

**KEYSTONE RESILIENT SEATED BUTTERFLY VALVES**

FIGURE 221 AND 222

An economical bonded resilient seated butterfly valve for bi-directional and end-of-line service

- F221 Wafer style valve
- F222 Lugged style valve



**FEATURES**

- Bubble tight shut-off at full rated pressure in both directions.
- The F222 lugged version is suitable for bi-directional end-of-line service at full pressure rating.
- Top and bottom bearings absorb side thrust loads.
- A moulded-in O-ring in the seat for flange sealing eliminates the need for flange gaskets.
- Body locating holes for easy installation and centering between flanges.
- Extended neck allows adequate clearance for flange and insulation.

**GENERAL APPLICATION**

Ideal for building services and irrigation applications that require shut-off control. The valve has a moulded in seat and can be used in full vacuum service.

**TECHNICAL DATA**

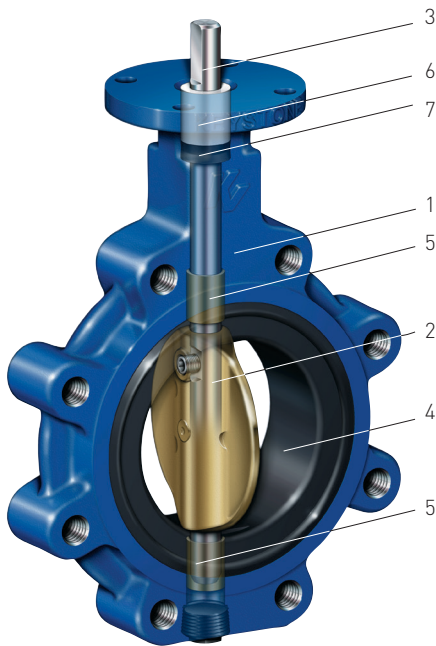
Size range: DN 50-300 (NPS 2-12)  
 Temperature rating: -29°C to 120°C (-20°F to 250°F)  
 Pressure rating: 16 bar (250 psi) bi-directional bubble tight shut-off rating.  
 End of line: 16 bar with F222 lugged valve.  
 Standard flange drilling: AS 2129 E, ASME Class 125/150, JIS 5K/10K, PN 10 and 16\*

**NOTE**

Other drillings available upon request.  
 \* Not available in all valve sizes.

# KEYSTONE RESILIENT SEATED BUTTERFLY VALVES

FIGURE 221 AND 222



## MATERIALS

Part	Material	Material standards
1 Body	Cast iron	ASTM A126 Class B
2 Disc	304 SS	ASTM A351 Grade CF8
	Aluminum bronze	ASTM B148 UNS C95200 Grade A
	316 SS	ASTM A743 Grade CF8M
3 Stem	416 SS	ASTM A582 UNS S41600
4 Molded-in liner	EPDM	
	NBR	
5 Inboard bearings	PTFE/steel	
6 Upper bushing	Polyester	
7 Upper stem seal	NBR	

## K<sub>v</sub> VALUES vs TRAVEL POSITION

Size (DN)	Angle of opening								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
50	0	1	4	12	22	35	45	51	52
65	0	1	5	18	38	64	93	119	131
80	1	1	7	25	58	99	151	202	227
100	1	13	42	93	170	275	400	509	560
125	3	28	86	178	313	501	720	904	987
150	3	41	125	255	441	700	1003	1254	1366
200	5	73	207	389	649	1029	1517	2063	2501
250	8	115	311	564	920	1455	2183	3110	3972
300	10	166	440	777	1253	1979	3001	4398	5779

### NOTE:

K<sub>v</sub> is the valve flow capacity expressed as flow rate of water at 20°C, in cubic meters per hour, which produces a 1 bar pressure drop across the valve.

## C<sub>v</sub> VALUES vs TRAVEL POSITION

Size (NPS)	Angle of opening								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
2	0	1.3	5	14	26	40	52	59	60
2½	0	1.4	6	21	44	74	107	138	150
3	0	1.5	8	29	67	115	175	234	262
4	1	15	48	107	196	318	463	589	647
5	3	32	99	206	362	579	832	1045	1141
6	4	47	145	295	510	810	1160	1450	1580
8	6	84	239	450	751	1190	1754	2385	2892
10	9	133	360	652	1064	1683	2524	3596	4593
12	12	192	509	899	1449	2288	3470	5085	6682

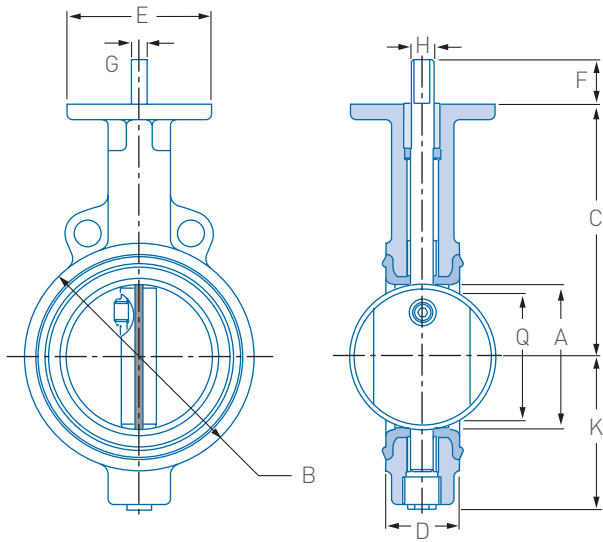
### NOTE:

C<sub>v</sub> is the valve flow capacity expressed as the flow rate of water at 60°F, in US gallons per minute, which produces a 1 psi pressure drop across the valve.

# KEYSTONE RESILIENT SEATED BUTTERFLY VALVES

## FIGURE 221 AND 222 - IMPERIAL

F221 WAFER VALVE



F222 LUGGED STYLE VALVE

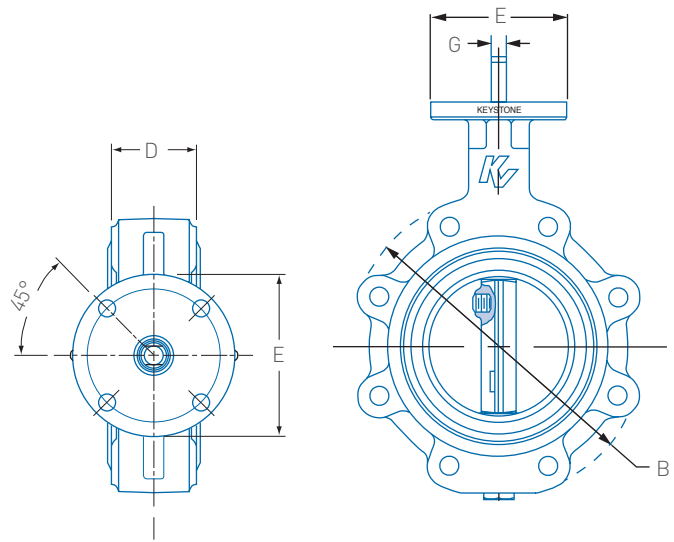


FIGURE 221 DIMENSIONS (inches)

Valve size (NPS)	Valve Dimensions								Shaft			Top plate drilling			Weight	
	A	B	C	D	E	F	K	Q	G	H	Key	Bolt circle	No. of holes	Hole dia.	F221	Stem conn. code
2	2 <sup>1</sup> / <sub>16</sub>	4 <sup>1</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub>	4	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	7.7	BAB
2 <sup>1</sup> / <sub>2</sub>	2 <sup>7</sup> / <sub>16</sub>	4 <sup>5</sup> / <sub>8</sub>	5 <sup>15</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>	4	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	2	9 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	8.8	BAB
3	3 <sup>1</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>	4	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	10.2	BAB
4*	4 <sup>1</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>16</sub>	4	1 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	3 <sup>11</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>16</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	16.9	BAC
5	5 <sup>1</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>8</sub>	7 <sup>11</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>4</sub>	4	1 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	19.9	BAD
6	5 <sup>13</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>5</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>4</sub>	4	1 <sup>1</sup> / <sub>4</sub>	5 <sup>11</sup> / <sub>16</sub>	5 <sup>9</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	25.3	BAD
8**	7 <sup>13</sup> / <sub>16</sub>	10 <sup>11</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>8</sub>	6	1 <sup>1</sup> / <sub>4</sub>	6 <sup>15</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>4</sub>	7 <sup>3</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	-	5	4	9 <sup>1</sup> / <sub>16</sub>	40.5	CAE
10	9 <sup>13</sup> / <sub>16</sub>	13	10 <sup>7</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	6	2	8 <sup>1</sup> / <sub>8</sub>	9 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	-	1 <sup>1</sup> / <sub>4</sub> x 1 <sup>1</sup> / <sub>4</sub>	5	4	9 <sup>1</sup> / <sub>16</sub>	61.1	CAF
12	11 <sup>13</sup> / <sub>16</sub>	14 <sup>13</sup> / <sub>16</sub>	12 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>8</sub>	6	2	9 <sup>3</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	-	1 <sup>1</sup> / <sub>4</sub> x 1 <sup>1</sup> / <sub>4</sub>	5	4	9 <sup>1</sup> / <sub>16</sub>	82.7	CAF

FIGURE 222 DIMENSIONS (inches)

Valve size (NPS)	Valve Dimensions								Shaft			Top plate drilling			Weight	
	A	B	C	D	E	F	K	Q	G	H	Key	Bolt circle	No. of holes	Hole dia.	F221	Stem conn. code
2	2 <sup>1</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub>	4	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	9.0	BAB
2 <sup>1</sup> / <sub>2</sub>	2 <sup>7</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>4</sub>	5 <sup>15</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>	4	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	2	9 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	10.5	BAB
3	3 <sup>1</sup> / <sub>16</sub>	5 <sup>13</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>16</sub>	1 <sup>13</sup> / <sub>16</sub>	4	1 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	11.9	BAB
4*	4 <sup>1</sup> / <sub>16</sub>	7	7 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>16</sub>	4	1 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	3 <sup>11</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>16</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	21.4	BAC
5	5 <sup>1</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>8</sub>	7 <sup>11</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>4</sub>	4	1 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	25.7	BAD
6	5 <sup>13</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>4</sub>	8 <sup>5</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>4</sub>	4	1 <sup>1</sup> / <sub>4</sub>	5 <sup>11</sup> / <sub>16</sub>	5 <sup>9</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	-	3 <sup>1</sup> / <sub>4</sub>	4	7 <sup>1</sup> / <sub>16</sub>	31.0	BAD
8**	7 <sup>13</sup> / <sub>16</sub>	11 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>8</sub>	6	1 <sup>1</sup> / <sub>4</sub>	6 <sup>15</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>4</sub>	7 <sup>3</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	-	5	4	9 <sup>1</sup> / <sub>16</sub>	48.0	CAE
10	9 <sup>13</sup> / <sub>16</sub>	13 <sup>7</sup> / <sub>8</sub>	10 <sup>7</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	6	2	8 <sup>1</sup> / <sub>8</sub>	9 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	-	1 <sup>1</sup> / <sub>4</sub> x 1 <sup>1</sup> / <sub>4</sub>	5	4	9 <sup>1</sup> / <sub>16</sub>	75.8	CAF
12	11 <sup>13</sup> / <sub>16</sub>	15 <sup>11</sup> / <sub>16</sub>	12 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>8</sub>	6	2	9 <sup>3</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>8</sub>	-	1 <sup>1</sup> / <sub>4</sub> x 1 <sup>1</sup> / <sub>4</sub>	5	4	9 <sup>1</sup> / <sub>16</sub>	106.5	CAF

**NOTES**

Q The disc chordal dimension at face of valve for disc clearance into pipe fittings or flanges.

H The stem connection diameter.

G The dimension across the stem flats.

\* Not available with PN10, PN16 flange drilling.

\*\* Not available with PN16 flange drilling.

Dimensions are nominal ± 0.039 inch.