

**FlowLine**

*Series 70/71*

*Wafer & Lug Style  
Sizes 1" - 12"*



Cartridge Seated Butterfly Valves

# KEY FEATURES

## Body

- One piece ribbed wafer and lugged body is Polyester coated as standard for a superior appearance and excellent resistance to external corrosion.
- Heavy duty ISO 5211 Top plate is slotted for ease of actuation and engineered to accept direct mounting of operators.
- Standard extended neck provides full clearance for 2" of insulation.

## Disc

- Streamlined design offers higher Cv and lower pressure drop.

## Shaft

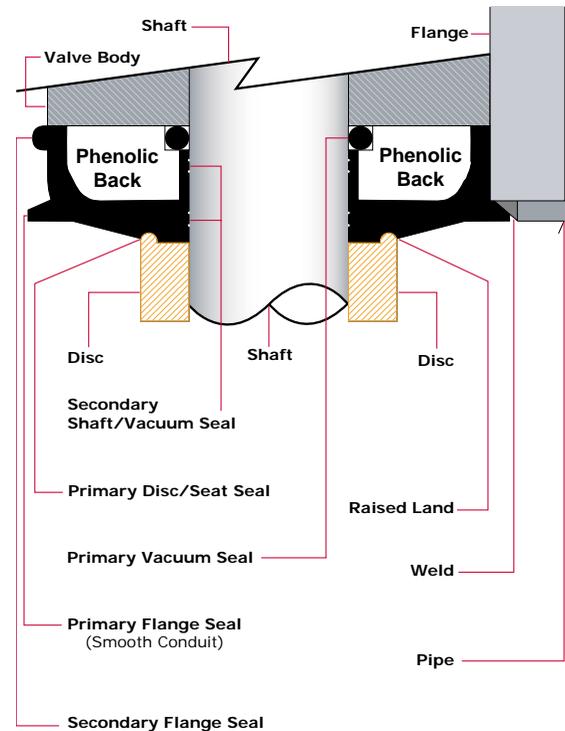
- Triple shaft seals support the primary seal on machined radius of the disc. Our triple shaft seals ensure a dry stem design.
- Two secondary shaft seals are located inside the seat shaft holes and an environmental shaft seal eliminates contaminants from entering the shaft bore.
- Two self lubricated bronze bearings offer consistent torque valves and eliminate side loading.

## Seat and Flange Seals

- Field replaceable, phenolic bonded cartridge seat provides no movement of the elastomer which is a common failure point of many resilient flexible seat designs.
- Torque fluctuation is eliminated by our phenolic bonded elastomer seats.
- Our dual purpose primary flange seal is widened offering additional compression of the elastomer against various flanges resulting in a positive seal.
- This resulting primary flange seal provides a smooth flow conduit for media and prevents build up in crevices created by traditional seat designs.
- Molded secondary flange seals assure no leakage when used with weld neck, slip on, and threaded flanges and eliminates the need for gaskets or O-rings.

## Disc/Shaft Connection

- A high strength Double D drive ensures a positive shaft to disc connection.
- Disc floats inside the seat for positive sealing and extended seat life.
- No pins or bolts are exposed to flow.
- Offset shaft retainers mechanically retain the shaft in the body ensuring a blow out proof design.



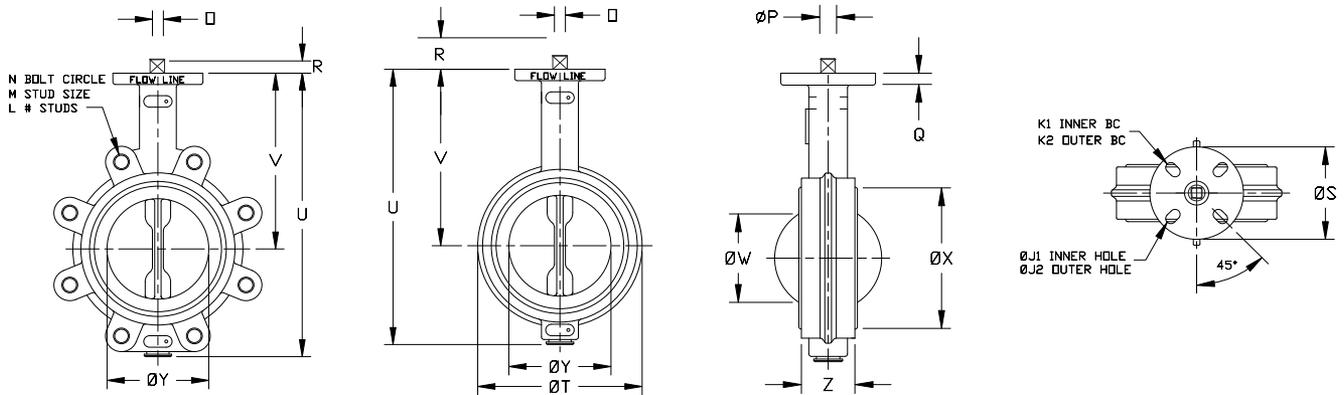
## Shaft Sealing Method

- Disc shaft holes surrounded by a 360° machined radius are in constant contact with the flattened area of the seat.
- This design is far superior to resilient flexible seat designs that depend on the “squeeze” effect of the disc and seat interference which allows leakage behind the seat and up the shaft.
- The Flow Line shaft seal is achieved through a continuous pressure exerted from the flattened area of the seat to the machined radius of the disc.
- This sealing mechanism is further enhanced by forces exerted on the seat and shaft providing a secondary seal resulting in media free disc, shaft and seat connection.

## Applicable Standards

- ANSI B16.1 Conforms to ANSI Class 125 flange drilling.
- ANSI B16.5 Conforms to ANSI 150 flange drilling.
- ANSI B16.42 Conforms to ANSI Class 150 flange drilling, body wall thickness and pressure-temperature ratings.
- ANSI B16.104 Exceeds Class VI shutoff requirements.
- API 609 Butterfly Valve Category A.
- AWWA C504 Diameter of stainless steel shaft exceeds AWWA Class 75B standard. Body wall thickness exceeds the AWWA Class 150B standard for butterfly valves.
- MSS SP-25 Markings and identification conform to the requirements.
- MSS SP-67 Butterfly Valves
- ISO 5211 Actuator Mounting
- USCG Category “A” Title 46, CFR, Part 56
- ABS American Bureau of Shipping

## DIMENSIONS



Valve Size	Z	Y	X	W	V	U	T	S	R	Q	P	O	Lug Drilling			Top Plate Drilling				Weight (lb)	
													N	M	L	K1	K2	#holes	J1		J2
2	1.74	2.25	2.65	1.46	5.62	8.44	4.12	4.00	0.827	.44	.551	0.551	4.75	5/8-11	4	2.76	3.25	4	.39	.41	8
2-1/2	1.86	2.81	3.15	2.14	6.12	9.19	4.88	4.00	0.827	.44	.551	0.551	5.50	5/8-11	4	2.76	3.25	4	.39	.41	10
3	1.86	3.31	3.78	2.74	6.38	9.69	5.38	4.00	0.827	.44	.551	0.551	6.00	5/8-11	4	2.76	3.25	4	.39	.41	11
4	2.11	4.19	4.78	3.60	7.12	11.00	6.88	4.00	0.827	.44	.551	0.551	7.50	5/8-11	8	2.76	3.25	4	.39	.41	17
5	2.24	5.06	5.84	4.58	7.75	12.12	7.75	4.00	0.92	.44	.670	0.670	8.50	3/4-10	8	2.76	3.25	4	.39	.41	23
6	2.24	6.06	7.03	5.62	8.25	13.25	8.75	4.00	0.92	.44	.670	0.670	9.50	3/4-10	8	2.76	3.25	4	.39	.41	29
8	2.54	7.94	8.96	7.43	9.44	15.56	11.00	6.00	1.063	.56	.866	0.866	11.75	3/4-10	8	4.02	5.00	4	.53	.53	44
10	2.74	10.00	11.09	9.38	11.25	18.69	13.38	6.00	1.063	.56	.866	0.866	14.25	7/8-9	12	4.02	5.00	4	.53	.53	66
12	3.24	11.94	13.09	11.35	12.19	21.69	16.12	6.00	1.063	.56	.866	0.866	17.00	7/8-9	12	4.02	5.00	4	.53	.53	99

## CLASS II TORQUES (Inch-Pounds)

Shutoff Pressure	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
50 PSI SHUTOFF	66	96	150	225	350	450	750	1325	2250
75 PSI SHUTOFF	98	141	237	261	504	651	1050	1778	2990
100 PSI SHUTOFF	103	148	249	343	531	685	1105	1872	3147
125 PSI SHUTOFF	107	155	260	376	553	714	1151	1950	3279
150 PSI SHUTOFF	110	158	265	384	564	728	1275	1989	3345
175 PSI SHUTOFF	121	175	283	417	632	814	1337	2320	3923
200 PSI SHUTOFF	132	192	300	450	700	900	1500	2650	4500
250 PSI SHUTOFF	145	211	318	486	770	990	1695	2995	5085
285 PSI SHUTOFF	160	232	337	528	847	1089	1915	3384	5746

## Cv VALUES

Valve Size	10°	20°	30°	40°	50°	60°	70°	80°	90°
2	2	3.5	8	21	40	87	108	141	170
2-1/2	3	5	11	27	52	121	172	253	332
3	8	16	23	50	92	147	224	420	473
4	17	33	57	110	182	297	462	773	913
5	47	94	143	231	380	578	908	1485	1650
6	91	182	248	396	627	902	1386	2063	2178
8	116	231	330	528	858	1452	2508	4158	4257
10	223	446	633	935	1320	2090	3630	6710	7095
12	303	605	825	1320	2063	3135	5528	10230	10780

### Notes:

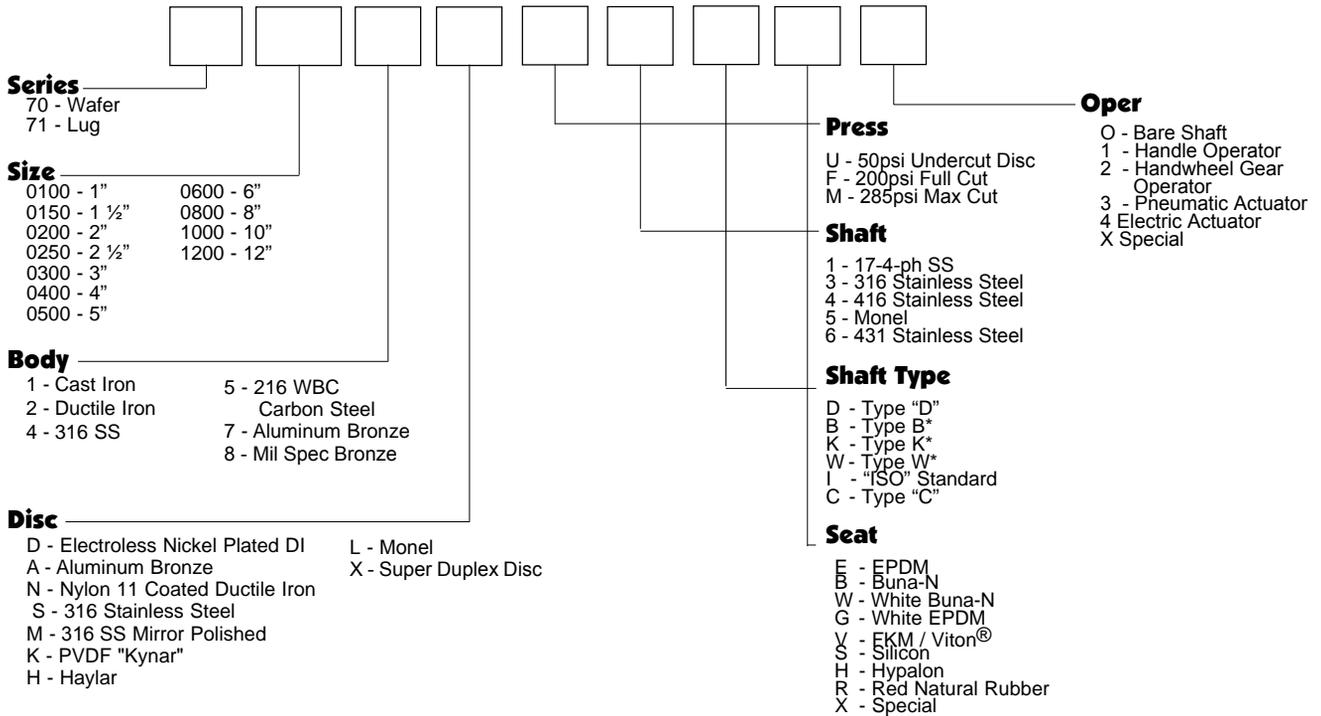
1. This chart to be used as a guide only.
2. These torque ratings do not apply to every possible service criteria, which may affect seating and unseating torque.
3. Torque values are applicable to Flow Line Series 70/71.
4. Do not apply a safety factor to the above torque values when sizing actuators.
5. Dynamic Torque should always be a consideration when sizing valves with high differential pressures.
6. For 3 way tee assemblies multiply the above torques by 1.5.

### Class II

- Valve to be operated a minimum of once a month.
- Temperature well within resilient seat limits.
- Line media is a self lubricating. (Aqueous liquids)
- Minor chemical attacks on seat.
- Disc corrosion and media deposits to be mild.

# SPECIFICATIONS

## HOW TO ORDER



\* Designates shaft types sold as automated packages or bare shaft design only.

## Recommended Specifications

- Polyester coated ribbed wafer or lug bodies to provide extended necks for insulation and be able to install between ANSI 125/150 flanges. Lug design in sizes 1" - 12" to be fully rated for dead end service without any modification.
- Streamlined disc design with no pins or screws in the flow path and designed for high Cv and lower pressure drop.
- Upper and lower shaft design to utilize triple shaft seals as standard.
- Blow out proof design utilizing a Double D drive for a positive disc/shaft connection.
- Pressure responsive 360° sealing design will use constant pressure between machined radius on disc and flatted area of the seat.
- Valve to be Flow Line Series 70 wafer or Flow Line Series 71 lug design.

### Components

Qty	Description	Qty	Description
1	Body	2	Shaft Retainers
1	Disc	1	Bearing Retainer
1	Upper Shaft	1	Environmental Shaft Seal
1	Lower Shaft	2	Secondary Shaft Seals
1	Seat	1	Thrust Bearing
		1	Inboard Bearing

## Materials of Construction 1" - 12"

### Body

- Cast Steel ASTM A-216 WCB
- 316 Stainless Steel ASTM A-351 CF8M
- Cast Iron ASTM A-126 Class B
- Ductile Iron ASTM A-536 (65-45-12)
- Ductile Iron ASTM A-395 (60-40-18)

### Disc

- Electroless Nickel Plated Ductile Iron ASTM A-536 (65-45-12)
- Aluminum Bronze ASTM B-148 (954)
- Nylon 11 Coated Ductile Iron ASTM A-536 Grade (65-45-12)
- 316 Stainless Steel ASTM A-351 (CF8M)

### Stem

- 316 Stainless Steel ASTM A-276 Type 316
- 416 Stainless Steel ASTM A-582 Type 416

### Seat

- EPDM - FDA Food Grade -30° to + 275°
- Buna-N - FDA Food Grade 0° to +180°
- White Buna-N - FDA Food Grade 0° to + 180°
- Viton® - FDA Food Grade 0° to + 375°
- Silicon - FDA Food Grade -80° to + 450°
- Hypalon 0° to + 180°
- Red Natural Rubber 0° to + 150°

Viton® is a registered trademark of the E. I. DuPont De Nemours Company. FKM is the ASTM D1418 designation for Fluorinated Hydrocarbon elastomers such as Viton® (DuPont) and Fluore® (3M).

# FEATURES

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- Slotted ISO 5211 top plate and shaft for flexibility of direct mounting options
  - Environmental shaft seal to keep contaminants from entering shaft bore
  - Offset shaft retainers mechanically retain the shaft ensuring a blow out proof design
  - One piece ribbed Polyester coated body with extended neck
  - Streamlined disc with no pins or screws in flow path
  - Primary seal provides a smooth flow conduit and prevents media buildup in crevices normally found with traditional designs
  - Independent seals provide full vacuum rating
  - High strength upper and lower shafts with triple shaft seals
  - Two self lubricated bronze bearings to eliminate side loading
  - Double D Drive for a positive disc/shaft connection with no pins or bolts exposed to flow
  - Proven pressure responsive 360° sealing method uses constant pressure between machined radius on disc and flatted area of the seat that eliminates the "squeeze" of the interference seat design our competition relies on
  - Phenolic bonded cartridge seat with primary and secondary seals provide no movement of the elastomer
  - Two secondary shaft seals located inside the seat shaft holes

The **Series 70 wafer** style and **Series 71 lug** style are heavy duty cartridge seated butterfly valves compatible ANSI 125/150 weld neck, slip on, and threaded flange standards. 2" - 12" valves are fully rated to 200 psi, bi-directional, dead end service. Valves with undercut discs to 50 psi are also available through the size range. Valves with Max cut Disc to 285 psi are also available through size range. All Series 70/71 valves, regardless of the rated working pressure, are vacuum rated to 29.92" of Mercury Gauge (0 Micron).

## COATINGS

Flow Line Series 70 and 71 butterfly valve bodies are Polyester coated as standard. Polyester is a significant upgrade to paint or two part epoxy coatings. Our standard Polyester coating offers outstanding protection against abrasion and corrosion. The Flow Line Polyester coating is not affected by outdoor exposure and maintains excellent resistance to UV rays.

TEST	RESULT
Salty Fog Test	No change in excess of 2000 hours
Outdoor Weathering (UV Rays)	No noticeable change in excess of 12 months
50% Sulfuric Acid Test	No change for 48 hours

# INSTALLATION, MAINTENANCE AND ASSEMBLY

## Handle Kit



The Flow Line Handle Kit is designed for manual on/off and throttling service for quarter turn, resilient seated butterfly valves ranging from 2" - 12". The Polyester coated ductile iron handle kit includes the handle assembly with a locking lever and bolt on plate notched at 10 degree increments. The notched plate also includes on/off stops to prevent over travel of the handle and can be used with a padlock as standard. Other available options include an Infinite Throttling Handle Kit, Memory Stop and a 2" Square Nut.

## Handwheel Gear Operator



available options include a Chainwheel Kit, Padlock Kit and a 2" Square Nut.

The Flow Line Handwheel Gear Operator is designed for manual on/off and throttling service for quarter turn butterfly valves ranging from 2" - 12". The handwheel gear operator is constructed with a heavy duty, Polyester coated ductile iron housing, is completely self lubricated and weatherproof. Along with the gear operator, it also includes a valve position indicator, ductile iron handwheel and mechanical travel stops for field adjustment. Other

## Actuation



Series 21 spring return actuators are available throughout the size range.



Series 50 solenoid valves are available in 1/8", 1/4", and 1/2"NPT.



Series 52 and 53 limit switches provide local and remote valve position.



Series 55 and 56 positioners are available with either a 3-15 psi or 4-20 MADC signal.

## Installation

To install, simply close the valve, position between the flanges and assemble the valve to the flanges with studs or cap screws. Do not use flange gaskets. Flow Line Series 70 and 71 butterfly valves can be installed with the disc closed. Before hand tightening the flange bolts, fully open the disc to ensure disc O.D. clearance with pipe I.D. Hand tighten the flange bolts and close the valve to check for valve disc and pipe clearance. If contact is made, reposition as necessary and tighten all flange bolts to proper torque specification.

## Maintenance and Repair

No regular maintenance or lubrication is required. Factory assembly procedures provide adequate lubrication for the life of the valve. To replace any component, remove valve from the line by fully closing valve disc. Spread flanges, remove all bolts then remove valve from line.

## Testing

All Flow Line Series 70 and 71 butterfly valves are bi-directionally tested to 130 percent of rated working pressure. Test certification is available upon request at time of order.

## Flanges

ANSI 125/150 cast iron, steel, raised face, flat faced weld neck, slip on and threaded flanges are suitable for use with Flow Line butterfly valves. Please contact the factory for proposed installation with plastic flanges.

## Warranty

All products manufactured by Flow Line Valve and Controls are warranted against defects in material and workmanship for a period of 1 year from date of installation.

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