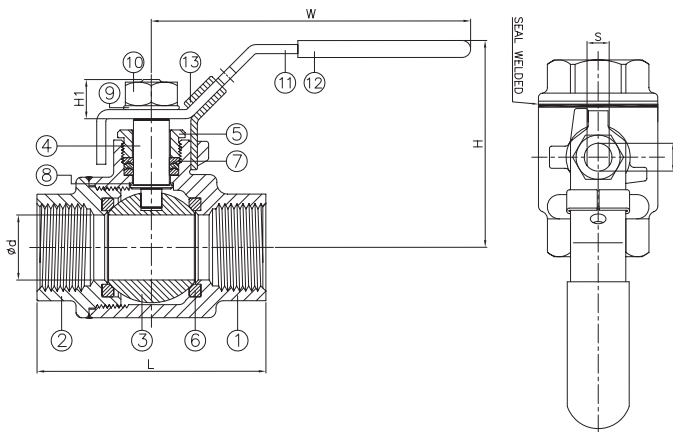
## SERIES: B820TM - B820TC (1/4" - 4")

### 2-PC. SCREWED END BALL VALVE

SEAL WELDED

**DESIGN FEATURES:**

- Full port
- **W.P. :**
  - » 1/4"-1" - 2000 WOG(PN150)
  - » 1-1/4"-2" - 1500 WOG(PN100)
  - » 2-1/2"-4" - 1000 WOG(PN63)
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Anti-static device
- Silicone Free
- Locking device
- **API 607 Fire safe approved**
- ASME B16.34 Wall thickness
- API 608 Design
- **NACE MRO103**
- Seal welded ends
- Thread type :
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL	
		B820MRGNXX	B820TCRGNXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	316 ASTM CF8M	
4	STEM	ASTM A276-316	
5	GLAND NUT	AISI 304	
6	SEAT	RTFE	
7	PACKING	GRAPHITE	
8	THRUST WASHER	CTFE	
9	SPRING WASHER	AISI 304	
10	NUT		
11	HANDLE	STAINLESS STEEL	
12	HANDLE SLEEVE	PVC	
13	LOCK DEVICE	STAINLESS STEEL	

DN	d	L	H	H1	W	S	P	Torque (N-M)		Weight (kg)
								Action	Breakaway	
8	11.6	60.5	53.6	10.5	102	5.0	5/16"	3.6	5.1	0.4
10	12.8	60.5	53.6	10.5	102	5.0	5/16"	3.8	6.4	0.4
15	15.0	62.5	57.0	10.5	102	5.0	5/16"	3.8	6.4	0.4
20	20.2	77.0	62.1	13.5	124	6.5	3/8"	3.8	6.4	0.7
25	25.6	90.0	80.0	15.7	165	8.0	7/16"	7.7	11.4	1.3
32	32.0	100.0	83.7	15.7	165	8.0	7/16"	19.5	28.6	2.0
40	38.0	118.0	99.0	17.0	188	9.0	1/2"	19.5	32.5	2.5
50	50.8	138.0	107.0	17.0	188	9.0	1/2"	20.8	44.2	4.1
65	65.5	167.0	142.0	27.5	250	12.0	3/4"	33.0	55.0	6.4
80	80.0	193.0	153.0	27.5	250	12.0	3/4"	42.0	70.0	10.9
100	100.0	258.0	180.0	34.0	324	16.0	1"	54.0	90.0	21.0

unit: mm

NPS	d	L	H	H1	W	S	P	Torque (in-lb)		Weight (lb)
								Action	Breakaway	
1/4"	0.46	2.38	2.11	0.41	4.02	0.20	5/16"	31.9	45.1	0.9
3/8"	0.50	2.38	2.11	0.41	4.02	0.20	5/16"	33.6	56.6	0.9
1/2"	0.59	2.46	2.24	0.41	4.02	0.20	5/16"	33.6	56.6	0.9
3/4"	0.80	3.03	2.44	0.53	4.88	0.26	3/8"	33.6	56.6	1.5
1"	1.01	3.54	3.15	0.62	6.50	0.31	7/16"	68.2	100.9	2.9
1-1/4"	1.26	3.94	3.30	0.62	6.50	0.31	7/16"	172.6	253.1	4.4
1-1/2"	1.50	4.65	3.90	0.67	7.40	0.35	1/2"	172.6	287.6	5.5
2"	2.00	5.43	4.21	0.67	7.40	0.35	1/2"	184.1	391.2	9.0
2-1/2"	2.58	6.57	5.59	1.08	9.84	0.47	3/4"	292.1	486.8	14.1
3"	3.15	7.60	6.02	1.08	9.84	0.47	3/4"	371.7	619.5	24.0
4"	3.94	10.16	7.09	1.34	12.76	0.63	1"	477.9	796.6	46.3

unit: in



## SERIES: B410TM - B410TC (1/4" - 3")

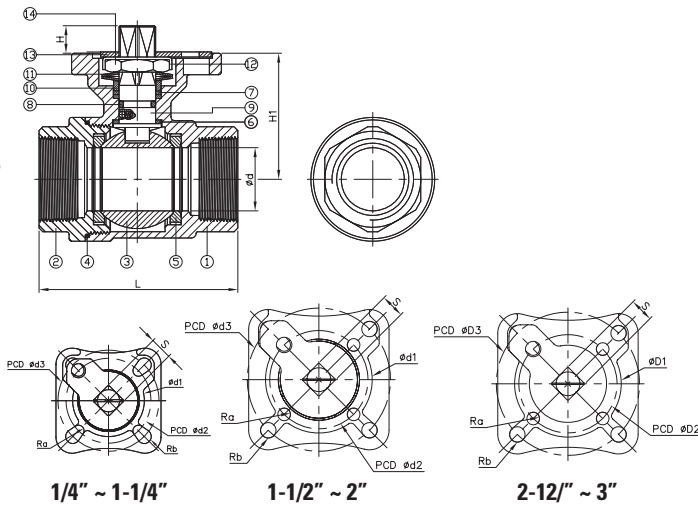
### 2-PC. SCREWED END BALL VALVE

### Stainless / Carbon Steel

DIRECT MOUNT

**DESIGN FEATURES:**

- Full port, 1/4" ~ 3" (DN8~DN50)
- **W.P. : 1000 WOG (PN63)**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Live-loading design
- Anti-static device
- Supplied with level handle
- Silicone Free
- Locking device
- **Direct Mounting pad ISO 5211**
- Thread type :
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL	
		B410TMMTXXX	B410TCMTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	SEAL	PTFE	
5	SEAT	TFM 1600	
6	THRUST WASHER	PTFE	
7	PACKING		
8	O-RING	VITON	
9	STEM	ASTM A276-316	
10	GLAND RING	AISI 304	
11	BELLEVILLE WASHER	AISI 301	
12	LOCK WASHER	AISI 304	
13	STOPPER		
14	STEM NUT		

DN	d	L	H	H1	S	d1	d2	d3	Ra	Rb	ISO 5211	Torque (N-m)	Weight (kg)
8	11.6	58.0	8.0	36.4	9	31.0	36	42	2.8	2.8	F03 / F04	5.5	0.5
10	12.7	58.0	8.0	36.4	9	31.0	36	42	2.8	2.8	F03 / F04	5.5	0.5
15	15	58.0	8.0	36.4	9	31.0	36	42	2.8	2.8	F03 / F04	5.5	0.5
20	20	65.6	9.0	39.2	9	31.0	36	42	2.8	2.8	F03 / F04	7.5	0.5
25	25	78.7	11.0	48.7	11	35.5	42	50	2.8	3.5	F04 / F05	11.0	0.8
32	32	90.0	11.0	54.2	11	35.5	42	50	2.8	3.5	F04 / F05	15.0	1.2
40	38	105.0	11.5	65.7	14	56.0	50	70	3.5	4.5	F05 / F07	20.0	2.0
50	50	124.0	11.5	75.5	14	56.0	50	70	3.5	4.5	F05 / F07	40.0	2.9
65	63	146.2	20.5	91.5	17	76.0	70	102	4.5	5.5	F07 / F10	60.0	5.3
80	76	163.7	20.5	100.8	17	76.0	70	102	4.5	5.5	F07 / F10	85.0	7.2

unit: mm

NPS	d	L	H	H1	S	d1	d2	d3	Ra	Rb	ISO 5211	Torque (in-lb)	Weight (lb)
1/4"	0.46	2.28	0.31	1.43	0.35	1.22	1.42	1.65	0.11	0.11	F03 / F04	48.7	1.0
3/8"	0.50	2.28	0.31	1.43	0.35	1.22	1.42	1.65	0.11	0.11	F03 / F04	48.7	1.0
1/2"	0.59	2.28	0.31	1.43	0.35	1.22	1.42	1.65	0.11	0.11	F03 / F04	48.7	1.0
3/4"	0.79	2.58	0.35	1.54	0.35	1.22	1.42	1.65	0.11	0.11	F03 / F04	66.4	1.0
1"	0.98	3.10	0.43	1.92	0.43	1.40	1.65	1.97	0.11	0.14	F04 / F05	97.4	1.8
1-1/4"	1.26	3.54	0.43	2.13	0.43	1.40	1.65	1.97	0.11	0.14	F04 / F05	132.8	2.6
1-1/2"	1.50	4.13	0.45	2.59	0.55	2.20	1.97	2.76	0.14	0.18	F05 / F07	177.0	4.4
2"	1.97	4.88	0.45	2.97	0.55	2.20	1.97	2.76	0.14	0.18	F05 / F07	354.0	6.4
2-1/2"	2.48	5.76	0.81	3.60	0.67	3.0	2.76	4.02	0.18	0.22	F07 / F10	531.0	11.7
3"	2.99	6.44	0.81	3.97	0.67	3.0	2.76	4.02	0.18	0.22	F07 / F10	752.0	15.8

unit: in

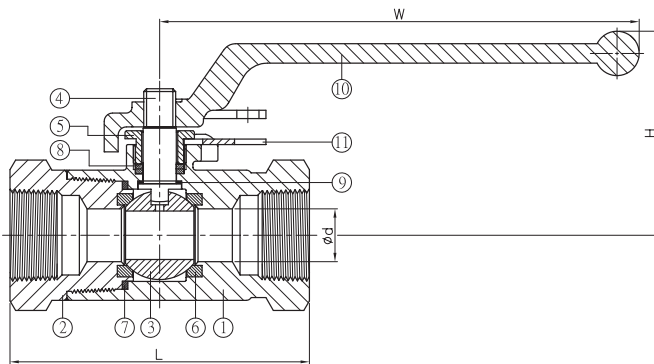
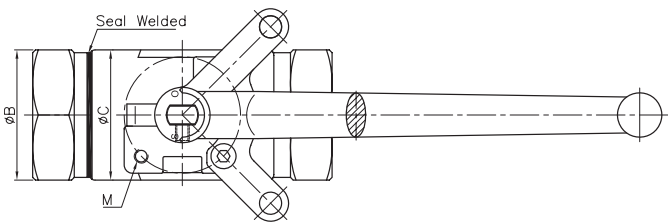




# SERIES: B836TM - B836TC (1/4" - 2") HIGH PRESSURE THREADED BALL VALVE

## Stainless / Carbon Steel

SEAL WELDED • FIRE SAFE



### DESIGN FEATURES:

- 1/4"~2" (DN8~DN50)
- **W.P. : 3600 WOG (PN250)**
- W.T. : -20°C~260°C (-4°F~500°F)
- Investment casting
- Blow-out proof stem
- Anti-static device (option)
- Locking device
- **Mounting pad ISO 5211**
- Silicone Free
- **Seal welded ends**
- ASME B16.34 Wall thickness
- **NACE MR0103**
- **API 607 Fire safe approved**
- Thread type:
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226

ITEM	PARTS	MATERIAL	
		B836TMKGNXX	B836TCCKGNXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	17-4PH	
4	STEM	ASTM A564-630 H900	
5	GLAND NUT	AISI 304	
6	SEAT	PEEK	
7	SEAL	GRAPHITE	
8	PACKING	GRAPHITE	
9	THRUST WASHER	CTFE	
10	HANDLE	AISI 304	
11	LOCK PAD	AISI 304	

PN 250	DN	d	B	C	L	H	W	M	ISO 5211	Torque (N-M)	Weight (kg)
	8 F	6.4	32	39	76.2	56.6	142.0	M5*P0.80	F03	9.5	0.7
	10 S	6.4	32	39	76.2	56.6	142.0	M5*P0.80	F03	9.5	0.7
	15 F	12.7	32	39	101.6	56.6	142.0	M5*P0.80	F03	9.5	0.8
	20 F	19.0	47	47	108.0	76.1	173.0	M5*P0.80	F04	28.0	1.3
	25 S	19.0	47	47	108.0	76.1	173.0	M5*P0.80	F04	28.0	1.3
	40 F	38.1	77	86	134.0	117.0	247.5	M8*P1.25	F07	53.0	4.9
	50 S	38.1	82	86	158.1	117.0	247.5	M8*P1.25	F07	53.0	5.4

F: Full Port S: Standard Port

unit: mm

3600 WOG	NPS	d	B	C	L	H	W	M	ISO 5211	Torque (in-lb)	Weight (lb)
	1/4" F	0.25	1.26	1.54	3.00	2.23	5.59	M5*P0.80	F03	84.1	1.5
	3/8" S	0.25	1.26	1.54	3.00	2.23	5.59	M5*P0.80	F03	84.1	1.5
	1/2" F	0.50	1.26	1.54	4.00	2.23	5.59	M5*P0.80	F03	84.1	1.7
	3/4" F	0.75	1.85	1.85	4.25	3.00	6.81	M5*P0.80	F04	247.8	2.9
	1" S	0.75	1.85	1.85	4.25	3.00	6.81	M5*P0.80	F04	247.8	2.9
	1-1/2" F	1.50	3.03	3.39	5.28	4.61	9.74	M8*P1.25	F07	469.1	10.8
	2" S	1.50	3.23	3.39	6.22	4.61	9.74	M8*P1.25	F07	469.1	11.8

F: Full Port S: Standard Port

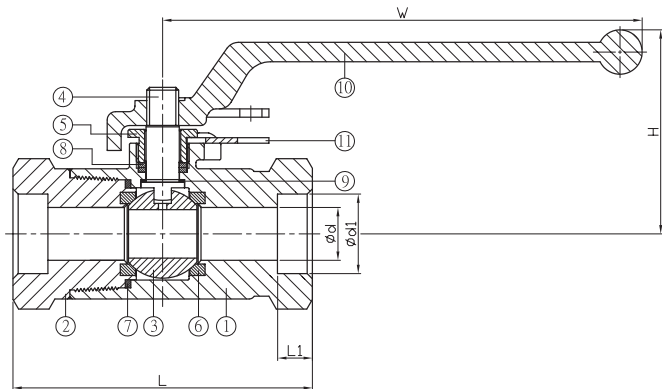
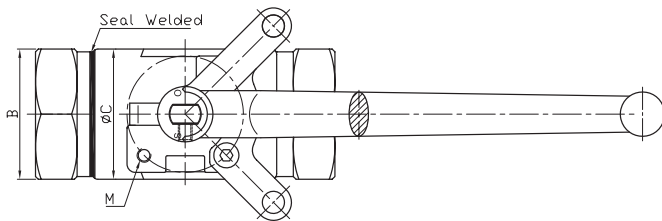
unit: in



# SERIES: B836SM - B836SC (1/4" - 2") HIGH PRESSURE SOCKET WELD BALL VALVE

**Stainless / Carbon Steel**

SEAL WELDED • FIRE SAFE



**DESIGN FEATURES:**

- 1/4"~2" (DN8~DN50)
- **W.P. : 3600 WOG (PN250)**
- W.T. : -20°C~260°C (-4°F~500°F)
- Investment casting
- Blow-out proof stem
- Anti-static device (option)
- Locking device
- **Mounting pad ISO 5211**
- Silicone Free
- **Seal welded ends**
- ASME B16.34 Wall thickness
- **NACE MR0103**
- **API 607 Fire safe approved**
- Socket Weld Ends:
  - » ASME B16.34 / 1.20.1
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226

ITEM	PARTS	MATERIAL	
		B836SMKGNXX	B836SCKGNXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	17-4PH	
4	STEM	ASTM A564-630 H900	
5	GLAND NUT	AISI 304	
6	SEAT	PEEK	
7	SEAL	GRAPHITE	
8	PACKING		
9	THRUST WASHER	CTFE	
10	HANDLE	AISI 304	
11	LOCK PAD		

PN 250	DN	d	B	C	L	H	W	M	ISO 5211	Torque (N-M)	Weight (kg)
	8 F	6.4	32	39	76.2	56.6	142.0	M5*P0.80	F03	9.5	0.7
	10 S	6.4	32	39	76.2	56.6	142.0	M5*P0.80	F03	9.5	0.7
	15 F	12.0	32	39	101.6	56.6	142.0	M5*P0.80	F03	9.5	0.8
	20 F	19.0	47	47	108.0	76.1	173.0	M5*P0.80	F04	28.0	1.3
	25 S	19.0	47	47	108.0	76.1	173.0	M5*P0.80	F04	28.0	1.3
	40 F	38.1	77	86	134.0	117.0	247.5	M8*P1.25	F07	53.0	4.9
	50 S	38.1	82	86	158.1	117.0	247.5	M8*P1.25	F07	53.0	5.4

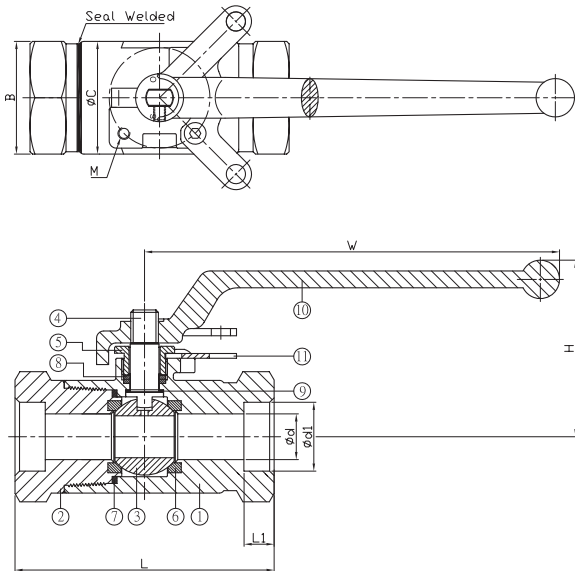
F: Full Port S: Standard Port

unit: mm

3600 WOG	NPS	d	B	C	L	H	W	M	ISO 5211	Torque (in-lb)	Weight (lb)
	1/4" F	0.25	1.26	1.54	3.00	2.23	5.59	M5*P0.80	F03	84.1	1.5
	3/8" S	0.25	1.26	1.54	3.00	2.23	5.59	M5*P0.80	F03	84.1	1.5
	1/2" F	0.50	1.26	1.54	4.00	2.23	5.59	M5*P0.80	F03	84.1	1.7
	3/4" F	0.75	1.85	1.85	4.25	3.00	6.81	M5*P0.80	F04	247.8	2.9
	1" S	0.75	1.85	1.85	4.25	3.00	6.81	M5*P0.80	F04	247.8	2.9
	1-1/2" F	1.50	3.03	3.39	5.28	4.61	9.74	M8*P1.25	F07	469.1	10.8
	2" S	1.50	3.23	3.39	6.22	4.61	9.74	M8*P1.25	F07	469.1	11.8

F: Full Port S: Standard Port

unit: in



# SERIES: B860SM - B860SC (1/4" - 2") HIGH PRESSURE BALL VALVE

## Stainless / Carbon Steel

SEAL WELDED • FIRE SAFE

**DESIGN FEATURES:**

- 1/4"-2" (DN8-DN50)
- **W.P. : 6000 WOG (PN420)**
- W.T. : -20°C~260°C (-4°F~500°F)
- Investment casting
- Blow-out proof stem
- Anti-static device
- Locking device
- **Mounting pad ISO 5211**
- Silicone Free
- **Seal welded ends**
- ASME B16.34 Wall thickness
- **NACE MR0103**
- **API 607 Fire safe approved**
- Socket Weld:
  - » ASME 16.34 / 16.11
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226

ITEM	PARTS	MATERIAL	
		B860SMKGNXX	B860SCKGNXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	17-4PH	
4	STEM	ASTM A564-630 H900	
5	GLAND NUT	AISI 304	
6	SEAT	PEEK	
7	SEAL	GRAPHITE	
8	PACKING		
9	THRUST WASHER	CTFE	
10	HANDLE	AISI 304	
11	LOCK PAD		

PN 420	DN	d	B	C	L	H	W	M	ISO 5211	Torque (N-M)	Weight (kg)
	8 F	6.4	32	39	76.2	56.6	142.0	M5*P0.80	F03	9.5	0.7
	10 S	6.4	32	39	76.2	56.6	142.0	M5*P0.80	F03	9.5	0.7
	15 F	12.7	38	39	101.6	56.6	142.0	M5*P0.80	F03	9.5	0.9
	20 F	19.0	47	52	108.0	76.1	173.0	M5*P0.80	F04	28.0	1.6
	25 S	19.0	55	55	108.0	76.1	173.0	M5*P0.80	F04	28.0	1.8
	25 F	25.4	55	68	122.0	83.1	173.0	M6*P1.00	F05	33.3	2.7
	40 F	38.1	77	97	134.0	117	247.5	M8*P1.25	F07	53.0	6.1
	50 S	38.1	92	97	158.1	117	247.5	M8*P1.25	F07	53.0	7.4

F:Full Port S:Standard Port

unit: mm

6000 WOG	NPS	d	B	C	L	H	W	M	ISO 5211	Torque (in-lb)	Weight (lb)
	1/4" F	0.25	1.26	1.54	3.00	2.23	5.59	M5*P0.8	F03	84.1	1.5
	3/8" S	0.25	1.26	1.54	3.00	2.23	5.59	M5*P0.8	F03	84.1	1.5
	1/2" F	0.50	1.50	1.54	4.00	2.23	5.59	M5*P0.8	F03	84.1	2.0
	3/4" F	0.75	1.85	2.05	4.25	3.00	6.81	M5*P0.8	F04	247.8	3.4
	1" S	0.75	2.17	2.17	4.25	3.00	6.81	M5*P0.8	F04	247.8	5.9
	1-1/2" F	1.50	3.03	3.82	5.28	4.61	9.74	M8*P1.25	F07	469.1	13.4
2" S	1.50	3.62	3.82	6.22	4.61	9.74	M8*P1.25	F07	469.1	16.3	

F:Full Port S:Standard Port

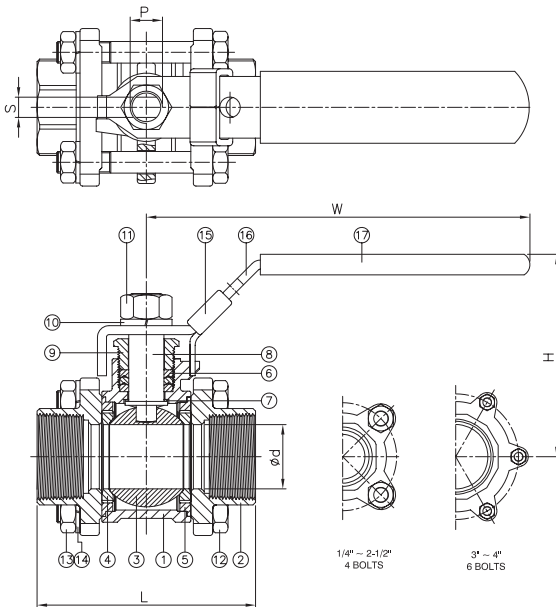
unit: in



## SERIES: B310TM - B310TC (1/4" - 4") 3-PC. SCREWED END BALL VALVE Stainless / Carbon Steel

### DESIGN FEATURES:

- Full port, 1/4"-4" (DN8~DN100)
- **W.P. : 1000 WOG (PN63)**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Anti-Static
- Locking device
- Thread type :
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL	
		B310TMRTXXX	B310TCRTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	SEAT	RTFE	
5	SEAL	PTFE	
6	PACKING		
7	THRUST WASHER	ASTM A276-316	
8	STEM		
9	GLAND	AISI 304	
10	SPRING WASHER		
11	STEM NUT		
12	BOLT		
13	NUT		
14	SPRING WASHER		
15	LOCKING DEVICE	STAINLESS STEEL	
16	HANDLE		
17	HANDLE SLEEVE	PVC	

DN	d	L	H	W	S	P	Torque (N-m)	Weight (kg)
8	11.6	65	60.2	98	5.0	3/8"-24UNF	3.5	0.4
10	12.5	65	60.2	98	5.0	3/8"-24UNF	4.0	0.4
15	15.0	65	62.2	98	5.0	3/8"-24UNF	5.5	0.5
20	20.0	75	64.6	121	6.5	7/16"-20UNF	7.5	0.7
25	25.0	85	80.1	147	8.0	7/16"-20UNF	11.0	1.1
32	32.0	101	85.1	147	8.0	7/16"-20UNF	15.0	1.6
40	38.0	112	103.3	188	10.0	1/2"-20UNF	20.0	2.4
50	50.0	130	110.8	188	10.0	1/2"-20UNF	40.0	3.1
65	63.0	162	141.7	245	12.0	3/4"-10UNC	60.0	6.5
80	76.0	188	150.4	245	12.0	3/4"-10UNC	85.0	9.5
100	96.0	224	181.7	316	16.0	1"-8UNC	150.0	19.0

unit: mm

NPS	d	L	H	W	S	P	Torque (in-lb)	Weight (lb)
1/4"	0.46	2.56	2.37	3.86	0.20	3/8"-24UNF	31.0	0.8
3/8"	0.49	2.56	2.37	3.86	0.20	3/8"-24UNF	35.4	0.8
1/2"	0.59	2.56	2.45	3.86	0.20	3/8"-24UNF	48.7	1.1
3/4"	0.79	2.95	2.54	4.76	0.26	7/16"-20UNF	66.4	1.5
1"	0.98	3.35	3.15	5.79	0.31	7/16"-20UNF	97.4	2.3
1-1/4"	1.26	3.98	3.35	5.79	0.31	7/16"-20UNF	132.8	3.5
1-1/2"	1.50	4.41	4.07	7.40	0.39	1/2"-20UNF	177.0	5.3
2"	1.97	5.12	4.36	7.40	0.39	1/2"-20UNF	354.0	6.8
2-1/2"	2.48	6.38	5.58	9.65	0.47	3/4"-10UNC	531.0	14.3
3"	2.99	7.40	5.92	9.65	0.47	3/4"-10UNC	752.3	20.9
4"	3.78	8.82	7.15	12.44	0.63	1"-8UNC	1327.6	41.9

unit: in



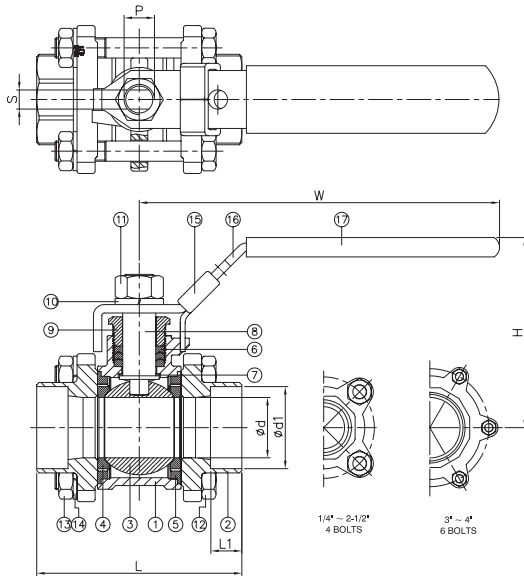
## SERIES: B310SM - B310SC (1/4" - 4")

### 3-PC. SOCKET WELD END BALL VALVE

#### Stainless / Carbon Steel

**DESIGN FEATURES:**

- Full port, 1/4"~4" (DN8-DN100)
- **W.P. : 1000 WOG (PN63)**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Anti-Static Device
- Locking device
- Socket weld ends:
  - » ASME B16.11
  - » DIN3239
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL	
		B310SMRTXXX	B310SCRTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	SEAT	RTFE	
5	SEAL	PTFE	
6	PACKING		
7	THRUST WASHER	ASTM A276-316	
8	STEM		
9	GLAND	AISI 304	
10	SPRING WASHER		
11	STEM NUT		
12	BOLT		
13	NUT	STAINLESS STEEL	
14	SPRING WASHER		
15	LOCKING DEVICE	PVC	
16	HANDLE		
17	HANDLE SLEEVE		

DN	d	d1	L	L1	H	W	S	P	Torque (N-m)	Weight (kg)
8	11.6	14.5	65	10	60.2	98	5.0	3/8"-24UNF	3.5	0.4
10	12.5	18.0	65	10	60.2	98	5.0	3/8"-24UNF	4.0	0.4
15	15.0	22.0	65	10	62.2	98	5.0	3/8"-24UNF	5.5	0.5
20	20.0	27.5	75	13	64.6	121	6.5	7/16"-20UNF	7.5	0.7
25	25.0	34.0	85	13	80.1	147	8.0	7/16"-20UNF	11.0	1.1
32	32.0	43.0	101	13	85.1	147	8.0	7/16"-20UNF	15.0	1.6
40	38.0	49.0	112	13	103.0	188	10.0	1/2"-20UNF	20.0	2.4
50	50.0	61.0	130	16	111.0	188	10.0	1/2"-20UNF	40.0	3.1
65	63.0	74.0	162	16	142.0	245	12.0	3/4"-10UNC	60.0	6.5
80	76.0	90.0	188	16	150.0	245	12.0	3/4"-10UNC	85.0	9.5
100	96.0	115.5	224	20	182.0	316	16.0	1"-8UNC	150.0	19.0

unit: mm

NPS	d	d1	L	L1	H	W	S	P	Torque (in-lb)	Weight (lb)
1/4"	0.46	0.57	2.56	0.39	2.37	3.86	0.20	3/8"-24UNF	31.0	0.8
3/8"	0.49	0.71	2.56	0.39	2.37	3.86	0.20	3/8"-24UNF	35.4	0.8
1/2"	0.59	0.87	2.56	0.39	2.45	3.86	0.20	3/8"-24UNF	48.7	1.1
3/4"	0.79	1.08	2.95	0.51	2.54	4.76	0.26	7/16"-20UNF	66.4	1.5
1"	0.98	1.34	3.35	0.51	3.15	5.79	0.31	7/16"-20UNF	97.4	2.3
1-1/4"	1.26	1.69	3.98	0.51	3.35	5.79	0.31	7/16"-20UNF	132.8	3.5
1-1/2"	1.50	1.93	4.41	0.51	4.06	7.40	0.39	1/2"-20UNF	177.0	5.3
2"	1.97	2.40	5.12	0.63	4.37	7.40	0.39	1/2"-20UNF	354.0	6.8
2-1/2"	2.48	2.91	6.38	0.63	5.59	9.65	0.47	3/4"-10UNC	531.0	14.3
3"	2.99	3.54	7.40	0.63	5.91	9.65	0.47	3/4"-10UNC	752.3	20.9
4"	3.78	4.55	8.82	0.79	7.17	12.44	0.63	1"-8UNC	1327.6	41.9

unit: in



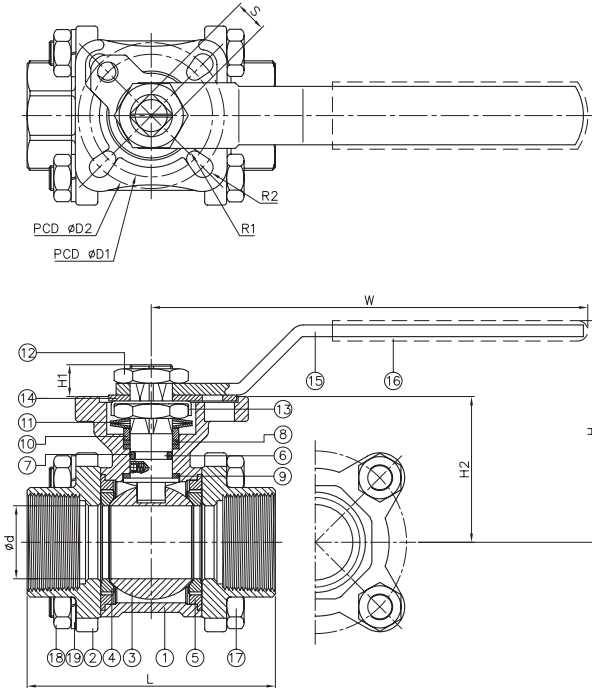
## SERIES: B710TM - B710TC (1/4" - 2")

### 3-PC THREADED BALL VALVE

#### Stainless / Carbon Steel

**DESIGN FEATURES:**

- Full port, 1/4" ~ 2" (DN8-DN50)
- **W.P. : 1000 WOG (PN63)**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Live-loading design
- Locking device
- Silicone Free
- Supplied with lever handle
- Anti-static device
- **Direct mounting pad ISO 5211**
- Automation accessories (option)
- Thread type :
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL	
		B710TMMTXXX	B710TCMTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	SEAT	TFM 1600	
5	SEAL	PTFE	
6	STEM	ASTM A276-316	
7	O-RING	VITON	
8	PACKING	PTFE	
9	THRUST WASHER		
10	GLAND RING	AISI 304	
11	BELLEVILLE WASHER	AISI 301	
12	STEM NUT		
13	LOCK WASHER	AISI 304	
14	LOCKING DEVICE		
15	HANDLE	STAINLESS STEEL	
16	HANDLE SLEEVE	PVC	
17	BOLT		
18	NUT	AISI 304	
19	SPRING WASHER		

DN	d	d1	L	L1	H	H1	H2	W	S	D1	D2	R1	R2	ISO 5211	Torque (N-M)		Weight (kg)
															Breakaway	Action	
8	11.6	14.5	65	10	61.0	7.5	35.3	114.5	9	36	42	2.8	2.8	F03/F04	7	4	0.6
10	12.5	18.0	65	10	61.0	7.5	35.3	114.5	9	36	42	2.8	2.8	F03/F04	7	4	0.6
15	15.0	22.0	65	10	62.7	7.1	36.4	114.5	9	36	42	2.8	2.8	F03/F04	7	4	0.6
20	20.0	27.5	75	13	65.1	7.3	39.5	114.5	9	36	42	2.8	2.8	F03/F04	9	5	0.7
25	25.0	34.0	85	13	76.5	11.0	49.0	140.0	11	42	50	2.8	3.5	F04/F05	15	9	1.1
32	32.0	43.0	101	13	82.0	9.5	54.2	140.0	11	42	50	2.8	3.5	F04/F05	18	11	1.7
40	38.0	49.0	112	13	102.0	12.4	64.6	172.0	14	50	70	3.5	4.5	F05/F07	25	15	2.6
50	50.0	61.0	130	16	110.1	13.6	72.5	172.0	14	50	70	3.5	4.5	F05/F07	35	21	3.7

unit: mm

NPS	d	d1	L	L1	H	H1	H2	W	S	D1	D2	R1	R2	ISO 5211	Torque (in-lb)		Weight (lb)
															Breakaway	Action	
1/4"	0.46	0.57	2.56	0.39	2.40	0.30	1.39	4.51	0.35	1.42	1.65	0.11	0.11	F03/F04	62.0	35.4	1.2
3/8"	0.49	0.71	2.56	0.39	2.40	0.30	1.39	4.51	0.35	1.42	1.65	0.11	0.11	F03/F04	62.0	35.4	1.2
1/2"	0.59	0.87	2.56	0.39	2.47	0.28	1.43	4.51	0.35	1.42	1.65	0.11	0.11	F03/F04	62.0	35.4	1.2
3/4"	0.79	1.08	2.95	0.51	2.56	0.29	1.56	4.51	0.35	1.42	1.65	0.11	0.11	F03/F04	79.7	44.3	1.6
1"	0.98	1.34	3.35	0.51	3.01	0.43	1.93	5.51	0.43	1.65	1.97	0.11	0.14	F04/F05	132.8	79.7	2.4
1-1/4"	1.26	1.69	3.98	0.51	3.23	0.37	2.13	5.51	0.43	1.65	1.97	0.11	0.14	F04/F05	159.3	97.4	3.7
1-1/2"	1.50	1.93	4.41	0.51	4.02	0.49	2.54	6.77	0.55	1.97	2.76	0.14	0.18	F05/F07	221.3	132.8	5.8
2"	1.97	2.40	5.12	0.63	4.33	0.54	2.85	6.77	0.55	1.97	2.76	0.14	0.18	F05/F07	309.8	185.9	8.1

unit: in

**FOR ADDITIONAL SIZES SEE NEXT PAGE**





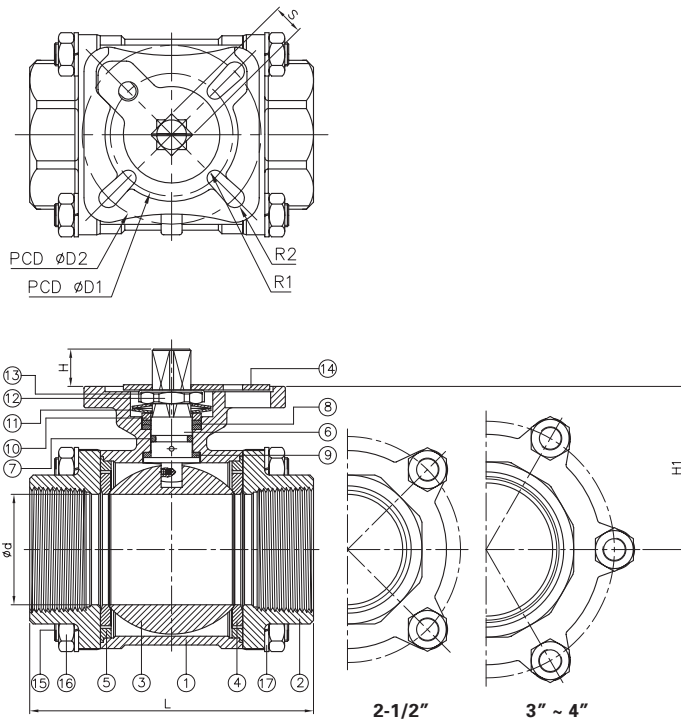
## SERIES: B710TM - B710TC (2-1/2" - 4")

### 3-PC THREADED BALL VALVE

#### Stainless / Carbon Steel

**DESIGN FEATURES:**

- Full port, 2-1/2"~ 4" (DN65 ~ DN100)
- **W.P. : 1000 WOG (PN63)**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Live-loading design
- Locking device
- Silicone Free
- Supplied with lever handle
- Anti-static device
- **Direct mounting pad ISO 5211**
- Automation accessories (option)
- Thread type :
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL	
		B710TMMTXXX	B710TCMTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	TFM 1600	
4	SEAT	PTFE	
5	SEAL	ASTM A276-316	
6	STEM	VITON	
7	O-RING	PTFE	
8	PACKING	AISI 304	
9	THRUST WASHER	AISI 301	
10	GLAND RING	AISI 304	
11	BELLEVILLE WASHER		
12	STEM NUT		
13	LOCK WASHER		
14	LOCKING DEVICE		
15	HANDLE		
16	BOLT		
17	NUT		
18	SPRING WASHER		
19	BOLT		
20	NUT		

DN	d	d1	L	L1	H	H1	H2	W	S	D1	D2	R1	R2	ISO 5211	Torque (N-M)		Weight (kg)
															Breakaway	Action	
65	63	74.0	162	16	127.3	16.3	92	325	17	70	102	4.5	5.5	F07/F10	55	33	7.4
80	76	90.0	188	16	136.3	16.3	100	325	17	70	102	4.5	5.5	F07/F10	70	42	10.3
100	96	115.5	224	20	142.5	20.5	130	325	22	102	125	5.5	6.5	F10/F12	90	54	19.9

unit: mm

NPS	d	d1	L	L1	H	H1	H2	W	S	D1	D2	R1	R2	ISO 5211	Torque (in-lb)		Weight (lb)
															Breakaway	Action	
2-1/2"	2.48	2.91	6.38	0.63	5.01	0.64	3.62	12.8	0.67	2.76	4.02	0.18	0.22	F07/F10	486.8	292.1	16.3
3"	2.99	3.54	7.40	0.63	5.37	0.64	3.94	12.8	0.67	2.76	4.02	0.18	0.22	F07/F10	619.5	371.7	22.7
4"	3.78	4.55	8.82	0.79	5.61	0.81	5.12	12.8	0.87	4.02	4.92	0.22	0.26	F10/F12	796.6	477.9	43.9

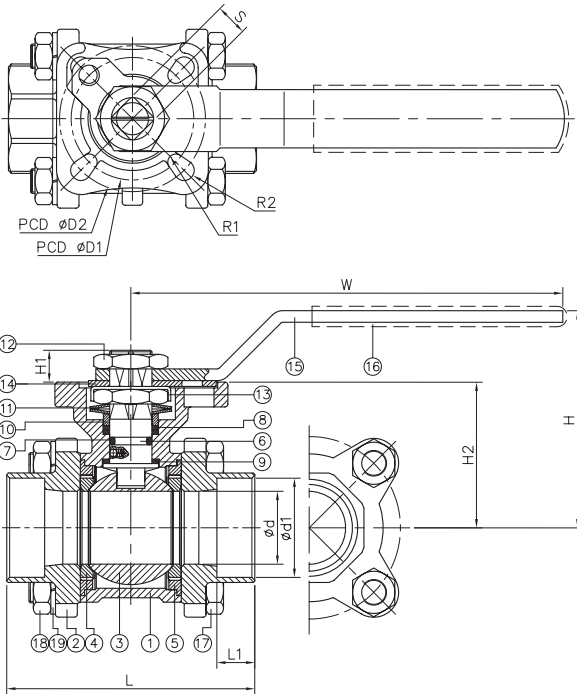
unit: in



## SERIES: B710SM - B710SC (1/4" - 2") 3-PC SOCKET WELD BALL VALVE Stainless / Carbon Steel

### DESIGN FEATURES:

- Full port, 1/4"~ 2" (DN8~DN50)
- **W.P. : 1000 WOG (PN63)**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Live-loading design
- Locking device
- Silicone Free
- Anti-static device
- **Direct mounting pad ISO 5211**
- Automation accessories (option)
- Socket Weld Ends:
  - » ASME B16.11
  - » DIN3239
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL	
		B710SMMTXXX	B710SCMTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	SEAT	TFM 1600	
5	SEAL	PTFE	
6	STEM	ASTM A276-316	
7	O-RING	VITON	
8	PACKING	PTFE	
9	THRUST WASHER	AISI 304	
10	GLAND RING	AISI 301	
11	BELLEVILLE WASHER	AISI 304	
12	STEM NUT	AISI 304	
13	LOCK WASHER	AISI 304	
14	LOCKING DEVICE	STAINLESS STEEL	
15	HANDLE	PVC	
16	HANDLE SLEEVE	AISI 304	
17	BOLT	AISI 304	
18	NUT	AISI 304	
19	SPRING WASHER	AISI 304	

DN	d	L	H	H1	H2	W	S	D1	D2	R1	R2	ISO 5211	Torque (N-M)		Weight (kg)
													Breakaway	Action	
8	11.6	65	61.0	7.5	35.3	114.5	9	36	42	2.8	2.8	F03/F04	7	4	0.6
10	12.5	65	61.0	7.5	35.3	114.5	9	36	42	2.8	2.8	F03/F04	7	4	0.6
15	15.0	65	62.7	7.1	36.4	114.5	9	36	42	2.8	2.8	F03/F04	7	4	0.6
20	20.0	75	65.1	7.3	39.5	114.5	9	36	42	2.8	2.8	F03/F04	9	5	0.7
25	25.0	85	76.5	11.0	49.0	140.0	11	42	50	2.8	3.5	F04/F05	15	9	1.1
32	32.0	101	82.0	11.5	54.2	140.0	11	42	50	2.8	3.5	F04/F05	18	11	1.7
40	38.0	112	102.0	12.4	64.6	172.0	14	50	70	3.5	4.5	F05/F07	25	15	2.6
50	50.0	130	110.1	13.6	72.5	172.0	14	50	70	3.5	4.5	F05/F07	35	21	3.7

unit: mm

NPS	d	L	H	H1	H2	W	S	D1	D2	R1	R2	ISO 5211	Torque (in-lb)		Weight (lb)
													Breakaway	Action	
1/4"	0.46	2.56	2.40	0.30	1.39	4.51	0.35	1.42	1.65	0.11	0.11	F03/F04	62.0	35.4	1.2
3/8"	0.49	2.56	2.40	0.30	1.39	4.51	0.35	1.42	1.65	0.11	0.11	F03/F04	62.0	35.4	1.2
1/2"	0.59	2.56	2.47	0.28	1.43	4.51	0.35	1.42	1.65	0.11	0.11	F03/F04	62.0	35.4	1.2
3/4"	0.79	2.95	2.56	0.29	1.56	4.51	0.35	1.42	1.65	0.11	0.11	F03/F04	79.7	44.3	1.6
1"	0.98	3.35	3.01	0.43	1.93	5.51	0.43	1.65	1.97	0.11	0.14	F04/F05	132.8	79.7	2.4
1-1/4"	1.26	3.98	3.23	0.45	2.13	5.51	0.43	1.65	1.97	0.11	0.14	F04/F05	159.3	97.4	3.7
1-1/2"	1.50	4.41	4.02	0.49	2.54	6.77	0.55	1.97	2.76	0.14	0.18	F05/F07	221.3	132.8	5.7
2"	1.97	5.12	4.33	0.54	2.85	6.77	0.55	1.97	2.76	0.14	0.18	F05/F07	309.8	185.9	8.2

unit: in

FOR ADDITIONAL SIZES SEE NEXT PAGE



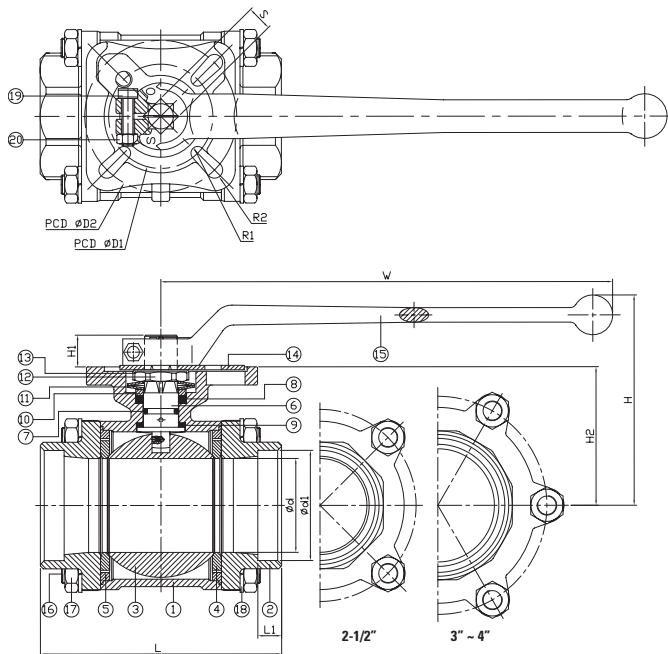
## SERIES: B710SM - B710SC (2-1/2" - 4")

### 3-PC SOCKET WELD BALL VALVE

#### Stainless / Carbon Steel

**DESIGN FEATURES:**

- Full port, 2 1/2"~ 4" (DN65~DN100)
- **W.P. : 1000 WOG (PN63)**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Live-loading design
- Locking device
- Silicone Free
- Anti-static device
- **Direct mounting pad ISO 5211**
- Automation accessories (option)
- Socket Weld Ends:
  - » ASME B16.11
  - » DIN3239
  - » ISO7/1 & EN10226



ITEM	PARTS	MATERIAL	
		B710SMMTXXX	B710SCMTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL		
4	SEAT	TFM 1600	
5	SEAL	PTFE	
6	STEM	ASTM A276-316	
7	O-RING	VITON	
8	PACKING	PTFE	
9	THRUST WASHER		
10	GLAND RING	AISI 304	
11	BELLEVILLE WASHER	AISI 301	
12	STEM NUT	AISI 304	
13	LOCK WASHER		
14	LOCKING DEVICE		
15	BOLT		
16	NUT		
17	SPRING WASHER		

DN	d	L	H	H1	S	D1	D2	R1	R2	ISO 5211	Torque (N-M)		Weight (kg)
											Breakaway	Action	
65	63	162	16.3	92	17	70	102	4.5	5.5	F07/F10	55	33	7.4
80	76	188	16.3	100	17	70	102	4.5	5.5	F07/F10	70	42	10.3
100	96	224	20.5	130	22	102	125	5.5	6.5	F10/F12	90	54	19.9

unit: mm

NPS	d	L	H	H1	S	D1	D2	R1	R2	ISO 5211	Torque (in-lb)		Weight (lb)
											Breakaway	Action	
2-1/2"	2.48	6.38	0.64	3.62	0.67	2.76	4.02	0.18	0.22	F07/F10	486.8	292.1	16.3
3"	2.99	7.40	0.64	3.94	0.67	2.76	4.02	0.18	0.22	F07/F10	619.5	371.7	22.7
4"	3.78	8.82	0.81	5.12	0.87	4.02	4.92	0.22	0.26	F10/F12	796.6	477.9	43.9

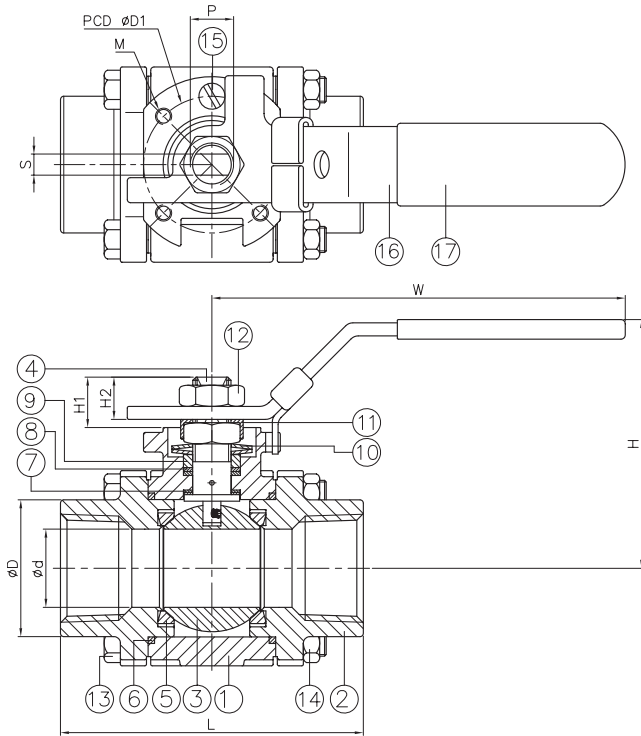
unit: in



## SERIES: B920TM - B910TC (1/4" - 3/4") 3-PC SCREWED END BALL VALVE Stainless / Carbon Steel

### DESIGN FEATURES:

- Full port, 1/4"~ 3/4" (DN8~DN20)
- **W.P. :**
  - » 1/4" ~ 1" - 2000 WOG
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Anti-static device
- Locking device
- Thread Type:
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226
- NACE MR0103
- **API 607 Fire Safe Approved**
- API 608 Design



ITEM	PARTS	MATERIAL	
		B920TMRGXXX	B920TCRGXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP	ASTM A351-CF3M	
3	BALL	ASTM A351-CF8M	
4	STEM	ASTM A276-316	
5	SEAT	RTFE	
6	GASKET	GRAPHITE	
7	THRUST WASHER	CTFE	
8	PACKING	GRAPHITE	
9	GLAND RING	AISI 304	
10	DISC SPRING	AISI 301	
11	LOCK PAD	ASTM A167-304	
12	STEM NUT	ASTM A194-8A	
13	BOLT	ASTM A193-B8A	
14	NUT	ASTM A194-8A	
15	STOP PIN	AISI 304	
16	HANDLE	STAINLESS STEEL	
17	HANDLE SLEEVE	PVC	

DN	d	D	L	H	H1	H2	W	S	D1	M	P	ISO 5211	Torque (N-M)	Weight (kg)
8	8	25.0	65.7	57.0	12.1	9.8	113.5	5.7	36	M5*0.8	3/8"-24UNF	F03	3.8	0.7
10	10	25.0	65.7	57.0	12.1	9.8	113.5	5.7	36	M5*0.8	3/8"-24UNF	F03	3.8	0.7
15	15	30.3	74.8	57.0	12.1	9.8	113.5	5.7	36	M5*0.8	3/8"-24UNF	F03	3.8	0.8
20	20	36.0	80.2	59.7	14.5	10.6	113.5	5.7	36	M5*0.8	3/8"-24UNF	F03	5.1	0.9

unit: mm

NPS	d	D	L	H	H1	H2	W	S	D1	M	P	ISO 5211	Torque (in-lb)	Weight (lb)
1/4"	0.31	0.98	2.59	2.24	0.48	0.39	4.5	0.22	1.42	M5*0.8	3/8"-24UNF	F03	33.8	1.6
3/8"	0.39	0.98	2.59	2.24	0.48	0.39	4.5	0.22	1.42	M5*0.8	3/8"-24UNF	F03	33.8	1.6
1/2"	0.59	1.20	2.94	2.24	0.48	0.39	4.5	0.22	1.42	M5*0.8	3/8"-24UNF	F03	33.8	1.7
3/4"	0.79	1.42	3.16	2.35	0.57	0.42	4.5	0.22	1.42	M5*0.8	3/8"-24UNF	F03	45.1	1.9

unit: in



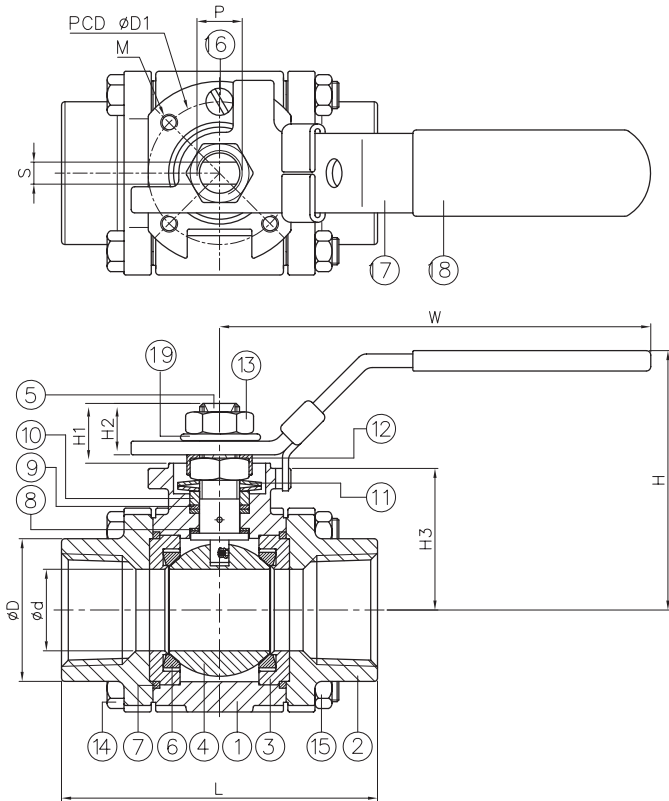
## SERIES: B920TM - B920TC (1" - 2")

### 3-PC SCREWED END BALL VALVE

#### Stainless / Carbon Steel

**DESIGN FEATURES:**

- Full port, 1" ~ 2" (DN25~DN50)
- **W.P. :**
  - » 1/4" ~ 1" - 2000 WOG
  - » 1-1/4" ~ 2" - 1500 WOG
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Anti-static device
- Locking device
- Thread Type:
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226
- NACE MR0103
- **API 607 Fire Safe Approved**
- API 608 Design



ITEM	PARTS	MATERIAL	
		B920TMRGXXX	B920TCRGXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP	ASTM A351-CF3M	
3	RETAINER	ASTM A351-CF8M	
4	BALL		
5	STEM	ASTM A276-316	
6	SEAT	RTFE	
7	GASKET	GRAPHITE	
8	THRUST WASHER	CTFE	
9	PACKING	GRAPHITE	
10	GLAND RING	AISI 304	
11	DISC SPRING	AISI 301	
12	LOCK PAD	ASTM A 167-304	
13	STEM NUT	ASTM A 194-8A	
14	BOLT	ASTM A 193-B8A	
15	NUT	ASTM A 194-8A	
16	STOP PIN	AISI 304	
17	HANDLE	STAINLESS STEEL	
18	HANDLE SLEEVE	PVC	
19	SPRING WASHER	AISI 304	

DN	d	D	L	H	H1	H2	H3	W	S	D1	M	P	ISO 5211	Torque (N-M)	Weight (kg)
25	24	44.8	93.0	81.5	15.5	14.0	42.1	146	7.5	42	M5*0.8	7/16"-24UNF	F04	10.2	1.8
32	30	54.0	110.6	85.9	15.5	15.0	46.1	146	7.5	42	M5*0.8	7/16"-20UNF	F04	15.9	2.7
40	38	62.0	120.0	96.7	27.3	18.7	48.3	180	8.6	50	M6*1.0	9/16"-18UNF	F05	21.0	3.8
50	50	76.0	140.0	104.9	28.1	19.0	56.5	180	8.6	50	M6*1.0	9/16"-18UNF	F05	32.1	6.1

unit: mm

NPS	d	D	L	H	H1	H2	H3	W	S	D1	M	P	ISO 5211	Torque (in-lb)	Weight (lb)
1"	0.94	1.76	3.66	3.21	0.61	0.55	1.66	5.75	0.30	1.65	M5*0.8	7/16"-24UNF	F04	90.2	3.9
1-1/4"	1.18	2.13	4.35	3.38	0.61	0.59	1.81	5.75	0.30	1.65	M5*0.8	7/16"-20UNF	F04	141.0	6.0
1-1/2"	1.50	2.44	4.72	3.81	1.07	0.74	1.90	7.09	0.34	1.97	M6*1.0	9/16"-18UNF	F05	186.0	8.4
2"	1.97	2.99	5.51	4.13	1.11	0.75	2.22	7.09	0.34	1.97	M6*1.0	9/16"-18UNF	F05	284.1	13.5

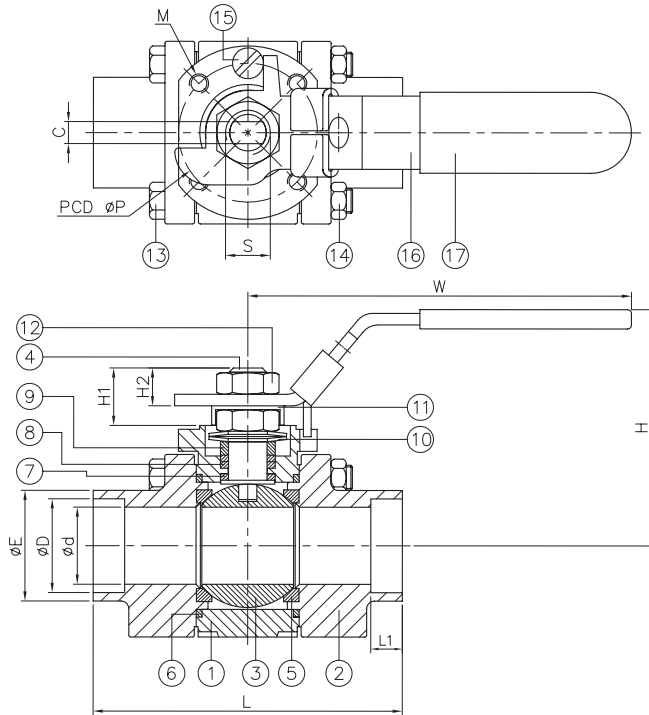
unit: in



## SERIES: B920SM - B920SC (1/4" - 3/4") 3-PC SOCKET WELD END BALL VALVE Stainless / Carbon Steel

### DESIGN FEATURES:

- Full port, 1/4" ~ 3/4" (DN8~DN20)
- **W.P. :**  
» 1/4" ~ 1" - 2000 WOG
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Anti-static device
- Locking device
- Thread Type:  
» ASME B1.20.1 (NPT)  
» DIN2999 & BS21  
» ISO7/1 & EN10226
- NACE MR0103
- **API 607 Fire Safe Approved**
- API 608 Design



ITEM	PARTS	MATERIAL	
		B920SMRGXXX	B920SCRGXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP	ASTM A351-CF3M	
3	BALL	ASTM A351-CF8M	
4	STEM	ASTM A276-316	
5	BALL SEAT	RTFE	
6	GASKET	GRAPHITE	
7	THRUST WASHER	CTFE	
8	PACKING	GRAPHITE	
9	GLAND RING	AISI 304	
10	DISC SPRING	AISI 301	
11	LOCK PAD	ASTM A167-304	
12	STEM NUT	ASTM A194-8A	
13	BOLT	ASTM A193-B8A	
14	NUT	ASTM A194-8A	
15	STOP PIN	AISI 304	
16	HANDLE	STAINLESS STEEL	
17	HANDLE SLEEVE	PVC	

DN	d	D	E	L	L1	H	H1	H2	W	C	P	ISO 5211	M	S	Torque (N-M)	Weight (kg)
8	8	14.0	25.0	65.7	10	57.0	12.1	9.8	113.5	5.7	36	F03	M5*0.8	3/8"-24UNF	3.8	0.7
10	10	18.0	25.0	65.7	10	57.0	12.1	9.8	113.5	5.7	36	F03	M5*0.8	3/8"-24UNF	3.8	0.7
15	15	22.0	30.3	74.8	10	57.0	12.1	9.8	113.5	5.7	36	F03	M5*0.8	3/8"-24UNF	3.8	0.8
20	20	27.5	36.0	80.2	13	59.7	14.5	10.6	113.5	5.7	36	F03	M5*0.8	3/8"-24UNF	5.1	0.9

unit: mm

NPS	d	D	E	L	L1	H	H1	H2	W	C	P	ISO 5211	M	S	Torque (in-lb)	Weight (lb)
1/4"	0.31	0.55	0.98	2.59	0.39	2.24	0.48	0.39	4.47	0.22	1.42	F03	M5*0.8	3/8"-24UNF	33.8	1.6
3/8"	0.39	0.71	0.98	2.59	0.39	2.24	0.48	0.39	4.47	0.22	1.42	F03	M5*0.8	3/8"-24UNF	33.8	1.6
1/2"	0.59	0.87	1.19	2.94	0.39	2.24	0.48	0.39	4.47	0.22	1.42	F03	M5*0.8	3/8"-24UNF	33.8	1.7
3/4"	0.79	1.08	1.42	3.16	0.51	2.35	0.57	0.42	4.47	0.22	1.42	F03	M5*0.8	3/8"-24UNF	45.1	1.9

unit: in





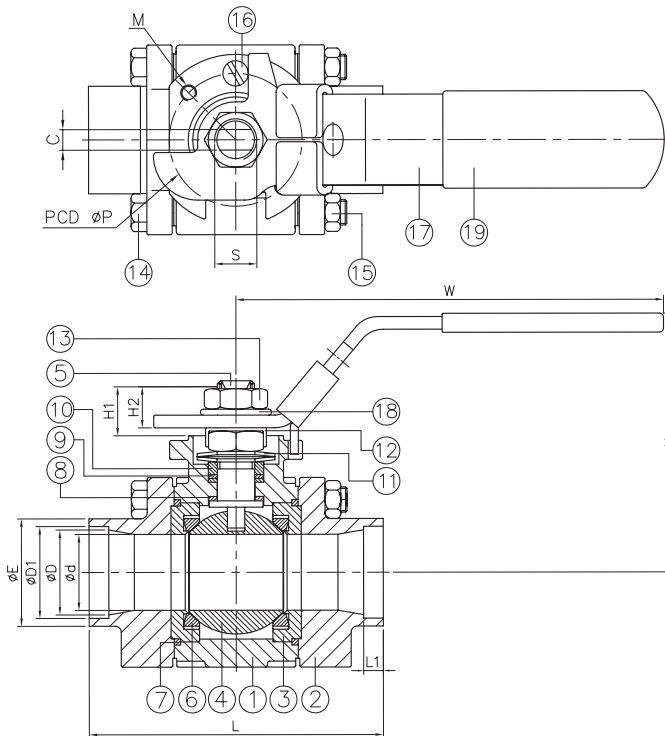
## SERIES: B920SM - B920SC (1" - 2")

### 3-PC SOCKET WELD END BALL VALVE

#### Stainless / Carbon Steel

**DESIGN FEATURES:**

- Full port, 1" ~ 2" (DN25~DN50)
- **W.P. :**
  - » 1/4" ~ 1" - **2000 WOG**
  - » 1-1/4" ~ 2" - **1500 WOG**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Anti-static device
- Locking device
- Thread Type:
  - » ASME B1.20.1 (NPT)
  - » DIN2999 & BS21
  - » ISO7/1 & EN10226
- NACE MR0103
- **API 607 Fire Safe Approved**
- API 608 Design



ITEM	PARTS	MATERIAL	
		B920SMRGXXX	B920SCRGXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP	ASTM A351-CF3M	
3	RETAINER	ASTM A351-CF8M	
4	BALL		
5	STEM	ASTM A276-316	
6	BALL SEAT	RTFE	
7	GASKET	GRAPHITE	
8	THRUST WASHER	CTFE	
9	PACKING	GRAPHITE	
10	GLAND RING	AISI 304	
11	DISC SPRING	AISI 301	
12	LOCK PAD	ASTM A167-304	
13	STEM NUT	ASTM A194-8A	
14	BOLT	ASTM A193-B8A	
15	NUT	ASTM A194-8A	
16	STOP PIN	AISI 304	
17	HANDLE	STAINLESS STEEL	
18	SPRING WASHER	AISI 304	
19	HANDLE SLEEVE	PVC	

DN	d	D	D1	E	L	L1	H	H1	H2	W	C	P	ISO 5211	M	S	Torque (N-M)	Weight (kg)
25	24	26.6	34.5	44.8	93.0	13	81.5	15.5	14.0	146	7.5	42	F04	M5*0.8	7/16"-20UNF	10.2	1.7
32	30	35.0	43.0	54.0	110.6	13	85.9	15.5	15.0	146	7.5	42	F04	M5*0.8	7/16"-20UNF	15.9	2.7
40	38	41.0	49.0	62.0	122.6	13	96.7	27.3	18.7	180	8.6	50	F05	M6*1.0	9/16"-18UNF	21.0	3.9
50	50	52.5	61.2	76.0	140.0	16	104.9	28.1	19.0	180	8.6	50	F05	M6*1.0	9/16"-18UNF	32.1	6.2

unit: mm

NPS	d	D	D1	E	L	L1	H	H1	H2	W	C	P	ISO 5211	M	S	Torque (in-lb)	Weight (lb)
1"	0.94	1.05	1.36	1.76	3.66	0.51	3.21	0.61	0.55	5.75	0.30	1.65	F04	M5*0.8	7/16"-20UNF	90.2	3.8
1-1/4"	1.18	1.38	1.69	2.13	4.35	0.51	3.38	0.61	0.59	5.75	0.30	1.65	F04	M5*0.8	7/16"-20UNF	141.0	6.0
1-1/2"	1.5	1.61	1.93	2.44	4.83	0.51	3.81	1.07	0.74	7.09	0.34	1.97	F05	M6*1.0	9/16"-18UNF	186.0	8.5
2"	1.97	2.07	2.41	2.99	5.51	0.63	4.13	1.11	0.75	7.09	0.34	1.97	F05	M6*1.0	9/16"-18UNF	284.1	13.6

unit: in

# SERIES: B501FM - B501FC - 150# (1" - 4")

## 1-PC FLANGED END BALL VALVE

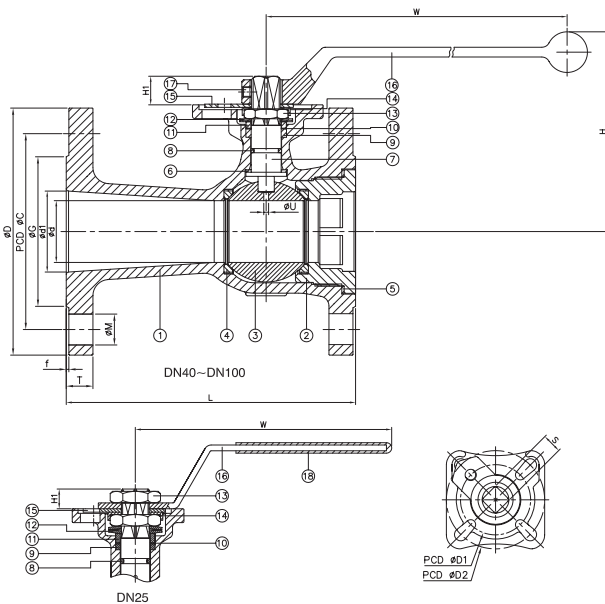
### Stainless / Carbon Steel

DIRECT MOUNT • FIRE SAFE



**DESIGN FEATURES:**

- Standard port, 1"~4" (DN25~DN100)
- **W.P. : CLASS 150**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Live-loading design
- Silicone Free
- Anti-static device
- **Direct mounting pad ISO 5211**
- **API 607 Fire safe approved**
- Wall thickness: ASME B16.34
- Flange dimension: ASME B16.5
- Face to face: ASME B16.10
- Supplied with lever handle



ITEM	PARTS	MATERIAL	
		B501FMMGXXX	B501FCMGXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	RETAINER		
3	BALL	ASTM A351-CF8M	
4	SEAT	TFM 1600	
5	SEAL	GRAPHITE	
6	THRUST WASHER	CTFE	
7	STEM	ASTM A276-316	
8	O-RING	VITON	
9	PACKING A	GRAPHITE	
10	PACKING B	CTFE	
11	GLAND RING	AISI 304	
12	BELLEVILLE WASHER	AISI 301	
13	STEM NUT	AISI 304	
14	LOCKING WASHER		
15	STOPPER		
16	HANDLE	STAINLESS STEEL	
17	SOCKET SET SCREWS	AISI 304	
18	HANDLE SLEEVE	PVC	

DN	d	d1	G	C	D	L	H	H1	W	T	f	S	D1	D2	M	U	ISO 5211	Torque (N-m)		Weight (kg)
																		Break-away	Action	
25	20	25	51	79.5	108.0	127.0	96	8.0	140.0	11.1	1.6	9	36	42	16	3	F03 / F04	9.8	5.9	2.0
40	30	40	73	98.5	127.0	165.0	101	10.5	197.5	14.3	1.6	11	42	50	16	3	F03 / F04	20.8	11.7	4.0
50	38	50	92	120.5	152.0	178.0	123	14.0	247.5	15.8	1.6	14	50	70	19	3	F05 / F07	29.9	20.8	6.8
65	50	64	105	139.5	178.0	190.5	136	15.5	247.5	17.6	1.6	14	50	70	19	3	F05 / F07	37.7	26.0	9.7
80	64	76	127	152.5	190.5	203.0	155	18.5	340.0	19.1	1.6	17	70	102	19	3	F07 / F10	48.1	36.4	15.2
100	76	100	157	190.5	229.0	229.0	170	20.0	340.0	24.0	1.6	17	70	102	19	3	F07 / F10	55.9	45.5	23.0

unit: mm

NPS	d	d1	G	C	D	L	H	H1	W	T	f	S	D1	D2	M	U	ISO 5211	Torque (in-lb)		Weight (lb)
																		Break-away	Action	
1"	0.79	0.98	2.01	3.13	4.25	5.00	3.79	0.31	5.51	0.44	0.06	0.35	1.42	1.65	0.63	0.12	F03 / F04	86.7	52.2	4.4
1-1/2"	1.18	1.57	2.87	3.88	5.00	6.50	3.97	0.41	7.78	0.56	0.06	0.43	1.65	1.97	0.63	0.12	F03 / F04	184.1	103.6	8.8
2"	1.50	1.97	3.62	4.74	5.98	7.01	4.84	0.55	9.74	0.62	0.06	0.55	1.97	2.76	0.75	0.12	F05 / F07	264.6	184.1	15.0
2-1/2"	1.97	2.52	4.13	5.49	7.01	7.50	5.35	0.61	9.74	0.69	0.06	0.55	1.97	2.76	0.75	0.12	F05 / F07	333.7	230.1	21.4
3"	2.52	2.99	5.00	6.00	7.50	7.99	6.11	0.73	13.39	0.75	0.06	0.67	2.76	4.02	0.75	0.12	F07 / F10	425.7	322.2	33.5
4"	2.99	3.94	6.18	7.50	9.02	9.02	6.70	0.79	13.39	0.94	0.06	0.67	2.76	4.02	0.75	0.12	F07 / F10	494.8	402.7	50.7

unit: in

**FOR ADDITIONAL SIZES SEE NEXT PAGE**



## SERIES: B101FM - B101FC - 150# (6")

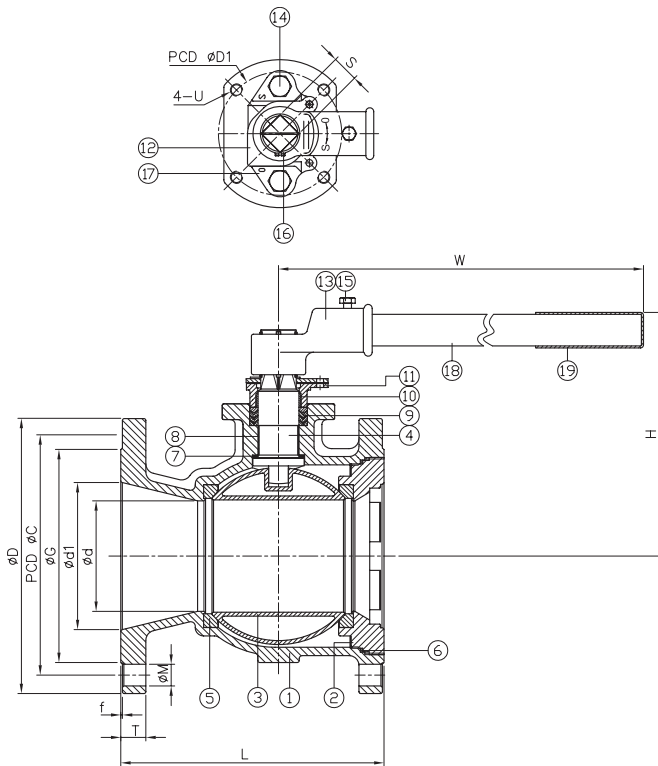
### 1-PC FLANGED END BALL VALVE

#### Stainless / Carbon Steel

DIRECT MOUNT

**DESIGN FEATURES:**

- Standard port, 6" (DN150)
- **W.P. : CLASS 150**
- W.T. : -20°C~200°C (-4°F~-392°F)
- Investment casting
- Blow-out proof stem
- Live-loading design
- Silicone Free
- Anti-static device
- **Mounting pad ISO 5211**
- API 598 Design
- Wall thickness: ASME B16.34
- Flange dimension: ASME B16.5
- Face to face: ASME B16.10
- Supplied with lever handle



ITEM	PARTS	MATERIAL	
		B101FMMTXXX	B101FCMTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A240-316	
4	STEM	ASTM A276316	
5	BALL SEAT	TFM 1600	
6	BODY SEAL	PTFE	
7	THRUST WASHER A		
8	THRUST WASHER B		
9	PACKING	AISI 304	
10	BUSHING		
11	GLAND		
12	STOPPER	AISI 304	
13	HANDLE HEAD		
14	BOLT		
15	BOLT	AISI 304	
16	CIRCLIPS FOR SHAFTS		
17	STOPPER		
18	STEEL TUBE	AISI 304	
19	HANDLE SLEEVE		

DN	d	d1	G	C	D	L	H	W	T	f	N	M	S	D1	U	ISO 5211	Torque (N-m)	Weight (kg)
150	112	150	216	241.5	279	267	246	745	25.4	1.6	8	22	27	125	1/2" -13UNC	F10 /F12	205	41

unit: mm

NPS	d	d1	G	C	D	L	H	W	T	f	N	M	S	D1	U	ISO 5211	Torque (in-lb)	Weight (lb)
6"	4.41	5.91	8.50	9.51	10.98	10.51	9.69	29.33	1.00	0.06	8.00	0.87	1.06	4.92	1/2" -13UNC	F10 /F12	1814.4	90.4

unit: in



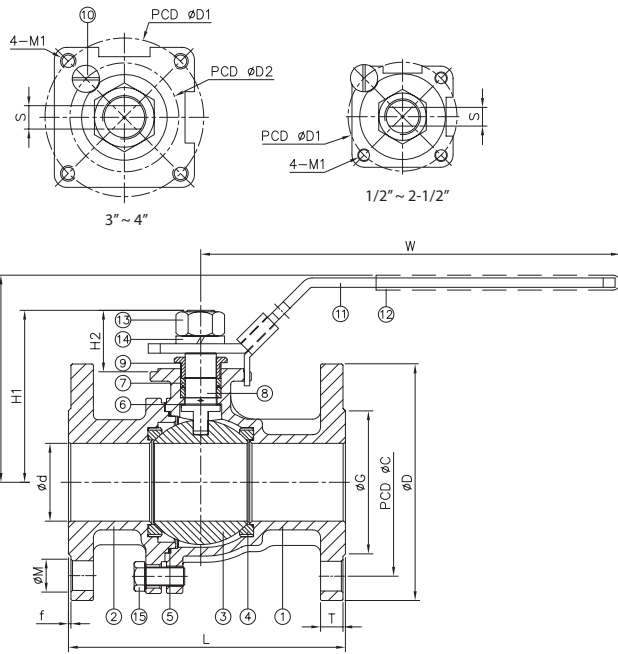
## SERIES: B201FM - B201FC - 150#

### 2-PC FLANGED END BALL VALVE

#### Stainless / Carbon Steel (1/2" - 4")

**DESIGN FEATURES:**

- Full port, 1/2"~4" (DN15~DN100)
- **W.P. : CLASS 150**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Anti-static device
- Locking device
- **Mounting pad ISO 5211**
- Flange dimension: ASME B16.5
- Face to face: ASME B16.10



ITEM	PARTS	MATERIAL	
		B201FMMTXXX	B201FCMTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	SEAT	TFM 1600	
5	SEAL	PTFE	
6	THRUST WASHER		
7	PACKING		
8	STEM	ASTM A276-316	
9	GLAND NUT	AISI 304	
10	STOP PIN		
11	HANDLE	STAINLESS STEEL	
12	HANDLE SLEEVE	PVC	
13	STEM NUT	AISI 304	
14	SPRING WASHER		
15	BOLT		

DN	d	G	C	D	L	H	H1	H2	W	T	f	S	D1	D2	M	M1	Torque (N-M)		Weight (kg)
																	Breakaway	Action	
15	15	35.0	60.5	89	108.0	85.7	57.2	23.7	169	9.6	1.6	8	42	-	16	M5	3.8	3.0	1.7
20	20	43.0	70.0	99	117.0	88.5	60.0	23.5	169	9.6	1.6	8	42	-	16	M5	5.5	4.0	2.1
25	25	51.0	79.0	108	127.0	103.3	73.8	29.0	205	9.7	1.6	10	50	-	16	M6	6.5	4.5	2.9
32	32	63.5	88.9	117	140.0	108.0	78.5	29.0	205	11.1	1.6	10	50	-	16	M6	9.0	7.5	4.0
40	38	73.2	98.6	127	165.0	128.4	102.9	39.4	266	12.7	1.6	12	70	-	16	M8	25.0	20.0	5.7
50	50	92.0	120.7	152	178.0	135.9	110.4	39.4	266	14.4	1.6	12	70	-	19.1	M8	38.0	30.0	8.4
65	65	104.6	139.0	178	190.0	147.6	122.1	38.6	298	16.0	1.6	12	70	-	19.1	M8	45.0	35.0	13.3
80	80	127.0	152.0	190	203.0	167.5	142.0	43.0	390	17.5	1.6	15	102	70	19.1	M10	61.0	50.0	16.4
100	100	157.2	190.5	228	228.5	182.5	157.0	43.0	390	22.4	1.6	15	102	70	19.1	M10	80.0	73.0	27.7

unit: mm

NPS	d	G	C	D	L	H	H1	H2	W	T	f	S	D1	D2	M	M1	Torque (lb-in)		Weight (lb)
																	Breakaway	Action	
1/2"	0.59	1.38	2.38	3.50	4.25	3.37	2.25	0.93	6.65	0.38	0.06	0.31	1.65	-	0.63	M5	33.6	26.6	3.8
3/4"	0.79	1.69	2.76	3.90	4.61	3.48	2.36	0.93	6.65	0.38	0.06	0.31	1.65	-	0.63	M5	48.7	35.4	4.5
1"	0.98	2.01	3.11	4.25	5.00	4.07	2.91	1.14	8.07	0.38	0.06	0.39	1.97	-	0.63	M6	57.5	39.8	6.4
1-1/4"	1.26	2.50	3.50	4.61	5.51	4.25	3.09	1.14	8.07	0.44	0.06	0.39	1.97	-	0.63	M6	79.7	66.4	8.8
1-1/2"	1.50	2.88	3.88	5.00	6.50	5.06	4.05	1.55	10.47	0.50	0.06	0.47	2.76	-	0.63	M8	221.3	177.0	12.5
2"	1.97	3.62	4.75	5.98	7.01	5.35	4.35	1.55	10.47	0.57	0.06	0.47	2.76	-	0.75	M8	336.3	265.5	18.5
2-1/2"	2.56	4.12	5.47	7.01	7.48	5.81	4.81	1.52	11.73	0.63	0.06	0.47	2.76	-	0.75	M8	398.3	309.8	29.3
3"	3.15	5.00	5.98	7.48	7.99	6.59	5.59	1.69	15.35	0.69	0.06	0.59	4.02	2.76	0.75	M10	539.9	442.5	36.1
4"	3.94	6.19	7.50	8.98	9.00	7.19	6.18	1.69	15.35	0.88	0.06	0.59	4.02	2.76	0.75	M10	708.1	646.1	61.0

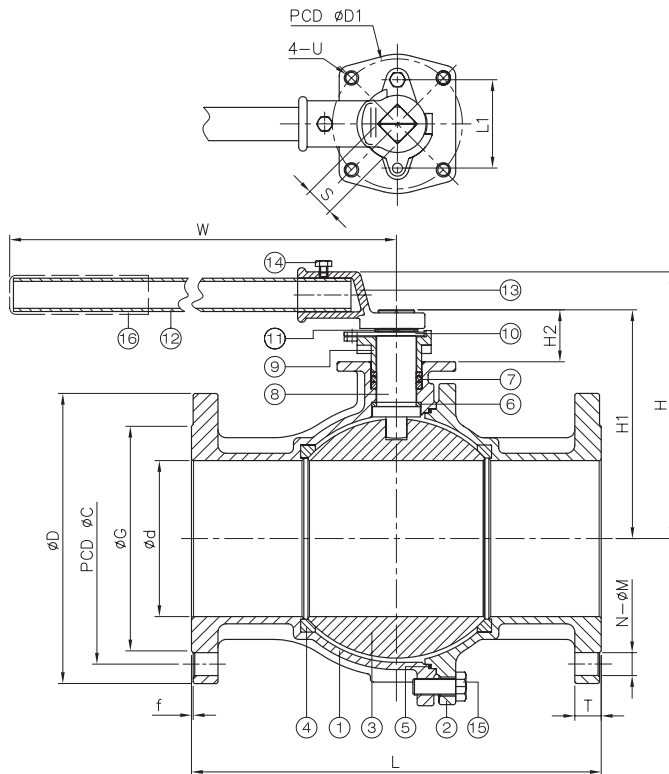
unit: in

## SERIES: B201FM - B201FC - 150# 2-PC FLANGED END BALL VALVE Stainless / Carbon Steel (5" - 10")



**DESIGN FEATURES:**

- Full port, 5" - 10" (DN125-DN250)
- **W.P. : CLASS 150**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Anti-static device
- Locking device
- **Mounting pad ISO 5211**
- Flange dimension: ASME B16.5
- Face to face: ASME B16.10



ITEM	PARTS	MATERIAL	
		B201FMMTXXX	B201FCMTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	SEAT	TFM 1600	
5	SEAL	PTFE	
6	THRUST WASHER		
7	PACKING	ASTM A276-316	
8	STEM		
9	GLAND	AISI 304	
10	STOPPER		
11	CIRCLIPS FOR SHAFT	AISI 304	
12	STEEL TUBE		
13	WRENCH BLOCK	AISI 304	
14	BOLT		
15	BOLT	PVC	
16	HANDLE SLEEVE		

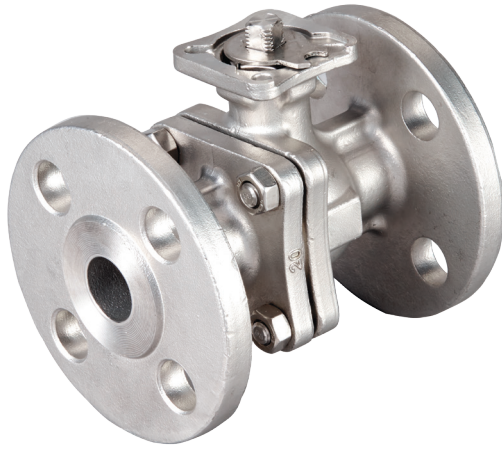
DN	d	G	C	D	L	H	H1	H2	W	T	f	N	M	S	L1	D1	U	Torque (N-M)		Weight (kg)
																		Breakaway	Action	
125	125	186	216.0	254	356	239.6	199.0	52.0	743	23.9	1.6	8	22.0	27	85	125	M12*1.75	160	96	46.0
150	150	216	241.5	279	394	256.5	220.0	50.0	743	25.4	1.6	8	22.0	27	85	125	M12*1.75	190	168	64.5
200	200	270	298.5	343	457	334.0	300.5	85.5	840	28.6	1.6	8	22.5	36	120	140	M16*2.00	470	350	121.0
250	250	324	362.0	406	533	378.0	334.5	74.5	1040	30.2	1.6	12	25.4	36	120	140	M16*2.00	750	450	186.0

unit: mm

NPS	d	G	C	D	L	H	H1	H2	W	T	f	N	M	S	L1	D1	U	Torque (in-lb)		Weight (lb)
																		Breakaway	Action	
5"	4.92	7.32	8.50	10.00	14.02	9.43	7.83	2.05	29.25	0.94	0.06	8	0.87	1.06	3.35	4.92	M12*1.75	1416.1	849.7	101.4
6"	5.91	8.50	9.51	10.98	15.51	10.10	8.66	1.97	29.25	1.00	0.06	8	0.87	1.06	3.35	4.92	M12*1.75	1681.6	1486.9	142.2
8"	7.87	10.63	11.75	13.50	17.99	13.15	11.83	3.37	33.07	1.13	0.06	8	0.89	1.42	4.72	5.51	M16*2.00	4159.8	3097.7	266.8
10"	9.84	12.76	14.25	15.98	20.98	14.88	13.17	2.93	40.94	1.19	0.06	12	1.00	1.42	4.72	5.51	M16*2.00	6638.0	3982.8	410.1

unit: in





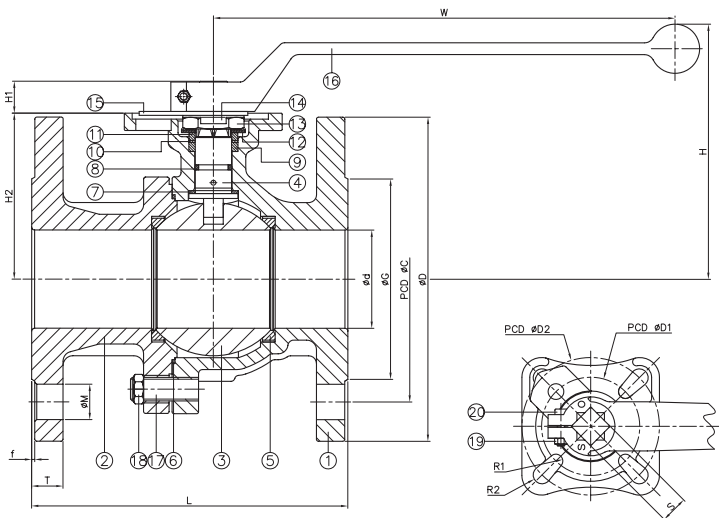
## SERIES: B601FM - B601FC - Class 150

### 2-PC FLANGED END BALL VALVE

#### Stainless / Carbon Steel (1/2" - 4")

**DESIGN FEATURES:**

- Full port, 1/2"~4" (DN15~DN100)
- **W.P. : CLASS 150**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Live-loading design
- Anti-static device
- Locking device
- **Direct mounting pad ISO 5211**
- **API 607 Fire safe approved**
- Supplied with lever handle



ITEM	PARTS	MATERIAL	
		B601FMMGXXX	B601FCMGXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A276-316	
4	STEM	ASTM A276-316	
5	SEAT	TFM 1600	
6	SEAL	GRAPHITE	
7	THRUST WASHER	CTFE	
8	O-RING	VITON	
9	PACKING A	GRAPHITE	
10	PACKING B	CTFE	
11	GLAND RING	AISI 304	
12	BELLEVILLE WASHER	AISI 301	
13	NUT	AISI 304	
14	LOCK WASHER		
15	STOPPER		
16	HANDLE		
17	STUD		
18	NUT		
19	NUT		
20	BOLT		

DN	d	G	C	D	L	H	H1	H2	W	T	f	S	D1	D2	R1	R2	M	ISO 5211	Torque (N-M)		Weight (kg)
																			Breakaway	Action	
15	15	35.0	60.5	89.0	108.0	85.0	8.5	50.5	190	11.1	1.6	9	36	42	2.75	2.75	16	F03 / F04	5.2	3.0	1.7
20	20	43.0	70.0	98.0	117.0	89.5	8.5	55.0	190	11.6	1.6	9	36	42	2.75	2.75	16	F03 / F04	8.0	4.7	2.1
25	24	51.0	79.5	108.0	127.5	94.2	10.5	59.0	190	11.6	1.6	11	42	50	2.75	3.50	16	F04 / F05	12.5	9.0	3.2
32	30	64.0	89.0	117.0	140.5	97.9	10.5	62.0	190	12.7	1.6	11	42	50	2.75	3.50	16	F04 / F05	14.0	11.0	3.7
40	38	73.0	98.5	127.0	165.0	120.9	14.0	76.0	235	14.3	1.6	14	50	70	3.50	4.50	16	F05 / F07	24.5	18.0	6.0
50	50	92.0	120.5	152.0	178.0	129.9	14.0	84.5	235	16.0	1.6	14	50	70	3.50	4.50	19	F05 / F07	32.0	23.0	8.0
65	64	105.0	139.5	178.0	190.5	156.3	17.0	104.5	325	17.5	1.6	17	70	102	4.50	5.50	19	F07 / F10	38.0	27.0	14.5
80	76	127.0	152.5	190.5	203.0	163.3	17.0	111.5	325	19.1	1.6	17	70	102	4.50	5.50	19	F07 / F10	45.0	30.0	18.2
100	100	157.2	190.5	229.0	229.0	195.9	23.0	142.0	325	24.3	1.6	22	102	125	5.50	6.50	19	F10 / F12	130.0	78.0	29.3

unit: mm

NPS	d	G	C	D	L	H	H1	H2	W	T	f	S	D1	D2	R1	R2	M	ISO 5211	Torque (in-lb)		Weight (lb)
																			Breakaway	Action	
1/2"	0.59	1.38	2.38	3.50	4.25	3.35	0.33	1.99	7.48	0.44	0.06	0.35	1.42	1.65	0.11	0.11	0.63	F03 / F04	46.0	26.6	3.7
3/4"	0.79	1.69	2.76	3.86	4.61	3.52	0.33	2.17	7.48	0.46	0.06	0.35	1.42	1.65	0.11	0.11	0.63	F03 / F04	70.8	41.6	4.6
1"	0.94	2.01	3.13	4.25	5.02	3.71	0.41	2.32	7.48	0.46	0.06	0.43	1.65	1.97	0.11	0.14	0.63	F04 / F05	110.6	79.7	7.1
1-1/4"	1.18	2.52	3.50	4.61	5.53	3.85	0.41	2.44	7.48	0.50	0.06	0.43	1.65	1.97	0.11	0.14	0.63	F04 / F05	123.9	97.4	8.2
1-1/2"	1.50	2.87	3.88	5.00	6.50	4.76	0.55	2.99	9.25	0.56	0.06	0.55	1.97	2.76	0.14	0.18	0.63	F05 / F07	216.8	159.3	13.2
2"	1.97	3.62	4.74	5.98	7.01	5.11	0.55	3.33	9.25	0.63	0.06	0.55	1.97	2.76	0.14	0.18	0.75	F05 / F07	283.2	203.6	17.6
2-1/2"	2.52	4.13	5.49	7.01	7.50	6.15	0.67	4.11	12.8	0.69	0.06	0.67	2.76	4.02	0.18	0.22	0.75	F07 / F10	336.3	239.0	32.0
3"	2.99	5.00	6.00	7.50	7.99	6.43	0.67	4.39	12.8	0.75	0.06	0.67	2.76	4.02	0.18	0.22	0.75	F07 / F10	398.3	265.5	40.2
4"	3.94	6.19	7.50	9.02	9.02	7.71	0.91	5.59	12.8	0.96	0.06	0.87	4.02	4.92	0.22	0.26	0.75	F10 / F12	1150.6	690.4	64.6

unit: in

FOR ADDITIONAL SIZES SEE NEXT PAGE



# SERIES: B601FM - B601FC - Class 150

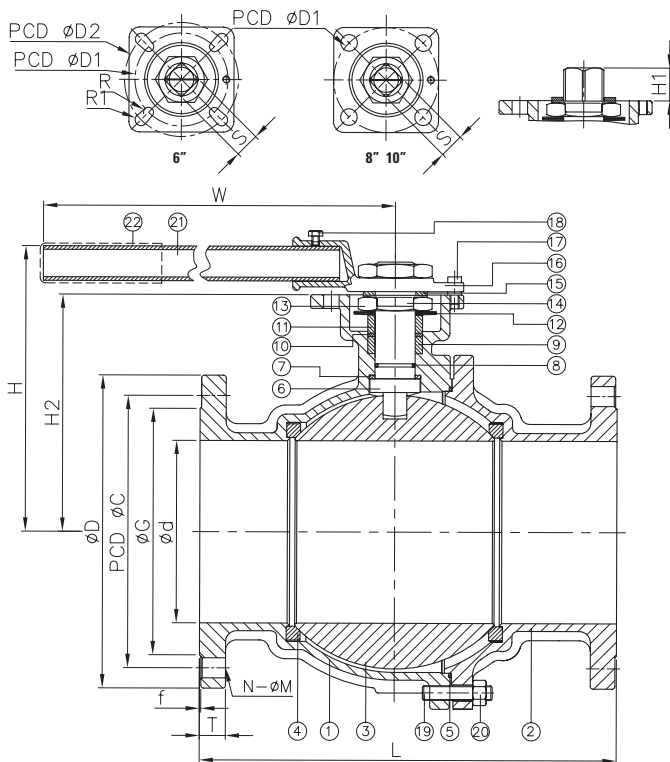
## 2-PC FLANGED END BALL VALVE

### Stainless / Carbon Steel (6" - 10")



**DESIGN FEATURES:**

- Full port, 6"-10" (DN150 ~ DN250)
- **W.P. : CLASS 150**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Supplied with lever handle
- Live-loading design
- Anti-static device
- Locking device
- **Direct mounting pad ISO 5211**
- **API 607 Fire safe approved**



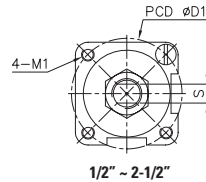
ITEM	PARTS	MATERIAL	
		B601FMMGXXX	B601FCMGXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	SEAT	TFM 1600	
5	SEAL	316+GRAPHITE	
6	STEM	ASTM A276-316	
7	THRUST WASHER	CTFE	
8	O-RING	VITON	
9	PACKING A	GRAPHITE	
10	PACKING B	CTFE	
11	GLAND RING	AISI 304	
12	BELLEVILLE WASHER	AISI 301	
13	STEM NUT	AISI 304	
14	LOCK WASHER		
15	FLAT WASHER		
16	HANDLE HEAD		
17	STOP PIN		
18	BOLT		
19	STUD		
20	NUT		
21	STEEL TUBE		
22	HANDLE SLEEVE		

DN	d	G	C	D	L	H	H1	H2	W	T	f	S	D1	D2	R	R1	N	M	ISO 5211	Torque (N-M)		Weight (kg)
																				Breakaway	Action	
150	150	216	241.5	279	394	230	27.5	201	743	25.4	1.6	27	102	125	5.5	6.5	8	22.4	F10 / F12	250	170	67
200	200	270	298.5	343	457	312	36	259	840	28.6	1.6	36	140	-	8.5	-	8	22.4	F14	470	280	116
250	250	324	362.0	406	533	350	36	295	1040	30.2	1.6	36	140	-	8.5	-	12	25.4	F14	750	532	186

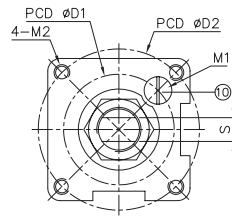
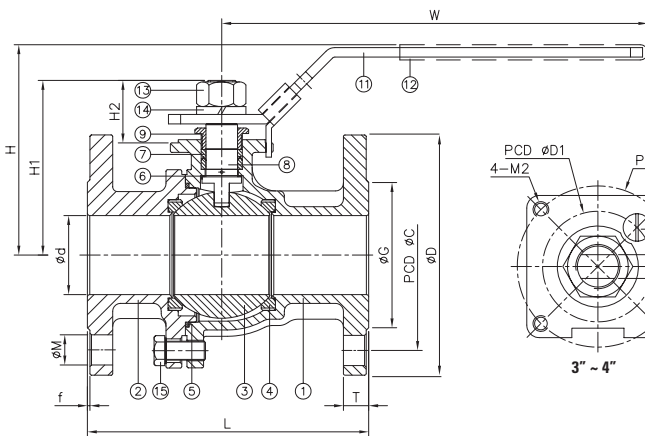
unit: mm

NPS	d	G	C	D	L	H	H1	H2	W	T	f	S	D1	D2	R	R1	N	M	ISO 5211	Torque (in-lb)		Weight (lb)
																				Breakaway	Action	
6"	5.91	8.50	9.51	10.98	15.51	9.06	1.08	7.91	29.25	1.00	0.06	1.06	4.02	4.92	0.22	0.26	8	0.88	F10 / F12	2212.7	1504.6	147.7
8"	7.87	10.63	11.75	13.5	17.99	12.28	1.42	10.20	33.07	1.13	0.06	1.42	5.51	-	0.33	-	8	0.88	F14	4159.8	2478.2	255.7
10"	9.84	12.76	14.25	15.98	20.98	13.78	1.42	11.61	40.94	1.19	0.06	1.42	5.51	-	0.33	-	12	1.00	F14	6638.0	4708.6	410.1

unit: in



1/2" - 2-1/2"



3" - 4"

## SERIES: B203FM - B203FC - 300# 2-PC FLANGED END BALL VALVE Stainless / Carbon Steel (1/2" - 4")

### DESIGN FEATURES:

- Full port, 1/2"-4" (DN15-DN100)
- **W.P. : CLASS 300**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Anti-static device (option)
- Locking device
- **Mounting pad ISO 5211**
- Flange dimension: ASME B16.5
- Face to face: ASME B16.10

ITEM	PARTS	MATERIAL	
		B203FMMTXXX	B203FCMTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	SEAT	TFM 1600	
5	SEAL	PTFE	
6	THRUST WASHER		
7	PACKING	ASTM A276-316	
8	STEM		
9	GLAND NUT	AISI 304	
10	STOP PIN	STAINLESS STEEL	
11	HANDLE		
12	HANDLE SLEEVE	PVC	
13	STEM NUT	AISI 304	
14	SPRING WASHER		
15	BOLT		

DN	d	G	C	D	L	H	H1	H2	W	T	f	S	D1	D2	M	M1	M2	Torque (N-m)		Weight (kg)
																		Breakaway	Action	
15	15	35	66.5	95	140	85.7	57.2	23.7	169	14.3	1.6	8	42	-	16	M5	-	7.5	5.0	2.0
20	20	43	82.5	117	152	88.5	60.0	23.5	169	15.8	1.6	8	42	-	19	M5	-	7.6	5.0	3.2
25	25	51	89.0	124	165	103.3	73.8	29.0	205	17.5	1.6	10	50	-	19	M6	-	17.5	15.1	3.8
32	32	64	98.5	133	178	108.0	78.5	29.0	205	19.1	1.6	10	50	-	19	M6	-	20.0	17.2	5.6
40	38	73	114.5	156	190	128.4	102.9	39.4	266	20.6	1.6	12	70	-	22	M8	-	22.9	20.5	8.1
50	50	92	127.0	165	216	135.9	110.4	39.4	266	22.4	1.6	12	70	-	19	M8	-	32.2	27.2	10.3
65	63	105	149.0	190	241	147.6	122.1	38.6	298	25.4	1.6	12	70	-	22	M8	-	42.3	34.2	16.1
80	76	127	168.0	210	282	167.5	142.0	43.0	390	28.5	1.6	15	70	102	22	M8	M10	87.2	74.6	22.7
100	100	157	200.0	254	305	182.5	157.0	43.0	390	31.8	1.6	15	70	102	22	M8	M10	98.2	75.2	36.7

unit: mm

NPS	d	G	C	D	L	H	H1	H2	W	T	f	S	D1	D2	M	M1	M2	Torque (in-lb)		Weight (lb)
																		Breakaway	Action	
1/2"	0.59	1.38	2.62	3.74	5.51	3.37	2.25	0.93	6.65	0.56	0.06	0.31	1.65	-	0.63	M5	-	66.4	44.3	4.4
3/4"	0.79	1.69	3.25	4.61	5.98	3.48	2.36	0.93	6.65	0.62	0.06	0.31	1.65	-	0.75	M5	-	67.3	44.3	7.1
1"	0.98	2.01	3.50	4.88	6.50	4.07	2.91	1.14	8.07	0.69	0.06	0.39	1.97	-	0.75	M6	-	154.9	133.7	8.4
1-1/4"	1.26	2.52	3.88	5.24	7.01	4.25	3.09	1.14	8.07	0.75	0.06	0.39	1.97	-	0.75	M6	-	177.0	152.2	12.3
1-1/2"	1.50	2.87	4.51	6.14	7.48	5.06	4.05	1.55	10.47	0.81	0.06	0.47	2.76	-	0.75	M8	-	202.7	181.4	17.9
2"	1.97	3.62	5.00	6.50	8.50	5.35	4.35	1.55	10.47	0.88	0.06	0.47	2.76	-	0.87	M8	-	285.0	240.7	22.7
2-1/2"	2.48	4.13	5.87	7.48	9.49	5.81	4.81	1.52	11.73	1.00	0.06	0.47	2.76	-	0.87	M8	-	374.4	302.7	35.5
3"	2.99	5.00	6.61	8.27	11.1	6.59	5.59	1.69	15.35	1.12	0.06	0.59	2.76	4.02	0.87	M8	M10	771.8	660.3	50.0
4"	3.94	6.18	7.87	10.0	12.01	7.19	6.18	1.69	15.35	1.25	0.06	0.59	2.76	4.02	0.87	M8	M10	869.2	665.6	80.9

unit:in

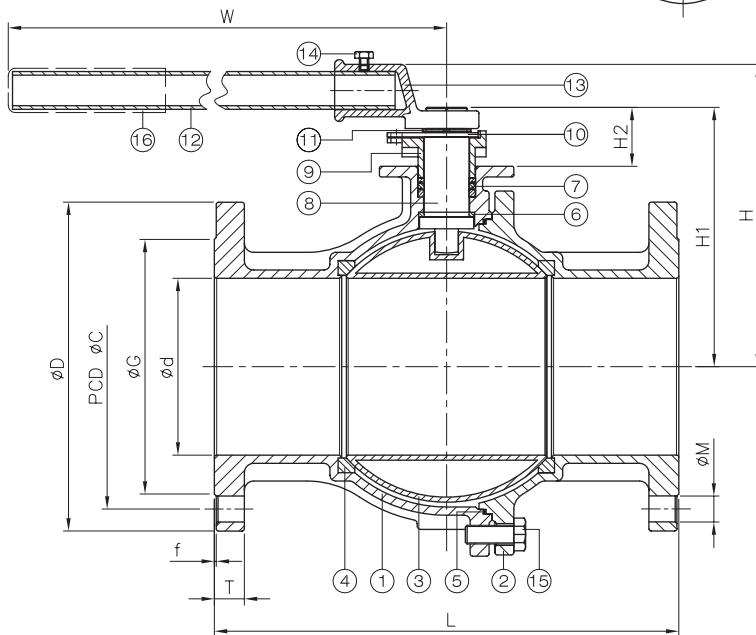
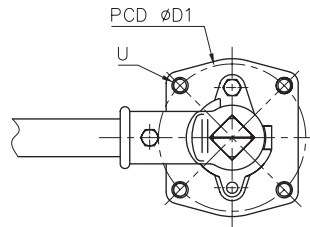
FOR ADDITIONAL SIZES SEE NEXT PAGE

# SERIES: B203FM - B203FC - 300# 2-PC FLANGED END BALL VALVE Stainless / Carbon Steel (6")



**DESIGN FEATURES:**

- Full port, 6" (DN150)
- **W.P. : CLASS 300**
- W.T. : -20°C-200°C (-4°F-392°F)
- Investment casting
- Blow-out proof stem
- Anti-static device (option)
- Locking device
- **Mounting pad ISO 5211**
- Flange dimension: ASME B16.5
- Face to face: ASME B16.10



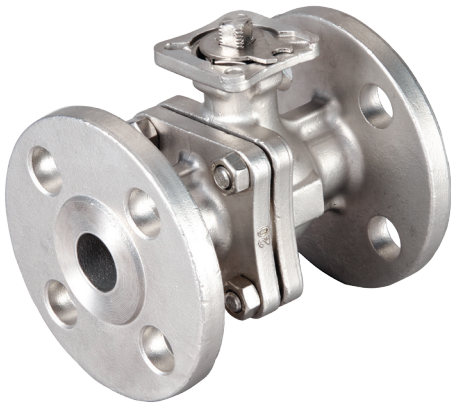
ITEM	PARTS	MATERIAL	
		B203FMMTXXX	B203FCMTXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A240-316	
4	SEAT	TFM 1600	
5	SEAL		
6	THRUST WASHER	PTFE	
7	PACKING		
8	STEM	ASTM A276-316	
9	GLAND		
10	STOPPER		
11	CIRCLIPS FOR SHAFT	AISI 304	
12	STEEL TUBE		
13	WRENCH BLOCK		
14	BOLT		
15	BOLT		
16	HANDLE SLEEVE	PVC	

DN	d	G	C	D	L	H	H1	H2	W	D1	T	f	U	M	Torque (N-M)		Weight (kg)
															Breakaway	Action	
150	150	216	270	317.5	403	256.5	220	50	743	125	36.6	1.6	M12X1.75	22.5	185	165	79

unit: mm

NPS	d	G	C	D	L	H	H1	H2	W	D1	T	f	U	M	Torque (in-lb)		Weight (lb)
															Breakaway	Action	
6"	5.91	8.5	10.63	12.5	15.87	10.1	8.66	1.97	29.25	4.92	1.44	0.06	M12X1.75	0.89	1637.4	1460.4	174.2

unit: in



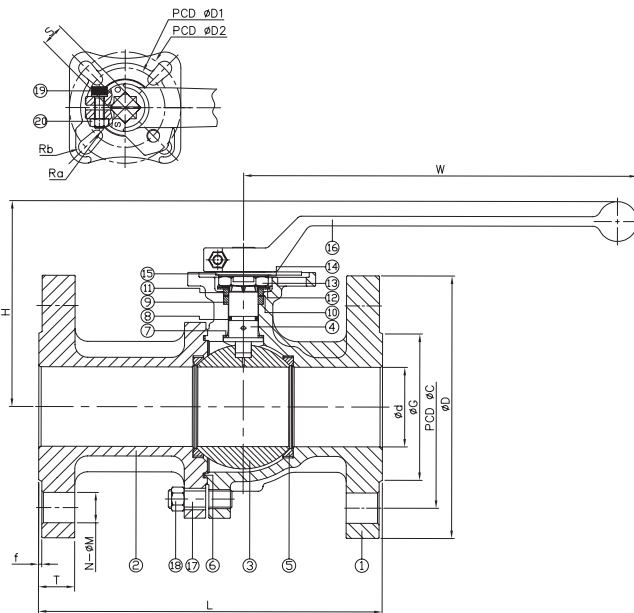
## SERIES: B603FM - B603FC - Class 300

### 2-PC FLANGED END BALL VALVE

#### Stainless / Carbon Steel (1/2" - 4")

**DESIGN FEATURES:**

- Full port, 1/2"~4" (DN15~DN100)
- **W.P. : CLASS 300**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Supplied with lever handle
- Live-loading design
- Anti-static device
- Locking device
- **Direct mounting pad ISO 5211**
- **API 607 Fire safe approved**



ITEM	PARTS	MATERIAL	
		B603FMMGXXX	B603FCMGXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A351-CF8M	
4	STEM	ASTM A276-316	
5	SEAT	TFM 1600	
6	SEAL	GRAPHITE	
7	THRUST WASHER	CTFE	
8	O-RING	VITON	
9	PACKING A	GRAPHITE	
10	PACKING B	CTFE	
11	GLAND RING	AISI 304	
12	BELLEVILLE WASHER	AISI 301	
13	STEM NUT	AISI 304	
14	LOCK WASHER		
15	STOPPER		
16	HANDLE		
17	STUD		
18	NUT		
19	BOLT		
20	HANDLE NUT		

DN	d	G	C	D	L	H	W	T	f	S	D1	D2	Ra	Rb	N	M	ISO 5211	Torque(N-M)		Weight (kg)
																		Breakaway	Action	
15	15	35.0	66.7	95	140	84.5	197.5	14.7	2	9	36	42	2.75	2.75	4	16.0	F03 / F04	5.2	3.0	2.4
20	20	43.0	82.6	115	152	94.5	197.5	16.3	2	9	36	42	2.75	2.75	4	19.1	F03 / F04	8.0	4.7	3.4
25	24	51.0	89.0	125	165	99.5	197.5	17.9	2	11	42	50	2.75	3.5	4	19.1	F04 / F05	12.5	9.0	4.6
32	30	63.5	98.4	135	178	105.0	197.5	19.5	2	11	42	50	2.75	3.5	4	19.1	F04 / F05	14.0	11.0	5.9
40	38	73.0	114.3	155	190	124.5	247.5	21.1	2	14	50	70	3.50	4.5	4	22.3	F05 / F07	24.5	18.0	8.8
50	50	92.0	127.0	165	216	129.0	247.5	22.7	2	14	50	70	3.50	4.5	8	19.1	F05 / F07	32.0	23.0	11.0
65	64	104.8	149.2	190	241	154.5	340.0	25.9	2	17	70	102	4.50	5.5	8	22.3	F07 / F10	38.0	27.0	18.5
80	75	127.0	168.3	210	282	165.5	340.0	29.0	2	17	70	102	4.50	5.5	8	22.3	F07 / F10	45.0	30.0	25.3
100	98	157.2	200.0	255	305	188.0	340.0	32.2	2	22	102	125	5.50	6.5	8	22.3	F10 / F12	55.0	37.0	39.5

unit: mm

NPS	d	G	C	D	L	H	W	T	f	S	D1	D2	Ra	Rb	N	M	ISO 5211	Torque(in-lb)		Weight (lb)
																		Breakaway	Action	
1/2'	0.59	1.38	2.63	3.74	5.51	3.33	7.78	0.58	0.08	0.35	1.42	1.65	0.11	0.11	4	0.63	F03 / F04	46.0	26.6	5.3
3/4"	0.79	1.69	3.25	4.53	5.98	3.72	7.78	0.64	0.08	0.35	1.42	1.65	0.11	0.11	4	0.75	F03 / F04	70.8	41.6	7.5
1"	0.94	2.01	3.50	4.92	6.50	3.92	7.78	0.70	0.08	0.43	1.65	1.97	0.11	0.14	4	0.75	F04 / F05	110.6	79.7	10.1
1-1/4"	1.18	2.50	3.87	5.31	7.01	4.13	7.78	0.77	0.08	0.43	1.65	1.97	0.11	0.14	4	0.75	F04 / F05	123.9	97.4	13.0
1-1/2"	1.50	2.87	4.50	6.10	7.48	4.90	9.74	0.83	0.08	0.55	1.97	2.76	0.14	0.18	4	0.88	F05 / F07	216.8	159.3	19.4
2"	1.97	3.62	5.00	6.50	8.50	5.08	9.74	0.89	0.08	0.55	1.97	2.76	0.14	0.18	8	0.75	F05 / F07	283.2	203.6	24.3
2-1/2"	2.52	4.13	5.87	7.48	9.49	6.08	13.39	1.02	0.08	0.67	2.76	4.02	0.18	0.22	8	0.88	F07 / F10	336.3	239.0	40.8
3"	2.95	5.00	6.63	8.27	11.1	6.52	13.39	1.14	0.08	0.67	2.76	4.02	0.18	0.22	8	0.88	F07 / F10	398.3	265.5	55.8
4"	3.86	6.19	7.87	10.04	12.01	7.40	13.39	1.27	0.08	0.87	4.02	4.92	0.22	0.26	8	0.88	F10 / F12	486.8	327.5	87.1

unit: in

FOR ADDITIONAL SIZES SEE NEXT PAGE



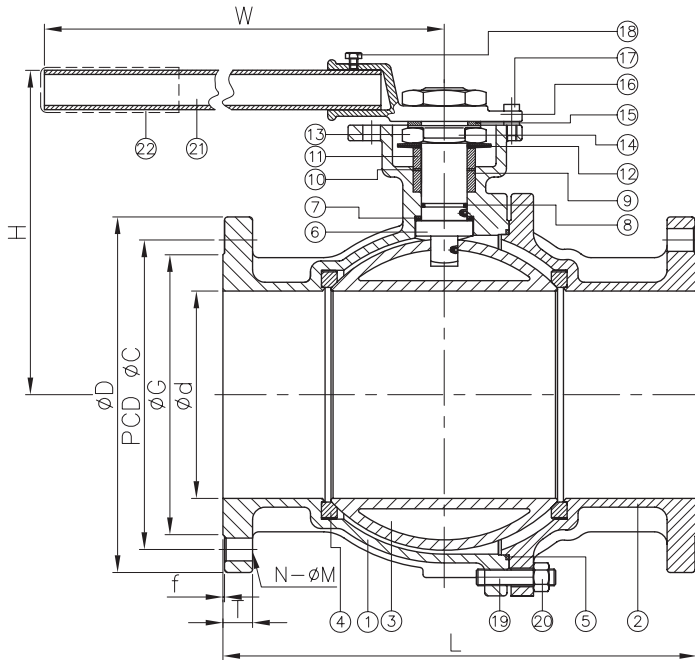
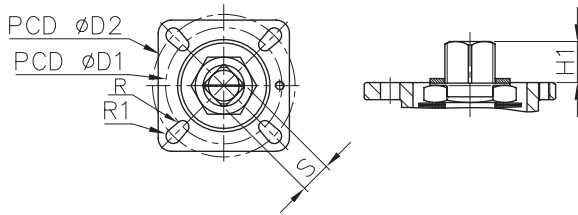
## SERIES: B603FC - B603FM - Class 300

### 2-PC FLANGED END BALL VALVE

#### Stainless / Carbon Steel (6")

**DESIGN FEATURES:**

- Full port, 6" (DN150)
- **W.P. : CLASS 300**
- W.T. : -20°C~200°C (-4°F~392°F)
- Investment casting
- Blow-out proof stem
- Silicone Free
- Supplied with lever handle
- Live-loading design
- Anti-static device
- Locking device
- **Direct mounting pad ISO 5211**
- **API 607 Fire safe approved**



ITEM	PARTS	MATERIAL	
		B603FMMGXXX	B603FCMGXXX
1	BODY	ASTM A351-CF8M	ASTM A216-WCB
2	CAP		
3	BALL	ASTM A240-316	
4	SEAT	TFM 1600	
5	SEAL	316+GRAPHITE	
6	STEM	ASTM A276-316	
7	THRUST WASHER	CTFE	
8	O-RING	VITON	
9	PACKING A	GRAPHITE	
10	PACKING B	CTFE	
11	GLAND RING	AISI 304	
12	BELLEVILLE WASHER	AISI 301	
13	STEM NUT	AISI 304	
14	LOCK WASHER		
15	FLAT WASHER		
16	HANDLE HEAD		
17	STOP PIN		
18	BOLT		
19	STUD		
20	NUT	PVC	
21	STEEL TUBE		
22	HANDLE SLEEVE	PVC	

DN	d	G	C	D	L	H	H1	W	T	f	S	D1	D2	R	R1	N	M	ISO 5211	Torque (N-M)		Weight (kg)
																			Breakaway	Action	
150	150	216	269.9	320	403	27.5	253	743	37	2	27	102	125	5.5	6.5	12	22.3	F10 / F12	250	170	79

unit: mm

NPS	d	G	C	D	L	H	H1	W	T	f	S	D1	D2	R	R1	N	M	ISO 5211	Torque (in-lb)		Weight (lb)
																			Breakaway	Action	
6"	5.91	8.5	10.63	12.6	15.87	1.08	9.96	29.25	1.46	0.08	1.06	4.02	4.92	0.22	0.26	12	0.88	F10 / F12	2212.7	1504.6	174.2

unit: in

## VALVE SEAT MATERIAL SELECTION GUIDE

MATERIAL	DESCRIPTION	COLOR
<b>PTFE</b>	The basic seat material used in most ball valves. Its chemical compatibility is excellent for almost all media service applications.	White
<b>RTFE</b>	15% Glass Reinforced TFE. This material is offered as the standard seal in most valves. Chemical resistance is compatible to virgin TFE with improved cycle life and greater pressure-temperature rating than PTFE	Off White
<b>CTFE</b>	25% Carbon with 75% TFE. This material offers a wide temperature range with better cycle life than RTFE	Black
<b>TFM</b>	TFM is chemically modified PTFE that fills the gap between conventional PTFE and melt-processable PFA. According to ASTM D 4894 and ISO Draft WDT 539-1.5, TFM is classified as a PTFE. Compared to conventional PTFE, TFM has lower permeability and much lower deformation under pressure (cold flow) at room and elevated temperature. Also, they can be used at higher pressures.	White
<b>PEEK</b>	Polyether-ether-ketone temperature semirigid elastomer. Best suited for high pressure and temperature service. Also offers very good corrosion resistance.	Grey
<b>DELRIN</b>	Delrin is capable of handling extremely high pressure. <b>Must not be used for oxygen service</b>	Creamy white



**OPTIONS AVAILABLE**

- T-HANDLES
- DEAD-MAN HANDLES
- GEAR OPERATORS
- STEM EXTENSIONS
- COMPLETE ACTUATION PACKAGES
  - » PNEUMATIC
  - » ELECTRIC
- SEAT OPTIONS
- MTRs AVAILABLE UPON REQUEST
- CUSTOM DESIGNS AVAILABLE

**OVAL HANDLES**



**STEM EXTENSIONS**



**TYPE A**

Features

- Rugged and stable
- Investment casting
- Stainless steel fabrication
- Airtight
- Mount upon ISO-5211 direct mounting pad F04 ~ F12
- Could be fitted with locking device and actuator



**TYPE B**

Features

- Less cost
- Bar stock
- Stainless steel fabrication
- Maintenance free

## API 607 FIRE SAFE APPROVAL

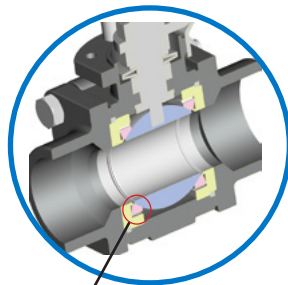
### POWELL API 607 FIRE SAFE VALVES

- B820
- B836
- B860
- B920
- B501
- B601
- B603



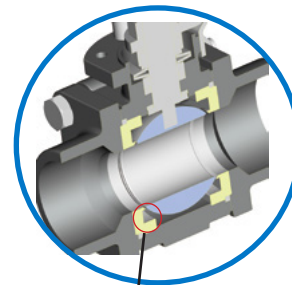
### Fire Safe Design

Before the Fire



BALL SEAT

After the Fire



FIRE SAFE LIP

Secondary metal to metal seal acts as backup if primary seal is destroyed by fire.

## STANDARDS AND MATERIALS

### FIRE SAFE TEST

API 607  
ISO 10497

### “SOUR GAS”

NACE MR0175

### BIOPROCESSING EQUIPMENT

ASME BPE  
Certification to EN 10204.3 given only when previously requested with valve supply inquiry

### BUTT WELD ENDS

ASME/ANSI B16.25  
DIN 3239 PART 1

### SOCKET WELD ENDS

ASME/ANSI B16.11  
DIN 3239 PART 2

### THREADED ENDS

ASME/ANSI B1.20.1  
ASME/ANSI B16.11  
ISO 7/1  
DIN 2999  
BS21

### FLANGED ENDS

ASME/ANSI B16.5  
ASME/ANSI B16.10  
ASME/ANSI B16.34  
EN 1092-1  
EN 558  
DIN 3202

### WALL THICKNESS

ASME/ANSI B16.34  
EN 12516

### MARKING

ASME/ANSI B16.34  
MSS SP 25  
ISO 5209

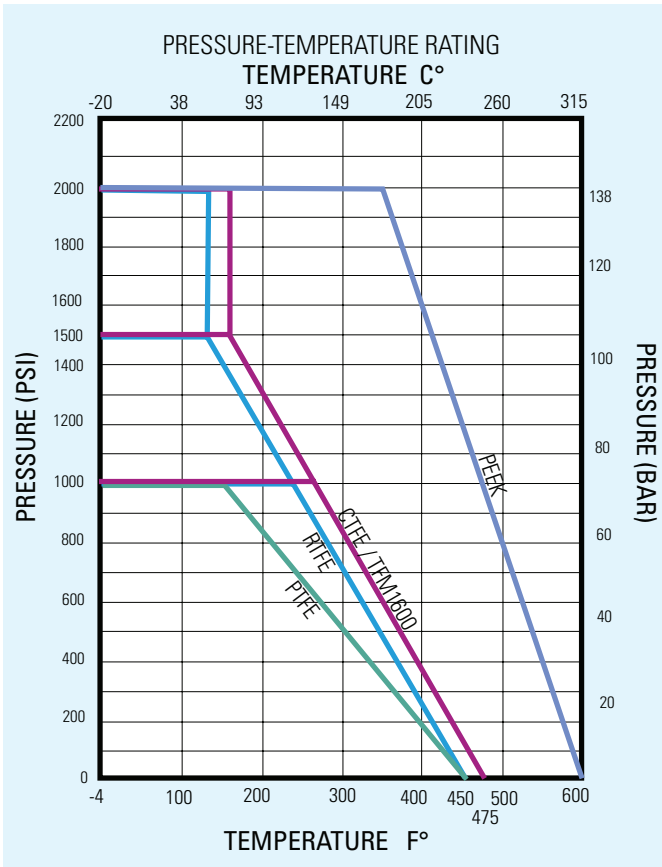
### TEST AND INSPECTION

API 598  
EN 12266

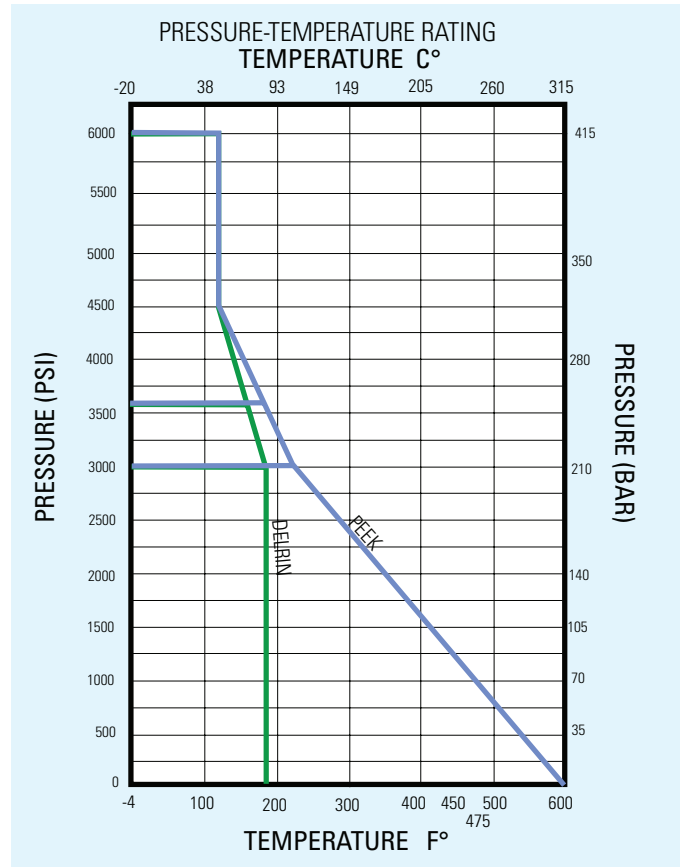
## SPECIAL MATERIALS

MATERIAL TYPE	MATERIAL CODE
Austenitic Stainless Steel	CN7M, CN3MN
Precipitation Hardening Stainless Steel	17-4PH, 15-5PH
Duplex Stainless Steel	CD4MCu, CD3MN, CE3MN, Alloy2205, Ferralium255, SAF2507, ASTM A890
Monel	Monel400
Hastelloy	Hastelloy C276, Hastelloy B2, CW2M, CW12MV
Inconel	Inconel 600

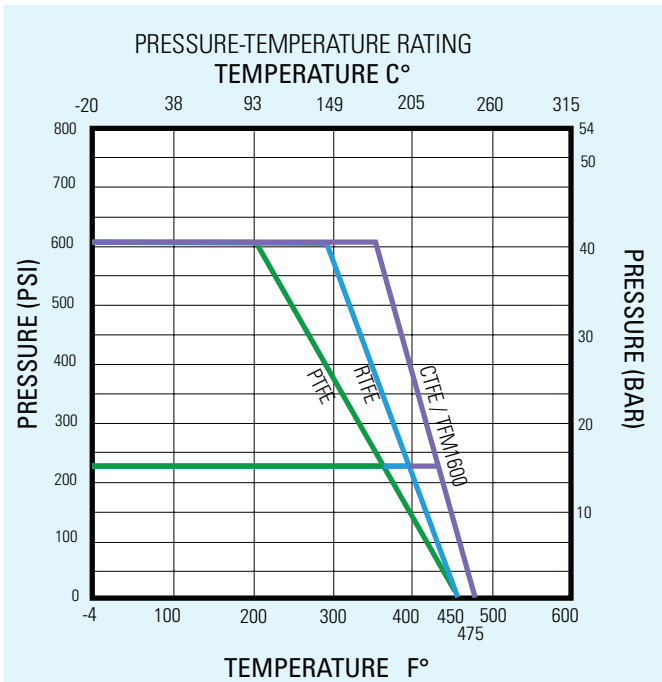
PRESSURE / TEMPERATURE RATING



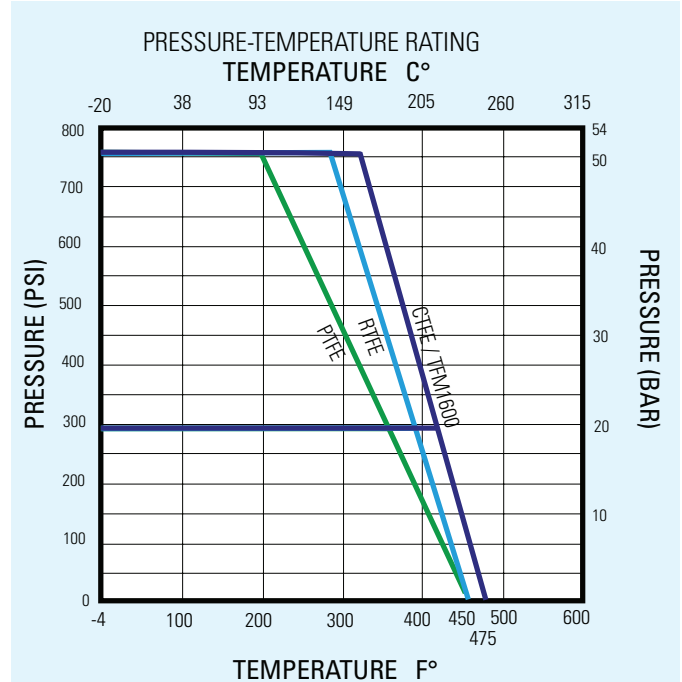
800/1000/1500/2000 WOG



3000/3600/6000 WOG



PN 16/40



CLASS 150/300

# 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. Only applicable to standard items shipped within the past 60 days. 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.

## GENERAL TERMS AND CONDITIONS OF SALE

**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.



## GENERAL TERMS AND CONDITIONS OF SALE

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.

## **Manufacturing, Sales and Distribution Centers:**

### **Global Corporate Headquarters**

2503 Spring Grove Ave.  
 Cincinnati, OH 45214  
 513.852.2000  
 Sales and Engineering  
 800.888.2583

### **Powell South Carolina**

Manning Manufacturing and Distribution Center  
 1567 Joe Rogers Jr. Blvd.  
 Manning, SC 29102

Orangeburg Manufacturing and Distribution Center  
 940 Cross Creek Road  
 Orangeburg, SC 29115

### **Powell Texas**

Houston/Stafford Sales and Distribution Center  
 Freeport Ninety Business Park  
 13843 N. Promenade Blvd.  
 Building 5, Suite 650  
 Stafford, TX 77477  
 800.888.2583

### **Powell China**

Yancheng Manufacturing, Sales and Distribution Center  
 Yancheng City, China



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 2503 Spring Grove Ave.  
 Cincinnati, OH 45214  
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