

700S/700E/704G·722F·720F

Standard specification for 700S/700E/704G · 722F · 720F

| Model | Wafer | | Full lugged | Double flanged | |
|---|--|---|--|--|----------------|
| | 700S | 700E / 700K | 704G | 722F | 720F |
| Size | 50 to 600 mm | 650 to 1350 mm | 50 to 100 mm | 125 to 800 mm | 850 to 1350 mm |
| Applicable flange standard | JIS 5K, 10K ANSI 125Lb, ANSI 150Lb BS 4504 PN 10, DIN PN 10 BS 10 E | JIS 5K, 10K ANSI B16. 47 series A BS 4504 PN 10, DIN PN 10 | JIS 10K (*1 JIS 5K), ANSI 150 Lb, (*1 BS 4504 PN 10, DIN 10K) | | |
| Max. working pressure | 0.98 MPa (10 kgf/cm ² G) | | | | |
| Body test pressure | 1.47 MPa (15 kgf/cm ² G) | | | | |
| Seat leakage test pressure | 1.08 MPa (11 kgf/cm ² G) | | | | |
| Working temperature range | NBR: -10 to 80°C EPDM: -20 to 120°C | | -10 to 80°C | | |
| Working temperature range for continues use | NBR: 0 to 60°C EPDM: 0 to 100°C | | 0 to 60°C | | |
| Standard materials *2 | Body | FC 250 / A126 CLASS B, FCD 450 / A395, SCPH ₂ / WCB | SCPH ₂ / WCB FCD 450 / A395 | | |
| | Disc | FCD 450 / A395 (Hard chrome plated), SCS 13 / CF8, SCS 14 / CF8M, ALBC ₂ / B148 | SCS 14 / CF8, ALBC ₂ / B148 | SCS 13 / CF8, SCS 14 / CF8M, ALBC ₂ / B148 | |
| | Stem | SUS 420 J2 / 316 | | | |
| | Seat ring | EPDM / NBR | | EPDM / NBR | |
| Coating | 50 to 300 mm: Epoxy primer finish (Munsell N7) 350 mm and over: Lacquer primer (Munsell N7) | | Lacquer primer (Munsell N7) | | |

*1 Consult with Tomoe as those are order to made.

*2 Any other special materials for body, disc, stem and seat may be available upon request.

700S/700E/704G · 722F · 720F Actuator selection chart

| Valve nominal size | | 3I | | 3Q · 3R | | 3Y | |
|--------------------|-------|---------------|---------------|---------------|---------------|---------------|---------------|
| mm | inch | Standard | Heavy duty | Standard | Heavy duty | Standard | Heavy duty |
| | | Double Acting | Double Acting | Single Acting | Single Acting | Double Acting | Double Acting |
| 50 | 2 | Type 1 | Type 1 | Type 2 | Type 2 | Z-06 | |
| 65 | 2 1/2 | | Type 2 | | Type 3 | Z-08 | |
| 80 | 3 | | | Type 2 | Type 3 | | |
| 100 | 4 | Type 3 | Type 4 | | | Z-11 | |
| 125 | 5 | | Type 3 | | Type 4 | | Z-13 |
| 150 | 6 | Type 4 | | Type 4 | | | |
| 200 | 8 | | Type 4 | | Type 4 | | |
| 250 | 10 | Type 4 | | Type 4 | | | |
| 300 | 12 | | Type 4 | | Type 4 | | |

| Valve nominal size | | 3A | | 3B · 3N | | 3T · 3S | | |
|--------------------|-------|---------------|---------------|---------------|---------------|---------------|---------------|-----------|
| mm | inch | Standard | Heavy duty | Standard | Heavy duty | Standard | Heavy duty | |
| | | Double Acting | Double Acting | Single Acting | Single Acting | Single Acting | Single Acting | |
| 50 | 2 | TGA-50 | | TGA-S-63 | | AG-09S | | |
| 65 | 2 1/2 | | | TGA-80 | | TGA-S-80 | | AG-13S |
| 80 | 3 | | | | | TGA-63 | | |
| 100 | 4 | TGA-90 | | TGA-S-100 | | AW-13S | | |
| 125 | 5 | | | | | TGA-100 | | TGA-S-125 |
| 150 | 6 | TGA-125 | | TGA-S-140 | AW-20S | | | |
| 200 | 8 | | | TGA-140 | | TGA-S-160 | AW-28S | |
| 250 | 10 | TGA-160 | | | | TGA-S-180 | | AW-28S |
| 300 | 12 | | | TGA-180 | | TGA-S-200 | AW-28S | |
| 350 | 14 | TGA-200 | | | | TGA-S-220 | | AW-28S |
| 400 | 16 | | | TGA-220 | | TGA-S-250 | AW-28S | |
| 450 | 18 | TGA-250 | | | | TGA-S-250 | | AW-28S |
| 500 | 20 | | | TGA-250 | | TGA-S-250 | AW-28S | |
| 550 | 22 | TGA-250 | | | | TGA-S-250 | | AW-28S |
| 600 | 24 | | | TGA-250 | | TGA-S-250 | AW-28S | |
| 650 | 26 | TGA-250 | | | | TGA-S-250 | | AW-28S |
| 700 | 28 | | | TGA-250 | | TGA-S-250 | AW-28S | |
| 750 | 30 | TGA-250 | | | | TGA-S-250 | | AW-28S |
| 800 | 32 | | | TGA-250 | | TGA-S-250 | AW-28S | |
| 850 | 34 | TGA-250 | | | | TGA-S-250 | | AW-28S |
| 900 | 36 | | | TGA-250 | | TGA-S-250 | AW-28S | |

* The selection chart for 704G is the same as for 700G/705G.

* The selection of pneumatic cylinder is based on 0.39 MPa air supply.

700S/700E/704G · 722F · 720F Actuator selection chart

**Butterfly valves
Auto Actuated**

| Valve nominal size | | 3X · 3W | | 3C | | 3D · 3L | |
|--------------------|-------|---------------|---------------|---------------|---------------|---------------|---------------|
| mm | inch | Standard | Heavy duty | Standard | Heavy duty | Standard | Heavy duty |
| | | Single Acting | Single Acting | Double Acting | Double Acting | Single Acting | Single Acting |
| 50 | 2 | Z-08S | | AT5-80 | | AT5S-100 | |
| 65 | 2 1/2 | | | | | | |
| 80 | 3 | Z-11S | | AT5-100 | | AT5S-120 | |
| 100 | 4 | Z-12S | | | | | |
| 125 | 5 | | | | | AT5S-150 | |
| 150 | 6 | Z-12S | Z-13S | AT5-120 | | AT5S-180 | |
| 200 | 8 | Z-13S | | AT5-150 | | AT5S-180 | AT5S-220 |
| 250 | 10 | | | AT5-180 | | AT5S-220 | AT5S-250 |
| 300 | 12 | | | AT5-220 | | AT5S-250 | |
| 350 | 14 | | | | | | |
| 400 | 16 | | | | | | |
| 450 | 18 | | | AT5-250 | | | |
| 500 | 20 | | | | | | |

| Valve nominal size | | 4I | | 4E | | | |
|--------------------|-------|--------------------|------------|----------|------------|---------------------|--|
| mm | inch | Standard | Heavy duty | Standard | Heavy duty | | |
| 50 | 2 | Type 1 | | SRE-010 | | | |
| 65 | 2 1/2 | | | | | | |
| 80 | 3 | | | | | | |
| 100 | 4 | Type 2 | | SRE-020 | | | |
| 125 | 5 | | | | | | |
| 150 | 6 | Type 3 (ON-OFF) | | SRE-060 | | | |
| 200 | 8 | | | | | Type 3 (Control) | |
| 250 | 10 | | | | | | |
| 300 | 12 | | | | | | |
| 350 | 14 | | | | | | |
| 400 | 16 | | | | | | |

* The selection chart for 704G is the same as for 700G · 705G.

* The control specification of 4I means one of following specifications.

- ① New MICOM ELMY
- ② With servo unit
- ③ With speed controller
- ④ Throttling use with potentiometer

* The selection of pneumatic cylinder is based on 0.39 MPa air supply.

700S/700E/704G · 722F · 720F Basic torque chart

(Unit: N·m)

| Type | | Rubber seat |
|------|------|-----------------------|
| Size | | 700S/700E/722F · 720F |
| mm | inch | |
| 50 | 2 ½ | 16.7 (4.9) |
| 65 | 2 | 23.5 (6.9) |
| 80 | 3 | 27.4 (8.8) |
| 100 | 4 | 39.2 (13.7) |
| 125 | 5 | 53.9 (21.6) |
| 150 | 6 | 73.5 (32.3) |
| 200 | 8 | 113.7 (58.8) |
| 250 | 10 | 199.9 (117.6) |
| 300 | 12 | 303.8 (196.0) |
| 350 | 14 | 416.5 (274.4) |
| 400 | 16 | 597.8 (401.8) |
| 450 | 18 | 833.0 (578.2) |
| 500 | 20 | 1097.6 (774.2) |
| 550 | 22 | 1411.2 (1009.4) |
| 600 | 24 | 1832.6 (1342.6) |
| 650 | 26 | 2352 |
| 700 | 28 | 2793 |
| 750 | 30 | 3528 |
| 800 | 32 | 4312 |
| 850 | 34 | 4998 |
| 900 | 36 | 5782 |
| 1000 | 40 | 7056 |
| 1100 | 44 | 8526 |
| 1200 | 48 | 9800 |

Minimum internal piping diameter for 700S/700E/704G · 722F · 720F

(Unit: mm)

| Size | | Minimum diameter A | |
|------|------|--------------------|-----------|
| mm | inch | 700S | 722F/720F |
| 50 | 2 | 37 | 37 |
| 65 | 2 ½ | 59 | 59 |
| 80 | 3 | 67 | 67 |
| 100 | 4 | 91 | 91 |
| 125 | 5 | 118 | 81 |
| 150 | 6 | 143 | 118 |
| 200 | 8 | 187 | 170 |
| 250 | 10 | 240 | 227 |
| 300 | 12 | 286 | 279 |
| 350 | 14 | 322 | 314 |
| 400 | 16 | 372 | 365 |
| 450 | 18 | 421 | 411 |
| 500 | 20 | 463 | 456 |
| 550 | 22 | 509 | 502 |
| 600 | 24 | 566 | 563 |
| 650 | 26 | 612 | 612 |
| 700 | 28 | 653 | 653 |
| 750 | 30 | 705 | 705 |
| 800 | 32 | 754 | 754 |
| 850 | 34 | 803 | 803 |
| 900 | 36 | 834 | 834 |
| 1000 | 40 | 950 | 950 |
| 1100 | 44 | 1040 | 1040 |
| 1200 | 48 | 1138 | 1138 |
| 1350 | 54 | 1277 | 1277 |

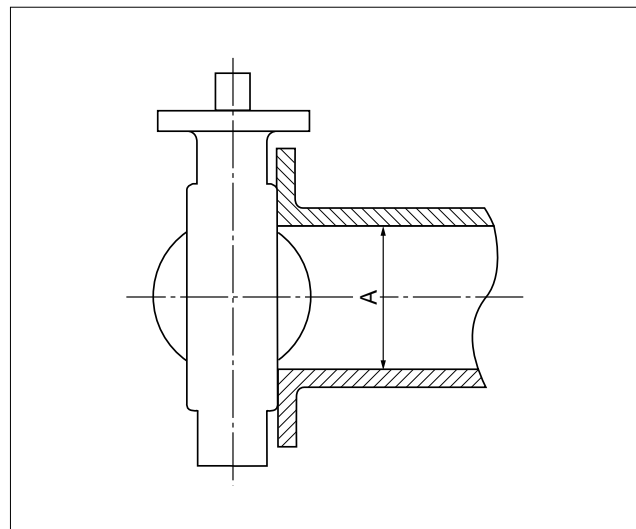
**Butterfly valves
Auto Actuated**

* Note

1. The data shows basic torque (seating torque) of each model/size for actuator selection.
2. () shows dynamic torque under 30° opening degree at $\Delta P = 0.2 \text{ MPa}$

* Special note for "Basic torque"

In case of concentric design rubber seat butterfly valves, seating torque may change subject to working conditions, such as type of fluid, working temperature, frequency of operation, duration at closed position, and type of rubber seat, body material etc. Therefore, carefully attention for working condition is essential.



Guidance for vacuum use

| Valve type | Size (mm) | Allowable vacuum level (Torr) | | | Leakage rate | |
|--------------|-----------|-------------------------------|------------|-------------|--|--------------------------------|
| | | 10 to 50°C | 50 to 80°C | 80 to 100°C | Seat leak | Gland leak |
| 700S | 50-80 | 13.30 | 26.60 | N.A | 1.3 kPa·ℓ/h | |
| 841T | 100-300 | 26.60 | 53.20 | N.A | Higher leakage at full open | |
| 842T | 350-600 | 39.90 | 66.50 | N.A | | |
| 700G | 40-200 | 26.60 | 39.90 | N.A | | |
| 702Z | 250-300 | 39.90 | 66.50 | N.A | | |
| 843T | 100-300 | 1.33 | 13.30 | 53.20 | 1.3 to 2.7 kPa·ℓ/h | |
| | 350-400 | 2.66 | 26.60 | 66.50 | 2.7 to 5.3 kPa·ℓ/h | |
| 845T | 450-600 | 26.60 | 53.20 | N.A | | |
| 731X | 50-250 | 1.33 | 6.65 | N.A | 1.3 to 2.7 kPa·ℓ/h | |
| 711A | 300-600 | 2.66 | 13.30 | N.A | 2.6 to 5.4 kPa·ℓ/h | |
| 302Y | 40-200 | 1.33 | 1.33 | 2.66 | 14 kPa·ℓ/h 0.04 cc/sec | 2.0×10 ⁻³ kPa·ℓ/sec |
| 304Y 304A | 250-300 | 2.66 | 3.99 | 5.32 | 0.8 kPa·ℓ/h | |
| 337Y | 40-200 | 1.33 | 1.33 | 2.66 | 14 kPa·ℓ/h 0.04 cc/sec | |
| | 250-300 | 2.66 | 3.99 | 5.32 | | |
| 336Y | 350-600 | | | | 48 kPa·ℓ/h 0.13 cc/sec | |
| 846T 847T | 50-200 | 1.33 | 1.33 | 2.66 | Higher leakage at heat cycle condition | |

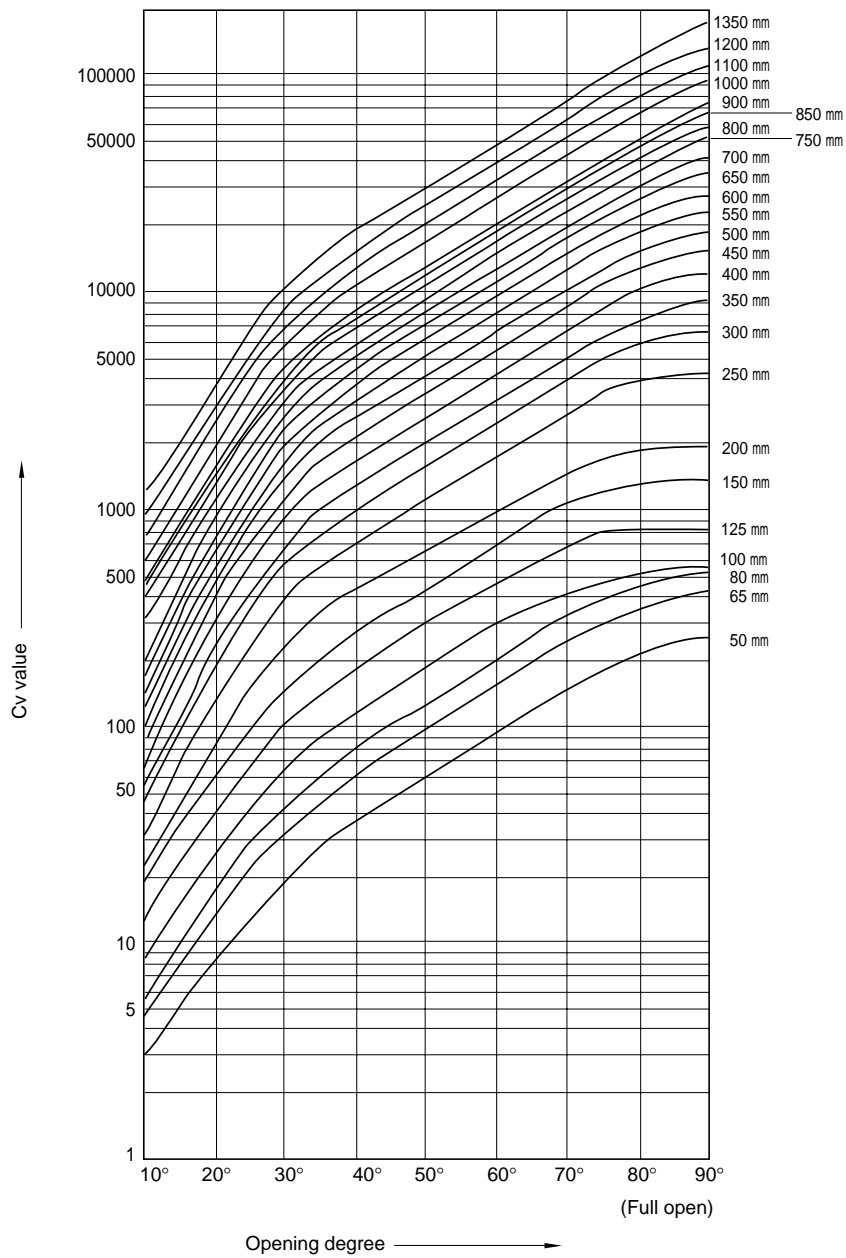
(Note) The special gland construction for 302A/Y, 304A/Y shall be prepared subject to condition.

700S/700E/704G·722F·720F

700S/700E/704G · 722F · 720F Cv value

Cv value is defined as follows:

The flow rate expressed as US gal./min. at which a fresh water of 60°F flows when the pressure difference across the valve is maintained at 1 psi.



Cv value · Pressure loss coefficient

700S/700E/722F · 720F Cv value chart

| Size | | Opening degree | | | | | | | |
|------|------|----------------|------|------|-------|-------|-------|-------|-------|
| mm | inch | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° |
| 50 | 2 | 8 | 20 | 35 | 59 | 95 | 149 | 210 | 250 |
| 65 | 2½ | 13 | 31 | 55 | 92 | 155 | 246 | 344 | 410 |
| 80 | 3 | 17 | 42 | 76 | 125 | 201 | 310 | 431 | 490 |
| 100 | 4 | 26 | 63 | 116 | 191 | 288 | 406 | 494 | 540 |
| 125 | 5 | 40 | 102 | 180 | 297 | 457 | 692 | 767 | 800 |
| 150 | 6 | 61 | 146 | 272 | 429 | 710 | 1039 | 1295 | 1350 |
| 200 | 8 | 71 | 239 | 417 | 646 | 969 | 1457 | 1836 | 1950 |
| 250 | 10 | 139 | 375 | 693 | 1135 | 1746 | 2724 | 3855 | 4200 |
| 300 | 12 | 184 | 544 | 995 | 1593 | 2461 | 3909 | 5571 | 6400 |
| 350 | 14 | 215 | 678 | 1248 | 1982 | 3028 | 4827 | 7054 | 9000 |
| 400 | 16 | 304 | 905 | 1656 | 2649 | 4094 | 6460 | 9782 | 12000 |
| 450 | 18 | 381 | 1158 | 2136 | 3433 | 5274 | 8120 | 12430 | 15000 |
| 500 | 20 | 496 | 1440 | 2631 | 4209 | 6434 | 10085 | 15436 | 17500 |
| 550 | 22 | 571 | 1765 | 3234 | 5141 | 7833 | 12066 | 17999 | 22500 |
| 600 | 24 | 688 | 2074 | 3815 | 6126 | 9433 | 14595 | 21897 | 26500 |
| 650 | 26 | 817 | 2441 | 4473 | 7159 | 11013 | 17254 | 26972 | 32500 |
| 700 | 28 | 934 | 2807 | 5122 | 8152 | 12511 | 19728 | 30929 | 39000 |
| 750 | 30 | 935 | 3220 | 5965 | 9450 | 14328 | 22687 | 38260 | 52000 |
| 800 | 32 | 1200 | 3721 | 6791 | 10771 | 16553 | 26976 | 43316 | 59000 |
| 850 | 34 | 1164 | 4018 | 7516 | 12063 | 18567 | 29284 | 46350 | 66000 |
| 900 | 36 | 1358 | 4497 | 8298 | 13177 | 20139 | 32362 | 53126 | 73000 |

700S/700E/722F · 720F Pressure loss coefficient

| Size | | Opening degree | | | | | | | |
|------|------|----------------|------|------|------|------|-------|-------|-------|
| mm | inch | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° |
| 50 | 2 | 258 | 41.2 | 13.5 | 4.74 | 1.83 | 0.743 | 0.374 | 0.264 |
| 65 | 2½ | 239 | 42.0 | 13.3 | 4.76 | 1.68 | 0.666 | 0.341 | 0.240 |
| 80 | 3 | 275 | 45.1 | 13.8 | 5.09 | 1.97 | 0.828 | 0.428 | 0.331 |
| 100 | 4 | 346 | 59.0 | 17.4 | 6.42 | 2.82 | 1.42 | 0.960 | 0.803 |
| 125 | 5 | 343 | 52.8 | 17.0 | 6.23 | 2.63 | 1.15 | 0.934 | 0.858 |
| 150 | 6 | 299 | 52.1 | 15.0 | 6.04 | 2.20 | 1.03 | 0.663 | 0.610 |
| 200 | 8 | 677 | 59.8 | 19.6 | 8.18 | 3.64 | 1.61 | 1.01 | 0.898 |
| 250 | 10 | 424 | 58.3 | 17.1 | 6.36 | 2.69 | 1.10 | 0.551 | 0.464 |
| 300 | 12 | 497 | 56.9 | 17.0 | 6.64 | 2.78 | 1.10 | 0.543 | 0.411 |
| 350 | 14 | 571 | 57.5 | 17.0 | 6.72 | 2.88 | 1.13 | 0.531 | 0.326 |
| 400 | 16 | 487 | 55.0 | 16.4 | 6.42 | 2.69 | 1.08 | 0.471 | 0.313 |
| 450 | 18 | 497 | 53.8 | 15.8 | 6.12 | 2.59 | 1.09 | 0.467 | 0.321 |
| 500 | 20 | 453 | 53.7 | 16.1 | 6.29 | 2.69 | 1.10 | 0.468 | 0.364 |
| 550 | 22 | 506 | 53 | 15.8 | 6.24 | 2.69 | 1.13 | 0.509 | 0.326 |
| 600 | 24 | 492 | 54.2 | 16.0 | 6.21 | 2.62 | 1.09 | 0.486 | 0.332 |
| 650 | 26 | 490 | 54.9 | 16.3 | 6.38 | 2.70 | 1.10 | 0.450 | 0.310 |
| 700 | 28 | 512 | 56.7 | 17.0 | 6.73 | 2.86 | 1.15 | 0.467 | 0.294 |
| 750 | 30 | 683 | 57.6 | 16.8 | 6.69 | 2.91 | 1.16 | 0.408 | 0.221 |
| 800 | 32 | 543 | 56.5 | 17.0 | 6.74 | 2.86 | 1.08 | 0.417 | 0.225 |
| 850 | 34 | 744 | 62.4 | 17.8 | 6.93 | 2.92 | 1.18 | 0.469 | 0.231 |
| 900 | 36 | 683 | 62.3 | 18.3 | 7.26 | 3.11 | 1.20 | 0.446 | 0.236 |

