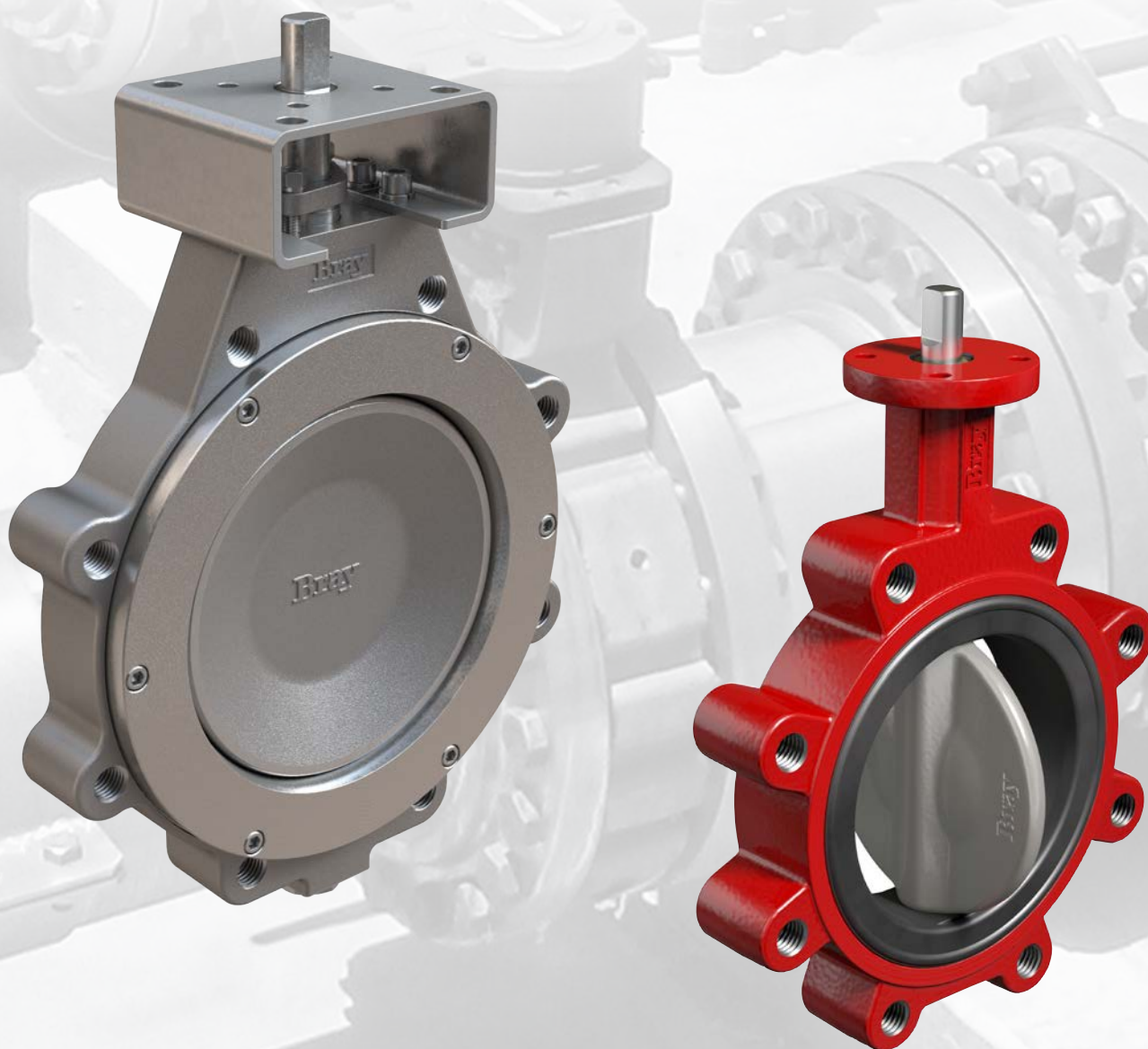


RESILIENT SEATED AND DOUBLE OFFSET VALVES
TYPICAL FLANGE BOLTING with Washers



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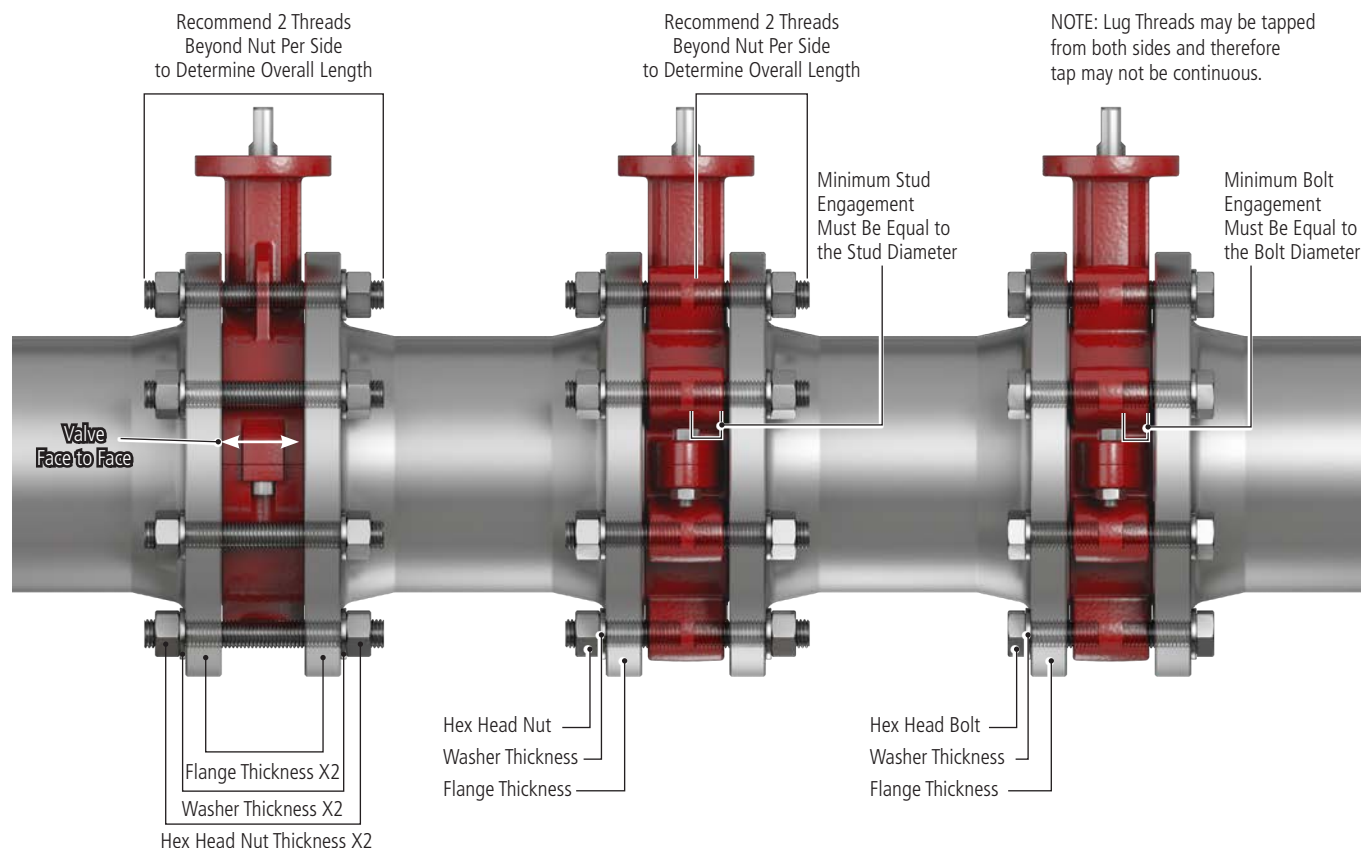
THE HIGH PERFORMANCE COMPANY

Examples of Typical Valve to Flange Bolting

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. Minimum bolt engagement must be equal to the diameter of the bolt.

CAUTION: To ensure proper installation refer to appropriate table within this guide for specific valve drilling information.

NOTES: Double flange style bolting not shown. Lug Threads may be tapped from both sides and therefore tap may not be continuous.



Wafer Valve

Through Stud Length

Valve Face to Face	+	Flange Thickness X2	+	Washer Thickness X2	+	Nut Thickness X2	=	Length of Stud (Plus 2 Threads for Studs)
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FLANGES WITH RAISED FACES - ADD IN THE THICKNESS OF THE RAISED FACE

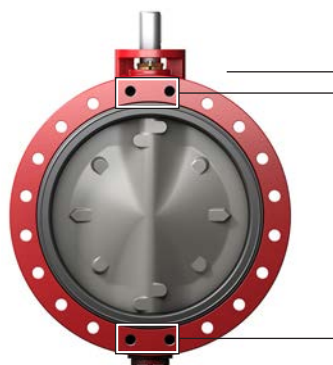
Lug Valve

Hex Head Bolt Length

Washer Thickness	+	Flange Thickness	+	Minimum Bolt Engagement Equal to the Bolt Diameter	=	Length of Bolt
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Stud Length

Washer Thickness	+	Nut Thickness	+	Flange Thickness	+	Minimum Stud Engagement Equal to the Stud Diameter	=	Length of Stud (Plus 2 Threads for Studs)
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CAUTION:
Tapped holes at neck locations **DO NOT** permit thru holes.

PLEASE REFER TO APPROPRIATE BRAY DIMENSIONAL DRAWINGS FOR SPECIFIC VALVE DRILLING INFORMATION

Assumptions Made in Calculations

Lengths rounded to the nearest 1/4" for maximum thread engagement.

Nut thickness as per ASME B18.2.2 Heavy Hex.

Washer thickness as per ASME B18.22.1 Type A.

Flange thickness as per ASME B16.5 or ASME B 16.47 Class A.

Note:

Bray Controls is issuing these recommendations only as a guide to installation. This recommendation is based on the full compliance of all materials supplied to their appropriate specifications. Since many of the components are not manufactured by Bray we can take no responsibility for any damage caused during installation.

S20/21, S22/23, S30/31, S32/33, S35/36 Recommended Flange Torques

Flange Size Range		Fastener Size		Recommended Torques*	
in	mm	in	mm	lb-ft	Nm
2" - 4"	50-100	5/8	16	35	50
5" - 8"	125-200	3/4	19	45	60
10" - 12"	250-300	7/8	22	75	100
14" - 16"	350-400	1	25	110	150
18" - 20"	450-500	1 1/8	29	200	270
22" - 30"	550-750	1 1/4	32	250	340
32" - 48"	800-1200	1 1/2	38	430	585
52" - 72"	1300-1800	1 3/4	45	715	970
84"	2200	2	51	1175	1595
90" - 96"	2250-2400	2 1/4	57	1675	2270

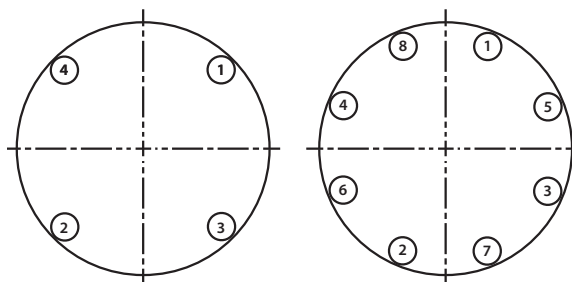
* Assumes well lubricated fastener selected to a grade sufficiently strong for the corresponding torque rating. Torque value is a general recommendation. Specific applications may require additional torque on flange fastener. Do not exceed 110% of recommended value.

WASHER THICKNESS

Size	in	mm	Size	in	mm
5/8	0.13	3	1 1/4	0.17	4
3/4	0.15	4	1 3/8	0.18	5
7/8	0.17	4	1 1/2	0.18	5
1	0.17	4	1 5/8	0.18	5
1 1/8	0.17	4	1 3/4	0.18	5

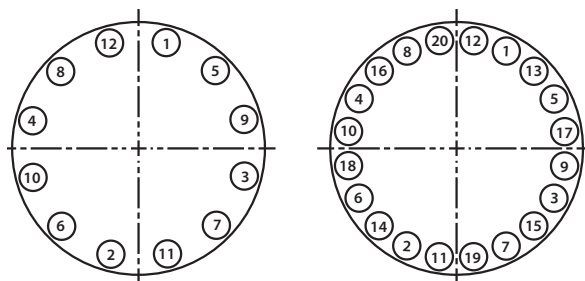
FIGURE 1

4 Bolt and 8 Bolt Flanges



- Lubricate, hand tighten, then SNUG up bolts
- **Round 1** - Tighten to 25% of final torque
- **Round 2** - Tighten to 50% of final torque
- **Round 3** - Tighten to 100% of final torque

12 Bolt Flanges and Above



- Lubricate, hand tighten, then SNUG up bolts
- **Round 1** - Tighten to 20% of final torque
- **Round 2** - Tighten to 40% of final torque
- **Round 3** - Tighten to 80% of final torque
- **Round 4** - Tighten to 100% of final torque

NOTES:

Refer to Bray Resilient BFV Technical Manual for additional flange bolt tensioning data.

For Series 4X, refer to gasket manufacturers recommended fastener torque.

Do not exceed flange manufacturers' recommended fastener torque.

Tighten in star pattern, progressively increasing fastener torque as per **Figure 1**.


SERIES 30 | WAFER

Valve Size		Diameter/Thread	Studs		
in	mm		in	mm	Qty
2	50	5/8-11UNC	5.00	127	4
2½	65	5/8-11UNC	5.50	140	4
3	80	5/8-11UNC	5.50	140	4
4	100	5/8-11UNC	5.75	146	8
5	125	¾-10UNC	6.25	159	8
6	150	¾-10UNC	6.50	165	8
8	200	¾-10UNC	7.00	178	8
10	250	7/8-9UNC	7.50	191	12
12	300	7/8-9UNC	8.00	203	12
14	350	1-8UNC	8.75	222	12
16	400	1-8UNC	9.75	248	16
18	450	1½-7UNC	10.50	267	16
20	500	1½-7UNC	11.50	292	20


SERIES 31 | LUG

Valve Size		Diameter/Thread	Studs		
in	mm		in	mm	Qty
2	50	5/8-11UNC	2.75	70	8
2½	60	5/8-11UNC	2.75	70	8
3	80	5/8-11UNC	2.75	70	8
4	100	5/8-11UNC	2.75	70	16
5	125	¾-10UNC	3.00	76	16
6	150	¾-10UNC	3.00	76	16
8	200	¾-10UNC	3.25	83	16
10	250	7/8-9UNC	3.50	89	24
12	300	7/8-9UNC	3.75	95	24
14	350	1-8UNC	4.00	102	24
16	400	1-8UNC	4.50	114	32
18	450	1½-7UNC	4.75	121	32
20	500	1½-7UNC	5.25	133	32
		Blind Bolts	4.50	114	8

OR

Hex Head Bolts		
in	mm	Qty
1.50	38	8
1.75	44	8
1.75	44	8
1.75	44	16
2.00	51	16
2.00	51	16
2.25	57	16
2.50	64	24
2.50	64	24
2.75	70	24
3.25	83	32
3.25	83	32
4.00	102	32
3.00	76	8

Deadend Service requires half the number of bolts and nuts

PLEASE REFER TO APPROPRIATE BRAY DIMENSIONAL DRAWINGS FOR SPECIFIC VALVE DRILLING INFORMATION
Assumptions Made in Calculations

Lengths rounded to the nearest 1/4" for maximum thread engagement.

Nut thickness as per ASME B18.2.2 Heavy Hex.

Washer thickness as per ASME B18.22.1 Type A.

Flange thickness as per ASME B16.5 Class 150.