

3" – 24" (DN 80 – 600) series 860 ASME Class 600 Jamesbury™ Wafer-Sphere™ high performance butterfly valves

Jamesbury™ Wafer-Sphere Series 860 ASME Class 600 high-performance butterfly valves provide long-lasting tight shutoff capability, excellent flow characteristics, and long service life. The following designs are available in sizes 3" – 24" (DN 80 – 600):

860W (Class 600 Wafer-Body Design)

860L (Class 600 Single-Flange Design)

F860W, F860L (Class 600 Fire-Tested Version)

868W (CE Marked Class 600 Wafer-Body Design)

868L (CE Marked Class 600 Single Flange Design)

F868W, F868L (CE Marked Class 600 Fire-Tested Version)

The Wafer-Sphere high-performance butterfly valve is available in a range of materials and seat combinations suitable for service in a wide variety of applications including NACE MR0103 and abrasive services. Also available are valves specifically prepared for chlorine, oxygen and high-vacuum applications.

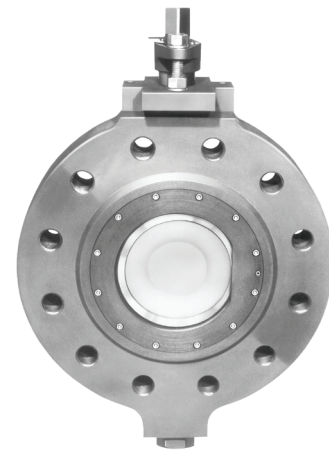
Features

Field-proven single-piece flexible seat design

- Xtreme™ seat provides longer life, expanded performance boundaries, and greater value
- Lip-seal design compensates for temperature and pressure changes
- No additional o-rings or metal parts required to maintain tightness
- Tight shut-off in either direction
- Longer service life with less maintenance

Offset shaft and eccentric disc

- No seat/disc contact in the open or intermediate position
- Eliminates wear points at top and bottom of seats for higher cycle life
- Reduces torque requirements, allowing for smaller operators



Fire-tested version available

- Fire-Tite™ Wafer-Sphere valves have been tested to API 607 and ISO-10497

Easy seat maintenance

- Simply remove body insert and replace seat; disassembly of disc and shaft is not required

CE marked versions available

- CE marked and documented valves that conform to the European Pressure Equipment Directive (PED) 2014/68/EU are available in ASME Class 600, both standard and Fire-Tite construction. Operating torques, construction options and valve dimensions are exactly the same as the standard ASME 600 offering.

Positive shaft retention

- 3" - 12" (DN 80 - 300) valves are equipped with a retaining ring at the top of the shaft to prevent movement of the top portion of the shaft past the compression ring if for any reason the shaft should break within the valve.

Excellent for both on-off and control applications

- Superior control characteristics
- Inherent flow characteristic is modified equal percentage
- Wide rangeability
- Tight shut-off even in control applications
- Standard lugged style valves are suitable for bidirectional dead-end service.

Single-source responsibility

- Purchase valves, actuators, and accessories, completely mounted from one source

- Available with electric, manual gear, and pneumatic double acting or spring return actuators and a variety of accessories including limit switches, solenoids, and positioners
- OEM service available through world-wide service centers

Additional information

Please refer to the bulletins listed below for additional information on other Jamesbury high-performance butterfly valves.

Wafer-Sphere polymer (soft) seat butterfly valves

Cryogenic Service	W130-1
Steam Service	W150-1
Chlorine Service	W150-2
Oxygen Service	W150-3
Vacuum Service	W150-4
Jacketed Valves	W151-3

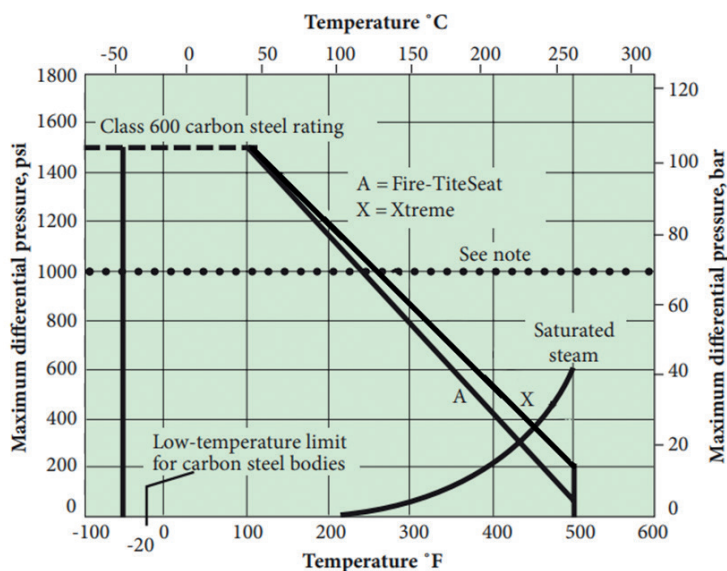
Specifications

Seat ratings

Seat ratings are based on differential pressure with the disc in the fully closed position and refer to seats only. Maximum body working pressures and test pressure of different materials are shown in the **Valve body ratings** table below.

These ratings are a conservative guide for general service. Previous experience in a process or new developments and alternate seat materials may permit applications at ratings above those shown. Please consult customer service at www.valmet.com/flowcontrol for specific recommendations.

Seat ratings for series 860 valves



Note:

Type 860, F860 & K860 valves are rated for a maximum differential pressure of 1000 psi (68.95 bar) when installed in the non-preferred flow direction (shaft-upstream).

Type 860, F860 & K860 valves with 316 stainless steel shafts are rated for a maximum differential pressure of 1000 psi (68.95 bar) in either installation direction.

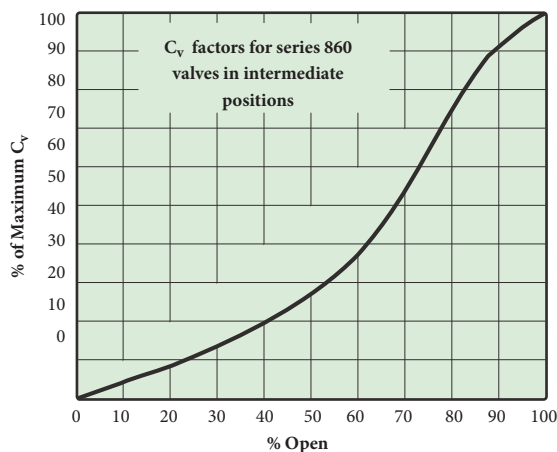
Standard Wafer-Sphere soft-seated butterfly valves are designed to handle temperatures -50°F to 500°F (-45.5°C to 260°C).

Flow data

The table below provides flow coefficients for Type 860W and 860L valves covered in this bulletin. The C_v values represent the flow of water at +60°F through the valve in U.S. gallons per minute at a pressure drop of 1 psi.

The metric equivalent, K_v , is the flow of water at 16°C through the valve in cubic meters per hour at pressure drop of 1 kg/cm². To convert C_v to K_v , multiply by 0.8569.

Valve size		C_v^*
inches	DN	
3	80	155
4	100	260
6	150	750
8	200	1350
10	250	2100
12	300	2900
14	350	4000
16	400	5100
18	450	5500
20	500	7950
24	600	11300



Valve body ratings

These are maximum working pressure ratings of the **Valve body only**. The seat ratings above determine the practical pressure limitations according to actual service conditions. Test pressures below are for a hydrostatic test with the valve open.

Valve body pressure/Temperature rating		
Temperature °F	Carbon steel* psi	316 Stainless steel* psi
-20 to 100	1480	1440
200	1360	1240
300	1310	1120
400	1265	1025
500	1205	955
Test Pressure	2250	2200

Temperature °C	Carbon steel* bar	316 Stainless steel* bar
-29 to 38	102.1	99.3
100	93.2	84.4
150	90.2	77.0
200	87.6	71.3
250	83.9	66.8
Test Pressure	154	150

*In accordance with ASME B16.34

Seat tightness

ASME/FCI 70-2 establishes a series of six leakage classes for control valves and defines the test procedure. Class VI allows the least leakage. Wafer-Sphere High performance butterfly valves are bubble-tight, MSS-SP61, which would exceed Class VI requirements.

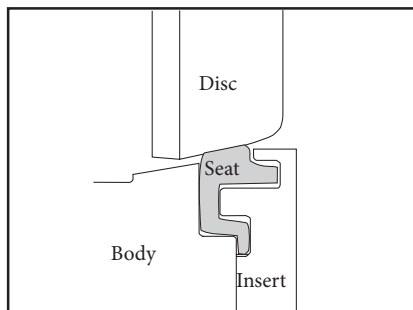
Seat designs

Xtreme performance and value

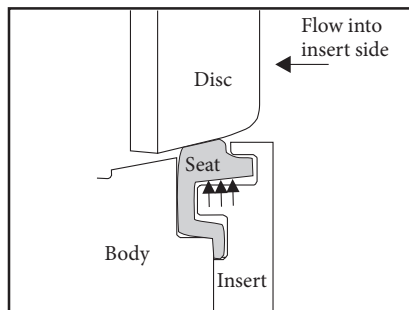
Xtreme seats provide longer life, expanded performance boundaries, and the greatest possible value. Xtreme is a unique material that resulted from a technological breakthrough in our polymer research lab. The material is a fluoropolymer-based blend that provides superior quarter-turn performance.

Standard seats

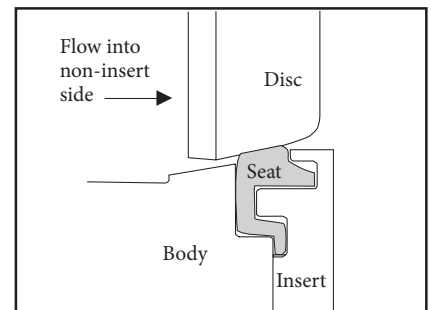
Wafer-Sphere standard seat design utilizes a flexible lip, which, when distorted, will always attempt to return to its original shape and maintain a seal against the disc regardless of flow direction.



When the valve is shut, the disc slightly deflects the seat. This slight deflection "energizes" the seat. While energized, the sealing surface of the seat is constantly pushing against the edge of the disc.



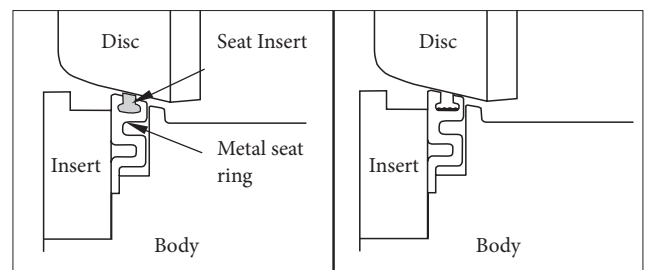
When pressure is on the insert side, pressure is applied under the seat lip. This further amplifies the sealing force between the disc and the seat.



When pressure is on the non-insert side, the disc moves into the seat. Due to the spherical profile of the disc, the more the disc moves into the seat, the tighter the shut-off. Excessive movement of the seat is limited by the flexible lip which contacts the bottom of the groove in the insert ring.

Fire-Tite seats

The Fire-Tite seat was developed for applications where effective shut-off during a fire is a concern. The primary sealing element is PTFE with a back-up metal seat ring. In the event that the polymer seat insert is destroyed, the secondary metal seat provides effective shut-off. The Fire-Tite seat is also ideal for critical or severe service applications. Wafer-Sphere butterfly valves with Fire-Tite seats have been tested and approved to API 607 and to ISO-10497-5.

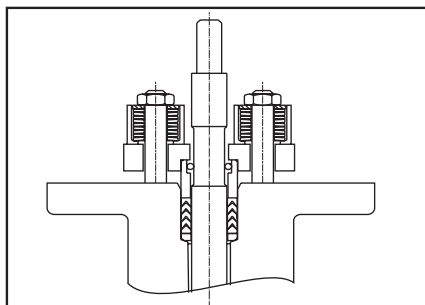


Special services

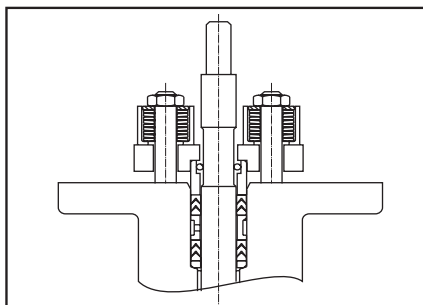
Emission-Pak™ live-loaded packing

When enhanced emissions control is needed to comply with evolving emissions standards, Emission-Pak live-loaded packing is available. The Emission-Pak live-loaded packing assembly includes V-ring packing live-loaded with disc spring washers for standard construction valves and graphite packing with Inconel™ disc springs for Fire-Tite valves to maintain a constant packing force without overcompression. It is available with new valves or as a retrofit kit for existing valves.

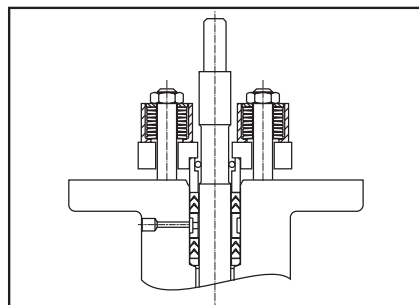
Additional options, available with or without the Emission-Pak live-loaded packing, include double packing or double packing with monitoring port to facilitate testing of the primary seal and allow detection of a potential leak problem. Refer to the How to Order section at the end of this bulletin for specific ordering instructions. The **operating torque** of valves with Emission-Pak live-loaded packing will increase. (Refer to the torque equation in the Valve torque data section).



Emission-Pak live-loaded packing



Emission-Pak live-loaded packing with double packing



Emission-Pak live-loaded packing with double packing and monitoring port

Note *All Emission-Pak illustrations depict a standard valve with V-ring packing.

Steam service

Wafer-Sphere butterfly valves are well-suited for a wide range of steam applications. Ratings of Wafer-Sphere valves in this bulletin for on-off steam service are as follows: Valves may be derated based on shaft material selection.

Series	Seat	Maximum differential pressure	
860W, 860L	Xtreme (X)	470 psi	32.4 bar
* Maximum rating of carbon steel body per ASME B16.34 at corresponding saturated steam temperatures.			

Cryogenic service

Using Wafer-Sphere with unique polymeric and polymeric/ metal composite seats, cryogenic Wafer-Sphere valves are rated to give tight, reliable shutoff on service extending from -320°F (-196°C) to ambient condition at pressures up to 1440 psi (99 bar). Cryogenic seats for valve sizes 3" – 12" (DN 80 – 300) are composite. Seats for sizes 14" – 24" (DN 350 – 600) are Kel-F® material. See Bulletin W130-1.

Chlorine service

Wafer-Sphere valves reliably control the flow of both liquid and gaseous chlorine. The patented seat design insures positive, leak tight shut-off of this lethal substance. A range of key materials permits selection of the Wafer-Sphere valve best suited for the moisture content of the chlorine that is to be handled. Valves for chlorine service are specially cleaned to preclude possible reaction of the chlorine to foreign substances. For further information see Bulletin W150-2.

Oxygen service

Wafer-Sphere valves are available specially prepared for oxygen service, capable of filling a wide range of applications that include both on-off operation and proportional control. A rigid procedure is followed in preparing components, assembling, testing, and packaging these valves to assure cleanliness and to avoid the inherent danger of oxygen's reaction with grease, oil, or other foreign matter. Bulletin W150-3 contains additional details.

NACE service

ASME Class 600 Wafer-Sphere valves are available to comply with the NACE MR0103 standard. These valves are well suited for oil and gas industry applications requiring sulfide stress cracking resistant metallic materials.

Vacuum service

Standard Wafer-Sphere valves are rated for tight shut-off of vacuum to 2×10^{-2} torr. Special high vacuum Wafer-Sphere valves can be provided for vacuums to 1×10^{-5} torr. Additionally, high vacuum valves can be certified to have a leakage rate not to exceed 1×10^{-5} cc/sec. of helium at 1×10^{-5} torr vacuum. Refer to Bulletin W150-4 for details.

High-cycle option

Testing in the Valmet R&D laboratories indicates that a combination of components, including Xtreme (X) seat, filled super PTFE shaft seals, 316 SS/Woven PTFE shaft bearings, PEEK® filled PTFE thrust bearings and excluder rings, yields significantly longer life than a standard configuration valve. Actual cycle performance is subject to media, pressure, and temperature conditions. Applications such as oxygen, nitrogen, hydrogen, water, and other clean media are ideally suited for this option.

Warning: Avoid any media containing acids or chemicals such as chlorine, bromine, sulfur dioxide, or steam, or temperatures that exceed 325°F (163°C).

The torque required to open or close series 860 and F860 valves can easily be calculated using the equation below. However, for your convenience, the tables on the following pages can be used as a quick guide for actuator selection. If the valve's torque is not listed in the tables, (use the equation to calculate the torque). Refer to our bulletins for pneumatic and electric actuators. Select an actuator that provides the same or greater torque output than the valve's torque. If in doubt, select the next larger actuator. Refer to these bulletins for pneumatic and electric actuator torque output values and actuator selection tables.

Manual gear actuators	A100-1
Spring-diaphragm actuators	A110-4
VPVL Mod D actuators	A111-5
Piston actuators (B1C/B1J series)	6 B 20

Valve torque data

Torque equation

Use the following equation (and the factors extracted from the table below) to calculate the torque required to open or close Series 860 valves.

Torque required (FT•LBS) = {(Kt) x (shut-off differential pressure in psi)} + Ts

Example:

6" (DN 150) 860W-11-36HBXZ at 900 psi (62.055 bar), installed shaft downstream. (From table, Kt = 0.195, Ts = 80.)
 = {0.195 x 900} + 80
 = 256 FT•LBS (To convert to N•m, multiply by 1.356)

Torque equation factors						
Valve size		Series 860, X seats			Series F860, Fire-Tite seats	
		Kt	Kt	Ts	Kt, Shaft upstream or downstream	Ts
Inches	DN	Shaft upstream	Shaft downstream			
3	80	0.023	0.018	30	0.02	60
4	100	0.128	0.11	51	0.105	100
6	150	0.265	0.195	80	0.3	180
8	200	0.426	0.406	110	0.57	320
10	250	0.711	0.701	200	0.97	450
12	300	1.47	1.08	330	1.8	700
14	350	1.86	1.48	430	2.4	930
16	400	2.42	1.74	580	3.43	1060
18	450	2.96	2.3	710	6.11	1350
20	500	3.52	3.2	840	8.5	1790
24	600	5.16	4.45	1240	12.67	2550

- Notes:**
- Type 860 and type F860 valves are rated for a maximum differential pressure of 1000psi (68.95 bar) when installed in the non-preferred flow direction (shaft-upstream).
 - Type 860 and type F860 valves with 316 stainless steel shafts are rated for a maximum differential pressure of 1000 psi (68.95 bar).

Valve torque data

Xtreme seat

Valve size		Torque for series 860W and 860L with X seat and shaft downstream at specified shut-off differential pressure											
inches	DN	FT•LBS @ 600 psi	N•m @ 41.4 bar	FT•LBS @ 800 psi	N•m @ 55.2 bar	FT•LBS @ 1000psi	N•m @ 69 bar	FT•LBS @ 1200 psi*	N•m @ 82.8 bar*	FT•LBS @ 1400 psi*	N•m @ 96.6 bar*	FT•LBS @ 1480 psi*	N•m @ 102 bar*
3	80	40	55	45	60	48	65	52	70	55	75	57	77
4	100	115	155	140	190	160	215	185	250	205	280	215	290
6	150	200	270	235	320	275	375	315	430	355	480	370	500
8	200	350	475	435	590	515	700	600	815	680	920	710	965
10	250	620	840	760	1030	900	1220	1040	1410	1180	1600	1240	1685
12	300	980	1330	1190	1615	1410	1915	1625	2210	1840	2500	1930	2620
14	350	1320	1790	1610	2185	1910	2595	2200	2990	2500	3015	2620	3560
16	400	1625	2210	1970	2675	2320	3150	2670	3625	3400	4090	3155	4285
18	450	2090	2840	2550	3460	3010	4090	3470	4710	3930	5340	4115	5590
20	500	2760	3750	3400	4620	4040	5485	4680	6355	5320	7225	5575	7570
24	600	3910	5310	4800	6520	5690	7730	6580	8935	7470	10145	7825	10625

Xtreme seat

Valve size		Torque for series 860W and 860L with X seat, shaft upstream at specified shut-off differential pressure					
inches	DN	FT•LBS @ 600 psi	N•m @ 41.4 bar	FT•LBS @ 800 psi	N•m @ 55.2 bar	FT•LBS @ 1000psi	N•m @ 69 bar
3	80	44	60	48	65	53	72
4	100	130	180	155	210	180	245
6	150	240	325	290	395	345	470
8	200	365	500	450	610	535	730
10	250	630	855	770	1045	910	1235
12	300	1210	1645	1505	2045	1800	2445
14	350	1545	2100	1920	2610	2290	3110
16	400	2030	2757	2515	3415	3000	4075
18	450	2485	3375	3080	4185	3670	4985
20	500	2950	4000	3655	4965	4360	5920
24	600	4335	5890	5370	7290	6400	8690

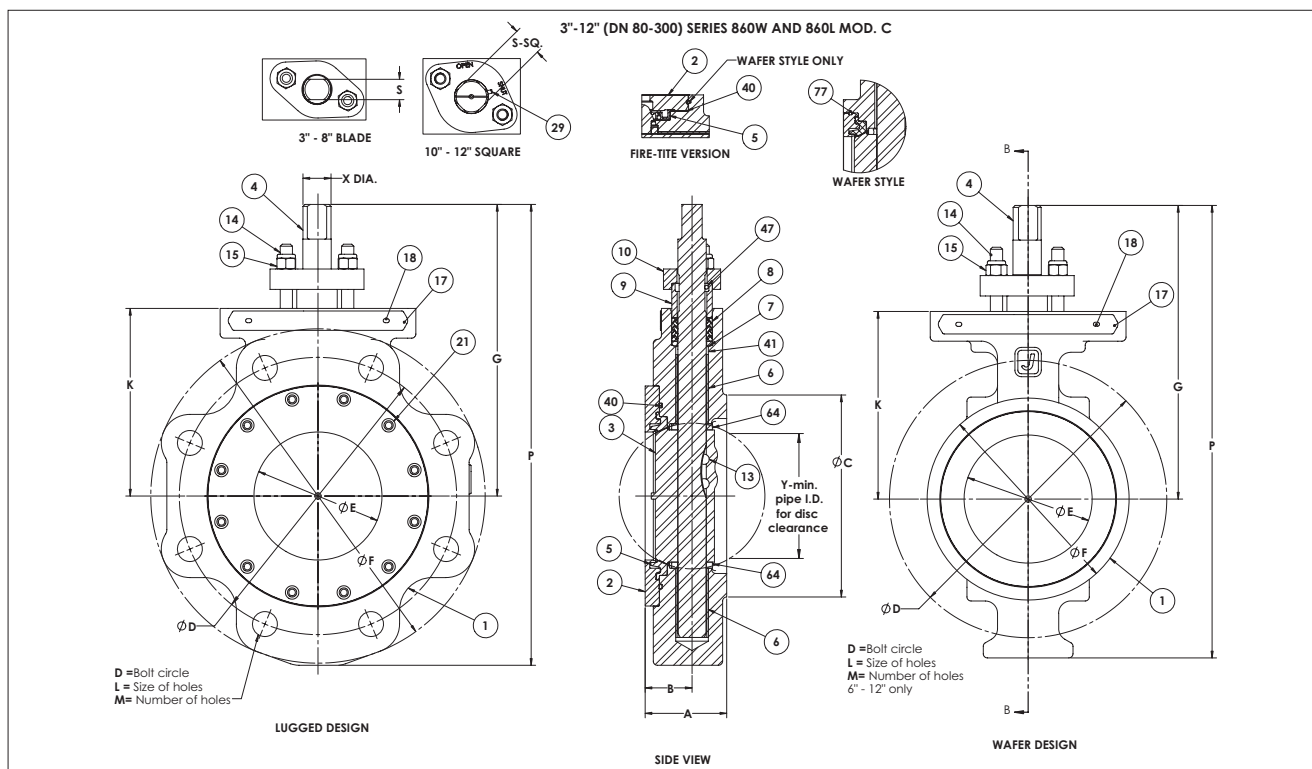
Torque for Series F860W and F860L with Fire-Tite Seat and Shaft Upstream or Downstream (See *)													
FT•LBS (N•m) at Specified Shutoff Differential Pressure													
Valve Size		FT•LBS @	N•m @	FT•LBS @	N•m @	FT•LBS @	N•m @	FT•LBS @	N•m @	FT•LBS @	N•m @	FT•LBS @	N•m @
inches	DN	600 psi	41.4 bar	800 psi	55.2 bar	1000psi	69 bar	1200 psi*	82.8 bar	1400 psi*	96.6 bar	1480 psi*	101.2 bar
3	80	72	98	76	103	80	108	84	114	88	119	90	122
4	100	165	225	185	250	205	280	225	305	250	340	255	345
6	150	360	490	420	570	480	650	540	735	600	815	625	850
8	200	660	895	775	1050	890	1210	1005	1365	1120	1520	1165	1580
10	250	1030	1400	1225	1665	1420	1930	1615	2195	1810	2460	1885	2560
12	300	1780	2420	2140	2905	2500	3395	2860	3885	3220	4375	3365	4570
14	350	2370	3220	2850	3870	3330	4520	3810	5175	4290	5825	4480	6085
16	400	3120	4240	3805	5170	4490	6100	5175	7030	5860	7960	6135	8330
18	450	5015	6810	6240	8475	7460	10130	8680	11790	9905	13450	10395	14115
20	500	6890	9360	8590	11665	10290	13975	11990	16280	13690	18590	14370	19515
24	600	10150	13785	12685	17225	15220	20670	17755	24110	20290	27555	21300	28925

- Notes:**
- * Type 860 and type F860 valves are rated for a maximum differential pressure of 1000 psi (68.95 bar) when installed in the non-preferred flow direction (shaft-upstream).
 - * Type 860 and type F860 valves with 316 stainless steel shafts are rated for a maximum differential pressure of 1000 psi (68.95 bar).

Parts and bills of materials

Part No.	Part name	Body material		
		Type 860_22HB, F860_22HB Type 868_22HB, F868_22HB	Type 860_36HB, F860_36HB Type 868_36HB, F868_36HB	Type 860_3600, F860_3600 Type 868_3600, F868_3600
1	Body	Carbon steel ASTM A216 type WCB or ASTM A515 Gr. 70	316 Stainless steel ASTM A351-type CF8M	
2	Insert	Carbon steel	316 Stainless steel	
3	Disc	316 Stainless steel ASTM A351-Type CF8M		
4	Shaft	17-4 PH Stainless steel		316 Stainless steel
5	Seat	Xtreme or PTFE/316 Stainless steel (Fire-Tite)		
6	Shaft bearing	PTFE-composite backed with 316 Stainless steel		
7	Spacer	316 Stainless steel		
8	Shaft Seal	Carbon-Filled enhanced PTFE or graphite (Fire-Tite)		
9	Comp ring	Stainless steel		
10	Comp plate	Carbon steel	Stainless steel	
12	Insert pin 14"-24" (DN 350-600) valves only	Stainless steel		
13	Disc pin	17-4 PH Stainless steel		Stainless steel
14	Stud	Stainless steel		
15	Lock nut 3"-12" (DN 80-300) valves only	Stainless steel		
15	Hex jam nut 14"-24" (DN 350-600) valves only	Stainless steel		
16	Lock washer 14"-24" (DN 350-600) valves only	Stainless steel		
17	Identification plate	Stainless steel		
18	Drive screw	Stainless steel		
21	Cap screw 14"-24" (DN 350-600) valves only	Stainless steel		
26	Position indicator 14"-24" (DN 350-600) valves only	Stainless steel		
27	Drive screw	Stainless steel		
29	Indicator pointer 10"-24" (DN 250-600) valves only	Carbon steel		
40	Body seal 3" & 4" (DN 80 &100) 860 lugged, 3"- 12" (DN 80-300) F860 valves only	PTFE or graphite (Fire-Tite)		
41	Bearing spacer Excluding 8" (DN 200) 860	PTFE		
47	Retaining ring 3"-12" (DN 80-300) valves only	Inconel™		
53	Cover plate 14"-24" (DN 350-600) valves only	Carbon steel	Stainless steel	
54	Gasket 14"-24" (DN 350-600) valves only	PTFE or graphite (Fire-Tite)		
55	Cap screw 14"-24" (DN 350-600) valves only	Stainless steel		
56	Lockwasher 14"-24" (DN 350-600) valves only	Stainless steel		
64	Thrust bearing	316 Stainless steel		
77	Insert spring 3"-12" (DN 80-300) wafer valves only	Inconel™		

Dimensions



3"-12" (DN 80-300) type 860W Wafer-Sphere valves ASME Class 600 wafer design

Approximate dimension - inches

Valve size inches	A	B	C	D	E	F	G	K	L	M	P	S	X	Y	Approx. weight lb
3	2.23	1.27	5.19	NA	2.95	5.19	8.37	5.12	NA	NA	12.50	0.44	0.62	2.90	15
4	2.63	1.46	6.19	NA	3.93	6.19	8.94	5.75	NA	NA	14.20	0.62	0.87	3.83	21
6	3.06	1.65	8.50	11.42	5.51	8.50	11.94	8.25	1.30	4	19.04	0.81	1.12	5.76	51
8	4.00	2.02	10.75	13.75	7.43	10.75	13.57	9.38	1.25	4	22.76	1.12	1.62	7.44	92
10	4.72	2.37	12.75	17.00	9.28	12.75	15.93	11.06	1-1/4-8	4	26.24	1.63	1.87	9.31	161
12	5.59	2.88	16.00	19.25	11.00	15.00	16.06	12.56	1-1/4-8	4	27.59	1.63	2.13	11.06	258

Approximate dimension - mm

Valve size DN	A	B	C	D	E	F	G	K	L	M	P	S	X	Y	Approx. weight kg
80	56.6	32.3	131.8	NA	74.9	131.8	212.6	130.0	NA	NA	317.5	11.2	15.7	73.7	6.8
100	66.8	37.1	157.2	NA	99.8	157.2	227.1	146.1	NA	NA	360.7	15.7	22.1	97.3	9.5
150	77.7	41.9	215.9	290.1	140.0	215.9	303.3	209.6	33.0	4	483.6	20.6	28.4	146.3	23.1
200	101.6	51.3	273.1	349.3	188.7	273.1	344.7	238.3	31.8	4	578.1	28.4	41.1	189.0	41.7
250	119.9	60.2	323.9	431.8	235.7	323.9	404.6	280.9	1-1/4-8	4	666.5	41.4	47.5	236.5	73.0
300	142.0	73.2	406.4	489.0	279.4	381.0	407.9	319.0	1-1/4-8	4	700.8	41.4	54.1	280.9	117.0

3"-12" (DN 80-300) type 860L Wafer-Sphere valves ASME Class 600 lugged design

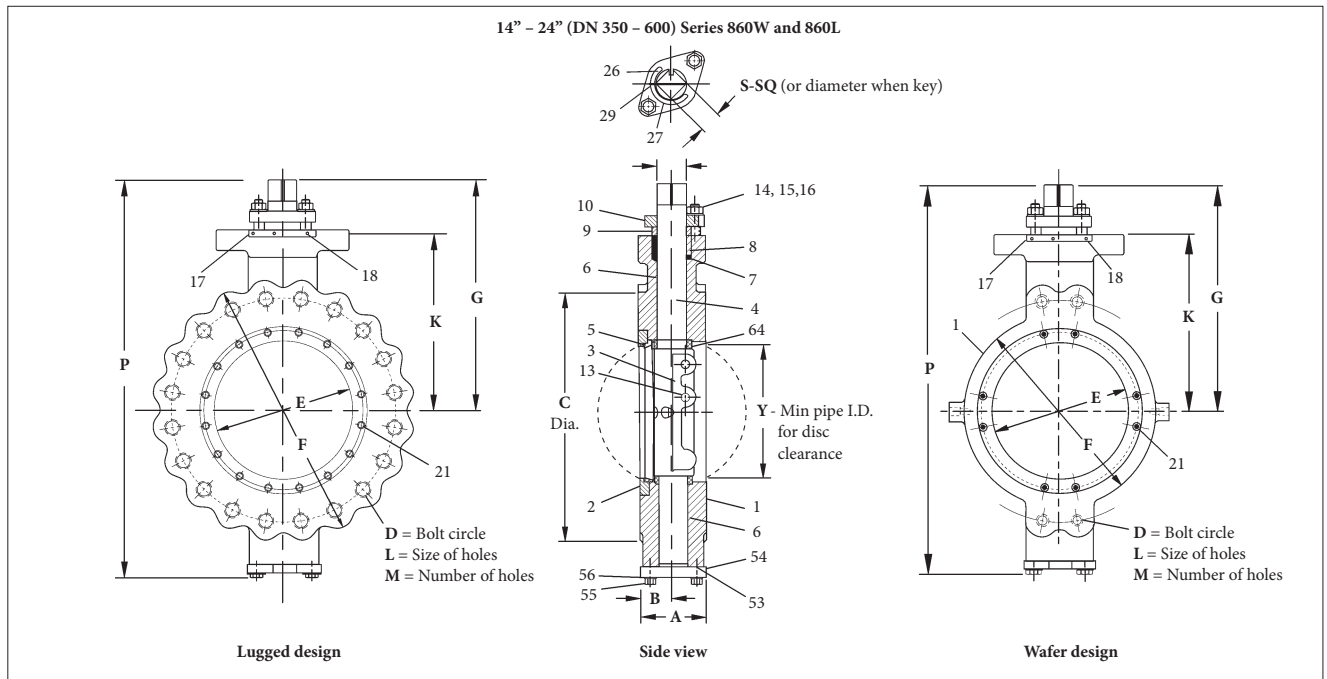
Approximate dimension - inches

Valve size inches	A	B	C	D	E	F	G	K	L	M	P	S	X	Y	Approx. weight lb
3	2.23	1.25	5.00	6.63	2.95	8.59	8.37	5.12	3/4-10	8	12.39	0.44	0.62	2.75	26
4	2.63	1.44	6.19	8.50	3.93	10.25	8.94	5.75	7/8-9	8	14.20	0.62	0.87	3.56	41
6	3.06	1.65	8.50	11.50	5.51	13.75	11.94	8.25	1-8	12	18.62	0.81	1.12	5.50	84
8	4.00	2.02	10.75	13.75	7.43	16.67	13.57	9.38	1-1/8-8	12	22.73	1.12	1.62	7.19	148
10	4.72	2.37	12.75	17.00	9.28	19.50	15.93	11.06	1-1/4-8	16	26.21	1.63	1.87	8.94	287
12	5.59	2.88	15.00	19.25	11.00	21.50	16.06	12.56	1-1/4-8	20	27.56	1.63	2.13	10.62	446

Approximate dimension - mm

Valve size DN	A	B	C	D	E	F	G	K	L	M	P	S	X	Y	Approx. weight kg
80	56.6	31.8	127.0	168.4	74.9	218.2	212.6	130.0	3/4-10	8	314.7	11.2	15.7	69.9	11.8
100	66.8	36.6	157.2	215.9	99.8	260.4	227.1	146.1	7/8-9	8	360.7	15.7	22.1	90.4	18.6
150	77.7	41.9	215.9	292.1	140.0	349.3	303.3	209.6	1-8	12	472.9	20.6	28.4	139.7	38.1
200	101.6	51.3	273.1	349.3	188.7	423.4	344.7	238.3	1-1/8-8	12	577.3	28.4	41.1	182.6	67.1
250	119.9	60.2	323.9	431.8	235.7	495.3	404.6	280.9	1-1/4-8	16	665.7	41.4	47.5	227.1	130.2
300	142.0	73.2	381.0	489.0	279.4	546.1	407.9	319.0	1-1/4-8	20	700.0	41.4	54.1	269.7	202.3

Dimensions



14" – 24" (DN 350 – 600) type 860W Wafer-Sphere valves ASME Class 600 wafer design															
Approximate dimension - inches															
Valve size inches	A	B	C	D	E	F	G	K	L	M	P	S	X	Y	Approx. weight lb
14	6.25	3.12	16.25	20.75	12.3	17.75	21.00	16.37	1-3/8-8	4	37.00	2.00	2.75	11.00	440
16	6.75	3.37	18.50	23.75	14.25	18.69	20.44	15.44	1-1/2-8	4	36.00	2.00	3.00	12.25	630
18	7.75	3.87	21.00	25.75	16.25	21.00	28.12	19.62	1-5/8-8	4	48.12	3.50*	3.50	14.75	820
20	8.25	4.12	23.19	28.50	17.87	23.19	27.25	22.25	1-5/8-8	4	49.25	3.50*	4.00	16.37	1070
24	11.00	4.62	27.25	33.00	21.00	29.62	35.00	24.50	1-7/8-8	4	61.37	4.00*	5.00	19.37	1660

Approximate dimension - mm															
Valve size DN	A	B	C	D	E	F	G	K	L	M	P	S	X	Y	Approx. weight kg
350	159	79	413	527	313	451	533	416	1-3/8-8	4	940	51	70	279	200
400	171	86	470	603	362	475	519	392	1-1/2-8	4	914	51	76	311	286
450	197	98	533	654	413	533	714	498	1-5/8-8	4	1222	89*	89	375	372
500	210	105	589	724	454	589	692	565	1-5/8-8	4	1251	89*	102	416	485
600	280	117	692	838	533	752	889	622	1-7/8-8	4	1559	89*	114	492	753

* Diameter with 7/8" key

14" – 24" (DN 350 – 600) type 860L Wafer-Sphere valves ASME Class 600 single-flange lugged design															
Approximate dimension - Inches															
Valve size inches	A	B	C	D	E	F	G	K	L	M	P	S	X	Y	Approx. weight lb
14	6.25	3.12	16.25	20.75	12.31	23.75	21.00	16.37	1-3/8-8	20	37.00	2.00	2.75	11.00	630
16	6.75	3.37	18.50	23.75	14.25	27.00	20.44	15.44	1-1/2-8	20	36.00	2.00	3.00	12.25	840
18	7.75	3.87	21.00	25.75	16.25	29.25	28.12	19.62	1-5/8-8	20	48.12	3.50*	3.50	14.75	1110
20	8.25	4.12	23.19	28.50	17.87	32.00	27.25	22.25	1-5/8-8	20	49.25	3.50*	4.00	16.37	1410
24	11.00	4.62	27.25	33.00	21.00	37.00	35.00	24.50	1-7/8-8	20	61.37	4.00*	5.00	19.37	2100

Approximate dimension - mm															
Valve size DN	A	B	C	D	E	F	G	K	L	M	P	S	X	Y	Approx. weight kg
350	159	79	413	527	313	603	533	416	1-3/8-8	20	940	51	70	279	286
400	171	86	470	603	362	686	519	392	1-1/2-8	20	940	914	96	311	381
450	197	98	533	654	413	743	714	498	1-5/8-8	20	1222	89*	89	375	503
500	210	105	589	724	454	813	692	565	1-5/8-8	20	1251	89*	102	416	640
600	280	117	692	838	533	940	889	622	1-7/8-8	20	1559	89*	114	492	953

* Diameter with 7/8" key

WARNING: As the use of the valve is application specific, a number of factors should be taken into account when selecting a valve for a given application. Therefore, some of the situations in which the valves are used are outside the scope of this manual. If you have any questions concerning the use, application or compatibility of the valve with the intended service, contact Valmet for more information.

How to order series 860 Wafer-Sphere valves

These Wafer-Sphere valves are described by size and a multi-character code that defines body configuration, body, disc, shaft, seat and seal materials. Explanation of the code for valves in this bulletin is as follows:

1	2	3	4	5	6	7	8	9	10
6	860	L	-	11	22	HB	XZ	C	-

EXAMPLE: The above example is for a 6" ASME Class 600 single-flange lugged-design valve with carbon steel body, 316 stainless steel disc, 17-4PH stainless steel shaft, Xtreme seat, and carbon-filled enhanced PTFE shaft seal.

1	Size*										
inches	3	4	6	8	10	12	14	16	18	20	24
DN	80	100	150	200	250	300	350	400	450	500	600

* When ordering, state size code in inches. Consult factory for larger sizes

2	Pressure class
860	Standard ASME Class 600
868	Standard ASME Class 600 w/CE Marking and Documentation
F860	Fire-Tite ASME Class 600
F868	Fire-Tite ASME Class 600 w/CE Marking and Documentation

3	Body style
W	Wafer
L	Single-flange lugged

4	Special service
O	Oxygen
—	No entry if standard

5	Seat type
11	Standard (non-Fire-Tite)
31	Fire-Tite

6	Body material
22	Carbon steel
36	316 Stainless steel

7	Disc & shaft material
HB	316 Stainless disc, 17-4 PH stainless shaft (NACE compatible)
00	(not NACE compatible) Same as body material
36	(not NACE compatible) 316 Stainless steel** (not NACE compatible)

** For use with carbon-steel body code. For 316 stainless body with 316 trim, use "00".

8	Seat & seal material
Standard	
XZ	Xtreme
	Carbon-filled enhanced PTFE
Fire-Tite	
AE	PTFE/Stainless steel
	Graphite

9	Model
C	For 3"-12", Non-Fire-Tite, Non cryo
A	For 14"-24", 3"-12" Fire-Tite and cryo

10	Modifier code
—	Standard
For others, please describe. Factory will supply code.	

Standards and specifications

Series 860 valves covered in this bulletin are available to conform to the following industry standards and specifications.

The Company

ISO 9001 – 2015

Pressure Equipment Directive 2014/68/EU

The Product - Standard

API 607	American Petroleum Institute - Fire Test for Soft Seated Valves (Division of refining)
ASME B16.10	American National Standard - Face-to-Face and End-to-End Dimensions of Ferrous Valves 3" – 24" only, 2-1/2" and 5" and not defined in ASME B16.10
ASME B16.5	American National Standard - Steel Pipe Flanges and Flanged Fittings 3" – 24" only
ASME B16.34	American National Standard - Steel Valves - Flanged and Butt welded End
ASME B31.1	American National Standard - Power Piping
ASME B31.3	American National Standard - Chemical Plant and Petroleum Refinery Piping
ASME B31.4	American National Standard - Liquid Transportation Systems for Hydrocarbons (Liquid Petroleum Gas), Anhydrous Ammonia, and Alcohols
ASME B31.8	American National Standard - Gas Transmission and Distribution Piping Systems
ASME/FCI 70-2	American National Standard - For Control Valve Seat Leakage
ISA 75.02	Valve Sizing Coefficient Cv, Piping Geometry Factor Fp and Pressure Drop Limitation XT
MSS SP-25	Manufacturers Standardization Society - Standard Marking System for Valves
MSS-SP-44	Steel Pipe Line Flanges
MSS-SP-55	Manufacturers Standardization Society - Quality Standards for Steel Castings
MSS-SP-61	Pressure Testing of Steel Valves
MSS SP-96	Terminology for Valves and Fittings

Optional

API 598	American Petroleum Institute - Valve Inspection and Testing
API 609	American Petroleum Institute - Butterfly Valves: Double Flanged, Lug- and Wafer-Type 3" – 24" only, 2-1/2" and 5" and not defined in API 609. Requires API 598 testing.
MSS SP-68	Manufacturers Standardization Society - High Pressure Butterfly Valves with Offset Design. Requires API 598 testing.
2014/68/EU	Pressure Equipment Directive - See "How to Order" Section
MSS SP-53	Quality Standard For Steel Castings and Forgings for Valves, Flanges and Fittings and Other Piping Components - Magnetic Particle Examination Method
MSS SP-54	Quality Standard For Steel Castings for Valves, Flanges and Fittings and Other Piping Components - Radiographic Examination Method
MSS SP-93	Quality Standard For Steel Castings and Forgings for Valves, Flanges and Fittings and Other Piping Components - Liquid Penetrant Method
NACE	Standard MR0103 National Association of Corrosion Engineers - Engineers - Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments

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