

Bray®

SERIES 40-45
Wafer & Lug Bodies
2 1/2" - 54" (65-1400 mm)



THE
HIGH
PERFORMANCE
COMPANY

PRESENTS THE ULTIMATE
HIGH PERFORMANCE VALVE

**BRAY / McCANNALOK
SERIES 40**

**HIGH PERFORMANCE
HIGH PRESSURE
HIGH TEMPERATURE
ZERO LEAKAGE
BUTTERFLY VALVES**

2 1/2" - 54" (65-1400mm)

WAFFER OFFER BUBBLE-TIGHT BIDIRECTIONAL SHUT-OFF AND FOR DEAD-END SERVICE LUG BODIES OFFER BIDIRECTIONAL BUBBLE-TIGHT SHUT-OFF, BOTH AT FULL RATED PRESSURE

WAFFER/LUG BODIES:

SERIES 40/41 – ANSI CLASS 150

SERIES 42/43 – ANSI CLASS 300

SERIES 44/45 – ANSI CLASS 600

TEMPERATURE RANGE: -20°F TO 500°F (-29°C TO 260°C)

Bray Controls is proud to offer the Bray/McCannalok line of high performance butterfly valves. This product line is recognized as a proven leader with over 30 years of successful service in process industries worldwide. The Series 40's unique, patented design received *Chemical Processing's* Vaaler Award for Best Product shortly after it was introduced. The simple, innovative design offers rugged reliability and extremely easy maintenance in the field. Independent and internal tests have proven Bray/McCannalok's superior service life capability, with bubble-tight shut-off through over 100,000 cycles.

The Series 40 valves can be automated inexpensively with Bray's pneumatic and electric actuators.

When compared to gate, globe, ball, diaphragm and plug valves, the Bray/McCannalok butterfly valve is significantly smaller and lighter weight, therefore installation space, time, and maintenance costs are greatly reduced.

The Bray/McCannalok High Performance Valve delivers the highest quality and highest value available for your requirements.

BODY (A) One piece wafer body style or lug style for dead-end service. Both body styles offer bidirectional sealing as standard to full ANSI Class 150, 300 or 600 ratings. Standard body materials are either carbon steel or stainless steel for excellent corrosion resistance. Extended neck allows for 2" of pipeline insulation and easy access to stem packing adjustments and actuator mounting.

STEM (B) The high-strength, one piece stem is 17-4 PH Stainless Steel. The valve stem is standardized for interchangeability of Bray actuators.

DISC (C) The disc has been engineered to maximize flow and minimize resistance, providing a high C_v . 316 Stainless Steel is standard.

TAPER PINS (D) Taper pins are precision fit into taper-reamed holes providing a positive connection of maximum strength between the valve disc and stem.

INTERNAL TRAVEL STOP (E) An internal travel stop has been designed to prevent over travel of the disc, minimizing possible seat damage, therefore extending the service life of the seat.

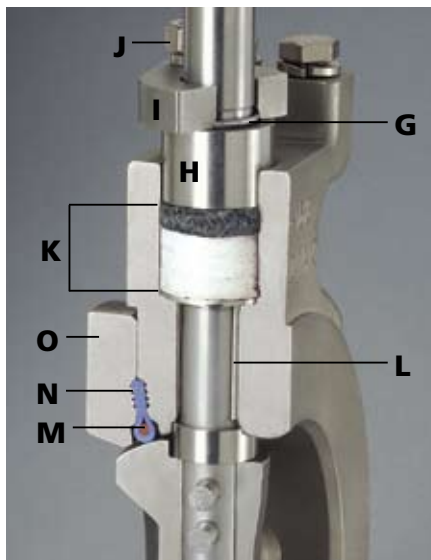
HANDLE AND NOTCH PLATE (F) The heavy-duty, spring release handle and 10 position notch plate allow for positioning the valve disc to precise angle stops between the full open and full closed positions.

BLOW-OUT PROOF STEM (G) The Series 40 High Performance valve features blow-out proof stem protection. A retaining ring is installed between the machined stem groove and gland retainer step providing full retention of the stem in the unlikely event of internal stem failure. (See photo on page 3).



ADJUSTABLE STEM PACKING

The stem packing system features easy access to adjusting hex head nuts without requiring removal of the actuator. The system consists of a gland ring (H), a gland retainer (I), studs, hex head nuts and lock washers (J). A slight 1/4 turn of the hex head nuts is usually all that is required should field adjustment ever be needed. Both hex head nuts must be evenly adjusted and not overtightened.



STEM SEAL (K)

The stem seal system provides constant compression for a positive seal around the stem. PTFE packing seals the stem, and a carbon fiber anti-extrusion ring contains the packing. Flexible graphite rings are available for high temperature applications and are standard on fire safe valves.

All Class 150 and Class 300 valves have one set of stem seal packing rings and a stem locating plug with a gasket or O-ring seal in the body base. All Class 600 valves have upper and base twin stem seals which balance axial forces on the stem and disc under all operating conditions, and eliminate any piston effect on the stem.

STEM BEARINGS (L)

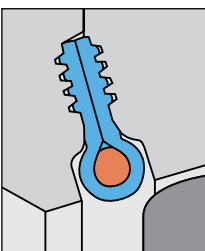
Top and bottom bearings, consisting of a 316 Stainless Steel shell with a TFE/glass fabric liner bearing surface, securely support the stem. The stem bearings provide excellent resistance to corrosion and distortion from high temperatures and mechanical loading forces.

SEAT DESIGN

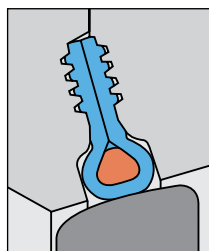
THE HEART OF THE SERIES 40

VALVE The unique, two-part seat assembly consists of a resilient energizer (M) which is totally encapsulated by the RTFE* seat (N). The assembly is locked in the body recess by a full-faced seat retainer (O). This simple, reliable and proven combination results in many exclusive advantages, including:

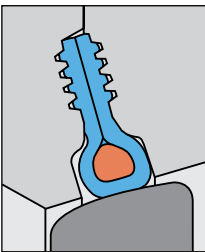
- The energizer is completely isolated from all contact with the line media by the RTFE seat.
- Serrations in the seat retainer and body recess secure the seat assembly in place regardless of disc position.
- The full-faced retainer is bolted to the body, locking the seat in the correct position. The seat is secured even without the mating flange.
- The closely confined and well supported seat is energized by the disc and line pressure. The higher the pressure, the tighter the seal. In low pressure and vacuum applications, the energized seat offers superior sealing and longer service life than many other designs.
- Line media is sealed to zero leakage in both directions.
- The seat is self-adjusting for wear and temperature changes.
- Seat replacement is extremely easy – just remove the seat retainer, rotate the disc into the closed position and place a new seat assembly in the machined recess of the body. This simple procedure will not disturb the disc or stem.



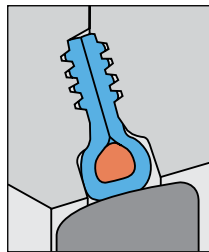
Seat non-compressed as disc approaches.



Disc in closed position; with no line pressure.



Disc in closed position; line pressure applied from the left.



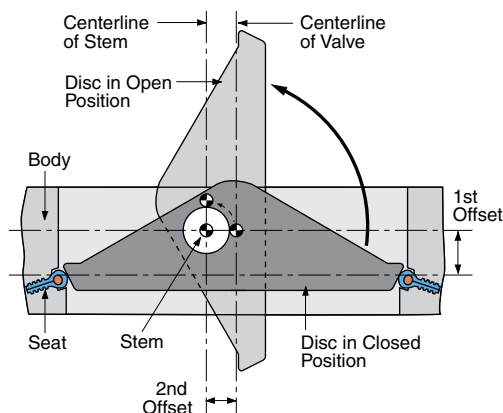
Disc in closed position; line pressure applied from the right.

DOUBLE OFFSET STEM AND DISC DESIGN

The double offset design of the Series 40 assures reduced seat wear and bidirectional, zero leakage, shut off throughout the full pressure range.

At the initial point of disc opening, the offset disc produces a cam-like action, pulling the disc from the seat. This cam-like action reduces seat wear and eliminates seat deformation when the disc is in the open position. When open, the disc does not contact the seat, therefore seat service life is extended and operating torques are reduced. As the valve closes, the cam-like action converts the rotary motion of the disc to a linear type motion to effectively push the disc onto the seat. The wiping action of the disc against the seat prevents undesirable material build-up from slurries or suspended solids.

The taper pins carry virtually equal loads while anchoring the disc to the stem, permitting accurate disc closure for consistent sealing and positive shut off.



For over 30 years the reliability of the Bray/McCannalok has been conclusively proven, both in lab tests and thousands of field applications. After a test of over 100,000 cycles at 720 psi, the seat remained in excellent condition, continuing to provide a bidirectional bubble-tight seal. Even after more than 878,000 cycles at 2 psi, the Series 40 still sealed bubble-tight in both directions.

*RTFE is the common designation for RPTFE as supplied by Bray.

BRAY/McCANNALOK HIGH PERFORMANCE SERIES 40 VALVES ARE AVAILABLE WITH PROVEN BIDIRECTIONAL FIRE SAFE SEATS ON SIZES 2 1/2"-24" ANSI CLASS 150 AND 2 1/2"-16" CLASS 300 WAFER & LUG BODIES

FOR RELIABLE CONTROL OF FLAMMABLE AND HAZARDOUS FLUIDS IN PETROLEUM, PETRO-CHEMICAL, CHEMICAL AND OTHER HIGH-RISK

APPLICATIONS, THE FIRE SAFE DESIGN COMBINES SUPERIOR PERFORMANCE, EXTENDED SERVICE LIFE AND COMPLIANCE WITH THE MOST DEMANDING WORLDWIDE FIRE-TEST STANDARDS – BEFORE, DURING AND AFTER A FIRE!

In normal service, the FIRE SAFE combination resilient/metal seat seals bubble-tight in both directions of line media flow through the full rated pressure and temperature ranges. When closed, the disc remains compressed against the resilient mechanically loaded seat, which is securely locked in place by a full-faced retainer. Line media pressure strengthens the seal.

In the event of a fire, if excessive heat destroys the resilient seat materials, either partially or completely, the seat provides a constant metal-to-metal backup seal.

In real-world fire conditions, line pressure is immediately reduced and the entire area is hosed down. The resulting pressure drop and rapid cool down causes many valves to fail. The FIRE SAFE design does not rely on line media pressure to seal, therefore the valve offers superior low pressure performance than competitive designs. The Inconel® metal seat functions as a spring mechanism, which allows for expansion and contraction without breaking contact with the disc. Additionally, the Inconel seat offers better corrosion and heat resistance and greater strength than the stainless steel seats commonly used.

The Bray/McCannalok delivers proven fire safe protection not only in the lab, but also where it counts the most – in the field.

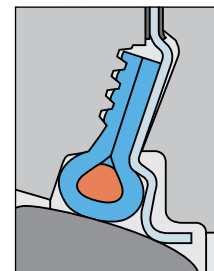


The adjustable stem sealing packing system is composed of flexible graphite and formed graphite rings. These ring materials offer maximum stem sealing capability. The packing can be easily adjusted by a slight turn of the readily accessible hex head nuts.



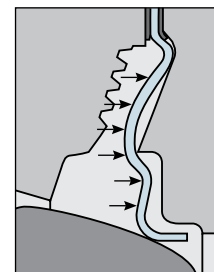
FIRE SAFE SEAT OPERATION

The seat assembly in normal service contacts the disc with both the resilient seat material and metal seat. During and after a fire, when the resilient material has been partially or completely destroyed, the metal seat provides a positive seal by remaining in constant contact with the disc in either direction of media flow.

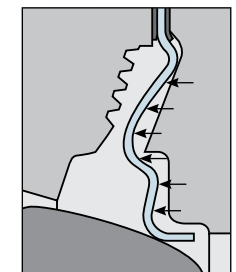


The FIRE SAFE Seat in normal service

Bidirectional Resilient Seat with O-ring Energizer / Inconel® Seat



Seat after fire, with disc sealing load and line media pressure acting on the seat from the left. (Seat retainer downstream)



Seat after fire, with disc sealing load and line media pressure acting on the seat from the right. (Seat retainer upstream)

FIRE-TEST STANDARDS API 607 4th Edition Certified.

The Bray/McCannalok FIRE SAFE has been thoroughly tested and meets or exceeds the latest international fire test standards. Since its introduction the FIRE SAFE design has passed field applications and lab tests with flying colors, delivering superior performance under the most demanding conditions.

*Inconel® is a registered trademark of Inco Alloys International, Inc.

Bray/McCannalok Series 40 valves handle a wide range of conditions and media, such as corrosive chemicals, water, gases, acids, alkalies, hydrocarbons plus many other fluids. Bray's standard valve line has been specifically designed to meet most applications. When applications demand special requirements, Bray offers valves and materials that meet these needs. Services and optional materials include:

VACUUM

Standard Series 40 valves with TFE seats are recommended for vacuum service down to .02 mm Hg absolute pressure, or 20 microns. For vacuum service down to 1×10^{-3} mm Hg absolute pressure, or 1 micron, specially prepared valves are recommended. Under certain conditions, these valves serve well in the high vacuum range down to 1×10^{-6} mm Hg absolute pressure.

STEAM

Series 40 valves are specifically designed for a wide range of high temperature and high pressure applications including on-off and modulating control of hot water, condensed water or chilled water. The Series 40 valve is rated 150 psi (10.3 bar) saturated steam at 366°F (185°C) for on-off applications. For modulating service, the Series 40 is rated 50 psi at 300°F. Use of the standard RTFE seat is recommended for this service.

DRY CHLORINE – Gas or Liquid

Special materials as well as assembly and testing procedures are applied to assure bubble-tight closure in these critical services.

SEA WATER

Series 40 valves have been successfully installed in power plants, desalination plants and deep sea drilling projects. Duplex, super duplex and super-austenitic stainless trims can be provided for sea water service. Higher alloy materials are available.

Please consult your Bray representative for specific recommendations regarding your requirements.



ASH HANDLING AND ABRASIVE

For applications where flow velocity and differential pressure are low, RTFE or UHMWPE seats and electroless nickel plated discs are recommended. For applications requiring improved resistance to wear and particles of higher hardness, a stellite faced disc and FIRE SAFE design are recommended.

CAUSTIC

Valve materials must be selected for sufficient corrosion requirements. Stainless steel is recommended for sodium and potassium hydroxide applications.

HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

Series 40 valves can be used for damping or balancing water flow, main stop valves, block valves, throttling valves, and control of pump suction or discharge.

OXYGEN

Series 40 valves for critical gaseous oxygen service are specially prepared, cleaned, inspected, assembled and tested to ensure removal of all burrs, sharp edges, dirt, hydrocarbon oil or grease, and other contaminants. Each valve is individually wrapped and sealed in polyethylene before shipment.

SOUR GAS

Selected materials of construction meeting NACE standards (MR-01-75) permit ready application and maximum serviceability in these difficult services.

DEAD-END SERVICE

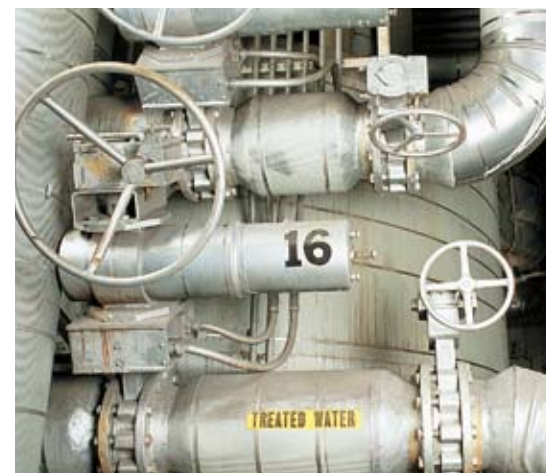
Bray/McCannalok lug bodies for bidirectional dead-end service are offered as standard in full ANSI Class 150, 300 and 600 ratings.

U.S. COAST GUARD APPROVED

The Bray/McCannalok High Performance Valve has been approved by the U.S. Coast Guard and American Bureau of Shipping for category A and P applications.

Series 40 valves can be optionally supplied in a number of different seat and body materials, including:

- PTFE and UHMWPE seats with resilient energizer.
- Fluorosilicone inner O-rings for methylene chloride service.
- FIRE SAFE graphite/carbon fiber or similar packing for fire safe or high temperature service.
- Hastelloy C bodies for hydrogen-cyanide service.
- Aluminum bronze bodies for marine environments.
- Longer stem lengths to accommodate differing control areas.
- Alloy 20 trim for sulfuric acid service.
- Monel discs for Chlorine service.
- Duplex, Superduplex and Super-austenitic stainless trims for salt water services.
- Many other materials are also available, please consult the Bray factory.



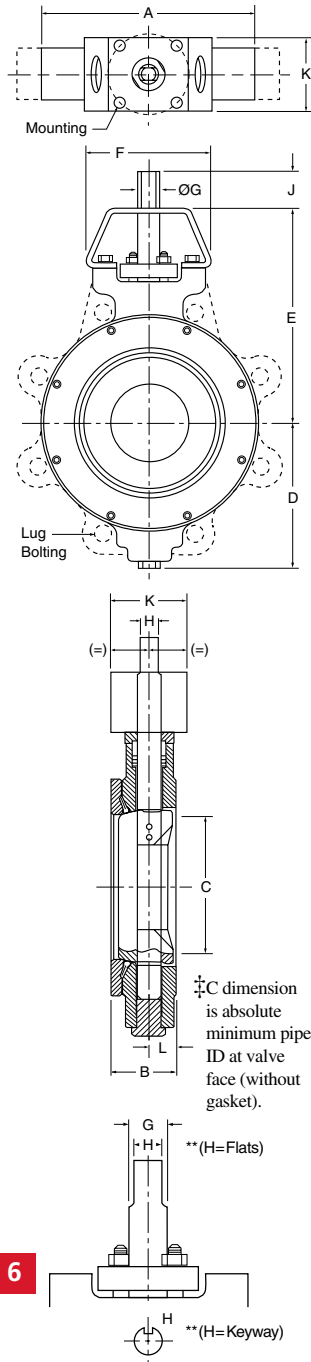
DIMENSIONS

Dimensions are in inches and weights in lbs.

Weights are for Cast Steel bodies, ex-cept when noted by *.

* Flame cut body weights.

Flame Cut Steel and SS bodies vary. Please consult factory.



ANSI 150 Series 40

Valve Size ins	mm	A	B	C [‡]	D	E	F	Mounting Data			G	H**	J	K	L	Lug Bolting Data			Series 40	Series 41
								BCD	No. Holes	Hole Dia.						BCD	No. Holes	Threads UNC-2B		
2 1/2	65	4.75	1.88	2.28	3.81	6.38	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	5.50	4	5/8-11	13	14
3	80	5.25	1.88	2.86	4.09	6.63	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	6.00	4	5/8-11	16	15
4	100	6.75	2.03	3.72	4.71	7.50	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.75	7.50	8	5/8-11	20	23
5	125	7.50	2.23	4.80	5.07	7.50	5.12	2.76	4	0.38	0.75	0.51	1.25	4.50	0.94	8.50	8	3/4-10	26	34
6	150	8.62	2.23	5.88	5.57	8.00	5.12	2.76	4	0.38	0.75	0.51	1.25	4.50	0.94	9.50	8	3/4-10	33	47
8	200	10.75	2.40	7.80	6.94	9.50	5.12	4.92	4	0.53	0.87	0.63	1.25	4.50	0.94	11.75	8	3/4-10	46	54
10	250	13.06	2.75	9.78	8.56	10.75	6.12	4.92	4	0.53	1.18	0.87	2.00	4.50	1.07	14.25	12	7/8-9	79	94
12	300	15.50	3.08	11.74	10.18	12.25	6.12	4.92	4	0.53	1.18	0.87	2.00	4.50	1.13	17.00	12	7/8-9	123	136
14	350	17.50	3.73	12.90	11.95	14.50	7.75	4.92	4	0.53	1.38	.39x.39	2.00	6.50	1.42	18.75	12	1-8	208	227
16	400	19.81	4.11	14.68	12.94	17.75	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	1.66	21.25	16	1-8	313	345
18	450	21.41	4.61	16.60	14.15	20.00	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	1.86	22.75	16	1 1/8-8	402	442
20	500	23.68	5.03	18.50	15.26	22.75	10.38	6.50	4	0.81	2.50	.62x.62	4.00	6.50	2.06	25.00	20	1 1/8-8	527	604
24	600	28.00	6.00	22.50	18.21	25.00	15.38	10.00	8	0.67	3.00	.75x.75	4.00	11.75	2.44	29.50	20	1 1/4-8	813	930
26	650	29.50	6.50	22.36	19.23	25.00	15.38	10.00	8	0.67	3.00	.75x.75	4.00	11.75	2.81	31.75	24	1 1/4-8	970*	1280*
28	700	32.41	6.50	26.47	20.54	26.75	15.38	10.00	8	0.67	3.00	.75x.75	4.00	11.75	2.81	34.00	28	1 1/4-8	1115	1300
30	750	34.50	7.50	28.31	21.36	28.75	19.50	11.73	8	0.81	3.50	.88x.62	5.25	13.50	3.10	36.00	28	1 1/4-8	1475	1740
32	800	37.62	7.50	30.19	22.36	30.00	19.50	11.73	8	0.81	3.50	.88x.62	5.25	13.50	3.22	38.50	28	1 1/2-8	1650*	2060*
34	850	39.62	7.75	30.13	23.86	30.00	19.50	11.73	8	0.81	3.50	.88x.62	5.25	13.50	3.35	40.50	32	1 1/2-8	1890*	2340*
36	900	40.68	8.26	34.00	25.27	33.00	19.50	11.73	8	0.81	3.50	.88x.62	5.25	13.50	3.63	42.75	32	1 1/2-8	1960	2600
40	1000	51.00	9.50	36.99	27.25	37.00	19.50	11.73	8	0.81	4.50	1.0x.75	5.25	13.50	4.38	47.25	36	1 1/2-8	3850*	3950*
42	1050	53.31	9.50	39.05	29.37	38.00	19.50	11.73	8	0.81	4.50	1.0x.75	5.25	13.50	4.38	49.50	36	1 1/2-8	4250*	4300
48	1200	54.00	10.00	46.09	33.12	42.13	24.00	14.02	8	1.25	5.00	1.25x.88	6.00	16.00	4.50	56.00	44	1 1/2-8	4610*	5680*
54	1400	66.38	10.75	52.45	35.65	45.50	24.00	14.02	8	1.25	6.00	1.5x1.0	6.50	16.00	4.75	62.75	44	1 3/4-8	7100*	7210*

Series 41

WEIGHTS

ANSI 300 Series 42

Valve Size ins	mm	A	B	C [‡]	D	E	F	Mounting Data			G	H**	J	K	L	Lug Bolting Data			Series 42	Series 43	S42	S43
								BCD	No. Holes	Hole Dia.						BCD	No. Holes	Threads UNC-2B				
2 1/2	65	4.75	1.88	2.28	3.81	6.38	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	5.88	8	3/4-10	13	15		
3	80	5.25	1.88	2.86	4.09	6.63	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.77	6.62	8	3/4-10	16	17		
4	100	6.75	2.03	3.72	4.71	7.50	4.36	2.76	4	0.38	0.63	0.43	1.25	2.50	0.75	7.88	8	3/4-10	20	23		
5	125	8.25	2.23	4.80	5.13	8.00	5.12	2.76	4	0.38	0.75	0.51	1.25	4.50	0.94	9.25	8	3/4-10	33	39		
6	150	8.88	2.42	5.75	6.25	8.75	5.12	4.92	4	0.53	0.87	0.63	1.25	4.50	0.97	10.62	12	3/4-10	40	54		
8	200	10.94	2.82	7.56	7.55	10.00	6.12	4.92	4	0.53	1.18	0.87	2.00	4.50	1.10	13.00	12	7/8-9	68	89		
10	250	13.26	3.28	9.44	9.36	11.38	6.12	4.92	4	0.53	1.38	.39x.39	2.00	4.50	1.28	15.25	16	1-8	113	144		
12	300	15.57	3.62	11.31	10.89	13.50	7.75	4.92	4	0.53	1.38	.39x.39	2.00	6.50	1.40	17.75	16	1 1/8-8	173	217		
14	350	17.90	4.66	11.38	12.50	18.25	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	2.13	20.25	20	1 1/8-8	328	444		
16	400	19.94	5.35	14.31	13.88	21.00	10.38	6.50	4	0.81	2.50	.62x.62	4.00	6.50	2.50	22.50	20	1 1/4-8	455	592		
18	450	22.00	5.98	15.00	15.43	21.00	15.38	10.00	8	0.67	2.50	.62x.62	4.00	11.75	2.65	24.75	24	1 1/4-8	605	856		
20	500	24.10	6.34	16.50	16.80	22.25	15.38	10.00	8	0.67	3.00	.75x.75	4.00	11.75	2.90	27.00	24	1 1/4-8	780	1050		
24	600	28.88	7.15	20.68	19.80	26.25	19.50	11.73	8	0.81	3.50	.88x.62	5.25	13.50	3.40	32.00	24	1 1/2-8	1260	1720		
30	750	35.12	8.98	26.81	23.40	32.25	24.00	14.02	8	1.25	4.50	1.0x.75	5.25	16.00	4.38	39.25	28	1 3/4-8	2260	3010		
36	900	42.00	10.67	33.13	27.12	36.25	24.00	14.02	8	1.25	5.00	1.25x.88	6.00	16.00	5.23	46.00	32	2-8	3320	4400		
42	1050	50.75	11.50	38.88	29.25	40.50	26.00	15.98	8	1.50	6.00	1.5x1.0	6.50	18.70	5.13	47.50	32	1 5/8-8	5000*	4700		
48	1200	57.75	12.50	45.75	33.16	44.75	29.00	19.02	12	1.50	7.00	1.75x1.5	7.50	22.00	5.50	54.00	32	1 7/8-8	—*	7000		

Series 43

S42 S43

ANSI 600 Series 44

Valve Size ins	mm	A	B	C [‡]	D	E	F	Mounting Data			G	H**	J	K	L	Lug Bolting Data			Series 44	Series 45	S44	S45
								BCD	No. Holes	Hole Dia.						BCD	No. Holes	Threads UNC-2B				
3	80	5.78	2.22	2.75	5.71	7.00	5.12	2.76	4	0.38	0.75	0.51	1.25	4.50	0.90	6.62	8	3/4-10	24*	31*		
4	100	7.00	2.77	3.56	7.04	8.50	5.12	4.92	4	0.53	0.87	0.63	1.25	4.50	1.15	8.50	8	7/8-9	41*	58‡		
6	150	9.75	3.34	5.38	8.57	9.75	6.12	4.92	4	0.53	1.18	0.87	2.00	4.50	1.50	11.50	12	1-8	79*	119*		
8	200	11.80	4.23	6.88	10.80	12.25	7.75	6.50	4	0.81	1.38	.39x.39	2.00	6.50	1.90	13.75	12	1 1/8-8	155*	227*		
10	250	14.09	4.82	8.50	14.62	17.00	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	2.15	17.00	16	1 1/4-8	280*	400*		
12	300	16.47	5.51	10.12	15.72	18.25	10.38	6.50	4	0.81	1.97	.47x.39	2.50	6.50	2.53	19.25	20	1 1/4-8	386*	547*		
14	350	18.03	6.09	10.88	17.48	19.75	15.38	10.00	8	0.67	2.50	.62x.62	4.00	11.75	2.90	20.75	20	1 3/8-8	549*	750*		
16	400	20.38	7.00	12.62	19.41	21.75	15.38	10.00	8	0.67	3.00	.75x.75	4.00	11.75	3.44	23.75	20	1 1/2-8	752*	1100*		
18	450	23.15	7.75	14.60	21.05	23.75	19.50	11.73	8	0.81	3.50	.88x.62	5.25	13.50	3.60	25.75	20	1 5/8-8	1090*	1470*		
20	500	25.15	8.50	16.37	23.21	25.75	19.50	11.73	8	0.81	4.00	1.0x.75	5.25	13.50	3.88	28.50	24	1 5/8-8	1360*	1850*		
24	600	29.38	9.13	19.87	27.71	31.00	24.00	14.02	8	1.25	5.00	1.25x.88	6.00	16.00	3.94	33.00	24	1 7/8-8	2160*	2900*		
30	750	36.00	11.25	26.50	31.50	36.00	26.00	15.98	8	1.50	6.00	1.5x1.0	6.50	18.70	5.00	40.25	28	2-8	3500*	4700*		

Series 45

S44 S45

** Keyway is applicable on valve sizes 14"-54" Class 150, 10"-48" Class 300, and 8"-30" Class 600.

ANSI 150 Series 40 / 41

Valve Size		Disc Position (degrees)								
ins	mm	90°	80°	70°	60°	50°	40°	30°	20°	10°
2 1/2	65	160	136	100	78	50	30	16	8	3
3	80	185	178	155	123	87	56	32	14	4.8
4	100	375	365	315	250	175	115	63	31	10
5	125	790	675	500	360	238	146	78	41	16
6	150	1350	1070	750	510	330	218	140	81	35
8	200	2800	2230	1590	1060	685	456	280	165	65
10	250	4300	3450	2430	1630	1050	700	450	250	100
12	300	6650	5330	3750	2530	1630	1080	700	390	155
14	350	7650	6100	4300	2900	1890	1250	810	450	175
16	400	9800	7860	5510	3700	2420	1530	1020	580	230
18	450	10500	9100	6960	5100	3520	2220	1180	500	170
20	500	13500	11700	8800	6500	4500	2820	1530	640	200
24	600	20000	17100	12800	9570	6640	3880	2200	920	240
26	650	20000	17100	12800	9570	6640	3880	2200	920	240
28	700	28000	23900	18200	13500	9300	5700	3100	1300	290
30	750	32000	27300	20900	15500	10700	6700	3600	1510	320
32	800	34000	29100	22300	16500	11400	7150	3850	1610	340
34	850	34000	29100	22300	16500	11400	7150	3850	1610	340
36	900	48500	41100	31700	23200	16400	10200	5430	2260	480
40	1000	62000	55200	44000	33300	23800	15200	8600	3520	670
42	1050	65000	58000	46100	35000	25000	16000	9000	3700	700
48	1200	91000	80900	63700	43600	29100	20000	11000	4600	920
54	1400	125000	111000	87500	60000	40000	27500	15000	6000	1200

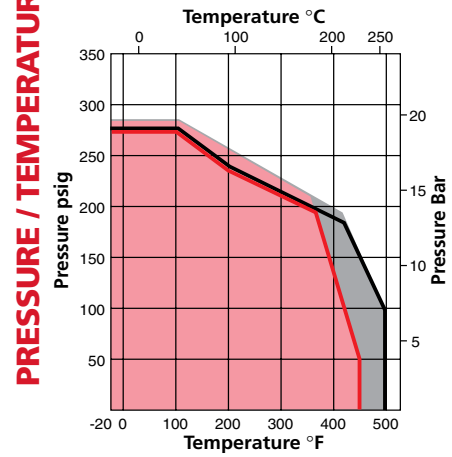
ANSI 300 Series 42 / 43

2 1/2	65	160	136	100	78	50	30	16	8	3
3	80	185	178	155	123	87	56	32	14	4.8
4	100	375	365	315	250	175	115	63	31	10
5	125	790	675	500	360	238	146	78	41	16
6	150	1000	875	710	530	370	240	138	79	26
8	200	2000	1720	1360	950	630	405	240	121	47
10	250	2650	2250	1740	1200	780	510	295	150	61
12	300	4000	3400	2500	1690	1100	710	430	220	92
14	350	4100	3500	2600	1770	1200	830	490	240	100
16	400	7800	6540	4550	2970	1840	1160	730	420	180
18	450	9500	8000	6170	4530	3110	1970	1080	440	94
20	500	11000	9570	7300	5400	3720	2330	1250	530	110
24	600	18000	15100	11400	8570	5920	3700	2000	830	180
30	750	29000	24400	18900	13700	8500	6000	3230	1330	290
36	900	45000	38100	29200	21000	14800	9100	4660	1730	380
42	1050	60000	54000	42000	30000	19000	13000	7500	2600	450
48	1200	83000	74000	58000	41000	26000	17000	10000	4400	800

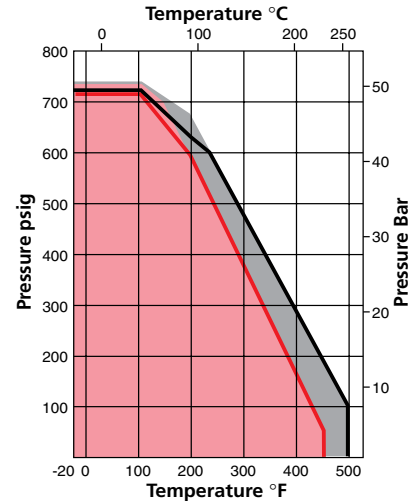
ANSI 600 Series 44 / 45

3	80	165	158	135	103	67	46	12	8	3
4	100	300	270	210	150	95	70	45	30	5
6	150	850	765	600	425	270	200	130	70	15
8	200	1500	1350	1050	750	480	345	209	78	20
10	250	2200	1970	1540	1100	700	500	300	140	40
12	300	3100	2790	2170	1550	1000	680	400	190	55
14	350	3900	3300	2400	1570	1100	730	420	200	70
16	400	5000	4200	2900	1900	1200	800	500	250	95
18	450	6000	5000	3900	2800	1900	1200	660	290	130
20	500	8000	6900	5300	3900	2700	1700	950	400	143
24	600	11000	9300	7000	5200	3600	2250	1200	500	180
30	750	15000	13000	10000	8400	5100	2800	1650	600	200

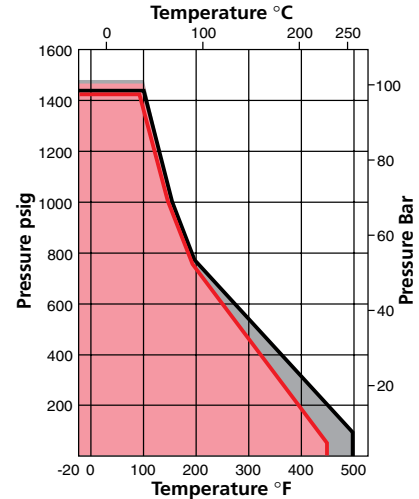
ANSI 150 Series 40 / 41



ANSI 300 Series 42 / 43



ANSI 600 Series 44 / 45



- Carbon Steel Bodies RTFE Seats
- Stainless Steel Bodies RTFE Seats
- Carbon Steel Bodies PTFE Seats
- Stainless Steel Bodies PTFE Seats

Note: Refer to Bray Technical Bulletin No.1168 for additional information on Pressure/Temperature Curves.

C_v is defined as the volume of water in U.S.G.P.M. that will flow through a given restriction or valve opening with a pressure drop of one (1) p.s.i. at room temperature. Recommended control angles are between 25°–70° open. Preferred angle for control valve sizing is 60°–65° open.

SEATING/UNSEATING TORQUES (LB-INS)

The values in the following Torque Charts for standard valves are for normal, wet media applications. Note that seating/unseating torque is always lower with the seat retainer installed upstream. Please consult Bray Technical Bulletin No. 1146 for discussion on service torque classes applicable to standard valves. If the media is lubricious, such as oil, the values in the Torque Charts should be multiplied by 0.9. If the media is abrasive or dry and thus a severe application, the values in charts should be multiplied by 1.3. For firesafe

ANSI 150 Series 40 / 41 Standard

Valve Size ins	System Pressure ΔP (PSIG)							
	Less than 150		150 – 200		200 – 250		250 – 285	
	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream
2 1/2	170	200	190	240	210	280	215	300
3	185	220	210	260	225	300	230	320
4	275	320	300	370	315	420	320	460
5	550	650	640	800	705	940	730	1040
6	690	810	770	960	825	1100	840	1200
8	1280	1500	1400	1700	1500	1950	1570	2100
10	2400	2800	2640	3300	2820	3760	2870	4100
12	3500	4100	4000	5000	4400	5900	4550	6500
14	5400	6300	5920	7400	6400	8500	6650	9500
16	7700	9100	9040	11300	10100	13500	10500	15000
18	11900	14000	13600	17000	15000	20000	15400	22000
20	15300	18000	17100	21300	18500	24700	18900	27000
24	24650	29000	27680	34600	30000	40100	30800	44000
26	24650	29000	27680	34600	30000	40100	30800	44000
28	34850	41000	37600	47000	44300	59200	44500	63500
30	39950	47000	42960	53700	50800	67700	52500	75000
32	45000	53000	48800	61000	57600	76800	58800	84000
34	45000	53000	48800	61000	57600	76800	58800	84000
36	54000	64000	64800	81000	73500	98000	77000	110000
40	62000	73000	73600	92000	82500	110000	84700	121000
42	71000	83000	84000	105000	95250	127000	101000	143000
48	98000	115000	121600	152000	142500	190000	151900	217000
54	136000	160000	169600	212000	198000	265000	211400	302000

ANSI 150 Series 40 / 41 Fire Safe

2 1/2	680	720	690	770	700	810	710	840
3	750	800	760	830	770	870	780	900
4	850	900	880	980	890	1050	910	1100
5	1420	1500	1470	1630	1500	1750	1600	1850
6	1660	1750	1690	1880	1800	2000	1900	2100
8	2600	2800	2690	2950	2750	3100	2860	3200
10	3900	4200	4100	4530	4250	4860	4400	5100
12	6500	6900	6600	7350	6700	7790	6900	8100
14	12300	13000	12600	14000	13200	15500	13600	17000
16	15200	16000	15800	17600	16300	19200	16320	20400
18	18000	19000	18900	21000	19000	22500	19200	24000
20	21800	23000	22500	25000	23800	28000	28800	36000
24	31000	33000	34200	38000	37400	44000	50400	63000

ANSI 300 Series 42 / 43 Standard

Valve Size ins	System Pressure ΔP (PSIG)							
	Less than 150		150 – 350		350 – 550		550 – 740	
	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream
2 1/2	170	200	290	360	380	510	470	670
3	185	220	310	380	400	530	490	690
4	270	320	420	530	550	730	700	1000
5	550	650	1000	1250	1390	1850	1800	2550
6	850	1000	1320	1650	1720	2300	2100	3000
8	1580	1850	2480	3100	3230	4300	3700	5300
10	2800	3300	4400	5500	5700	7600	7000	10000
12	4250	5000	6640	8300	8630	11500	10500	15000
14	7300	8600	10720	13400	13700	18300	15400	22000
16	11900	14000	17200	21500	21800	29000	26600	38000
18	15300	18000	21600	27000	27100	36100	31500	45000
20	20400	24000	29400	36700	37000	49300	42700	61000
24	32300	38000	45600	57000	57500	76700	66500	95000
30	68000	80000	101600	127000	129000	172000	147000	210000
36	101150	119000	144000	180000	180000	240000	203000	290000
42	115600	136000	168000	210000	222000	296000	278600	398000
48	127500	150000	217600	272000	321000	428000	403200	576000

valves, the operating torque should be taken directly from the charts, with due consideration for the location of the seat retainer. No reduction or multiplication factors should be used to determine torque of firesafe valves.

These torque figures are seating and unseating torques. Dynamic torques should also be determined in the event dynamic torques are greater than the seating/unseating torques. Refer to Bray Technical Bulletin No. 1172 for dynamic torques.

ANSI 300 Series 42 / 43 Fire Safe

Valve Size ins	System Pressure ΔP (PSIG)			
	Less than 150		150 – 350	
	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream
2 1/2	680	720	775	860
3	750	800	855	950
4	850	900	1080	1200
5	1420	1500	2070	2300
6	2000	2100	2610	2900
8	3000	3150	3870	4300
10	6900	7300	9180	10200
12	10450	11000	13200	14700
14	18050	19000	21600	24000
16	26600	28000	34200	38000

Valve Size ins	System Pressure ΔP (PSIG)			
	350 – 550		550 – 740	
	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream
2 1/2	860	1010	880	1100
3	935	1100	960	1200
4	1275	1500	1360	1700
5	2635	3100	2880	3600
6	3150	3700	3440	4300
8	4675	5500	4960	6200
10	11050	13000	12000	15000
12	15640	18400	16800	21000
14	22100	26000	22400	28000
16	37400	44000	39200	49000

ANSI 600 Series 44 / 45

Valve Size ins	System Pressure ΔP (PSIG)			
	Less than 150		150 – 600	
	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream
3	400	480	700	870
4	850	960	1280	1600
6	1450	1700	2560	3200
8	3500	4100	5760	7200
10	7100	8300	9600	12000
12	10100	11800	11200	14000
14	11900	14000	19200	24000
16	14000	16500	28400	35500
18	16200	19000	34400	43000
20	21300	25000	45600	57000
24	33000	39000	71000	89000
30	71000	83000	137000	172000

Valve Size ins	System Pressure ΔP (PSIG)			
	600 – 1050		1050 – 1480	
	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream
3	900	1200	1000	1450
4	1580	2100	1900	2700
6	3450	4600	4100	5800
8	7600	10100	9800	14000
10	13500	18000	16800	24000
12	19500	26000	21000	30000
14	24800	33000	30000	43000
16	34500	46000	45500	65000
18	49000	65000	64400	92000
20	66000	88000	87000	124000
24	94000	125000	123000	175000
30	180000	240000	217000	310000

MATERIALS OF CONSTRUCTION

Item	Name	Material
1	Body	Stainless Steel, ASTM A351 GR CF8M Carbon Steel, ASTM A216 GR WCB/A516 GR 70
2	Disc	Stainless Steel, ASTM A351 GR CF8M – Standard with Electroless Nickel Plating on disc edge – FIRE SAFE
3	Stem	17-4 PH SS, ASTM A564-Type 630
4	Taper Pins	17-4 PH SS, ASTM A564-Type 630
5	Disc Spacers	316 Stainless Steel, ASTM 276 Type 316
6	Bearing Assembly	316 Stainless Steel with TFE & Glass Fabric Liner
7	Gland Ring	316 Stainless Steel, ASTM 276 Type 316
8	Stem Seal	PTFE rings plus 1 Carbon Fiber ring – Standard Valve Flexible Graphite rings – FIRE SAFE Valve
9	Thrust Washer	316 Stainless Steel, ASTM 276 Type 316
10	Retaining Ring	18-8 Stainless Steel
11	Gland Retainer	316 Stainless Steel, ASTM A351 CF8M Carbon Steel, ASTM A216 GR WCB/A516 GR 70
12	Stud	316 Stainless Steel, ASTM A193-B8M
13	Lock Washers	18-8 Stainless Steel
14	Hex Nut	18-8 Stainless Steel
15	Seat Assembly	RTFE [^] with Silicone Rubber Energizer PTFE with Silicone Rubber Energizer
16	Seat Retainer Plate	Stainless Steel, ASTM A351 CF8M/A240-316 Carbon Steel, ASTM A216 GR WCB/A516 GR 70
17	Cap Screws	18-8 Stainless Steel Alloy Steel
18	Gasket	PTFE – Standard Valve Flexible Graphite – FIRE SAFE Valve
19	Locating Plug	316 Stainless Steel, ASTM 276 Type 316/A240-316 Carbon Steel, Phosphate Coated
20	Mounting Plate	18-8 Stainless Steel Carbon Steel, Phosphate Coated
21	Cap Screws	18-8 Stainless Steel Alloy Steel
22	Lock Washers	18-8 Stainless Steel Alloy Steel
23	Metal Seat ^{‡‡}	Inconel [®] 718, ASTM B670
24	Gasket ^{‡‡}	Flexible Graphite

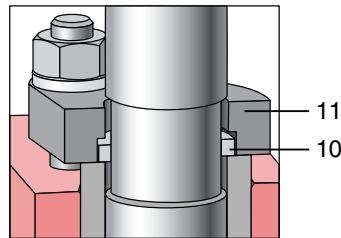
Not Shown: Bellville Washer and Grounding Washer: 18-8 Stainless Steel, for 14"–54" Class 150, 14"–48" Class 300 and 10"–30" Class 600 valves

[^] RTFE is supplied by Bray as RPTFE (reinforced polytetrafluoroethylene).

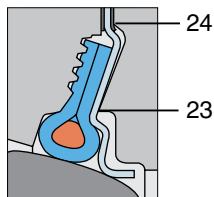
^{‡‡} FIRE SAFE Valve only.

Other materials are available, please consult factory for your specific application.

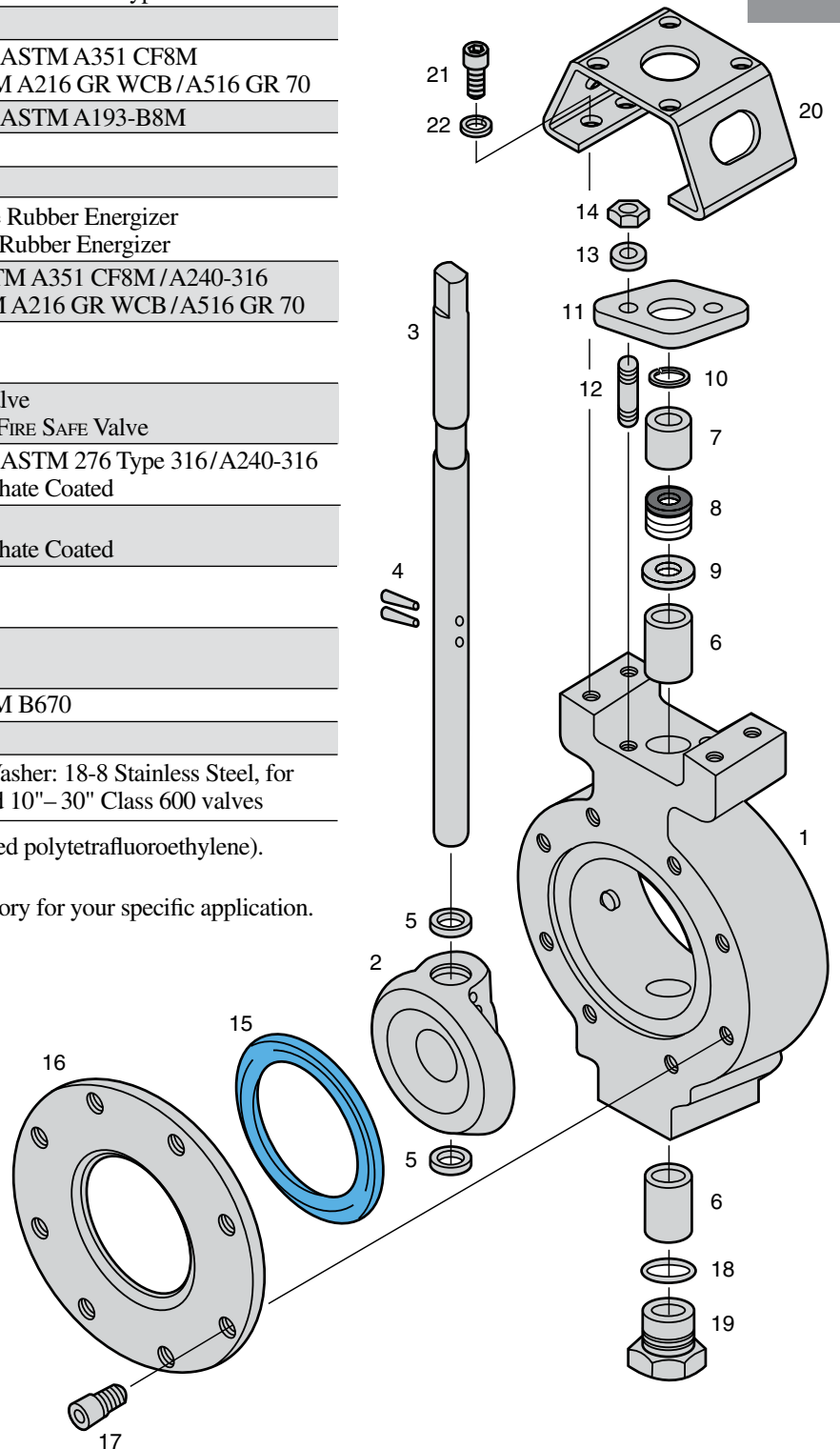
BLOW-OUT PROOF STEM



FIRE SAFE Valve



Exploded View Series 40





IN ADDITION TO THE EXCELLENT FEATURES OF THE SERIES 40, THIS HIGH PERFORMANCE BUTTERFLY VALVE OFFERS SUPERIOR ADVANTAGES OVER OTHER VALVES.

When matched against comparably rated plug, globe, gate, ball and diaphragm valves, the reduced weight and space requirements of the Series 40 is readily apparent.

The cost savings of installation and maintenance are substantial.

The torque requirements of the High Performance Series 40 Butterfly Valve are also significantly lower. For example, an 8" Series 40 Class 150 valve weighs 45 lbs. and has a maximum torque of 1,500 in/lbs. Comparable plug valves weigh 319 lbs. with 12,500 in/lbs. of torque, and ball valves weigh 158 lbs. with 6,400

in/lbs. of torque. A gate valve with a comparable rating weighs 310 lbs. and requires a linear unit for actuation. Therefore, the Series 40 Butterfly Valve requires a much smaller actuator than other valves.

Economy, efficiency and proven superior performance establish the Bray/McCannalok as the premier solution for demanding high pressure applications.



DIRECT MOUNTING OF COMPACT, HIGH TORQUE BRAY PNEUMATIC AND ELECTRIC ACTUATORS PROVIDE LOW COST AUTOMATION FOR ON-OFF AND CONTROL SERVICES.

The Series 40 valves can be automated inexpensively with Bray's pneumatic and electric actuators. These actuators fully complement the Bray/McCannalok and directly mount without the need for large brackets or adapters. Bray has designed the most advanced, highest quality line of actuators and Brayline accessories available today.

At left, a Series 92 Pneumatic Actuator with a Series 52 Valve Status Monitor are mounted to a 3" Series 40 Valve. At right, a Series 70 Electric Actuator is shown mounted to a 3" Series 40 Valve.



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