
McCANNALOK SERIES

HIGH PERFORMANCE BUTTERFLY VALVES

TECHNICAL SALES MANUAL



Bray[®]

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For information on this product and other Bray products please visit us at www.bray.com



HIGH PERFORMANCE BUTTERFLY VALVE

Featuring Bray’s patented, award-winning design, this double offset high performance butterfly valve is precision engineered to deliver **quality**, **value**, and **reliability** in the most demanding applications.

- > Designed for high pressure, high temperature, and critical service applications.
- > Energized resilient seat design provides bidirectional zero-leakage shutoff throughout full pressure range.
- > Dead-end service, with bidirectional sealing.
- > Firesafe design available.
- > Low fugitive emissions.
- > Metal seated control valve available.
- > Easy field maintenance.
- > Low torque requirements allow smaller actuators than other comparably rated valve types.
- > Direct mounting of Bray actuators and controls provides a strong mechanical connection and allows economical automation.
- > High cycle configuration available, rigorously tested to 1 million cycles.

DOUBLE OFFSET STEM AND DISC DESIGN

The disc motion of the double offset design provides many performance benefits:

DISC OPENING

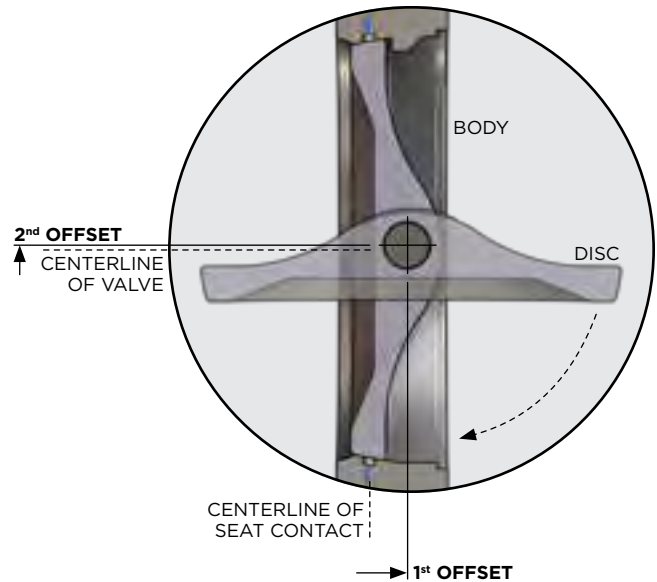
- > Cam-action movement pulls disc away from seat.
- > Reduces seat wear.

OPEN POSITION

- > Disc does not contact seat.
- > Eliminates seat deformation.
- > Reduces operating torques.
- > Extends service life.

DISC CLOSING

- > Linear motion pushes disc onto seat.
- > Wiping action prevents undesirable material buildup.



INDUSTRIES

- > Air Separation
- > Chemical
- > Data Centers
- > Electric Power Generation
- > Heating, Ventilation & Air Conditioning (HVAC)
- > Metal Processing
- > Mining
- > Oilfield
- > Petrochemical
- > Petroleum
- > Shipbuilding
- > Water & Wastewater Treatment

APPLICATIONS

- > Caustic
- > Chilled Water
- > Pressure Swing Adsorption (PSA)
- > Seawater
- > Sour Gas (NACE)
- > Steam
- > Vacuum

MEDIA

- > Acids
- > Alkalis
- > Corrosive Chemicals
- > Dry Chlorine (Gas or Liquid)
- > Gases
- > Hydrogen
- > Oxygen
- > Water

SPECIFICATIONS

Size Range¹	NPS 2 to 66	
	DN 50 to 1500	
Body Style	Wafer Lug Double Flanged	
Temperature Range²	Resilient Seated	-62°F to 500°F
		-52°C to 260°C
	Firesafe	-62°F to 500°F
		-52°C to 260°C
	Metal Seated	Up to 900°F
		Up to 482°C
Pressure Ratings	ASME Class 150 300 600	
	PN 10 16 25 40 63 100	
Leakage Rate	Resilient Seated	Zero Leakage
		EN12266-1: Rate A
	Metal Seated	FCI 70-2 Class IV

NOTE

- 1 Other sizes are available on request. Contact Bray for more information.
- 2 Depending on material selection. Refer to pressure/temperature graphs.

MATERIAL OPTIONS¹

Body Materials	Carbon Steel
	Stainless Steel
	Nickel Aluminum Bronze
	Hastelloy® C
	Titanium
Disc Materials	Stainless Steel
	Nickel Aluminum Bronze
	Monel®
Stem Materials	Stainless Steel
	Monel® K500
	Inconel® 718
Seat Materials	RPTFE with Resilient Energizer
	PTFE with Resilient Energizer
	UHMWPE with Resilient Energizer
	TFM with Low Temperature Resilient Energizer
	(Firesafe) Inconel® & RPTFE with Resilient Energizer

NOTE

- 1 Other materials are available on request. Contact Bray for more information.

DESIGN STANDARDS

Valve Design	API 609 Category B
	ASME B16.34
	ASME BPVC VIII
	EN 593
	EN 12516
	MSS SP 68
Top Flange	ISO 5211
Flange Drilling¹	ASME B16.5
	ASME B16.47
	EN 1092-1

Seat Tightness Test	API 598
	EN 12266
	ISO 5208
	MSS SP 61
Face-to-Face	API 609 Category B
	ASME B16.10
	EN 558
	ISO 5752

NOTE

- 1 Additional flange drilling options available.

CERTIFICATIONS & APPROVALS¹

Certifications	ANSI/NSF 61/372
	CE: PED 2014/68/EU
	SIL 3 Capable
Fire Test	API 607
	ISO 10497
Fugitive Emissions	API 641
	ISO 15848-1
	TA-Luft VDI 2440

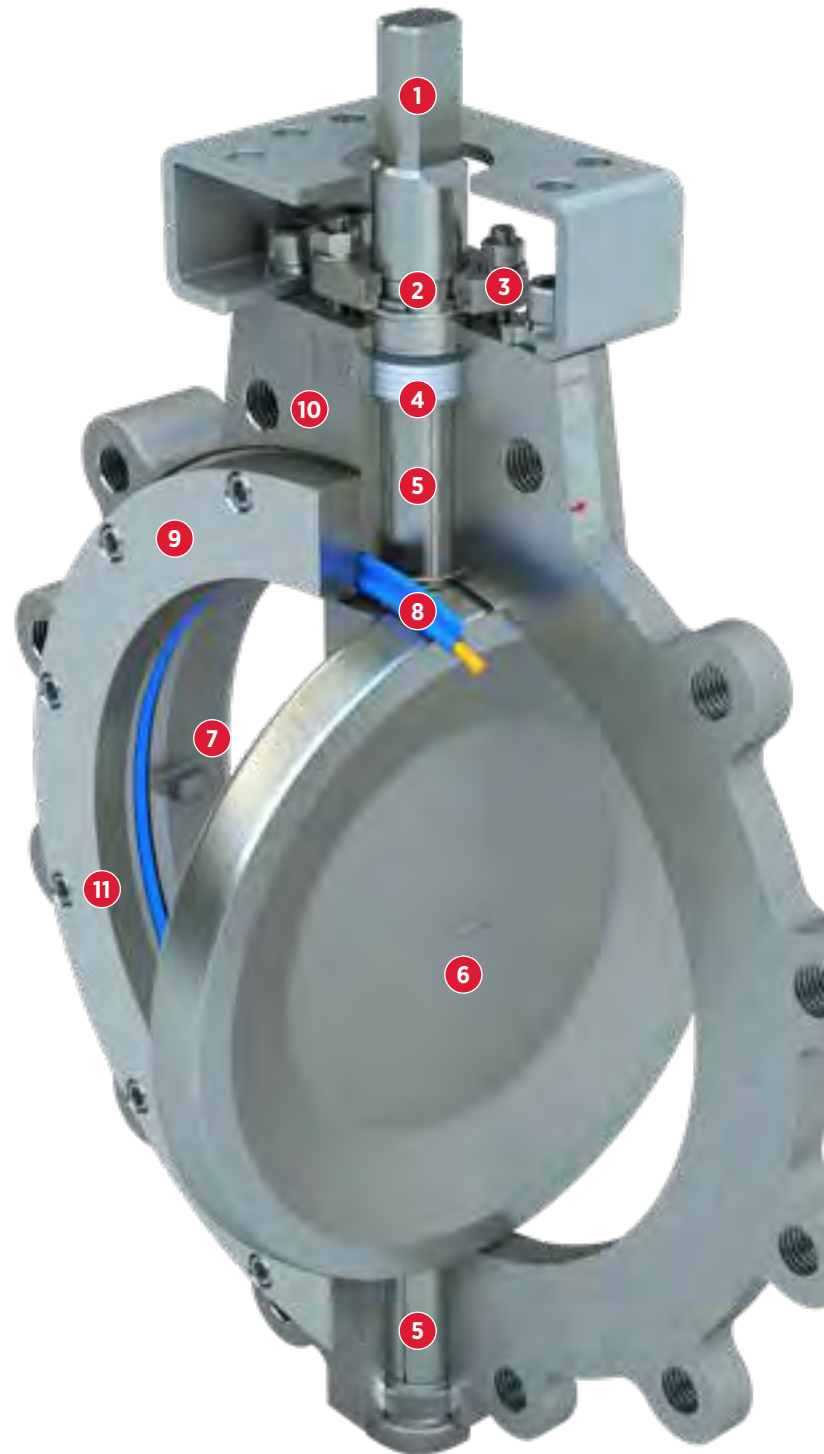
Approvals	ABS Type
	ATEX 2014/34/EU
	Bureau Veritas Type
	China Classification Society (CCS) Type
	CRN
	DNV
	EC1935
	TR CU

NOTE

- 1 A complete listing of certifications and approvals can be found at BRAY.COM.

DESIGN FEATURES

- 1 STEM DESIGN:** High-strength, one-piece stem design is standardized for interchangeability of Bray actuators.
- 2 BLOWOUT-PROOF STEM:** The stem retention design does not rely on actuation components to prevent stem blowout.
- 3 ADJUSTABLE STEM PACKING:** Easy access allows simple quarter-turn field adjustments without actuator removal.
- 4 STEM SEAL SYSTEM:** PTFE packing rings with carbon fiber anti-extrusion ring provides constant compression for a positive seal around the stem. Options are available for high temperature, high cycle and firesafe applications.
- 5 STEM BEARINGS:** Top and bottom bearings securely support the stem, provide excellent corrosion resistance, and minimize deflection from high temperatures and mechanical loading forces.
- 6 DISC:** The disc is engineered to maximize flow and minimize resistance for optimal flow rates.
- 7 INTERNAL OVER-TRAVEL STOP:** Designed to minimize possible seat damage — extending the service life of the seat.
- 8 BIDIRECTIONAL RESILIENT SEAT:** Provides bidirectional zero-leakage sealing while isolating the energizer from line media.
- 9 FULL-FACED SEAT RETAINER:** Cap screws located outside sealing area are protected from corrosion while allowing simple seat replacement.
- 10 BODY:** Extended neck allows access to stem packing adjustments and actuator mounting when valve is fully insulated.
- 11 DEAD-END SERVICE:** Lug and double-flanged bodies are full rated for bidirectional dead-end service.



Series 41 Lug Style

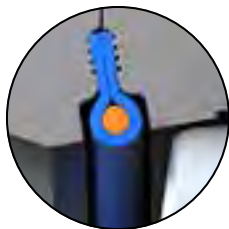
RESILIENT SEAT DESIGN (STANDARD)

Bray’s unique, patented resilient seat design offers many exclusive advantages:

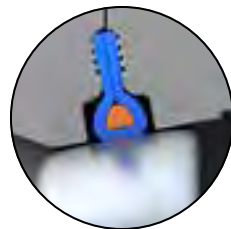
- > Proven zero-leakage shutoff in both directions.
- > Interference-fit sealing, even when there is no differential line pressure.
- > Pressure-assisted sealing is energized by line media pressure, providing a tighter seal in higher differential pressure services.
- > Extended service life with reliable sealing after 1 million cycles.
- > Resilient energizer ring is fully encapsulated by the seat and isolated from all line media contact.
- > Full-faced retainer secures seat in the correct position, even without mating flange.
- > Seat self-adjusts for wear and temperature changes, providing longer service life.
- > Simplified seat replacement.

INTERFERENCE-FIT SEALING

Provides bidirectional sealing for low pressure applications.



Disc in Open Position.
Seat non-compressed.



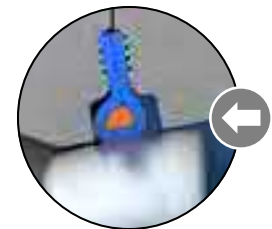
Disc in Closed Position.
No line pressure.

PRESSURE-ASSISTED SEALING

Provides tighter bidirectional sealing in higher pressure applications.



Disc in Closed Position.
Line pressure applied from the **preferred** flow direction.



Disc in Closed Position.
Line pressure applied from the **non-preferred** flow direction.

FIRESAFE SEAT DESIGN

Bray’s firesafe design consists of the standard bidirectional resilient seat assembly with added Inconel® metal seat. With the valve closed, the firesafe seat assembly contacts the disc with both the resilient seat and metal seat. During and after a fire, when the resilient material has been partially or completely destroyed, the metal seat provides a bidirectional seal by remaining in contact with the disc.

Disc in Closed Position



No line pressure.
(Pre-fire event condition.)



Line pressure applied from **preferred** flow direction.
(During or after fire event.)



Line pressure applied from **non-preferred** flow direction.
(During or after fire event.)

METAL SEAT DESIGN

Bray’s Inconel® metal seat provides bidirectional FCI 70-2 Class IV leakage. The seat and nitride hardened disc have appropriate differences in hardness to eliminate the risk of valve damage caused by galling.



Disc in Closed Position.
No line pressure.

FIRE TEST STANDARDS — API 607 and ISO 10497 Certified

Bray’s proven firesafe valve design meets or exceeds the latest international fire test standards — in lab tests and in field applications.

SERIES 40/41/4A

Up to 285 psi (19.6 bar)



VALVE SIZES (NPS)

Model	Body Style	Resilient Seated	Firesafe	Metal Seated
40	Wafer	2 to 66	2 to 48	2½ to 36
41	Lug	2 to 66	2 to 48	2½ to 36
4A	Double Flanged	2 to 54	2 to 48	2½ to 36

VALVE SIZES (DN)

Model	Body Style	Resilient Seated	Firesafe	Metal Seated
40	Wafer	50 to 1500	50 to 1200	65 to 900
41	Lug	50 to 1500	50 to 1200	65 to 900
4A	Double Flanged	50 to 1400	50 to 1200	65 to 900

SERIES 42/43/4B

Up to 740 psi (51 bar)



VALVE SIZES (NPS)

Model	Body Style	Resilient Seated	Firesafe	Metal Seated
42	Wafer	2 to 36	2 to 36	2½ to 30
43	Lug	2 to 54	2 to 36	2½ to 30
4B	Double Flanged	3 to 42	2 to 36	2½ to 30

VALVE SIZES (DN)

Model	Body Style	Resilient Seated	Firesafe	Metal Seated
42	Wafer	50 to 900	50 to 900	65 to 750
43	Lug	50 to 1400	50 to 900	65 to 750
4B	Double Flanged	80 to 900	50 to 900	65 to 750

SERIES 44/45

Up to 1440 psi (100 bar)



VALVE SIZES (NPS)

Model	Body Style	Resilient Seated	Firesafe	Metal Seated
44	Wafer	3 to 24	3 to 24	3 to 12
45	Lug	3 to 36	3 to 36	4 to 12

VALVE SIZES (DN)

Model	Body Style	Resilient Seated	Firesafe	Metal Seated
44	Wafer	80 to 600	80 to 600	80 to 300
45	Lug	80 to 900	80 to 900	100 to 300

VALVE PART NUMBERING SYSTEM (ASME)

Select one code from each category to build a complete valve order number.

4X-XXXX-110XX-XXX

SERIES 4X			SIZE XXXX			BASE NUMBER 110XX		TRIM XXX		
Code	Body Style	ASME Class	Code	NPS	DN	Code	Description	Code	Item	Material ¹
40	Wafer	150	0200	2	50	11001	Full ASME Class Pressure Rated	466 Carbon Steel	Body	Carbon Steel, WCB
41	Lug	150	0250	2½	65				Disc	Stainless Steel, CF8M
4A	Double Flanged	150	0300	3	80				Stem	17-4 PH Stainless Steel
42	Wafer	300	0400	4	100				Stem Seal	PTFE rings plus 1 Carbon Fiber Ring
43	Lug	300	0500	5	125				Seat Assembly	RPTFE with Silicone Rubber Energizer
4B	Double Flanged	300	0600	6	150			066 Stainless Steel	Body	Stainless Steel, CF8M
44	Wafer	600	0800	8	200				Disc	Stainless Steel, CF8M
45	Lug	600	1000	10	250				Stem	17-4 PH Stainless Steel
			1200	12	300				Stem Seal	PTFE rings plus 1 Carbon Fiber Ring
			1400	14	350				Seat Assembly	RPTFE with Silicone Rubber Energizer
			1600	16	400			468 Carbon Steel Fire Safe	Body	Carbon Steel, WCB
			1800	18	450				Disc	Stainless Steel, CF8M + ENP ²
			2000	20	500				Stem	17-4 PH Stainless Steel
			2400	24	600				Stem Seal	Flexible Graphite Rings
			2600	26	—				Seat Assembly	RPTFE with Silicone Rubber Energizer
			2800	28	700				Metal Seat	Inconel [®] 718
			3000	30	750			068 Stainless Steel Fire Safe	Body	Stainless Steel, CF8M
			3200	32	800				Disc	Stainless Steel, CF8M + ENP ²
			3400	34	—				Stem	17-4 PH Stainless Steel
			3600	36	900				Stem Seal	Flexible Graphite Rings
			4000	40	1000				Seat Assembly	RPTFE with Silicone Rubber Energizer
			4200	42	—				Metal Seat	Inconel [®] 718
			4800	48	1200			45P Carbon Steel Metal Seated	Body	Carbon Steel, WCB
			5400	54	1400				Disc	Nitride Hardened Stainless Steel, CF8M
			6000	60	1500				Stem	17-4 PH Stainless Steel
			6600	66	—				Stem Seal	Flexible Graphite Rings
									Metal Seat	Inconel [®] 718
								04P Stainless Steel Metal Seated	Body	Stainless Steel, CF8M
									Disc	Nitride Hardened Stainless Steel, CF8M
									Stem	17-4 PH Stainless Steel
									Stem Seal	Flexible Graphite Rings
									Metal Seat	Inconel [®] 718
								4ZL Carbon Steel High Cycle	Body	Carbon Steel, WCB
									Disc	Stainless Steel, CF8M + ENP ²
									Stem	Inconel [®] 718
									Stem Seal	Carbon and Graphite Filled PTFE
									Seat Assembly	RPTFE with Silicone Rubber Energizer
								0YU Stainless Steel High Cycle	Body	Stainless Steel, CF8M
									Disc	Stainless Steel, CF8M + ENP ²
									Stem	Inconel [®] 718
									Stem Seal	Carbon and Graphite Filled PTFE
									Seat Assembly	RPTFE with Silicone Rubber Energizer

NOTES

- > Not all combinations are possible.
- 1 Other materials are available on request. Contact Bray for additional information.
- 2 ENP = Electroless Nickel Plating

EXAMPLE

41-1200-11001-466

- > Lug Body, ASME Class 150
- > Size NPS 12 (DN 300)
- > Full ASME Class Pressure Rated McCannalok Valve
- > 466 Trim

VALVE PART NUMBERING SYSTEM (EN)

Select one code from each category to build a complete valve order number.

4X-XXXX-110XX-XXX

SERIES 4X			SIZE XXXX		BASE NUMBER 110XX		TRIM XXX		
Code	Body Style	PN	Code	DN	Code	Description	Code	Item	Material ¹
40	Wafer	10, 16	M050	50	1100D	Multi-drilled: ISO PN16; ANSI 150	4YS Carbon Steel	Body	Carbon Steel, EN 1.0619
41	Lug	10, 16	M065	65				Disc	Stainless Steel, EN 1.4408
4A	Double Flanged	10, 16	M080	80	1103E	Multi-drilled: ISO PN10, 16; ANSI 125/150		Stem	17-4 PH Stainless Steel
42	Wafer	25, 40	M100	100				Stem Seal	PTFE Rings plus 1 Carbon Fiber Ring
43	Lug	25, 40	M125	125	11059	ISO PN10;		Seat Assembly	RPTFE with Silicone Energizer
4B	Double Flanged	25, 40	M150	150	11050	ISO PN16	4FY Carbon Steel	Body	Carbon Steel, WCB
44	Wafer	63, 100	M200	200	1101E	ISO PN40		Disc	Stainless Steel, CF8M
45	Lug	63, 100	M250	250	1104K	Multi-drilled: ISO PN25, 40		Stem	17-4 PH Stainless Steel
			M300	300	1101D	ISO PN25		Stem Seal	PTFE rings plus 1 Carbon Fiber Ring
			M350	350	1104K	Multi-drilled: ISO PN25, 40		Seat Assembly	RPTFE with Silicone Energizer
			M400	400	1101D	ISO PN25	4FZ Carbon Steel Fire Safe	Body	Carbon Steel, WCB
			M450	450	110GP	Multi-drilled: ISO PN63, 100		Disc	Stainless Steel, CF8M + ENP ²
			M500	500	1102Q	DIN 2504; PN63		Stem	17-4 PH Stainless Steel
			2400	600	1104C	ISO PN100		Stem Seal	Flexible Graphite Rings
			2800	700				Seat Assembly	RPTFE with Silicone Energizer
			3000	750				Metal Seat	Inconel [®] 718
			3200	800				Body	Stainless Steel, EN 1.4408
			3600	900				Disc	Stainless Steel, EN 1.4408
			4000	1000				Stem	17-4 PH Stainless Steel
			4800	1200				Stem Seal	PTFE Rings plus 1 Carbon Fiber Ring
			5400	1400				Seat Assembly	RPTFE with Silicone Energizer
			6000	1500				Seat Assembly	RPTFE with Silicone Energizer

NOTES

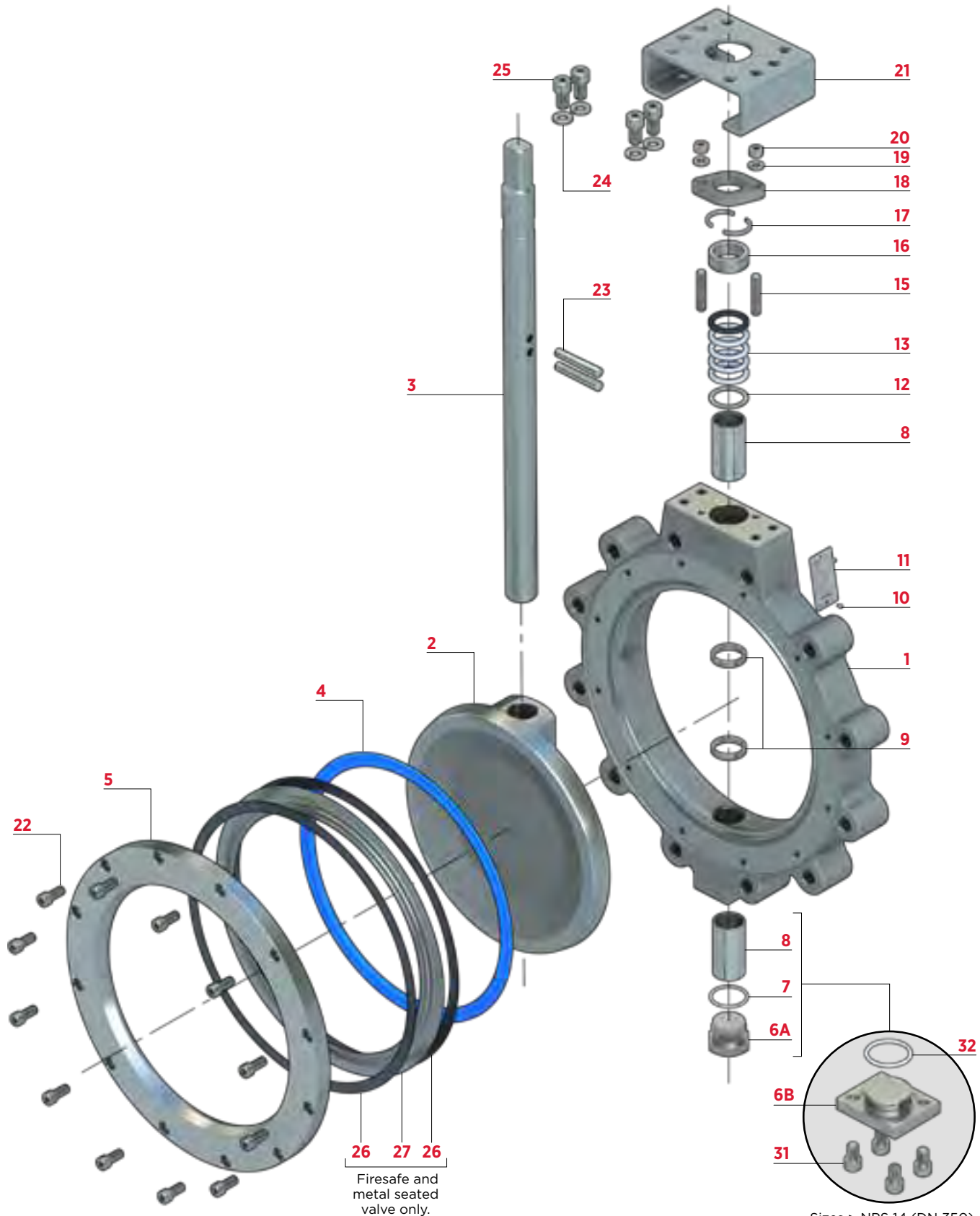
- > Not all combinations are possible.
- 1 Other materials are available on request. Contact Bray for additional information.
- 2 ENP = Electroless Nickel Plating

EXAMPLE

40-M300-1100D-4YS

- > Wafer Body, Multi-Drilled
- > Size DN300
- > PN16 Rated McCannalok Valve
- > 4YS Trim

PARTS CALLOUT



26 27 26
Firesafe and metal seated valve only.

Sizes ≥ NPS 14 (DN 350)

PARTS LIST AND MATERIAL SPECIFICATIONS (ASME)

ITEM	DESCRIPTION	MATERIAL	
		Resilient Seated	Optional
1	Body	Carbon Steel, ASTM A216 Gr. WCB/A516 Gr. 70	Nickel Aluminum Bronze, ASTM B-148 C95800
		Stainless Steel, ASTM A351 Gr. CF8M	
2	Disc	Stainless Steel, ASTM A351 Gr. CF8M	Nickel Aluminum Bronze, ASTM B-148 C95800
			Electroless Nickel Plating ³
3	Stem	17-4 PH Stainless Steel, ASTM A564-Type 630	Monel® K500
			316 Stainless Steel, ASTM 276 Type 316/A240-316 ¹
			Inconel® 718
4	Seat Assembly	RPTFE ² with Resilient Energizer	PTFE with Resilient Energizer
			TFM with Low Temperature Resilient Energizer
			Inconel® 718 & RPTFE ² with Resilient Energizer ³
5	Seat Retainer	Carbon Steel, ASTM A216 Gr. WCB/A516 Gr. 70	Nickel Aluminum Bronze, ASTM B-148 C95800
		Stainless Steel, ASTM A351 Gr. CF8M	
6A	Locating Plug	316 Stainless Steel, ASTM 276 Type 316/A240-316	—
6B	Bottom Plate	Carbon Steel, Phosphate Coated	—
		316 Stainless Steel, ASTM 276 Type 316/A240-316	—
7	Gasket, Locating Plug	PTFE	Flexible Graphite ³
8	Bearing	316 Stainless Steel with Glass Fiber Reinforced PTFE Liner	Nitride Hardened Stainless Steel ³
9	Disc Spacers	316 Stainless Steel, ASTM 276 Type 316	Nitronic® 60 ⁴
10	Drive Screw	18-8 Stainless Steel	—
11	ID Tag	18-8 Stainless Steel	—
12	Thrust Washer	316 Stainless Steel, ASTM 276 Type 316	—
13	Stem Seal Set	PTFE rings + 1 Carbon Fiber Ring	Flexible Graphite Rings ³
			Carbon and Graphite Filled PTFE ⁴
14	Ground Washer	—	316 Stainless Steel (not shown)
15	Stud	316 Stainless Steel, ASTM A193-B8M	—
16	Gland Ring	316 Stainless Steel, ASTM 276 Type 316	—
17	Retaining Ring	18-8 Stainless Steel	—
18	Gland Retainer	316 Stainless Steel	—
19	Lock Washers or Belleville Washers ⁴	18-8 Stainless Steel	17-7 Stainless Steel
20	Hex Nut	18-8 Stainless Steel	—
21	Mounting Bracket	Carbon Steel, Zinc Plated	316 Stainless Steel
22	Cap Screws	18-8 Stainless Steel	Alloy Steel
23	Taper Pins	17-4 PH Stainless Steel, ASTM A564-Type 630	Monel® K500
24	Lock Washers	18-8 Stainless Steel	Alloy Steel
25	Cap Screws	18-8 Stainless Steel	Alloy Steel
26	Gasket ³	—	Flexible Graphite ³
27	Metal Seat ³	—	Inconel® 718, ASTM B670 ³
31	Cap Screws	18-8 Stainless Steel	Alloy Steel
32	Gasket, Bottom Plate	PTFE	—

NOTES

> Material specifications provided for reference only, and are subject to change without notice.

> Additional materials available upon request.

1 May require pressure rating to be reduced. Contact Bray for more information.

2 RTFE is supplied by Bray as RPTFE (reinforced polytetrafluoroethylene.)

3 Firesafe and metal seated valve only.

4 Used in high cycle configuration.

PARTS LIST AND MATERIAL SPECIFICATIONS (EN)

ITEM	DESCRIPTION	MATERIAL	
		Resilient Seated	Optional
1	Body	Carbon Steel, EN 1.0619/EN 1.0843	Nickel Aluminum Bronze
		Stainless Steel, EN 1.4408	
2	Disc	Stainless Steel, EN 1.4408	Nickel Aluminum Bronze
			Electroless Nickel Plating ³
			Nitride Hardened Stainless Steel ³
3	Stem	17-4 PH Stainless Steel	Monel® K500
			316 Stainless Steel, EN 1.4401
			Inconel® 718
4	Seat Assembly	RPTFE ² with Resilient Energizer	PTFE with Resilient Energizer
			TFM with Low Temperature Resilient Energizer
			Inconel® 718 & RPTFE ² with Resilient Energizer ³
5	Seat Retainer	Carbon Steel, EN 1.0619/EN 1.0843	Nickel Aluminum Bronze
		Stainless Steel, EN 1.4408	
6A	Locating Plug	316 Stainless Steel, EN 1.4401	–
6B	Bottom Plate	Carbon Steel, Phosphate Coated	–
		316 Stainless Steel, EN 1.4401	
7	Gasket, Locating Plug	PTFE	Flexible Graphite ³
8	Bearing	316 Stainless Steel with Glass Fiber Reinforced PTFE Liner	Nitride Hardened Stainless Steel ³
9	Disc Spacers	316 Stainless Steel, EN 1.4401	Nitronic® 60 ⁴
10	Drive Screw	18-8 Stainless Steel	–
11	ID Tag	18-8 Stainless Steel	–
12	Thrust Washer	316 Stainless Steel, EN 1.4401	–
13	Stem Seal Set	PTFE rings + 1 Carbon Fiber Ring	Flexible Graphite Rings ³
			Carbon and Graphite Filled PTFE ⁴
14	Ground Washer	–	316 Stainless Steel (not shown)
15	Stud	316 Stainless Steel, EN 1.4401	–
16	Gland Ring	316 Stainless Steel, EN 1.4401	–
17	Retaining Ring	18-8 Stainless Steel	–
18	Gland Retainer	316 Stainless Steel	–
19	Lock Washers or Belleville Washers ⁴	18-8 Stainless Steel	17-7 Stainless Steel
20	Hex Nut	18-8 Stainless Steel	–
21	Mounting Bracket	Carbon Steel, Zinc Plated	316 Stainless Steel
22	Cap Screws	18-8 Stainless Steel	Alloy Steel
23	Taper Pins	17-4 PH Stainless Steel	Monel® K500
24	Lock Washers	18-8 Stainless Steel	Alloy Steel
25	Cap Screws	18-8 Stainless Steel	Alloy Steel
26	Gasket ³	–	Flexible Graphite ³
27	Metal Seat ³	–	Inconel® 718, ASTM B670 ³
31	Cap Screws	18-8 Stainless Steel	Alloy Steel
32	Gasket, Bottom Plate	PTFE	–

NOTES

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> Additional materials available upon request.

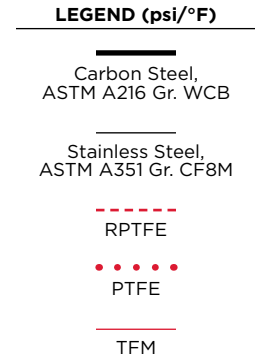
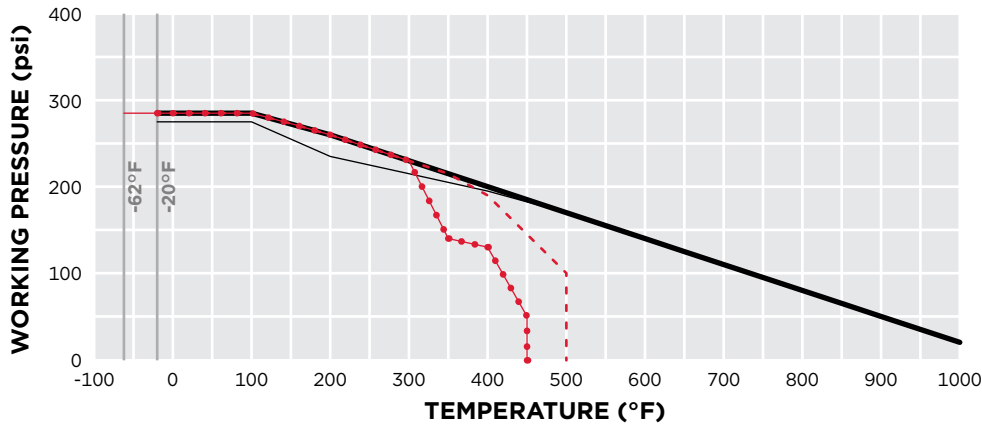
1 May require pressure rating to be reduced. Contact Bray for more information.

2 RTFE is supplied by Bray as RPTFE (reinforced polytetrafluoroethylene.)

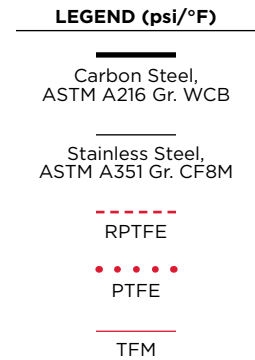
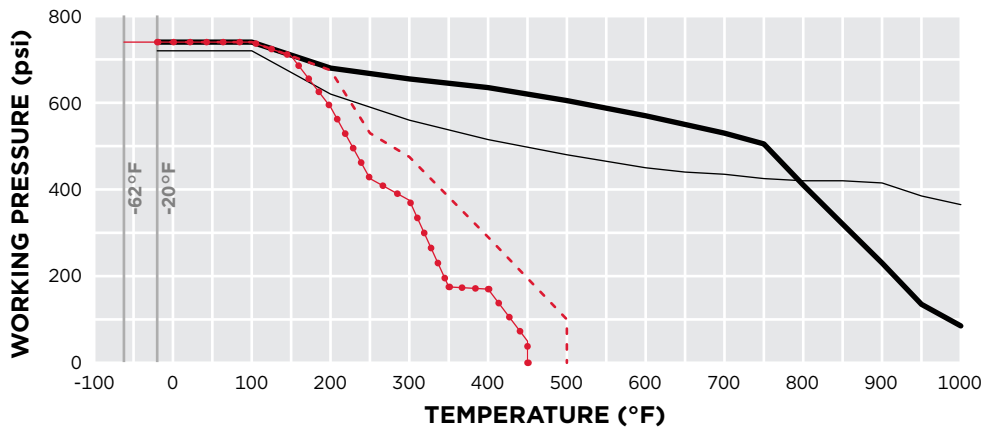
3 Firesafe and metal seated valve only.

4 Used in high cycle configuration.

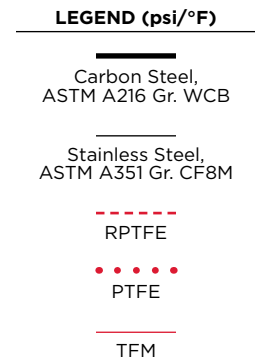
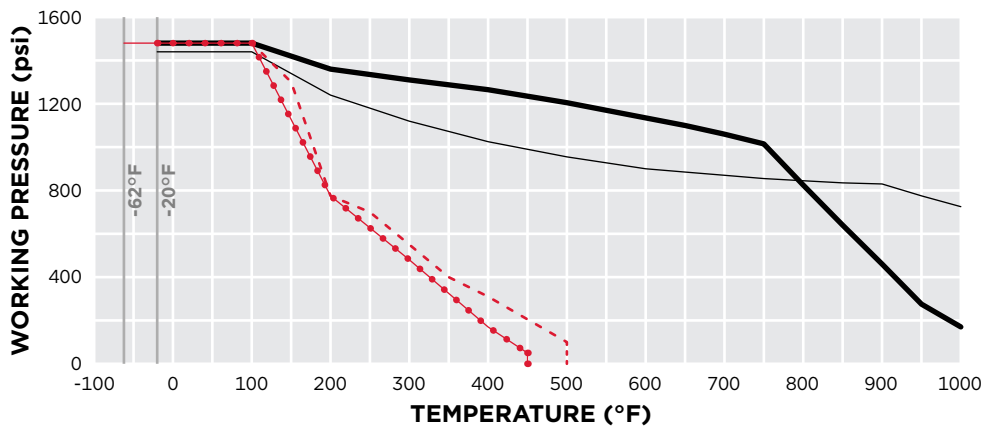
ASME CLASS 150 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



ASME CLASS 300 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



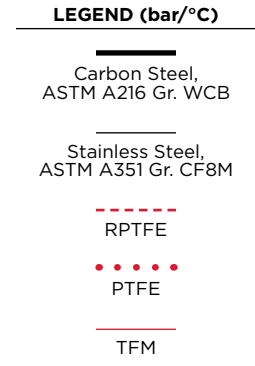
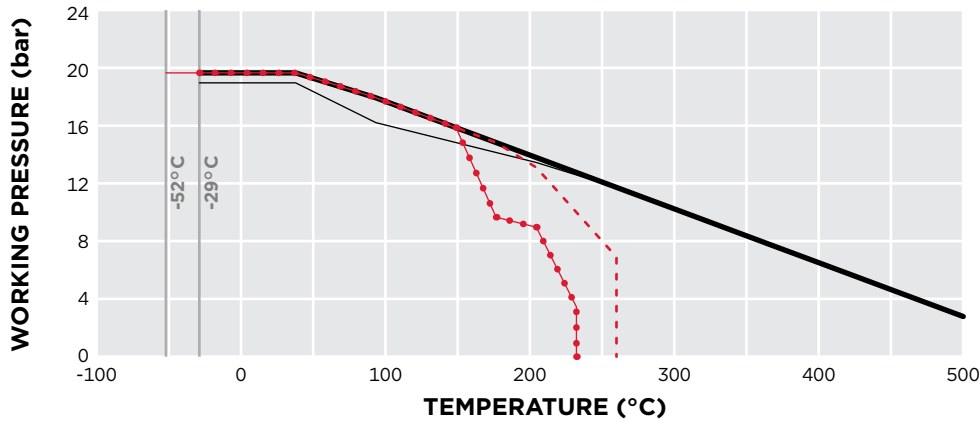
ASME CLASS 600 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



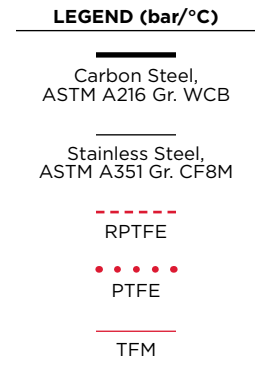
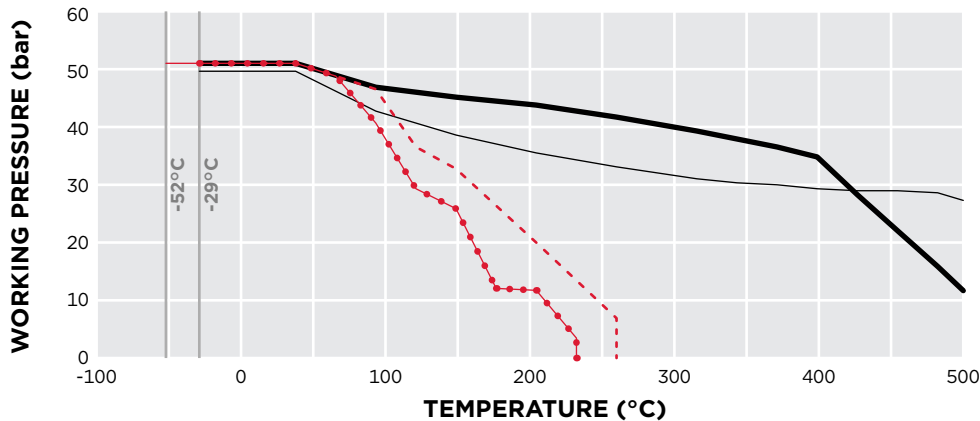
NOTES

- 1 The Firesafe design is limited to the same pressure/temperature rating as the resilient seat material.
- 2 The Inconel® seat used in the metal seated design is limited to the same pressure/temperature rating as the body material.

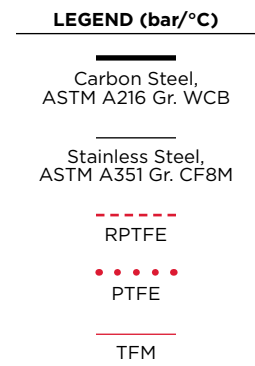
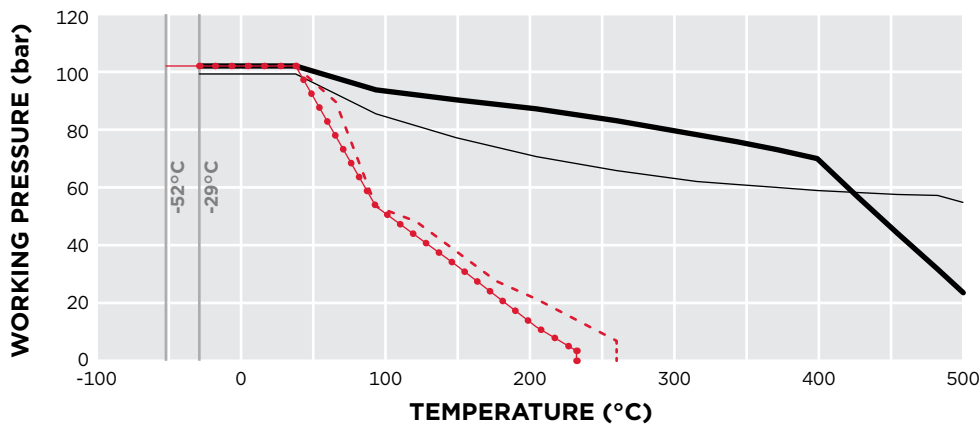
ASME CLASS 150 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



ASME CLASS 300 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



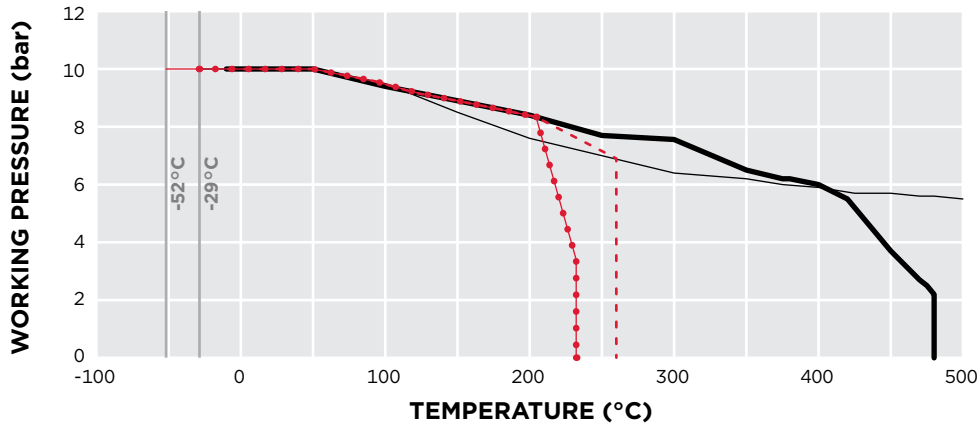
ASME CLASS 600 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



NOTES

- 1 The Firesafe design is limited to the same pressure/temperature rating as the resilient seat material.
- 2 The Inconel® seat used in the metal seated design is limited to the same pressure/temperature rating as the body material.

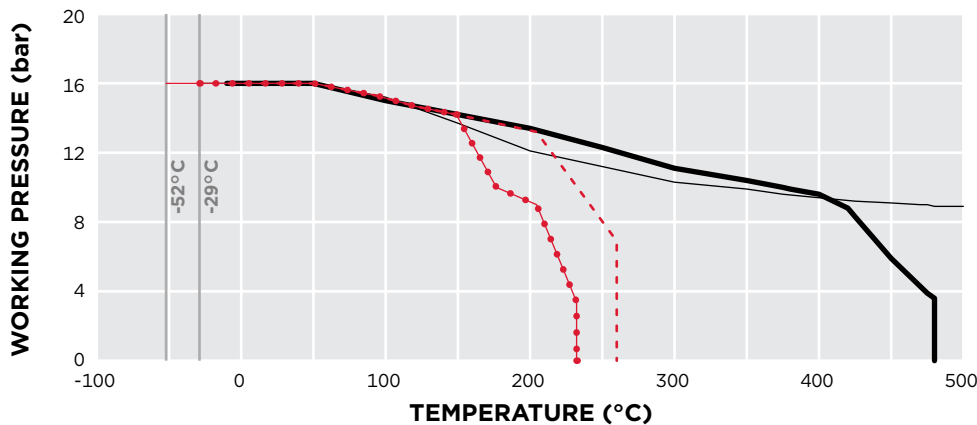
PN10 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



LEGEND (bar/°C)

- Carbon Steel, 1.0619/1.0843
- Stainless Steel, 1.4408
- RPTFE
- PTFE
- TFM

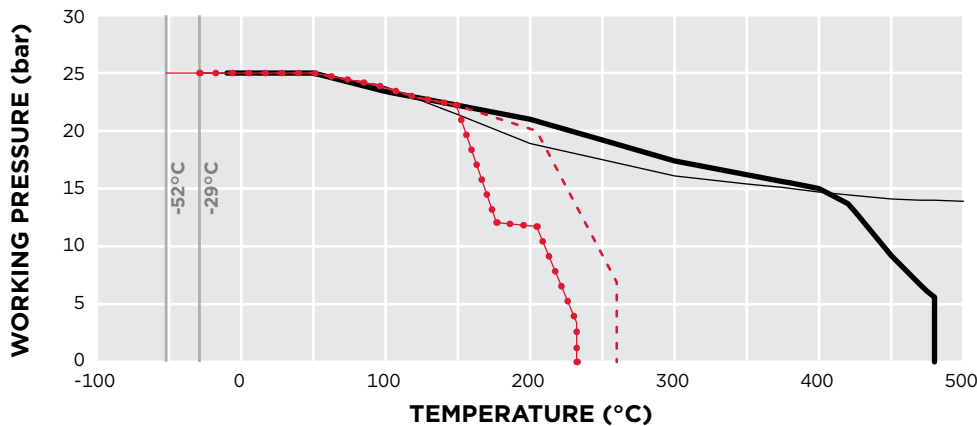
PN16 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



LEGEND (bar/°C)

- Carbon Steel, 1.0619/1.0843
- Stainless Steel, 1.4408
- RPTFE
- PTFE
- TFM

PN25 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



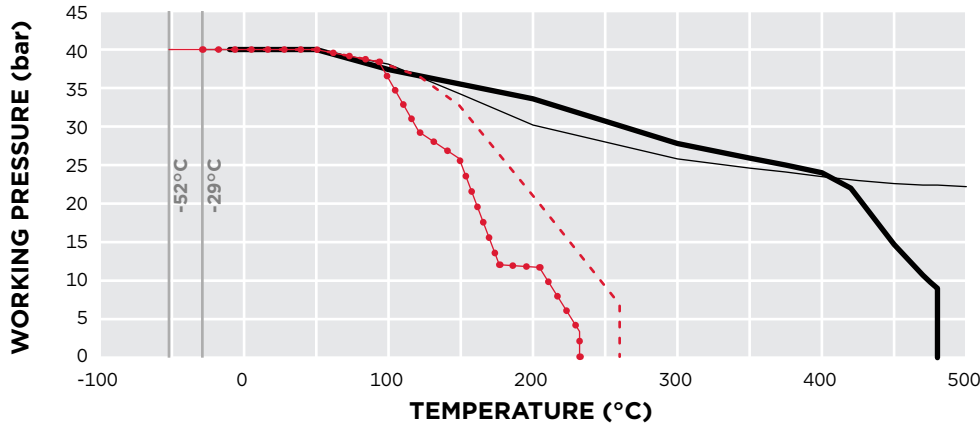
LEGEND (bar/°C)

- Carbon Steel, 1.0619/1.0843
- Stainless Steel, 1.4408
- RPTFE
- PTFE
- TFM

NOTES

- 1 The Firesafe design is limited to the same pressure/temperature rating as the resilient seat material.
- 2 The Inconel® seat used in the metal seated design is limited to the same pressure/temperature rating as the body material.

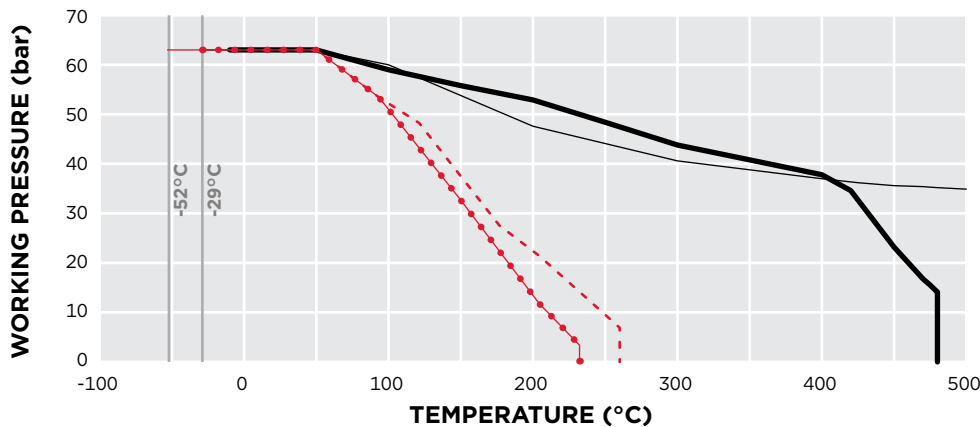
PN40 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



LEGEND (bar/°C)

- Carbon Steel, 1.0619/1.0843
- Stainless Steel, 1.4408
- - - RPTFE
- PTFE
- TFM

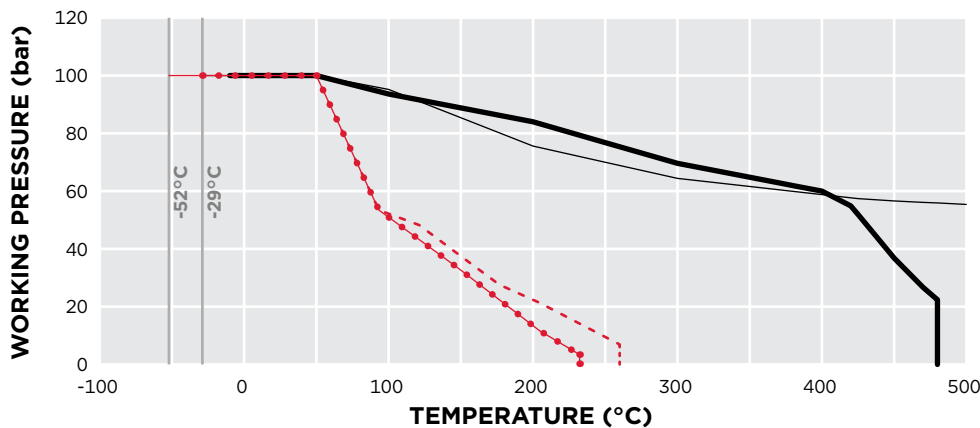
PN63 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



LEGEND (bar/°C)

- Carbon Steel, 1.0619/1.0843
- Stainless Steel, 1.4408
- - - RPTFE
- PTFE
- TFM

PN100 | RESILIENT SEATED | FIRESAFE¹ | METAL SEATED²



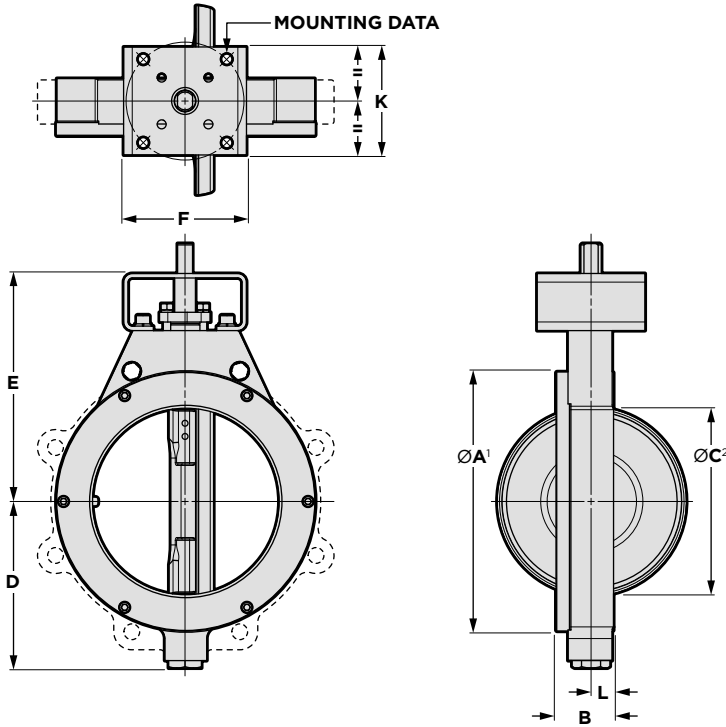
LEGEND (bar/°C)

- Carbon Steel, 1.0619/1.0843
- Stainless Steel, 1.4408
- - - RPTFE
- PTFE
- TFM

NOTES

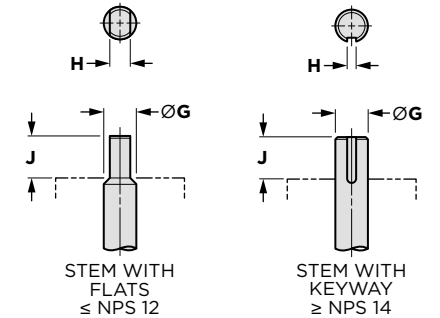
- 1 The Firesafe design is limited to the same pressure/temperature rating as the resilient seat material.
- 2 The Inconel® seat used in the metal seated design is limited to the same pressure/temperature rating as the body material.

ASME CLASS 150 – SERIES 40 WAFER/41 LUG



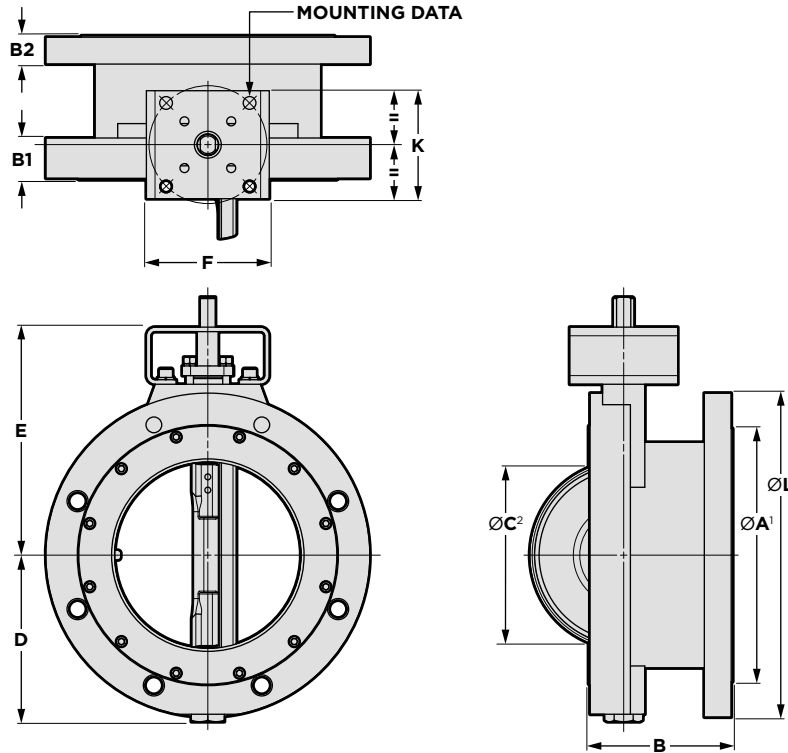
- NOTES**
- > Additional flange drilling options available.
 - > Weights are for cast steel bodies, except when noted.
 - 1 Dimension A is diameter of raised face flange.
 - 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).
 - 3 Flame cut body weights. Flame cut steel and stainless steel bodies vary. Consult Bray factory.

STEM DETAILS



NPS	DIMENSIONS (inches)											WEIGHT (lbs)				
	ØA ¹	B	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			Wafer	Lug
												Bolt Circle	Hole Qty	Hole Dia		
2	4.00	1.75	1.94	3.63	6.00	4.36	0.55	0.39	1.25	2.50	0.73	2.76	4	0.38	9	11
2 1/2	4.75	1.88	2.32	3.82	6.38	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	11	13
3	5.25	1.88	2.90	4.10	6.63	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	13	15
4	6.72	2.03	3.83	4.72	7.50	4.36	0.63	0.43	1.25	2.50	0.75	2.76	4	0.38	20	23
5	7.62	2.23	4.81	5.07	7.50	5.12	0.75	0.51	1.25	4.50	0.94	4.92	4	0.53	27	32
6	8.62	2.23	5.88	5.57	8.00	5.12	0.75	0.51	1.25	4.50	0.94	4.92	4	0.53	32	36
8	10.81	2.40	7.94	6.94	9.50	5.12	0.88	0.63	1.25	4.50	0.94	4.92	4	0.53	48	54
10	13.06	2.75	10.02	8.56	10.75	6.12	1.18	0.87	2.00	4.50	1.07	4.92	4	0.53	79	93
12	15.42	3.08	11.87	10.18	12.25	6.12	1.18	0.87	2.00	4.50	1.13	4.92	4	0.53	118	134
14	17.24	3.73	13.00	11.95	14.50	7.75	1.38	.39 x .39	2.00	6.50	1.42	4.92	4	0.53	211	221
16	19.50	4.11	14.75	13.10	17.75	10.38	1.97	.47 x .39	2.50	6.50	1.66	6.50	4	0.81	314	337
18	21.38	4.61	16.62	14.37	20.00	10.38	1.97	.47 x .39	2.50	6.50	1.86	6.50	4	0.81	404	429
20	23.62	5.03	18.50	15.55	22.75	10.38	2.50	.63 x .63	4.00	6.50	2.06	6.50	4	0.81	533	568
24	27.96	6.00	22.62	18.38	25.00	15.38	3.00	.75 x .75	4.00	11.75	2.44	10.00	8	0.67	810	849
26	29.50	6.50	24.00	19.23	25.00	15.38	3.00	.75 x .75	4.00	11.75	2.84	10.00	8	0.67	1053 ³	1208 ³
28	32.41	6.50	26.62	20.55	26.75	15.38	3.00	.75 x .75	4.00	11.75	2.81	10.00	8	0.67	1119	1228
30	34.41	7.50	28.25	21.38	28.75	19.50	3.50	.88 x .63	5.25	13.50	3.10	11.73	8	0.81	1466	1577
32	37.62	7.50	30.25	22.36	30.00	19.50	3.50	.88 x .63	5.25	13.50	3.22	11.73	8	0.81	1650 ³	1825 ³
34	39.62	7.75	31.50	23.86	30.00	19.50	3.50	.88 x .63	5.25	13.50	3.35	11.73	8	0.81	1890 ³	2340 ³
36	39.87	8.26	34.00	25.27	33.00	19.50	3.50	.88 x .63	5.25	13.50	3.63	11.73	8	0.81	1983	2294
40	44.20	9.51	37.50	27.25	37.00	19.50	4.50	1.0 x .75	5.25	13.50	4.38	11.73	8	0.81	2625 ³	3515 ³
42	46.20	9.51	39.50	29.37	38.00	19.50	4.50	1.0 x .75	5.25	13.50	4.38	11.73	8	0.81	3216 ³	3813
48	52.25	10.00	46.00	33.12	42.13	24.00	5.00	1.25 x .88	6.00	16.00	4.50	14.02	8	1.25	4582 ³	5119 ³
54	58.88	10.75	52.45	35.68	45.50	24.00	6.00	1.5 x 1.0	6.50	16.00	4.75	14.02	8	1.25	5172 ³	6618 ³
60	64.63	12.50	58.50	38.94	50.75	26.00	7.00	1.75 x 1.5	7.50	18.70	5.50	15.98	8	1.50	7168 ³	7793
66	72.75	12.00	64.75	42.69	50.31	23.00	4.50	1.0 x .75	5.25	16.00	5.93	14.02	8	1.25	—	6947

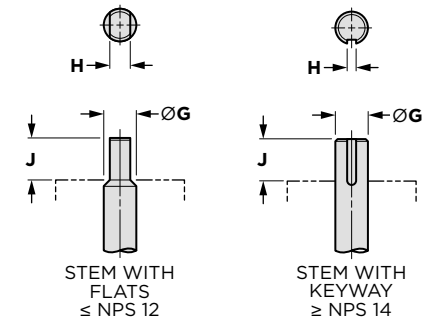
ASME CLASS 150 — SERIES 4A DOUBLE FLANGED



NOTES

- > Additional flange drilling options available.
- 1 Dimension A is diameter of raised face flange.
- 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).

STEM DETAILS



DIMENSIONS (inches)

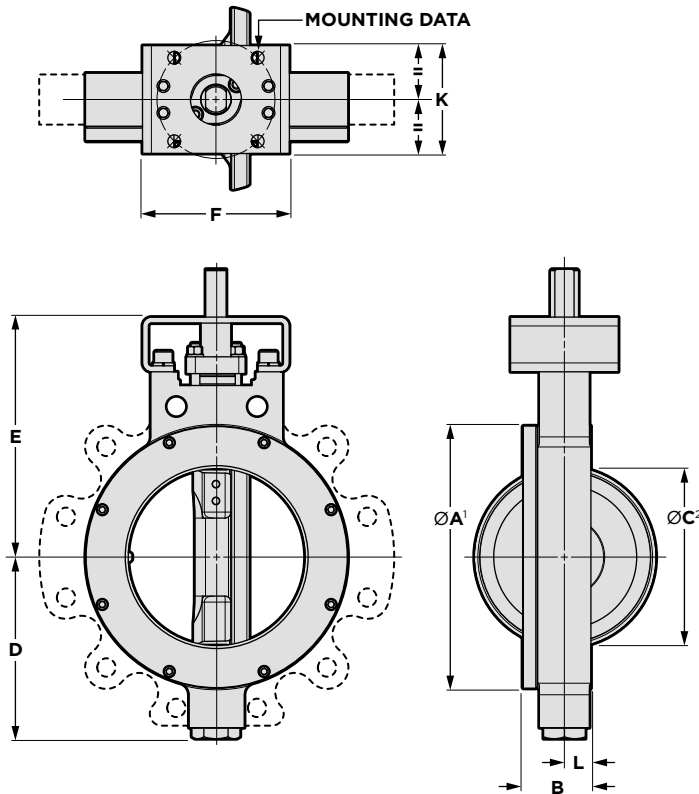
WEIGHT (lbs)

NPS	ØA¹	B	B1	B2	ØC²	D	E	F	ØG	H	J	K	L	Mounting Data			Weight (lbs)
														Bolt Circle	Hole Qty	Hole Dia	
3	5.25	4.50	1.40	1.06	2.30	4.10	6.63	4.36	0.63	0.43	1.25	2.50	7.50	2.76	4	0.38	31
4	6.75	5.00	1.47	1.06	3.15	4.74	7.50	4.36	0.63	0.43	1.25	2.50	9.00	2.76	4	0.38	45
5	7.42	5.50	1.36	1.06	4.56	5.09	7.50	5.12	0.75	0.51	1.25	4.50	10.00	2.76	4	0.38	58
6	8.63	5.50	1.51	1.06	5.63	5.50	8.00	5.12	0.75	0.51	1.25	4.50	11.00	2.76	4	0.38	64
8	10.62	6.00	1.74	1.18	7.63	6.94	9.50	5.12	0.88	0.63	1.25	4.50	13.50	4.92	4	0.53	103
10	13.09	6.50	1.81	1.25	9.56	8.56	10.75	6.12	1.18	0.87	2.00	4.50	16.00	4.92	4	0.53	152
12	15.49	7.00	2.07	1.31	11.37	10.18	12.25	6.12	1.18	0.87	2.00	4.50	19.00	4.92	4	0.53	228
14	17.25	7.50	2.28	1.44	12.50	11.95	14.50	7.75	1.38	.39 x .39	2.00	6.50	21.00	4.92	4	0.53	359
16	19.75	8.50	2.24	1.50	14.25	13.10	17.75	10.38	1.97	.47 x .39	2.50	6.50	23.50	6.50	4	0.81	481
18	21.38	8.75	2.45	1.62	16.25	14.37	20.00	10.38	1.97	.47 x .39	2.50	6.50	25.00	6.50	4	0.81	585
20	23.62	8.99	2.58	1.74	18.12	15.55	22.75	10.38	2.50	.63 x .63	4.00	6.50	28.15	6.50	4	0.81	774
24	27.96	10.56	3.00	1.94	22.00	18.38	25.00	15.38	3.00	.75 x .75	4.00	11.75	33.00	10.00	8	0.67	1179
28	32.00	11.50	4.00	2.88	26.12	20.55	26.75	15.38	3.00	.75 x .75	4.00	11.75	36.50	10.00	8	0.67	1680
30	34.50	12.52	4.33	3.07	27.75	21.36	28.75	19.50	3.50	.88 x .63	5.25	13.50	38.75	11.73	8	0.81	1266
32	36.00	12.54	4.90	3.32	29.75	22.36	30.00	19.50	3.50	.88 x .63	5.25	13.50	41.75	11.73	8	0.81	2408
36	40.25	12.99	5.57	3.69	33.50	25.27	33.00	19.50	3.50	.88 x .63	5.25	13.50	46.00	11.73	8	0.81	3061
42	48.00	16.14	5.82	3.94	39.50	29.37	38.00	19.50	4.50	1.0 x .75	5.25	13.50	53.31	11.73	8	0.81	5005

NOTE

> For sizes not shown, contact Bray for more information.

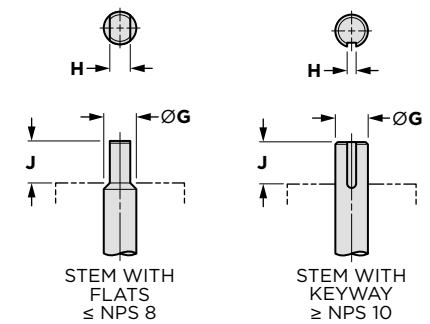
ASME CLASS 300 – SERIES 42 WAFER/43 LUG



NOTES

- > Additional flange drilling options available.
- > Weights are for cast steel bodies, except when noted.
- 1 Dimension A is diameter of raised face flange.
- 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).

STEM DETAILS

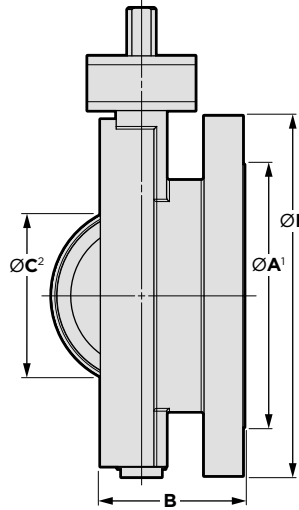
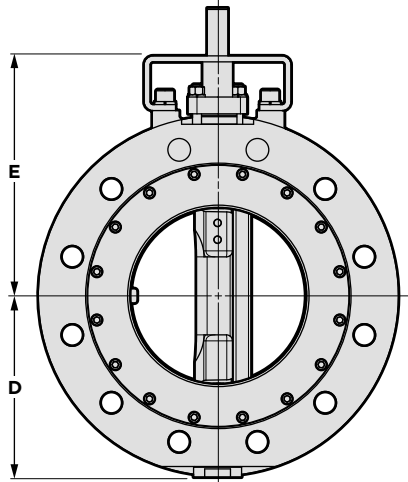
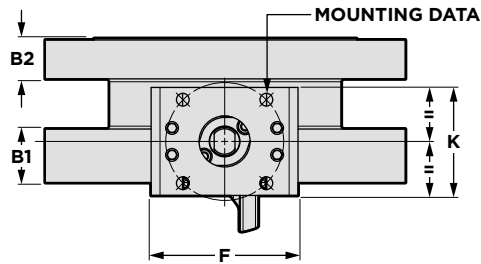


NPS	DIMENSIONS (inches)											WEIGHT (lbs)				
	ØA ¹	B	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			Wafer	Lug
												Bolt Circle	Hole Qty	Hole Dia		
2	4.00	1.75	1.94	3.63	6.00	4.36	0.55	0.39	1.25	2.50	0.73	2.76	4	0.38	9	11
2 1/2	4.75	1.88	2.32	3.82	6.38	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	11	13
3	5.25	1.88	2.90	4.10	6.63	4.36	0.63	0.43	1.25	2.50	0.77	2.76	4	0.38	13	15
4	6.72	2.03	3.83	4.72	7.50	4.36	0.63	0.43	1.25	2.50	0.75	2.76	4	0.38	20	23
5	8.25	2.23	4.81	5.07	8.00	5.12	0.75	0.51	1.25	4.50	0.94	4.92	4	0.53	33	39
6	8.88	2.42	5.76	6.25	8.75	5.12	0.87	0.63	1.25	4.50	0.99	4.92	4	0.53	41	51
8	10.94	2.82	7.63	7.55	10.00	6.12	1.18	0.87	2.00	4.50	1.10	4.92	4	0.53	69	83
10	13.26	3.28	9.50	9.36	11.38	6.12	1.38	.39 x .39	2.00	4.50	1.28	4.92	4	0.53	114	137
12	15.42	3.62	11.37	10.89	13.50	7.75	1.38	.39 x .39	2.00	6.50	1.40	4.92	4	0.53	173	210
14	17.27	4.66	11.50	12.50	18.25	10.38	1.97	.47 x .39	2.50	6.50	2.13	6.50	4	0.81	333	445
16	19.50	5.35	14.38	14.18	21.00	10.38	2.50	.63 x .63	4.00	6.50	2.50	6.50	4	0.81	454	531
18	21.38	5.98	15.25	15.43	21.00	15.38	2.50	.63 x .63	4.00	11.75	2.65	10.00	8	0.67	609	753
20	23.76	6.33	16.50	16.80	22.25	15.38	3.00	.75 x .75	4.00	11.75	2.90	10.00	8	0.67	783	960
24	28.75	7.15	20.88	19.80	26.25	19.50	3.50	.88 x .63	5.25	13.50	3.40	11.73	8	0.81	1281	1555
30	35.00	9.00	27.50	23.40	32.25	24.00	4.50	1.0 x .75	5.25	16.00	4.31	14.02	8	1.25	2247	2738
36	42.06	10.67	33.50	27.12	36.25	24.00	5.00	1.25 x .88	6.00	16.00	5.23	14.02	8	1.12	3203	3992
42	45.63	11.51	39.50	29.25	40.50	26.00	6.00	1.5 x 1.0	6.50	18.70	5.13	15.98	8	1.25	4417	4694
48	52.06	12.50	45.75	33.16	44.75	29.00	7.00	1.75 x 1.50	7.50	22.00	5.50	19.02	12	1.50	6210	6600

NOTE

> For sizes not shown, contact Bray for more information.

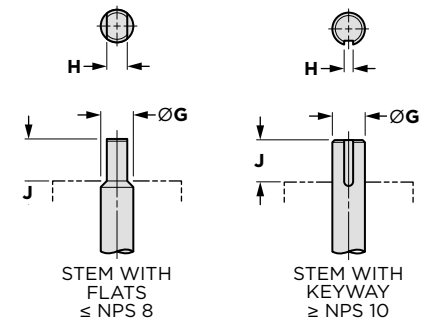
ASME CLASS 300 – SERIES 4B DOUBLE FLANGED



NOTES

- > Additional flange drilling options available.
- > Weights are for cast steel bodies, except when noted.
- 1 Dimension A is diameter of raised face flange.
- 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).

STEM DETAILS



DIMENSIONS (inches)

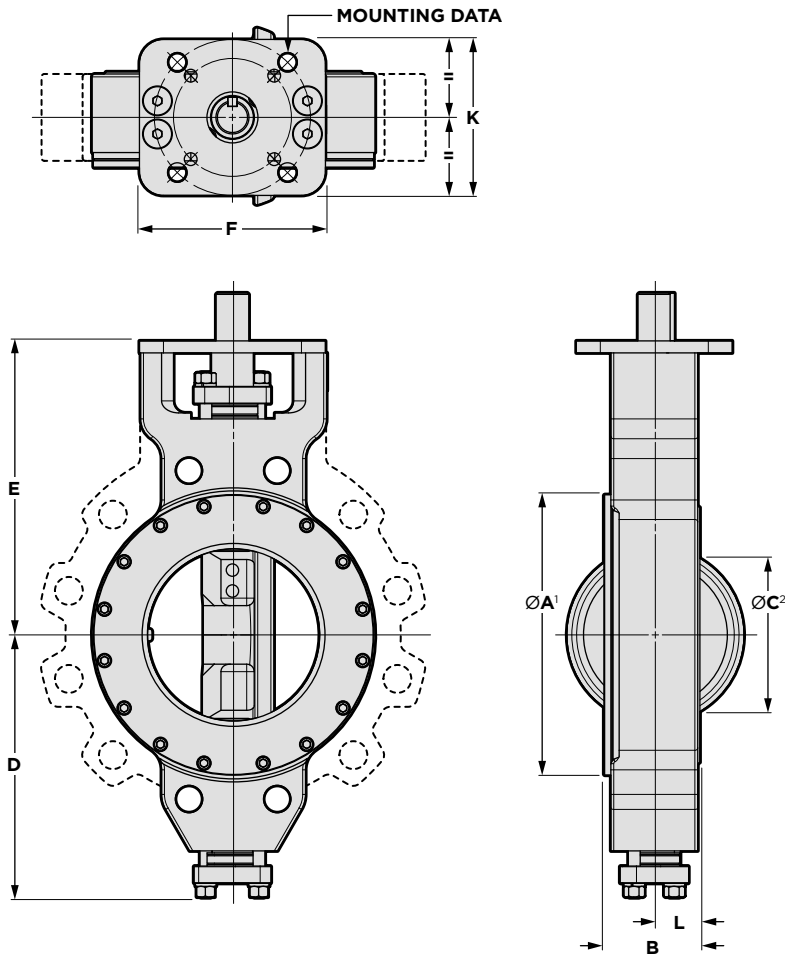
WEIGHT (lbs)

NPS	ØA¹	B	B1	B2	ØC²	D	E	F	ØG	H	J	K	L	Mounting Data			Weight
														Bolt Circle	Hole Qty	Hole Dia	
3	5.25	4.49	1.57	1.12	2.62	4.10	6.63	4.36	0.63	0.43	1.25	2.50	8.25	2.76	4	0.38	39
4	7.00	5.00	1.78	1.25	3.15	4.72	7.50	4.36	0.63	0.43	1.25	2.50	10.00	2.76	4	0.38	62
6	8.50	5.50	1.97	1.44	5.38	6.25	8.75	5.12	0.87	0.63	1.25	4.50	12.50	4.92	4	0.53	86
8	10.94	6.00	2.23	1.68	7.00	7.55	10.00	6.12	1.18	0.87	2.00	4.50	15.00	4.92	4	0.53	171
10	12.78	6.50	2.60	1.94	8.87	9.36	11.38	6.12	1.38	.39 x .39	2.00	4.50	17.50	4.92	4	0.53	209
12	15.00	7.00	2.81	2.06	10.87	10.89	13.50	7.75	1.38	.39 x .39	2.00	6.50	20.50	4.92	4	0.53	401
14	16.25	7.50	2.99	2.18	11.19	12.50	18.25	10.38	1.97	.47 x .39	2.50	6.50	23.00	6.50	4	0.81	613
16	17.80	8.50	3.19	2.31	14.12	14.18	21.00	10.38	2.50	.63 x .63	4.00	6.50	25.50	6.50	4	0.81	773
18	21.00	8.75	3.69	2.44	14.44	15.43	21.00	15.38	2.50	.63 x .63	4.00	11.75	28.00	10.00	8	0.67	1046
20	23.00	9.00	3.63	2.56	16.50	16.80	22.25	15.38	3.00	.75 x .75	4.00	11.75	30.50	10.00	8	0.67	1290
24	27.25	10.50	4.00	2.81	20.38	19.80	26.25	19.50	3.50	.88 x .63	5.25	13.50	36.00	11.73	8	0.81	2011
30	33.81	12.52	5.12	3.71	27.50	23.40	32.25	24.00	4.50	1.0 x .75	5.25	16.00	43.00	14.02	8	1.25	2339
36	40.26	12.99	6.15	4.21	33.50	27.12	36.25	24.00	5.00	1.25 x .88	6.00	16.00	50.00	14.02	8	1.25	4636
42	45.63	16.14	7.07	4.82	39.50	29.25	40.50	26.00	6.00	1.5 x 1.0	6.50	18.70	50.75	15.98	8	1.25	5475

NOTE

> For sizes not shown, contact Bray for more information.

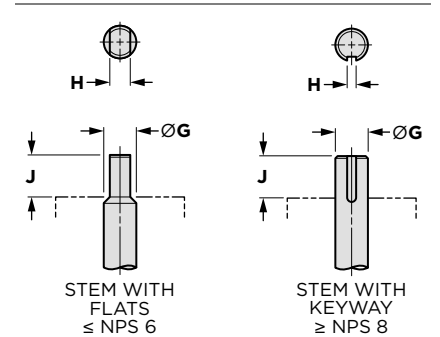
ASME CLASS 600 – SERIES 44 WAFER/45 LUG



NOTES

- > Additional flange drilling options available.
- > Weights are for cast steel bodies, except when noted.
- 1 Dimension A is diameter of raised face flange.
- 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).
- 3 Flame cut body weights. Flame cut steel and stainless steel bodies vary. Consult Bray factory.

STEM DETAILS

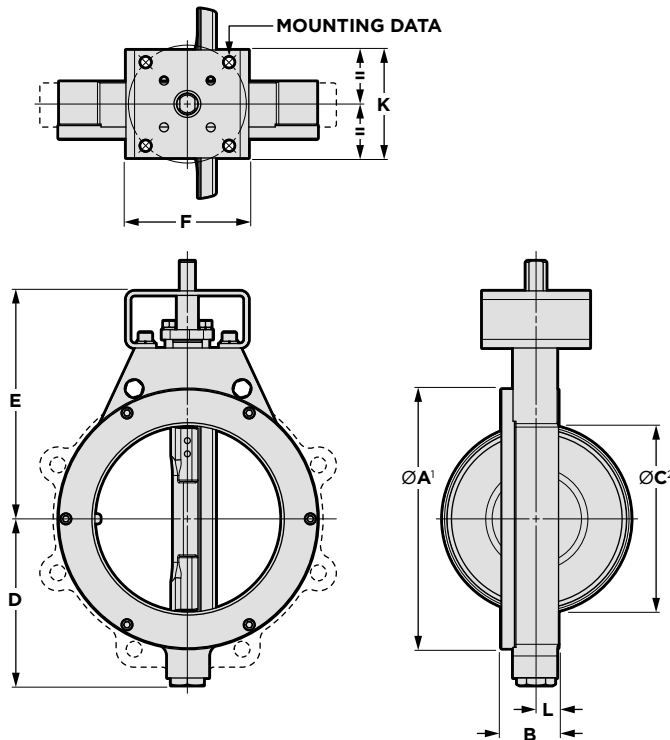


DIMENSIONS (inches)												WEIGHT (lbs)				
NPS	ØA ¹	B	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			Wafer	Lug
												Bolt Circle	Hole Qty	Hole Dia.		
3	5.69	2.22	2.90	5.79	7.00	5.12	0.75	0.51	1.19	4.50	0.90	2.76	4	0.38	25 ³	30 ³
4	7.00	2.50	3.62	7.10	8.50	5.12	1.00	0.63	1.19	4.50	1.15	4.92	4	0.53	40 ³	48 ³
6	9.62	3.18	5.19	8.57	9.75	6.12	1.18	0.87	2.00	4.50	1.38	4.92	4	0.53	78 ³	106 ³
8	11.69	4.00	7.00	10.95	12.25	7.75	0.69	.39 x .39	2.00	6.50	1.90	6.50	4	0.81	149 ³	203 ³
10	13.75	4.61	8.75	14.66	17.00	10.38	1.97	.47 x .39	2.50	6.50	1.96	6.50	4	0.81	281 ³	367 ³
12	16.12	5.51	10.50	15.72	18.25	10.38	1.97	.47 x .39	2.50	6.50	2.53	6.50	4	0.81	407 ³	552 ³
14	17.63	6.09	11.19	17.79	19.75	15.38	2.50	.62 x .62	4.00	11.75	2.90	10.00	8	0.67	497 ³	704 ³
16	20.38	7.00	12.81	19.67	21.75	15.38	3.00	.75 x .75	4.00	11.75	3.44	10.00	8	0.67	681 ³	997 ³
18	22.88	7.75	14.88	21.05	23.75	19.50	3.50	.88 x .62	5.25	13.50	3.60	11.73	8	0.81	992 ³	1311 ³
20	24.63	8.50	16.50	23.21	25.75	19.50	4.00	1 x .75	5.25	13.50	3.88	11.73	8	0.81	1360 ³	1850 ³
24	29.19	9.13	19.88	27.88	31.00	24.00	5.00	1.25 x .88	6.00	16.00	3.94	14.02	8	1.25	1945 ³	2612 ³
36	40.25	13.97	33.50	38.75	44.54	33.50	7.00	1.75 x 1.25	6.75	22.00	5.78	19.01	12	1.50	5274 ³	7095 ³

NOTE

> For sizes not shown, contact Bray for more information.

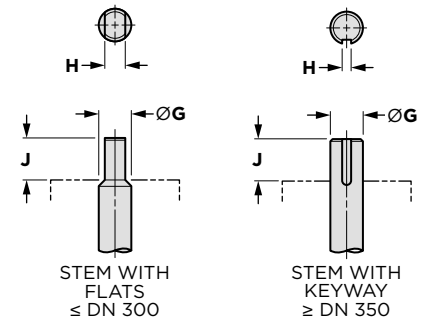
ASME CLASS 150 – SERIES 40 WAFER/41 LUG



NOTES

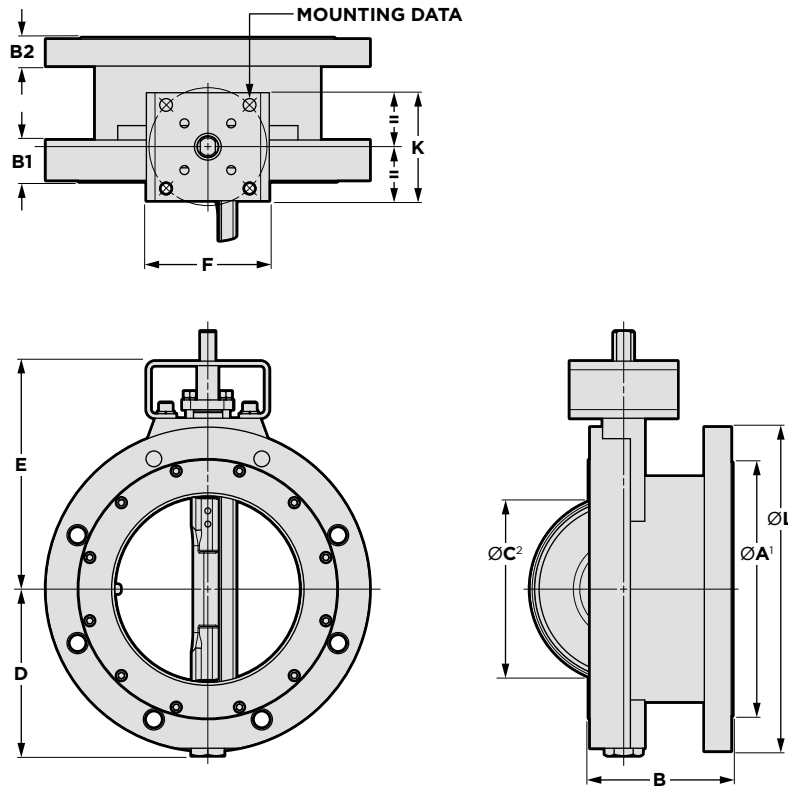
- > Additional flange drilling options available.
 - > Weights are for cast steel bodies, except when noted.
 - > Metric dimensions are converted from imperial.
- 1 Dimension A is diameter of raised face flange.
 - 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).
 - 3 Flame cut body weights. Flame cut steel and stainless steel bodies vary. Consult Bray factory.

STEM DETAILS



DIMENSIONS (mm)													WEIGHT (kg)				
NPS	DN	ØA ¹	B	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			Wafer	Lug
													Bolt Circle	Hole Qty	Hole Dia		
2	50	102	44	49	92	152	111	14	10	32	64	19	70	4	10	4	5
2 1/2	65	121	48	59	97	162	111	16	11	32	64	19	70	4	10	5	6
3	80	133	48	74	104	168	111	16	11	32	64	19	70	4	10	6	7
4	100	171	52	97	120	191	111	16	11	32	64	19	70	4	10	9	10
5	125	194	57	122	129	191	130	19	13	32	114	24	125	4	13	12	14
6	150	219	57	149	142	203	130	19	13	32	114	24	125	4	13	15	16
8	200	275	61	202	176	241	130	22	16	32	114	24	125	4	13	22	24
10	250	332	70	255	217	273	155	30	22	51	114	27	125	4	13	36	42
12	300	392	78	302	259	311	155	30	22	51	114	29	125	4	13	54	61
14	350	438	95	330	304	368	197	35	10 x 10	51	165	36	125	4	13	96	100
16	400	495	104	375	333	451	264	50	12 x 10	64	165	42	165	4	21	142	153
18	450	543	117	422	365	508	264	50	12 x 10	64	165	47	165	4	21	183	194
20	500	600	128	470	395	578	264	64	16 x 16	102	165	52	165	4	21	242	258
24	600	710	152	575	467	635	391	76	19 x 19	102	298	62	254	8	17	368	385
26	—	749	165	610	489	635	391	76	19 x 19	102	298	72	254	8	17	477 ³	548 ³
28	700	823	165	676	522	679	391	76	19 x 19	102	298	71	254	8	17	508	557
30	750	874	191	718	543	730	495	89	22 x 16	133	343	79	298	8	21	665	715
32	800	956	191	768	568	762	495	89	22 x 16	133	343	82	298	8	21	748 ³	828 ³
34	—	1006	197	800	606	762	495	89	22 x 16	133	343	85	298	8	21	857 ³	1061 ³
36	900	1013	210	864	642	838	495	89	22 x 16	133	343	92	298	8	21	899	1041
40	1000	1123	241	953	692	940	495	114	25 x 19	133	343	111	298	8	21	1191 ³	1594 ³
42	—	1173	241	1003	746	965	495	114	25 x 19	133	343	111	298	8	21	1459 ³	1729
48	1200	1327	254	1168	841	1070	610	127	32 x 22	152	406	114	356	8	32	2079 ³	2322 ³
54	1400	1496	273	1332	906	1156	610	152	38 x 25	165	406	121	356	8	32	2346 ³	3002
60	1500	1642	318	1486	989	1289	660	178	44 x 38	191	475	140	406	8	38	3251 ³	3535 ³
66	—	1848	305	1645	1084	1278	584	114	25 x 19	133	406	151	356	8	32	—	3151

ASME CLASS 150 — SERIES 4A DOUBLE FLANGED

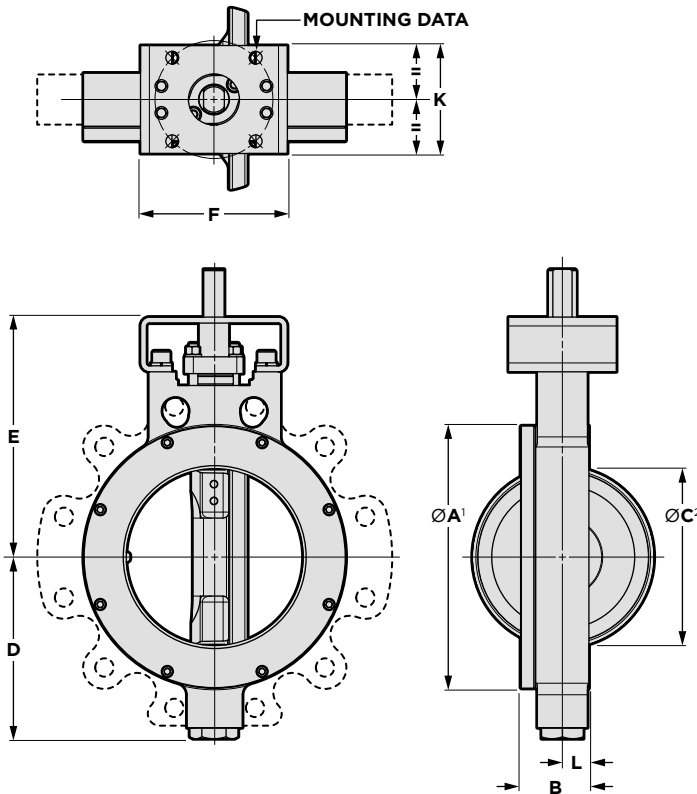


- NOTES**
- > Additional flange drilling options available.
 - > Weights are for cast steel bodies, except when noted.
 - > Metric dimensions are converted from imperial.
- 1 Dimension A is diameter of raised face flange.
 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).

DIMENSIONS (mm)															WEIGHT			
NPS	DN	ØA ¹	B	B1	B2	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			(kg)
															Bolt Circle	Hole Qty	Hole Dia	
3	80	133	114	36	27	58	104	168	111	16	11	32	64	191	70	4	10	14
4	100	171	127	37	27	80	120	191	111	16	11	32	64	229	70	4	10	21
5	125	189	140	35	27	116	129	191	130	19	13	32	114	254	70	4	10	26
6	150	219	140	38	27	143	140	203	130	19	13	32	114	279	70	4	10	29
8	200	270	152	44	30	194	176	241	130	22	16	32	114	343	125	4	13	47
10	250	333	165	46	32	243	217	273	155	30	22	51	114	406	125	4	13	69
12	300	393	178	53	33	289	259	311	155	30	22	51	114	483	125	4	13	103
14	350	438	191	58	37	318	304	368	197	35	10 x 10	51	165	533	125	4	13	163
16	400	502	216	57	38	362	333	451	264	50	12 x 10	64	165	597	165	4	21	218
18	450	543	222	62	41	413	365	508	264	50	12 x 10	64	165	635	165	4	21	265
20	500	600	228	66	44	460	395	578	264	64	16 x 16	102	165	715	165	4	21	351
24	600	710	268	76	49	559	467	635	391	76	19 x 19	102	298	838	254	8	17	535
28	700	813	292	101	73	664	522	679	391	76	19 x 19	102	298	927	254	8	17	762
30	750	876	318	110	78	705	542	730	495	89	22 x 16	133	343	984	298	8	21	574
32	800	914	318	125	84	756	568	762	495	89	22 x 16	133	343	1060	298	8	21	1092
36	900	1022	330	141	94	851	642	838	495	89	22 x 16	133	343	1168	298	8	21	1388
42	—	1219	410	148	100	1003	746	965	495	114	25 x 19	133	343	1354	298	8	21	2270

NOTE
 > For sizes not shown, contact Bray for more information.

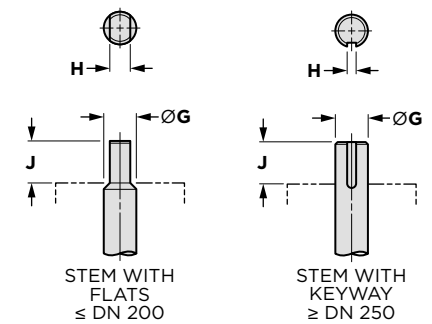
ASME CLASS 300 – SERIES 42 WAFER/43 LUG



NOTES

- > Additional flange drilling options available.
- > Weights are for cast steel bodies, except when noted.
- > Metric dimensions are converted from imperial.
- 1 Dimension A is diameter of raised face flange.
- 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).

STEM DETAILS

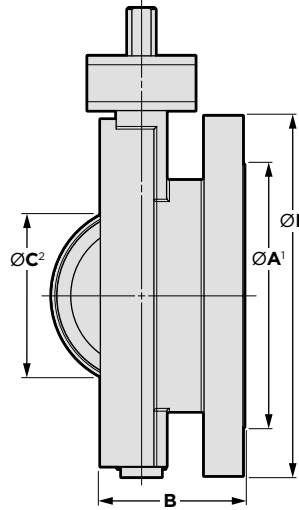
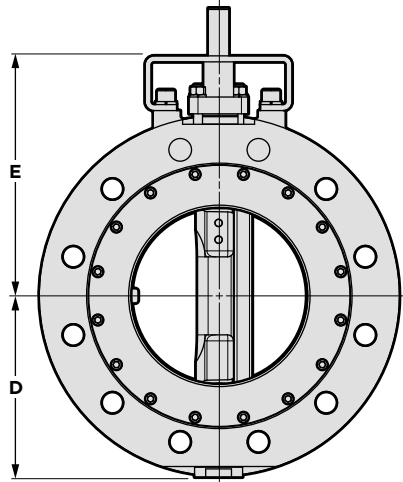
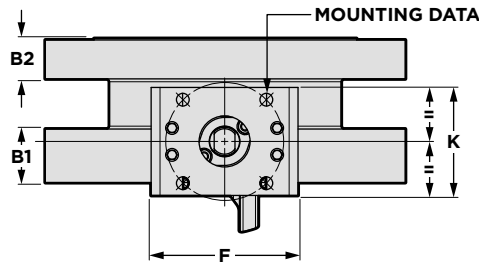


DIMENSIONS (mm)													WEIGHT (kg)				
NPS	DN	ØA¹	B	ØC²	D	E	F	ØG	H	J	K	L	Mounting Data			Wafer	Lug
													Bolt Circle	Hole Qty	Hole Dia		
2	50	102	44	49	92	152	111	14	10	32	64	19	70	4	10	4	5
2 1/2	65	121	48	59	97	162	111	16	11	32	64	19	70	4	10	5	6
3	80	133	48	74	104	168	111	16	11	32	64	19	70	4	10	6	7
4	100	171	52	97	120	191	111	16	11	32	64	19	70	4	10	9	10
5	125	210	57	122	129	203	130	19	13	32	114	24	125	4	13	15	17
6	150	226	61	146	159	222	130	22	16	32	114	25	125	4	13	18	23
8	200	278	72	194	192	254	155	30	22	51	114	28	125	4	13	31	38
10	250	337	83	241	238	289	155	35	10 x 10	51	114	33	125	4	13	52	62
12	300	392	92	289	277	343	197	35	10 x 10	51	165	36	125	4	13	78	95
14	350	439	118	292	318	464	264	50	12 x 10	64	165	54	165	4	21	151	202
16	400	495	136	365	360	533	264	64	16 x 16	102	165	64	165	4	21	206	241
18	450	543	152	387	392	533	391	64	16 x 16	102	298	67	254	8	17	276	342
20	500	604	161	419	427	565	391	76	19 x 19	102	298	74	254	8	17	355	436
24	600	730	181	530	503	667	495	89	22 x 16	133	343	86	298	8	21	581	705
30	750	889	229	699	594	819	610	114	25 x 19	133	406	109	356	8	32	1019	1242
36	900	1068	271	851	689	921	610	127	32 x 22	152	406	133	356	8	28	1453	1811
42	—	1159	292	1003	743	1029	660	152	38 x 25	165	475	130	406	8	32	2003	2129
48	1200	1322	318	1162	842	1137	737	178	44 x 38	191	559	140	483	12	38	2817	2994

NOTE

> For sizes not shown, contact Bray for more information.

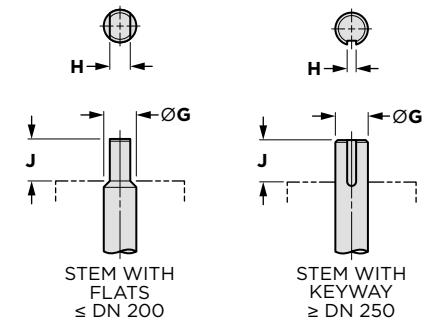
ASME CLASS 300 – SERIES 4B DOUBLE FLANGED



NOTES

- > Additional flange drilling options available.
 - > Weights are for cast steel bodies, except when noted.
 - > Metric dimensions are converted from imperial.
- 1 Dimension A is diameter of raised face flange.
 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).

STEM DETAILS

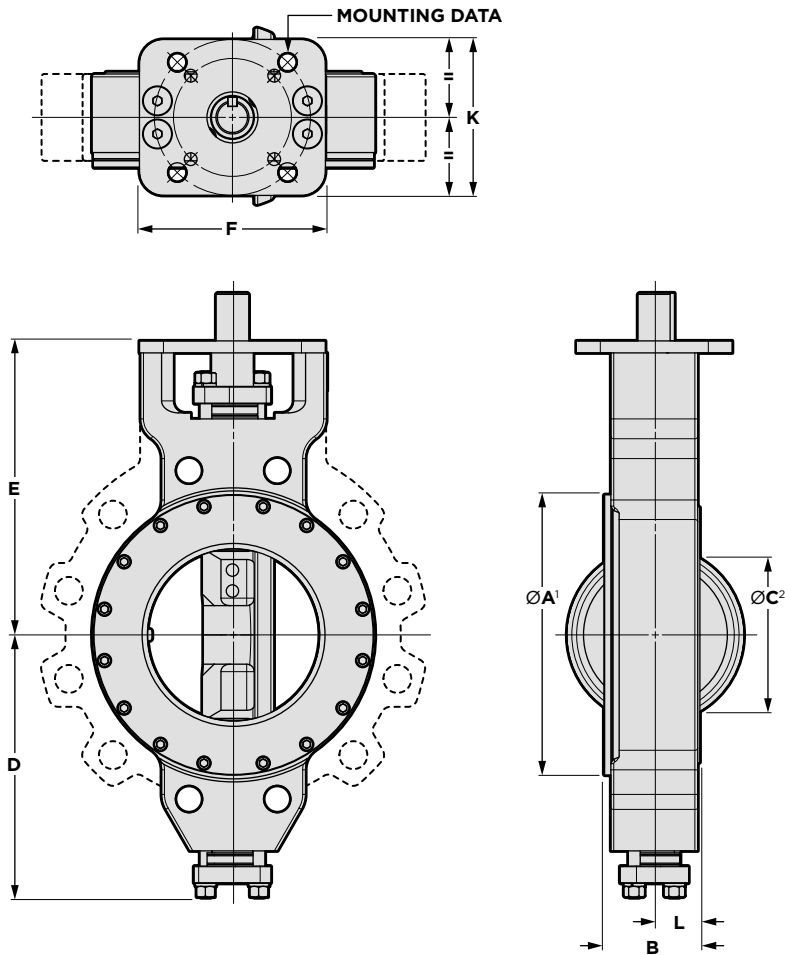


DIMENSIONS (mm)															WEIGHT			
NPS	DN	ØA ¹	B	B1	B2	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			(kg)
															Bolt Circle	Hole Qty	Hole Dia	
3	80	133	114	40	28	67	104	168	111	16	11	32	64	210	70	4	10	18
4	100	178	127	45	32	80	120	191	111	16	11	32	64	254	70	4	10	28
6	150	216	140	50	37	137	159	222	130	22	16	32	114	318	125	4	13	39
8	200	278	152	57	43	178	192	254	155	30	22	51	114	381	125	4	13	78
10	250	325	165	66	49	225	238	289	155	35	10 x 10	51	114	445	125	4	13	95
12	300	381	178	71	52	276	277	343	197	35	10 x 10	51	165	521	125	4	13	182
14	350	413	191	76	55	284	318	464	264	50	12 x 10	64	165	584	165	4	21	278
16	400	452	216	81	59	359	360	533	264	64	16 x 16	102	165	648	165	4	21	350
18	450	533	222	94	62	367	392	533	391	64	16 x 16	102	298	711	254	8	17	474
20	500	584	229	92	65	419	427	565	391	76	19 x 19	102	298	775	254	8	17	585
24	600	692	267	102	71	518	503	667	495	89	22 x 16	133	343	914	298	8	21	912
30	750	859	318	130	94	699	594	819	610	114	25 x 19	133	406	1092	356	8	32	1061
36	900	1023	330	156	107	851	689	921	610	127	32 x 22	152	406	1270	356	8	32	2103
42	—	1159	410	180	122	1003	743	1029	660	152	38 x 25	165	475	1289	406	8	32	2483

NOTE

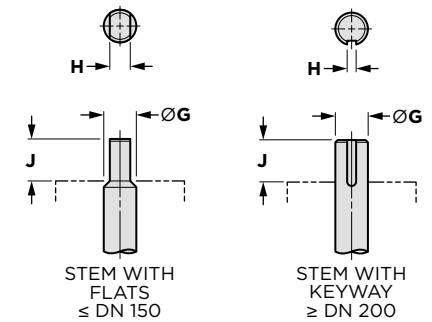
> For sizes not shown, contact Bray for more information.

ASME CLASS 600 – SERIES 44 WAFER/45 LUG



- NOTES**
- > Additional flange drilling options available.
 - > Weights are for cast steel bodies, except when noted.
 - > Metric dimensions are converted from imperial.
- 1 Dimension A is diameter of raised face flange.
 - 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).
 - 3 Flame cut body weights. Flame cut steel and stainless steel bodies vary. Consult Bray factory.

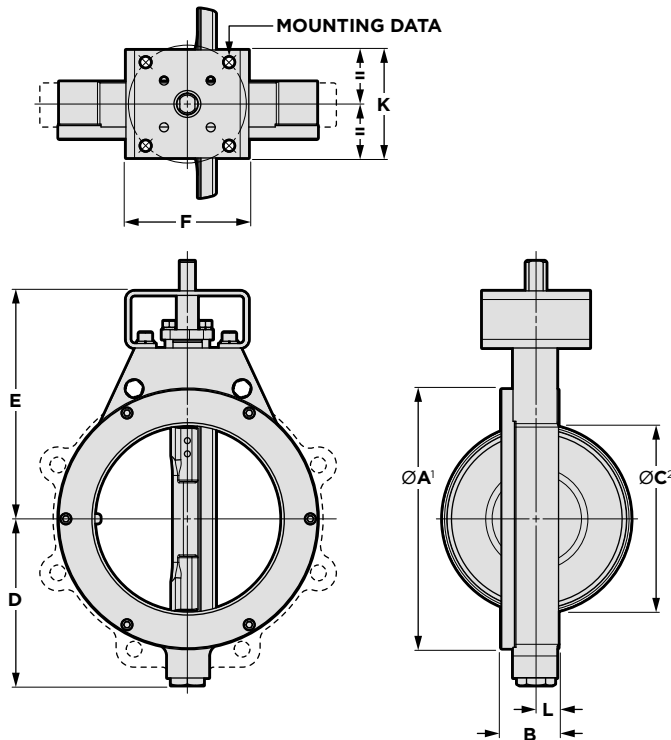
STEM DETAILS



DIMENSIONS (mm)													WEIGHT (kg)				
NPS	DN	ØA ¹	B	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data		Wafer	Lug	
													Bolt Circle	Hole Qty	Hole Dia		
3	80	145	56	74	147	178	130	19	13	30	114	23	70	4	10	11 ³	13 ³
4	100	178	64	92	180	216	130	25	16	30	114	29	125	4	13	18 ³	22 ³
6	150	244	81	132	218	248	155	30	22	51	114	35	125	4	13	36 ³	48 ³
8	200	297	102	178	278	311	197	18	10 x 10	51	165	48	165	4	21	68 ³	92 ³
10	250	349	117	222	372	432	264	50	12 x 10	64	165	50	165	4	21	127 ³	167 ³
12	300	409	140	267	399	464	264	50	12 x 10	64	165	64	165	4	21	185 ³	250 ³
14	350	448	155	284	452	502	391	64	16 x 16	102	298	74	254	8	17	226 ³	319 ³
16	400	518	178	325	500	552	391	76	19 x 19	102	298	87	254	8	17	309 ³	452 ³
18	450	581	197	378	535	603	495	89	22 x 16	133	343	91	298	8	21	450 ³	595 ³
20	500	626	216	419	590	654	495	102	25 x 19	133	343	99	298	8	21	617 ³	839 ³
24	600	741	232	505	708	787	610	127	32 x 22	152	406	100	356	8	32	882 ³	1185 ³
36	900	1022	355	851	984	1131	851	178	44 x 32	171	559	147	483	12	38	2392 ³	3218 ³

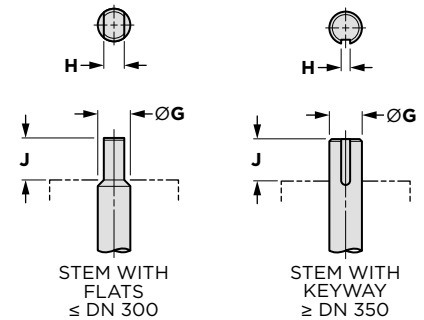
NOTE
> For sizes not shown, contact Bray for more information.

PN 10, 16 – SERIES 40 WAFER/41 LUG



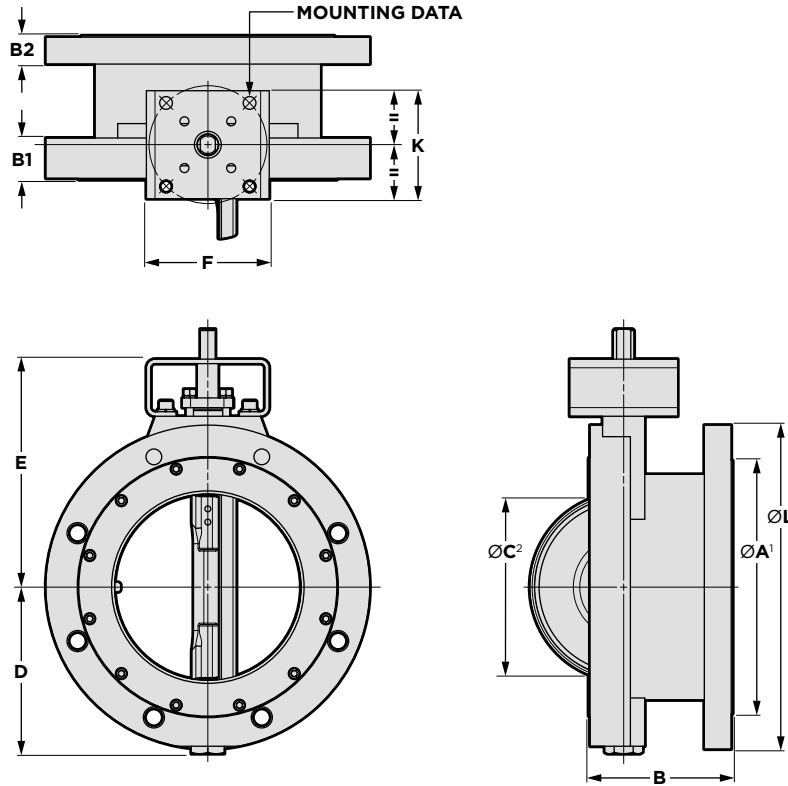
- NOTES**
- > Additional flange drilling options available.
 - > Weights are for cast steel bodies, except when noted.
 - > Metric dimensions are converted from imperial.
- 1 Dimension A is diameter of raised face flange.
 - 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).
 - 3 Flame cut body weights. Flame cut steel and stainless steel bodies vary. Consult Bray factory.

STEM DETAILS

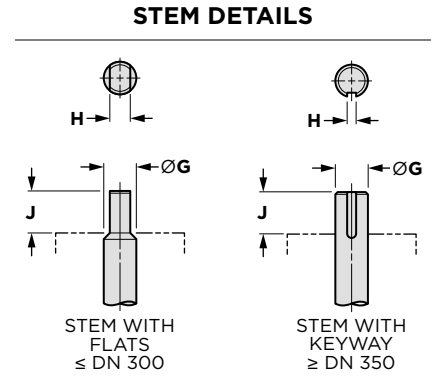


DN	DIMENSIONS (mm)											WEIGHT (kg)				
	ØA ¹	B	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			Wafer	Lug
												Bolt Qty	Hole Dia	Hole Dia		
50	102	44	49	92	152	111	14	10	32	64	19	70	4	10	4	5
65	121	48	59	97	162	111	16	11	32	64	19	70	4	10	5	6
80	133	48	74	104	168	111	16	11	32	64	19	70	4	10	6	7
100	171	52	97	120	191	111	16	11	32	64	19	70	4	10	9	10
125	194	57	122	129	191	130	19	13	32	114	24	125	4	13	12	14
150	219	57	149	142	203	130	19	13	32	114	24	125	4	13	15	16
200	275	61	202	176	241	130	22	16	32	114	24	125	4	13	22	24
250	332	70	255	217	273	155	30	22	51	114	27	125	4	13	36	42
300	392	78	302	259	311	155	30	22	51	114	29	125	4	13	54	61
350	438	95	330	304	368	197	35	10 x 10	51	165	36	125	4	13	96	100
400	495	104	375	333	451	264	50	12 x 10	64	165	42	165	4	21	142	153
450	543	117	422	365	508	264	50	12 x 10	64	165	47	165	4	21	183	194
500	600	128	470	395	578	264	64	16 x 16	102	165	52	165	4	21	242	258
600	710	152	575	467	635	391	76	19 x 19	102	298	62	254	8	17	368	385
700	823	165	676	522	679	391	76	19 x 19	102	298	71	254	8	17	508	557
750	874	191	718	543	730	495	89	22 x 16	133	343	79	298	8	21	665	715
800	956	191	768	568	762	495	89	22 x 16	133	343	82	298	8	21	748 ³	828 ³
900	1013	210	864	642	838	495	89	22 x 16	133	343	92	298	8	21	899	1041
1000	1123	241	953	692	940	495	114	25 x 19	133	343	111	298	8	21	1191 ³	1594 ³
1200	1327	254	1168	841	1070	610	127	32 x 22	152	406	114	356	8	32	2079 ³	2322 ³
1400	1496	273	1332	906	1156	610	152	38 x 25	165	406	121	356	8	32	2346 ³	3002
1500	1642	318	1486	989	1289	660	178	44 x 38	191	475	140	406	8	38	3251 ³	3535 ³

PN 10, 16 – SERIES 4A DOUBLE FLANGED



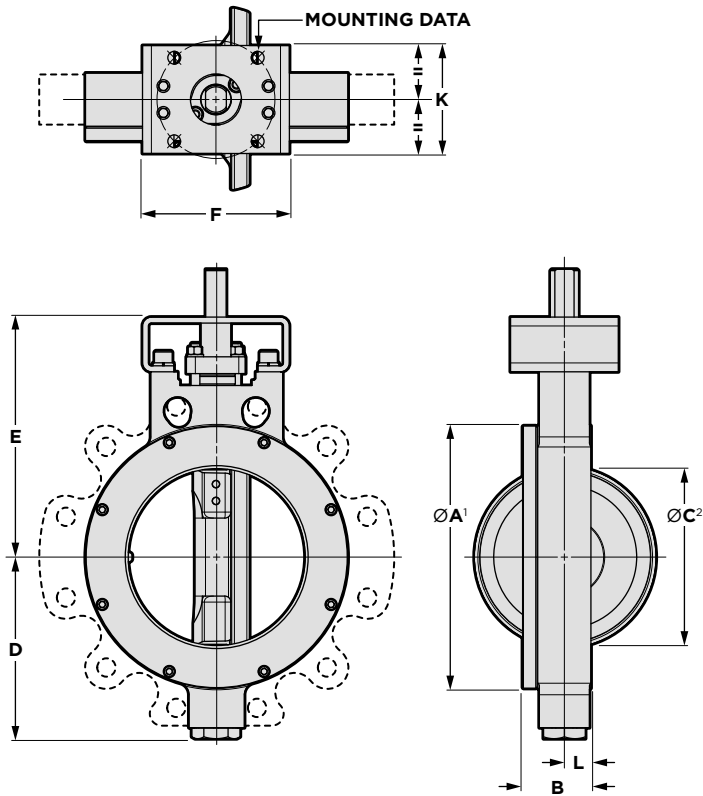
- NOTES**
- > Additional flange drilling options available.
 - > Weights are for cast steel bodies, except when noted.
 - > Metric dimensions are converted from imperial.
- 1 Dimension A is diameter of raised face flange.
 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).



DIMENSIONS (mm)														WEIGHT (kg)			
DN	ØA'	B	B1	B2	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			
														Bolt Circle	Hole Qty	Hole Dia	
80	133	114	36	27	58	104	168	111	16	11	32	64	191	70	4	10	14
100	171	127	37	27	80	120	191	111	16	11	32	64	229	70	4	10	21
125	189	140	35	27	116	129	191	130	19	13	32	114	254	70	4	10	26
150	219	140	38	27	143	140	203	130	19	13	32	114	279	70	4	10	29
200	270	152	44	30	194	176	241	130	22	16	32	114	343	125	4	13	47
250	333	165	46	32	243	217	273	155	30	22	51	114	406	125	4	13	69
300	393	178	53	33	289	259	311	155	30	22	51	114	483	125	4	13	103
350	438	191	58	37	318	304	368	197	35	10 x 10	51	165	533	125	4	13	163
400	502	216	57	38	362	333	451	264	50	12 x 10	64	165	597	165	4	21	218
450	543	222	62	41	413	365	508	264	50	12 x 10	64	165	635	165	4	21	265
500	600	228	66	44	460	395	578	264	64	16 x 16	102	165	715	165	4	21	351
600	710	268	76	49	559	467	635	391	76	19 x 19	102	298	838	254	8	17	535
700	813	292	101	73	664	522	679	391	76	19 x 19	102	298	927	254	8	17	762
750	876	318	110	78	705	542	730	495	89	22 x 16	133	343	984	298	8	21	574
800	914	318	125	84	756	568	762	495	89	22 x 16	133	343	1060	298	8	21	1092
900	1022	330	141	94	851	642	838	495	89	22 x 16	133	343	1168	298	8	21	1388

NOTE
 > For sizes not shown, contact Bray for more information.

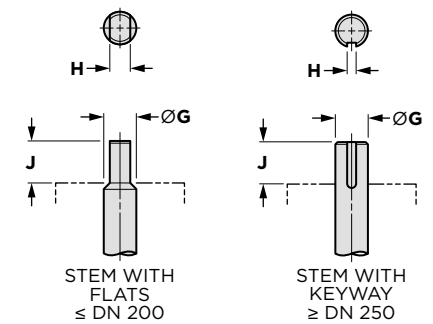
PN 25, 40 – SERIES 42 WAFER/43 LUG



NOTES

- > Additional flange drilling options available.
 - > Weights are for cast steel bodies, except when noted.
 - > Metric dimensions are converted from imperial.
- 1 Dimension A is diameter of raised face flange.
 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).

STEM DETAILS



DIMENSIONS (mm)

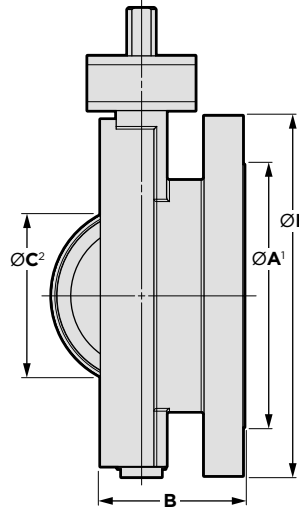
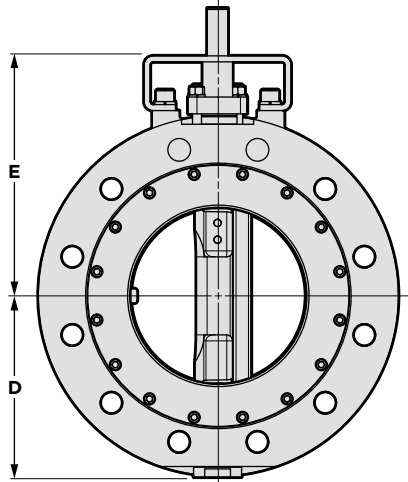
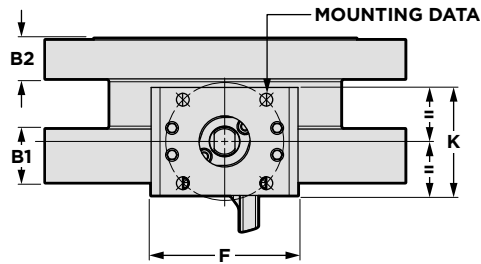
WEIGHT (kg)

DN	ØA ¹	B	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			Wafer		Lug	
												Bolt Qty	Hole Dia	Hole Dia	Wafer	Lug		
50	102	44	49	92	152	111	14	10	32	64	19	70	4	10	4	5		
65	121	48	59	97	162	111	16	11	32	64	19	70	4	10	5	6		
80	133	48	74	104	168	111	16	11	32	64	19	70	4	10	6	7		
100	171	52	97	120	191	111	16	11	32	64	19	70	4	10	9	10		
125	210	57	122	129	203	130	19	13	32	114	24	125	4	13	15	17		
150	226	61	146	159	222	130	22	16	32	114	25	125	4	13	18	23		
200	278	72	194	192	254	155	30	22	51	114	28	125	4	13	31	38		
250	337	83	241	238	289	155	35	10 x 10	51	114	33	125	4	13	52	62		
300	392	92	289	277	343	197	35	10 x 10	51	165	36	125	4	13	78	95		
350	439	118	292	318	464	264	50	12 x 10	64	165	54	165	4	21	151	202		
400	495	136	365	360	533	264	64	16 x 16	102	165	64	165	4	21	206	241		
450	543	152	387	392	533	391	64	16 x 16	102	298	67	254	8	17	276	342		
500	604	161	419	427	565	391	76	19 x 19	102	298	74	254	8	17	355	436		
600	730	181	530	503	667	495	89	22 x 16	133	343	86	298	8	21	581	705		
750	889	229	699	594	819	610	114	25 x 19	133	406	109	356	8	32	1019	1242		
900	1068	271	851	689	921	610	127	32 x 22	152	406	133	356	8	28	1453	1811		
1200	1322	318	1162	842	1137	737	178	44 x 38	191	559	140	483	12	38	2817	2994		

NOTE

> For sizes not shown, contact Bray for more information.

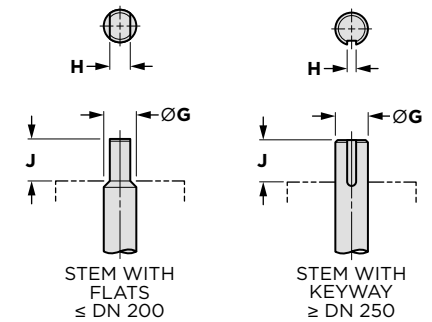
PN 25, 40 – SERIES 4B DOUBLE FLANGED



NOTES

- > Additional flange drilling options available.
 - > Weights are for cast steel bodies, except when noted.
 - > Metric dimensions are converted from imperial.
- 1 Dimension A is diameter of raised face flange.
 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).

STEM DETAILS



DIMENSIONS (mm)

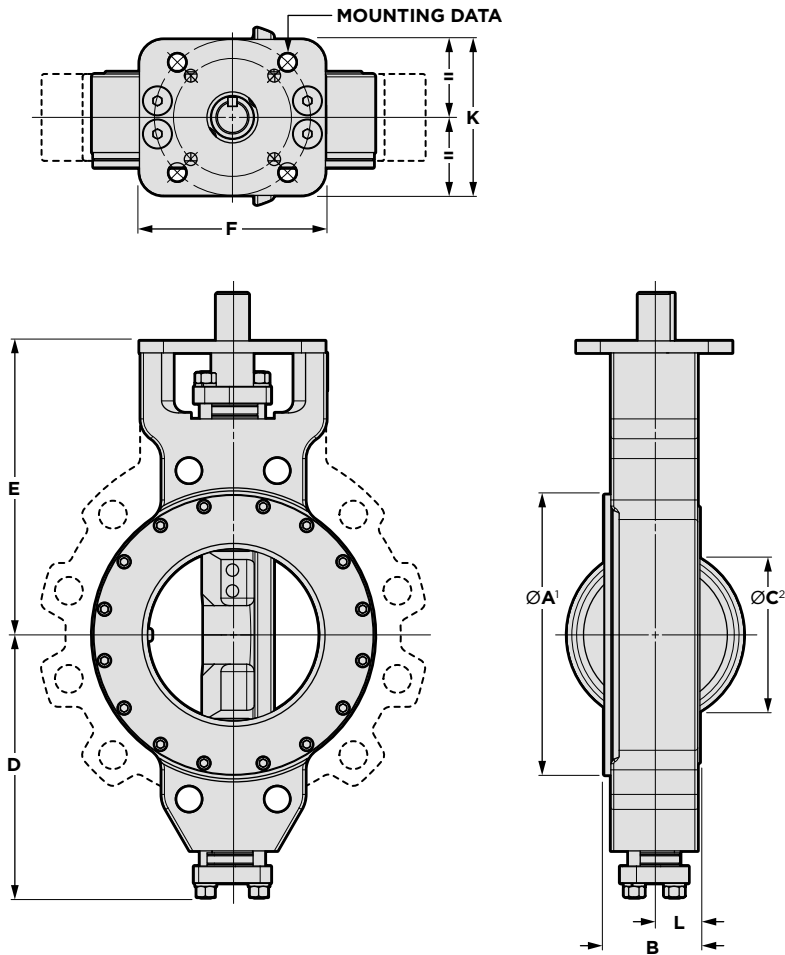
WEIGHT (kg)

DN	ØA ¹	B	B1	B2	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			Weight (kg)
														Bolt Circle	Hole Qty	Hole Dia	
80	133	114	40	28	67	104	168	111	16	11	32	64	210	70	4	10	18
100	178	127	45	32	80	120	191	111	16	11	32	64	254	70	4	10	28
150	216	140	50	37	137	159	222	130	22	16	32	114	318	125	4	13	39
200	278	152	57	43	178	192	254	155	30	22	51	114	381	125	4	13	78
250	325	165	66	49	225	238	289	155	35	10 x 10	51	114	445	125	4	13	95
300	381	178	71	52	276	277	343	197	35	10 x 10	51	165	521	125	4	13	182
350	413	191	76	55	284	318	464	264	50	12 x 10	64	165	584	165	4	21	278
400	452	216	81	59	359	360	533	264	64	16 x 16	102	165	648	165	4	21	350
450	533	222	94	62	367	392	533	391	64	16 x 16	102	298	711	254	8	17	474
500	584	229	92	65	419	427	565	391	76	19 x 19	102	298	775	254	8	17	585
600	692	267	102	71	518	503	667	495	89	22 x 16	133	343	914	298	8	21	912
750	859	318	130	94	699	594	819	610	114	25 x 19	133	406	1092	356	8	32	1061
900	1023	330	156	107	851	689	921	610	127	32 x 22	152	406	1270	356	8	32	2103

NOTE

> For sizes not shown, contact Bray for more information.

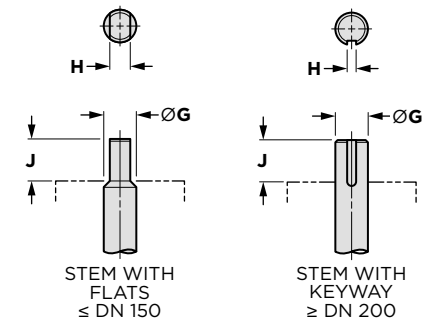
PN 63, 100 – SERIES 44 WAFER/45 LUG



NOTES

- > Additional flange drilling options available.
 - > Weights are for cast steel bodies, except when noted.
 - > Metric dimensions are converted from imperial.
- 1 Dimension A is diameter of raised face flange.
 - 2 Dimension C is absolute minimum pipe ID at valve face (without gasket).
 - 3 Flame cut body weights. Flame cut steel and stainless steel bodies vary. Consult Bray factory.

STEM DETAILS



DIMENSIONS (mm)

DN	ØA ¹	B	ØC ²	D	E	F	ØG	H	J	K	L	Mounting Data			WEIGHT (kg)	
												Bolt Circle	Hole Qty	Hole Dia	Wafer	Lug
80	145	56	74	147	178	130	19	13	30	114	23	70	4	10	11 ³	13 ³
100	178	64	92	180	216	130	25	16	30	114	29	125	4	13	18 ³	22 ³
150	244	81	132	218	248	155	30	22	51	114	35	125	4	13	36 ³	48 ³
200	297	102	178	278	311	197	18	10 x 10	51	165	48	165	4	21	68 ³	92 ³
250	349	117	222	372	432	264	50	12 x 10	64	165	50	165	4	21	127 ³	167 ³
300	409	140	267	399	464	264	50	12 x 10	64	165	64	165	4	21	185 ³	250 ³
350	448	155	284	452	502	391	64	16 x 16	102	298	74	254	8	17	226 ³	319 ³
400	518	178	325	500	552	391	76	19 x 19	102	298	87	254	8	17	309 ³	452 ³
450	581	197	378	535	603	495	89	22 x 16	133	343	91	298	8	21	450 ³	595 ³
500	626	216	419	590	654	495	102	25 x 19	133	343	99	298	8	21	617 ³	839 ³
600	741	232	505	708	787	610	127	32 x 22	152	406	100	356	8	32	882 ³	1185 ³
900	1022	355	851	984	1131	851	178	44 x 32	171	559	147	483	12	38	2392 ³	3218 ³

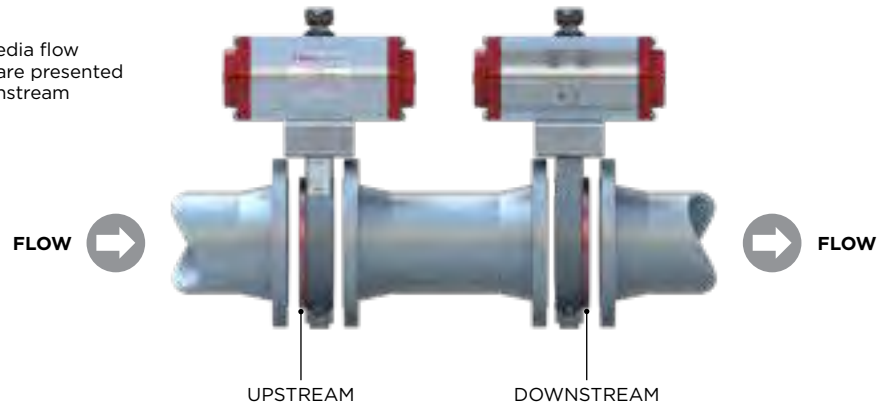
NOTE

> For sizes not shown, contact Bray for more information.

SEAT RETAINER POSITION

NOTE

> Valve orientation to media flow affects torque. Values are presented for upstream and downstream orientations.



ASME CLASS 150 – SERIES 40/41/4A

RESILIENT SEATED VALVE – TORQUE VALUES (lbf-in)

NPS	Valve Differential Pressure (psi)							
	<150 psi		>150 to 200 psi		>200 to 250 psi		>250 to 285 psi	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
2	155	180	170	220	195	260	200	280
2½	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	1,040
6	690	810	770	960	825	1,100	840	1,200
8	1,280	1,500	1,400	1,700	1,500	1,950	1,570	2,100
10	2,400	2,800	2,640	3,300	2,820	3,760	2,870	4,100
12	3,500	4,100	4,000	5,000	4,400	5,900	4,550	6,500
14	5,400	6,300	5,920	7,400	6,400	8,500	6,650	9,500
16	7,700	9,100	9,040	11,300	10,100	13,500	10,500	15,000
18	11,900	14,000	13,600	17,000	15,000	20,000	15,400	22,000
20	15,300	18,000	17,100	21,300	18,500	24,700	18,900	27,000
24	24,650	29,000	27,680	34,600	30,000	40,100	30,800	44,000
28	34,850	41,000	37,600	47,000	44,300	59,200	44,500	63,500
30	39,950	47,000	42,960	53,700	50,800	67,700	52,500	75,000
32	45,000	53,000	48,800	61,000	57,600	76,800	58,800	84,000
36	54,000	64,000	64,800	81,000	73,500	98,000	77,000	110,000
40	62,000	73,000	73,600	92,000	82,500	110,000	84,700	121,000
42	71,000	83,000	84,000	105,000	95,250	127,000	101,000	143,000
48	98,000	115,000	121,600	152,000	142,500	190,000	151,900	217,000
54	136,000	160,000	169,600	212,000	198,000	265,000	211,400	302,000
60	174,497	211,326	220,929	280,435	262,162	350,544	284,544	399,520

NOTE

> For sizes not shown, contact Bray for more information.

ASME CLASS 150 — SERIES 40/41/4A

FIRESAFE VALVE — TORQUE VALUES (lbf-in)

NPS	Valve Differential Pressure (psi)							
	<150 psi		>150 to 200 psi		>200 to 250 psi		>250 to 285 psi	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
2	672	695	680	737	688	769	696	794
2½	680	720	690	770	700	810	710	840
3	750	800	760	830	770	870	780	900
4	850	900	880	980	890	1,050	910	1,100
5	1,420	1,500	1,470	1,630	1,500	1,750	1,600	1,850
6	1,660	1,750	1,690	1,880	1,800	2,000	1,900	2,100
8	2,600	2,800	2,690	2,950	2,750	3,100	2,860	3,200
10	3,900	4,200	4,100	4,530	4,250	4,860	4,400	5,100
12	6,500	6,900	6,600	7,350	6,700	7,790	6,900	8,100
14	12,300	13,000	12,600	14,000	13,200	15,500	13,600	17,000
16	15,200	16,000	15,800	17,600	16,300	19,200	16,320	20,400
18	18,000	19,000	18,900	21,000	19,000	22,500	19,200	24,000
20	21,800	23,000	22,500	25,000	23,800	28,000	28,800	36,000
24	31,000	33,000	34,200	38,000	37,400	44,000	50,400	63,000
28	38,900	42,200	44,900	50,800	50,600	60,900	76,200	102,200
30	46,400	50,200	55,400	62,100	63,800	75,700	97,800	130,100
32	52,500	57,100	64,300	72,400	75,000	89,400	118,200	157,300
36	64,900	76,100	83,300	100,600	99,300	126,900	163,500	227,800
40	75,800	88,600	97,500	117,500	116,500	148,900	235,700	292,800
42	83,200	97,500	10,800	130,400	129,800	166,200	264,400	330,200
48	114,700	135,500	152,900	184,800	186,500	237,900	374,300	475,200

METAL SEATED VALVE — TORQUE VALUES (lbf-in)

NPS	Valve Differential Pressure (psi)							
	<150 psi		>150 to 200 psi		>200 to 250 psi		>250 to 285 psi	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
2½	612	648	621	693	630	729	639	756
3	675	720	684	747	693	783	702	810
4	765	810	792	882	801	945	819	990
5	1,278	1,350	1,323	1,467	1,350	1,575	1,440	1,665
6	1,494	1,575	1,521	1,692	1,620	1,800	1,710	1,890
8	2,340	2,520	2,421	2,655	2,475	2,790	2,574	2,880
10	3,510	3,780	3,690	4,077	3,825	4,374	3,960	4,590
12	5,850	6,210	5,940	6,615	6,030	7,011	6,210	7,290
14	11,070	11,700	11,340	12,600	11,880	13,950	12,240	15,300
16	13,680	14,400	14,220	15,840	14,670	17,280	14,688	18,360
18	16,200	17,100	17,010	18,900	17,100	20,250	17,280	21,600
20	19,620	20,700	20,250	22,500	21,420	25,200	25,920	32,400
24	27,900	29,700	30,780	34,200	33,660	39,600	45,360	56,700
28	35,010	37,980	40,410	45,720	45,540	54,810	68,580	91,980
30	41,760	45,180	49,860	55,890	57,420	68,130	88,020	117,090

NOTE

> For sizes not shown, contact Bray for more information.

ASME CLASS 300 – SERIES 42/43/4B

RESILIENT SEATED VALVE – TORQUE VALUES (lbf-in)

NPS	Valve Differential Pressure (psi)							
	<150 psi		>150 to 350 psi		>350 to 550 psi		>550 to 740 psi	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
2	155	180	270	340	360	490	447	559
2½	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	1,000
5	550	650	1,000	1,250	1,390	1,850	1,800	2,550
6	850	1,000	1,320	1,650	1,720	2,300	2,100	3,000
8	1,580	1,850	2,480	3,100	3,230	4,300	3,700	5,300
10	2,800	3,300	4,400	5,500	5,700	7,600	7,000	10,000
12	4,250	5,000	6,640	8,300	8,630	11,500	10,500	15,000
14	7,300	8,600	10,720	13,400	13,700	18,300	15,400	22,000
16	11,900	14,000	17,200	21,500	21,800	29,000	26,600	38,000
18	15,300	18,000	21,600	27,000	27,100	36,100	31,500	45,000
20	20,400	24,000	29,400	36,700	37,000	49,300	42,700	61,000
24	32,300	38,000	45,600	57,000	57,500	76,700	66,500	95,000
30	68,000	80,000	101,600	127,000	129,000	172,000	147,000	210,000
36	101,150	119,000	144,000	180,000	180,000	240,000	203,000	290,000
40	115,600	136,000	168,000	210,000	222,000	296,000	278,600	398,000
48	127,500	150,000	217,600	272,000	321,000	428,000	403,200	576,000

FIRESAFE VALVE – TORQUE VALUES (lbf-in)

2	672	695	758	803	834	921	845	981
2½	680	720	775	860	860	1,010	880	1,100
3	750	800	855	950	935	1,100	960	1,200
4	850	900	1,080	1,200	1,275	1,500	1,360	1,700
5	1,420	1,500	2,070	2,300	2,635	3,100	2,880	3,600
6	2,000	2,100	2,610	2,900	3,150	3,700	3,440	4,300
8	3,000	3,150	3,870	4,300	4,675	5,500	4,960	6,200
10	6,900	7,300	9,180	10,200	11,050	13,000	12,000	15,000
12	10,450	11,000	13,200	14,700	15,640	18,400	16,800	21,000
14	18,050	19,000	21,600	24,000	22,100	26,000	22,400	28,000
16	26,600	28,000	34,200	38,000	37,400	44,000	39,200	49,000
18	35,300	36,600	43,800	47,400	45,900	52,200	46,900	56,300
20	47,300	48,600	59,800	63,700	63,300	70,000	65,600	75,900
24	73,700	75,400	92,400	97,700	95,700	105,000	97,900	112,300
30	91,300	96,800	125,100	139,400	141,700	165,200	156,500	190,200
36	145,500	154,400	203,300	228,500	232,600	269,700	260,000	312,900

METAL SEATED VALVE – TORQUE VALUES (lbf-in)

2½	612	648	698	774	774	909	792	990
3	675	720	770	855	842	990	864	1,080
4	765	810	972	1,080	1,148	1,350	1,224	1,530
5	1,278	1,350	1,863	2,070	2,372	2,790	2,592	3,240
6	1,800	1,890	2,349	2,610	2,835	3,330	3,096	3,870
8	2,700	2,835	3,483	3,870	4,208	4,950	4,464	5,580
10	6,210	6,570	8,262	9,180	9,945	11,700	10,800	13,500
12	9,405	9,900	11,880	13,230	14,076	16,560	15,120	18,900
14	16,245	17,100	19,440	21,600	19,890	23,400	20,160	25,200
16	23,940	25,200	30,780	34,200	33,660	39,600	35,280	44,100
20	42,570	43,740	53,820	57,330	56,970	63,000	59,040	68,310
24	66,330	67,860	83,160	87,930	86,130	94,500	88,110	101,070
30	82,170	87,120	112,590	125,460	127,530	148,680	140,850	171,180

NOTE

> For sizes not shown, contact Bray for more information.

ASME CLASS 600 – SERIES 44/45

RESILIENT SEATED VALVE – TORQUE VALUES (lbf-in)

NPS	Valve Differential Pressure (psi)							
	<150 psi		>150 to 600 psi		>600 to 1050 psi		>1050 to 1480 psi	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
3	400	480	700	870	900	1,200	1,000	1,450
4	850	960	1,280	1,600	1,580	2,100	1,900	2,700
6	1,450	1,700	2,560	3,200	3,450	4,600	4,100	5,800
8	3,500	4,100	5,760	7,200	7,600	10,100	9,800	14,000
10	7,100	8,300	9,600	12,000	13,500	18,000	16,800	24,000
12	10,100	11,800	11,200	14,000	19,500	26,000	21,000	30,000
14	11,900	14,000	19,200	24,000	24,800	33,000	30,000	43,000
16	14,000	16,500	28,400	35,500	34,500	46,000	45,500	65,000
18	16,200	19,000	34,400	43,000	49,000	65,000	64,400	92,000
20	21,300	25,000	45,600	57,000	66,000	88,000	87,000	124,000
24	33,000	39,000	71,000	89,000	94,000	125,000	123,000	175,000
36	69,600	82,500	175,200	219,800	371,400	493,800	405,700	576,400

FIRESAFE VALVE – TORQUE VALUES (lbf-in)

NPS	Valve Differential Pressure (psi)							
	<150 psi		>150 to 600 psi		>600 to 1050 psi		>1050 to 1480 psi	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
3	1,217	1,336	1,642	1,678	1,850	2,056	1,795	2,018
4	1,510	1,615	2,021	2,250	2,415	2,936	2,640	3,685
6	2,719	2,950	4,218	5,068	5,790	7,790	5,830	8,100
8	4,422	5,000	7,383	8,657	8,420	12,500	10,760	16,500
10	9,233	8,600	15,400	17,360	20,200	24,500	22,000	26,350
12	15,900	12,100	23,000	25,500	30,700	36,500	33,870	39,500
14	22,300	18,300	30,250	31,800	39,400	45,900	43,900	49,900
16	29,200	26,500	45,400	48,000	62,600	70,300	70,500	96,000

METAL SEATED VALVE – TORQUE VALUES (lbf-in)

NPS	Valve Differential Pressure (psi)							
	<150 psi		>150 to 600 psi		>600 to 1050 psi		>1050 to 1480 psi	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
3	1,096	1,202	1,478	1,510	1,665	1,850	1,615	1,816
4	1,359	1,454	1,819	2,025	2,173	2,642	2,376	3,316
6	2,447	2,655	3,796	4,562	5,211	7,011	5,247	7,290
8	3,979	4,500	6,644	7,792	7,578	11,250	9,684	14,850
10	8,310	7,740	13,860	15,624	18,180	22,050	19,800	23,715
12	14,310	10,890	20,700	22,950	27,630	32,850	30,483	35,550

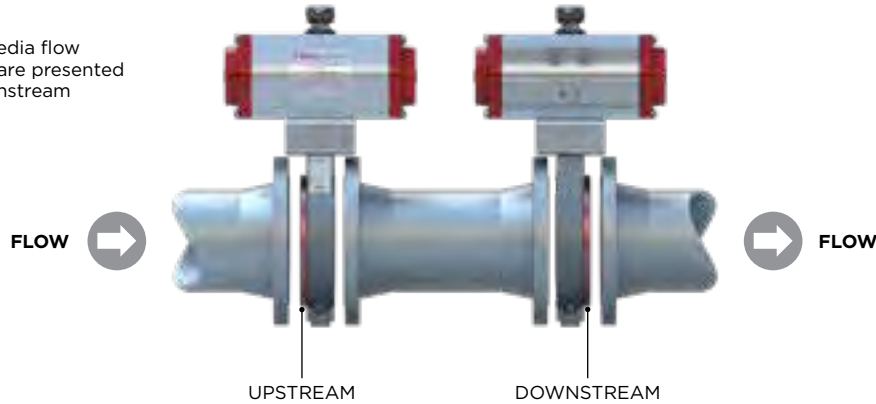
NOTE

> For sizes not shown, contact Bray for more information.

SEAT RETAINER POSITION

NOTE

> Valve orientation to media flow affects torque. Values are presented for upstream and downstream orientations.



ASME CLASS 150 – SERIES 40/41/4A

RESILIENT SEATED VALVE – TORQUE VALUES (N m)

		Valve Differential Pressure (bar)							
		<10.3 bar		>10.3 to 14 bar		>14 to 17.2 bar		>17.2 to 20 bar	
NPS	DN	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
2	50	18	20	19	25	22	29	23	32
2 1/2	65	19	23	21	27	24	32	24	34
3	80	21	25	24	29	25	34	26	36
4	100	31	36	34	42	36	47	36	52
5	125	62	73	72	90	80	106	82	118
6	150	78	92	87	108	93	124	95	136
8	200	145	169	158	192	169	220	177	237
10	250	271	316	298	373	319	425	324	463
12	300	395	463	452	565	497	667	514	734
14	350	610	712	669	836	723	960	751	1,073
16	400	870	1,028	1,021	1,277	1,141	1,525	1,186	1,695
18	450	1,345	1,582	1,537	1,921	1,695	2,260	1,740	2,486
20	500	1,729	2,034	1,932	2,407	2,090	2,791	2,135	3,051
24	600	2,785	3,277	3,127	3,909	3,390	4,531	3,480	4,971
28	700	3,938	4,632	4,248	5,310	5,005	6,689	5,028	7,175
30	750	4,514	5,310	4,854	6,067	5,740	7,649	5,932	8,474
32	800	5,084	5,988	5,514	6,892	6,508	8,677	6,644	9,491
36	900	6,101	7,231	7,321	9,152	8,304	11,073	8,700	12,428
40	1000	7,005	8,248	8,316	10,395	9,321	12,428	9,570	13,671
42	—	8,022	9,378	9,491	11,863	10,762	14,349	11,411	16,157
48	1200	11,073	12,993	13,739	17,174	16,100	21,467	17,162	24,518
54	1400	15,366	18,078	19,162	23,953	22,371	29,941	23,885	34,121
60	1500	19,716	23,877	24,962	31,685	29,620	39,606	32,149	45,140

NOTE

> For sizes not shown, contact Bray for more information.

ASME CLASS 150 — SERIES 40/41/4A

FIRESAFE VALVE — TORQUE VALUES (N m)

		Valve Differential Pressure (bar)							
		<10.3 bar		>10.3 to 14 bar		>14 to 17.2 bar		>17.2 to 20 bar	
NPS	DN	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
2	50	76	79	77	83	78	87	79	90
2 1/2	65	77	81	78	87	79	92	80	95
3	80	85	90	86	94	87	98	88	102
4	100	96	102	99	111	101	119	103	124
5	125	160	169	166	184	169	198	181	209
6	150	188	198	191	212	203	226	215	237
8	200	294	316	304	333	311	350	323	362
10	250	441	475	463	512	480	549	497	576
12	300	734	780	746	830	757	880	780	915
14	350	1,390	1,469	1,424	1,582	1,491	1,751	1,537	1,921
16	400	1,717	1,808	1,785	1,989	1,842	2,169	1,844	2,305
18	450	2,034	2,147	2,135	2,373	2,147	2,542	2,169	2,712
20	500	2,463	2,599	2,542	2,825	2,689	3,164	3,254	4,067
24	600	3,503	3,728	3,864	4,293	4,226	4,971	5,694	7,118
28	700	4,395	4,768	5,073	5,740	5,717	6,881	8,609	11,547
30	750	5,242	5,672	6,259	7,016	7,208	8,553	11,050	14,699
32	800	5,932	6,451	7,265	8,180	8,474	10,101	13,355	17,773
36	900	7,333	8,598	9,412	11,366	11,219	14,338	18,473	25,738
40	1000	8,564	10,010	11,016	13,276	13,163	16,823	26,630	33,082
42	—	9,400	11,016	1,220	14,733	14,665	18,778	29,873	37,308
48	1200	12,959	15,309	17,275	20,880	21,072	26,879	42,290	53,690

METAL SEATED VALVE — TORQUE VALUES (N m)

		Valve Differential Pressure (bar)							
		<10.3 bar		>10.3 to 14 bar		>14 to 17.2 bar		>17.2 to 20 bar	
NPS	DN	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
2 1/2	65	69	73	70	78	71	82	72	85
3	80	76	81	77	84	78	88	79	92
4	100	86	92	89	100	91	107	93	112
5	125	144	153	149	166	153	178	163	188
6	150	169	178	172	191	183	203	193	214
8	200	264	285	274	300	280	315	291	325
10	250	397	427	417	461	432	494	447	519
12	300	661	702	671	747	681	792	702	824
14	350	1,251	1,322	1,281	1,424	1,342	1,576	1,383	1,729
16	400	1,546	1,627	1,607	1,790	1,657	1,952	1,660	2,074
18	450	1,830	1,932	1,922	2,135	1,932	2,288	1,952	2,440
20	500	2,217	2,339	2,288	2,542	2,420	2,847	2,929	3,661
24	600	3,152	3,356	3,478	3,864	3,803	4,474	5,125	6,406
28	700	3,956	4,291	4,566	5,166	5,145	6,193	7,748	10,392
30	750	4,718	5,105	5,633	6,315	6,488	7,698	9,945	13,229

NOTE

> For sizes not shown, contact Bray for more information.

ASME CLASS 300 – SERIES 42/43/4B

RESILIENT SEATED VALVE – TORQUE VALUES (N m)

		Valve Differential Pressure (bar)							
		<10.3 bar		>10.3 to 24 bar		>24 to 38 bar		>38 to 51 bar	
NPS	DN	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
2	50	18	20	31	38	41	55	51	63
2 1/2	65	19	23	33	41	43	58	53	76
3	80	21	25	35	43	45	60	55	78
4	100	31	36	47	60	62	82	79	113
5	125	62	73	113	141	157	209	203	288
6	150	96	113	149	186	194	260	237	339
8	200	179	209	280	350	365	486	418	599
10	250	316	373	497	621	644	859	791	1,130
12	300	480	565	750	938	975	1,299	1,186	1,695
14	350	825	972	1,211	1,514	1,548	2,068	1,740	2,486
16	400	1,345	1,582	1,943	2,429	2,463	3,277	3,005	4,293
18	450	1,729	2,034	2,440	3,051	3,062	4,079	3,559	5,084
20	500	2,305	2,712	3,322	4,147	4,180	5,570	4,824	6,892
24	600	3,649	4,293	5,152	6,440	6,497	8,666	7,513	10,734
30	750	7,683	9,039	11,479	14,349	14,575	19,433	16,609	23,727
36	900	11,428	13,445	16,270	20,337	20,337	27,116	22,936	32,766
40	1000	13,061	15,366	18,981	23,727	25,083	33,444	31,478	44,968
48	1200	14,406	16,948	24,585	30,732	36,268	48,358	45,555	65,079

FIRESAFE VALVE – TORQUE VALUES (N m)

2	50	76	79	86	91	94	104	95	111
2 1/2	65	77	81	88	97	97	114	99	124
3	80	85	90	97	107	106	124	108	136
4	100	96	102	122	136	144	169	154	192
5	125	160	169	234	260	298	350	325	407
6	150	226	237	295	328	356	418	389	486
8	200	339	356	437	486	528	621	560	701
10	250	780	825	1,037	1,152	1,248	1,469	1,356	1,695
12	300	1,181	1,243	1,491	1,661	1,767	2,079	1,898	2,373
14	350	2,039	2,147	2,440	2,712	2,497	2,938	2,531	3,164
16	400	3,005	3,164	3,864	4,293	4,226	4,971	4,429	5,536
18	450	3,988	4,135	4,949	5,355	5,186	5,898	5,299	6,361
20	500	5,344	5,491	6,756	7,197	7,152	7,909	7,412	8,576
24	600	8,327	8,519	10,440	11,039	10,813	11,863	11,061	12,688
30	750	10,316	10,937	14,134	15,750	16,010	18,665	17,682	21,490
36	900	16,439	17,445	22,970	25,817	26,280	30,472	29,376	35,353

METAL SEATED VALVE – TORQUE VALUES (N m)

2 1/2	65	69	73	79	87	87	103	89	112
3	80	76	81	87	97	95	112	98	122
4	100	86	92	110	122	130	153	138	173
5	125	144	153	210	234	268	315	293	366
6	150	203	214	265	295	320	376	350	437
8	200	305	320	394	437	475	559	504	630
10	250	702	742	933	1,037	1,124	1,322	1,220	1,525
12	300	1,063	1,119	1,342	1,495	1,590	1,871	1,708	2,135
14	350	1,835	1,932	2,196	2,440	2,247	2,644	2,278	2,847
16	400	2,705	2,847	3,478	3,864	3,803	4,474	3,986	4,983
20	500	4,810	4,942	6,081	6,477	6,437	7,118	6,671	7,718
24	600	7,494	7,667	9,396	9,935	9,731	10,677	9,955	11,419
30	750	9,284	9,843	12,721	14,175	14,409	16,799	15,914	19,341

NOTE

> For sizes not shown, contact Bray for more information.

ASME CLASS 600 – SERIES 44/45

RESILIENT SEATED VALVE – TORQUE VALUES (N m)

		Valve Differential Pressure (bar)							
		<10.3 bar		>10.3 to 41.4 bar		>41.4 to 72.4 bar		>72.4 to 102 bar	
NPS	DN	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
3	80	45	54	79	98	102	136	113	164
4	100	96	108	145	181	179	237	215	305
6	150	164	192	289	362	390	520	463	655
8	200	395	463	651	813	859	1,141	1,107	1,582
10	250	802	938	1,085	1,356	1,525	2,034	1,898	2,712
12	300	1,141	1,333	1,265	1,582	2,203	2,938	2,373	3,390
14	350	1,345	1,582	2,169	2,712	2,802	3,728	3,390	4,858
16	400	1,582	1,864	3,209	4,011	3,898	5,197	5,141	7,344
18	450	1,830	2,147	3,887	4,858	5,536	7,344	7,276	10,395
20	500	2,407	2,825	5,152	6,440	7,457	9,943	9,830	14,010
24	600	3,728	4,406	8,022	10,056	10,621	14,123	13,897	19,772
36	900	7,864	9,321	19,795	24,834	41,963	55,792	45,838	65,124

FIRESAFE VALVE – TORQUE VALUES (N m)

		Valve Differential Pressure (bar)							
		<10.3 bar		>10.3 to 41.4 bar		>41.4 to 72.4 bar		>72.4 to 102 bar	
NPS	DN	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
3	80	138	151	186	190	209	232	203	228
4	100	171	182	228	254	273	332	298	416
6	150	307	333	477	573	654	880	659	915
8	200	500	565	834	978	951	1,412	1,216	1,864
10	250	1,043	972	1,740	1,961	2,282	2,768	2,486	2,977
12	300	1,796	1,367	2,599	2,881	3,469	4,124	3,827	4,463
14	350	2,520	2,068	3,418	3,593	4,452	5,186	4,960	5,638
16	400	3,299	2,994	5,130	5,423	7,073	7,943	7,965	10,847

METAL SEATED VALVE – TORQUE VALUES (N m)

		Valve Differential Pressure (bar)							
		<10.3 bar		>10.3 to 41.4 bar		>41.4 to 72.4 bar		>72.4 to 102 bar	
NPS	DN	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
3	80	124	136	167	171	188	209	182	205
4	100	154	164	206	229	246	299	268	375
6	150	276	300	429	515	589	792	593	824
8	200	450	508	751	880	856	1,271	1,094	1,678
10	250	939	875	1,566	1,765	2,054	2,491	2,237	2,679
12	300	1,617	1,230	2,339	2,593	3,122	3,712	3,444	4,017

NOTE

> For sizes not shown, contact Bray for more information.

SEAT RETAINER POSITION

NOTE

> Valve orientation to media flow affects torque. Values are presented for upstream and downstream orientations.



PN10 | PN16 – SERIES 40/41/4A

RESILIENT SEATED VALVE – TORQUE VALUES (N m)

DN	Valve Differential Pressure (bar)							
	≤6 bar		>6 to ≤10 bar		>10 to ≤16 bar		>16 to ≤20 bar	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
50	17	19	19	24	22	29	23	32
65	19	23	21	27	24	32	24	34
80	21	25	24	29	25	34	26	36
100	31	36	34	42	36	47	36	52
125	62	73	72	90	80	106	83	118
150	78	92	87	108	93	124	95	137
200	145	169	158	192	169	220	178	240
250	271	316	298	373	319	425	327	468
300	395	463	452	565	497	667	518	743
350	610	712	669	836	723	960	758	1,087
400	870	1,028	1,021	1,277	1,141	1,525	1,195	1,715
450	1,345	1,582	1,537	1,921	1,695	2,260	1,753	2,514
500	1,729	2,034	1,932	2,407	2,090	2,791	2,155	3,088
600	2,785	3,277	3,127	3,909	3,390	4,531	3,517	5,035
700	3,938	4,632	4,248	5,310	5,005	6,689	5,079	7,264
750	4,514	5,310	4,854	6,067	5,740	7,649	6,003	8,588
800	5,084	5,988	5,514	6,892	6,508	8,677	6,726	9,622
900	6,101	7,231	7,321	9,152	8,304	11,073	8,804	12,613
1000	7,005	8,248	8,316	10,395	9,321	12,428	9,688	13,886
1200	11,073	12,993	13,739	17,174	16,100	21,467	17,371	24,874
1400	15,366	18,078	19,162	23,953	22,371	29,941	24,155	34,581

NOTE

> For sizes not shown, contact Bray for more information.

PN10 | PN16 – SERIES 40/41/4A

FIRESAFE VALVE – TORQUE VALUES (N m)

DN	Valve Differential Pressure (bar)							
	≤6 bar		>6 to ≤10 bar		>10 to ≤16 bar		>16 to ≤20 bar	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
50	76	77	77	82	78	86	79	90
65	76	79	77	85	79	91	80	95
80	84	86	85	90	87	97	88	102
100	95	95	98	105	100	117	103	125
125	157	158	163	174	168	194	181	210
150	183	180	187	197	202	221	215	239
200	282	283	294	304	307	341	324	364
250	410	410	436	456	471	531	500	581
300	679	676	697	740	741	851	784	923
350	1,311	1,302	1,355	1,436	1,469	1,704	1,543	1,934
400	1,609	1,554	1,690	1,767	1,811	2,097	1,853	2,325
450	1,866	1,793	1,989	2,064	2,099	2,441	2,183	2,740
500	2,218	2,123	2,328	2,409	2,619	3,028	3,273	4,105
600	3,038	2,926	3,459	3,593	4,093	4,742	5,731	7,182
700	3,744	3,643	4,505	4,756	5,530	6,553	8,659	11,639
750	4,340	4,230	5,473	5,764	6,946	8,141	11,123	14,811
800	5,163	5,067	6,597	6,971	8,257	9,700	13,412	17,880
900	6,382	6,635	8,578	9,660	10,944	13,780	18,548	25,897
1000	7,419	7,645	10,017	11,210	12,831	16,148	26,721	33,290
1200	10,915	11,411	15,493	17,476	20,483	25,760	42,447	54,039

METAL SEATED VALVE – TORQUE VALUES (N m)

DN	Valve Differential Pressure (bar)							
	≤6 bar		>6 to ≤10 bar		>10 to ≤16 bar		>16 to ≤20 bar	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
65	68	69	69	74	70	78	71	81
80	69	71	70	76	71	82	72	86
100	76	78	77	81	78	87	79	92
125	85	86	88	95	90	105	93	112
150	141	142	147	156	152	175	163	189
200	164	162	168	178	182	199	194	215
250	254	255	264	274	277	307	292	328
300	369	369	393	410	424	478	450	523
350	611	609	628	666	667	766	706	831
400	1,180	1,172	1,219	1,293	1,322	1,533	1,389	1,741
450	1,448	1,399	1,521	1,590	1,630	1,887	1,667	2,093
500	1,679	1,614	1,790	1,858	1,889	2,197	1,964	2,466
600	1,996	1,911	2,095	2,168	2,357	2,725	2,946	3,695
700	2,734	2,634	3,113	3,234	3,684	4,268	5,158	6,464
750	3,370	3,278	4,055	4,280	4,977	5,898	7,793	10,475

NOTE

> For sizes not shown, contact Bray for more information.

PN25 | PN40 – SERIES 42/43/4B

RESILIENT SEATED VALVE – TORQUE VALUES (N m)

DN	Valve Differential Pressure (bar)							
	≤10 bar		>10 to ≤16 bar		>16 to ≤25 bar		>25 to ≤40 bar	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
50	17	20	30	36	40	51	50	59
65	19	22	32	36	41	50	52	69
80	21	25	34	36	43	48	53	68
100	30	36	45	48	58	64	76	97
125	62	72	107	119	147	174	195	258
150	65	111	134	150	170	202	217	289
200	177	206	243	277	307	370	368	500
250	313	367	422	490	526	650	690	952
300	475	556	618	724	765	960	1,007	1,405
350	819	960	1,066	1,236	1,317	1,627	1,543	2,108
400	1,332	1,558	1,654	1,867	2,004	2,386	2,613	3,532
450	1,716	2,008	2,131	2,449	2,571	3,126	3,139	4,269
500	2,284	2,676	2,831	2,170	3,403	4,228	4,159	5,743
600	3,620	4,241	4,459	5,193	5,399	6,690	6,246	9,043
750	7,613	8,930	9,838	11,770	11,974	15,346	13,668	20,230
900	11,332	13,285	13,993	16,558	16,729	21,127	17,795	27,641
1000	12,924	15,170	16,623	19,098	19,962	26,108	24,136	37,507
1200	14,248	16,710	20,875	24,333	29,155	36,984	32,088	54,293

FIRESAFE VALVE – TORQUE VALUES (N m)

50	76	78	85	88	94	100	95	107
65	77	81	87	92	96	106	98	117
80	85	90	95	100	103	113	106	126
100	96	101	120	124	140	151	150	176
125	160	169	227	238	288	315	317	151
150	225	236	280	291	332	360	368	436
200	337	353	400	413	470	506	511	601
250	776	819	963	1,021	1,130	1,260	1,255	1,516
300	1,175	1,234	1,359	1,447	1,557	1,740	1,719	2,082
350	2,033	2,135	2,295	2,433	2,266	2,497	2,334	2,786
400	2,993	3,140	3,575	3,732	3,767	4,081	4,037	4,775
450	3,975	4,110	4,639	4,754	4,695	4,945	4,879	5,546
500	5,323	5,455	6,266	6,305	6,375	6,567	6,747	7,427
600	8,298	8,466	9,747	9,566	9,715	9,888	10,122	10,998
750	10,246	10,828	12,493	13,431	13,409	14,578	15,457	17,993
900	16,321	17,253	20,083	21,430	21,716	23,522	25,465	29,401

METAL SEATED VALVE – TORQUE VALUES (N m)

65	69	73	78	83	86	96	88	106
80	76	81	86	90	93	101	96	113
100	86	91	108	112	126	136	135	159
125	144	152	205	214	259	283	285	136
150	203	212	252	262	299	324	331	393
200	304	318	360	371	423	455	459	541
250	699	737	866	919	1,017	1,134	1,129	1,365
300	1,058	1,110	1,223	1,302	1,402	1,566	1,547	1,874
350	1,830	1,921	2,065	2,190	2,040	2,247	2,100	2,508
400	2,694	2,826	3,217	3,358	3,390	3,673	3,633	4,297
500	3,578	3,699	4,175	4,279	4,225	4,450	4,391	4,991
600	4,791	4,910	5,639	5,674	5,737	5,910	6,072	6,684
750	7,468	7,620	8,772	8,609	8,743	8,899	9,110	9,898

NOTE

> For sizes not shown, contact Bray for more information.

PN63 | PN100 – SERIES 44/45

RESILIENT SEATED VALVE – TORQUE VALUES (N m)

DN	Valve Differential Pressure (bar)							
	≤25 bar		>25 to ≤40 bar		>40 to ≤63 bar		>63 to ≤100 bar	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
80	49	68	79	97	99	127	112	162
100	108	137	143	178	171	219	213	301
150	201	267	286	355	366	472	458	645
200	479	640	643	797	805	1,028	1,095	1,557
250	958	1,235	1,070	1,328	1,426	1,844	1,876	2,670
300	1,402	1,796	1,241	1,538	2,037	2,642	2,336	3,324
350	1,703	2,181	2,136	2,655	2,573	3,346	3,339	4,774
400	2,211	2,826	3,150	3,921	3,496	4,584	5,052	7,209
450	2,771	3,645	3,798	4,718	4,936	6,388	7,144	10,184
500	3,766	4,864	5,024	6,249	6,589	8,640	9,638	13,723
600	5,527	7,142	7,853	9,799	9,472	12,377	13,564	19,387
900	14,099	17,713	19,214	24,047	35,593	47,220	44,363	63,583

FIRESAFE VALVE – TORQUE VALUES (N m)

DN	Valve Differential Pressure (bar)							
	≤25 bar		>25 to ≤40 bar		>40 to ≤63 bar		>63 to ≤100 bar	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
80	141	164	185	188	207	224	202	226
100	183	211	227	252	265	313	297	412
150	345	408	473	566	630	833	653	905
200	583	742	826	962	898	1,299	1,204	1,840
250	1,199	1,269	1,729	1,933	2,181	2,582	2,467	2,935
300	2,058	1,832	2,571	2,836	3,296	3,830	3,790	4,397
350	2,877	2,661	3,384	3,536	4,223	4,807	4,907	5,550
400	3,927	3,956	5,069	5,333	6,668	7,330	7,877	10,715
450	5,679	5,720	7,133	7,823	9,467	10,872	8,998	12,792
500	7,586	7,463	9,647	10,295	12,927	14,397	12,402	17,030
600	11,937	10,211	13,103	14,040	17,506	19,588	20,603	23,123
900	22,318	27,516	38,458	38,880	52,719	55,308	64,102	66,353

METAL SEATED VALVE – TORQUE VALUES (N m)

DN	Valve Differential Pressure (bar)							
	≤25 bar		>25 to ≤40 bar		>40 to ≤63 bar		>63 to ≤100 bar	
	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream	Seat Retainer Upstream	Seat Retainer Downstream
80	127	148	167	170	186	201	182	204
100	164	190	205	226	239	282	267	371
150	310	367	426	509	567	749	588	815
200	525	668	744	865	808	1,169	1,084	1,656
250	1,079	1,142	1,556	1,740	1,963	2,324	2,220	2,641
300	1,852	1,648	2,314	2,552	2,966	3,447	3,411	3,957

NOTE

> For sizes not shown, contact Bray for more information.

RESILIENT SEATED / FIRE SAFE / METAL SEATED VALVES

MAXIMUM ALLOWABLE STEM TORQUE VALUES ¹ (lbf-in)			
NPS	ASME 150	ASME 300	ASME 600
	Series 40/41/4A	Series 42/43/4B	Series 44/45
2	1,347	1,347	—
2½	1,968	1,968	—
3	1,968	1,968	3,368
4	1,968	1,968	5,630
5	3,368	3,368	—
6	3,368	5,630	9,945
8	5,544	10,292	27,818
10	10,251	18,511	64,635
12	14,454	27,818	81,314
14	27,818	64,635	136,042
16	64,635	136,042	221,381
18	81,314	136,042	375,962
20	136,042	149,811	550,204
24	149,811	375,962	802,018
28	221,381	—	—
30	375,962	771,674	—
32	375,962	—	—
36	431,471	802,018	1,622,749
40	771,674	1,484,117	—
42	771,674	1,484,117	—
48	802,018	1,622,749	—
54	1,484,117	2,364,969	—
60	1,622,749	—	—

NOTE

¹ Based on stem material 17-4 PH stainless steel, ASTM A564 Type 630 H1150D.
 > For sizes not shown, contact Bray for more information.

RESILIENT SEATED / FIRE SAFE / METAL SEATED VALVES

MAXIMUM ALLOWABLE STEM TORQUE VALUES¹ (N m)

NPS	DN	ASME 150	ASME 300	ASME 600
		Series 40/41/4A	Series 42/43/4B	Series 44/45
2	50	152	152	—
2 1/2	65	222	222	—
3	80	222	222	381
4	100	222	222	636
5	125	381	381	—
6	150	381	636	1,124
8	200	626	1,163	3,143
10	250	1,158	2,091	7,303
12	300	1,633	3,143	9,187
14	350	3,143	7,303	15,371
16	400	7,303	15,371	25,013
18	450	9,187	15,371	42,478
20	500	15,371	16,926	62,165
24	600	16,926	42,478	90,616
28	700	25,013	—	—
30	750	42,478	87,187	—
32	800	42,478	—	—
36	900	48,750	90,616	183,346
40	1000	87,187	167,683	—
42	—	87,187	167,683	—
48	1200	90,616	183,346	—
54	1400	167,683	267,206	—
60	1500	183,346	—	—

NOTE

¹ Based on stem material 17-4 PH stainless steel, ASTM A564 Type 630 H1150D.
 > For sizes not shown, contact Bray for more information.

RESILIENT SEATED / FIRE SAFE / METAL SEATED VALVES

MAXIMUM ALLOWABLE STEM TORQUE VALUES ¹ (N m)			
DN	PN 10, 16	PN 25, 40	PN 63, 100
	Series 40/41/4A	Series 42/43/4B	Series 44/45
50	152	152	—
65	222	222	—
80	222	222	381
100	222	222	636
125	381	381	—
150	381	636	1,124
200	626	1,163	3,143
250	1,158	2,091	7,303
300	1,633	3,143	9,187
350	3,143	7,303	15,371
400	7,303	15,371	25,013
450	9,187	15,371	42,478
500	15,371	16,926	62,165
600	16,926	42,478	90,616
700	25,013	—	—
750	42,478	87,187	—
800	42,478	—	—
900	48,750	90,616	183,346
1000	87,187	167,683	—
1200	90,616	183,346	—
1400	167,683	267,206	—
1500	183,346	—	—

NOTE

¹ Based on stem material 17-4 PH stainless steel, ASTM A564 Type 630 H1150D.
 > For sizes not shown, contact Bray for more information.

RESILIENT SEATED / FIRESAFE / METAL SEATED

ASME CLASS 150 – SERIES 40/41/4A – Cv VALUES

NPS	DISC POSITION (Degrees)								
	90°	80°	70°	60°	50°	40°	30°	20°	10°
2	87	77	65	51	37	25	14	8	6
2½	160	136	100	78	50	30	16	8	3
3	185	178	155	123	87	56	32	14	5
4	375	365	315	250	175	115	63	31	10
5	790	675	500	360	238	146	78	41	16
6	1,350	1,070	750	510	330	218	140	81	35
8	2,800	2,230	1,590	1,060	685	456	280	165	65
10	4,300	3,450	2,430	1,630	1,050	700	450	250	100
12	6,650	5,330	3,750	2,530	1,630	1,080	700	390	155
14	7,650	6,100	4,300	2,900	1,890	1,250	810	450	175
16	9,800	7,860	5,510	3,700	2,420	1,530	1,020	580	230
18	10,500	9,100	6,960	5,100	3,520	2,220	1,180	500	170
20	13,500	11,700	8,800	6,500	4,500	2,820	1,530	640	200
24	20,000	17,100	12,800	9,570	6,640	3,880	2,200	920	240
26	20,000	17,100	12,800	9,570	6,640	3,880	2,200	920	240
28	28,000	23,900	18,200	13,500	9,300	5,700	3,100	1,300	290
30	32,000	27,300	20,900	15,500	10,700	6,700	3,600	1,510	320
32	34,000	29,100	22,300	16,500	11,400	7,150	3,850	1,610	340
34	34,000	29,100	22,300	16,500	11,400	7,150	3,850	1,610	340
36	48,500	41,100	31,700	23,200	16,400	10,200	5,430	2,260	480
40	62,000	55,200	44,000	33,300	23,800	15,200	8,600	3,520	670
42	65,000	58,000	46,100	35,000	25,000	16,000	9,000	3,700	700
48	91,000	80,900	63,700	43,600	29,100	20,000	11,000	4,600	920
54	125,000	111,000	87,500	60,000	40,000	27,500	15,000	6,000	1,200
60	160,000	140,000	105,000	75,000	50,000	31,000	17,000	7,000	1,400

ASME CLASS 300 – SERIES 42/43/4B – Cv VALUES

2	87	77	65	51	37	25	14	8	6
2½	160	136	100	78	50	30	16	8	3
3	185	178	155	123	87	56	32	14	5
4	375	365	315	250	175	115	63	31	10
5	790	675	500	360	238	146	78	41	16
6	1,000	875	710	530	370	240	138	79	26
8	2,000	1,720	1,360	950	630	405	240	121	47
10	2,650	2,250	1,740	1,200	780	510	295	150	61
12	4,000	3,400	2,500	1,690	1,100	710	430	220	92
14	4,100	3,500	2,600	1,770	1,200	830	490	240	100
16	7,800	6,540	4,550	2,970	1,840	1,160	730	420	180
18	9,500	8,000	6,170	4,530	3,110	1,970	1,080	440	94
20	11,000	9,570	7,300	5,400	3,720	2,330	1,250	530	110
24	18,000	15,100	11,400	8,570	5,920	3,700	2,000	830	180
30	29,000	24,400	18,900	13,700	8,500	6,000	3,230	1,330	290
36	45,000	38,100	29,200	21,000	14,800	9,100	4,660	1,730	380
42	60,000	54,000	42,000	30,000	19,000	13,000	7,500	2,600	450
48	83,000	74,000	58,000	41,000	26,000	17,000	10,000	4,400	800

ASME CLASS 600 – SERIES 44/45 – Cv VALUES

3	165	158	135	103	67	46	12	8	3
4	300	270	210	150	95	70	45	30	5
6	800	765	600	425	270	200	130	70	15
8	1,500	1,350	1,050	750	480	345	209	78	20
10	2,200	1,970	1,540	1,100	700	500	300	140	40
12	3,100	2,790	2,170	1,550	1,000	680	400	190	55
14	3,900	3,720	3,000	2,220	1,600	1,130	720	340	80
16	5,000	4,200	2,900	1,900	1,200	800	500	250	95
18	6,000	5,000	3,900	2,800	1,900	1,200	660	290	130
20	8,000	6,900	5,300	3,900	2,700	1,700	950	400	143
24	11,000	9,300	7,000	5,200	3,600	2,250	1,200	500	180
30	15,000	13,000	10,000	8,400	5,100	2,800	1,650	600	200

NOTES

- > Cv varies with the valve size, angle of opening and the manufacturer's valve style.
- > Cv value is the volume of water in USGPM that will flow through a given restriction or valve opening with a pressure drop of one (1) psi at room temperature.
- > For sizes not shown, contact Bray for more information.

RESILIENT SEATED / FIRESAFE / METAL SEATED

ASME CLASS 150 – SERIES 40/41/4A – Kv VALUES

NPS	DN	DISC POSITION (Degrees)								
		90°	80°	70°	60°	50°	40°	30°	20°	10°
2	50	74	65	55	43	31	21	12	7	5
2 1/2	65	136	116	85	67	43	26	14	7	3
3	80	158	152	132	105	74	48	27	12	4
4	100	320	311	269	213	149	98	54	26	9
5	125	674	576	427	307	203	125	67	35	14
6	150	1,152	913	640	435	281	186	119	69	30
8	200	2,388	1,902	1,356	904	584	389	239	141	55
10	250	3,668	2,943	2,073	1,390	896	597	384	213	85
12	300	5,672	4,546	3,199	2,158	1,390	921	597	333	132
14	350	6,525	5,203	3,668	2,474	1,612	1,066	691	384	149
16	400	8,359	6,705	4,700	3,156	2,064	1,305	870	495	196
18	450	8,957	7,762	5,937	4,350	3,003	1,894	1,007	427	145
20	500	11,516	9,980	7,506	5,545	3,839	2,405	1,305	546	171
24	600	17,060	14,586	10,918	8,163	5,664	3,310	1,877	785	205
26	—	17,060	14,586	10,918	8,163	5,664	3,310	1,877	785	205
28	700	23,884	20,387	15,525	11,516	7,933	4,862	2,644	1,109	247
30	750	27,296	23,287	17,828	13,222	9,127	5,715	3,071	1,288	273
32	800	29,002	24,822	19,022	14,075	9,724	6,099	3,284	1,373	290
34	—	29,002	24,822	19,022	14,075	9,724	6,099	3,284	1,373	290
36	900	41,371	35,058	27,040	19,790	13,989	8,701	4,632	1,928	409
40	1000	52,886	47,086	37,532	28,405	20,301	12,966	7,336	3,003	572
42	—	55,445	49,474	39,323	29,855	21,325	13,648	7,677	3,156	597
48	1200	77,623	69,008	54,336	37,191	24,822	17,060	9,383	3,924	785
54	1400	106,625	94,683	74,638	51,180	34,120	23,458	12,795	5,118	1,024
60	1500	136,480	119,420	89,565	63,975	42,650	26,443	14,501	5,971	1,194

ASME CLASS 300 – SERIES 42/43/4B – Kv VALUES

2	50	74	65	55	43	31	21	12	7	5
2 1/2	65	136	116	85	67	43	26	14	7	3
3	80	158	152	132	105	74	48	27	12	4
4	100	320	311	269	213	149	98	54	26	9
5	125	674	576	427	307	203	125	67	35	14
6	150	853	746	606	452	316	205	118	67	22
8	200	1,706	1,467	1,160	810	537	345	205	103	40
10	250	2,260	1,919	1,484	1,024	665	435	252	128	52
12	300	3,412	2,900	2,133	1,442	938	606	367	188	78
14	350	3,497	2,986	2,218	1,510	1,024	708	418	205	85
16	400	6,653	5,579	3,881	2,533	1,570	989	623	358	154
18	450	8,104	6,824	5,263	3,864	2,653	1,680	921	375	80
20	500	9,383	8,163	6,227	4,606	3,173	1,987	1,066	452	94
24	600	15,354	12,880	9,724	7,310	5,050	3,156	1,706	708	154
30	750	24,737	20,813	16,122	11,686	7,251	5,118	2,755	1,134	247
36	900	38,385	32,499	24,908	17,913	12,624	7,762	3,975	1,476	324
42	—	51,180	46,062	35,826	25,590	16,207	11,089	6,398	2,218	384
48	1200	70,799	63,122	49,474	34,973	22,178	14,501	8,530	3,753	682

ASME CLASS 600 – SERIES 44/45 – Kv VALUES

3	80	141	135	115	88	57	39	10	7	3
4	100	256	230	179	128	81	60	38	26	4
6	150	735	662	519	368	234	173	112	61	13
8	200	1,280	1,152	896	640	409	294	178	67	17
10	250	1,877	1,680	1,314	938	597	427	256	119	34
12	300	2,644	2,380	1,851	1,322	853	580	341	162	47
14	350	3,326	3,173	2,559	1,893	1,364	963	614	290	68
16	400	4,265	3,583	2,474	1,621	1,024	682	427	213	81
18	450	5,118	4,265	3,327	2,388	1,621	1,024	563	247	111
20	500	6,824	5,886	4,521	3,327	2,303	1,450	810	341	122
24	600	9,383	7,933	5,971	4,436	3,071	1,919	1,024	427	154
30	750	12,795	11,089	8,530	7,165	4,350	2,388	1,407	512	171

NOTES

- > Kv varies with the valve size, angle of opening and the manufacturer's valve style.
- > Kv value is the volume of water in cubic meters/hour (m³/hr) that will flow through a given restriction or valve opening with a pressure drop of one (1) bar at room temperature.
- > For sizes not shown, contact Bray for more information.

RESILIENT SEATED / FIRESAFE / METAL SEATED

PN10 | PN16 – SERIES 40/41/4A – Kv VALUES

DN	DISC POSITION (Degrees)								
	90°	80°	70°	60°	50°	40°	30°	20°	10°
50	74	65	55	43	31	21	12	7	5
65	136	116	85	67	43	26	14	7	3
80	158	152	132	105	74	48	27	12	4
100	320	311	269	213	149	98	54	26	9
125	674	576	427	307	203	125	67	35	14
150	1,152	913	640	435	281	186	119	69	30
200	2,388	1,902	1,356	904	584	389	239	141	55
250	3,668	2,943	2,073	1,390	896	597	384	213	85
300	5,672	4,546	3,199	2,158	1,390	921	597	333	132
350	6,525	5,203	3,668	2,474	1,612	1,066	691	384	149
400	8,359	6,705	4,700	3,156	2,064	1,305	870	495	196
450	8,957	7,762	5,937	4,350	3,003	1,894	1,007	427	145
500	11,516	9,980	7,506	5,545	3,839	2,405	1,305	546	171
600	17,060	14,586	10,918	8,163	5,664	3,310	1,877	785	205
700	23,884	20,387	15,525	11,516	7,933	4,862	2,644	1,109	247
750	27,296	23,287	17,828	13,222	9,127	5,715	3,071	1,288	273
800	29,002	24,822	19,022	14,075	9,724	6,099	3,284	1,373	290
900	41,371	35,058	27,040	19,790	13,989	8,701	4,632	1,928	409
1000	52,886	47,086	37,532	28,405	20,301	12,966	7,336	3,003	572
1200	77,623	69,008	54,336	37,191	24,822	17,060	9,383	3,924	785
1400	106,625	94,683	74,638	51,180	34,120	23,458	12,795	5,118	1,024
1500	136,480	119,420	89,565	63,975	42,650	26,443	14,501	5,971	1,194

PN25 | PN40 – SERIES 42/43/4B – Kv VALUES

50	74	65	55	43	31	21	12	7	5
65	136	116	85	67	43	26	14	7	3
80	158	152	132	105	74	48	27	12	4
100	320	311	269	213	149	98	54	26	9
125	674	576	427	307	203	125	67	35	14
150	853	746	606	452	316	205	118	67	22
200	1,706	1,467	1,160	810	537	345	205	103	40
250	2,260	1,919	1,484	1,024	665	435	252	128	52
300	3,412	2,900	2,133	1,442	938	606	367	188	78
350	3,497	2,986	2,218	1,510	1,024	708	418	205	85
400	6,653	5,579	3,881	2,533	1,570	989	623	358	154
450	8,104	6,824	5,263	3,864	2,653	1,680	921	375	80
500	9,383	8,163	6,227	4,606	3,173	1,987	1,066	452	94
600	15,354	12,880	9,724	7,310	5,050	3,156	1,706	708	154
750	24,737	20,813	16,122	11,686	7,251	5,118	2,755	1,134	247
900	38,385	32,499	24,908	17,913	12,624	7,762	3,975	1,476	324
1200	70,799	63,122	49,474	34,973	22,178	14,501	8,530	3,753	682

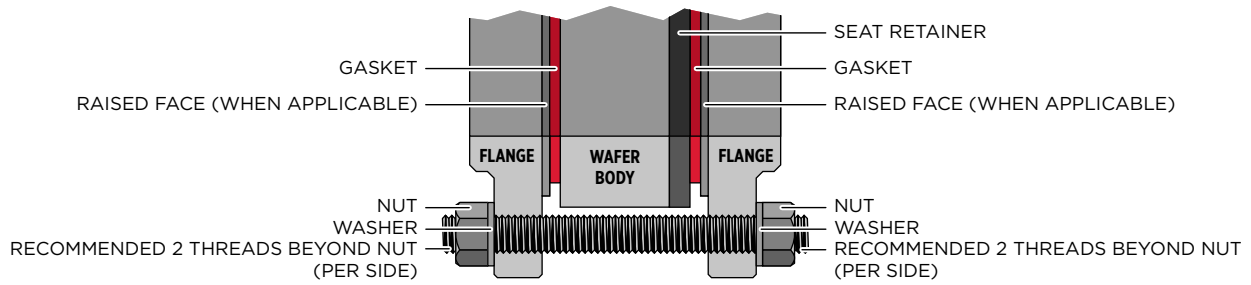
PN63 | PN100 – SERIES 44/45 – Kv VALUES

80	141	135	115	88	57	39	10	7	3
100	256	230	179	128	81	60	38	26	4
150	735	662	519	368	234	173	112	61	13
200	1,280	1,152	896	640	409	294	178	67	17
250	1,877	1,680	1,314	938	597	427	256	119	34
300	2,644	2,380	1,851	1,322	853	580	341	162	47
350	3,326	3,173	2,559	1,893	1,364	963	614	290	68
400	4,265	3,583	2,474	1,621	1,024	682	427	213	81
450	5,118	4,265	3,327	2,388	1,621	1,024	563	247	111
500	6,824	5,886	4,521	3,327	2,303	1,450	810	341	122
600	9,383	7,933	5,971	4,436	3,071	1,919	1,024	427	154
750	12,795	11,089	8,530	7,165	4,350	2,388	1,407	512	171

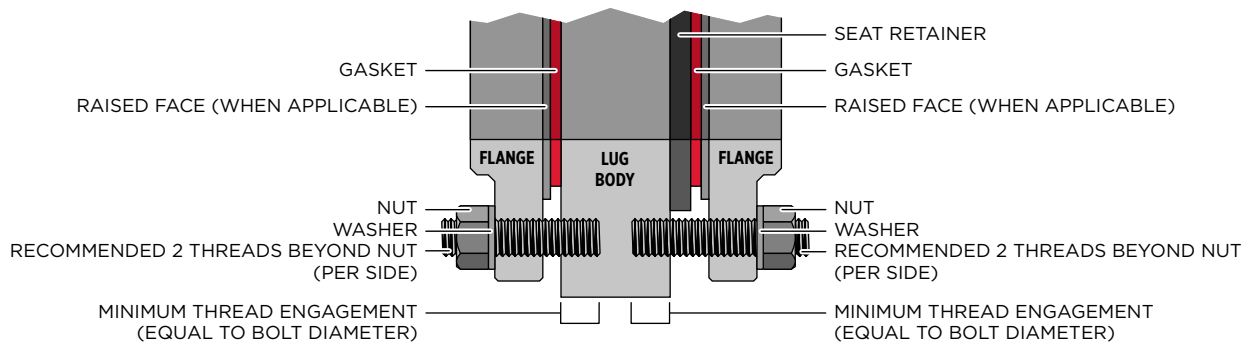
NOTES

- > Kv varies with the valve size, angle of opening and the manufacturer's valve style.
- > Kv value is the volume of water in cubic meters/hour (m³/hr) that will flow through a given restriction or valve opening with a pressure drop of one (1) bar at room temperature.
- > For sizes not shown, contact Bray for more information.

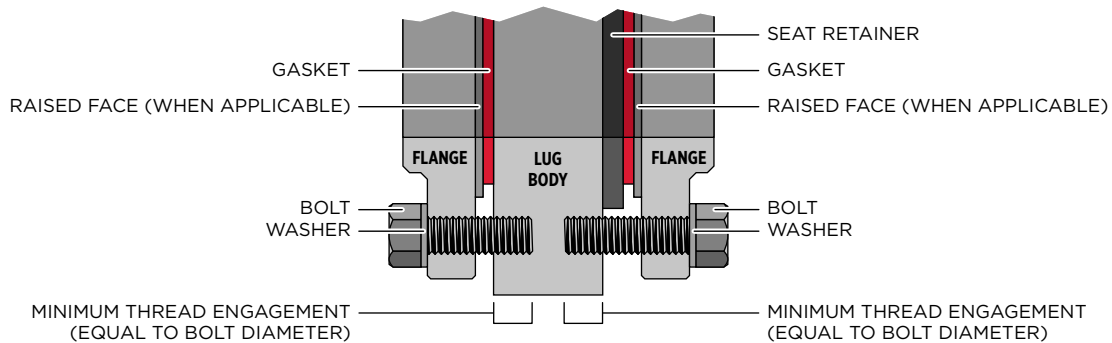
WAFER VALVE WITH THROUGH-STUDS



LUG VALVE WITH STUDS



LUG VALVE WITH HEX HEAD BOLTS



IMPORTANT INFORMATION

- > Double flange style bolting not shown.
- > Refer to appropriate Bray dimensional drawings for specific valve drilling information.
- > Pipe flange thickness may vary, therefore no stud/bolt lengths are stated.
- > Lug threads may be tapped from both sides, and therefore tap may not be continuous.
- > Minimum bolt engagement must be equal to the diameter of the bolt.
- > When bolting the valve into the line, use standard bolting torque as recommended by applicable piping standards. Additional force from the flange bolts is not required.



CAUTION
Tapped holes at neck locations **do not** permit through-holes.

ASME CLASS 150 | SERIES 40 WAFER STYLE | THROUGH-STUD

Valve Size		Fastener Size	Through Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty
2	50	5/8-11 UNC	4	—	—	8	8
2½	65	5/8-11 UNC	4	—	—	8	8
3	80	5/8-11 UNC	4	—	—	8	8
4	100	5/8-11 UNC	8	—	—	16	16
5	125	¾-10 UNC	8	—	—	16	16
6	150	¾-10 UNC	8	—	—	16	16
8	200	¾-10 UNC	8	—	—	16	16
10	250	7/8-9 UNC	12	—	—	24	24
12	300	7/8-9 UNC	12	—	—	24	24
14	350	1-8 UNC	12	—	—	24	24
16	400	1-8 UNC	16	—	—	32	32
18	450	1 1/8-8 UN	16	—	—	32	32
20	500	1 1/8-8 UN	16	4	4	40	40
24	600	1 1/4-8 UN	20	—	—	40	40
26	—	1 1/4-8 UN	20	4	4	48	48
28	700	1 1/4-8 UN	24	4	4	56	56
30	750	1 1/4-8 UN	24	4	4	56	56
32	800	1 1/4-8 UN	24	4	4	56	56
36	900	1 1/2-8 UN	28	4	4	64	64
42	—	1 1/2-8 UN	32	4	4	72	72
48	1200	1 1/2-8 UN	40	4	4	88	88
54	1400	1 3/4-8 UN	40	4	4	88	88

ASME CLASS 150 | SERIES 41 LUG STYLE | STUD

Valve Size		Fastener Size	Retainer Side Stud	Back Side Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
2	50	5/8-11 UNC	4	4	—	—	8	8
2½	65	5/8-11 UNC	4	4	—	—	8	8
3	80	5/8-11 UNC	4	4	—	—	8	8
4	100	5/8-11 UNC	8	8	—	—	16	16
5	125	¾-10 UNC	8	8	—	—	16	16
6	150	¾-10 UNC	8	8	—	—	16	16
8	200	¾-10 UNC	8	8	—	—	16	16
10	250	7/8-9 UNC	12	12	—	—	24	24
12	300	7/8-9 UNC	12	12	—	—	24	24
14	350	1-8 UNC	12	12	—	—	24	24
16	400	1-8 UNC	16	16	—	—	32	32
18	450	1 1/8-8 UN	16	16	—	—	32	32
20	500	1 1/8-8 UN	16	16	4	4	40	40
24	600	1 1/4-8 UN	20	20	—	—	40	40
28	700	1 1/4-8 UN	24	24	4	4	56	56
30	750	1 1/4-8 UN	24	24	4	4	56	56
32	800	1 1/2-8 UN	24	24	4	4	56	56
36	900	1 1/2-8 UN	28	28	4	4	64	64
40	1000	1 1/2-8 UN	32	32	4	4	72	72
42	—	1 1/2-8 UN	32	32	4	4	72	72
48	1200	1 1/2-8 UN	40	40	4	4	88	88
54	1400	1 3/4-8 UN	40	40	4	4	88	88
60	1500	1 3/4-8 UN	42	42	10	10	104	104

ASME CLASS 150 | SERIES 41 LUG STYLE | BOLT

Valve Size		Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
2	50	5/8-11 UNC	4	4	—	—	8	—
2½	65	5/8-11 UNC	4	4	—	—	8	—
3	80	5/8-11 UNC	4	4	—	—	8	—
4	100	5/8-11 UNC	8	8	—	—	16	—
5	125	¾-10 UNC	8	8	—	—	16	—
6	150	¾-10 UNC	8	8	—	—	16	—
8	200	¾-10 UNC	8	8	—	—	16	—
10	250	7/8-9 UNC	12	12	—	—	24	—
12	300	7/8-9 UNC	12	12	—	—	24	—
14	350	1-8 UNC	12	12	—	—	24	—
16	400	1-8 UNC	16	16	—	—	32	—
18	450	1½-8 UN	16	16	—	—	32	—
20	500	1½-8 UN	16	16	4	4	40	—
24	600	1¼-8 UN	20	20	—	—	40	—
28	700	1¼-8 UN	24	24	4	4	56	—
30	750	1¼-8 UN	24	24	4	4	56	—
32	800	1½-8 UN	24	24	4	4	56	—
36	900	1½-8 UN	28	28	4	4	64	—
40	1000	1½-8 UN	32	32	4	4	72	—
42	—	1½-8 UN	32	32	4	4	72	—
48	1200	1½-8 UN	40	40	4	4	88	—
54	1400	1¾-8 UN	40	40	4	4	88	—
60	1500	1¾-8 UN	42	42	10	10	104	—

ASME CLASS 150 | SERIES 4A DOUBLE FLANGE STYLE | BOLT

Valve Size		Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
2	50	5/8-11 UNC	4	4	—	—	16	8
2½	65	5/8-11 UNC	4	4	—	—	16	8
3	80	5/8-11 UNC	4	4	—	—	16	8
4	100	5/8-11 UNC	6	8	2	—	30	14
5	125	¾-10 UNC	6	8	2	—	30	14
6	150	¾-10 UNC	6	8	2	—	30	14
8	200	¾-10 UNC	6	8	2	—	30	14
10	250	7/8-9 UNC	10	12	2	—	46	22
12	300	7/8-9 UNC	8	12	4	—	44	20
14	350	1-8 UNC	8	12	4	—	44	20
16	400	1-8 UNC	12	16	4	—	60	28
18	450	1½-8 UN	12	16	4	—	60	28
20	500	1½-8 UN	16	20	4	—	76	36
24	600	1¼-8 UN	16	20	4	—	76	36
28	700	1¼-8 UN	24	24	4	4	104	48
30	750	1¼-8 UN	24	24	4	4	104	48
36	900	1½-8 UN	28	28	4	4	120	56
42	—	1½-8 UN	32	32	4	4	136	64
48	1200	1½-8 UN	40	40	4	4	88	—
54	1400	1¾-8 UN	36	36	8	8	124	36

ASME CLASS 300 | SERIES 42 WAFER STYLE | THROUGH-STUD

Valve Size		Fastener Size	Through Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty
2	50	5/8-11 UNC	8	—	—	16	16
2½	65	¾-10 UNC	8	—	—	16	16
3	80	¾-10 UNC	8	—	—	16	16
4	100	¾-10 UNC	8	—	—	16	16
5	125	¾-10 UNC	8	—	—	16	16
6	150	¾-10 UNC	12	—	—	24	24
8	200	7/8-9 UNC	12	—	—	24	24
10	250	1-8 UNC	16	—	—	32	32
12	300	1½-8 UN	16	—	—	32	32
14	350	1½-8 UN	16	4	4	40	40
16	400	1¼-8 UN	16	4	4	40	40
18	450	1¼-8 UN	20	4	4	48	48
20	500	1¼-8 UN	20	4	4	48	48
24	600	1½-8 UN	20	4	4	48	48
30	750	1¾-8 UN	24	4	4	56	56
36	900	2-8 UN	28	4	4	64	64

ASME CLASS 300 | SERIES 43 LUG STYLE | STUD

Valve Size		Fastener Size	Retainer Side Stud	Back Side Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
2	50	5/8-11 UNC	8	8	—	—	16	16
2½	65	¾-10 UNC	8	8	—	—	16	16
3	80	¾-10 UNC	8	8	—	—	16	16
4	100	¾-10 UNC	8	8	—	—	16	16
5	125	¾-10 UNC	8	8	—	—	16	16
6	150	¾-10 UNC	12	12	—	—	24	24
8	200	7/8-9 UNC	12	12	—	—	24	24
10	250	1-8 UNC	16	16	—	—	32	32
12	300	1½-8 UN	16	16	—	—	32	32
14	350	1½-8 UN	16	16	4	4	40	40
16	400	1¼-8 UN	16	16	4	4	40	40
18	450	1¼-8 UN	20	20	4	4	48	48
20	500	1¼-8 UN	20	20	4	4	48	48
24	600	1½-8 UN	20	20	4	4	48	48
30	750	1¾-8 UN	24	24	4	4	56	56
36	900	2-8 UN	28	28	4	4	64	64
40	1000	1½-8 UN	28	28	4	4	64	64
42	—	1½-8 UN	28	28	4	4	64	64
44	1100	1¾-8 UN	28	28	4	4	64	64
48	1200	1½-8 UN	28	28	4	4	64	64
54	1400	2¼-8 UN	24	24	4	4	56	56

ASME CLASS 300 | SERIES 43 LUG STYLE | BOLT

Valve Size		Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
2	50	5/8-11 UNC	8	8	—	—	16	—
2½	65	¾-10 UNC	8	8	—	—	16	—
3	80	¾-10 UNC	8	8	—	—	16	—
4	100	¾-10 UNC	8	8	—	—	16	—
5	125	¾-10 UNC	8	8	—	—	16	—
6	150	¾-10 UNC	12	12	—	—	24	—
8	200	7/8-9 UNC	12	12	—	—	24	—
10	250	1-8 UNC	16	16	—	—	32	—
12	300	1½-8 UN	16	16	—	—	32	—
14	350	1½-8 UN	16	16	4	4	40	—
16	400	1¼-8 UN	16	16	4	4	40	—
18	450	1¼-8 UN	20	20	4	4	48	—
20	500	1¼-8 UN	20	20	4	4	48	—
24	600	1½-8 UN	20	20	4	4	48	—
30	750	1¾-8 UN	24	24	4	4	56	—
36	900	2-8 UN	28	28	4	4	64	—
40	1000	1¾-8 UN	28	28	4	4	64	—
42	—	1¾-8 UN	28	28	4	4	64	—
44	1100	1¾-8 UN	28	28	4	4	64	—
48	1200	1¾-8 UN	28	28	4	4	64	—
54	1400	2¼-8 UN	24	24	4	4	56	—

ASME CLASS 300 | SERIES 4B DOUBLE FLANGE STYLE | BOLT

Valve Size		Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
3	80	¾-10 UNC	8	8	—	—	24	8
4	100	¾-10 UNC	8	8	—	—	24	8
5	125	¾-10 UNC	8	8	—	—	24	8
6	150	¾-10 UNC	12	12	—	—	36	12
8	200	7/8-9 UNC	10	12	2	—	36	12
10	250	1-8 UNC	12	12	4	4	44	12
12	300	1½-8 UN	12	12	4	4	44	12
14	350	1½-8 UN	16	16	4	4	56	16
16	400	1¼-8 UN	16	16	4	4	56	16
18	450	1¼-8 UN	20	20	4	4	68	20
20	500	1¼-8 UN	20	20	4	4	68	20
24	600	1½-8 UN	20	20	4	4	68	20
30	750	1¾-8 UN	24	24	4	4	80	24
32	800	1¾-8 UN	24	24	4	4	80	24
36	900	2-8 UN	28	28	4	4	92	28
42	—	1¾-8 UN	28	28	4	4	92	28

ASME CLASS 600 | SERIES 44 WAFER STYLE | THROUGH-STUD

Valve Size		Fastener Size	Through Stud	Retainer Side Blind Stud	Back Side Blind Stud	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty
3	80	3/4-10 UNC	8	—	—	16	16
4	100	7/8-9 UNC	8	—	—	16	16
6	150	1-8 UNC	12	—	—	24	24
8	200	1 1/8-8 UN	12	—	—	24	24
10	250	1 1/4-8 UN	12	4	4	32	32
12	300	1 1/4-8 UN	16	4	4	40	40
14	350	1 3/8-8 UN	16	4	4	40	40
16	400	1 1/2-8 UN	16	4	4	40	40
18	450	1 5/8-8 UN	16	4	4	40	40
20	500	1 5/8-8 UN	20	4	4	48	48
24	600	1 7/8-8 UN	20	4	4	48	48

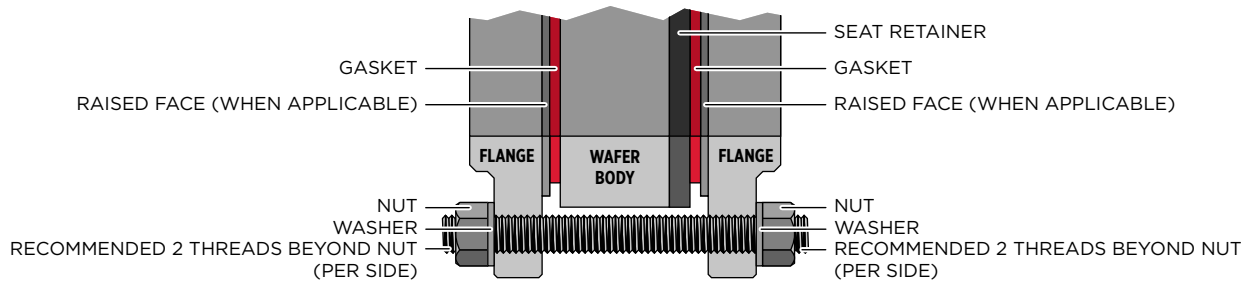
ASME CLASS 600 | SERIES 45 LUG STYLE | STUD

Valve Size		Fastener Size	Retainer Side Stud	Back Side Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
3	80	3/4-10 UNC	8	8	—	—	16	16
4	100	7/8-9 UNC	8	8	—	—	16	16
6	150	1-8 UNC	12	12	—	—	24	24
8	200	1 1/8-8 UN	12	12	—	—	24	24
10	250	1 1/4-8 UN	12	12	4	4	32	32
12	300	1 1/4-8 UN	16	16	4	4	40	40
14	350	1 3/8-8 UN	16	16	4	4	40	40
16	400	1 1/2-8 UN	16	16	4	4	40	40
18	450	1 5/8-8 UN	16	16	4	4	40	40
20	500	1 5/8-8 UN	20	20	4	4	48	48
24	600	1 7/8-8 UN	20	20	4	4	48	48

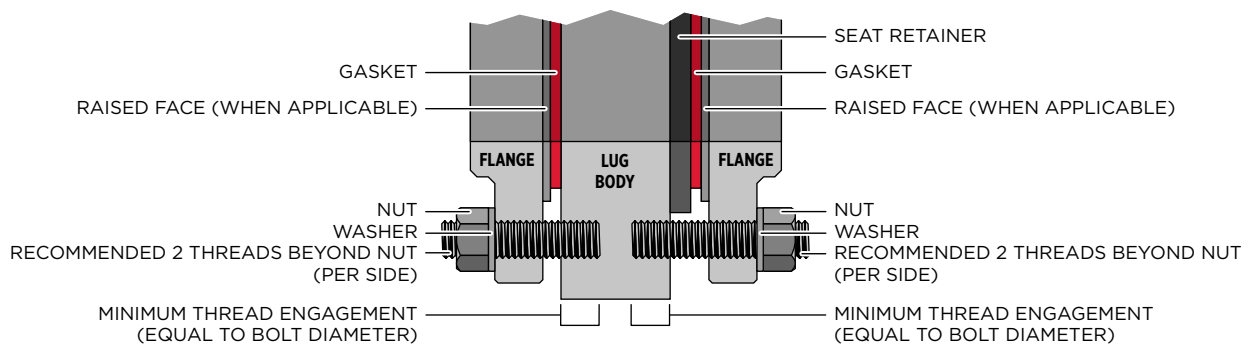
ASME CLASS 600 | SERIES 45 LUG STYLE | BOLT

Valve Size		Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
NPS	DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
3	80	3/4-10 UNC	8	8	—	—	16	—
4	100	7/8-9 UNC	8	8	—	—	16	—
6	150	1-8 UNC	12	12	—	—	24	—
8	200	1 1/8-8 UN	12	12	—	—	24	—
10	250	1 1/4-8 UN	12	12	4	4	32	—
12	300	1 1/4-8 UN	16	16	4	4	40	—
14	350	1 3/8-8 UN	16	16	4	4	40	—
16	400	1 1/2-8 UN	16	16	4	4	40	—
18	450	1 5/8-8 UN	16	16	4	4	40	—
20	500	1 5/8-8 UN	20	20	4	4	48	—
24	600	1 7/8-8 UN	20	20	4	4	48	—

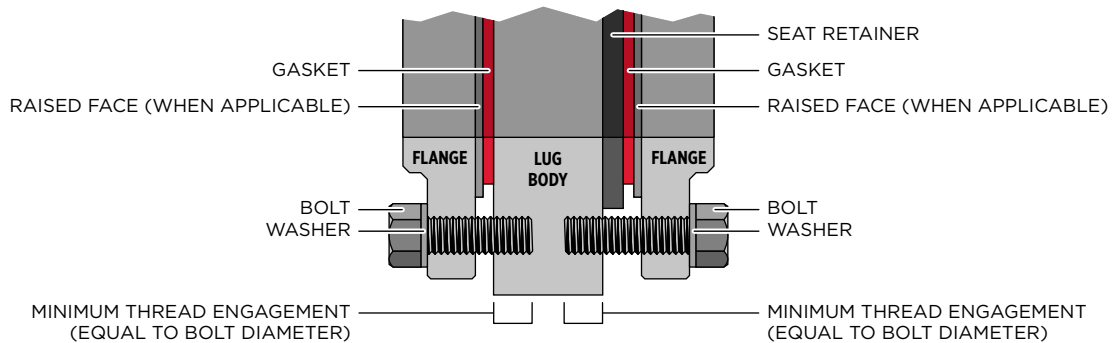
WAFER VALVE WITH THROUGH-STUDS



LUG VALVE WITH STUDS



LUG VALVE WITH HEX HEAD BOLTS



IMPORTANT INFORMATION

- > Double flange style bolting not shown.
- > Refer to appropriate Bray dimensional drawings for specific valve drilling information.
- > Pipe flange thickness may vary, therefore no stud/bolt lengths are stated.
- > Lug threads may be tapped from both sides, and therefore tap may not be continuous.
- > Minimum bolt engagement must be equal to the diameter of the bolt.
- > When bolting the valve into the line, use standard bolting torque as recommended by applicable piping standards. Additional force from the flange bolts is not required.



CAUTION
Tapped holes at neck locations **do not** permit through-holes.

PN10 | SERIES 40 WAFER STYLE | THROUGH-STUD

Valve Size	Fastener Size	Through Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty
50	M16	4	—	—	8	8
65	M16	4	—	—	8	8
80	M16	8	—	—	16	16
100	M16	8	—	—	16	16
125	M16	8	—	—	16	16
150	M20	8	—	—	16	16
200	M20	8	—	—	16	16
250	M20	12	—	—	24	24
300	M20	12	—	—	24	24
350	M20	16	—	—	32	32
400	M24	16	—	—	32	32
450	M24	16	4	4	40	40
500	M24	16	4	4	40	40
600	M27	16	4	4	40	40
700	M27	20	4	4	48	48
800	M30	20	4	4	48	48
900	M30	24	4	4	56	56
1200	M36	28	4	4	64	64
1400	M39	32	4	4	72	72

PN16 | SERIES 40 WAFER STYLE | THROUGH-STUD

Valve Size	Fastener Size	Through Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty
50	M16	4	—	—	8	8
65	M16	4*	—	—	8	8
80	M16	8	—	—	16	16
100	M16	8	—	—	16	16
125	M16	8	—	—	16	16
150	M20	8	—	—	16	16
200	M20	12	—	—	24	24
250	M24	12	—	—	24	24
300	M24	12	—	—	24	24
350	M24	16	—	—	32	32
400	M27	16	—	—	32	32
450	M27	16	4	4	40	40
500	M30	16	4	4	40	40
600	M33	16	4	4	40	40
700	M33	20	4	4	48	48
800	M36	20	4	4	48	48
900	M36	24	4	4	56	56
1200	M45	28	4	4	64	64
1400	M45	32	4	4	72	72

PN10 | SERIES 41 LUG STYLE | STUD

Valve Size	Fastener Size	Retainer Side Stud	Back Side Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
50	M16	4	4	—	—	8	8
65	M16	4*	4*	—	—	8	8
80	M16	8	8	—	—	16	16
100	M16	8	8	—	—	16	16
125	M16	8	8	—	—	16	16
150	M20	8	8	—	—	16	16
200	M20	8	8	—	—	16	16
250	M20	12	12	—	—	24	24
300	M20	12	12	—	—	24	24
350	M20	16	16	—	—	32	32
400	M24	16	16	—	—	32	32
450	M24	16	16	4	4	40	40
500	M24	20	20	—	—	40	40
600	M27	20	20	—	—	40	40
700	M27	20	20	4	4	48	48
800	M30	20	20	4	4	48	48
900	M30	24	24	4	4	56	56
1000	M33	28	28	—	—	56	56
1200	M36	28	28	4	4	64	64
1400	M39	32	32	4	4	72	72

PN16 | SERIES 41 LUG STYLE | STUD

Valve Size	Fastener Size	Retainer Side Stud	Back Side Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
50	M16	4	4	—	—	8	8
65	M16	4	4	—	—	8	8
80	M16	4	4	—	—	8	8
100	M16	8	8	—	—	16	16
125	M16	8	8	—	—	16	16
150	M20	8	8	—	—	16	16
200	M20	12	12	—	—	24	24
250	M24	12	12	—	—	24	24
300	M24	12	12	—	—	24	24
350	M24	16	16	—	—	32	32
400	M27	16	16	—	—	32	32
450	M27	16	16	4	4	40	40
500	M30	16	16	4	4	40	40
600	M33	20	20	—	—	40	40
700	M33	20	20	4	4	48	48
800	M36	20	20	4	4	48	48
900	M36	24	24	4	4	56	56
1000	M39	24	24	4	4	56	56
1200	M45	28	28	4	4	64	64
1400	M45	32	32	4	4	72	72

PN10 | SERIES 41 LUG STYLE | BOLT

Valve Size	Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
50	M16	4	4	—	—	8	—
65	M16	4*	4*	—	—	8	—
80	M16	8	8	—	—	16	—
100	M16	8	8	—	—	16	—
125	M16	8	8	—	—	16	—
150	M20	8	8	—	—	16	—
200	M20	8	8	—	—	16	—
250	M20	12	12	—	—	24	—
300	M20	12	12	—	—	24	—
350	M20	16	16	—	—	32	—
400	M24	16	16	—	—	32	—
450	M24	16	16	4	4	40	—
500	M24	20	20	—	—	40	—
600	M27	20	20	—	—	40	—
700	M27	20	20	4	4	48	—
800	M30	20	20	4	4	48	—
900	M30	24	24	4	4	56	—
1000	M33	28	28	—	—	56	—
1200	M36	28	28	4	4	64	—
1400	M39	32	32	4	4	72	—

PN16 | SERIES 41 LUG STYLE | BOLT

Valve Size	Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
50	M16	4	4	—	—	8	—
65	M16	4	4	—	—	8	—
80	M16	4	4	—	—	8	—
100	M16	8	8	—	—	16	—
125	M16	8	8	—	—	16	—
150	M20	8	8	—	—	16	—
200	M20	12	12	—	—	24	—
250	M24	12	12	—	—	24	—
300	M24	12	12	—	—	24	—
350	M24	16	16	—	—	32	—
400	M27	16	16	—	—	32	—
450	M27	16	16	4	4	40	—
500	M30	16	16	4	4	40	—
600	M33	20	20	—	—	40	—
700	M33	20	20	4	4	48	—
800	M36	20	20	4	4	48	—
900	M36	24	24	4	4	56	—
1000	M39	24	24	4	4	56	—
1200	M45	28	28	4	4	64	—
1400	M45	32	32	4	4	72	—

PN10 | SERIES 4A DOUBLE FLANGE STYLE | BOLT

Valve Size	Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
80	M16	4	8	4	—	28	12
100	M16	6	8	2	—	30	14
125	M16	6	8	2	—	30	14
150	M20	8	8	—	—	32	16
200	M20	8	8	—	—	32	16
250	M20	12	12	—	—	48	24
300	M20	12	12	—	—	48	24
350	M20	12	16	4	—	60	28
400	M24	12	16	4	—	60	28
450	M24	16	20	4	—	76	36
500	M24	16	20	4	—	76	36
600	M27	16	20	4	—	76	36
700	M27	20	20	4	4	88	40

PN16 | SERIES 4A DOUBLE FLANGE STYLE | BOLT

Valve Size	Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
80	M16	4	8	4	—	28	12
100	M16	6	8	2	—	30	14
125	M16	6	8	2	—	30	14
150	M20	8	8	—	—	32	16
200	M20	12	12	—	—	48	24
250	M24	12	12	—	—	48	24
300	M24	12	12	—	—	48	24
350	M24	12	16	4	—	60	28
400	M27	12	16	4	—	60	28
450	M27	16	20	4	—	76	36
500	M30	16	20	4	—	76	36
600	M33	16	20	4	—	76	36
700	M33	20	20	4	4	88	40

PN25 | SERIES 42 WAFER STYLE | THROUGH-STUD

Valve Size	Fastener Size	Through Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty
65	M16	8	—	—	16	16
80	M16	8	—	—	16	16
100	M20	8	—	—	16	16
125	M24	8	—	—	16	16
150	M24	8	—	—	16	16
200	M24	12	—	—	24	24
250	M27	12	—	—	24	24
300	M27	16	—	—	32	32
350	M30	12	4	4	32	32
400	M33	12	4	4	32	32
450	M33	16	4	4	40	40
500	M33	16	4	4	40	40
600	M36	16	4	4	40	40
750	M45	20	4	4	48	48
900	M45	24	4	4	56	56

PN40 | SERIES 42 WAFER STYLE | THROUGH-STUD

Valve Size	Fastener Size	Through Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty
65	M16	8	—	—	16	16
80	M16	8	—	—	16	16
100	M20	8	—	—	16	16
125	M24	8	—	—	16	16
150	M24	8	—	—	16	16
200	M27	12	—	—	24	24
250	M30	12	—	—	32	32
300	M30	16	—	—	32	32
350	M33	16	—	—	32	32
400	M36	16	—	—	32	32
450	M36	16	4	4	40	40
500	M39	16	4	4	40	40
600	M45	16	4	4	40	40

PN25 | SERIES 43 LUG STYLE | STUD

Valve Size	Fastener Size	Retainer Side Stud	Back Side Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
65	M16	8	8	—	—	16	16
80	M16	8	8	—	—	16	16
100	M20	8	8	—	—	16	16
125	M24	8	8	—	—	16	16
150	M24	8	8	—	—	16	16
200	M24	12	12	—	—	24	24
250	M27	12	12	—	—	24	24
300	M27	16	16	—	—	32	32
350	M30	16	16	—	—	32	32
400	M33	12	12	4	4	32	32
450	M33	16	16	4	4	40	40
500	M33	16	16	4	4	40	40
600	M36	16	16	4	4	40	40
900	M45	24	24	4	4	56	56
1000	M52	24	24	4	4	56	56

PN40 | SERIES 43 LUG STYLE | STUD

Valve Size	Fastener Size	Retainer Side Stud	Back Side Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
65	M16	8	8	—	—	16	16
80	M16	8	8	—	—	16	16
100	M20	8	8	—	—	16	16
125	M24	8	8	—	—	16	16
150	M24	8	8	—	—	16	16
200	M27	12	12	—	—	24	24
250	M30	16	16	—	—	32	32
300	M30	16	16	—	—	32	32
350	M33	12	12	4	4	32	32
400	M36	16	16	—	—	32	32
450	M36	16	16	4	4	40	40
500	M39	16	16	4	4	40	40
600	M45	16	16	4	4	40	40

PN25 | SERIES 43 LUG STYLE | BOLT

Valve Size	Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
65	M16	8	8	—	—	16	—
80	M16	8	8	—	—	16	—
100	M20	8	8	—	—	16	—
125	M24	8	8	—	—	16	—
150	M24	8	8	—	—	16	—
200	M24	12	12	—	—	24	—
250	M27	12	12	—	—	24	—
300	M27	16	16	—	—	32	—
350	M30	16	16	—	—	32	—
400	M33	12	12	4	4	32	—
450	M33	16	16	4	4	40	—
500	M33	16	16	4	4	40	—
600	M36	16	16	4	4	40	—
900	M45	24	24	4	4	56	—
1000	M52	24	24	4	4	56	—

PN40 | SERIES 43 LUG STYLE | BOLT

Valve Size	Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
65	M16	8	8	—	—	16	—
80	M16	8	8	—	—	16	—
100	M20	8	8	—	—	16	—
125	M24	8	8	—	—	16	—
150	M24	8	8	—	—	16	—
200	M27	12	12	—	—	24	—
250	M30	16	16	—	—	32	—
300	M30	16	16	—	—	32	—
350	M33	12	12	4	4	32	—
400	M36	16	16	—	—	32	—
450	M36	16	16	4	4	40	—
500	M39	16	16	4	4	40	—
600	M45	16	16	4	4	40	—

PN25 | SERIES 4B DOUBLE FLANGE STYLE | BOLT

Valve Size	Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
80	M16	8	8	—	—	32	16
100	M20	8	8	—	—	32	16
125	M24	8	8	—	—	32	16
150	M24	8	8	—	—	32	16
200	M24	12	12	—	—	48	24
250	M27	8	10	4	2	42	18
300	M27	12	12	4	4	56	24
350	M30	12	12	4	4	56	24
400	M33	12	12	4	4	56	24
450	M33	16	16	4	4	72	32
500	M33	16	16	4	4	72	32
600	M36	16	16	4	4	72	32
900	M45	28	28	8	—	120	56

PN40 | SERIES 4B DOUBLE FLANGE STYLE | BOLT

Valve Size	Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
80	M16	8	8	—	—	32	16
100	M20	8	8	—	—	32	16
125	M24	8	8	—	—	32	16
150	M24	8	8	—	—	32	16
200	M27	12	12	—	—	48	24
250	M30	10	8	2	4	42	18
300	M30	12	12	4	4	56	24
350	M33	12	12	4	4	56	24
400	M36	12	12	4	4	56	24
450	M36	16	16	4	4	72	32
500	M39	16	16	4	4	72	32
600	M45	16	16	4	4	72	32

PN63 | SERIES 44 WAFER STYLE | THROUGH-STUD

Valve Size	Fastener Size	Through Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty
80	M20	8	—	—	16	16
100	M24	8	—	—	16	16
150	M30	8	—	—	16	16
200	M33	8	4	4	24	24
250	M33	8	4	4	24	24
300	M33	12	4	4	32	32
350	M36	12	4	4	32	32
400	M39	12	4	4	32	32

PN100 | SERIES 44 WAFER STYLE | THROUGH-STUD

Valve Size	Fastener Size	Through Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty
80	M24	8	—	—	16	16
100	M27	8	—	—	16	16
150	M30	8	4	4	24	24
200	M33	12	—	—	24	24
250	M36	12	—	—	32	32
300	M39	12	4	4	32	32
350	M45	12	4	4	32	32

PN63 | SERIES 45 LUG STYLE | STUD

Valve Size	Fastener Size	Retainer Side Stud	Back Side Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
80	M20	8	8	—	—	16	16
100	M24	8	8	—	—	16	16
200	M33	12	12	—	—	24	24

PN100 | SERIES 45 LUG STYLE | STUD

Valve Size	Fastener Size	Retainer Side Stud	Back Side Stud	Retainer Blind Stud	Back Blind Stud	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
80	M24	8	8	—	—	16	16
100	M30	8	8	4	4	24	24
200	M33	12	12	—	—	24	24

PN63 | SERIES 45 LUG STYLE | BOLT

Valve Size	Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
80	M20	8	8	—	—	16	—
100	M24	8	8	—	—	16	—
200	M33	12	12	—	—	24	—

PN100 | SERIES 45 LUG STYLE | BOLT

Valve Size	Fastener Size	Retainer Side Hex Head Bolt	Back Side Hex Head Bolt	Retainer Blind Hex Head Bolt	Back Blind Hex Head Bolt	Washer	Nut
DN	Ø-Thread	Qty	Qty	Qty	Qty	Qty	Qty
100	M24	8	8	—	—	16	—
150	M30	8	8	4	4	24	—
200	M33	12	12	—	—	24	—

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