

HITER

1000 SERIES
CONTROL
VALVE



Features

ANSI B16.34 Classes 150, 300, or 600.

Sizes 6 to 16 in. – Available Types

1010 - With balanced plug, cage guided and seal ring between plug and cage. Suitable for high pressure drop applications and where shutoff is not critical.

1110 - With balanced plug, cage guided, seal ring between plug and cage and soft seat. Suitable for applications that require tight shutoff.

1020 - With unbalanced plug, cage guided. Suitable for low pressure drop applications that require a good shutoff.

1120 - With unbalanced plug, cage guided, and soft seat. Suitable for low pressure drop applications that require tight shutoff.

1080 - With two stage plug, cage guided. Suitable for high pressure drop and high temperature applications that require a good shutoff.

1210 - With balanced plug, cage guided, and metal seat between plug and cage. Suitable for high pressure drop and high temperature applications, where shutoff is not critical.

1040 - Angle body, with balanced plug, cage guided and seal ring between plug and cage. Suitable for high pressure drop applications and where shutoff is not critical.

1140 - Angle body, with balanced plug, cage guided, seal ring between plug and cage and soft seat. Suitable for applications that require tight shutoff.

1090 - Angle body, with low flow plug, top guided. Suitable for high pressure drop applications, low flow, high temperature and that require a good shutoff.

1190 - Angle body, with low flow plug, top guided and soft seat. Suitable for applications that require tight shutoff.

ANSI B16.34 Classes 900, 1500 or 2500.

Sizes 0.5 to 12 in. – Available Types

1010 - With balanced plug, cage guided and seal ring between plug and cage. Suitable for high pressure drop applications and where shutoff is not critical.

1020 - With unbalanced plug, cage guided. Suitable for low pressure drop applications that require a good shutoff.

1070 - With low flow plug, cage guided. Suitable for high pressure drop applications, low flow, high temperature and that require a good shutoff.

1210 - With balanced plug, cage guided, and metal seat between plug and cage. Suitable for high pressure drop and high temperature applications, where shutoff is not critical.

1040 - Angle body, with balanced plug, cage guided and seal ring between plug and cage. Suitable for high pressure drop applications and where shutoff is not critical.

1090 - Angle body, with low flow plug, top guided. Suitable for high pressure drop applications, low flow, high temperature and that require a good shutoff.

End Connections

FR - Raised Face - sizes 0.5 to 16 in.

RTJ - Ring Joint - sizes 0.5 to 16 in.

RC - Threaded - sizes 0.5 to 2 in.

SW - Socket Welding - sizes 0.5 to 2 in.

BW - Butt Welding - sizes 3 to 16 in.

Body Materials

See table 1 for standard materials.

Other materials are available on application.

Bonnet Types

CE1 - Standard.

CE3 - Extended, for very high or very low temperature.

CE4 - Extended with bellows seal.

Trim Materials

See table 2a through 2d for standard materials (ANSI Classes 150, 300 and 600) or 3a/3b (ANSI Classes 900, 1500 and 2500). Other materials are available on application.

Packing Materials

See table 4.

Gasket Materials

See table 5 (for ANSI Classes 150, 300 or 600)

or table 6 (for ANSI Classes 900, 1500 or 2500).

Flow Characteristic and Cv

See tables 7a/7b (for ANSI Classes 150, 300 or 600)

or 8a/8b (for ANSI Classes 900, 1500 or 2500).

For other available Cv values, consult Hiter.

Shutoff Classifications

See table 9.

Special Trims

Low noise cage. Anti-cavitation cage. Anti-cavitation cascade plug.

Main parts identification

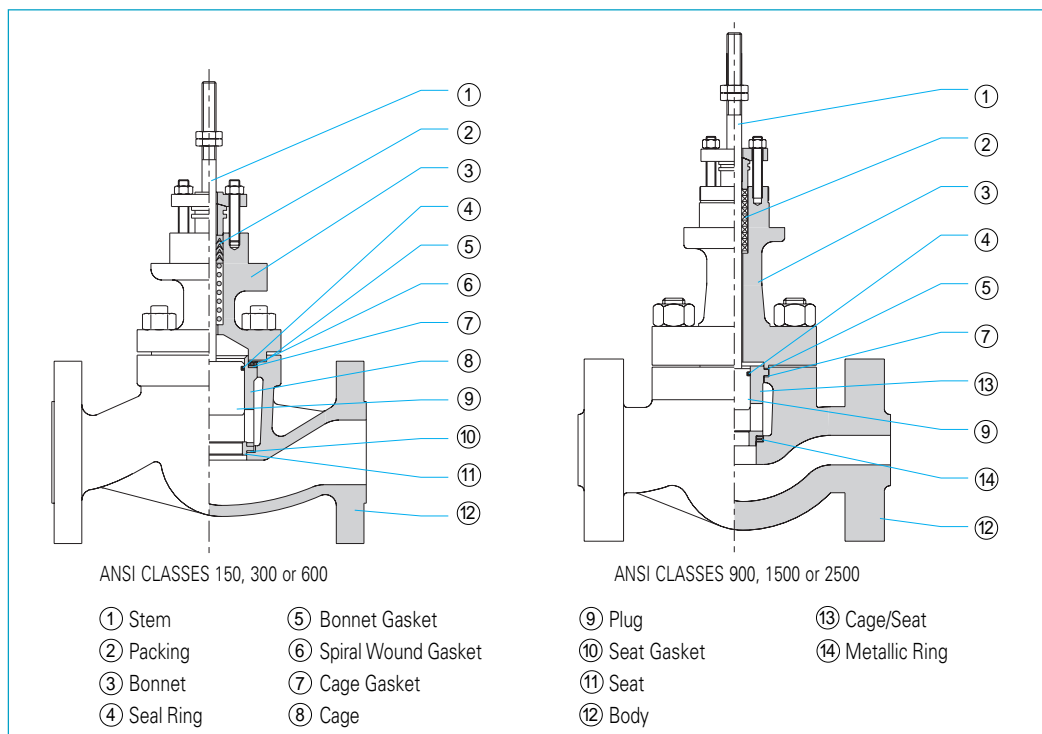


Table 1
Body materials

| MATERIAL | TEMPERATURE RANGE (°F) ⁽¹⁾ |
|-----------------------------|---------------------------------------|
| Carbon steel (WCB) | -20 to 800 |
| Cr-Mo steel (C5) | -20 to 1200 ⁽²⁾ |
| 304 stainless steel (CF8) | -425 to 1500 ⁽²⁾ |
| 304L stainless steel (CF3) | -425 to 850 |
| 316 stainless steel (CF8M) | -425 to 1500 ⁽²⁾ |
| 316L stainless steel (CF3M) | -425 to 850 |

(1) Do not exceed the maximum pressure and temperature for the class rating of the valve. (2) ANSI Class 150 over 1000 °F for welding end valves only.

Table 2a
Trim materials
1010 type
ANSI Classes 150,
300 or 600

| PLUG | SEAT | CAGE | SEAL RING | MAX. ΔP (psi) | TEMPERATURE RANGE (°F) |
|------------------------------|------------------------------|----------------------------------|-----------|---------------|------------------------|
| 304 stainless steel | 304 stainless steel | 420 stainless steel hardened | EPDM | 300 | -20 to 248 |
| 316 stainless steel | 316 stainless steel | | PTFE | | -20 to 392 |
| 304 stainless steel | 304 stainless steel | 17.4 PH stainless steel hardened | EPDM | 300 | -65 to 248 |
| 316 stainless steel | 316 stainless steel | | PTFE | | -129 to 392 |
| 420 stainless steel hardened | 420 stainless steel hardened | 420 stainless steel hardened | EPDM | 1450 | -20 to 100 |
| | | | | 1400 | 101 to 200 |
| | | | | 1350 | 201 to 248 |
| | | | PTFE | 1450 | -20 to 100 |
| 1400 | 101 to 200 | | | | |
| 1350 | 201 to 300 | | | | |
| 1300 | 301 to 392 | | | | |

Table 2b
Trim materials
1110 type
ANSI Classes 150,
300 or 600

| PLUG | SEAT | CAGE | SEAL RING | MAX. ΔP (psi) | TEMPERATURE RANGE (°F) |
|---------------------|-------------------------------|----------------------------------|-----------|---------------|------------------------|
| 304 stainless steel | 304 stainless steel with PTFE | 420 stainless steel hardened | EPDM | 300 | -20 to 248 |
| 316 stainless steel | 316 stainless steel with PTFE | | VITON | | -15 to 400 |
| 304 stainless steel | 304 stainless steel with PTFE | 17.4 PH stainless steel hardened | EPDM | 300 | -65 to 248 |
| 316 stainless steel | 316 stainless steel with PTFE | | VITON | | -15 to 400 |

Table 2c
Trim materials
1020, 1080
and 1210 types
ANSI Classes 150,
300 or 600

| PLUG | SEAT | CAGE | MAX. ΔP (psi) | TEMPERATURE RANGE (°F) |
|---|---|---|---------------|------------------------|
| 304 stainless steel | 304 stainless steel | 420 stainless steel hardened | 300 | -20 to 600 |
| 316 stainless steel | 316 stainless steel | | | |
| 304 stainless steel | 304 stainless steel | 17.4 PH stainless steel hardened | 300 | -150 to 600 |
| 316 stainless steel | 316 stainless steel | | | |
| 304 stainless steel with Stellite hard faced seat | 304 stainless steel with Stellite hard faced seat | 17.4 PH stainless steel hardened | 1450 | -450 to 100 |
| 316 stainless steel with Stellite hard faced seat | 316 stainless steel with Stellite hard faced seat | | 1400 | 101 to 200 |
| | | | 1350 | 201 to 300 |
| 304 stainless steel with Stellite hard faced seat and guide | 304 stainless steel with Stellite hard faced seat and guide | 304 stainless steel with Stellite lands | 900 | 601 to 800 |
| 316 stainless steel with Stellite hard faced seat and guide | 316 stainless steel with Stellite hard faced seat and guide | 316 stainless steel with Stellite lands | 800 | 801 to 900 |
| | | | 700 | 901 to 1000 |
| 420 stainless steel hardened | 420 stainless steel hardened | 420 stainless steel hardened | 600 | 1001 to 1100 |
| | | | 1450 | -20 to 100 |
| | | | 1400 | 101 to 200 |
| | | | 1350 | 201 to 300 |
| 420 stainless steel hardened | 420 stainless steel hardened | 17.4 PH stainless steel hardened | 1300 | 301 to 400 |
| | | | 1050 | 401 to 500 |
| | | | 800 | 501 to 600 |
| | | | 500 | 601 to 700 |

Table 2d
Trim materials
1120 type
ANSI Classes 150,
300 or 600

| PLUG | SEAT | CAGE | MAX. ΔP (psi) | TEMPERATURE RANGE (°F) |
|---------------------|-------------------------------|----------------------------------|---------------|------------------------|
| 304 stainless steel | 304 stainless steel with PTFE | 420 stainless steel hardened | 300 | -20 to 392 |
| 316 stainless steel | 316 stainless steel with PTFE | | | |
| 304 stainless steel | 304 stainless steel with PTFE | 17.4 PH stainless steel hardened | 300 | -129 to 392 |
| 316 stainless steel | 316 stainless steel with PTFE | | | |

Table 3a
Trim materials
1010 type
ANSI Classes 900,
1500 or 2500

| PLUG | CAGE and SEAT | SEAL RING | MAX. ΔP (psi) | TEMPERATURE RANGE (°F) |
|------------------------------|----------------------------------|-----------|---------------|------------------------|
| 304 stainless steel | 420 stainless steel hardened | EPDM | 300 | -20 to 248 |
| 316 stainless steel | | PTFE | | -20 to 392 |
| 304 stainless steel | 17.4 PH stainless steel hardened | EPDM | 300 | -65 to 248 |
| 316 stainless steel | | PTFE | | -129 to 392 |
| 420 stainless steel hardened | 420 stainless steel hardened | EPDM | 1450 | -20 to 100 |
| | | | 1400 | 101 to 200 |
| | | | 1350 | 201 to 248 |
| | | PTFE | 1450 | -20 to 100 |
| | | | 1400 | 101 to 200 |
| | | | 1350 | 201 to 300 |
| 1300 | 301 to 392 | | | |

Table 3b
Trim materials
1020, 1070 and
1210 types
ANSI Classes 900,
1500 or 2500

| PLUG | CAGE and SEAT | MAX. ΔP (psi) | TEMPERATURE RANGE (°F) |
|---|---|---------------|------------------------|
| 304 stainless steel | 420 stainless steel hardened | 300 | -20 to 600 |
| 316 stainless steel | | | |
| 304 stainless steel | 17.4 PH stainless steel hardened | 300 | -150 to 600 |
| 316 stainless steel | | | |
| 304 stainless steel with Stellite hard faced seat | 17.4 PH stainless steel hardened | 1450 | -450 to 100 |
| 316 stainless steel with Stellite hard faced seat | | 1400 | 101 to 200 |
| | | 1350 | 201 to 300 |
| 304 stainless steel with Stellite hard faced seat and guide | 304 stainless steel with Stellite hard faced seat and guide | 900 | 601 to 800 |
| 316 stainless steel with Stellite hard faced seat and guide | 316 stainless steel with Stellite hard faced seat and guide | 800 | 801 to 900 |
| | | 700 | 901 to 1000 |
| | | 600 | 1001 to 1100 |
| 420 stainless steel hardened | 420 stainless steel hardened | 1450 | -20 to 100 |
| | | 1400 | 101 to 200 |
| | | 1350 | 201 to 300 |
| | | 1300 | 301 to 400 |
| 420 stainless steel hardened | 17.4 PH stainless steel hardened | 1050 | 401 to 500 |
| | | 800 | 501 to 600 |
| | | 500 | 601 to 700 |

Table 4
Packing materials

| MATERIAL | TEMPERATURE RANGE (°F) | |
|-----------------------------------|------------------------|-----------------|
| | STANDARD BONNET | EXTENDED BONNET |
| PTFE "V" rings | -22 to 450 | -150 to 800 |
| Braided PTFE | | |
| Graphite | -22 to 700 | -94 to 2000 |
| Asbestos with PTFE ⁽¹⁾ | -22 to 450 | -150 to 800 |

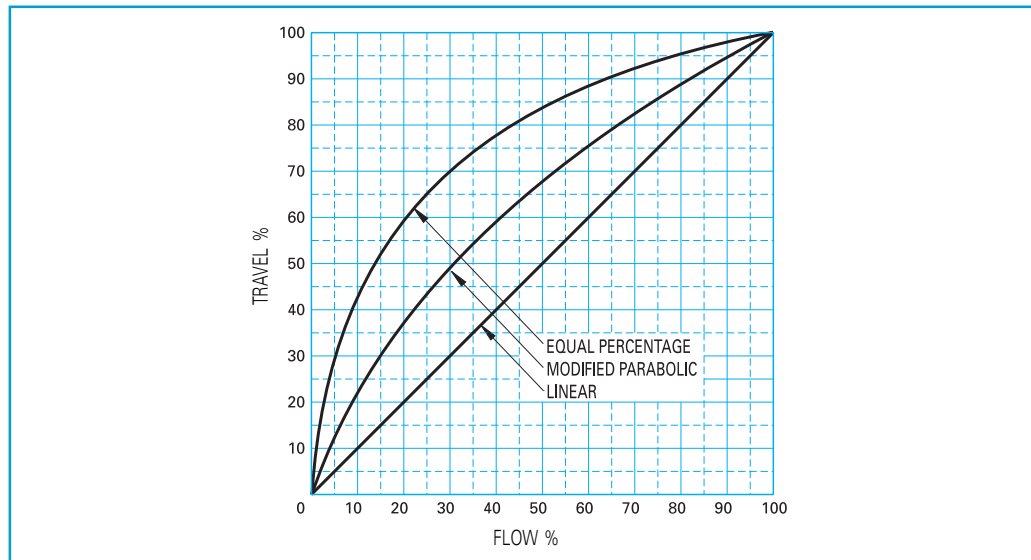
(1) Used only in case of no restrictions to asbestos.

| SEAT, BONNET and CAGE GASKET | SPIRAL-WOUND GASKET | TEMPERATURE LIMIT (°F) |
|---|---|------------------------|
| Synthetic fibers with NBR rubber (non asbestos). | 304 stainless steel and synthetic fibers with NBR rubber (non asbestos) | 450 |
| Carbon and graphite fibers with NBR rubber (non asbestos) | 304 stainless steel and carbon and graphite fibers with NBR rubber (non asbestos) | 450 |
| PTFE | 304 stainless steel and PTFE | 450 |
| Expanded graphite laminate with stainless steel insert | Inconel and expanded graphite | 1100 |

Table 5
Gaskets materials
ANSI Classes 150,
300 or 600

| METALLIC RING | CAGE and BONNET GASKET | TEMPERATURE LIMIT (°F) |
|-------------------------|------------------------|------------------------|
| 17.4 PH stainless steel | 316 stainless steel | 750 |
| 17.4 PH stainless steel | Copper | 600 |
| 17.4 PH stainless steel | Aluminum | 750 |
| 17.4 PH stainless steel | Low carbon steel | 750 |

Table 6
Gaskets materials
ANSI Classes 900,
1500 or 2500



Flow characteristics

| BODY SIZE (in.) | ORIFICE SIZE (in.) | STROKE (in.) | FULL BORE | | | | | ORIFICE SIZE (in.) | STROKE (in.) | REDUCED BORE | | | | |
|-----------------|--------------------|--------------|-----------|-----|------|------|-----|--------------------|--------------|--------------|-----|------|------|-----|
| | | | LV | PV | MV | BRR | BKV | | | LV | PV | MV | BRR | BKV |
| 6 | 7 | 2 | 410 | 390 | 310 | 380 | 250 | 3.3125 | 1.5 | 155 | 140 | — | 189 | 104 |
| 8 | 8.125 | 2 | 610 | 550 | 550 | 610 | 450 | 4.3125 | 2 | 260 | 210 | — | 256 | 210 |
| 10 | 10.125 | 3 | 900 | 880 | 884 | 800 | 700 | 7 | 2 | 450 | 400 | 405 | 579 | 288 |
| 12 | 12.125 | 3 | 1640 | — | 1062 | 1200 | 650 | 8.125 | 2 | 650 | — | 600 | 717 | 488 |
| 14 | 13.25 | 4 | 1830 | — | 1800 | 2080 | — | 10.125 | 3 | 1050 | — | 950 | 1178 | 729 |
| 16 | 15.25 | 4 | 2720 | — | 2000 | 2200 | — | 12.125 | 3 | 1900 | — | 1750 | 1352 | 671 |
| 18 | 17.5 | 6 | 3800 | — | 3040 | 3050 | — | 13.25 | 4 | 2120 | — | 2085 | 2340 | — |
| 20 | 19.5 | 7 | 4930 | — | 3945 | 3950 | — | 15.25 | 4 | 3100 | — | 2317 | 2548 | — |
| 24 | 23 | 8 | 6640 | — | 5320 | 5330 | — | 17.5 | 6 | 4400 | — | 3520 | 3530 | — |

Table 7a
Flow coefficient - Cv
1010, 1110, 1020,
1120 and 1210 type
ANSI Classes 150,
300 or 600

Table 7b
Flow coefficient - Cv
1080 type
ANSI Classes 150,
300 or 600

| BODY SIZE (in.) | ORIFICE SIZE (in.) | STROKE (in.) | FULL BORE | | | ORIFICE SIZE (in.) | STROKE (in.) | REDUCED BORE | | |
|--------------------|-----------------------|-----------------|-----------|-----|-----|-----------------------|-----------------|--------------|-----|------|
| | | | LV | PV | MV | | | LV | PV | MV |
| 6 | 7 | 2 | 360 | 390 | 263 | 3.3125 | 1.5 | 136 | 140 | — |
| 8 | 8.125 | 2 | 534 | 550 | 467 | 4.3125 | 2 | 228 | 210 | — |
| 10 | 10.125 | 3 | 788 | 880 | 750 | 7 | 2 | 344 | 400 | 344 |
| 12 | 12.125 | 3 | 1435 | — | 900 | 8.125 | 2 | 590 | — | 510 |
| 14 | 13.25 | 4 | — | — | — | 10.125 | 3 | 920 | — | 806 |
| 16 | 15.25 | 4 | — | — | — | 12.125 | 3 | 1660 | — | 1484 |

LV - Linear PV - Equal percentage MV - Modified parabolic

Table 8a
Flow coefficient - Cv
1010, 1020
and 1210 types
ANSI Classes 900,
1500 or 2500

| BODY SIZE (in.) | STROKE (in.) | CLASS 900 | | | CLASS 1500 | | | CLASS 2500 | | |
|--------------------|-----------------|--------------------|-----|-----|--------------------|-----|-----|--------------------|-----|-----|
| | | ORIFICE SIZE (in.) | MV | BRR | ORIFICE SIZE (in.) | MV | BRR | ORIFICE SIZE (in.) | MV | BRR |
| 1.5 | .75 | 1.375 | 20 | 18 | 1.375 | 20 | 18 | — | — | — |
| 2 | 1.125 | 1.75 | 36 | 48 | 1.75 | 36 | 48 | 1.5 | 26 | 15 |
| | .75 | 1.375 | 22 | — | 1.375 | 22 | — | — | — | — |
| 3 | 1.5 | 2.875 | 120 | 100 | 2.75 | 85 | 93 | 2.25 | 63 | 77 |
| | 1.125 | 1.75 | 39 | — | 1.75 | 39 | — | 1.5 | 30 | — |
| 4 | 2 | 3.875 | 170 | 178 | 3.625 | 150 | 154 | 2.875 | 95 | 141 |
| | 1.5 | 2.875 | 89 | — | 2.75 | 89 | — | 2.25 | 70 | — |
| 6 | 2 | 5.75 | 270 | 286 | 5.375 | 235 | 200 | 4.375 | 157 | 217 |
| | | 3.875 | 180 | — | 3.625 | 160 | — | 2.875 | 105 | — |
| 8 | 2 | 7.5 | 470 | 433 | 7 | 390 | 430 | — | — | — |
| | | 5.75 | 283 | — | 5.375 | 250 | — | — | — | — |
| 10 | 3 | 9.375 | 884 | 800 | 8.75 | 650 | 678 | — | — | — |
| | 2 | 7.5 | 485 | — | 7 | 405 | — | — | — | — |

MV - Modified parabolic BRR - Low noise multiple passage

Table 8b
Flow coefficient - Cv
1070 type
ANSI Classes 900,
1500 or 2500

| BODY SIZE (in.) | ORIFICE CODE | ORIFICE SIZE (in.) | STROKE (in.) | PC | LC | MV | AQP | AOPT |
|--------------------|--------------|-----------------------|-----------------|------|------|------|------|------|
| | M1 | .25 | .75 | — | — | .25 | .25 | — |
| | M2 | | | — | — | .4 | .4 | .25 |
| | M3 | | | .85 | .85 | .85 | .7 | .5 |
| | M4 | .375 | | 2 | 2 | 2 | 1.6 | 1 |
| | M5 | .5 | | 3.4 | 3.4 | 3.4 | 2.9 | 2 |
| | M6 | .625 | | 5.5 | 5.5 | 5.5 | 4.6 | 3.5 |
| | M7 | .75 | | 7.5 | 7.5 | 7.5 | 6.5 | 5.5 |
| | M8 | .875 | | 10.6 | 10.6 | 10.6 | 9 | 7.5 |
| | M9 | 1 | | 13 | 13 | 13 | 11.5 | 10 |

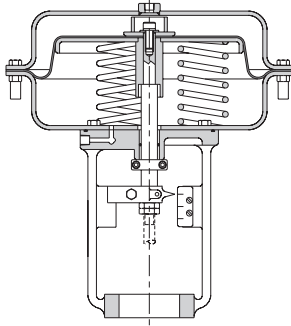
PC - Equal Percentage LC - Linear MV - Modified Parabolic AQP - Partial Cascade Linear AOPT - Full Cascade Linear
(1) Size .5 in.. only from M1 up to M5 orifice code. Size .75 in.. only from M1 up to M7 orifice code.

Table 9
Leakage Classes
(ANSI/FCI 70-2
formerly
ANSI B16.104)

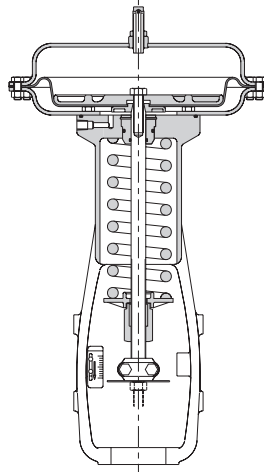
| VALVE TYPE | CLASS | NOTE |
|---------------------|---------------|--|
| 1010 | II IV or V | With PTFE seal ring With seal ring in elastomer |
| 1210 | IV | Metal seat |
| 1110 and 1120 | VI | With PTFE seat |
| 1020, 1070 and 1080 | IV or V | Metal seat |

The **1000 Series** control valve is normally operated by diaphragm/spring pneumatic actuators (DC or DN series) or by double action or spring return pneumatic piston actuators (PP series).

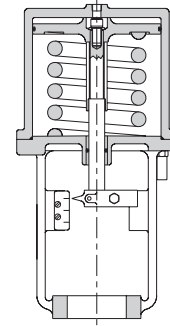
Can also be supplied with electric or hydraulic actuator. Detailed information about actuators are given in specific bulletins.



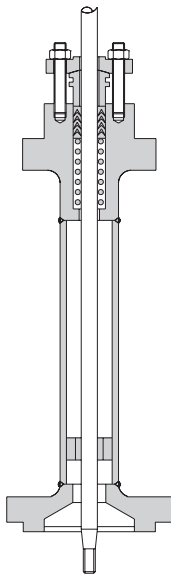
DC SERIES - DIAPHRAGM/SRING ACTUATOR



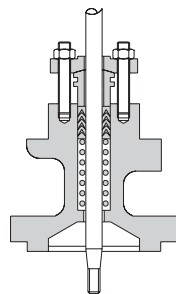
DN SERIES - DIAPHRAGM/SRING ACTUATOR



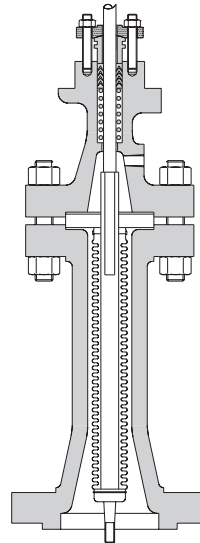
PP SERIES - PISTON ACTUATOR



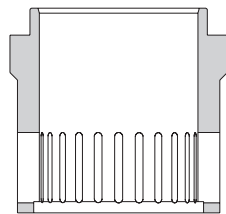
CE-3 EXTENDED



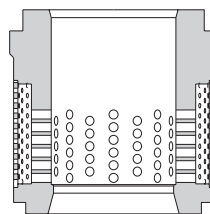
CE-1 STANDARD



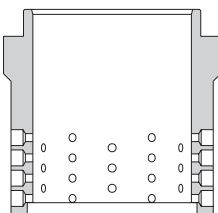
CE-4 EXTENDED WITH BELLOWS



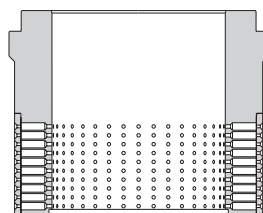
BRR - LOW NOISE SINGLE STAGE
MULTIPLE FLOW PASSAGE



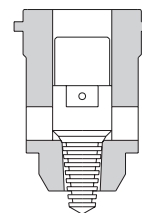
BR2 - 2 STAGES LOW NOISE



BKV - ANTI CAVITATION



2K - 2 STAGES ANTICAVITATION

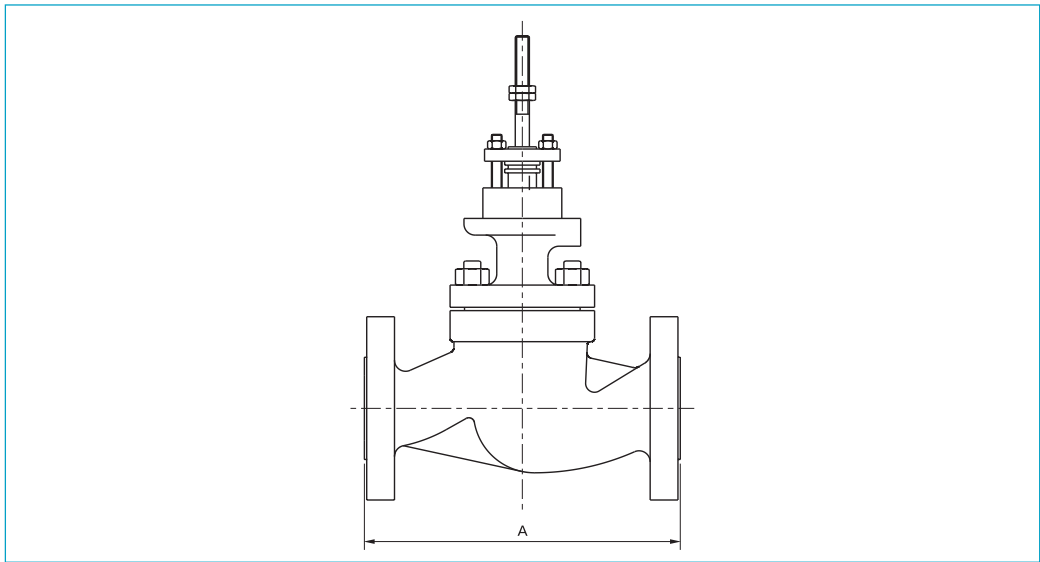


AQP - CASCADE
FOR HIGH PRESSURE DROP

Bonnet types

Special trims

Face-to-face
dimensions



| BODY SIZE (in.) | A (mm) - FLANGED BODY ⁽¹⁾ | | | | | | | | | | | |
|--------------------|---|------|------|------|------|------|------|------|------|------|------|------|
| | CLASS | | | | | | | | | | | |
| | 150 | | 300 | | 600 | | 900 | | 1500 | | 2500 | |
| | FR | RTJ | FR | RTJ | FR | RTJ | FR | RTJ | FR | RTJ | FR | RTJ |
| .5 | For these sizes and classes, use 85 Series Control Valve | | | | | | 260 | 260 | 260 | 260 | — | — |
| .75 | | | | | | | 260 | 260 | 260 | 260 | — | — |
| 1 | | | | | | | 260 | 260 | 260 | 260 | — | — |
| 1.5 | | | | | | | 305 | 305 | 305 | 305 | 359 | 362 |
| 2 | | | | | | | 337 | 340 | 337 | 340 | 400 | 403 |
| 3 | | | | | | | 394 | 397 | 413 | 416 | 498 | 505 |
| 4 | | | | | | | 470 | 473 | 546 | 549 | 574 | 584 |
| 6 | 450 | 463 | 473 | 489 | 508 | 511 | 619 | 622 | 673 | 680 | 819 | 832 |
| 8 | 542 | 555 | 568 | 584 | 610 | 612 | 800 | 803 | 857 | 867 | 1022 | 1038 |
| 10 | 673 | 686 | 708 | 724 | 752 | 756 | 838 | 841 | 991 | 1001 | 1270 | 1292 |
| 12 | 736 | 749 | 774 | 790 | 820 | 823 | 1016 | 1019 | 1130 | 1148 | — | — |
| 14 | 889 | 902 | 927 | 943 | 972 | 975 | — | — | — | — | — | — |
| 16 | 1016 | 1029 | 1057 | 1073 | 1108 | 1111 | — | — | — | — | — | — |
| 18 | 1143 | 1152 | 1184 | 1200 | 1229 | 1232 | — | — | — | — | — | — |
| 20 | 1267 | 1280 | 1308 | 1327 | 1372 | 1384 | — | — | — | — | — | — |
| 24 | 1556 | 1568 | 1600 | 1622 | 1676 | 1686 | — | — | — | — | — | — |

(1) According to ISA S75.03 for classes 150, 300 and 600 and sizes up to 16 inches.

Ordering
information

1. Valve size and type
2. End connection style
3. Body material
4. Trim material
5. Bonnet type
6. Packing material
7. Maximum working condition
8. Normal working condition
9. Minimum working condition
10. Shutoff differential pressure
11. Specific gravity
12. Specific heat ratio
13. Critical pressure
14. Critical temperature
15. Viscosity
16. Inlet and outlet pipe diameter and thickness.



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Representative

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