

# **KEYSTONE** FIGURE 320 WAFER AND FIGURE 322 LUGGED BUTTERFLY VALVES

## The Figure 320 is an economical resilient seated butterfly valve with dimensions according ISO standards

### FEATURES

* Bubble-tight shut-off at full rating in both directions.
* One piece, specially profiled, wafer thin disc stem.
* Extended body neck allows free access to actuator where pipe insulation has been fitted.
* The seat and disc are the only two parts in contact with the medium.
* Face to face dimensions according

ISO 3202 Part 3, K1 (ISO 5752 series 20) and

DIN EN 558-1, series 20.

* The F320 wafer version has four flange locating holes for end of line service under certain conditions.
* Standard actuation:
  + Handle (F414) on DN 50-200 valves.
  + Gear operators (F455) on DN 250-300.
* The F322 lugged version is suitable for bi-directional end of line service.
* Suitable for pneumatic, electric and hydraulic actuation.

**GENERAL APPLICATION**

Figure 320/322 is designed for applications requiring shut-off control. The valve has a non-replaceable seat and can be used in

combination with manual or a gear operator, or any other common type of pneumatic, electric or hydraulic actuator.

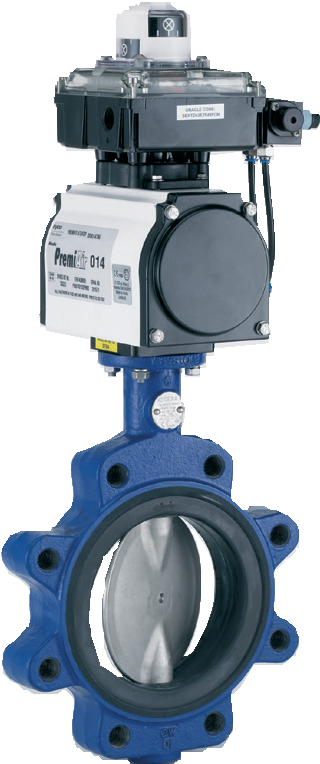
**TECHNICAL DATA**

Size range: Figure 320 (wafer style)

DN 50-300

Figure 322 (lugged style) DN 50-300

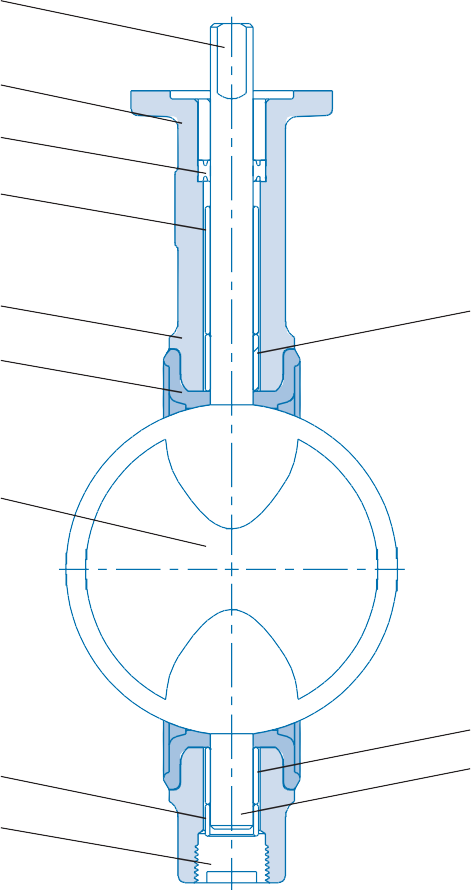
Pressure: 16 bar (in line and end of line)

Temperature (°C): Minus 29°C to 120°C

(EPDM seat)

Minus 15°C to 100°C (NBR seat)

|  |  |  |
| --- | --- | --- |
| **End connections** | **Between flanges** | **End of line** |
| F320 | DN 50-300: PN 6-10-16  ASME 150 | DN 50-300: PN 16  ASME 150 |
|  |  | DN 50-150: PN 10 |
| F322 | DN 50-300: PN 6-10-16  ASME 150 | DN 50-300: PN 6-10-16  ASME 150 |

4

10

9

7

1 6

3

2

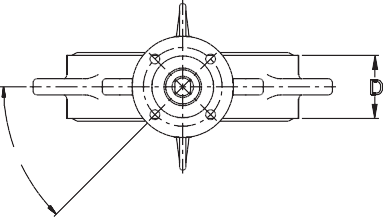
6

8 5

11

**PART LIST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Description** | **Material** | **Standard** | **Material number** |
| 1 | Body | Ductile iron | ASTM 536 Gr 65-45-12 | DIN 0.7040 |
| 2 | Disc | Stainless steel Aluminum bronze  Nickel aluminum bronze | ASTM A 351 Gr CF8M ASTM B 148 UNS C95200 A  BS EN 1982 CC 333 G | DIN 1.4408  DIN 2.0940.01  DIN 2.0975.01 |
| 3 | Seat | EPDM | - | - |
|  |  | NBR | - | - |
| 4 | Top stem | 416 S/S | ASTM A 582, 416 cond. H | - |
| 5 | Bottom stem | 416 S/S | ASTM A 582, 416 cond. H | - |
| 6 | Bushing | Sintered bronze | ASTM B438 | - |
| 7 | Upper spacer | - | - | - |
| 8 | Lower spacer | - | - | - |
| 9 | Packing | - | - | - |
| 10 | Upper bushing | Thermoplastic polyester | ASTM D 4507 TPES 110M10 | A22310 |
| 11 | Plug | - | - | - |



D

45?

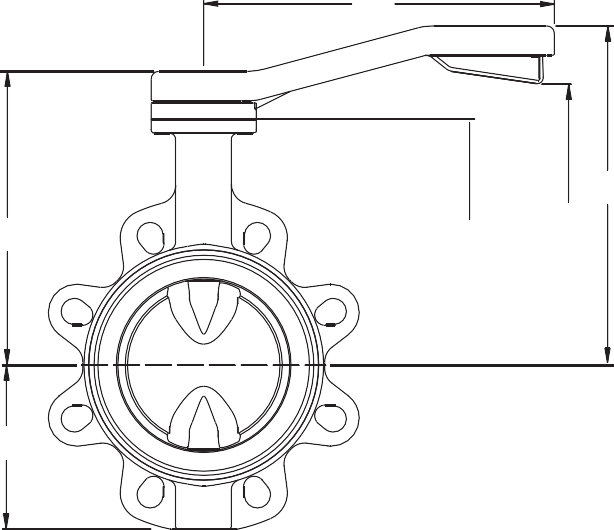


G

F



H



M

C2

C

E

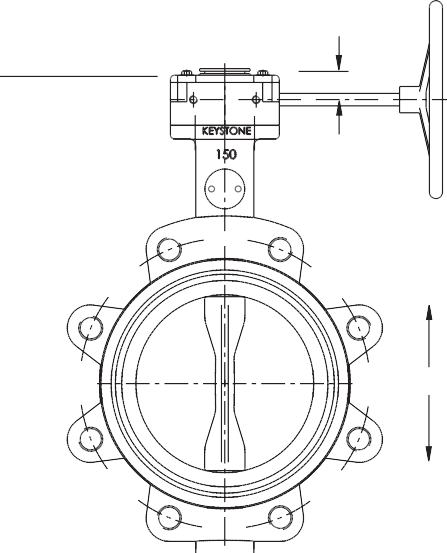
C1

K

ØB

Figure 320 wafer

Figure 322 lugged



M

R

ØN

C2

Q ØA ØYY

K

ØB1

**DIMENSIONS (mm)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | **Stem connections** | | |  | | | | | | | **Mass kg\*** | |  | |
| **Size** | **ØA** | **ØB** | **ØB1** | **C** | **C1** | **C2** | **D** | **E** | **F** | **ØGh9** | **H 0**  **-0.05** | **ISO Type** | **K** | **M** | **ØN** | **Q** | **R** | **ØYY** | **F320** | **F322** | **Kv** | **fully open** |
| 50 | 52 | 98 | 157 | 172 | 147 | 197 | 43 | 135 | 25 | 12.00 | 8 | F05 | 78 | 230 |  | 31 |  | 87 | 3.7 | 4.4 | 108 | |
| 65 | 64 | 116 | 177 | 194 | 180 | 230 | 46 | 150 | 30 | 15.88 | 11 | F07 | 83 | 300 |  | 47 |  | 98 | 5.9 | 6.5 | 217 | |
| 80 | 77 | 126 | 192 | 204 | 190 | 240 | 46 | 160 | 30 | 15.88 | 11 | F07 | 91 | 300 |  | 63 |  | 114 | 6.4 | 7.6 | 409 | |
| 100 | 103 | 156 | 225 | 224 | 110 | 260 | 52 | 180 | 30 | 15.88 | 11 | F07 | 105 | 300 |  | 90 |  | 146 | 7.9 | 9.7 | 807 | |
| 125 | 128 | 182 | 254 | 239 | 225 | 275 | 56 | 195 | 30 | 20.00 | 14 | F07 | 127 | 300 |  | 116 |  | 168 | 9.4 | 12.7 | 1251 | |
| 150 | 147 | 207 | 279 | 254 | 240 | 290 | 56 | 210 | 30 | 20.00 | 14 | F07 | 140 | 300 |  | 137 |  | 197 | 11.3 | 14.1 | 1946 | |
| 200 | 198 | 264 | 336 | 240 |  | 311 | 60 | 240 | 30 | 20.00 | 14 | F07 | 174 | 327 | 300 | 190 | 37 | 258 | 26.1 | 30.2 | 3516 | |
| 250 | 249 | 317 | 406 | 275 |  | 346 | 68 | 275 | 50 | 30.00 | 22 | F12 | 203 | 327 | 300 | 241 | 37 | 309 | 35.0 | 43.0 | 5806 | |
| 300 | 300 | 373 | 476 | 310 |  | 381 | 78 | 310 | 50 | 30.00 | 22 | F12 | 235 | 327 | 300 | 291 | 37 | 354 | 46.1 | 55.4 | 8910 | |

#### NOTES

Dimensions are nominal ± 1 mm.

1. Q is the disc chordal dimension at face of valve for disc clearance into pipe fitting or equipment.
2. Valves DN 50-200 are supplied standard with handles (F414).

Valves DN 250-300 are supplied standard with gear operators (F455).

1. YY is outside diameter of seat face.

\* The mass shown includes the standard operator.

### ISO 5211 MOUNTING DETAILS

**Type PCD Bolt holes**

F05 50 4 x Ø7

F07 70 4 x Ø9

F12 125 4 x Ø14

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ΔP in kPa** | **Size DN** | | | | | | | | |
| **50** | **65** | **80** | **100** | **125** | **150** | **200** | **250** | **300** |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SIZING TORQUES (Nm)** |  | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| **I\*** |  |  |  |  |  |  |  |  |  |
| 350 | 13 | 19 | 26 | 37 | 58 | 81 | 148 | 241 | 345 |
| 700 | 13 | 20 | 27 | 40 | 63 | 88 | 164 | 271 | 387 |
| 1000 | 14 | 21 | 30 | 44 | 70 | 99 | 188 | 315 | 451 |
| 1400 | 15 | 23 | 33 | 49 | 80 | 113 | 219 | 374 | 536 |
| 1600 | 15 | 24 | 35 | 51 | 85 | 120 | 235 | 403 | 578 |
| **II\*** |  |  |  |  |  |  |  |  |  |
| 350 | 14 | 21 | 29 | 42 | 66 | 93 | 169 | 274 | 392 |
| 700 | 14 | 22 | 31 | 45 | 71 | 100 | 185 | 303 | 434 |
| 1000 | 15 | 23 | 33 | 49 | 78 | 111 | 208 | 347 | 498 |
| 1400 | 16 | 26 | 36 | 54 | 88 | 125 | 240 | 406 | 583 |
| 1600 | 17 | 27 | 38 | 56 | 93 | 132 | 255 | 435 | 625 |
| **III\*** |  |  |  |  |  |  |  |  |  |
| 350 | 15 | 23 | 32 | 48 | 74 | 105 | 190 | 306 | 439 |
| 700 | 16 | 24 | 34 | 50 | 79 | 112 | 206 | 336 | 481 |
| 1000 | 16 | 26 | 36 | 54 | 86 | 122 | 229 | 380 | 545 |
| 1400 | 17 | 28 | 40 | 59 | 96 | 136 | 261 | 439 | 629 |
| 1600 | 18 | 29 | 41 | 61 | 101 | 143 | 276 | 468 | 672 |
| \* Application I, II, III  **NOTES** |  |  |  |  |  |  |  |  |  |

1. **Application I:** Water, seawater, lubricating types of hydrocarbons. Temp.: 0-80°C; valve opens at least once a month.

**Application II:** All other liquid applications and lubricating gasses.

**Application III:** Non lubricating and dry media.

1. The charted maximum sizing operating torque is the sum of all friction and resistance for opening and closing of the disc against the indicated pressure differential.
2. The effect of dynamic torque is not considered in tabulation.
3. In sizing operators it is not necessary to include safety-factors.
4. Rated Kv = the volume of water in m3/hr that will pass through a given valve opening at a pressure drop of 1 bar.

### TRIM CODES MAXIMUM ALLOWABLE SHAFT TORQUES (Nm)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Figure no.** | **Trim Code** | **Body** | **Disc** | **Shaft** | **Seat** |  | **Size DN** | **Torques** |
| F320/322 | **112** | Ductile iron | S/S | S/S | EPDM |  | 50 | 75 |
| F320/322 | **116** | Ductile iron | S/S | S/S | NBR |  | 65 | 184 |
| F320/322 | **135** | Ductile iron | NiAlBz | S/S | EPDM |  | 80 | 184 |
| F320/322 | **137** | Ductile iron | NiAlBz | S/S | NBR |  | 100 | 184 |
| F320/322 | **333** | Ductile iron | AlBz | S/S | EPDM |  | 125 | 374 |
| F320/322 | **334** | Ductile iron | AlBz | S/S | NBR |  | 150 | 374 |
|  |  |  |  |  |  |  | 200 | 374 |
|  |  |  |  |  |  |  | 250 | 1353 |
|  |  |  |  |  |  |  | 300 | 1353 |

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