

Masoneilan™ 41005 Series

Complete Line of Cage-Guided,
Globe Valves with **Lo-dB™**,
Anti-Cavitation and High
Pressure API 6A Capabilities



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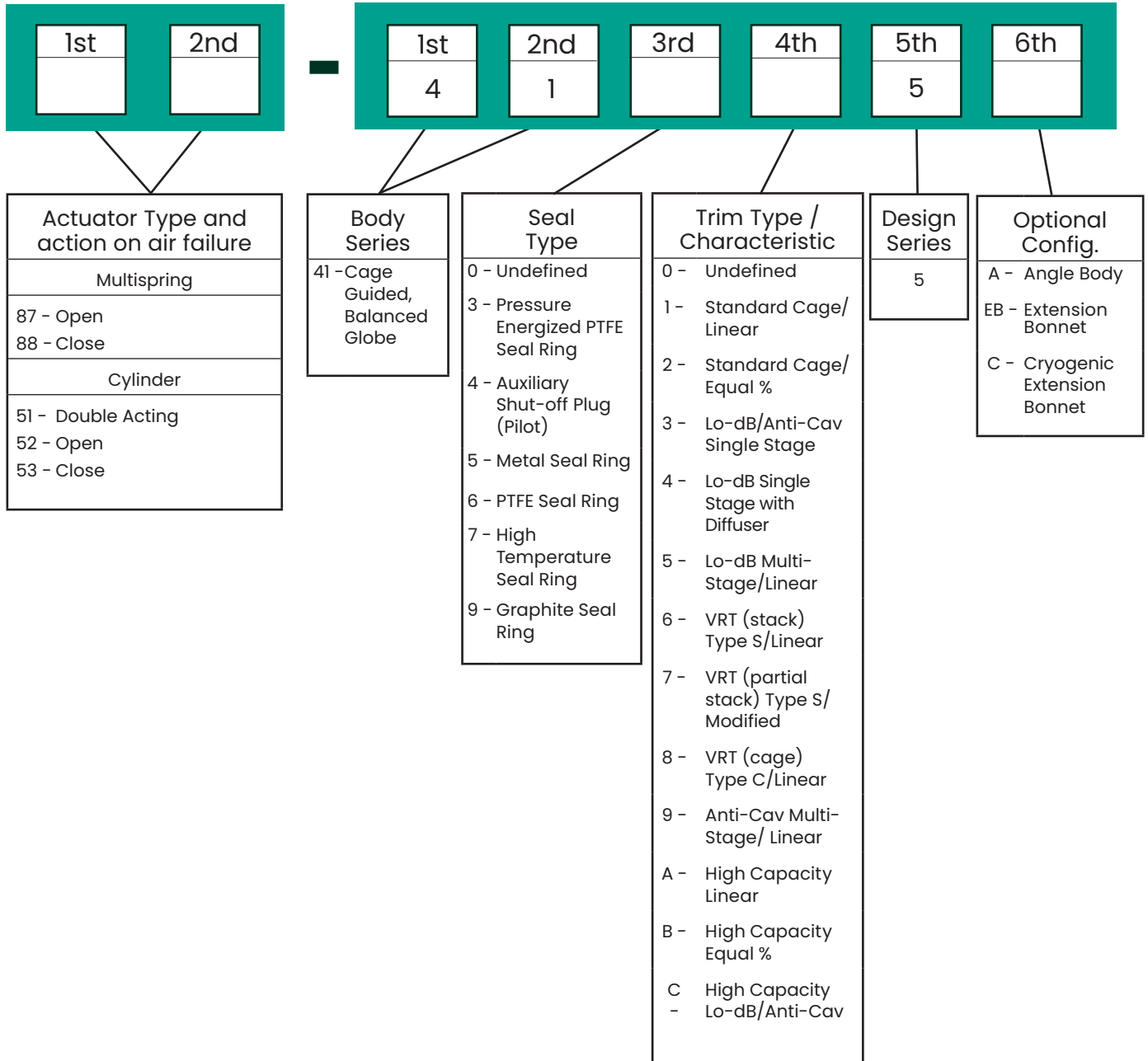
41005 Series High Pressure Valves

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Numbering System



Engineered trim options are also available for high temperature and high pressure drop applications. Please consult factory for details.

Ratings / Connections

 Threaded
  Socket Weld
  Butt Weld
  RF and RTJ

| Valve Size | | ASME Class 150 to 1500 and equivalent PN | | | | ASME Class 2500 and equivalent PN | | |
|----------------------|---------|---|---|---|---|--------------------------------------|---|---|
| inch | mm | | | | | | | |
| 2 | 50 | ■ | ● | □ | ○ | ■ | ● | □ |
| 3 | 80 | ■ | | □ | | ■ | | □ |
| 4 | 100 | ■ | | □ | | ■ | | □ |
| 6 ⁽¹⁾ | 150 | ■ | | □ | | ■ | | □ |
| 8 ⁽¹⁾ | 200 | ■ | | □ | | ■ | | □ |
| 10 ⁽¹⁾ | 250 | ■ | | □ | | ■ | | □ |
| 12 ⁽¹⁾ | 300 | ■ | | □ | | ■ | | □ |
| 14 ⁽³⁾ | 350 | ■ | | □ | | | | |
| 16 ⁽²⁾ | 400 | ■ | | □ | | ■ | | |
| 18 ⁽¹⁾ | 450 | ■ | | □ | | | | |
| 20 ⁽⁴⁾ | 500 | ■ | | □ | | | | |
| 24 ⁽⁵⁾ | 600 | ■ | | □ | | | | |
| 30 ⁽⁸⁾ | 762 | ■ | | □ | | | | |
| 3x2 | 80x50 | ■ | | □ | | ■ | | □ |
| 4x2 | 100x50 | ■ | | □ | | ■ | | □ |
| 4x3 | 100x80 | ■ | | □ | | | | |
| 6x3 | 150x80 | ■ | | □ | | | | |
| 6x4 | 150x100 | ■ | | □ | | | | |
| 8x4 | 200x100 | ■ | | □ | | | | |
| 8x6 | 200x150 | ■ | | □ | | | | |
| 10x6 | 250x150 | ■ | | □ | | | | |
| 10x8 | 250x200 | ■ | | □ | | | | |
| 12x8 | 300x200 | ■ | | □ | | | | |
| 16x12 | 400x300 | ■ | | □ | | | | |
| 30x32 ⁽⁹⁾ | 750x800 | ■ | | □ | | | | |

- 6" through 12" + 18" High Capacity designs available in ASME Class 150 to 600 only. 20" and 24" High Capacity designs available in ASME Class 150 to 300 only.
- 16" ASME Class 2500 available in Butt Weld end connections only. 16" High Capacity design is available in ASME Class 600 only.
- 14" ASME Class limited to 1500. There is no 14" size in High Capacity design.
- 20" available in ASME Classes 150 to 900 only.
- 24" available in ASME Classes 150 to 600 only.
- Angle body versions are available in 2" to 8" in ASME Classes 150 to 1500.
- Consult Baker Hughes for DIN and special end connections and unlisted constructions.
- CL 150-600 Flanged only.
- CL 150-300 Flanged only.

Seal Type vs Temperature Range/Seat Leakage

| Valve Model | Seal Type | Valve Size | | Temperature Range ⁽¹⁾ | | | | Seat Leakage per IEC 534-4 and ASME / FCI 70.2 Class |
|-------------|---|-----------------------|-----------|----------------------------------|--------|------------|--------|--|
| | | inches | mm | Minimum | | Maximum | | |
| 41305 | Pressure Energized PTFE Seal Ring | 2 - 30 | 50 - 600 | -148°F | -100°C | +450°F | +232°C | IV (standard) V (optional) |
| | | 2 - 24 ⁽²⁾ | 50 - 300 | | | +575°F | +302°C | |
| 41405 | Auxiliary Pilot Plug with Metal Seal Ring | 2 | 50 | -320°F | -196°C | +1099°F | +593°C | IV (standard) V (optional) |
| | | 3 - 4 | 80 - 100 | | | +800°F | +427°C | |
| | | 6 - 18 | 150 - 450 | | | +1099°F | +593°C | |
| 41505 | Metal Seal Ring | 2 | 50 | -320°F | -196°C | +1099°F | +593°C | II |
| | | 3 - 4 | 80 - 100 | | | +800°F | +427°C | II |
| | | 6 - 18 | 150 - 450 | | | +1099°F | +593°C | III |
| | | 20 & 24 | 500 & 600 | | | -51°F | -46°C | +650°F |
| 41605 | PTFE Seal Ring | 2 - 24 | 50 - 600 | -20°F | -29°C | +300°F | +149°C | IV |
| 41705 | High Temperature Seal Ring | 4 | 100 | -20°F | -29°C | +800°F | +427°C | V |
| | | 6 - 12 | 150 - 300 | | | FTO +850°F | +454°C | |
| 41905 | Graphite Seal Ring | 2 | 50 | -320°F | -196°C | +849°F | +454°C | III |
| | | 3 - 4 | 80 - 100 | | | +800°F | +427°C | |
| | | 6 - 18 | 150 - 450 | | | +850°F | +454°C | IV |
| | | 20 & 24 | 500 & 600 | | | -51°F | -46°C | |

1. See Materials of Construction Tables for other temperature limitations.
2. Pressure Energized PTFE Seal w/ backup rings for 2-24" up to 575°F (302°C)

Seal Type vs Trim Type

| Model No. | 413X5 | 414X5 ^(1 & 4) | 415X5 | 416X5 | 417X5 ⁽⁷⁾ | 419X5 |
|--|--|---|---------------------------|---------------------------|----------------------------|---------------------------|
| Trim Type | Seal Type | | | | | |
| | Pressure Energized PTFE Seal Ring | Auxiliary Pilot Plug with Metal Seal Ring | Metal Seal Ring | PTFE Seal Ring | High Temperature Seal Ring | Graphite Seal Ring |
| Standard Trim 41X15/41X25 | 41315/41325 FTO or FTC ⁽²⁾ | 41415/41425 FTC | 41515/41525 FTO or FTC | 41615/41625 FTO or FTC | 41715/41725 FTO | 41915/41925 FTO or FTC |
| Lo-dB Single Stage 41X35 | 41335 FTO | 41435 FTC | 41535 FTO | 41635 FTO | 41735 FTO | 41935 FTO |
| Anti-Cavitation, Single Stage 41X35 | 41335 FTC | 41435 FTC | 41535 FTC | 41635 FTC | - | 41935 FTC |
| Lo-dB Single Stage with Internal Diffuser 41X45 ⁽³⁾ | - | 41445 FTC | - | - | - | - |
| Lo-dB Multi-Stage 41X55 | 41355 FTO | - | 41555 FTO | 41655 FTO | 41755 FTO | 41955 FTO |
| High Pressure Anti-Cavitation VRT | 41365 ⁽⁵⁾ 41375 ⁽⁶⁾ | - | - | - | - | - |
| Anti-Cavitation, Multi-Stage 41X95 | 41395 FTC | - | 41595 FTC | 41695 FTC | - | 41995 FTC |

1. Flow direction for Pilot Plug Seal configuration is always FTC.
2. Seal ring must be installed in correct orientation relative to high pressure direction.
3. Flow direction with Internal Diffuser is always FTC.
4. 41405 is not available in 20" or 24" sizes.
5. 41365 available in 8", 10" and 12" sizes.
6. 41375 available in 3" to 10".
7. 41705 available in 4" to 12". 4" size is limited to 800°F for FTO only.

C_v and F_L Versus Travel

Standard Trim

Models: 41315, 41415⁽¹⁾, 41515, 41615, 41715 and 41915

Flow Characteristic: LINEAR

| | | | | | | | Percent of Travel | | | | | | | | | |
|--------------------|---------|------------------------------|------------------|------|--------------------|---------------------|----------------------|------|------|------|------|------|------|------|------|-------|
| | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| | | | | | | | F _L | | | | | | | | | |
| Valve Size | | ASME CLASS and Equivalent PN | Orifice Diameter | | Travel | | Rated C _v | | | | | | | | | |
| inches | mm | | in. | mm | in. | mm | | | | | | | | | | |
| 2 | 50 | 900-1500-2500 | 1.84 | 46.7 | 0.8 | 20.3 | 1.4 | 2.7 | 4.2 | 6 | 8 | 10 | 12.5 | 14 | 15.5 | 16 |
| | | | | | | | 2 | 4.9 | 8.3 | 13 | 19 | 25 | 30 | 35 | 38 | 40 |
| 2 | 50 | 150-600 | 2.5 | 63.5 | 1.5 | 38.1 | 2.7 | 5.1 | 7.9 | 11 | 15 | 19 | 23 | 26 | 29 | 30 |
| 3x2 ⁽²⁾ | 80x50 | 150-1500 | | | | | 4 | 9 | 15 | 24 | 35 | 47 | 57 | 65 | 71 | 75 |
| 4x2 | 100x50 | 2500 | | | | | | | | | | | | | | |
| 3 | 80 | 2500 | 3.5 | 88.9 | 2 | 50.8 | 5 | 10 | 16 | 22 | 30 | 38 | 46 | 52 | 58 | 60 |
| 4x3 | 80 | 150-1500 | | | | | 8 | 19 | 31 | 50 | 73 | 96 | 118 | 135 | 147 | 155 |
| 6x3 | 100x80 | 150x80 | | | | | | | | | | | | | | |
| 4 | 100 | 2500 | 4.38 | 111 | 2 | 50.8 | 9 | 16 | 25 | 35 | 48 | 60 | 72 | 83 | 91 | 95 |
| 4 | 100 | 150-1500 | | | | | 12 | 29 | 48 | 77 | 113 | 149 | 182 | 209 | 228 | 240 |
| 6x4 | 150x100 | 200x100 | | | | | | | | | | | | | | |
| 6 | 150 | 2500 | 5.12 | 130 | 0.8 ⁽³⁾ | 20.3 ⁽³⁾ | 7 | 15 | 28 | 41 | 58 | 74 | 94 | 117 | 144 | 165 |
| 6 | 150 | 150-1500 | | | | | 2 | 50.8 | 20 | 52 | 92 | 148 | 204 | 260 | 308 | 348 |
| 8x6 | 200x150 | 250x150 | | | 2500 | | | | | | | | | | | |
| 8 | 200 | 2500 | 6.5 | 165 | 1.5 | 38.1 | 17 | 37 | 71 | 104 | 145 | 187 | 237 | 295 | 361 | 415 |
| 8 | 200 | 150-1500 | | | 2.5 | 36.5 | 32 | 83 | 147 | 237 | 326 | 416 | 493 | 557 | 602 | 640 |
| 10x8 | 250x200 | 300x200 | | | | | | | | | | | | | | |
| 10 | 250 | 2500 | 8 | 203 | 1.5 | 38.1 | 20 | 46 | 87 | 128 | 179 | 230 | 291 | 362 | 444 | 510 |
| 10 | 250 | 150-1500 | | | 3 | 76.2 | 50 | 130 | 230 | 370 | 510 | 650 | 770 | 870 | 940 | 1000 |
| 12 | 300 | 2500 | | | | | | | | | | | | | | |
| 12 | 300 | 150-1500 | 9.75 | 248 | 2 | 50.8 | 31 | 69 | 131 | 193 | 270 | 347 | 439 | 547 | 670 | 770 |
| 16x12 | 400x300 | 2500 | | | 3.75 | 95.3 | 70 | 182 | 322 | 518 | 714 | 910 | 1078 | 1218 | 1316 | 1400 |
| 16 | 400 | 2500 | | | | | | | | | | | | | | |
| 14 | 350 | 150-1500 | 11.55 | 293 | 2.5 | 63.5 | 15 | 97 | 195 | 304 | 413 | 528 | 643 | 757 | 872 | 980 |
| | | | | | 4 | 102 | 57 | 216 | 391 | 573 | 756 | 935 | 1106 | 1262 | 1399 | 1520 |
| | | | | | 5 | 127 | 105 | 330 | 573 | 822 | 1064 | 1288 | 1486 | 1654 | 1792 | 1900 |
| 16 | 400 | 150-1500 | 13 | 330 | 2.5 | 63.5 | 51 | 128 | 211 | 320 | 448 | 576 | 730 | 922 | 1114 | 1280 |
| | | | | | 4 | 102 | 104 | 268 | 464 | 744 | 1024 | 1304 | 1544 | 1720 | 1880 | 2000 |
| | | | | | 5 | 127 | 130 | 335 | 580 | 930 | 1280 | 1630 | 1930 | 2150 | 2350 | 2500 |
| 18 | 450 | 150-1500 | 14.5 | 368 | 3.5 | 88.9 | 84 | 217 | 376 | 603 | 829 | 1056 | 1251 | 1393 | 1523 | 1620 |
| | | | | | 5 | 127 | 120 | 310 | 536 | 859 | 1183 | 1506 | 1783 | 1987 | 2171 | 2310 |
| | | | | | 7 | 178 | 168 | 434 | 752 | 1205 | 1659 | 2112 | 2501 | 2786 | 3046 | 3110 |
| 20 | 500 | 150-900 | 19 | 483 | 4 | 102 | 79 | 422 | 790 | 1158 | 1517 | 1860 | 2182 | 2481 | 2753 | 3000 |
| | | | | | 6 | 152 | 244 | 792 | 1343 | 1866 | 2342 | 2762 | 3124 | 3431 | 3688 | 3900 |
| | | | | | 9 | 229 | 524 | 1356 | 2103 | 2724 | 3219 | 3604 | 3907 | 4147 | 4342 | 4500 |
| 24 | 600 | 150-600 | 23 | 584 | 4 | 102 | 114 | 608 | 1138 | 1668 | 2187 | 2688 | 3161 | 3604 | 4011 | 4300 |
| | | | | | 6 | 152 | 345 | 1115 | 1892 | 2635 | 3321 | 3933 | 4468 | 4928 | 5320 | 5600 |
| | | | | | 9 | 229 | 703 | 1832 | 2871 | 3765 | 4499 | 5094 | 5569 | 5952 | 6265 | 6500 |
| | | | | | 11 | 279 | 964 | 2327 | 3511 | 4460 | 5191 | 5749 | 6180 | 6519 | 6793 | 7000 |
| 30, 32x30 FTO | 750 | 150-600 ⁽⁴⁾ | 29 | 736 | 15 | 381 | 1185 | 2631 | 3946 | 5084 | 6129 | 7181 | 8143 | 8954 | 9650 | 10500 |
| 30, 32x30 FTC | | | | | | | 1184 | 2621 | 3921 | 5034 | 6043 | 7048 | 7955 | 8712 | 9290 | 9750 |

1. Model 41415 is not available in 20", 24", and 30" sizes.

2. Ex. 3x2 size = valve with 3" body with standard 2" trim.

3. Travel of 1.5" (38.1 mm) for 41405.

4. Size 32x30 is available only for Class 150-300.

C_V and F_L Versus Travel

Balanced Trim

Models: 413A5, 415A5, 416A5 and 419A5 Series

Flow Characteristic: LINEAR, High Capacity

| Percent of Travel | | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|-------------------|-----|------------------------------|------------------|-----|--------|------|-----------|----------------------|------|------|------|------|------|------|------|------|------|
| F _L | | | | | | | | 0.94 | 0.94 | 0.93 | 0.93 | 0.92 | 0.92 | 0.91 | 0.91 | 0.90 | 0.90 |
| Valve Size | | ASME CLASS and Equivalent PN | Orifice Diameter | | Travel | | Flow Dir. | Rated C _V | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | | | | | | | | | | | |
| 6 | 150 | 150-600 | 6.5 | 165 | 2.5 | 63.5 | FTC | 67 | 123 | 185 | 246 | 303 | 353 | 396 | 430 | 454 | 469 |
| | | | | | | | FTO | 71 | 132 | 197 | 262 | 323 | 377 | 423 | 458 | 485 | 501 |
| 8 | 200 | 150-600 | 8 | 203 | 3.5 | 88.9 | FTC | 109 | 202 | 303 | 403 | 497 | 580 | 649 | 705 | 745 | 770 |
| | | | | | | | FTO | 125 | 231 | 346 | 461 | 568 | 663 | 742 | 805 | 851 | 880 |
| 10 | 250 | 150-600 | 9.57 | 243 | 3.5 | 88.9 | FTC | 153 | 283 | 424 | 564 | 695 | 812 | 909 | 986 | 1042 | 1078 |
| | | | | | | | FTO | 174 | 322 | 482 | 642 | 791 | 923 | 1034 | 1122 | 1186 | 1226 |
| 12 | 300 | 150-600 | 10.75 | 273 | 5.5 | 140 | FTC | 145 | 290 | 435 | 580 | 725 | 870 | 1015 | 1160 | 1305 | 1450 |
| | | | | | | | FTO | 151 | 303 | 454 | 605 | 757 | 908 | 1059 | 1210 | 1362 | 1513 |
| 16 | 400 | 600 | 14.4 | 366 | 6 | 152 | FTC | 356 | 660 | 989 | 1316 | 1622 | 1893 | 2121 | 2301 | 2432 | 2515 |
| | | | | | 6.15 | 156 | FTO | 397 | 735 | 1101 | 1465 | 1806 | 2107 | 2361 | 2562 | 2707 | 2800 |
| 18 | 450 | 150-600 | 16.89 | 429 | 7.5 | 191 | FTC | 296 | 913 | 1419 | 1954 | 2445 | 2878 | 3201 | 3471 | 3610 | 3705 |
| | | | | | | | FTO | 299 | 789 | 1322 | 1870 | 2293 | 2600 | 2939 | 3081 | 3374 | 3430 |
| 20 | 508 | 150-300 | 23 | 584 | 11 | 279 | FTC | 540 | 1082 | 1622 | 2163 | 2704 | 3245 | 3786 | 4326 | 4867 | 5408 |
| | | | | | | | FTO | 571 | 1142 | 1714 | 2285 | 2856 | 3425 | 4000 | 4570 | 5140 | 5712 |
| 24 | 609 | 150-300 | 27 | 686 | 12 | 305 | FTC | 1205 | 2233 | 3345 | 4450 | 5483 | 6400 | 7170 | 7780 | 8220 | 8500 |
| | | | | | | | FTO | 1177 | 2180 | 3266 | 4345 | 5354 | 6248 | 7000 | 7595 | 8030 | 8300 |

C_v and F_L Versus Travel

Standard Trim

Models: 41325, 41425¹, 41525, 41625, 41725 and 41925

Flow Characteristic: EQUAL PERCENTAGE

| Percent of Travel | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
|--------------------------------|---------------------------|------------------------------|------------------|------|--------|------|----------------------|------|------|------|------|------|------|------|------|------|------|
| F _L | | | | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.93 | 0.92 | 0.92 | 0.92 | 0.90 |
| Valve Size | | ASME CLASS and Equivalent PN | Orifice Diameter | | Travel | | Rated C _v | | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | | | | | | | | | | | |
| 2 | 50 | 900-1500-2500 | 1.84 | 46.7 | 0.8 | 20.3 | 0.2 | 0.4 | 0.8 | 1.3 | 2.1 | 3.8 | 6.7 | 10 | 12 | 14 | |
| | | | | | | | 0.5 | 1.1 | 2 | 3.2 | 5.2 | 9.5 | 17 | 25 | 31 | 35 | |
| 2 3x2 ⁽²⁾ 4x2 | 50 80x50 100x50 | 150-600 | 2.5 | 63.5 | 1.5 | 38.1 | 0.3 | 0.8 | 1.5 | 2.3 | 4 | 7 | 12 | 18 | 23 | 26 | |
| | | | | | | | 0.8 | 2 | 4 | 6 | 10 | 18 | 31 | 46 | 58 | 65 | |
| 3 | 80 | 2500 | | | | | | | | | | | | | | | |
| 3 4x3 6x3 | 80 100x80 150x80 | 150-1500 | 3.5 | 88.9 | 2 | 50.8 | 0.7 | 1.7 | 3 | 5 | 8 | 15 | 27 | 39 | 50 | 56 | |
| | | | | | | | 1.8 | 4 | 8 | 13 | 21 | 38 | 67 | 100 | 124 | 140 | |
| 4 | 100 | 2500 | | | | | | | | | | | | | | | |
| 4 6x4 8x4 | 100 150x100 200x100 | 150-1500 | 4.38 | 111 | 2 | 50.8 | 1.2 | 3 | 5 | 8 | 13 | 24 | 43 | 64 | 81 | 90 | |
| | | | | | | | 3 | 7 | 13 | 20 | 33 | 61 | 107 | 160 | 200 | 225 | |
| 6 | 150 | 2500 | | | | | | | | | | | | | | | |
| 6 8x6 10x6 | 150 200x150 250x150 | 150-1500 | 5.12 | 130 | 2 | 50.8 | 4 | 8 | 15 | 24 | 35 | 54 | 80 | 108 | 130 | 144 | |
| | | | | | | | 9 | 21 | 39 | 60 | 87 | 135 | 200 | 269 | 326 | 360 | |
| 8 | 200 | 2500 | | | | | | | | | | | | | | | |
| 8 10x8 12x8 | 200 250x200 300x200 | 150-1500 | 6.5 | 165 | 2.5 | 63.5 | 6 | 14 | 25 | 39 | 56 | 86 | 128 | 172 | 208 | 230 | |
| | | | | | | | 14 | 34 | 62 | 97 | 140 | 215 | 320 | 430 | 521 | 575 | |
| 10 | 250 | 2500 | | | | | | | | | | | | | | | |
| 10 | 250 | 150-1500 | 8 | 203 | 3 | 76.2 | 9 | 21 | 39 | 60 | 87 | 135 | 200 | 269 | 326 | 360 | |
| 12 | 300 | 2500 | | | | | 23 | 53 | 97 | 151 | 219 | 337 | 500 | 672 | 815 | 900 | |
| 12 16x12 | 300 400x300 | 150-1500 | 9.75 | 248 | 3.75 | 95.3 | 13 | 30 | 54 | 84 | 122 | 187 | 278 | 374 | 453 | 500 | |
| | | | | | | | 32 | 75 | 136 | 212 | 306 | 471 | 700 | 941 | 1142 | 1260 | |
| 14 | 350 | 150-1500 | 11.5 | 292 | 5 | 127 | 17 | 28 | 43 | 62 | 93 | 139 | 196 | 286 | 469 | 680 | |
| | | | | | | | 38 | 116 | 202 | 321 | 511 | 789 | 1099 | 1357 | 1553 | 1700 | |
| 16 | 400 | 150-1500 | 13 | 330 | 5 | 127 | 22 | 53 | 97 | 151 | 219 | 337 | 500 | 672 | 815 | 900 | |
| | | | | | | | 56 | 133 | 243 | 378 | 547 | 842 | 1251 | 1681 | 2038 | 2250 | |
| 18 | 450 | 150-1500 | 14.5 | 368 | 3.5 | 127 | 29 | 69 | 125 | 195 | 282 | 434 | 645 | 867 | 1051 | 1160 | |
| | | | | | 7 | 178 | 72 | 171 | 313 | 487 | 705 | 1085 | 1612 | 2167 | 2627 | 2784 | |
| 20 | 500 | 150-900 | 19 | 483 | 4 | 102 | 12 | 82 | 162 | 257 | 386 | 589 | 854 | 1119 | 1375 | 1620 | |
| | | | | | 9 | 229 | 75 | 218 | 404 | 656 | 981 | 1426 | 2109 | 2944 | 3596 | 4050 | |
| 24 | 600 | 150-600 | 23 | 584 | 6 | 152 | 39 | 139 | 249 | 386 | 574 | 852 | 1256 | 1694 | 2118 | 2520 | |
| | | | | | 11 | 279 | 133 | 344 | 572 | 1005 | 1608 | 2406 | 3553 | 4814 | 5692 | 6300 | |
| 30, 32x30 FTO | 750 | 150-600 ⁽³⁾ | 29 | 736 | 15 | 381 | | | | | | 2729 | 3466 | 4363 | 6334 | 8500 | |
| 30, 32x30 FTC | | | | | | | | | | | 265 | 633 | 997 | 1371 | 1904 | 2719 | 3430 |

1. Model 41425 is not available in 20", 24", and 30" sizes.
2. Ex. 3x2 size = valve with 3" body with standard 2" trim.
3. Size 32x30 is available only for Class 150-300.

C_v and F_L Versus Travel

Balanced Trim

Models: 413B5, 415B5, 416B5 and 419B5 Series

Flow Characteristic: EQUAL PERCENT, High Capacity

| Percent of Travel | | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
|-------------------|-----|------------------------------|------------------|-----|--------|------|-----------|----------------------|------|------|------|------|------|------|------|------|------|------|
| F _L | | | | | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.93 | 0.92 | 0.92 | 0.92 | 0.90 |
| Valve Size | | ASME CLASS and Equivalent PN | Orifice Diameter | | Travel | | Flow Dir. | Rated C _v | | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | | | | | | | | | | | | |
| 6 | 150 | 150-600 | 6.5 | 165 | 2.5 | 63.5 | FTC | 20 | 32 | 53 | 85 | 131 | 191 | 261 | 331 | 394 | 437 | |
| | | | | | | | FTO | 21 | 34 | 56 | 90 | 139 | 201 | 275 | 349 | 415 | 461 | |
| 8 | 200 | 150-600 | 8 | 203 | 3.5 | 88.9 | FTC | 51 | 79 | 124 | 189 | 277 | 383 | 494 | 595 | 670 | 707 | |
| | | | | | | | FTO | 63 | 97 | 152 | 232 | 340 | 470 | 607 | 731 | 822 | 869 | |
| 10 | 250 | 150-600 | 9.57 | 243 | 4 | 102 | FTC | 48 | 78 | 127 | 204 | 315 | 458 | 624 | 793 | 942 | 1047 | |
| | | | | | | | FTO | 55 | 90 | 148 | 237 | 365 | 531 | 724 | 920 | 1093 | 1215 | |
| 12 | 300 | 150-600 | 10.75 | 273 | 5.5 | 140 | FTC | 143 | 286 | 429 | 572 | 715 | 858 | 1001 | 1144 | 1287 | 1430 | |
| | | | | | | | FTO | 108 | 166 | 260 | 399 | 584 | 805 | 1040 | 1253 | 1410 | 1490 | |
| 16 | 400 | 600 | 14.4 | 366 | 7 | 178 | FTC | 178 | 275 | 431 | 660 | 956 | 1333 | 1721 | 2074 | 2334 | 2466 | |
| | | | | | | | FTO | 190 | 293 | 458 | 701 | 1027 | 1418 | 1831 | 2206 | 2483 | 2623 | |
| 18 | 450 | 150-600 | 16.89 | 429 | 7.5 | 191 | FTC | 66 | 188 | 348 | 558 | 969 | 1509 | 2158 | 2621 | 2801 | 2976 | |
| | | | | | | | FTO | 70 | 195 | 360 | 599 | 997 | 1591 | 2339 | 2957 | 3431 | 3661 | |
| 20 | 508 | 150-300 | 23 | 584 | 11 | 279 | FTC | 117 | 273 | 507 | 780 | 1131 | 1755 | 2600 | 3497 | 4238 | 4680 | |
| | | | | | | | FTO | 128 | 300 | 556 | 856 | 1241 | 1926 | 2853 | 3837 | 4650 | 5135 | |
| 24 | 609 | 150-300 | 27 | 686 | 12 | 305 | FTC | 310 | 513 | 862 | 1414 | 2205 | 3215 | 4353 | 5418 | 6250 | 6700 | |
| | | | | | | | FTO | 323 | 536 | 900 | 1477 | 2303 | 3360 | 4538 | 5660 | 6530 | 7000 | |

C_V and F_L Versus Travel

Single Stage Lo-dB/Anti-Cavitation

Models: 41335, 41435⁽¹⁾, 41445⁽¹⁾, 41535, 41635, 41735, and 41935
(with internal diffuser)

Flow Characteristic: LINEAR

| Percent of Travel | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | | |
|-------------------|--------|------------------------------|------------------|------|--------|------|----------------------|------|------|------|------|------|------|------|------|------|------|------|
| F _L | | | | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | |
| Valve Size | | ASME CLASS and equivalent PN | Orifice Diameter | | Travel | | Rated C _V | | | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| 2 | 50 | 900-2500 | 1.84 | 46.7 | 0.8 | 20.3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| | | | | | | | 1.3 | 2.6 | 3.9 | 5.2 | 6.5 | 7.8 | 9.1 | 10.4 | 11.7 | 13 | | |
| | | | | | | | 1.7 | 3.4 | 5.1 | 6.8 | 8.5 | 10.2 | 11.9 | 13.6 | 15.3 | 17 | | |
| | | | | | | | 2.3 | 4.6 | 6.9 | 9.2 | 11.5 | 13.8 | 16.1 | 18.4 | 20.7 | 23 | | |
| | | | | | | | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | | |
| 2 | 50 | 150-600 | 2.5 | 63.5 | 1.5 | 38.1 | 2.5 | 5 | 7.5 | 10 | 12.5 | 15 | 17.5 | 20 | 22.5 | 25 | | |
| | | | | | | | 3 | 6 | 10 | 13 | 16 | 19 | 22 | 26 | 29 | 32 | | |
| | | | | | | | 4 | 9 | 13 | 17 | 22 | 26 | 30 | 34 | 39 | 43 | | |
| 3x2 | 80x50 | 150-1500 | 2.5 | 63.5 | 1.5 | 38.1 | 6 | 12 | 17 | 23 | 29 | 35 | 41 | 46 | 52 | 58 | | |
| 4x2 | 100x50 | | | | | | 7 | 14 | 22 | 29 | 36 | 43 | 50 | 58 | 65 | 72 | | |
| 3 | 80 | 2500 | 3.5 | 88.9 | 2 | 50.8 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | | |
| 3 | 80 | 150-1500 | | | | | 5 | 11 | 16 | 22 | 27 | 32 | 38 | 43 | 49 | 54 | | |
| | | | | | | | 7 | 14 | 22 | 29 | 36 | 43 | 50 | 58 | 65 | 72 | | |
| | | | | | | | 10 | 19 | 29 | 38 | 48 | 57 | 67 | 76 | 86 | 95 | | |
| 4 | 100 | 2500 | | | | | 13 | 25 | 38 | 50 | 63 | 75 | 88 | 100 | 113 | 125 | | |
| 4 | 100 | 150-1500 | 4.38 | 111 | 2 | 50.8 | 7 | 13 | 20 | 26 | 33 | 39 | 46 | 52 | 59 | 65 | | |
| | | | | | | | 9 | 17 | 26 | 34 | 43 | 51 | 60 | 68 | 77 | 85 | | |
| | | | | | | | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 99 | 110 | | |
| | | | | | | | 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 | | |
| 6 | 150 | 2500 | 20 | 39 | 59 | 78 | 98 | 117 | 137 | 156 | 176 | 195 | | | | | | |
| 6 | 150 | 150-1500 | 5.12 | 130 | 2.5 | 63.5 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | | |
| | | | | | | | 13 | 26 | 39 | 52 | 65 | 78 | 91 | 104 | 117 | 130 | | |
| | | | | | | | 18 | 35 | 53 | 70 | 88 | 105 | 123 | 140 | 158 | 175 | | |
| | | | | | | | 23 | 46 | 69 | 92 | 115 | 138 | 161 | 184 | 207 | 230 | | |
| | | | | | | | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 | 300 | | |
| 8 | 200 | 150-1500 | 6.5 | 165 | 2.5 | 63.5 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | | |
| | | | | | | | 21 | 42 | 63 | 84 | 105 | 126 | 147 | 168 | 189 | 210 | | |
| | | | | | | | 27 | 54 | 81 | 108 | 135 | 162 | 189 | 216 | 243 | 270 | | |
| | | | | | | | 36 | 72 | 108 | 144 | 180 | 216 | 252 | 288 | 324 | 360 | | |
| 10 | 250 | 2500 | 3 | 76.2 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | | | | |
| 10 | 250 | 150-1500 | 8 | 203 | 2.5 | 63.5 | 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | | |
| | | | | | | | 26 | 52 | 78 | 104 | 130 | 156 | 182 | 208 | 234 | 260 | | |
| | | | | | | | 36 | 72 | 108 | 144 | 180 | 216 | 252 | 288 | 324 | 360 | | |
| | | | | | | | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | | |
| 12 | 300 | 2500 | 3.5 | 88.9 | 65 | 130 | 195 | 260 | 325 | 390 | 455 | 520 | 585 | 650 | | | | |
| 12 | 300 | 150-1500 | 9.75 | 248 | 2.5 | 63.5 | 45 | 90 | 135 | 180 | 225 | 270 | 315 | 360 | 405 | 450 | | |
| | | | | | | | 60 | 120 | 180 | 240 | 300 | 360 | 420 | 480 | 540 | 600 | | |
| | | | | | | | 81 | 162 | 243 | 324 | 405 | 486 | 567 | 648 | 729 | 810 | | |
| 16 | 400 | 2500 | 5 | 127 | 110 | 220 | 330 | 440 | 550 | 660 | 770 | 880 | 990 | 1100 | | | | |
| 14 | 350 | 150-1500 | 11.5 | 292 | 2.5 | 63.5 | 38 | 113 | 170 | 244 | 318 | 389 | 442 | 510 | 592 | 640 | | |
| | | | | | | | 4 | 102 | 73 | 178 | 281 | 383 | 482 | 578 | 671 | 760 | 848 | 920 |
| | | | | | | | 4 | 102 | 89 | 222 | 352 | 478 | 599 | 713 | 821 | 921 | 1014 | 1100 |
| | | | | | | | 5.5 | 140 | 140 | 346 | 523 | 690 | 847 | 1007 | 1137 | 1254 | 1357 | 1450 |

Table continued next page.

C_v and F_L Versus Travel (Cont.)

Single Stage Lo-dB/Anti-Cavitation

Models: 41335, 41435⁽¹⁾, 41445⁽¹⁾, 41535, 41635, 41735, and 41935
(with internal diffuser)

Flow Characteristic: LINEAR

| Percent of Travel | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
|-------------------|-----|------------------------------|------------------|-----|--------|------|----------------------|------|------|------|------|------|------|------|------|------|------|
| F _L | | | | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Valve Size | | ASME CLASS and equivalent PN | Orifice Diameter | | Travel | | Rated C _v | | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | | | | | | | | | | | |
| 16 | 400 | 150-1500 | 13 | 330 | 2.5 | 63.5 | 73 | 146 | 219 | 292 | 365 | 438 | 511 | 584 | 657 | 730 | |
| | | | | | 4 | 102 | 99 | 198 | 297 | 396 | 495 | 594 | 693 | 792 | 891 | 990 | |
| | | | | | | | 130 | 260 | 390 | 520 | 650 | 780 | 910 | 1040 | 1170 | 1300 | |
| 6 | 152 | 180 | 360 | 540 | 720 | 900 | 1080 | 1260 | 1440 | 1620 | 1800 | | | | | | |
| 18 | 450 | 150-1500 | 14.5 | 368 | 3.5 | 88.9 | 107 | 214 | 321 | 428 | 535 | 642 | 749 | 856 | 963 | 1070 | |
| | | | | | 5 | 127 | 139 | 278 | 417 | 556 | 695 | 834 | 973 | 1112 | 1251 | 1390 | |
| | | | | | | | 185 | 370 | 555 | 740 | 925 | 1110 | 1295 | 1480 | 1665 | 1850 | |
| 7 | 178 | 243 | 486 | 729 | 972 | 1215 | 1458 | 1701 | 1944 | 2187 | 2430 | | | | | | |
| 20 | 500 | 150-900 | 19 | 483 | 4 | 102 | 190 | 380 | 570 | 760 | 950 | 1140 | 1330 | 1520 | 1710 | 1900 | |
| | | | | | 6 | 152 | 280 | 560 | 840 | 1120 | 1400 | 1680 | 1960 | 2240 | 2520 | 2800 | |
| | | | | | 9 | 229 | 350 | 700 | 1050 | 1400 | 1750 | 2100 | 2450 | 2800 | 3150 | 3500 | |
| 24 | 600 | 150-600 | 23 | 584 | 4 | 102 | 270 | 540 | 810 | 1080 | 1350 | 1620 | 1890 | 2160 | 2430 | 2700 | |
| | | | | | 6 | 152 | 350 | 700 | 1050 | 1400 | 1750 | 2100 | 2450 | 2800 | 3150 | 3500 | |
| | | | | | 9 | 229 | 480 | 960 | 1440 | 1920 | 2400 | 2880 | 3360 | 3840 | 4320 | 4800 | |
| | | | | | 11 | 279 | 540 | 1080 | 1620 | 2160 | 2700 | 3240 | 3780 | 4320 | 4860 | 5400 | |
| | | | | | 15 | 381 | 660 | 1320 | 1980 | 2640 | 3300 | 3960 | 4620 | 5280 | 5940 | 6600 | |
| 30, 32x30 | 750 | 150-600 ⁽³⁾ | 29 | 736 | 15 | 381 | 1270 | 2592 | 3784 | 4783 | 5604 | 6273 | 6816 | 7263 | 7633 | 8000 | |

1. Models 41435 and 41445 are not available in 20", 24", and 30" sizes.

2. Ex. 3x2 size = valve with 3" body with standard 2" trim.

3. Size 32x30 is available only for Class 150-300.

C_V and F_L Versus Travel

Balanced Single Stage Anti-Cav / Lo-dB Trim
Models: 413C5, 415C5, 416C5 and 419C5 Series

Flow Characteristic: LINEAR High Capacity

| Percent of Travel | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
|-------------------|-----|------------|------------------|-----|--------|------|----------------------|------|------|------|------|------|------|------|------|------|------|
| F _L | | | | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Valve Size | | ASME CLASS | Orifice Diameter | | Travel | | Rated C _V | | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | | | | | | | | | | | |
| 6 6x8x6 | 150 | 150-600 | 6.5 | 165 | 2.5 | 63.5 | 27 | 54 | 81 | 108 | 135 | 162 | 189 | 216 | 243 | 270 | |
| | | | | | | | 34 | 67 | 101 | 135 | 168 | 202 | 236 | 269 | 303 | 337 | |
| | | | | | 3 | 76.2 | 41 | 82 | 123 | 164 | 205 | 246 | 287 | 328 | 369 | 410 | |
| 8 8x10x8 | 200 | 150-600 | 8 | 203 | 3.5 | 88.9 | 52 | 104 | 155 | 207 | 259 | 311 | 362 | 414 | 466 | 518 | |
| | | | | | | | 63 | 126 | 188 | 251 | 314 | 377 | 439 | 502 | 565 | 630 | |
| 10 | 250 | 150-600 | 9.57 | 243 | 4 | 102 | 77 | 155 | 232 | 309 | 387 | 464 | 541 | 618 | 696 | 773 | |
| | | | | | | | 5 | 127 | 95 | 190 | 285 | 380 | 475 | 570 | 665 | 760 | 855 |
| 12 | 300 | 150-600 | 10.75 | 273 | 5.5 | 140 | 130 | 260 | 390 | 520 | 650 | 780 | 910 | 1040 | 1170 | 1300 | |
| 16 | 400 | 600 | 14.4 | 366 | 5 | 127 | 186 | 372 | 558 | 745 | 931 | 1117 | 1304 | 1490 | 1676 | 1863 | |
| | | | | | | | 7 | 178 | 223 | 452 | 679 | 905 | 1131 | 1357 | 1584 | 1810 | 2036 |
| 18 | 450 | 150-600 | 16.89 | 429 | 7.5 | 191 | 290 | 579 | 869 | 1158 | 1448 | 1737 | 2027 | 2316 | 2606 | 2895 | |
| 20 | 500 | 150-300 | 23 | 584 | 11 | 280 | 425 | 851 | 1276 | 1701 | 2127 | 2552 | 2978 | 3403 | 3829 | 4254 | |
| 24 | 600 | 150-300 | 27 | 686 | 12 | 305 | 690 | 1380 | 2070 | 2760 | 3450 | 4140 | 4830 | 5520 | 6210 | 6900 | |
| | | | | | | | 15 | 381 | 753 | 1506 | 2259 | 3012 | 3765 | 4518 | 5271 | 6024 | 6777 |

Note : Consult Baker Hughes Engineering for Lo-dB Equal percentage for High Capacity designs.

C_v and F_L Versus Travel

Single-Stage Lo-dB /Anti-Cavitation

Models: 41335, 41435, 41535, 41635, 41735 and 41935

Flow Characteristic: EQUAL PERCENTAGE

| Percent of Travel | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 110 | |
|--------------------------------|---------------------------|------------------------------|-----------------|------|--------|------|----------------------|------|------|------|------|------|-------|-------|-------|------|------|
| F _L | | | | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Valve Size | | ASME CLASS and equivalent PN | Office Diameter | | Travel | | Rated C _v | | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | | | | | | | | | | | |
| 2 | 50 | 900-2500 | 1.84 | 46.7 | 0.8 | 20.3 | 0.2 | 0.3 | 0.6 | 1 | 1.6 | 3 | 5.2 | 7.9 | 9.8 | 11 | |
| | | | | | | | 0.2 | 0.5 | 0.9 | 1.5 | 2.4 | 4.4 | 7.6 | 11.4 | 14.2 | 16 | |
| | | | | | | | 0.3 | 0.7 | 1.3 | 2.1 | 3.4 | 6.3 | 11 | 16.5 | 20.4 | 23 | |
| 2 3x2 ⁽¹⁾ 4x2 | 50 80x50 100x50 | 150-600 | 2.5 | 63.5 | 1.5 | 38.1 | 0.3 | 0.8 | 1.5 | 2.4 | 3.8 | 7.1 | 12.4 | 18.5 | 23.1 | 26 | |
| | | 150-1500 | | | | | 0.5 | 1.2 | 2.2 | 3.5 | 5.6 | 10.4 | 18.1 | 27.1 | 33.8 | 38 | |
| 3 | 80 | 2500 | | | | | 0.7 | 1.7 | 3.1 | 4.9 | 8 | 14.8 | 25.8 | 38.5 | 48 | 54 | |
| 3 4x3 6x3 | 80 100x80 150x80 | 150-1500 | 3.5 | 88.9 | 2 | 50.8 | 0.6 | 1.3 | 2.7 | 4.4 | 7.1 | 12.8 | 22.5 | 33.6 | 41.6 | 47 | |
| | | | | | | | 0.9 | 1.9 | 3.8 | 6.2 | 10.1 | 18.2 | 32.1 | 47.9 | 59.4 | 67 | |
| 4 | 100 | 2500 | | | | | 1.2 | 2.7 | 5.5 | 8.9 | 14.4 | 26.1 | 46 | 68.6 | 85.1 | 96 | |
| 4 6x4 8x4 | 100 150x100 200x100 | 150-1500 | 4.38 | 111 | 2 | 50.8 | 0.9 | 2.2 | 4 | 6.2 | 10.3 | 19 | 33.3 | 49.8 | 62.2 | 70 | |
| | | | | | | | 1.3 | 3.1 | 5.8 | 8.9 | 14.7 | 27.2 | 47.6 | 71.2 | 88.9 | 100 | |
| 6 | 150 | 2500 | | | | | 1.9 | 4.5 | 8.4 | 12.9 | 21.3 | 39.4 | 69.1 | 103.2 | 128.9 | 145 | |
| 6 8x6 10x6 | 150 200x150 250x150 | 150-1500 | 5.12 | 130 | 2.5 | 63.5 | 3 | 6 | 12 | 18 | 27 | 41 | 61 | 82 | 99 | 110 | |
| | | | | | | | 3.9 | 9.1 | 16.9 | 25.9 | 37.6 | 58.3 | 86.4 | 116 | 140.5 | 155 | |
| 8 | 200 | 2500 | | | | | 5.7 | 13.2 | 24.5 | 37.7 | 54.7 | 84.8 | 125.4 | 168.3 | 203.8 | 225 | |
| 8 10x8 12x8 | 200 250x200 300x200 | 150-1500 | 6.5 | 165 | 3 | 76.2 | 4 | 11 | 19 | 30 | 44 | 67 | 100 | 135 | 163 | 180 | |
| | | | | | | | 6 | 15 | 28 | 44 | 64 | 97 | 145 | 195 | 236 | 260 | |
| 10 | 250 | 2500 | | | | | 9 | 22 | 41 | 64 | 92 | 141 | 209 | 281 | 340 | 375 | |
| 10 | 250 | 150-1500 | 8 | 203 | 3.5 | 88.9 | 6 | 14 | 25 | 39 | 56 | 86 | 128 | 172 | 208 | 230 | |
| | | | | | | | 9 | 20 | 37 | 57 | 83 | 128 | 190 | 254 | 308 | 340 | |
| 12 | 300 | 2500 | | | | | 12 | 29 | 53 | 82 | 119 | 183 | 270 | 363 | 439 | 485 | |
| 12 16x12 | 300 400x300 | 150-1500 | 9.75 | 248 | 5 | 127 | 10 | 24 | 43 | 67 | 97 | 150 | 222 | 299 | 363 | 400 | |
| | | | | | | | 15 | 34 | 62 | 97 | 140 | 215 | 320 | 430 | 521 | 575 | |
| 16 | 400 | 2500 | | | | | 21 | 49 | 89 | 139 | 201 | 309 | 459 | 617 | 748 | 825 | |
| 16 | 400 | 150-1500 | 13 | 330 | 6 | 152 | 17 | 39 | 72 | 112 | 162 | 249 | 370 | 497 | 603 | 665 | |
| | | | | | | | 24 | 56 | 103 | 160 | 232 | 356 | 529 | 711 | 861 | 950 | |
| | | | | | | | 34 | 80 | 146 | 228 | 329 | 507 | 752 | 1009 | 1223 | 1350 | |

1. Ex. 3x2 size = valve with 3" body with standard 2" trim.

Consult Baker Hughes Engineering for Lo-dB Equal Percentage for High Capacity designs.

C_V and F_L Versus Travel

Multi-Stage Lo-dB

Models: 41355, 41555, 41655, 41755 and 41955

Flow Characteristic: FLOW TO OPEN

| Percent of Travel | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | | |
|--------------------|--------|------------------------------|------------------|------|--------|------|----------------------|---------|------|------|------|------|------|------|------|------|------|------|
| F _L | | | | | | | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | |
| Valve Size | | ASME CLASS and equivalent PN | Orifice Diameter | | Travel | | Rated C _V | | | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | | | | | | | | | | | | |
| 2 | 50 | 900-2500 | 1.84 | 46.7 | 0.8 | 20.3 | 1.2 | 2.4 | 3.6 | 4.8 | 6 | 7.2 | 8.4 | 9.6 | 10.8 | 12 | | |
| | | | | | | | 1.9 | 3.8 | 5.7 | 7.6 | 9.5 | 11.4 | 13.3 | 15.2 | 17.1 | 19 | | |
| | | | | | | | 2.4 | 4.8 | 7.2 | 9.6 | 12 | 14.4 | 16.8 | 19.2 | 21.6 | 24 | | |
| 2 | 50 | 150-600 | 2.5 | 63.5 | 1.5 | 38.1 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | | |
| 3x2 ⁽¹⁾ | 80x50 | 150-1500 | | | | | 4 | 9 | 13 | 17 | 22 | 26 | 30 | 34 | 39 | 43 | | |
| 4x2 | 100x50 | 2500 | | | | | 5 | 11 | 16 | 21 | 27 | 32 | 37 | 42 | 48 | 53 | | |
| 3 | 80 | 150-1500 | 3.5 | 88.9 | 2 | 50.8 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | | |
| | | | | | | | 4x3 | 100x80 | 8 | 15 | 23 | 30 | 38 | 45 | 53 | 60 | 68 | 75 |
| | | | | | | | 6x3 | 150x80 | 2500 | 10 | 19 | 29 | 38 | 48 | 57 | 67 | 76 | 86 |
| 4 | 100 | 150-1500 | 4.38 | 111 | 2 | 50.8 | 7 | 14 | 22 | 29 | 36 | 43 | 50 | 58 | 65 | 72 | | |
| | | | | | | | 6x4 | 150x100 | 11 | 21 | 32 | 42 | 53 | 63 | 74 | 84 | 95 | 105 |
| | | | | | | | 8x4 | 200x100 | 2500 | 13 | 26 | 39 | 52 | 65 | 78 | 91 | 104 | 117 |
| 6 | 150 | 150-1500 | 5.12 | 139 | 2.5 | 63.5 | 10 | 19 | 29 | 38 | 48 | 58 | 67 | 77 | 86 | 96 | | |
| | | | | | | | 8x6 | 200x150 | 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 | 135 | 150 |
| | | | | | | | 10x6 | 250x150 | 2500 | 19 | 38 | 57 | 76 | 95 | 114 | 133 | 152 | 171 |
| 8 | 200 | 150-1500 | 6.5 | 165 | 2.5 | 63.5 | 16 | 31 | 47 | 62 | 78 | 93 | 109 | 124 | 140 | 155 | | |
| | | | | | | | 10x8 | 250x200 | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 225 | 250 |
| | | | | | | | 12x8 | 300x200 | 2500 | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 |
| 10 | 250 | 2500 | 3 | 76.2 | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 | 300 | | | | |
| 10 | 250 | 150-1500 | 8 | 203 | 2.5 | 63.5 | 23 | 46 | 69 | 92 | 115 | 138 | 161 | 184 | 207 | 230 | | |
| | | | | | | | 35 | 70 | 105 | 140 | 175 | 210 | 245 | 280 | 315 | 350 | | |
| | | | | | | | 12 | 300 | 2500 | 3 | 76.2 | 42 | 84 | 126 | 168 | 210 | 252 | 294 |
| 12 | 300 | 150-1500 | 9.75 | 248 | 2.5 | 63.5 | 38 | 75 | 113 | 150 | 188 | 225 | 263 | 300 | 338 | 375 | | |
| | | | | | | | 4 | 102 | 60 | 120 | 180 | 240 | 300 | 360 | 420 | 480 | 540 | 600 |
| | | | | | | | 16x12 | 400x300 | 2500 | 5 | 127 | 73 | 145 | 218 | 290 | 363 | 435 | 508 |
| 14 | 350 | 150-1500 | 11.55 | 293 | 2.5 | 63.5 | 31 | 96 | 148 | 198 | 246 | 292 | 335 | 386 | 424 | 450 | | |
| | | | | | | | 4 | 102 | 66 | 149 | 226 | 301 | 378 | 440 | 508 | 573 | 624 | 678 |
| | | | | | | | 5 | 127 | 87 | 201 | 302 | 399 | 489 | 575 | 655 | 736 | 802 | 863 |
| 16 | 400 | 150-1500 | 13 | 330 | 2.5 | 63.5 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | | |
| | | | | | | | 4 | 102 | 80 | 160 | 240 | 320 | 400 | 480 | 560 | 640 | 720 | 800 |
| | | | | | | | 6 | 152 | 111 | 221 | 332 | 442 | 553 | 663 | 774 | 884 | 995 | 1105 |
| 18 | 450 | 150-1500 | 14.5 | 368 | 3.5 | 88.9 | 73 | 146 | 219 | 292 | 365 | 438 | 511 | 584 | 657 | 730 | | |
| | | | | | | | 5 | 127 | 117 | 234 | 351 | 468 | 585 | 7002 | 819 | 936 | 1053 | 1170 |
| | | | | | | | 7 | 178 | 146 | 292 | 438 | 584 | 730 | 876 | 1022 | 1168 | 1314 | 1460 |
| 20 | 500 | 150-900 | 19 | 483 | 4 | 1012 | 79 | 422 | 790 | 1158 | 1517 | 1860 | 2182 | 2481 | 2753 | 3000 | | |
| | | | | | | | 6 | 152 | 244 | 792 | 1343 | 1866 | 2342 | 2762 | 3124 | 3431 | 3688 | 3900 |
| | | | | | | | 9 | 229 | 524 | 1356 | 2103 | 2724 | 3219 | 3604 | 3907 | 4147 | 4342 | 4500 |
| 24 | 600 | 150-600 | 23 | 584 | 4 | 102 | 130 | 260 | 390 | 520 | 650 | 780 | 910 | 1040 | 1170 | 1300 | | |
| | | | | | | | 6 | 152 | 190 | 380 | 570 | 760 | 950 | 1140 | 1330 | 1520 | 1710 | 1900 |
| | | | | | | | 9 | 229 | 280 | 560 | 840 | 1120 | 1400 | 1680 | 1960 | 2240 | 2520 | 2800 |
| | | | | | | | 11 | 279 | 320 | 640 | 960 | 1280 | 1600 | 1920 | 2240 | 2560 | 2880 | 3200 |
| | | | | | | | 15 | 381 | 420 | 840 | 1260 | 1680 | 2100 | 2520 | 2940 | 3360 | 3780 | 4200 |

1. Ex. 3x2 size=valve with 3" body with standard 2" trim

Multi-stage Lo-dB trim is not available for High Capacity designs.

C_v and F_L Versus Travel

Multi-Stage Anti-Cavitation
Model: 41395

Flow Characteristic: LINEAR

| Percent of Travel | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
|--------------------------------|---------------------------|------------------------------|------------------|------|--------|------|----------------------|------|------|------|------|------|------|------|------|------|------|
| F _L | | | | | | | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Valve Size | | ASME CLASS and equivalent PN | Orifice Diameter | | Travel | | Rated C _v | | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | | | | | | | | | | | |
| 2 | 50 | 900-2500 | 1.52 | 38.6 | 0.8 | 20.3 | 0.9 | 1.8 | 2.7 | 3.6 | 4.5 | 5.4 | 6.3 | 7.2 | 8.1 | 9 | |
| | | | | | | | 1.3 | 2.6 | 3.9 | 5.2 | 6.5 | 7.8 | 9.1 | 10.4 | 11.7 | 13 | |
| | | | | | | | 1.5 | 3 | 4.5 | 6 | 7.5 | 9 | 10.5 | 12 | 13.5 | 15 | |
| 2 3x2 ⁽¹⁾ 4x2 | 50 80x50 100x50 | 150-600 | 2.15 | 54.6 | 1.5 | 38.1 | 2.3 | 4.6 | 6.9 | 9.2 | 12 | 14 | 16 | 18 | 21 | 23 | |
| | | | | | | | 3.5 | 7 | 10.5 | 14 | 18 | 21 | 25 | 28 | 32 | 35 | |
| 3 | 80 | 2500 | | | | | 4.4 | 8.8 | 13.2 | 18 | 22 | 26 | 31 | 35 | 40 | 44 | |
| 3 4x3 6x3 | 80 100x80 150x80 | 150-1500 | 3.15 | 80.0 | 1.5 | 38.1 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | |
| | | | | | | | 6.5 | 13 | 20 | 26 | 33 | 39 | 46 | 52 | 59 | 65 | |
| 4 | 100 | 2500 | | | | | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 | |
| 4x3 6x3 | 100x80 150x80 | 150-1500 | 3.15 | 80.0 | 2 | 50.8 | 9.3 | 18.6 | 28 | 37 | 47 | 56 | 65 | 74 | 84 | 93 | |
| 4 6x4 8x4 | 100 150x100 200x100 | 150-1500 | 4.0 | 102 | 2 | 50.8 | 6.5 | 13 | 20 | 26 | 33 | 39 | 46 | 52 | 59 | 65 | |
| | | | | | | | 10.5 | 21 | 32 | 42 | 53 | 63 | 74 | 84 | 95 | 105 | |
| 6 | 150 | 2500 | | | | | 12.5 | 25 | 38 | 50 | 63 | 75 | 88 | 100 | 113 | 125 | |
| 6 8x6 10x6 | 150 200x150 250x150 | 150-1500 | 4.78 | 121 | 2.5 | 63.5 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
| | | | | | | | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | |
| 8 | 200 | 2500 | | | | | 20 | 39 | 59 | 78 | 98 | 117 | 137 | 156 | 176 | 195 | |
| 8 10x8 12x8 | 200 250x200 300x200 | 150-1500 | 6.15 | 156 | 2.5 | 63.5 | 17 | 34 | 51 | 68 | 85 | 102 | 119 | 136 | 153 | 170 | |
| | | | | | | | 26 | 52 | 78 | 104 | 130 | 156 | 182 | 208 | 234 | 260 | |
| 10 | 250 | 2500 | | | 3 | 76.2 | 32 | 64 | 96 | 128 | 160 | 192 | 224 | 256 | 288 | 320 | |
| 10 | 250 | 150-1500 | 7.63 | 194 | 2.5 | 63.5 | 23 | 46 | 69 | 92 | 115 | 138 | 161 | 184 | 207 | 230 | |
| | | | | | | | 88.9 | 38 | 76 | 114 | 152 | 190 | 228 | 266 | 304 | 342 | 380 |
| 12 | 300 | 2500 | | | 3.5 | 88.9 | 45 | 90 | 135 | 180 | 225 | 270 | 315 | 360 | 405 | 450 | |
| 12 16x12 | 300 400x300 | 150-1500 | 9.37 | 238 | 2.5 | 63.5 | 40 | 80 | 120 | 160 | 200 | 240 | 280 | 320 | 360 | 400 | |
| | | | | | | | 64 | 128 | 192 | 256 | 320 | 384 | 448 | 512 | 576 | 640 | |
| 16 | 400 | 2500 | | | 5 | 127 | 80 | 160 | 240 | 320 | 400 | 480 | 560 | 640 | 720 | 800 | |
| 16 | 400 | 150-1500 | 13 | 330 | 2.5 | 63.5 | 60 | 120 | 180 | 240 | 300 | 360 | 420 | 480 | 540 | 600 | |
| | | | | | | | 95 | 190 | 285 | 380 | 475 | 570 | 665 | 760 | 855 | 950 | |
| | | | | | | | 131 | 262 | 393 | 524 | 655 | 786 | 917 | 1048 | 1179 | 1310 | |

1. Ex. 3x2 size= valve with 3" body with standard 2" trim

C_V and F_L Versus Travel

Variable Resistance Trim (VRT) Type S
Model: 41365

Flow Characteristic: LINEAR

| Percent of Travel | | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|-------------------|-----|------------------------------|------------------|------|--------|-----|---------------------------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| F _L | | | | | | | | 0.999 | 0.999 | 0.999 | 0.998 | 0.997 | 0.996 | 0.994 | 0.992 | 0.990 | 0.988 |
| Valve Size | | ASME CLASS and equivalent PN | Orifice Diameter | | Travel | | Minimum Operable C _V | Rated C _V | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | | | | | | | | | | | |
| 8 | 200 | 300 - 1500 | 2.99 | 75.9 | 4 | 102 | 2.1 | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 |
| 10 | 250 | 300 - 1500 | 4.11 | 104 | 4 | 102 | 2.3 | 19 | 38 | 57 | 76 | 95 | 114 | 133 | 152 | 171 | 190 |
| 12 | 300 | 300 - 1500 | 4.91 | 125 | 4 | 102 | 2.8 | 27 | 54 | 81 | 108 | 135 | 162 | 189 | 216 | 243 | 270 |

C_V and F_L versus Travel

Variable Resistance Trim (VRT) Partial Stack Type S
Model: 41375

Flow Characteristic: MODIFIED LINEAR

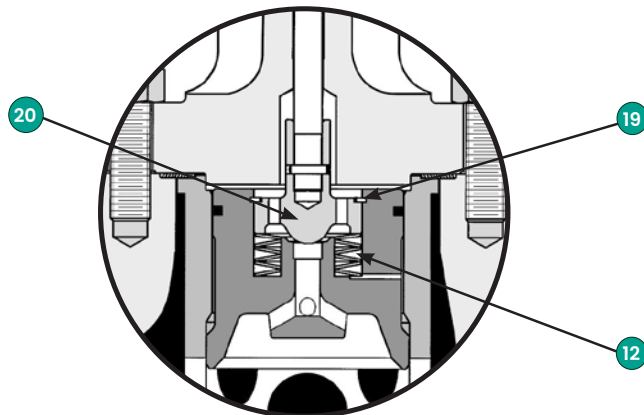
| Percent of Travel | | | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
|-------------------|-----|------------------------------|------------------|------|--------|------|---------------------------------|----------------------|-------|-------|-------|-------|-------|-------|------|------|------|------|
| Valve Size | | ASME CLASS and equivalent PN | Orifice Diameter | | Travel | | Minimum Operable C _V | Rated C _V | | | | | | | | | | |
| in. | mm | | in. | mm | in. | mm | | | | | | | | | | | | |
| 3 | 80 | 150-1500 | 2.42 | 61.5 | 2.5 | 63.5 | 1.0 | C _V | 7 | 11 | 15 | 23 | 33 | 42 | 54 | 67 | 83 | 95 |
| 4 | 100 | 2500 | | | | | | FI | 0.998 | 0.996 | 0.991 | 0.98 | 0.958 | 0.927 | 0.92 | 0.92 | 0.92 | 0.92 |
| 4 | 100 | 150-1500 | 2.99 | 75.9 | 2.5 | 63.5 | 1.3 | C _V | 7 | 11 | 17 | 25 | 36 | 52 | 66 | 86 | 113 | 140 |
| 6 | 150 | 2500 | | | | | | FI | 0.998 | 0.996 | 0.991 | 0.98 | 0.956 | 0.927 | 0.92 | 0.92 | 0.92 | 0.92 |
| 6 | 150 | 150-1500 | 3.99 | 101 | 3.5 | 88.9 | 1.8 | C _V | 14 | 22 | 35 | 57 | 82 | 115 | 163 | 210 | 245 | 270 |
| 8 | 200 | 2500 | | | | | | FI | 0.998 | 0.995 | 0.987 | 0.969 | 0.929 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| 8 | 200 | 150-1500 | 5.36 | 136 | 4 | 102 | 3.8 | C _V | 22 | 38 | 58 | 99 | 140 | 192 | 280 | 360 | 425 | 480 |
| 10 | 250 | 2500 | | | | | | FI | 0.998 | 0.994 | 0.984 | 0.962 | 0.926 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| 10 | 250 | 150-1500 | 7.49 | 190 | 4 | 102 | 3.9 | C _V | 22 | 43 | 65 | 110 | 165 | 240 | 375 | 520 | 640 | 750 |
| 12 | 300 | 2500 | | | | | | FI | 0.998 | 0.994 | 0.982 | 0.956 | 0.923 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |

Note: Throttling at less than minimum operable C_V levels for extended period of time can result in trim damage.

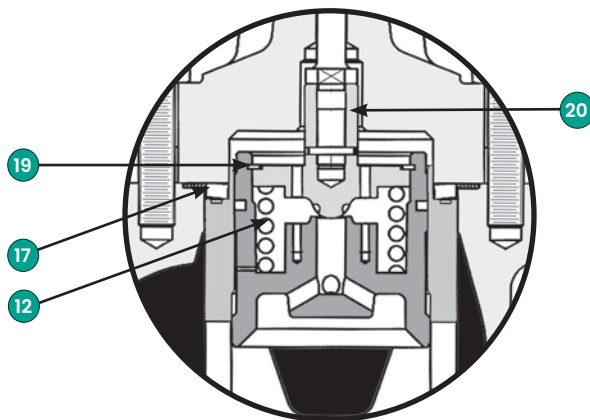
Body S/A Construction

Models 41X15, 41X25, 41X35, 41X45, 41X55, 41X95, 41XA5, 41XB5 and 41XC5

| Ref. No. | Part Name |
|----------|---------------------------|
| 1 | Valve Plug Stem |
| 2 | Packing Flange Stud |
| 3 | Packing Flange Nut |
| 4 | Packing Flange |
| 5 | Packing Spacer |
| ● | 6 Packing |
| 7 | Bonnet |
| 8 | Valve Body Nut |
| 9 | Plug Stem Pin |
| ● | 10 Body Gasket |
| * | 12 Pilot Spring(s) |
| 13 | Seat Ring |
| ● | 14 Seat Ring Gasket |
| 15 | Valve Plug (or Piston) |
| 16 | Cage |
| + | 17 Conical Spring |
| 18 | Valve Body |
| * | 19 Retaining Ring |
| * | 20 Auxiliary Pilot Plug |
| 21 | Valve Body Stud |
| 22 | Guide Bushing |
| 23 | Packing Follower |
| ● | 24 Cage Gasket |
| ⊕ ● | 31 Tec Seal |
| ○ ● | 35 Ni-resist® Seal Ring |
| ★ ● | 40 PTFE Seal Ring |
| ★ ● | 41 Nordel® Backup Ring |
| ▲ | 42 High Temp Seal |
| □ ● | 45 Graphite Seal Ring |
| ● | 46 Ni-resist® Backup Ring |
| 75 | Double cage |
| 76 | Pin |



Pilot Balanced Construction Model 41405
Sizes 2" to 4" shown



Pilot Balanced Construction Model 41405
Applications above 450°F to 1050°F
(232°C to 566°C)
Sizes 6" to 18" shown

- * For 41405 Series Valves only
- + For all valve sSizes above 450°F (232°C)
- ★ For 41605 Series Valves only
- Recommended Spare Parts
- ▲ For use with 41705 Series Valves only
- For 41905 Series Valves only
- For 41405 / 41505 Series Valves only
- ⊕ For 41305 Series Valves only

Note: 6" through 24" High Capacity designs are not available with pilot construction.

Materials of Construction

Models 41X15, 41X25, 41X35, 41X45, 41X55, and 41X95

Models 41XA5, 41XB5 and 41XC5 limited to 575°F for sizes 6" and 8" and limited to 450°F for sizes 10" to 24" High Capacity designs

Standard Carbon Steel Version

| Ref. No | Temperature Range | | -20°F (-29°C) | 450°F (232°C) | 650°F (343°C) | 800°F (427°C) |
|---------|--|-----------|---|---|------------------|--|
| | Description | | Standard Materials | | | |
| 1 | Plug Stem | | 17-4 PH St. St. ASTM A564 GR 630 | | | See Optional Materials |
| 2 | Packing Flange Stud | | 304 St. St. ASTM A193 GR B8 | | | |
| 3 | Packing Flange Nut | | 304 St. St. ASTM A194 GR 8 | | | |
| 4 | Packing Flange | | Carbon Steel ASTM A105 Zinc Plated | | | |
| 5 | Packing Spacer | | 303 St. St. ASTM A582 TY 303 | | | |
| 6 | Packing | | Carbon Core Braided PTFE (ASME Class 150-900) PTFE/Carbon + Braided Graphite End Rings (ASME Class 1500-2500) For use with standard length bonnet | | | See Optional Materials |
| 7 | Valve Bonnet ⁽⁴⁾ | | Carbon Steel ASTM A216 Grade WCC | | | |
| 8 | Valve Body Nut | | Carbon Steel ASTM A194 GR 2H | | | |
| 9 | Plug Stem Pin | | 316 St. St. ASTM A479 TY 316 | | | |
| 10 | Valve Body Gasket | | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | | | |
| 12 | Pilot Spring(s) (41405 Only) | 2" to 4" | Inconel X-750 AMS 5598 (Stacked Washers) | | | |
| | | 6" to 16" | Inconel X-750 ASTM B637 GR 688 | | | |
| 13 | Seat Ring | | 410 St. St. ASTM A479 TY 410 Hardened | | | See Optional Materials |
| 14 | Seat Ring Gasket | | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | | | |
| 15 | Valve Plug | | 17-4 PH St. St. ASTM A747 GR CB7CU-1 Condition HI075 | | | See Optional Materials |
| 16 | Cage | | Martensitic St. St. ASTM A487 GR CA6NM CL B Hard Chrome Plated | | | See Optional Materials |
| 17 | Conical Spring ⁽¹⁾ (6" to 30") | | See Note 1 | 17-4 PH ASTM A564 GR 630 Condition HI075 | | Inconel X-750 ASTM B637 + Shot Peening |
| 18 | Valve Body ⁽⁴⁾ | | Carbon Steel ASTM A216 Grade WCC | | | |
| 19 | Retaining Ring (41405 Only) | | Inconel X-750 AMS 5598 | | | |
| 20 | Auxiliary Pilot Plug (41405 Only) | 2" to 4" | 410 St. St. ASTM A479 TY 410 Hardened | | | |
| | | 6" to 16" | Martensitic St. St. ASTM A487 GR CA6NM CL B with Chrome Plated Guide and Hardfaced Seat | | | |
| 21 | Valve Body Stud | | Alloy Steel ASTM A193 GR B7 | | | |
| 22 | Guide Bushing | | 440C St. St. ASTM A276 TY 440C | | | |
| 23 | Packing Follower | | Solution Annealed 316L St. St. Hrc 22 Maximum | | | |
| - | Internal Diffuser ⁽²⁾ (6" to 24") | | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat | | | |
| 24 | Cage Gasket ⁽³⁾ | | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | | | See Note 3 |
| 30 | Retainer | | 17-4 PH St. St. HI075 | | | |
| 31 | Seal Ring | | See Page 24 | | | |
| 35 | | | | | | |
| 40 | | | | | | |
| 41 | | | | | | |
| 42 | | | | | | |
| 45 | | | | | | |
| 46 | | | | | | |

1. Conical spring only required for valve sizes 6" and larger for applications > 450°F (232°C) and no conical spring available for any High Capacity designs.
2. Internal Diffuser includes an internal 316SS Seat Ring with hardfaced seat. This part replaces the Seat Ring (Ref. No. 13) when this option is selected. See graphic on page 15.
3. Cage gasket only required for valve sizes 6" and larger for applications ≤ 450°F (232°C) and all applications for 2" to 6" ASME 2500 Class ratings only.
4. For sizes 8" and larger, Body with optional Inconel 625 cladding, and Bonnets with optional Inconel cladding or full Inconel 625 material.

Materials of Construction

Models 41X15, 41X25, 41X35, 41X45, 41X55 and 41X95

Models 41XA5, 41XB5 and 41XC5 limited to 575°F for sizes 6" and 8" and limited to 450°F for sizes 10" to 24" High Capacity designs.

Standard Stainless Steel Version⁽¹⁾

| Ref. No | Temperature Range | -320°F (-196°C) | -148°F (-100°C) | -50°F (-46°C) | -20°F (-29°C) | 450°F (232°C) | 650°F (343°C) | 800°F (427°C) | 850°F (454°C) | 950°F (510°C) | 1050°F (566°C) | |
|---------|---|--|-----------------|------------------------------|--------------------------------|--|------------------------|---------------|----------------------------------|---------------|----------------|--|
| | | Standard Materials | | | | | | | | | | |
| 1 | Plug Stem | See Optional Materials | | 316 St. St. ASTM A479 TY 316 | | | See Optional Materials | | | | | |
| 7 18 | Valve Bonnet ⁽²⁾ Valve Body | 316 St. St. ASTM A351 GR CF8M | | | | | | | | | | |
| 13 | Seat Ring | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat | | | | | | | | | | |
| 15 | Valve Plug | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat | | | | | | | | | | |
| 16 | Cage | 316 St. St. ASTM A479 TY 316 Chrome-Plated | | | | | See Optional Materials | | | | | |
| 17 | Conical Spring (6" to 16") ⁽³⁾ | See Optional Materials | | | | Inconel X-750 ASTM B637 + Shot Peening | | | | | | |
| 20 | Auxiliary Pilot Plug (414X5) Only | 316 St. St. ASTM A479 TY 316 with Chrome Plated Guide and Hardfaced Seat | | | | | | | | | | |
| 22 | Guide Bushing | 316 St. St. ASTM A479 TY 316 with Hardfacing Stellite or Equivalent 6 UNS 30006 (HRC 22 Max.) | | | | | | | | | | |
| 21 | Valve Body Stud | | | | ASTM A193 GR B7 – ZINC PLATING | | A 193 Gr B7 | | ASTM A 193 Gr B16 ⁽⁶⁾ | | | |
| | | ASTM A320 GR L7 ZINC PLATING | | | | | | | | | | |
| | | ASTM A 193 GR B8 class 2 (optional for 2" and 3" ASME class 300 and 600 only) | | | | | | | | | | |
| | | ASTM A453 GRADE 660 or ASTM A193 GRADE B8RA ⁽⁴⁾ | | | | | | | | | | |
| 8 | Valve Body Nut | | | | ASTM A194 GR 2H – ZINC PLATING | | A 194 Gr 2H | | | | | |
| | | ASTM A194 GR 7 – ZINC PLATING | | | | | | | | | | |
| | | ASTM A 194 Gr 8 (optional for 2" and 3" ASME class 300 and 600 only) | | | | | | | | | | |
| | | ASTM A 194 Gr 8 ⁽⁴⁾ | | | | | | | | | | |
| 30 | Retainer | 17-4 PH St. St. H1075 Hardfacing Stellite No. 6 on 316 St. St. | | | | | | | | | | |

- Materials for other components are same as listed for Standard Carbon Steel Version.
- Extension bonnet : use a low temperature extension bonnet between -46°C and -100°C. Use a cryogenic bonnet between -101°C and 196°C.
- Conical spring only required for valve sizes 6" and larger for applications > 450°F (232°C).
- Bolting must be checked by the Engineering Department.
- See Optional Bolting Materials Table for temperatures >510°C.

Optional Configurations and Materials

| Ref. No. | Temperature Range | -320°F (-196°C) | -100°F (-73°C) | -50°F (-46°C) | -20°F (-29°C) | 650°F (343°C) | 800°F (427°C) | 1050°F (566°C) | |
|----------|-------------------|--|---|---|---|---|---------------|----------------|--|
| | | Optional Materials | | | | | | | |
| 1 | Plug Stem | A286 Super Alloy ASTM A638 GR 660 | | | | | | | |
| 6 | Packing | Teflon V-Ring For use with Cryogenic bonnet | Carbon Core Braided PTFE (ASME Class 150-900) PTFE/Carbon + Braided Graphite End Rings (ASME Class 1500-2500) For use with extended length bonnet | Carbon Core Braided PTFE (ASME Class 150-900) PTFE/Carbon + Braided Graphite End Rings (ASME Class 1500-2500) For use with standard length bonnet | Carbon Core Braided PTFE (ASME Class 150-900) PTFE/Carbon + Braided Graphite End Rings (ASME Class 1500-2500) For use with extended length bonnet | Low-E Packing ⁽¹⁾ For use with standard length bonnet | | | |
| | | | | | | Flexible Graphite / For use with standard length bonnet. | | | |
| | | | | | | | | | |
| 7 | Valve Bonnet | Chrome-Moly Steel ASTM A217 Grade WC6 or Grade WC9 | | | | | | | |
| 18 | Valve Body | Carbon Steel ASTM A 352 Grade LCC | | | | | | | |
| 13 | Seat Ring | 2" to 4" | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat | | | | | | |
| | | 6" to 16" | Martensitic St. St. ASTM A487 GR CA6NM CL A with Hardfaced Seat | | | | | | |
| 15 | Valve Plug | Martensitic St. St. ASTM A487 GR CA6NM CL B Nitride | | | | | | | |
| 16 | Cage | Martensitic St. St. ASTM A487 GR CA6NM CL B Nitrided | | | | | | | |
| | | 316 St. St. ASTM A479 TY 316 Nitrided | | | | | | | |

1. Low Emissions packing options and application guidelines are available in Tech Spec titled Masoneilan Low-E Packing Series, Ref. 32991.

Materials of Construction

Optional Bolting Materials

| Ref. No. | Temperature Range | -320°F to -150°F (-196°C to -101°C) | -150°F to -20°F (-101°C to -29°C) | 850°F to 950°F (454°C to 510°C) | 950°F to 1050°F (510°C to 566°C) |
|----------|--|--|--------------------------------------|------------------------------------|-------------------------------------|
| | Description | Optional Materials | | | |
| 8 | Valve Body Nut ^(1 & 2) | 304 SS ASTM A194 Grade 8 | Alloy Steel ASTM A194 Grade 4 | Alloy Steel ASTM A194 Grade 8 | 304 SS ASTM A194 Grade 8 |
| 21 | Valve Body Stud ^(1 & 2) | Super Alloy ASTM A453 Grade 660 | Alloy Steel ASTM A320 Grade L7 | Alloy Steel ASTM A193 Grade B16 | Super Alloy ASTM A453 Grade 660 |

- Use following materials for 2" and 3" sizes ASME Class 300/600 at temperatures below -20°F (-29°C).
Studs - 304 SS ASTM A193 Grade B8 Class 2 • Nuts - 304 SS ASTM A194 Grade 8.
- For high temperature use the following materials:
Studs- ASTM A193 GRADE B8RA (for NACE) • Nuts-ASTM A 194 Gr 2HM (for NACE)
Studs-ASTM B637 N07718 INCONEL 718 • Nuts- ASTM A 194 Gr 8.

Additional Material Options:

The 41005 Series is also available in the following body materials with appropriate trim and bolting options.

| | | |
|------------------------------|---------------|-----------------|
| A351 Grade CF3M | A995 Grade 4A | A217 Grade C5 |
| A351 Grade CF8C | A995 Grade 6A | A217 Grade C12A |
| Monel ASTM A 484 Grade M35-1 | | |

Products in these materials can be fully configured in ValvStream.
Consult Baker Hughes for appropriate material combinations.

Materials of Construction

NACE⁽¹⁾ Configuration and Material Options

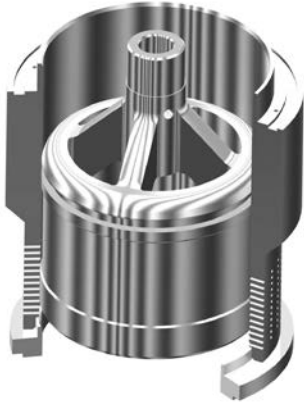
Models 41X15, 41X25, 41X35, 41X45, 41X55 and 41X95

Model 41XA5, 41XB5 and 41XC5 limited to 575°F for sizes 6" and 8" and limited to 450°F for sizes 10" and larger High Capacity designs

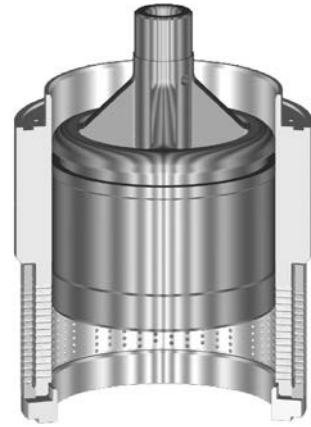
| Ref. No | Temperature Range | | -20°F (-29°C) | 800°F (427°C) |
|---------|---|-----------|--|------------------|
| | Description | | Standard and Optional Materials | |
| 1 | Plug Stem | | 316 St. St. ASTM A479 TY 316 (HRC 22 Max.) Super Alloy ASTM A638 GR 660 (HRC 35 Max.) | |
| 2 | Packing Flange Stud | | 304 St. St. ASTM A193 GR B8 ⁽²⁾ 304 St. St. ASTM A193 Gr B8 ⁽³⁾ (HRC 22 Max.) | |
| 3 | Packing Flange Nut | | 304 St. St. ASTM A194 GR 8 ⁽²⁾ 304 St. St. ASTM A194 GR 8A ⁽³⁾ (HRC 22 Max.) | |
| 4 | Packing Flange | | Corrosion Protected Carbon Steel (HRC 22 Max.) | |
| 5 | Packing Spacer | | 304 St. St. ASTM A479 TY 304 | |
| 6 | Packing | | Carbon Core Braided PTFE (ASME Class 150-900) PTFE/Carbon + Braided Graphite End Rings (ASME Class 1500-2500) For use with standard length bonnet | |
| 7 | Valve Bonnet ⁽⁶⁾ | | Carbon Steel ASTM A216 Grade WCC (HRC 22 Max.) Carbon Steel ASTM A105 (HRC 22 Max.) 316 St. St. ASTM A351 Gr CF8M (HRC 22 Max.) | |
| 8 | Valve Body Nut | | Alloy Steel ASTM A194 GR 2H ⁽²⁾ Alloy Steel ASTM A194 Gr 2HM ⁽³⁾ | |
| 9 | Plug Stem Pin | | 316 St. St. ASTM A479 TY 316 (HRC 22 Max.) | |
| 10 | Valve Body Gasket | | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | |
| 12 | Pilot pring(s) (41405 Only) | 2" to 4" | Inconel X-750 AMS 5598 (HRC 50 Max.) | |
| | | 6" to 16" | Inconel X-750 ASTM B637 GR 688 (HRC 50 Max.) | |
| 13 | Seat Ring | | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat (HRC 22 Max.) | |
| 14 | Seat Ring Gasket | | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | |
| 15 | Valve Plug | | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat (HRC 22 Max.) Martensitic St. St. ASTM A487 GR CA6NM CL B (HRC 22 Max.) | |
| 16 | Cage | | 316 St. St. ASTM A479 TY 316 Hard Chrome Plated (HRC 22 Max.) Martensitic St. St. ASTM A487 GR CA6NM CL B Hard Chrome Plated (HRC 23 Max.) | |
| 17 | Conical Spring ⁽¹⁾ (6" to 24") | | Inconel X-750 ASTM B637 + Shot Peening | |
| 18 | Valve Body ⁽⁶⁾ | | Carbon Steel ASTM A216 Grade WCC (HRC 22 Max.) 316 St. St. ASTM A351 Gr CF8M (HRC 22 Max.) | |
| 19 | Retaining Ring (41405 Only) | | Inconel X-750 AMS 5598 (HRC 50 Max.) | |
| 20 | Auxiliary Pilot Plug (41405 Only) | | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat (HRC 22 Max.) Martensitic St. St. ASTM A487 GR CA6NM CL B Chrome Plated Guide and Hardfaced Seat (HRC 23 Max.) | |
| 21 | Valve Body Stud | | Alloy Steel ASTM A193 GR B7 ⁽²⁾ Alloy Steel ASTM A193 Gr B7M ⁽³⁾ | |
| 22 | Guide Bushing | | Stelliteor Equivalent 6 UNS 30006 (HRC 22 Max.) 316 St. St. ASTM A479 TY 316 with Hardfacing (HRC 22 Max.) | |
| 23 | Packing Follower | | 316 St. St. ASTM A479 TY 316 (HRC 22 Max.) | |
| - | Internal Diffuser ⁽²⁾ (6" to 24") (not shown) | | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat (HRC 22 Max.) | |
| 24 | Cage Gasket ⁽³⁾ | | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | |
| 30 | Retainer | | CA6NM ASTM 487 Gr CA 6 NM Class B Hardfacing Stellite No. 6 on 316 St. St. | |
| 31 | Seal Ring | | See Page 24 and 25 | |
| 35 | | | | |
| 40 | | | | |
| 41 | | | | |
| 42 | | | | |
| 45 | | | | |
| 46 | Drive Nut (not shown) | | Carbon Steel SAE 1117 ⁽²⁾ Carbon Steel ASTM A105 or SAE 1010-1025 ⁽³⁾ | |

- Standard materials and processes are in accordance with the requirements of NACE specification MR0103. Applications requiring compliance to MR0175-2003 or ISO15156 must be reviewed by Masonellan.
- Materials designated for these parts conform to NACE Class III bolting requirements. (Non-Exposed)
- Materials designated for these parts conform to NACE Class I or Class II bolting requirements. (Exposed)
- Cage gasket only required for valve sizes 6" and larger for applications ≤ 450°F (232°C) and all applications for 2" to 6" ASME 2500 Class ratings only.
- Seal ring materials for Model 41605 (PTFE Seal Ring) will be replaced with Glass-Reinforced PTFE External Seal Ring (Ref. No. 40) and Viton Internal Seal Ring (Ref. No. 41). Maximum temperature for Models 41305 and 41605 limited to 450°F (232°C).
- For sizes 8" and larger, Body with optional Inconel 625 cladding, and Bonnets with optional Inconel cladding or full Inconel 625 material.

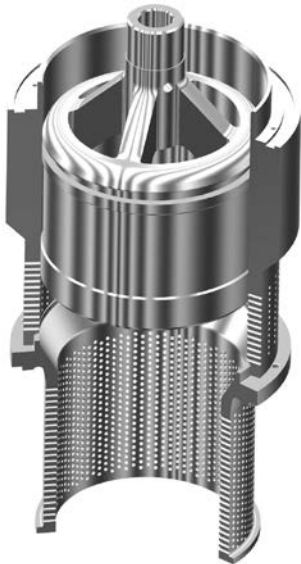
Trim Types



Models 41335 - 41535 - 41635 - 41735 - 41935
413C5 - 415C5 - 416C5 - 419C5
 Single Stage Low Noise Trim FTO
 Anti-Cavitation Trim FTC



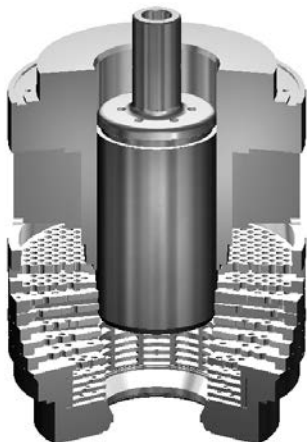
Models 41355 - 41555 - 41655 - 41755 - 41955
 Multi-Stage Low Noise Trim FTO



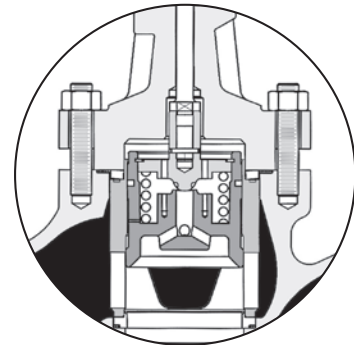
Model 41045
 Single Stage with Internal Diffuser
 (Sizes 6" - 24")



Models 41395 - 41595 - 41695 - 41795 - 41995
 Multi-Stage Anti-Cavitation Trim FTC



Model 41365 - 41375
 High Pressure Anti-Cavitation VRT



Model 41405
 Pilot Balanced Construction FTC

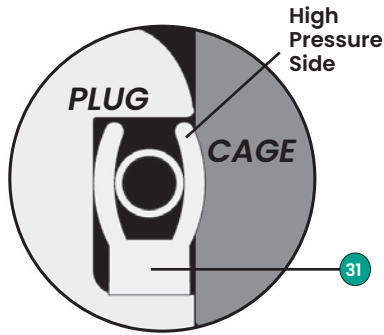
Seal Ring Construction

Model 41305

Seal Type:
Pressure Energized
Polymeric

Leakage:
Class IV Standard
(Class V Optional)

Temperature:
-148°F (-100°C) to
+450°F (+232°C)



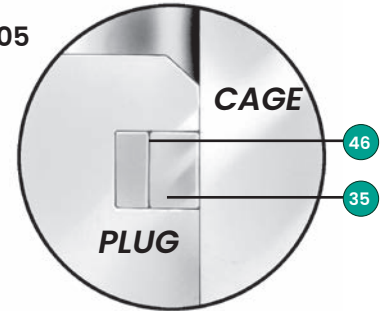
Seal Shown in FTO Orientation

Models 41405 and 41505

Seal Type:
Metal

Leakage:
From Class II to
Class V (with pilot)

Temperature:
-320°F (-196°C) to
+1099°F (+592°C)



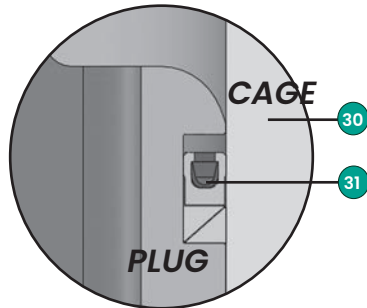
Model 41305^(1 & 2)

Optional High
Temperature Version
(non VRT)

Seal Type:
Pressure Energized
Polymeric

Leakage:
Class IV Standard
(Class V Optional)

Temperature:
-148°F (-100°C) to
+575°F (+302°C)

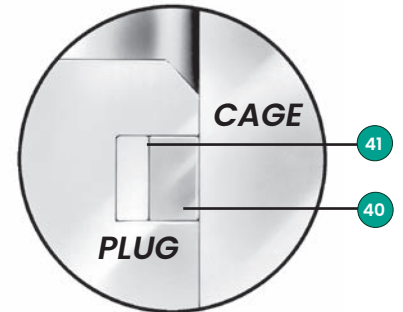


Model 41605

Seal Type:
TFE and Resilient Inner

Leakage:
Class IV Standard

Temperature:
-20°F (-29°C) to
+300°F (+149°C)

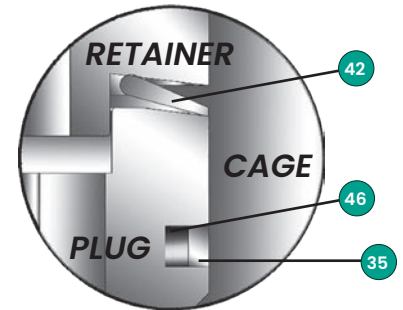


Model 41705

Seal Type:
Metal

Leakage:
Class V

Temperature: (FTO)
-20°F (-29 C) to
+850°F (+454°C)

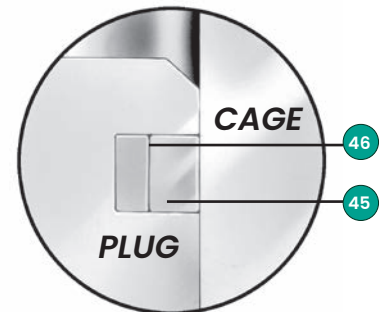


Model 41905

Seal Type:
Graphite and Metal Inner

Leakage:
Class III and
Class IV Standard

Temperature:
-320°F (-196°C) to
+850°F (+454°C)



1. Optional high temperature seal for 41305 non-VRT applications.
2. FTO and FTC capable.
3. For all plug seal ring types, 3" and 4" sizes are limited to 800°F (427°C).

Seal Ring Construction

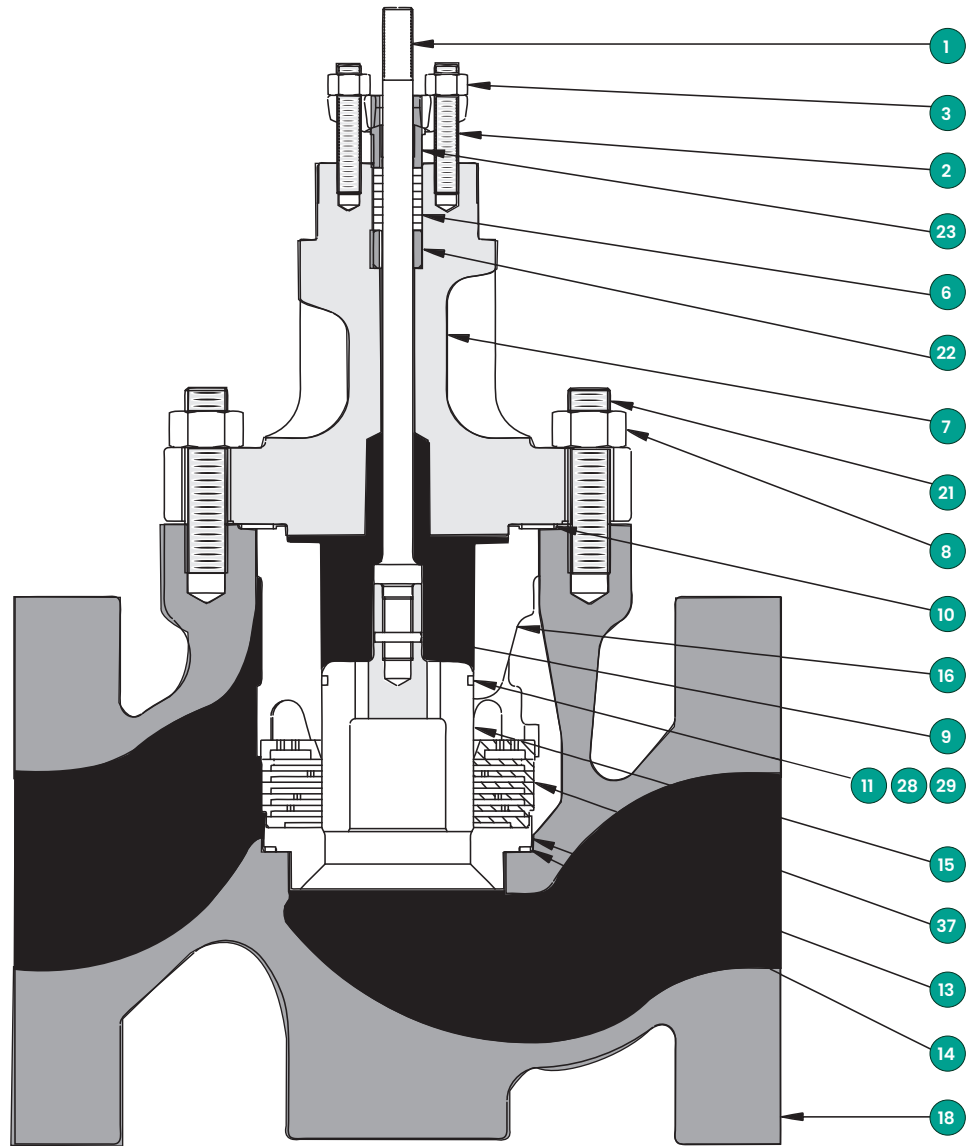
| Ref. No. | Temperature Range | -320°F (-196°C) -148°F (-100°C) -20°F (-29°C) 300°F (+149°C) 450°F (+232°C) 575°F (+302°C) 650°F (+343°C) 850°F (+454°C) 1099°F (+593°C) | | | | | | | | | |
|----------|--------------------|--|-----------|--|--|--|--|------------------------------|--|--|--|
| | | Description | Materials | | | | | | | | |
| 31 | Seal Ring | PTFE + 25% Graphite and ELGILOY Spring | | | | | | | | | |
| | Seal Ring | | | | | | | Fluoroloy A21 ⁽³⁾ | | | |
| 35 | External Seal Ring | NiResist ASTM A439 Type D3 | | | | | | Nitrided CA6NM | | | |
| 40 | External Seal Ring | Bronze PTFE | | | | | | | | | |
| | | Glass Reinforced PTFE ⁽¹⁾ | | | | | | | | | |
| 41 | Internal Seal Ring | Nordel | | | | | | | | | |
| | | Viton ^(1 & 2) | | | | | | | | | |
| 42 | High Temp. Seal | Surface Hardened Inconel 718 | | | | | | | | | |
| 45 | External Seal Ring | Graphite | | | | | | | | | |
| 46 | Internal Seal Ring | NiResist ASTM A439 Type D3 | | | | | | | | | |

1. Optional materials for NACE service. Viton not recommended for water or steam service.
2. Viton is recommended for oil and hydrocarbon service.
3. Optional high temperature seal for 41365 and 41375 VRT.
4. For all plug seal ring types, 3" and 4" sizes are limited to 800°F (427°C).

Materials of Construction

Models 41365 and 41375 VRT

| Ref. No | Part Name |
|---------|--------------------------------|
| 1 | Plug Stem |
| 2 | Packing Flange Stud |
| 3 | Packing Flange Nut |
| 4 | Packing Flange |
| 5 | Packing Spacer |
| • 6 | Packing |
| 7 | Valve Bonnet |
| 8 | Valve Body Nut |
| 9 | Plug Stem Pin |
| • 10 | Valve Body Gasket |
| • 11 | Seal Ring |
| 13 | Seat Ring |
| • 14 | Seat Ring Gasket |
| 15 | Valve Plug |
| 16 | Cage |
| 18 | Valve Body |
| 21 | Valve Body Stud |
| 22 | Guide Bushing |
| 23 | Packing Follower |
| • 24 | Cage Gasket |
| 28 | Retaining Ring |
| 29 | Retaining Ring |
| 37 | Stack |
| • | Recommended Spare Parts |



Materials of Construction

Models 41365 and 41375 VRT
Standard Carbon Steel Version

| Ref. No | Temperature Range | -20°F (-29°C) | | 450°F (232°C) | | 600°F (316°C) | | |
|---------|-----------------------------|--|---|--------------------|--|------------------------------|--|--|
| | | Description | | Standard Materials | | | | |
| 1 | Plug Stem | 174 PH St. St. ASTM A564 GR 630 | | | | | | |
| 2 | Packing Flange Stud | 304 St. St. ASTM A193 GR B8 | | | | | | |
| 3 | Packing Flange Nut | 304 St. St. ASTM A194 GR 8 | | | | | | |
| 4 | Packing Flange | Carbon Steel ASTM A105 Zinc Plated | | | | | | |
| 5 | Packing Spacer | 303 St. St. ASTM A582 TY 303 | | | | | | |
| 6 | Packing | Carbon Core Braided PTFE (ASME Class 150-900) PTFE/Carbon + Braided Graphite End Rings (ASME Class 1500-2500) For use with standard length bonnet | | | | | | |
| 7 | Valve Bonnet ⁽²⁾ | Carbon Steel ASTM A216 Grade WCC | | | | | | |
| 8 | Valve Body Nut | Carbon Steel ASTM A194 GR 2H | | | | | | |
| 9 | Plug Stem Pin | 316 St. St. ASTM A479 TY 316 | | | | | | |
| 10 | Valve Body Gasket | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | | | | | | |
| 11 | Seal Ring | Standard | PTFE + Graphite (25%) with ELGILOY Spring | | | | | |
| | | Optional | | | | Fluoroloy A21 | | |
| 13 | Seat Ring | 410 St. St. ASTM A479 TY 410 Hardened | | | | | | |
| 14 | Seat Ring Gasket | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | | | | | | |
| 15 | Valve Plug | 3" to 6" | 440C St. St. ASTM A276 TY 440C | | | | | |
| | | 8" and 10" | 17-4 PH St. St. ASTM A747 Gr CB7CU-1 Condition H900 | | | | | |
| 16 | Cage | Martensitic St. St. ASTM A487 GR CA6NM CL B Hard Chrome Plated | | | | | | |
| 18 | Valve Body ⁽²⁾ | Carbon Steel ASTM A216 Grade WCC | | | | | | |
| 21 | Valve Body Stud | Alloy Steel ASTM A193 GR B7 | | | | | | |
| 22 | Guide Bushing | 440C St. St. ASTM A276 TY 440C | | | | | | |
| 23 | Packing Follower | 303 St. St. ASTM A582 TY 303 | | | | | | |
| 24 | Cage Gasket ⁽¹⁾ | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | | | | | | |
| 28 | Retaining Ring | | | | | ASTM A564 Gr 632 H950 St. St | | |
| 29 | Retaining Ring | | | | | 316 St. St. ASTM A479 TY 316 | | |
| 30 | Retaining Ring | Hardfacing Stellite No.6 on 316 Stainless Steel ASTM A487 Gr CA 6 NM Class B 17-4 PH Stainless Steel H1075 ASTM A479 UNS S31803 + Chrome Plating ASTM A479 UNS S31803 + Hardfacing | | | | | | |
| 37 | Stack | Inconel 718 | | | | | | |

1. Cage gasket only required for valve sizes 6" and larger for applications ≤ 450°F (232°C) and all applications for 2" to 6" ASME 2500 Class ratings only.
2. For sizes 8" and larger, Body with optional Inconel 625 cladding, and Bonnets with optional Inconel cladding or full Inconel 625 material.

Materials of Construction

Models 41365 and 41375 VRT
Standard Stainless Steel Version

| Ref. No | Temperature Range | -20°F (-29°C) | 450°F (232°C) |
|---------|--------------------------|---|------------------|
| | Description | Standard Materials | |
| 1 | Plug Stem | A286 Super Alloy ASTM A638 GR 660 | |
| 2 | Packing Flange Stud | 304 St. St. ASTM A193 GR B8 | |
| 3 | Packing Flange Nut | 304 St. St. ASTM A194 GR 8 | |
| 4 | Packing Flange | Carbon Steel ASTM A105 Zinc Plated | |
| 5 | Packing Spacer | 303 St. St. ASTM A582 TY 303 | |
| 6 | Packing | Carbon Core Braided PTFE (ASME Class 150-900) PTFE/Carbon + Braided Graphite End Rings (ASME Class 1500-2500) For use with standard length bonnet | |
| 7 | Valve Bonnet | 316 St. St. ASTM A351 GR CF8M | |
| 8 | Valve Body Nut | Carbon Steel ASTM A194 GR 2H | |
| 9 | Plug Stem Pin | 316 St. St. ASTM A479 TY 316 | |
| 10 | Valve Body Gasket | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | |
| 11 | Seal Ring | PTFE + Graphite (25%) with ELGILOY Spring | |
| 13 | Seat Ring | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat | |
| 14 | Seat Ring Gasket | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | |
| 15 | Valve Plug | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat | |
| 16 | Cage | 316 St. St. ASTM A479 TY 316 Chrome-Plated | |
| 18 | Valve Body | 316 St. St. ASTM A351 GR CF8M | |
| 21 | Valve Body Stud | Alloy Steel ASTM A193 GR B7 | |
| 22 | Guide Bushing | 316 St. St. ASTM A479 TY 316 with Hardfacing | |
| 23 | Packing Follower | 303 St. St. ASTM A582 TY 303 | |
| 24 | Cage Gasket ³ | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | |
| 28 | Retaining Ring | ASTM A564 Gr 632 H950 St. St. | |
| 29 | Retaining Ring | 316 St. St. ASTM A479 TY 316 | |
| 37 | Stack | Inconel 718 | |

Note: Materials for other components are as listed for Standard Carbon Steel Version.

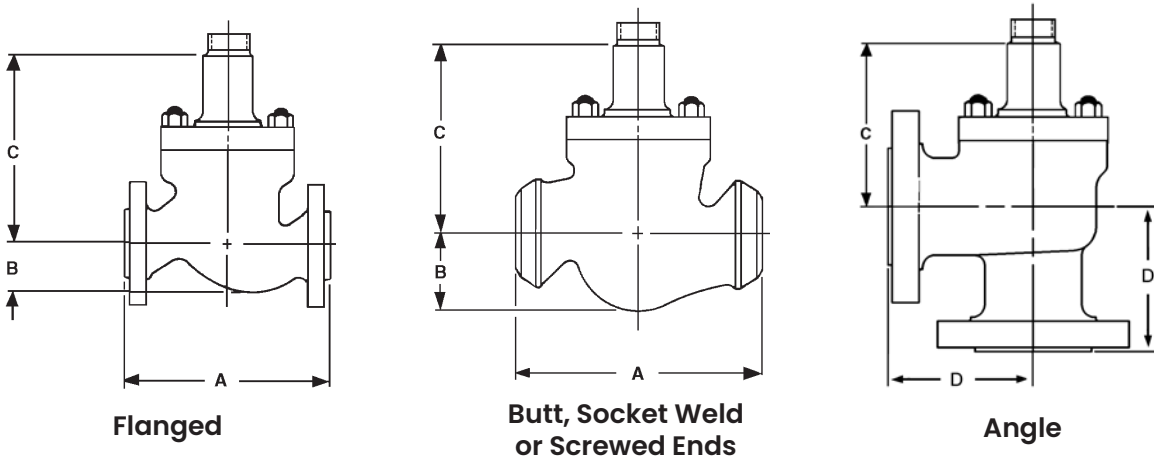
Materials of Construction

NACE⁽¹⁾ Configuration and Material Options
Models 41365 and 41375 VRT

| Ref. No | Temperature Range | | -20°F (-29°C) | 450°F (232°C) | 600°F (316°C) |
|---------|-----------------------------|----------|---|------------------|------------------------------|
| | Description | | Standard Materials | | |
| 1 | Plug Stem | | A286 Super Alloy ASTM A638 GR 660 | | |
| 2 | Packing Flange Stud | | 304 St. St. ASTM A193 GR B8 ⁽²⁾ 304 St. St. ASTM A193 GR B8 ⁽³⁾ (HRC 22 Max.) | | |
| 3 | Packing Flange Nut | | 304 St. St. ASTM A194 GR 8 ⁽²⁾ 304 St. St. ASTM A194 GR 8A ⁽³⁾ (HRC 22 Max.) | | |
| 4 | Packing Flange | | Corrosion Protected Carbon Steel (HRC 22 Max.) | | |
| 5 | Packing Spacer | | 304 St. St. ASTM A479 TY 304 | | |
| 6 | Packing | | Carbon Core Braided PTFE (ASME Class 150-900) PTFE/Carbon + Braided Graphite End Rings (ASME Class 1500-2500) For use with standard length bonnet | | |
| 7 | Valve Bonnet ⁽⁵⁾ | | Carbon Steel ASTM A216 Grade WCC (NRC 22 Max.) | | |
| | | | 316 St. St. ASTM A351 Gr CF8M (HRC 22 Max.) | | |
| 8 | Valve Body Nut | | Carbon Steel ASTM A194 GR 2H ⁽²⁾ Carbon Steel ASTM A194 GR 2HM ⁽³⁾ | | |
| 9 | Plug Stem Pin | | 316 St. St. ASTM A479 TY 316 (HRC 22 Max.) | | |
| 10 | Valve Body Gasket | | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | | |
| 11 | Seal Ring | Standard | PTFE + Graphite (25%) with ELGILOY Spring | | |
| | | Optional | | | Fluoroloy A21 |
| 13 | Seat Ring | | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat (HRC 22 Max.) | | |
| 14 | Seat Ring Gasket | | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | | |
| 15 | Valve Plug | | 316 St. St. ASTM A479 TY 316 with Hardfaced Seat (HRC 22 Max.) | | |
| 16 | Cage | | Martensitic St. St. ASTM A487 GR CA6NM CL B Hard Chrome Plated | | |
| 18 | Valve Body ⁽⁵⁾ | | Carbon Steel ASTM A216 Grade WCC (NRC 22 Max.) | | |
| | | | 316 St. St. ASTM A351 Gr CF8M (HRC 22 Max.) | | |
| 21 | Valve Body Stud | | Alloy Steel ASTM A193 GR B7 ⁽²⁾ Alloy Steel ASTM A 193 GRADE B7M | | |
| 22 | Guide Bushing | | 316 St. St. ASTM A479 TY 316 with Hardfacing | | |
| 23 | Packing Follower | | 316 St. St. ASTM A479 TY 316 (HRC 22 Max.) | | |
| 24 | Cage Gasket ⁽⁴⁾ | | 316L St. St. w/Flexible Graphite Filler (Spiral Wound) | | |
| 28 | Retaining Ring | | | | ASTM A564 Gr 632 H950 St. St |
| 29 | Retaining Ring | | | | 316 St. St. ASTM A479 TY 316 |
| 37 | Stack | | Inconel 718 ASTM B637 Solution Annealed and Precipitation Hardened | | |

- Standard materials and processes are in accordance with the requirements of NACE specification MR0103. Applications requiring compliance to MR0175-2003 or ISO15156 must be reviewed by Baker Hughes.
- Materials designated for these parts conform to NACE Class III bolting requirements. (Non-Exposed).
- Materials designated for these parts conform to NACE Class I or Class II bolting requirements. (Exposed).
- Cage gasket only required for valve sizes 6" and larger for applications ≤ 450°F (232°C) and all applications for 2" to 6" ASME 2500 Class ratings only.
- For sizes 8" and larger, Body with optional Inconel 625 cladding, and Bonnets with optional Inconel cladding or full Inconel 625 material.

Dimensions (inches)



| Pressure Class | | A | | | | | | | | | | |
|----------------|---------|----------------------------------|-------|----------------------------------|-------|-------|----------------------------------|-------|-------|----------------------------------|----------------------|----------------------|
| | | ASME Class 150 and equivalent PN | | ASME Class 300 and equivalent PN | | | ASME Class 600 and equivalent PN | | | ASME Class 900 and equivalent PN | | |
| Valve Size | | RF | RTJ | BW & SW | RF | RTJ | BW & SW | RF | RTJ | BW & SW | RF | RTJ |
| in. | mm | | | | | | | | | | | |
| 2 | 50 | 10.00 | 10.50 | 11.26 | 10.50 | 11.12 | 11.26 | 11.24 | 11.38 | 14.76 | 14.74 | 14.88 |
| 3 | 80 | 11.75 | 12.25 | 13.27 | 12.50 | 13.12 | 13.27 | 13.25 | 13.37 | 18.11 ⁽¹⁾ | 17.38 ⁽¹⁾ | 17.48 ⁽¹⁾ |
| 4 | 100 | 13.86 | 14.33 | 15.51 | 14.50 | 15.12 | 15.51 | 15.50 | 15.62 | 20.87 ⁽¹⁾ | 20.12 ⁽¹⁾ | 20.24 ⁽¹⁾ |
| 6 | 150 | 17.75 | 18.27 | 20 | 18.64 | 19.25 | 20 | 20 | 20.12 | 30.24 | 28.12 | 28.24 |
| 6x3 | 150x80 | | | | | | | | | | | |
| 6x4 | 150x100 | | | | | | | | | | | |
| 8 | 200 | 21.38 | 21.87 | 24.02 | 22.38 | 22.99 | 24.02 | 24 | 24.13 | 32.76 | 36.00 | 36.00 |
| 8x4 | 200x100 | | | | | | | | | | | |
| 8x6 | 200x150 | | | | | | | | | | | |
| 10 | 250 | 26.50 | 27.00 | 29.61 | 27.88 | 28.50 | 29.61 | 29.62 | 29.72 | 39.02 | 43.00 | 43.12 |
| 10x6 | 250x150 | | | | | | | | | | | |
| 10x8 | 250x200 | | | | | | | | | | | |
| 12 | 300 | 29.02 | 29.53 | 32.24 | 30.51 | 31.14 | 32.24 | 32.25 | 32.36 | 44.49 | 44.49 | 44.61 |
| 12x8 | 300x200 | | | | | | | | | | | |
| 14 | 350 | 35 | 35.5 | 38.25 | 36.50 | 37.13 | 38.25 | 38.25 | 38.39 | 49.88 | 49.5 | 49.88 |
| 16 | 400 | 40.00 | 40.51 | 43.62 | 41.61 | 42.25 | 43.62 ⁽¹⁾ | 43.62 | 43.74 | 55.98 ⁽¹⁾ | 54.72 ⁽¹⁾ | 55.08 ⁽¹⁾ |
| 18 | 450 | 44.76 | 45.08 | 48.82 | 46.85 | 47.32 | 48.82 ⁽³⁾ | 51.50 | 51.97 | 64.72 | 58.03 | 58.50 |
| 20 | 500 | 65.43 | 65.91 | 71.14 | 67.09 | 67.80 | 74.41 | 69.57 | 69.80 | 84.72 | 71.06 | 71.57 |
| 24 | 600 | 78.70 | 79.21 | 86.22 | 80.94 | 81.81 | 94.33 | 83.46 | 83.86 | - | - | - |
| 32x30 | 800 | 1090 | - | - | 1090 | - | - | - | - | - | - | - |

1. Consult Baker Hughes.
2. Ex. 3x2 size = valve with 3" body x standard 2" trim.
3. Applies to Schedule 40 only. Schedule 80 Face to Face is 58.27 in.

Note: Values for B and C are shown as maximum and may vary with valve body and bonnet attributes. Certified drawings will provide specific dimensions.

Dimensions (inches)

| Pressure Class | | A | | | A | | | B max | | | | | C max | | | | |
|-------------------------|----------------------|-----------------------------------|-------|-------|-----------------------------------|-------|-------|----------------|----------|----------|-----------|-----------|----------------|----------|----------|-----------|-----------|
| | | ASME Class 1500 and equivalent PN | | | ASME Class 2500 and equivalent PN | | | ASME 150 / 300 | ASME 600 | ASME 900 | ASME 1500 | ASME 2500 | ASME 150 / 300 | ASME 600 | ASME 900 | ASME 1500 | ASME 2500 |
| Valve Size | | BW & SW | RF | RTJ | BW & SW | RF | RTJ | | | | | | | | | | |
| in. | mm | | | | | | | | | | | | | | | | |
| 2 | 50 | 14.76 | 14.74 | 14.88 | 15.75 | 17.17 | 17.24 | 3.70 | 3.70 | 2.24 | 2.24 | 5.12 | 9.84 | 9.84 | 8.50 | 8.50 | 10.31 |
| 3 | 80 | 18.11 | 18.13 | 18.23 | 19.61 | 19.13 | 19.33 | 4.49 | 4.49 | 5.63 | 5.63 | 6.89 | 11.81 | 11.81 | 11.81 | 11.81 | 14.06 |
| 3x2 | 80x50 ⁽²⁾ | (i) | (i) | (i) | (i) | (i) | (i) | 4.57 | 4.57 | 5.63 | 5.63 | (i) | 9.88 | 9.88 | 10.39 | 10.39 | (i) |
| 4 | 100 | 20.87 | 20.88 | 21.00 | 22.64 | 23.66 | 23.98 | 5.51 | 5.51 | 6.26 | 6.26 | 7.87 | 12.99 | 12.99 | 12.99 | 12.99 | 14.76 |
| 4x2 | 100x50 | (i) | (i) | (i) | (i) | (i) | (i) | 5.51 | 5.51 | 6.06 | 6.06 | (i) | 10.28 | 10.28 | 10.08 | 10.08 | (i) |
| 4x3 | 100x80 | 20.87 | 20.88 | 21.00 | (i) | (i) | (i) | 5.51 | 5.51 | 6.26 | 6.26 | (i) | 12.68 | 12.68 | 12.68 | 12.68 | (i) |
| 6 | 150 | 30.24 | 30.24 | 30.47 | 32.24 | 29.33 | 29.45 | 7.80 | 7.80 | 8.54 | 8.54 | 10.35 | 15.35 | 15.35 | 15.35 | 15.35 | 15.39 |
| 6x3 | 150x80 | 30.24 | 30.24 | 30.47 | (i) | (i) | (i) | 7.48 | 7.48 | 6.30 | 6.30 | (i) | 12.68 | 12.68 | 12.60 | 12.60 | (i) |
| 6x4 | 150x100 | 30.24 | 30.24 | 30.47 | (i) | (i) | (i) | 7.48 | 7.48 | 6.30 | 6.30 | (i) | 13.46 | 13.46 | 13.27 | 13.27 | (i) |
| 8 | 200 | 32.76 | 38.25 | 38.62 | 40.51 | 35.12 | 35.67 | 7.32 | 7.52 | 7.52 | 8.07 | 11.81 | 19.53 | 19.53 | 20.51 | 20.51 | 17.72 |
| 8x4 | 200x100 | 32.76 | 38.25 | 38.62 | (i) | (i) | (i) | 8.74 | 8.74 | 6.69 | 6.69 | (i) | 14.41 | 14.41 | 12.99 | 12.99 | (i) |
| 8x6 | 200x150 | 32.76 | 38.25 | 38.62 | (i) | (i) | (i) | 8.74 | 8.74 | 6.77 | 6.77 | (i) | 17.05 | 17.05 | 15.35 | 15.35 | (i) |
| 10 | 250 | 39.02 | 46.00 | 46.38 | 50.00 | 42.72 | 43.54 | 8.66 | 8.98 | 9.06 | 9.61 | 14.25 | 21.65 | 21.65 | 22.44 | 22.44 | 24.21 |
| 10x6 | 250x150 | | | | (i) | (i) | (i) | 9.13 | 9.13 | 9.09 | 9.09 | (i) | 18.46 | 18.46 | 15.35 | 15.35 | (i) |
| 10x8 | 250x200 | | | | (i) | (i) | (i) | 9.13 | 9.13 | 8.58 | 8.74 | (i) | 19.65 | 19.65 | 20.51 | 20.51 | (i) |
| 12 | 300 | 44.49 | 47.95 | 48.58 | 55.98 | 46.93 | 47.76 | 12.80 | 13.19 | 13.58 | 14.17 | 16.30 | 24.41 | 24.41 | 24.65 | 24.65 | 24.90 |
| 12x8 | 300x200 | (i) | (i) | (i) | (i) | (i) | (i) | 9.53 | 9.53 | 9.84 | 9.84 | (i) | 19.53 | 19.53 | 20.51 | 20.51 | (i) |
| 14 | 350 | 54.92 | 49.50 | 50.25 | - | - | - | 17.32 | 17.32 | 18.50 | 18.50 | - | 26.10 | 26.10 | 27.48 | 31.85 | - |
| 16 | 400 | 55.98 | 59.37 | 60.24 | 72.44 | - | - | 17.32 | 17.72 | 18.11 | 19.09 | 17.36 | 27.32 | 27.32 | 31.69 | 31.69 | 27.52 |
| 16x12 | 400x300 | (i) | (i) | (i) | (i) | - | - | 17.72 | 17.72 | 17.83 | 18.78 | (i) | 25.59 | 25.59 | 27.40 | 27.40 | (i) |
| 18 | 450 | 72.05 | 61.34 | 61.81 | - | - | - | 20.43 | 20.91 | 20.91 | 21.97 | - | 33.62 | 33.62 | 39.13 | 42.09 | - |
| 20 | 500 | - | - | - | - | - | - | 26.34 | 26.77 | 27.24 | - | - | 34.13 | 35.59 | 37.40 | - | - |
| 24 ^(3&4) | 600 | - | - | - | - | - | - | 31.65 | 32.28 | - | - | - | 40.00 | 41.18 | - | - | - |
| | | | | | | | | 31.65 | 32.28 | | | | 47.99 | 49.17 | | | |

1. Consult Baker Hughes.
2. Ex. 80x50 size = valve with 80mm body x standard 50mm trim.
3. 11" Nominal stroke length.
4. 15" Nominal stroke length.

Note: Values for B and C are shown as maximum and may vary with valve body and bonnet attributes. Certified drawings will provide specific dimensions.

Dimensions (inches)

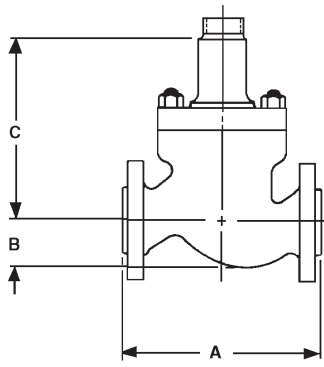
Angle Body S/A (inches)

| Pressure Class | | D | | | | | | | | | | | | | | |
|----------------|-----|----------------------------------|------|------|----------------------------------|------|------|----------------------------------|-------|-------|----------------------------------|-------|-------|-----------------------------------|-------|-------|
| | | ASME Class 150 and equivalent PN | | | ASME Class 300 and equivalent PN | | | ASME Class 600 and equivalent PN | | | ASME Class 900 and equivalent PN | | | ASME Class 1500 and equivalent PN | | |
| Valve Size | | BW | RF | RTJ | BW | RF | RTJ | BW | RF | RTJ | BW | RF | RTJ | BW | RF | RTJ |
| in. | mm | | | | | | | | | | | | | | | |
| 2 | 50 | 7.44 | 5.15 | 5.38 | 7.44 | 5.27 | 5.58 | 7.44 | 5.78 | 5.84 | 8.66 | 7.27 | 7.35 | 8.66 | 7.27 | 7.35 |
| 3 | 80 | 7.5 | 5.92 | 6.17 | 7.5 | 6.29 | 6.61 | 7.5 | 7.04 | 7.12 | 9.27 | 8.89 | 8.97 | 9.27 | 9.28 | 9.36 |
| 4 | 100 | 7.9 | 7.71 | 7.94 | 9.2 | 8.04 | 8.34 | 9.29 | 8.53 | 8.61 | 10.5 | 10.38 | 10.46 | - | 10.78 | 10.86 |
| 6 | 150 | 8.07 | 8.34 | 8.59 | 8.07 | 8.77 | 9.09 | 11.2 | 11.02 | 11.07 | 16.3 | 12.04 | 12.10 | 16.3 | 13.89 | 14.01 |
| 8 | 203 | 14.7 | 13.2 | - | 14.4 | 13.2 | - | 14.7 | 14.0 | 14.0 | 17.0 | - | - | 16.2 | 16.2 | 16.3 |

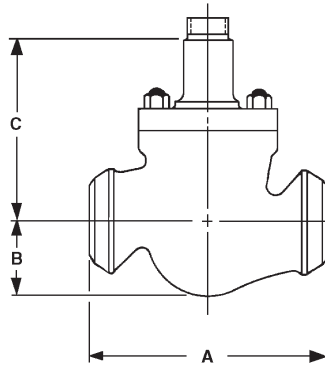
High Capacity Globe valve (inches)

| Pressure Class | | 150 | | 300 | | | 600 | | | | |
|----------------|-----|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Valve Size | | Dimension | RF | RTJ | BW | RF | RTJ | BW | RF | RTJ | |
| in. | mm | | | | | | | | | | |
| 6 | 150 | A | 17.76 | 17.76 | 20.00 | 18.62 | 18.62 | 20.00 | 20.00 | 20.00 | |
| | | B | 5.43 | 5.43 | 5.43 | 5.43 | 5.43 | 5.47 | 5.47 | 5.47 | |
| | | C (no ext.) | 15.51 | 15.51 | 15.51 | 15.51 | 15.51 | 15.51 | 15.51 | 15.51 | 15.51 |
| | | C (w. ext.) | 18.62 | 18.62 | 18.62 | 18.62 | 18.62 | 18.62 | 18.62 | 18.62 | 18.62 |
| 8 | 200 | A | 21.38 | 21.38 | 24.02 | 22.36 | 22.36 | 24.02 | 24.02 | 24.02 | |
| | | B | 7.48 | 7.48 | 7.48 | 7.48 | 7.48 | 7.68 | 7.68 | 7.68 | |
| | | C (no ext.) | 16.46 | 16.46 | 16.46 | 16.46 | 16.46 | 16.46 | 16.46 | 16.46 | 16.46 |
| | | C (w. ext.) | 19.57 | 19.57 | 19.57 | 19.57 | 19.57 | 19.57 | 19.57 | 19.57 | 19.57 |
| 10 | 250 | A | 26.50 | 27.01 | 29.61 | 27.87 | 28.50 | 29.61 | 29.61 | 29.72 | |
| | | B | 10.16 | 10.16 | 10.16 | 10.16 | 10.16 | 10.43 | 10.43 | 10.43 | |
| | | C | 24.37 | 24.37 | 24.37 | 24.37 | 24.37 | 24.37 | 24.37 | 24.37 | 24.37 |
| 12 | 300 | A | 29.02 | 29.49 | 32.24 | 30.51 | 31.10 | 32.24 | 32.24 | 32.36 | |
| | | B | 10.98 | 10.98 | 10.98 | 10.98 | 10.98 | 11.50 | 11.50 | 11.50 | |
| | | C | 31.26 | 31.26 | 31.26 | 31.26 | 31.26 | 31.61 | 31.61 | 31.61 | |
| 16 | 400 | A | - | - | - | - | - | 43.62 | 43.62 | 43.74 | |
| | | B | - | - | - | - | - | 15.12 | 15.12 | 15.12 | |
| | | C | - | - | - | - | - | 32.87 | 32.87 | 32.87 | |
| 18 | 450 | A | 44.76 | 45.08 | 48.82 | 46.85 | 47.32 | 48.82 | 51.50 | 51.97 | |
| | | B | 15.35 | 15.35 | 15.35 | 15.35 | 15.35 | 16.89 | 16.89 | 16.89 | |
| | | C | 33.78 | 33.78 | 33.78 | 33.78 | 33.78 | 33.78 | 33.78 | 33.78 | |
| 20 | 500 | A | 65.43 | 65.91 | 71.14 | 67.09 | 67.80 | - | - | - | |
| | | B | 20.94 | 20.94 | 20.94 | 20.94 | 20.94 | - | - | - | |
| | | C | 39.21 | 39.21 | 39.21 | 39.21 | 39.21 | - | - | - | |
| 24 | 600 | A | 78.82 | 79.33 | 86.34 | 81.06 | 81.93 | - | - | - | |
| | | B | 22.85 | 22.95 | 22.95 | 22.95 | 22.95 | - | - | - | |
| | | C | 45.91 | 45.91 | 45.91 | 45.91 | 45.91 | - | - | - | |

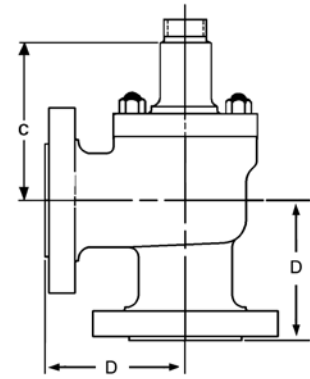
Dimensions (mm)



Flanged



**Butt, Socket Weld
or Screwed Ends**



Angle

| Pressure Class | | A | | | | | | | | | | |
|----------------|----------------------|--|-------|--|-------|-------|--|-------|-------|--|-------|-------|
| | | ASME Class 150 and equivalent PN | | ASME Class 300 and equivalent PN | | | ASME Class 600 and equivalent PN | | | ASME Class 900 and equivalent PN | | |
| Valve Size | | RF | RTJ | BW & SW | RF | RTJ | BW & SW | RF | RTJ | BW & SW | RF | RTJ |
| in. | mm | | | | | | | | | | | |
| 2 | 50 | 254 | 266.5 | 286 | 266.5 | 282.5 | 286 | 285.5 | 289 | 375 | 374.5 | 378 |
| 3 | 80 | 298.5 | 311 | 337 | 317.5 | 333.5 | 337 | 336.5 | 339.5 | 460 | 441.5 | 444 |
| 3x2 | 80x50 ⁽²⁾ | | | | | | | | | (1) | (1) | (1) |
| 4 | 100 | 352 | 364 | 394 | 368.5 | 384 | 394 | 393.5 | 397 | 530 | 511 | 514 |
| 4x2 | 100x50 | | | | | | | | | (1) | (1) | (1) |
| 4x3 | 100x80 | | | | | | | | | 530 | 511 | 514 |
| 6 | 150 | 451 | 464 | 508 | 473 | 489 | 508 | 508 | 511 | 768 | 714 | 717 |
| 6x3 | 150x80 | | | | | | | | | | | |
| 6x4 | 150x100 | | | | | | | | | | | |
| 8 | 200 | 543 | 555.5 | 610 | 568.5 | 584 | 610 | 609.5 | 613 | 832 | 914.5 | 917.5 |
| 8x4 | 200x100 | | | | | | | | | | | |
| 8x6 | 200x150 | | | | | | | | | | | |
| 10 | 250 | 673 | 686 | 752 | 708 | 724 | 752 | 752 | 755 | 991 | 1092 | 1095 |
| 10x6 | 250x150 | | | | | | | | | | | |
| 10x8 | 250x200 | | | | | | | | | | | |
| 12 | 300 | 737 | 750 | 819 | 775 | 791 | 819 | 819 | 822 | 1130 | 1130 | 1133 |
| 12x8 | 300x200 | | | | | | | | | | | |
| 14 | 350 | 889 | 902 | 972 | 927 | 943 | 972 | 972 | 975 | 1267 | 1257 | 1267 |
| 16 | 400 | 1016 | 1029 | 1108 | 1057 | 1073 | 1108 | 1108 | 1111 | 1422 | 1390 | 1399 |
| 16x12 | 400x300 | | | | | | (1) | | | (1) | (1) | |
| 18 | 450 | 1137 | 1145 | 1240 | 1190 | 1202 | 1240 ⁽³⁾ | 1308 | 1320 | 1644 | 1474 | 1486 |
| 20 | 500 | 1662 | 1674 | 1807 | 1704 | 1722 | 1890 | 1767 | 1773 | 2152 | 1805 | 1818 |
| 24 | 600 | 1999 | 2012 | 2190 | 2056 | 2078 | 2396 | 2120 | 2130 | - | - | - |
| 32x30 | 800 | 1090 | - | - | 1090 | - | - | - | - | - | - | - |

1. Consult Baker Hughes.
2. Ex. 80x50 size = valve with 80mm body x standard 50mm trim.
3. Applies to Schedule 40 only. Schedule 80 Face to Face is 1480 mm.

Note: Values for B and C are shown as maximum and may vary with valve body and bonnet attributes. Certified drawings will provide specific dimensions.

Dimensions (mm)

| Pressure Class | | A | | | A | | | B max | | | | | C max | | | | |
|-------------------|----------------------|-----------------------------------|-------|-------|-----------------------------------|------|------|----------------|----------|----------|-----------|-----------|----------------|----------|----------|-----------|-----------|
| | | ASME Class 1500 and equivalent PN | | | ASME Class 2500 and equivalent PN | | | ASME 150 / 300 | ASME 600 | ASME 900 | ASME 1500 | ASME 2500 | ASME 150 / 300 | ASME 600 | ASME 900 | ASME 1500 | ASME 2500 |
| Valve Size | | BW & SW | RF | RTJ | BW & SW | RF | RTJ | | | | | | | | | | |
| in. | mm | | | | | | | | | | | | | | | | |
| 2 | 50 | 375 | 374.5 | 378 | 400 | 436 | 438 | 94 | 94 | 57 | 57 | 130 | 250 | 250 | 216 | 216 | 262 |
| 3 | 80 | 460 | 460.5 | 463 | 498 | 486 | 491 | 114 | 114 | 143 | 143 | 175 | 300 | 300 | 300 | 300 | 357 |
| 3x2 | 80x50 ⁽²⁾ | (i) | (i) | (i) | (i) | (i) | (i) | 116 | 116 | 143 | 143 | (i) | 251 | 251 | 264 | 264 | (i) |
| 4 | 100 | 530 | 530.5 | 533.5 | 575 | 601 | 609 | 140 | 140 | 159 | 159 | 200 | 330 | 330 | 330 | 330 | 375 |
| 4x2 | 100x50 | (i) | (i) | (i) | (i) | (i) | (i) | 140 | 140 | 154 | 154 | (i) | 261 | 261 | 256 | 256 | (i) |
| 4x3 | 100x80 | 530 | 530.5 | 533.5 | (i) | (i) | (i) | 140 | 140 | 159 | 159 | (i) | 322 | 322 | 322 | 322 | (i) |
| 6 | 150 | 768 | 768 | 774 | 819 | 745 | 748 | 198 | 198 | 217 | 217 | 263 | 390 | 390 | 390 | 390 | 391 |
| 6x3 | 150x80 | 768 | 768 | 774 | (i) | (i) | (i) | 190 | 190 | 160 | 160 | (i) | 322 | 322 | 320 | 320 | (i) |
| 6x4 | 150x100 | 768 | 768 | 774 | (i) | (i) | (i) | 190 | 190 | 160 | 160 | (i) | 342 | 342 | 337 | 337 | (i) |
| 8 | 200 | 832 | 971.5 | 981 | 1029 | 892 | 906 | 186 | 191 | 191 | 205 | 300 | 496 | 496 | 521 | 521 | 450 |
| 8x4 | 200x100 | 832 | 971.5 | 981 | (i) | (i) | (i) | 222 | 222 | 170 | 170 | (i) | 366 | 366 | 330 | 330 | (i) |
| 8x6 | 200x150 | 832 | 971.5 | 981 | (i) | (i) | (i) | 222 | 222 | 172 | 172 | (i) | 433 | 433 | 390 | 390 | (i) |
| 10 | 250 | | | | 1270 | 1085 | 1106 | 220 | 228 | 230 | 244 | 362 | 550 | 550 | 570 | 570 | 615 |
| 10x6 | 250x150 | 991 | 1168 | 1178 | (i) | (i) | (i) | 232 | 232 | 231 | 231 | (i) | 469 | 469 | 390 | 390 | (i) |
| 10x8 | 250x200 | | | | (i) | (i) | (i) | 232 | 232 | 218 | 222 | (i) | 499 | 499 | 521 | 521 | (i) |
| 12 | 300 | 1130 | 1218 | 1234 | 1422 | 1192 | 1213 | 325 | 335 | 345 | 360 | 415 | 620 | 620 | 626 | 626 | 632 |
| 12x8 | 300x200 | (i) | (i) | (i) | (i) | (i) | (i) | 242 | 242 | 250 | 250 | (i) | 496 | 496 | 521 | 521 | (i) |
| 14 | 350 | 1395 | 1257 | 1276 | - | - | - | 440 | 440 | 470 | 470 | - | 663 | 663 | 698 | 809 | - |
| 16 | 400 | 1422 | 1508 | 1530 | 1840 | - | - | 440 | 450 | 460 | 485 | 441 | 694 | 694 | 805 | 805 | 699 |
| 16x12 | 400x300 | (i) | (i) | (i) | (i) | - | - | 450 | 450 | 453 | 477 | (i) | 650 | 650 | 696 | 696 | (i) |
| 18 | 450 | 1830 | 1558 | 1570 | - | - | - | 519 | 531 | 531 | 558 | - | 854 | 854 | 994 | 1069 | - |
| 20 | 500 | - | - | - | - | - | - | 669 | 680 | 692 | - | - | 867 | 904 | 950 | - | - |
| 24 ⁽³⁾ | 600 | - | - | - | - | - | - | 804 | 820 | - | - | - | 1016 | 1046 | - | - | - |
| 24 ⁽⁴⁾ | 600 | - | - | - | - | - | - | 804 | 820 | - | - | - | 1219 | 1249 | - | - | - |

1. Consult Baker Hughes.
2. Ex. 80x50 size = valve with 80mm body x standard 50mm trim.
3. 11" Nominal stroke length.
4. 15" Nominal stroke length.

Note: Values for B and C are shown as maximum and may vary with valve body and bonnet attributes. Certified drawings will provide specific dimensions.

Applicable Size Ranges

| PN | ASME Construction Equivalency (other than Body (B001)) |
|----------|--|
| EN PN 10 | ASME Class 150 |
| EN PN 16 | ASME Class 150 |
| EN PN 25 | ASME Class 300 |
| EN PN 40 | ASME Class 300 |
| EN PN 63 | ASME Class 600 |

B1 Flanges Face-to-Face Dimensions mm

| Rating \ DN | PN 10-PN 16 | PN 25-PN 40 | PN 63 |
|-------------|-------------|-------------|-------------|
| 2 | 254 ± 1.5 | 266.5 ± 1.5 | 285.5 ± 1.5 |
| 3 | 298.5 ± 1.5 | 317.5 ± 1.5 | 336.5 ± 1.5 |
| 4 | 352 ± 1.5 | 368.5 ± 1.5 | 393.5 ± 1.5 |
| 6 | 451 ± 1.5 | 473 ± 1.5 | 508 ± 1.5 |
| 8 | 543 ± 1.5 | 568.5 ± 1.5 | 609.5 ± 1.5 |

Dimensions (mm)

High Capacity Globe valve (mm)

| Pressure Class | | 150 | | | 300 | | | 600 | | |
|----------------|-----|-------------|------|------|------|------|------|------|------|------|
| Valve Size | | Dimension | RF | RTJ | BW | RF | RTJ | BW | RF | RTJ |
| in. | mm | | | | | | | | | |
| 6 | 150 | A | 451 | 451 | 508 | 473 | 473 | 508 | 508 | 508 |
| | | B | 138 | 138 | 138 | 138 | 138 | 139 | 139 | 139 |
| | | C (no ext.) | 394 | 394 | 394 | 394 | 394 | 394 | 394 | 394 |
| | | C (w. ext.) | 473 | 473 | 473 | 473 | 473 | 473 | 473 | 473 |
| 8 | 200 | A | 543 | 543 | 610 | 568 | 568 | 610 | 610 | 610 |
| | | B | 190 | 190 | 190 | 190 | 190 | 195 | 195 | 195 |
| | | C (no ext.) | 418 | 418 | 418 | 418 | 418 | 418 | 418 | 418 |
| | | C (w. ext.) | 497 | 497 | 497 | 497 | 497 | 497 | 497 | 497 |
| 10 | 250 | A | 673 | 686 | 752 | 708 | 724 | 752 | 752 | 755 |
| | | B | 258 | 258 | 258 | 258 | 258 | 265 | 265 | 265 |
| | | C | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 |
| 12 | 300 | A | 737 | 749 | 819 | 775 | 790 | 819 | 819 | 822 |
| | | B | 279 | 279 | 279 | 279 | 279 | 292 | 292 | 292 |
| | | C | 794 | 794 | 794 | 794 | 794 | 803 | 803 | 803 |
| 16 | 400 | A | - | - | - | - | - | 1108 | 1108 | 1111 |
| | | B | - | - | - | - | - | 384 | 384 | 384 |
| | | C | - | - | - | - | - | 835 | 835 | 835 |
| 18 | 450 | A | 1137 | 1145 | 1240 | 1190 | 1202 | 1240 | 1308 | 1320 |
| | | B | 390 | 390 | 390 | 390 | 390 | 429 | 429 | 429 |
| | | C | 858 | 858 | 858 | 858 | 858 | 858 | 858 | 858 |
| 20 | 500 | A | 1662 | 1674 | 1807 | 1704 | 1722 | - | - | - |
| | | B | 532 | 532 | 532 | 532 | 532 | - | - | - |
| | | C | 996 | 996 | 996 | 996 | 996 | - | - | - |
| 24 | 600 | A | 2002 | 2015 | 2193 | 2059 | 2081 | - | - | - |
| | | B | 583 | 583 | 583 | 583 | 583 | - | - | - |
| | | C | 1166 | 1166 | 1166 | 1166 | 1166 | - | - | - |

Angle Body S/A (mm)

| Pressure Class | D | | | | | | | | | | | | | | | |
|----------------|----------------------------------|-----|-----|----------------------------------|-----|-----|----------------------------------|-----|-----|----------------------------------|-------|-----|-----------------------------------|-------|-----|-----|
| | ASME Class 150 and equivalent PN | | | ASME Class 300 and equivalent PN | | | ASME Class 600 and equivalent PN | | | ASME Class 900 and equivalent PN | | | ASME Class 1500 and equivalent PN | | | |
| Valve Size | | BW | RF | RTJ | BW | RF | RTJ | BW | RF | RTJ | BW | RF | RTJ | BW | RF | RTJ |
| in. | mm | | | | | | | | | | | | | | | |
| 2 | 50 | 189 | 131 | 137 | 189 | 134 | 142 | 189 | 147 | 148 | 220 | 185 | 187 | 220 | 185 | 187 |
| 3 | 80 | 191 | 150 | 157 | 191 | 160 | 168 | 191 | 179 | 181 | 235.5 | 226 | 228 | 235.5 | 236 | 238 |
| 4 | 100 | 201 | 196 | 202 | 236 | 204 | 212 | 236 | 217 | 219 | 266.7 | 264 | 266 | - | 274 | 276 |
| 6 | 150 | 205 | 212 | 218 | 205 | 223 | 231 | 285 | 280 | 281 | 415 | 306 | 307 | 415 | 353 | 356 |
| 8 | 203 | 374 | 337 | - | 374 | 337 | - | 374 | 358 | 358 | 434 | - | - | 412 | 412 | 416 |

Weights

Globe Style Body S/A Weights (lbs)

| Valve Size | | Flanged Connection | | | | | | Threaded / Welded Connection | | | | | |
|-------------------|--------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|
| in. | mm | ASME Class 150 & equivalent PN | ASME Class 300 & equivalent PN | ASME Class 600 & equivalent PN | ASME Class 900 & equivalent PN | ASME Class 1500 & equivalent PN | ASME Class 2500 & equivalent PN | ASME Class 150 & equivalent PN | ASME Class 300 & equivalent PN | ASME Class 600 & equivalent PN | ASME Class 900 & equivalent PN | ASME Class 1500 & equivalent PN | ASME Class 2500 & equivalent PN |
| 2 | 50 | 99 | 99 | 88 | 121 | 121 | 320 | 88 | 88 | 88 | 88 | 88 | (1) |
| 3 | 80 | 176 | 187 | 187 | 265 | 287 | 518 | 165 | 165 | 165 | 220 | 220 | (1) |
| 3x2 | 80x50 | 143 | 154 | 165 | 198 | 220 | (1) | 132 | 132 | 132 | 154 | 154 | (1) |
| 4 | 100 | 231 | 254 | 265 | 463 | 496 | 860 | 209 | 209 | 209 | 386 | 397 | (1) |
| 4x2 | 100x50 | 176 | 198 | 209 | 331 | 364 | (1) | 154 | 154 | 154 | 254 | 265 | (1) |
| 4x3 | 100x80 | 209 | 220 | 243 | 397 | 430 | (1) | 176 | 187 | 187 | 331 | 331 | (1) |
| 6 | 150 | 397 | 430 | 518 | 893 | 1036 | 1653 | 363 | 363 | 408 | 750 | 816 | (1) |
| 6x3 | 150x80 | 320 | 364 | 441 | 739 | 893 | (1) | 286 | 297 | 342 | 595 | 661 | (1) |
| 6x4 | 150x100 | 353 | 386 | 474 | 805 | 948 | (1) | 319 | 319 | 364 | 650 | 717 | (1) |
| 8 | 200 | 772 | 827 | 937 | 1400 | 1698 | 2679 | 727 | 738 | 783 | 1146 | 1323 | (1) |
| 8x4 | 200x100 | 584 | 639 | 750 | 1157 | 1466 | (1) | 529 | 540 | 584 | 915 | 1091 | (1) |
| 8x6 | 200x150 | 628 | 683 | 794 | 1257 | 1554 | (1) | 573 | 584 | 628 | 1003 | 1179 | (1) |
| 10 | 250 | 1168 | 1257 | 1378 | 2227 | 2646 | 4806 | 1102 | 1113 | 1124 | 1863 | 2006 | (1) |
| 10x6 | 250x150 | 838 | 926 | 1047 | 1775 | 2194 | (1) | 771 | 782 | 794 | 1422 | 1554 | (1) |
| 12 | 300 | 1532 | 1631 | 2116 | 2932 | 4288 | 7176 | 1421 | 1444 | 1819 | 2458 | 3329 | (1) |
| 12x8 | 300x200 | 1135 | 1235 | 1720 | 2502 | 3671 | (1) | 1036 | 1047 | 1422 | 2028 | 2723 | (1) |
| 14 | 350 | 1951 | 2129 | 2698 | 4576 | 6867 | - | 1893 | 1893 | 2336 | 4096 | 5782 | - |
| 16 | 400 | 3274 | 3472 | 3847 | 6338 | 7959 | - | 3119 | 3152 | 3318 | 5666 | 6294 | (1) |
| 16x12 | 400x300 | 3009 | 3197 | 3395 | 5776 | 7363 | - | 2843 | 2888 | 2877 | 5093 | 5699 | (1) |
| 18 | 450 | 3583 | 3869 | 5192 | 8267 | 12765 | - | 3163 | 3163 | 4652 | 7507 | 11023 | - |
| 20 | 500 | 6989 | 7363 | 9160 | 11729 | - | - | 6790 | 6790 | 8311 | 11442 | - | - |
| 24 ⁽¹⁾ | 600 ⁽¹⁾ | 10659 | 11431 | 13702 | - | - | - | 10813 | 10813 | 13062 | - | - | - |
| 30 | 750 | 18287 | 20172 | 28219 | - | - | - | - | - | - | - | - | - |
| 32x30 | 800x750 | 18739 | 20943 | - | - | - | - | - | - | - | - | - | - |

1. Consult Baker Hughes.

Note: Weight values are maximum and may vary with valve body and bonnet attributes. Certified drawings will provide specific values.

Globe Style Body S/A Weights (kg)

| Valve Size | | Flanged Connection | | | | | | Threaded / Welded Connection | | | | | |
|-------------------|--------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|
| in. | mm | ASME Class 150 & equivalent PN | ASME Class 300 & equivalent PN | ASME Class 600 & equivalent PN | ASME Class 900 & equivalent PN | ASME Class 1500 & equivalent PN | ASME Class 2500 & equivalent PN | ASME Class 150 & equivalent PN | ASME Class 300 & equivalent PN | ASME Class 600 & equivalent PN | ASME Class 900 & equivalent PN | ASME Class 1500 & equivalent PN | ASME Class 2500 & equivalent PN |
| 2 | 50 | 45 | 45 | 40 | 55 | 55 | 145 | 40 | 40 | 40 | 40 | 40 | (1) |
| 3 | 80 | 80 | 85 | 85 | 120 | 130 | 235 | 75 | 75 | 75 | 100 | 100 | (1) |
| 3x2 | 80x50 | 65 | 70 | 75 | 90 | 100 | (1) | 60 | 60 | 60 | 70 | 70 | (1) |
| 4 | 100 | 105 | 115 | 120 | 210 | 225 | 390 | 95 | 95 | 95 | 175 | 180 | (1) |
| 4x2 | 100x50 | 80 | 90 | 95 | 150 | 165 | (1) | 70 | 70 | 70 | 115 | 120 | (1) |
| 4x3 | 100x80 | 95 | 100 | 110 | 180 | 195 | (1) | 80 | 85 | 85 | 150 | 150 | (1) |
| 6 | 150 | 180 | 195 | 235 | 405 | 470 | 750 | 165 | 165 | 185 | 340 | 370 | (1) |
| 6x3 | 150x80 | 145 | 165 | 200 | 335 | 405 | (1) | 130 | 297 | 155 | 270 | 300 | (1) |
| 6x4 | 150x100 | 160 | 175 | 215 | 365 | 430 | (1) | 145 | 145 | 165 | 295 | 325 | (1) |
| 8 | 200 | 350 | 375 | 425 | 635 | 770 | 1215 | 330 | 335 | 355 | 520 | 600 | (1) |
| 8x4 | 200x100 | 265 | 290 | 340 | 525 | 665 | (1) | 240 | 245 | 265 | 415 | 495 | (1) |
| 8x6 | 200x150 | 285 | 310 | 360 | 570 | 705 | (1) | 260 | 265 | 285 | 455 | 535 | (1) |
| 10 | 250 | 530 | 570 | 625 | 1010 | 1200 | 2180 | 500 | 505 | 510 | 845 | 910 | (1) |
| 10x6 | 250x150 | 380 | 420 | 475 | 805 | 995 | (1) | 350 | 355 | 360 | 645 | 705 | (1) |
| 12 | 300 | 695 | 740 | 960 | 1330 | 1945 | 3255 | 645 | 655 | 825 | 1115 | 1510 | (1) |
| 12x8 | 300x200 | 515 | 560 | 780 | 1135 | 1665 | (1) | 470 | 475 | 645 | 920 | 1235 | (1) |
| 14 | 350 | 885 | 966 | 1224 | 2076 | 3115 | - | 859 | 859 | 1060 | 1858 | 2623 | - |
| 16 | 400 | 1485 | 1575 | 1745 | 2875 | 3610 | - | 1415 | 1430 | 1505 | 2570 | 2855 | (1) |
| 16x12 | 400x300 | 1365 | 1450 | 1540 | 2620 | 3340 | - | 1290 | 1310 | 1305 | 2310 | 2585 | (1) |
| 18 | 450 | 1625 | 1755 | 2355 | 3750 | 5790 | - | 1435 | 1435 | 2110 | 3405 | 5000 | - |
| 20 | 500 | 3170 | 3340 | 4155 | 5320 | - | - | 3080 | 3080 | 3770 | 5190 | - | - |
| 24 ⁽¹⁾ | 600 ⁽¹⁾ | 4835 | 5185 | 6215 | - | - | - | 4905 | 4905 | 5925 | - | - | - |
| 30 | 750 | 8295 | 9150 | 12800 | - | - | - | - | - | - | - | - | - |
| 32x30 | 800x750 | 8500 | 9500 | - | - | - | - | - | - | - | - | - | - |

1. Consult Baker Hughes.

Note: Weight values are maximum and may vary with valve body and bonnet attributes. Certified drawings will provide specific values.

Weights

Globe Style Body S/A High Capacity Trim Weights (lbs)

| Valve Size | | Flanged Connection | | | Welded Connection | |
|------------|-----|--------------------|----------------|----------------|-------------------|----------------|
| Inches | mm | ASME Class 150 | ASME Class 300 | ASME Class 600 | ASME Class 300 | ASME Class 600 |
| 6 | 150 | 390 | 390 | 507 | 333 | 575 |
| 8 | 200 | 664 | 664 | 935 | 576 | 774 |
| 10 | 250 | 1155 | 1230 | 1786 | 1096 | 1552 |
| 12 | 300 | 1768 | 1881 | 2269 | 1826 | 2134 |
| 16 | 400 | 3305 | 3495 | 4807 | 3151 | 4322 |
| 18 | 450 | 4937 | 5228 | 8824 | 4847 | 8401 |
| 20 | 500 | 7651 | 8017 | - | 7632 | - |
| 24 | 600 | 12238 | 12789 | - | 12436 | - |

Globe Style Body S/A High Capacity Trim Weights (kg)

| Valve Size | | Flanged Connection | | | Welded Connection | |
|------------|-----|--------------------|----------------|----------------|-------------------|----------------|
| Inches | mm | ASME Class 150 | ASME Class 300 | ASME Class 600 | ASME Class 300 | ASME Class 600 |
| 6 | 150 | 177 | 177 | 230 | 151 | 270 |
| 8 | 200 | 301 | 301 | 424 | 261 | 351 |
| 10 | 250 | 524 | 558 | 810 | 497 | 704 |
| 12 | 300 | 802 | 853 | 1029 | 828 | 968 |
| 16 | 400 | 1499 | 1585 | 2180 | 1429 | 1960 |
| 18 | 450 | 2239 | 2371 | 4002 | 2198 | 3810 |
| 20 | 500 | 3470 | 3636 | - | 3461 | - |
| 24 | 600 | 5550 | 5800 | - | 5640 | - |

Weights

Angle Style Body S/A Weights (lbs)

| Valve Size | | Flanged Connection | | | | |
|------------|-----|----------------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|
| | | ASME Class 150 and equivalent PN | ASME Class 300 and equivalent PN | ASME Class 600 and equivalent PN | ASME Class 900 and equivalent PN | ASME Class 1500 and equivalent PN |
| in. | mm | | | | | |
| 2 | 50 | 77 | 79 | 82 | 110 | 110 |
| 3 | 80 | 154 | 165 | 165 | 231 | 254 |
| 4 | 100 | 209 | 220 | 243 | 419 | 463 |
| 6 | 150 | 353 | 375 | 452 | 838 | 992 |

Angle Style Body S/A Weights (kg)

| Valve Size | | Flanged Connection | | | | |
|------------|-----|----------------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|
| | | ASME Class 150 and equivalent PN | ASME Class 300 and equivalent PN | ASME Class 600 and equivalent PN | ASME Class 900 and equivalent PN | ASME Class 1500 and equivalent PN |
| in. | mm | | | | | |
| 2 | 50 | 35 | 36 | 37 | 50 | 50 |
| 3 | 80 | 70 | 75 | 75 | 105 | 115 |
| 4 | 100 | 95 | 100 | 110 | 190 | 210 |
| 6 | 150 | 160 | 170 | 205 | 380 | 450 |

Options

- Extension Bonnets
- Environmental Capabilities (Low-E Packing)
- Lubricator and Isolation Valve
- Other Flange Facings
- Limit Stops
- Body Drain Plug
- Reducer and Nipple Connections
- NACE Compliance
- Custom Trim Materials
- U.O.P. Trim Materials
- Other Materials
- Soft Seat (IEC 534-4 and ASME Class VI)
- Non-Destructive Examination
- Oxygen Cleaning
- Anti-Surge Applications

For Accessories and additional Options, please consult Baker Hughes.

41005 API 6A Series High Pressure Valves

Features

41005 API 6A Series single ported, cage guided control valves are designed to meet API 6A standard for high pressure applications:

Forged Body

Globe Forged body handles pressure up to 15K PSI in operation.

Body/Bonnet Bolted Joint

API 6A 41005 uses body bonnet bolting joint and metal seal for high pressures up to 15K PSI in operation.

Body/Bonnet Metallic Seal

41005 API 6A seal is a low leakage design using a metallic seal.

Integral Cage Seat-Ring Trim

41005 API 6A trim design is comprised of an Integral Seat-ring/Cage for easy maintenance. Available in linear flow characteristic it is also available with options for a ported cage, single stage Lo-dB and Double stage Lo-dB.

High Pressure Capability

41005 API 6A valves meet API standards and are capable of 10K PSI [690 bar] and 15K PSI [1034 bar] rated pressure.

Cage Mechanical Pressure drop is limited as follows:

- 7252 PSI [500 bar] for double cage
- 4351 PSI [300 bar] for single stage Lo-dB
- 870 PSI [60 bar] for ported cage.

Leakage Class

Meets class IV and V leakage is standard as per IEC-60534-4.

41005 API 6A should be closed only for a short period of time. There is a risk of damaging trim parts for a long period of closing.

41005 API 6A valves are designed as control valves, not as isolating valves.

Hardened Trim

Provided to handle erosion from high pressure drop applications.

Quick Change Trim

An integral seat-ring/cage design allows for quick disassembly for ease of maintenance.

Packing

Standard

The Integral Packing flange/follower design improves flange stiffness for better performance against leaks.

Environmental

Low emission Low-E Packing is available (consult factory for the latest certificate).

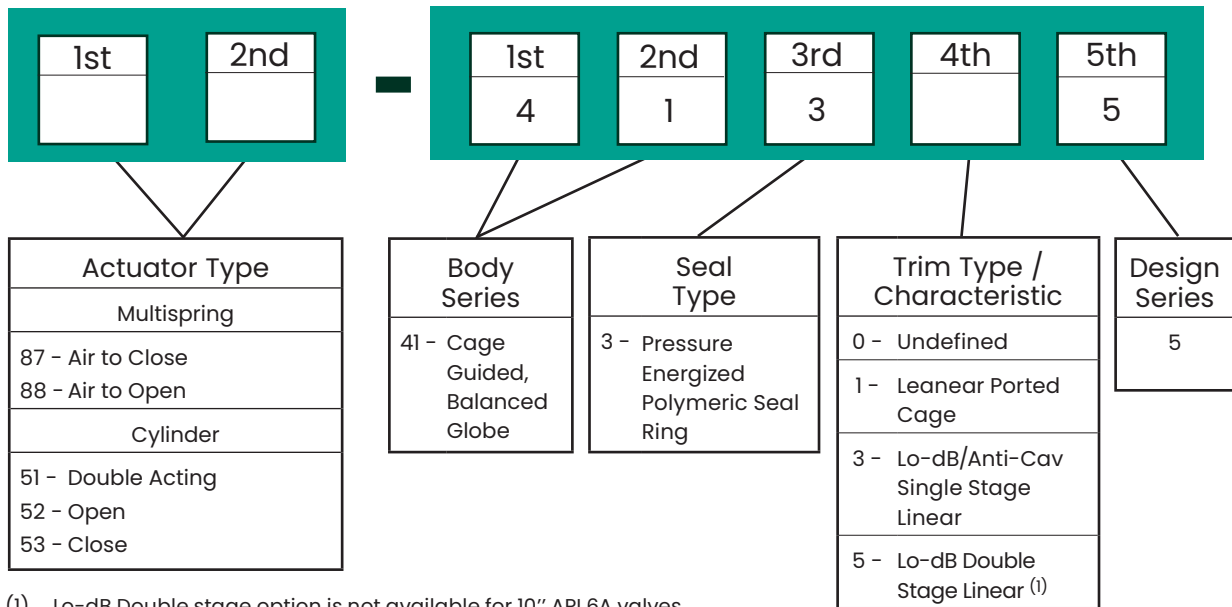
NACE Compliance

The 41005 API 6A Series is available for Sour Service Applications using design and construction methods in accordance with ANSI/NACE MR0175/ISO 15156-1.

Lifting lugs on body sub assembly

Lifting lugs are provided for easy handling.

41005 API 6A Numbering System



Temperature Ratings

| Temperature Class | Temperature Range ⁽¹⁾⁽²⁾ | | | |
|-------------------|-------------------------------------|------|------|------|
| | °C | | °F | |
| | Min. | Max. | Min. | Max. |
| K | -60 | 82 | -75 | 180 |
| L | -46 | 82 | -50 | 180 |
| N | -46 | 60 | -50 | 140 |
| P | -29 | 82 | -20 | 180 |
| S | -18 | 60 | 0 | 140 |
| T | -18 | 82 | 0 | 180 |
| U | -18 | 121 | 0 | 250 |
| V | 2 | 121 | 35 | 250 |
| X | -18 | 180 | 0 | 350 |

1. Valve end size fit API 6A standard for 6BX flanges and cover the entire product
2. See Materials of Construction Tables for other temperature limitations.

Material Class/Material of Construction

| Material Class | | NACE MR0175/ISO 15156 | Material of Construction Availability | | | |
|----------------|-----------------|-----------------------|---------------------------------------|-------------------------|-------------------------------|------------------------------|
| | | | Martensitic NACE Non-Exposed | Duplex NACE Non-Exposed | Super Duplex NACE Non-Exposed | Inconel 718 NACE Non-Exposed |
| AA | General Service | Non-Exposed | X | X | X | X |
| BB | General Service | Non-Exposed | X | X | X | X |
| CC | General Service | Non-Exposed | X | X | X | X |
| Material Class | | NACE MR0175/ISO 15156 | Material of Construction Availability | | | |
| | | | Martensitic NACE Exposed | Duplex NACE Exposed | Super Duplex NACE Exposed | Inconel 718 NACE Exposed |
| DD | Sour Service | Exposed | | | | X |
| EE | Sour Service | Exposed | | | | X |
| FF | Sour Service | Exposed | X | X | X | X |
| HH | Sour Service | Exposed | | | | X |

Ratings/End Connections

Valve ends connection are designed to API 6A standard.

| Valve Body Size | Valve Ends Size | API 10K | API 15K |
|-----------------|---|--------------------|--------------------|
| NPS | NPS | 6BX ⁽¹⁾ | 6BX ⁽¹⁾ |
| 3 | 4 ¹ / ₁₆ (4.0625) | X | X |
| 4 | 5 ¹ / ₈ (5.125) | X | X |
| 6 | 7 ¹ / ₁₆ (7.0625) | X | X |
| 8 | 9" | X | X |
| 10 | 11" | X | X |

1. Only 6BX printed flange are available

C_V and F_L Versus Travel

API 10K and 15K – Linear – Models 41315

Sizes: 3" through 10" Linear Ported Cage API 10K and 15K – Flow to Open/Flow to Close

| Travel (Percent) | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|-----------------------|-----|--------------|--------|--------|-------|----------------------|------|------|------|------|------|------|------|-----|------|
| FL | | | | | | 0.94 | 0.94 | 0.93 | 0.93 | 0.92 | 0.92 | 0.91 | 0.91 | 0.9 | 0.9 |
| Valve Body Size (NPS) | | Orifice Dia. | | Travel | | Rated C _V | | | | | | | | | |
| inch | mm | inch | mm | inch | mm | | | | | | | | | | |
| 3 | 80 | 3.5 | 88.9 | 2 | 50.8 | 2 | 12 | 25 | 45 | 64 | 83 | 109 | 127 | 143 | 155 |
| 4 | 100 | 4.38 | 111.13 | 2 | 50.8 | 4 | 17 | 38 | 72 | 106 | 138 | 171 | 188 | 204 | 214 |
| 6 | 150 | 5.12 | 130.04 | 2.5 | 63.5 | 14 | 70 | 127 | 186 | 236 | 287 | 331 | 356 | 377 | 400 |
| 8 | 200 | 6.5 | 165.1 | 3 | 76.2 | 28 | 121 | 209 | 295 | 372 | 452 | 539 | 576 | 624 | 640 |
| 10 | 250 | 8 | 203.2 | 3.5 | 88.90 | 67 | 210 | 353 | 494 | 629 | 752 | 852 | 913 | 972 | 1000 |

C_v and F_L Versus Travel

API 10K and 15K – Linear – Models 41335

Sizes: 3" through 10" Linear Lo-dB Single Stage API 10K and 15K – Flow to Open/Flow to Close

| Travel (Percent) | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
|-----------------------|-----|--------------|--------|--------|-------|----------------------|------|------|------|------|------|------|------|------|------|------|
| FL | | | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Valve Body Size (NPS) | | Orifice Dia. | | Travel | | Rated C _v | | | | | | | | | | |
| Inch | mm | inch | mm | inch | mm | Cv | 3 | 12 | 22 | 31 | 40 | 48 | 57 | 65 | 72 | 78 |
| 3 | 80 | 3.5 | 88.9 | 2 | 50.8 | Cv | 3 | 12 | 22 | 31 | 40 | 48 | 57 | 65 | 72 | 78 |
| 4 | 100 | 4.38 | 111.25 | 2 | 50.8 | Cv | 7 | 24 | 42 | 59 | 76 | 89 | 101 | 114 | 127 | 140 |
| 6 | 150 | 5.12 | 130.04 | 2.5 | 63.5 | Cv | 9 | 37 | 65 | 88 | 118 | 136 | 159 | 183 | 207 | 230 |
| 8 | 200 | 6.5 | 165.1 | 2.5 | 63.5 | Cv | 7 | 48 | 87 | 127 | 166 | 201 | 235 | 270 | 304 | 340 |
| 10 | 250 | 8 | 203.2 | 3.5 | 88.90 | Cv | 24 | 81 | 136 | 193 | 249 | 297 | 346 | 394 | 443 | 500 |

API 10K and 15K – Linear – Models 41355

Sizes: 3" through 8" Linear Lo-dB double Stage API 10K and 15K – Flow to Open Only (1)(2)

| Travel (Percent) | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | |
|-----------------------|-----|--------------|--------|--------|-------|----------------------|------|------|------|------|------|------|------|------|------|------|
| FL | | | | | | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Valve Body Size (NPS) | | Orifice Dia. | | Travel | | Rated C _v | | | | | | | | | | |
| Inch | mm | inch | mm | inch | mm | Cv | 2 | 7 | 12 | 17 | 22 | 27 | 31 | 35 | 40 | 42 |
| 3 | 80 | 3.5 | 88.9 | 2 | 50.8 | 2 | 7 | 12 | 17 | 22 | 27 | 31 | 35 | 40 | 42 | |
| 4 | 100 | 4.38 | 111.13 | 2 | 50.8 | 3 | 11 | 19 | 26 | 34 | 40 | 47 | 54 | 60 | 66 | |
| 6 | 150 | 5.12 | 130.04 | 2.5 | 63.50 | 3 | 14 | 24 | 33 | 44 | 52 | 61 | 70 | 79 | 90 | |
| 8 | 200 | 6.5 | 165.1 | 2.5 | 63.50 | 8 | 24 | 39 | 55 | 70 | 84 | 97 | 111 | 124 | 140 | |

1. Important : the Lo-dB double cage TRIMs are only low noise TRIM for gas.
2. Linear Lo-dB double stage is out of standard scope for 10" valves.

Body Sub Assembly Construction

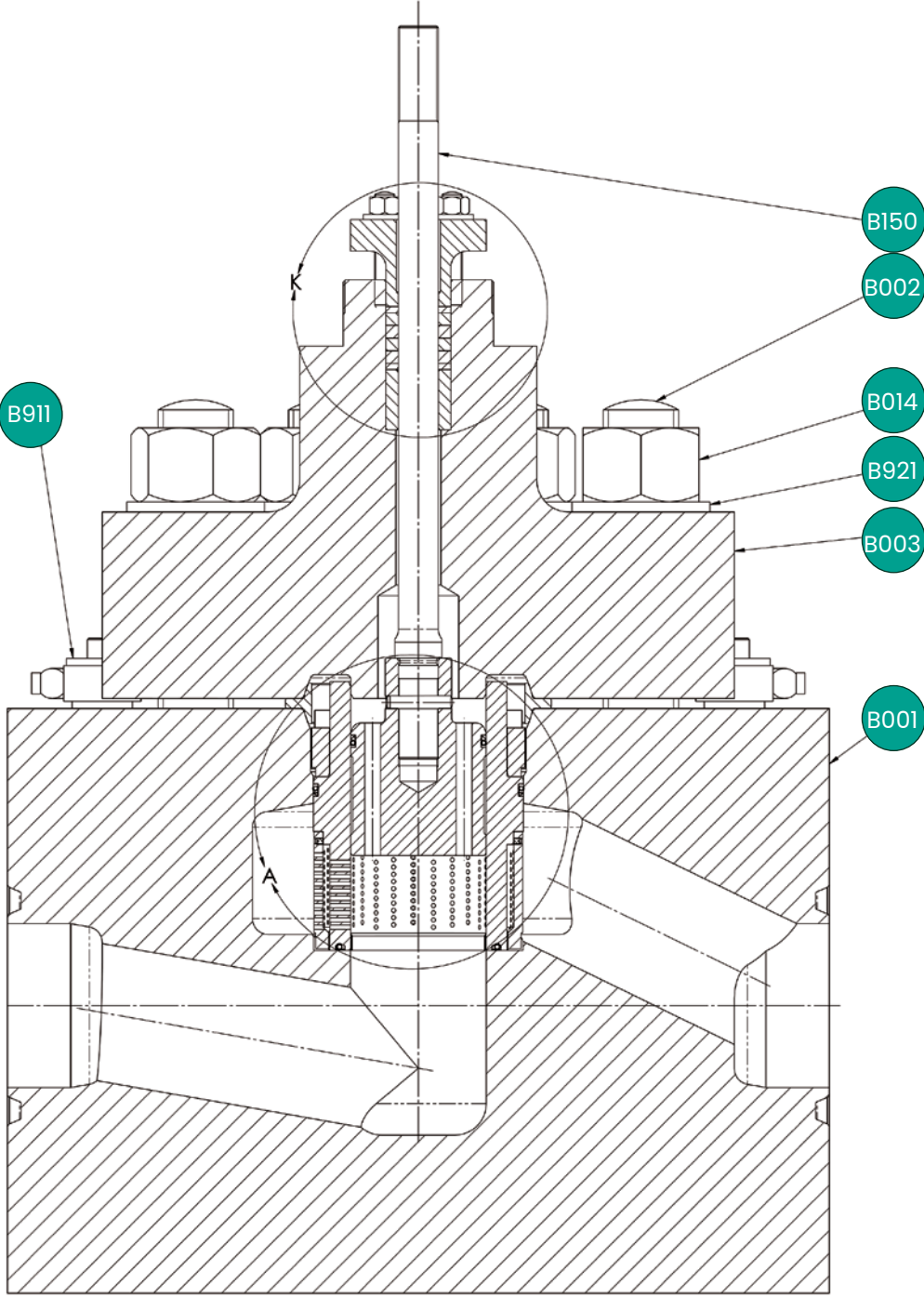


Figure x - Cross Sectional View of 41005 API 6A Design

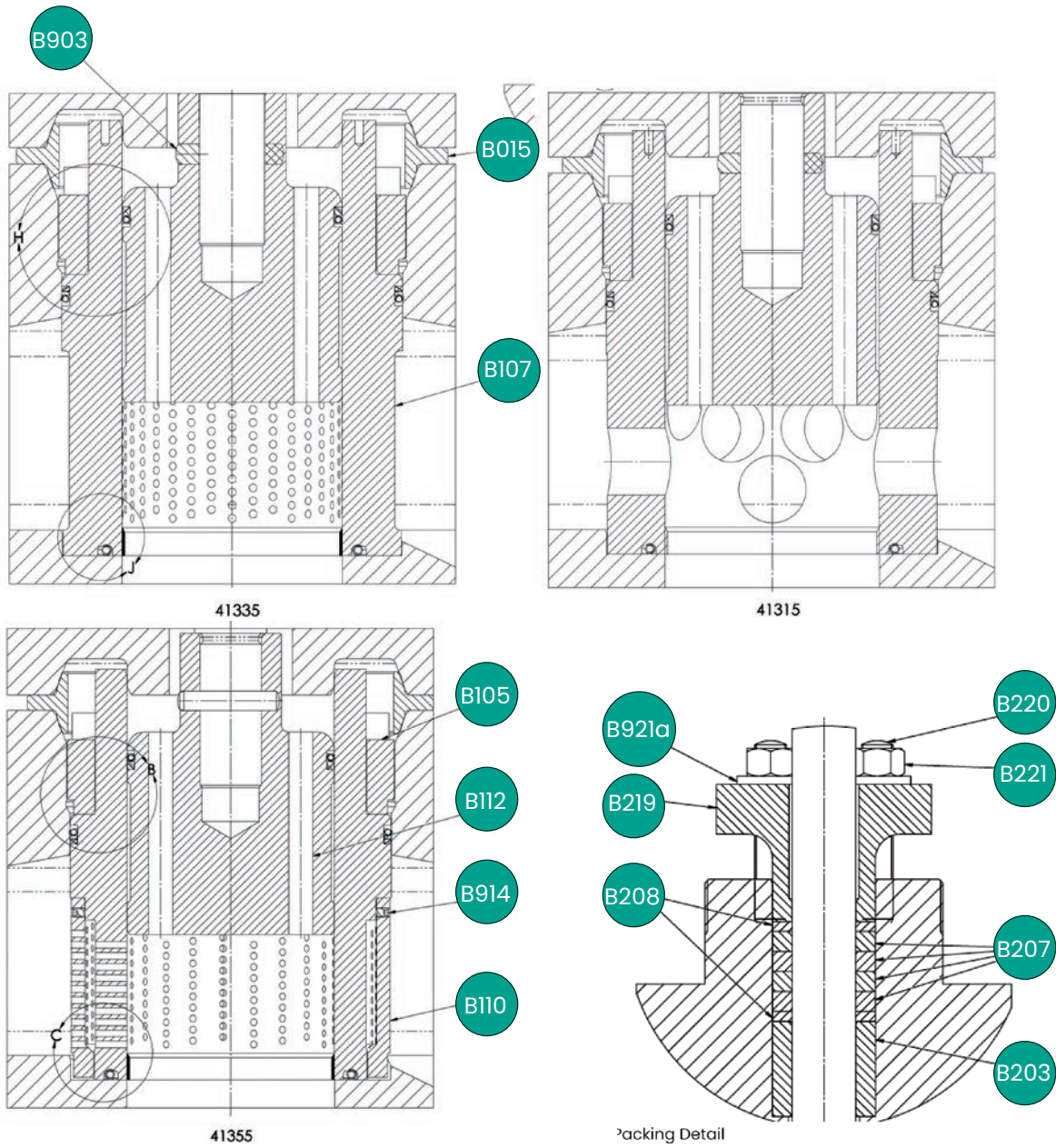


Figure x - Trim Type and Packing Detail

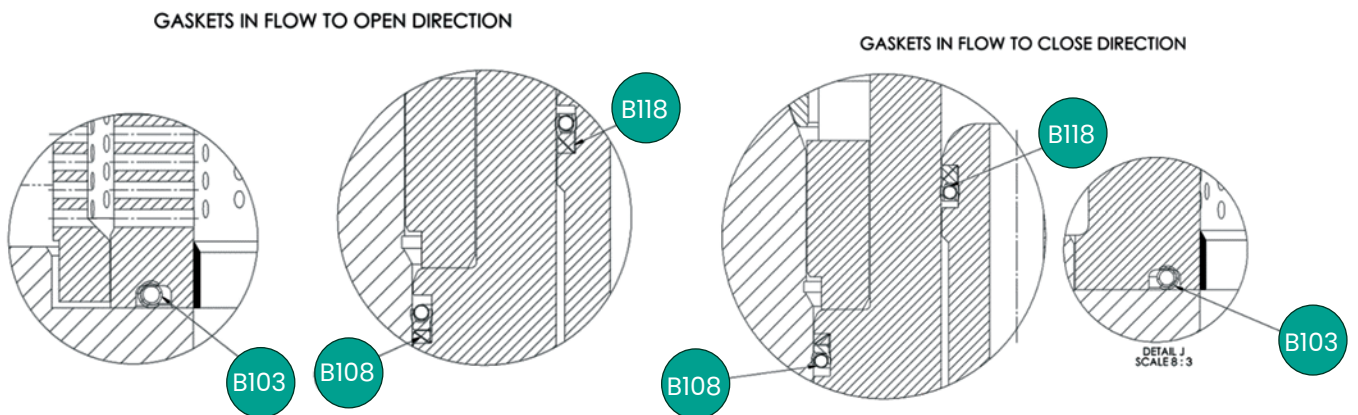


Figure x - Trim Gaskets Detail

Materials of Construction

Martensitic Stainless Steel Construction

41005 API 6A Martensitic Stainless Steel construction is covering:

- Max operating pressure up to 15 kPSI [1034 bar]
- Temperature Ratings: K/L/N/P/S/T/U/V/X (Refer to table on page 41)
- Material classes: AA/BB/CC/FF (Refer to table on page 41)

| Ref. No | Temperature Range | -60°C [-76°F] | -29°C [-20°F] | 121°C [250°F] | 180°C [356°F] | |
|---------|--------------------------|---|--|------------------|------------------|--|
| | | Materials | | | | |
| B001 | Valve Body | ASTM A182 GR F6NM API6A | | | | |
| | | ASTM A182 GR F6NM API6A ELEVATED TEMPERATURE X (see page 41) | | | | |
| B002 | Body Stud ⁽⁴⁾ | | ASTM A193 GRADE B7 ZINC PLATED + PTFE COATING API6A ^(1 & 5) | | | |
| | | | ASTM A193 GR B7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | | |
| | | | ASTM A320 Gr L7 ZINC PLATED + PTFE COATING ^(1 & 5) | | | |
| | | | ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING + PTFE COATING ⁽²⁾ | | | |
| B003 | Bonnet | ASTM A182 GR F6NM API6A | | | | |
| | | ASTM A182 GR F6NM API6A ELEVATED TEMPERATURE X (see page 41) | | | | |
| B014 | Body Nut ⁽⁴⁾ | | ASTM A194 GR 2H ZINC PLATED + PTFE COATING ^(1 & 5) | | | |
| | | | ASTM A194 GR 2HM, ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | | |
| | | | ASTM A194 Gr 7 ZINC PLATED as per CES 1041 + PTFE COATING ^(1 & 5) | | | |
| | | | ASTM A194 Gr 7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | | |
| B015 | Body Gasket | ALLOY 718 + MOS2 COATING | | | | |
| B103 | Seat Ring Gasket | INCONEL 718 + SILVER PLATING | | | | |
| B105 | Retainer | SUPER AUSTENITIC STAINLESS STEEL UNS S20910 (NITRONIC X) 35 HRC MAXIMUM | | | | |
| B107 | Cage | ASTM A182 GR F6NM CL B + CHROME PLATING + STELLITE N°6 HARDFACING | | | | |
| B108 | Cage Gasket | PRESSURE ENERGIZED POLYMERIC | | | | |
| B112 | Plug | HARDFACING STELLITE 6 ON 6NM | | | | |
| B110 | Outer Cage | CA6NM CLASS B STAINLESS STEEL HB 255 MAXIMUM | | | | |
| B118 | Plug Balanced Seal | PRESSURE ENERGIZED POLYMERIC | | | | |

41005 API 6A Martensitic Stainless Steel construction (Cont.)

| Ref. No | Temperature Range | -60°C [-76°F] | -29°C [-20°F] | 121°C [250°F] | 180°C [356°F] |
|---------|--|--|---|------------------|------------------|
| | | Materials | | | |
| B150 | Plug Stem ⁽³⁾ | ASTM A182 GR F6NM API6A | | | |
| | | ASTM A182 GR F6NM API6A ELEVATED TEMPERATURE X (see page 41) | | | |
| B203 | Packing Bushing | STELLITE NO.6 OR EQUIVALENT | | | |
| B207 | Packing Ring | CARBON CORE ⁽⁶⁾ | | | |
| B208 | Anti Extrusion Ring | CARBON-GRAPHITE BRAIDED ⁽⁶⁾ | | | |
| B219 | Packing Flange/ Follower ⁽³⁾ | ASTM A182 GR F6NM API6A | | | |
| | | ASTM A182 GR F6NM API6A ELEVATED TEMPERATURE X (see page 41) | | | |
| B220 | Packing Stud ⁽⁴⁾ | | ASTM A193 GRADE B7 ZINC PLATED ⁽¹⁾ | | |
| | | | ASTM A193 GR B7M ELECTROLESS NICKEL PLATING ⁽²⁾ | | |
| | | | ASTM A320 Gr L7 ZINC PLATED ⁽¹⁾ | | |
| | | | ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING ⁽²⁾ | | |
| B221 | Packing Nut ⁽⁴⁾ | | ASTM A 194 GR 2H ZINC PLATED ⁽¹⁾ | | |
| | | | ASTM A194 GR 2HM, ELECTROLESS NICKEL PLATING ⁽²⁾ | | |
| | | | ASTM A194 GR 7 ZINC PLATED ⁽¹⁾ | | |
| | | | ASTM A194 GR 7M ELECTROLESS NICKEL PLATING ⁽²⁾ | | |
| B903 | Plug Pin | SOLUTION ANNEALED 316 STAINLESS STEEL HRC 22 MAXIMUM | | | |
| B914 | Cage Set Screw | SOLUTION ANNEALED 316L HRC 22 MAXIMUM STAINLESS STEEL HARDNESS COMPLIANCE WITH NACE MR0103 and MR0175 SHALL BE CERTIFIED | | | |
| B921 | Body plain Washer ⁽⁴⁾ | ASTM F436 ZINC PLATED | | | |
| | | 410 ST ST HRC 35-45 | | | |
| B921a | Packing Plain Washer ⁽⁴⁾ | ASTM F436 ZINC PLATED | | | |
| | | 410 ST ST HRC 35-45 | | | |

Notes:

1. For General Service only: NACE Non-Exposed per ANSI/NACE MR0175/ISO 15156-1.
2. For Sour Service only: NACE Exposed per ANSI/NACE MR0175/ISO 15156-1.
3. Considered as pressure containing parts in API 6A specification see Design Practice BHDP10046.
4. Zinc electroplating is not permitted for splash zone or subsea service.
5. Blue is the standard coating color.
6. No equivalents allowed to maintain fugitive emission certification and performance.

Materials of Construction

Duplex F51 Stainless Steel Construction

41005 API 6A Duplex F51 Stainless-Steel construction is covering:

- Max operating pressure up to 10 kPSI [690 bar]
- Temperature class: L/N/P/S/T/U/V/X (Refer to table on page 41)
- Material class: AA/BB/CC/FF (Refer to table on page 41)

| Ref. No. | Temperature Range | -46°C [-50°F] | -29°C [-20.2°F] | 121°C [250°F] | 180°C [356°F] |
|----------|--------------------------|--|--|---------------|---------------|
| | | Materials | | | |
| B001 | Valve Body | ASTM A182 GR F51 API6A | | | |
| | | ASTM A182 GR F51 API6A ELEVATED TEMPERATURE X (see page 41) | | | |
| B002 | Body Stud ⁽⁴⁾ | | ASTM A193 GRADE B7 ZINC PLATED + PTFE COATING API6A ^(1&5) | | |
| | | | ASTM A193 GR B7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2&5) | | |
| | | | ASTM A320 Gr L7 ZINC PLATED + PTFE COATING ^(1&5) | | |
| | | | ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2&5) | | |
| B003 | Bonnet | ASTM A182 GR F51 API6A | | | |
| | | ASTM A182 GR F51 API6A ELEVATED TEMPERATURE X (see page 41) | | | |
| B014 | Body Nut ⁽⁴⁾ | | ASTM A 194 GR 2H ZINC PLATED + PTFE COATING ^(1&5) | | |
| | | | ASTM A194 GR 2HM, ELECTROLESS NICKEL PLATING + PTFE COATING ^(2&5) | | |
| | | | ASTM A194 Gr 7 ZINC PLATED + PTFE COATING ^(1&5) | | |
| | | | ASTM A194 Gr 7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2&5) | | |
| B015 | Body Gasket | ALLOY 718 + MOS2 COATING | | | |
| B103 | Seat Ring Gasket | INCONEL 718 + SILVER PLATING | | | |
| B105 | Retainer | SUPER AUSTENITIC STAINLESS STEEL UNS S20910 (NITRONIC 50) 35 HRC MAXIMUM | | | |
| B107 | Cage | ASTM A 479 UNS S31803 + STELLITE N°6 + CHROME PLATING | | | |
| B108 | Cage Gasket | PRESSURE ENERGIZED POLYMERIC | | | |
| B110 | Outer Cage | SOLUTION ANNEALED 2205 STAINLESS STEEL (DUPLEX) HRc 28 MAXIMUM | | | |
| B112 | Plug | 2205 STAINLESS STEEL (DUPLEX) HRc 28 MAXIMUM + HARDFACING STELLITE NO.6 | | | |
| B118 | Plug Balanced Seal | PRESSURE ENERGIZED POLYMERIC | | | |

Duplex F51 Stainless Steel construction (Cont.)

| Ref. No. | Temperature Range | -46°C [-50°F] | -29°C [-20.2°F] | 121°C [250°F] | 180°C [356°F] | |
|----------|--|--|--------------------|------------------|---|--|
| | | Materials | | | | |
| B150 | Plug Stem ⁽³⁾ | ASTM A182 GR F51 API6A | | | | |
| | | ASTM A182 GR F51 API6A ELEVATED TEMPERATURE X (see page 41) | | | | |
| B203 | Packing Bushing | STELLITE NO.6 OR EQUIVALENT | | | | |
| B207 | Packing Ring | CARBON CORE PTFE ⁽⁶⁾ | | | | |
| B208 | Anti Extrusion Ring | CARBON-GRAPHITE BRAIDED ⁽⁶⁾ | | | | |
| B219 | Packing Flange/ Follower ⁽³⁾ | ASTM A182 GR F51 API6A | | | | |
| | | ASTM A182 GR F51 API6A ELEVATED TEMPERATURE X (see page 41) | | | | |
| B220 | Packing Stud ⁽⁴⁾ | | | | ASTM A193 GRADE B7 ZINC PLATED ⁽¹⁾ | |
| | | | | | ASTM A193 GR B7M ELECTROLESS NICKEL PLATING ⁽²⁾ | |
| | | | | | ASTM A320 Gr L7 ZINC PLATED ⁽¹⁾ | |
| | | | | | ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING ⁽²⁾ | |
| B221 | Packing Nut ⁽⁴⁾ | | | | ASTM A 194 GR 2H ZINC PLATED ⁽¹⁾ | |
| | | | | | ASTM A194 GR 2HM, ELECTROLESS NICKEL PLATING ⁽²⁾ | |
| | | | | | ASTM A194 GR 7 ZINC PLATED ⁽¹⁾ | |
| | | | | | ASTM A194 GR 7M ELECTROLESS NICKEL PLATING ⁽²⁾ | |
| B903 | Plug Pin | SOLUTION ANNEALED 2205 STAINLESS STEEL (DUPLEX) HRC 28 MAXIMUM | | | | |
| B914 | Cage Set Screw | SOLUTION ANNEALED 316L HRC 22 MAXIMUM STAINLESS STEEL HARDNESS COMPLIANCE WITH NACE MR0103 and MR0175 SHALL BE CERTIFIED | | | | |
| B921 | Body plain Washer | ASTM F436 ZINC PLATED | | | | |
| | | 410 ST ST HRC 35-45 | | | | |
| B921a | Packing Plain Washer ⁽⁴⁾ | ASTM F436 ZINC PLATED | | | | |
| | | 410 ST ST HRC 35-45 | | | | |

Notes:

1. For General Service only: Nace Non-Exposed per ANSI/NACE MR0175/ISO 15156-1.
2. For Sour Service only: Nace Exposed per ANSI/NACE MR0175/ISO 15156-1.
3. Considered as pressure containing parts in API 6A specification.
4. Zinc electroplating is not permitted for splash zone or subsea service.
5. Blue is the standard coating color.
6. No equivalents allowed to maintain fugitive emission certification and performance.

Materials of Construction

Super Duplex F55 Stainless Construction

41005 API 6A Super Duplex F55 Stainless-Steel construction is covering:

- Max operating pressure up to 15 kPSI [1034 bar]
- Temperature class: L/N/P/S/T/U/V/X (Refer to table on page 41)
- Material class: AA/BB/CC/FF (Refer to table on page 41)

| Ref. No. | Temperature Range | -46°C [-50°F] | -29°C [-20.2°F] | 121°C [250°F] | 180°C [356°F] | |
|----------|--------------------------|--|--|------------------|------------------|--|
| | | Materials | | | | |
| B001 | Valve Body | ASTM A182 GR F55 API6A | | | | |
| | | ASTM A182 GR F55 API6A ELEVATED TEMPERATURE X (see page 41) | | | | |
| B002 | Body Stud ⁽⁴⁾ | | ASTM A193 GRADE B7 ZINC PLATED + PTFE COATING API6A ^(1 & 5) | | | |
| | | | ASTM A193 GR B7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | | |
| | | | ASTM A320 Gr L7 ZINC PLATED + PTFE COATING ^(1 & 5) | | | |
| | | | ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | | |
| B003 | Bonnet | ASTM A182 GR F55 API6A | | | | |
| | | ASTM A182 GR F55 API6A ELEVATED TEMPERATURE X (see page 41) | | | | |
| B014 | Body Nut ⁽⁴⁾ | | ASTM A 194 GR 2H ZINC PLATED + PTFE COATING ^(1 & 5) | | | |
| | | | ASTM A194 GR 2HM, ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | | |
| | | | ASTM A194 Gr 7 ZINC PLATED + PTFE COATING ^(1 & 5) | | | |
| | | | ASTM A194 Gr 7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | | |
| B015 | Body Gasket | ALLOY 718 + MOS2 COATING | | | | |
| B103 | Seat Ring Gasket | INCONEL 718 + SILVER PLATING | | | | |
| B105 | Retainer | SUPER AUSTENITIC STAINLESS STEEL UNS S20910 (NITRONIC 50) 35 HRC MAXIMUM | | | | |
| B107 | Cage | ASTM A 479 UNS S32760 + STELLITE N°6 + CHROME PLATING | | | | |
| B108 | Cage Gasket | PRESSURE ENERGIZED POLYMERIC | | | | |
| B110 | Outer Cage | SUPER DUPLEX AUSTENO-FERRITIQUE STAINLESS STEEL (TYPE UNS S32760) HRC 32 MAXIMUM] | | | | |
| B112 | Plug | HARDFACING STELL N°6 ON SOLUTION ANNEALED SUPER DUPLEX AUSTENO-FERRITIQUE STAINLESS STEEL (TYPE UNS S32760) HRC 32 MAXIMUM | | | | |
| B118 | Plug Balanced Seal | PRESSURE ENERGIZED POLYMERIC | | | | |

Super Duplex F55 Stainless Steel construction (Cont.)

| Ref. No. | Temperature Range | -46°C [-50°F] | -29°C [-20.2°F] | 121°C [250°F] | 180°C [356°F] | |
|----------|--|--|--------------------|------------------|---|--|
| | | Materials | | | | |
| B150 | Plug Stem ⁽³⁾ | ASTM A182 GR F55 API6A | | | | |
| | | ASTM A182 GR F55 API6A ELEVATED TEMPERATURE X (see page 41) | | | | |
| B203 | Packing Bushing | STELLITE NO.6 OR EQUIVALENT | | | | |
| B207 | Packing Ring | CARBON CORE PTFE ⁽⁶⁾ | | | | |
| B208 | Anti Extrusion Ring | CARBON-GRAPHITE BRAIDED ⁽⁶⁾ | | | | |
| B219 | Packing Flange/ Follower ⁽³⁾ | ASTM A182 GR F55 API6A | | | | |
| | | ASTM A182 GR F55 API6A ELEVATED TEMPERATURE X (see page 41) | | | | |
| B220 | Packing Stud ⁽⁴⁾ | | | | ASTM A193 GRADE B7 ZINC PLATED ⁽¹⁾ | |
| | | | | | ASTM A193 GR B7M ELECTROLESS NICKEL PLATING ⁽²⁾ | |
| | | | | | ASTM A320 Gr L7 ZINC PLATED ⁽¹⁾ | |
| | | | | | ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING ⁽²⁾ | |
| B221 | Packing Nut ⁽⁴⁾ | | | | ASTM A 194 GR 2H ZINC PLATED ⁽¹⁾ | |
| | | | | | ASTM A194 GR 2HM, ELECTROLESS NICKEL PLATING ⁽²⁾ | |
| | | | | | ASTM A194 GR 7 ZINC PLATED ⁽¹⁾ | |
| | | | | | ASTM A194 GR 7M ELECTROLESS NICKEL PLATING ⁽²⁾ | |
| B903 | Plug Pin | SUPER DUPLEX AUSTENO-FERRITIQUE STAINLESS STEEL (TYPE UNS S32760) HRC 32 MAXIMUM | | | | |
| B914 | Cage Set Screw | SOLUTION ANNEALED 316L HRC 22 MAXIMUM STAINLESS STEEL HARDNESS COMPLIANCE WITH NACE MR0103 and MR0175 SHALL BE CERTIFIED | | | | |
| B921 | Body plain Washer ⁽⁴⁾ | ASTM F436 ZINC PLATED | | | | |
| | | 410 ST ST HRC 35-45 | | | | |
| B921a | Packing Plain Washer ⁽⁴⁾ | ASTM F436 ZINC PLATED | | | | |
| | | 410 ST ST HRC 35-45 | | | | |

Notes:

1. For General Service only: Nace Non-Exposed per ANSI/NACE MR0175/ISO 15156-1
2. For Sour Service only: Nace Exposed per ANSI/NACE MR0175/ISO 15156-1
3. Considered as pressure containing parts in API 6A specification
4. Zinc electroplating is not permitted for splash zone or subsea service.
5. Blue is the standard coating color.
6. No equivalents allowed to maintain fugitive emission certification and performance.

Materials of Construction

CRA Inconel 718 Construction

41005 API 6A CRA Inconel 718 construction is covering:

- Max operating pressure is up to 15 kPSI [1034 bar]
- Temperature class: K/L/N/P/S/T/U/V/X (Refer to table on page 41)
- Material class: AA/BB/CC/DD/EE/FF/HH (Refer to table on page 41)

| Ref. No. | Temperature Range | -60°C [-76°F] | -29°C [-20.2°F] | 121°C [250°F] | 180°C [356°F] |
|----------|--------------------------|--|--|------------------|------------------|
| | | Materials | | | |
| B001 | Valve Body | UNS N07718 | | | |
| | | UNS N07718 ELEVATED TEMPERATURE X (see page 41) | | | |
| B002 | Body Stud ⁽⁴⁾ | | ASTM A193 GRADE B7 ZINC PLATED + PTFE COATING API6A ^(1 & 5) | | |
| | | | ASTM A193 GR B7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | |
| | | | ASTM A320 Gr L7 ZINC PLATED + PTFE COATING ^(1 & 5) | | |
| | | | ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | |
| B003 | Bonnet | UNS N07718 | | | |
| | | UNS N07718 ELEVATED TEMPERATURE X (see page 41) | | | |
| B014 | Body Nut ⁽⁴⁾ | | ASTM A 194 GR 2H ZINC PLATED + PTFE COATING ^(1 & 5) | | |
| | | | ASTM A194 GR 2HM, ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | |
| | | | ASTM A194 Gr 7 ZINC PLATED + PTFE COATING ^(1 & 5) | | |
| | | | ASTM A194 Gr 7M ELECTROLESS NICKEL PLATING + PTFE COATING ^(2 & 5) | | |
| B015 | Body Gasket | ALLOY 718 + MOS2 COATING | | | |
| B103 | Seat Ring Gasket | INCONEL 718 + SILVER PLATING | | | |
| B105 | Retainer | SUPER AUSTENITIC STAINLESS STEEL UNS S20910 (NITRONIC 50) 35 HRC MAXIMUM | | | |
| B107 | Cage | UNS N07718 | | | |
| | | UNS N07718 ELEVATED TEMPERATURE X (see page 41) | | | |
| B108 | Cage Gasket | PRESSURE ENERGIZED POLYMERIC | | | |
| B110 | Outer Cage | UNS N07718 | | | |
| | | UNS N07718 ELEVATED TEMPERATURE X (see page 41) | | | |
| B112 | Plug | UNS N07718 | | | |
| | | UNS N07718 ELEVATED TEMPERATURE X (see page 41) | | | |
| B118 | Plug Balanced Seal | PRESSURE ENERGIZED POLYMERIC | | | |

CRA Inconel 718 construction (Cont.)

| Ref. No. | Temperature Range | -60°C [-76°F] | -29°C [-20.2°F] | 121°C [250°F] | 180°C [356°F] |
|----------|--|---|--|------------------|------------------|
| | | Materials | | | |
| B150 | Plug Stem ⁽³⁾ | UNS N07718 | | | |
| | | UNS N07718 ELEVATED TEMPERATURE X (see page 41) | | | |
| B220 | Packing Stud ⁽⁴⁾ | | ASTM A193 GRADE B7 ZINC PLATED ⁽¹⁾ | | |
| | | | ASTM A193 GR B7M ELECTROLESS NICKEL PLATING ⁽²⁾ | | |
| | | | ASTM A320 Gr L7 ZINC PLATED(1) | | |
| | | | ASTM A320 Gr L7M ELECTROLESS NICKEL PLATING (2) | | |
| B221 | Packing Nut ⁽⁴⁾ | | ASTM A 194 GR 2H ZINC PLATED ⁽¹⁾ | | |
| | | | ASTM A194 GR 2HM, ELECTROLESS NICKEL PLATING | | |
| | | | ASTM A194 GR 7 ZINC PLATED | | |
| | | | ASTM A194 GR 7M ELECTROLESS NICKEL PLATING | | |
| B203 | Packing Bushing | STELLITE NO.6 OR EQUIVALENT | | | |
| B207 | Packing Ring | CARBON CORE PTFE ⁽⁶⁾ | | | |
| B208 | Anti Extrusion Ring | CARBON-GRAPHITE BRAIDED ⁽⁶⁾ | | | |
| B213 | Packing Flange/ Follower ⁽³⁾ | UNS N07718 | | | |
| | | UNS N07718 ELEVATED TEMPERATURE X (see page 41) | | | |
| B903 | Plug Pin | ASTM B637 GRADE NO7718 (UNS 07718) HRc 40 MAXIMUM . HARDNESS COMPLIANCE WITH NACE MR0103 SHALL BE CERTIFIED | | | |
| B914 | Cage Set Screw | ASTM B637 GRADE NO7718 (UNS 07718) HRc 40 MAXIMUM. HARDNESS COMPLIANCE WITH NACE MR0103 SHALL BE CERTIFIED | | | |
| B921 | Body plain Washer ⁽⁴⁾ | ASTM F436 ZINC PLATED | | | |
| | | 410 ST ST HRC 35-45 | | | |
| B921a | Packing Plain Washer ⁽⁴⁾ | ASTM F436 ZINC PLATED | | | |
| | | 410 ST ST HRC 35-45 | | | |

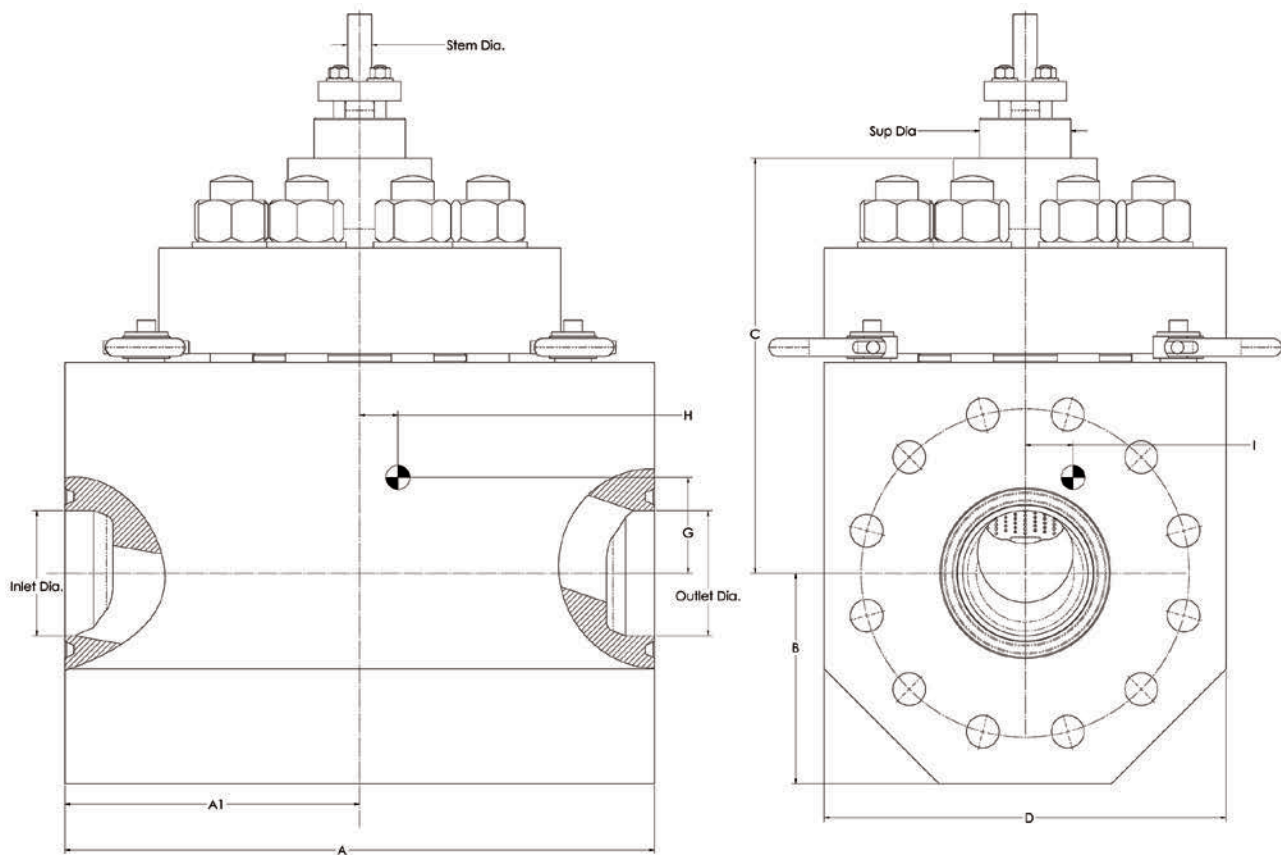
Notes:

1. For General Service only: Nace Non-Exposed per ANSI/NACE MR0175/ISO 15156-1.
2. For Sour Service only: Nace Exposed per ANSI/NACE MR0175/ISO 15156-1.
3. Considered as pressure containing parts in API 6A specification.
4. Zinc electroplating is not permitted for splash zone or subsea service.
5. Blue is the standard coating color.
6. No equivalents allowed to maintain fugitive emission certification and performance.

Common Parts

| Ref. No. | Temperature Range | -60°C [-76°F] | -29°C [-20.2°F] | 121°C [250°F] | 180°C [356°F] |
|----------|-------------------|--|--------------------|------------------|------------------|
| | | Materials | | | |
| B017 | Drive Nut | SOLUTION ANNEALED 316 STAINLESS STEEL HRc 22 MAXIMUM | | | |
| B703 | Serial Plate | GENERAL SERVICE ANNEALED 316L ST ST HRc 22 MAX | | | |
| B704 | Flow Arrow | AUSTENITIC STAINLESS STEEL | | | |
| B902 | Drive Screw | AUSTENITIC STAINLESS STEEL | | | |
| B911 | Lifting Lugs | STAINLESS STEEL | | | |
| B913 | Yoke/Bonnet Screw | A4-80 (ISO 3506) 316L | | | |

Dimensions



Inches API 10K and 15K Body S/A dimensions

| Valve Body Size (NPS) | Valve Ends Size (NPS) | Stem Dia. | Inlet Dia. | Outlet Dia. | Spud Dia. | API 10K and API 10K Design 120K | | | | | API 15K and API 15K Design 120K | | | | |
|-----------------------|--|-----------|------------|-------------|-----------|---------------------------------|-------|-------|-------|-------|---------------------------------|-------|-------|-------|-------|
| | | | | | | 6BX | | | | | 6BX | | | | |
| | | | | | | A | A1 | B | C | D | A | A1 | B | C | D |
| 3 | 4 ¹ / ₁₆ (4.0625) | 1 | 4.08 | 4.08 | 3.75 | 20.47 | 10.23 | 6.38 | 16.43 | 14.76 | 20.47 | 10.23 | 7.16 | 16.43 | 15.75 |
| 4 | 5 ¹ / ₈ (5.125) | 1 | 5.15 | 5.15 | 3.75 | 24.25 | 12.13 | 8.66 | 17 | 14.96 | 24.25 | 12.13 | 8.66 | 17 | 16.54 |
| 6 | 7 ¹ / ₁₆ (7.0625) | 1.125 | 7.09 | 7.09 | 5 | 27.56 | 13.78 | 9.45 | 19.35 | 19.17 | 27.56 | 13.78 | 10.04 | 19.35 | 20.08 |
| 8 | 9" | 1.25 | 8.27 | 8.27 | 5 | 34.64 | 17.32 | 13 | 22.19 | 24.4 | 34.64 | 17.32 | 13 | 22.19 | 26 |
| 10 | 11" | 1.25 | 10.12 | 10.12 | 5 | 40.55 | 20.28 | 13.78 | 25.74 | 27.17 | 40.55 | 20.28 | 16.34 | 25.74 | 32 |

mm API 10K and 15K Body S/A dimensions

| Valve Trim Size (NPS) | Valve Ends Size (NPS) | Stem Dia. | Inlet Dia. | Outlet Dia. | Spud Dia. | API 10K and API 10K Design 120K | | | | | API 15K and API 15K Design 120K | | | | |
|-----------------------|--|-----------|------------|-------------|-----------|---------------------------------|-----|-----|-------|-----|---------------------------------|-----|-----|-------|-----|
| | | | | | | 6BX | | | | | 6BX | | | | |
| | | | | | | A | A1 | B | C | D | A | A1 | B | C | D |
| 3 | 4 ¹ / ₁₆ (4.0625) | 25.4 | 103.65 | 103.65 | 95.25 | 520 | 260 | 162 | 417 | 375 | 520 | 260 | 182 | 417 | 400 |
| 4 | 5 ¹ / ₈ (5.125) | 25.4 | 130.85 | 130.85 | 95.25 | 616 | 308 | 220 | 433 | 380 | 616 | 308 | 220 | 433 | 420 |
| 6 | 7 ¹ / ₁₆ (7.0625) | 28.575 | 180.1 | 180.1 | 127 | 700 | 350 | 240 | 491.5 | 487 | 700 | 350 | 255 | 491.5 | 510 |
| 8 | 9" | 31.75 | 210 | 210 | 127 | 880 | 440 | 330 | 564 | 620 | 880 | 440 | 330 | 563.5 | 660 |
| 10 | 11" | 31.75 | 257 | 257 | 127 | 1030 | 515 | 350 | 654 | 690 | 1030 | 515 | 415 | 654 | 814 |

Weights / Center of Gravity

Body S/A (lbs.) / Center of Gravity (inches)

| Valve Body Size (NPS) | Valve Ends Size (NPS) | API 10K | | | | API 15K | | | |
|-----------------------|-----------------------|--------------------|---|---|------|--------------------|---|---|-------|
| | | 6BX Printed Flange | | | | 6BX Printed Flange | | | |
| | | G | H | I | Mass | G | H | I | Mass |
| 3 | 4"1/16 (4.0625) | 3.3 | 0 | 0 | 1216 | 3 | 0 | 0 | 1410 |
| 4 | 5"1/8 (5.125) | 2.2 | 0 | 0 | 1672 | 2.4 | 0 | 0 | 1917 |
| 6 | 7"1/16 (7.0625) | 3.56 | 0 | 0 | 2943 | 3.28 | 0 | 0 | 3343 |
| 8 | 9" | 3.8 | 0 | 0 | 5886 | 4.14 | 0 | 0 | 6489 |
| 10 | 11" | 5 | 0 | 0 | 8597 | 3.67 | 0 | 0 | 10898 |

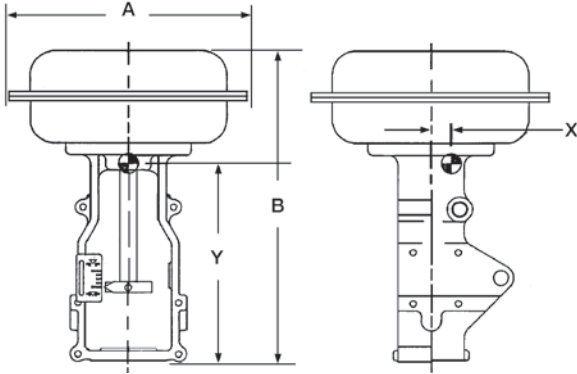
| Valve Body Size (NPS) | Valve Ends Size (NPS) | API 10K Design 120K | | | | API 15K Design 120K | | | |
|-----------------------|-----------------------|---------------------|---|---|------|---------------------|---|---|-------|
| | | 6BX Printed Flange | | | | 6BX Printed Flange | | | |
| | | G | H | I | Mass | G | H | I | Mass |
| 3 | 4"1/16 (4.0625) | 3 | 0 | 0 | 1172 | 2.6 | 0 | 0 | 1354 |
| 4 | 5"1/8 (5.125) | 1.8 | 0 | 0 | 1645 | 2 | 0 | 0 | 1917 |
| 6 | 7"1/16 (7.0625) | 3.17 | 0 | 0 | 2855 | 2.85 | 0 | 0 | 3238 |
| 8 | 9" | 3.18 | 0 | 0 | 5673 | 3.5 | 0 | 0 | 6237 |
| 10 | 11" | 4.32 | 0 | 0 | 8319 | 3.15 | 0 | 0 | 10628 |

Body S/A (kg) / Center of Gravity (mm)

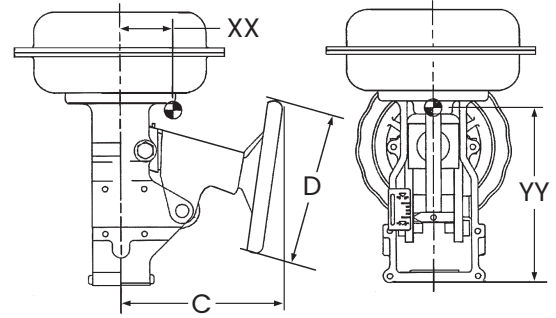
| Valve Trim Size (NPS) | Valve Ends Size (NPS) | API 10K | | | | API 15K | | | |
|-----------------------|-----------------------|--------------------|---|---|------|--------------------|---|---|------|
| | | 6BX Printed Flange | | | | 6BX Printed Flange | | | |
| | | G | H | I | Mass | G | H | I | Mass |
| 3 | 4"1/16 (4.0625) | 83 | 0 | 0 | 552 | 76 | 0 | 0 | 640 |
| 4 | 5"1/8 (5.125) | 54 | 0 | 0 | 758 | 61 | 0 | 0 | 870 |
| 6 | 7"1/16 (7.0625) | 90 | 0 | 0 | 1335 | 83 | 0 | 0 | 1516 |
| 8 | 9" | 97 | 0 | 0 | 2670 | 105 | 0 | 0 | 2943 |
| 10 | 11" | 125 | 0 | 0 | 3900 | 93 | 0 | 0 | 4941 |

| Valve Trim Size (NPS) | Valve Ends Size (NPS) | API 10K Design 120K | | | | API 15K Design 120K | | | |
|-----------------------|-----------------------|---------------------|---|---|------|---------------------|---|---|------|
| | | 6BX Printed Flange | | | | 6BX Printed Flange | | | |
| | | G | H | I | Mass | G | H | I | Mass |
| 3 | 4"1/16 (4.0625) | 75 | 0 | 0 | 532 | 66 | 0 | 0 | 614 |
| 4 | 5"1/8 (5.125) | 47 | 0 | 0 | 746 | 51 | 0 | 0 | 870 |
| 6 | 7"1/16 (7.0625) | 81 | 0 | 0 | 1295 | 72 | 0 | 0 | 1469 |
| 8 | 9" | 81 | 0 | 0 | 2573 | 89 | 0 | 0 | 2829 |
| 10 | 11" | 110 | 0 | 0 | 3774 | 80 | 0 | 0 | 4821 |

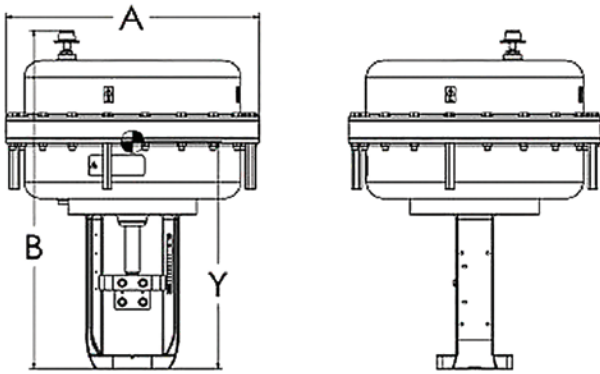
87/88 Actuators - Dimensions and Weights (U.S.)



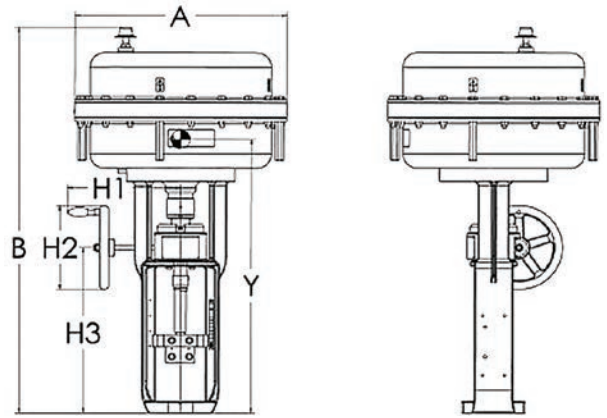
Shown without optional Handwheel



Shown with optional Handwheel



23L Shown without optional Handwheel



23L Shown with optional Handwheel

Dimensions and Weights

| Actuator Size | Spring Range | Actuator Dimensions (inches) | | | | H1 | H2 | Weights (lbs.) | |
|---------------|--------------|------------------------------|---------------|------|----|------|-----|----------------|-------------|
| | | A | B (Model 88) | C | D | | | Standard | w/Handwheel |
| 6 | All | 11.5 | 15.54 (17.52) | 10 | 9 | - | - | 45 | 60 |
| 10 | All | 14.5 | 19.58 (21.54) | 10.9 | 12 | - | - | 85 | 105 |
| 16 | All | 18.75 | 28.22 (30.79) | 14 | 18 | - | - | 210 | 245 |
| 23 | All | 21.63 | 30.71 (33.27) | 16 | 18 | - | - | 265 | 320 |
| 23L | 3-15, 6-30 | 21.63 | 27.8 (30.00) | - | - | 11.5 | 8.9 | 375 | 417 |
| 23L | 11-23, 21-45 | 21.63 | 38.55 (40.75) | - | - | 11.5 | 8.9 | 507 | 549 |

Actuator Removal Clearance = 6 inches

Center of Gravity (inches)

Without Handwheel

| Size | X | Y |
|------------------|-----|------|
| 6 | 0.2 | 9.8 |
| 10 | 0.0 | 12.9 |
| 16 | 0.1 | 18.5 |
| 23 | 0.1 | 21.1 |
| 23L ¹ | 0.0 | 20.1 |
| 23L ² | 0.0 | 21.9 |

With Handwheel

| Size | XX | YY |
|------------------|-----|------|
| 6 | 1.3 | 9.1 |
| 10 | 0.9 | 12.0 |
| 16 | 1.4 | 16.7 |
| 23 | 1.4 | 19.0 |
| 23L ¹ | 0.0 | 28.9 |
| 23L ² | 0.0 | 30.7 |

1. Nominal spring ranges 3-15 and 6-30

2. Nominal spring ranges 11-23 and 21-45

87/88 Actuators – Dimensions and Weights (U.S.)

Limit Stops (inches)

Up Stop

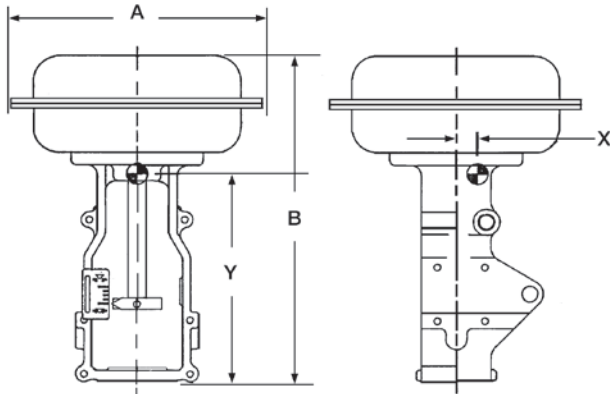
| Size | Spring Range | Model | Overall Height B |
|------------------|--------------|-------|------------------|
| 6 | All | 87 | 19.5 |
| 10 | All | | 25.4 |
| 16 | All | | 36.4 |
| 23 | All | | 38.8 |
| 23L ¹ | 3-15, 6-30 | | 38.4 |
| 23L ¹ | 11-23, 21-45 | | 41.3 |
| 23L ² | 3-15, 6-30 | | 49.1 |
| 23L ² | 11-23, 21-45 | | 52.1 |
| 6 | All | 88 | 19.2 |
| 10 | All | | 25.1 |
| 16 | All | | 35.5 |
| 23 | All | | 35.5 |
| 23L ¹ | 3-15, 6-30 | | 38.4 |
| 23L ¹ | 11-23, 21-45 | | 41.3 |
| 23L ² | 3-15, 6-30 | | 49.1 |
| 23L ² | 11-23, 21-45 | | 52.1 |

1. Without Handwheel
2. With Handwheel

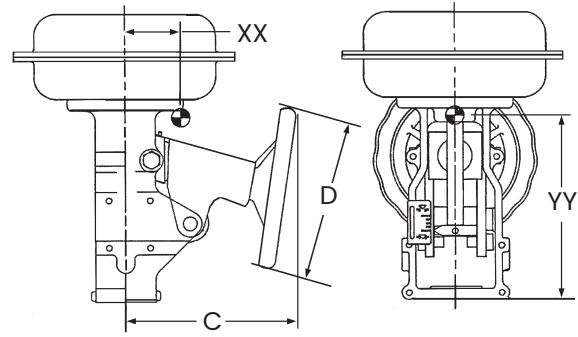
Down Stop

| Size | Spring Range | Model | Overall Height B |
|------------------|--------------|-------|------------------|
| 6 | All | 87 | 19.8 |
| 10 | All | | 26.0 |
| 16 | All | | 37.2 |
| 23 | All | | 39.9 |
| 23L ¹ | 3-15, 6-30 | | 39.9 |
| 23L ¹ | 11-23, 21-45 | | 42.8 |
| 23L ² | 3-15, 6-30 | | 50.6 |
| 23L ² | 11-23, 21-45 | | 53.6 |
| 6 | All | 88 | 19.7 |
| 10 | All | | 25.9 |
| 16 | All | | 37.5 |
| 23 | All | | 40.3 |
| 23L ¹ | 3-15, 6-30 | | 39.9 |
| 23L ¹ | 11-23, 21-45 | | 42.8 |
| 23L ² | 3-15, 6-30 | | 50.6 |
| 23L ² | 11-23, 21-45 | | 53.6 |

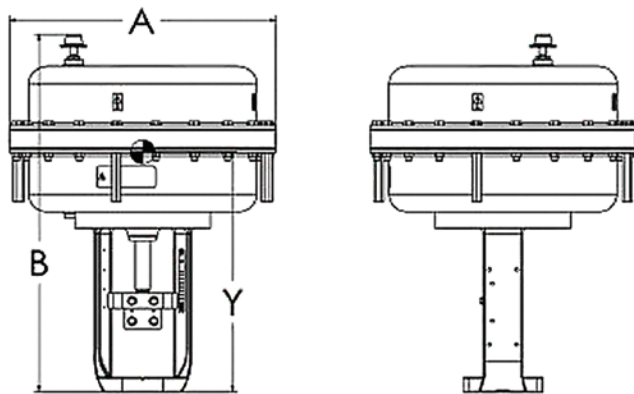
87/88 Actuators - Dimensions and Weights (Metric)



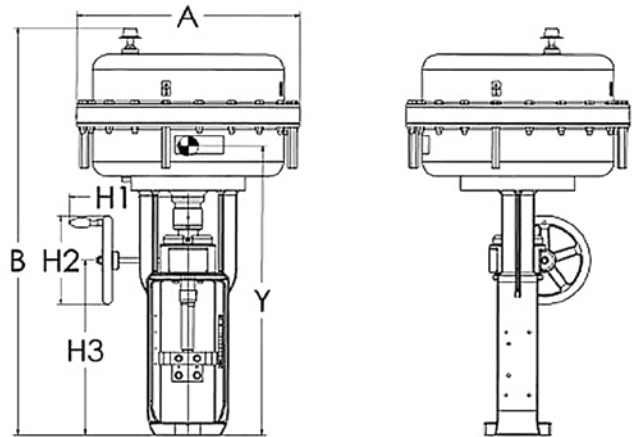
Shown without optional Handwheel



Shown with optional Handwheel



23L Shown without optional Handwheel



23L Shown with optional Handwheel

Dimensions and Weights

| Actuator Size | Spring Range | Actuator Dimensions (mm) | | | | H1 | H2 | Weights (kg) | |
|---------------|--------------|--------------------------|--------------|-----|-----|-----|-----|--------------|-------------|
| | | A | B (Model 88) | C | D | | | Standard | w/Handwheel |
| 6 | All | 302 | 395 (445) | 254 | 229 | - | - | 20 | 27 |
| 10 | All | 373 | 497 (547) | 277 | 305 | - | - | 39 | 48 |
| 16 | All | 476 | 717 (782) | 356 | 457 | - | - | 95 | 111 |
| 23 | All | 549 | 780 (845) | 406 | 457 | - | - | 120 | 145 |
| 23L | 3-15, 6-30 | 549 | 706 (762) | - | - | 292 | 225 | 170 | 189 |
| 23L | 11-23, 21-45 | 549 | 781 (837) | - | - | 292 | 225 | 230 | 249 |

Actuator Removal Clearance = 150 mm

Center of Gravity (mm)

Without Handwheel

| Size | X | Y |
|------------------|---|-----|
| 6 | 5 | 248 |
| 10 | 0 | 327 |
| 16 | 3 | 470 |
| 23 | 2 | 537 |
| 23L ¹ | 0 | 511 |
| 23L ² | 0 | 557 |

With Handwheel

| Size | XX | YY |
|------------------|----|-----|
| 6 | 32 | 232 |
| 10 | 22 | 305 |
| 16 | 35 | 425 |
| 23 | 35 | 483 |
| 23L ¹ | 0 | 734 |
| 23L ² | 0 | 780 |

1. Nominal spring ranges 3-15 and 6-30
2. Nominal spring ranges 11-23 and 21-45

87/88 Actuators – Dimensions and Weights (Metric)

Limit Stops (mm)

Up Stop

| Size | Spring Range | Model | Overall Height B | |
|------------------|--------------|-------|------------------|-----|
| 6 | All | 87 | 494 | |
| 10 | All | | 646 | |
| 16 | All | | 925 | |
| 23 | All | | 987 | |
| 23L ¹ | 3-15, 6-30 | | 975 | |
| 23L ¹ | 11-23, 21-45 | | 1050 | |
| 23L ² | 3-15, 6-30 | | 1248 | |
| 23L ² | 11-23, 21-45 | | 1323 | |
| 6 | All | | 88 | 487 |
| 10 | All | | | 636 |
| 16 | All | 901 | | |
| 23 | All | 982 | | |
| 23L ¹ | 3-15, 6-30 | 975 | | |
| 23L ¹ | 11-23, 21-45 | 1050 | | |
| 23L ² | 3-15, 6-30 | 1248 | | |
| 23L ² | 11-23, 21-45 | 1323 | | |

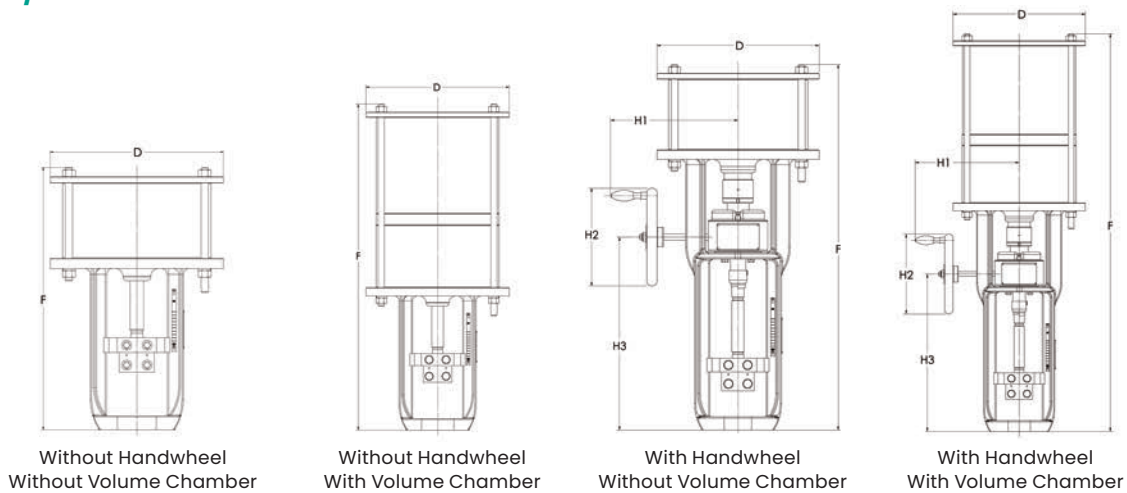
Down Stop

| Size | Spring Range | Model | Overall Height B | |
|------------------|--------------|-------|------------------|-----|
| 6 | All | 87 | 503 | |
| 10 | All | | 660 | |
| 16 | All | | 945 | |
| 23 | All | | 1014 | |
| 23L ¹ | 3-15, 6-30 | | 1013 | |
| 23L ¹ | 11-23, 21-45 | | 1088 | |
| 23L ² | 3-15, 6-30 | | 1286 | |
| 23L ² | 11-23, 21-45 | | 1361 | |
| 6 | All | | 88 | 501 |
| 10 | All | | | 657 |
| 16 | All | 952 | | |
| 23 | All | 1024 | | |
| 23L ¹ | 3-15, 6-30 | 1013 | | |
| 23L ¹ | 11-23, 21-45 | 1088 | | |
| 23L ² | 3-15, 6-30 | 1286 | | |
| 23L ² | 11-23, 21-45 | 1361 | | |

1. Without Handwheel

2. With Handwheel

51/52/53 Actuators - Dimensions



Model 51 Dimensional Data

Inches (mm)

| Size | D | H1 | H2 | H3 |
|------|------------|------------|-----------|------------|
| 12 | 14.7 (373) | 11.5 (292) | 8.9 (225) | 17.4 (443) |
| 16 | 18.1 (461) | 13.4 (340) | 11 (280) | 21.7 (553) |
| 20 | 22.6 (573) | 13.4 (340) | 11 (280) | 22.1 (563) |
| 24 | 18.1 (461) | 13.4 (340) | 11 (280) | 22.1 (563) |
| 28 | 22.6 (573) | 13.4 (340) | 11 (280) | 22.1 (563) |
| 32 | 26.4 (670) | 13.4 (340) | 11 (280) | 22.2 (564) |

| Actuator Type | Actuator Size | Dimension F inches (mm) | | | | | |
|--|---------------|-------------------------------------|-------------|-------------|-------------|-------------|-------------|
| | | Nominal Actuator Travel inches (mm) | | | | | |
| | | 2.5 (63.5) | 4 (101.6) | 6 (152.4) | 8 (203.2) | 10 (254) | 12 (304.8) |
| Standard | 12 | - | 23.0 (584) | - | - | - | - |
| | 16 | 24.7 (628) | 26.2 (666) | 28.2 (717) | 36.2 (920) | 38.2 (971) | 42.2 (1073) |
| | 20 | 25.4 (645) | 26.9 (683) | 28.9 (734) | 36.7 (931) | 38.7 (982) | 45.0 (1142) |
| | 24 | 33.1 (842) | 36.1 (918) | 40.1 (1020) | 48.1 (123) | 52.1 (1324) | 60.2 (1528) |
| | 28 | 34.3 (870) | 37.3 (946) | 52.2 (1326) | 49.3 (1251) | 53.3 (1353) | 61.3 (1556) |
| | 32 | 42.7 (1085) | 45.7 (1161) | 49.7 (1262) | 57.8 (1467) | 61.8 (1569) | 69.8 (1773) |
| Standard with Integral Volume Tank | 12 | - | 34.0 (864) | - | - | - | - |
| | 16 | 35.8 (908) | 37.3 (946) | 39.3 (997) | - | - | - |
| | 20 | 36.0 (915) | 37.5 (953) | 39.5 (1004) | - | - | - |
| Standard with Handwheel | 12 | - | 33.7 (857) | - | - | - | - |
| | 16 | 40.6 (1031) | 42.1 (1069) | 44.1 (1119) | 59.3 (1506) | 61.3 (1557) | 69.3 (1760) |
| | 20 | 41.2 (1048) | 42.7 (1086) | 44.7 (1136) | 59.6 (1513) | 61.6 (1564) | 69.6 (1767) |
| | 24 | 48.2 (1224) | 51.2 (1301) | 55.2 (1402) | 71.2 (1808) | 75.2 (1910) | 85.2 (2164) |
| | 28 | 49.2 (1249) | 52.2 (1326) | 53.2 (1427) | 72.1 (1831) | 76.1 (1933) | 86.1 (2187) |
| | 32 | 56.6 (1440) | 59.7 (1516) | 63.7 (1617) | 79.7 (2025) | 83.7 (2126) | 93.7 (2381) |
| Standard with Integral Volume Tank and Handwheel | 12 | - | 44.8 (1137) | - | - | - | - |
| | 16 | 51.6 (1311) | 53.1 (1349) | 55.1 (1399) | - | - | - |
| | 20 | 51.9 (1318) | 53.4 (1356) | 55.4 (1406) | - | - | - |

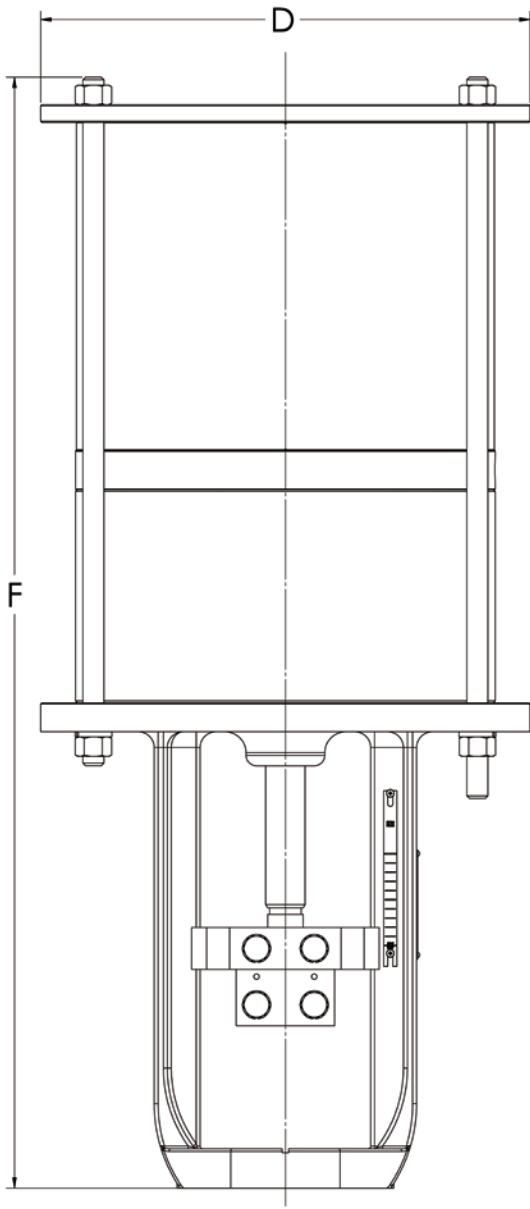
51/52/53 Actuators – Dimensions

Model 52 and 53 Dimensional Data

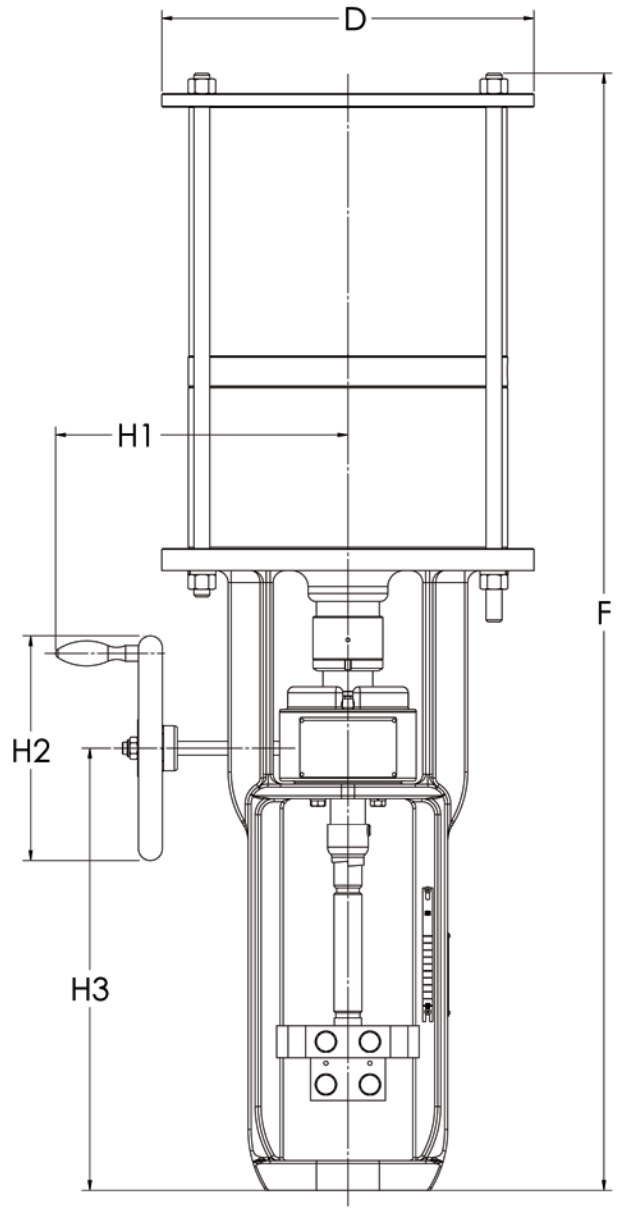
Inches (mm)

| Size | D | H1 | H2 | H3 |
|------|-------------|-------------|-------------|-------------|
| 12 | 14.69 (373) | 11.50 (292) | 8.86 (225) | 17.44 (443) |
| 16 | 18.15 (461) | 13.39 (340) | 11.02 (280) | 21.77 (553) |
| 20 | 22.56 (573) | 13.39 (340) | 11.02 (280) | 22.17 (563) |

| Actuator Type | Actuator Size | Dimension F in (mm) | | |
|-------------------------|---------------|----------------------------------|--------------|-------------|
| | | Nominal Actuator Travel In. (mm) | | |
| | | 2.5 (63.5) | 4 (101.6) | 6 (152.4) |
| Standard | 12 | - | 39.1 (993.8) | - |
| | 16 | 39.5 (1003) | 44 (1117) | 50 (1269) |
| | 20 | 41.1 (1045) | 45.6 (1159) | 51.6 (1311) |
| Standard with Handwheel | 12 | - | 49.9 (1267) | - |
| | 16 | 55.3 (1406) | 59.8 (1520) | 65.8 (1671) |
| | 20 | 64.6 (1642) | 69.1 (1756) | 75.1 (1908) |



Without Handwheel



With Handwheel

51/52/53 Actuators – Weights

In US Units (lbs)

| Actuator Size | Construction | Nominal Stroke in (mm) | Model 51 | | Model 52 | | Model 53 | |
|---------------|------------------------------|------------------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|
| | | | Without Handwheel | With Handwheel | Without Handwheel | With Handwheel | Without Handwheel | With Handwheel |
| 12 | Standard | 4 (101.6) | 179 | 227 | 412 | 456 | 410 | 454 |
| | with Integral Volume Chamber | 4 (101.6) | 280 | 328 | - | - | - | - |
| 16 | Standard | 2.5 (63.5) | 386 | 529 | 712 | 853 | 703 | 849 |
| | | 4 (101.6) | 386 | 529 | 761 | 902 | 754 | 897 |
| | | 6 (152.4) | 386 | 529 | 864 | 1005 | 855 | 1001 |
| | | 10 (254) | 465 | 628 | - | - | - | - |
| | | 12 (304.8) | 500 | 688 | - | - | - | - |
| | with Integral Volume Chamber | 2.5 (63.5) | 578 | 721 | - | - | - | - |
| | | 4 (101.6) | 578 | 721 | - | - | - | - |
| | | 6 (152.4) | 578 | 721 | - | - | - | - |
| | | 10 (254) | 465 | 628 | - | - | - | - |
| | | 12 (304.8) | 500 | 688 | - | - | - | - |
| 20 | Standard | 2.5 (63.5) | 639 | 785 | 1157 | 1303 | 1149 | 1294 |
| | | 4 (101.6) | 639 | 785 | 1261 | 1407 | 1252 | 1398 |
| | | 6 (152.4) | 639 | 785 | 1387 | 1532 | 1378 | 1523 |
| | | 10 (254) | 699 | 849 | - | - | - | - |
| | | 12 (304.8) | 741 | 919 | - | - | - | - |
| | with Integral Volume Chamber | 2.5 (63.5) | 919 | 1065 | - | - | - | - |
| | | 4 (101.6) | 919 | 1065 | - | - | - | - |
| | | 6 (152.4) | 919 | 1065 | - | - | - | - |
| | | 10 (254) | 699 | 849 | - | - | - | - |
| | | 12 (304.8) | 741 | 919 | - | - | - | - |
| 24 | Standard | 6 (152.4) | 714 | 970 | - | - | - | - |
| | | 10 (254) | 791 | 1109 | - | - | - | - |
| | | 12 (304.8) | 838 | 1177 | - | - | - | - |
| 28 | Standard | 6 (152.4) | 1190 | 1362 | - | - | - | - |
| | | 10 (254) | 1305 | 1506 | - | - | - | - |
| | | 12 (304.8) | 1369 | 1579 | - | - | - | - |
| 32 | Standard | 6 (152.4) | 2116 | 2299 | - | - | - | - |
| | | 10 (254) | 2235 | 2449 | - | - | - | - |
| | | 12 (304.8) | 2304 | 2522 | - | - | - | - |

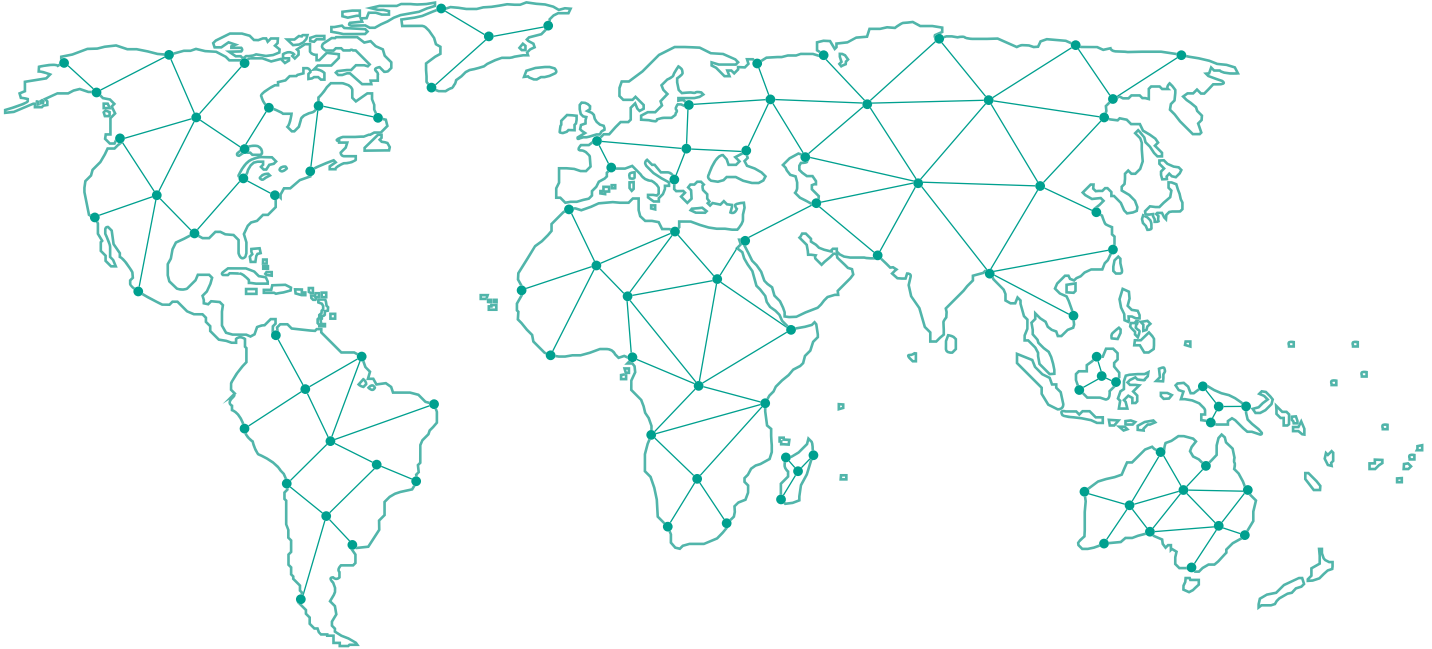
51/52/53 Actuators – Weights

In Metric Units (kg)

| Actuator Size | Construction | Nominal Stroke in (mm) | Model 51 | | Model 52 | | Model 53 | |
|---------------|------------------------------|------------------------|-------------------|----------------|-------------------|----------------|-------------------|----------------|
| | | | Without Handwheel | With Handwheel | Without Handwheel | With Handwheel | Without Handwheel | With Handwheel |
| 12 | Standard | 4 (102) | 81 | 103 | 187 | 207 | 186 | 206 |
| | with Integral Volume Chamber | 4 (102) | 127 | 149 | - | - | - | - |
| 16 | Standard | 2.5 (64) | 175 | 240 | 323 | 387 | 319 | 385 |
| | | 4 (102) | 175 | 240 | 345 | 409 | 342 | 407 |
| | | 6 (152) | 175 | 240 | 392 | 456 | 388 | 454 |
| | | 10 (254) | 211 | 285 | - | - | - | - |
| | | 12 (305) | 227 | 312 | - | - | - | - |
| | with Integral Volume Chamber | 2.5 (64) | 262 | 327 | - | - | - | - |
| | | 4 (102) | 262 | 327 | - | - | - | - |
| | | 6 (152) | 262 | 327 | - | - | - | - |
| | | 10 (254) | 211 | 285 | - | - | - | - |
| | | 12 (305) | 227 | 312 | - | - | - | - |
| 20 | Standard | 2.5 (64) | 290 | 356 | 525 | 591 | 521 | 587 |
| | | 4 (102) | 290 | 356 | 572 | 638 | 568 | 634 |
| | | 6 (152) | 290 | 356 | 629 | 695 | 625 | 691 |
| | | 10 (254) | 317 | 385 | - | - | - | - |
| | | 12 (305) | 336 | 417 | - | - | - | - |
| | with Integral Volume Chamber | 2.5 (64) | 417 | 483 | - | - | - | - |
| | | 4 (102) | 417 | 483 | - | - | - | - |
| | | 6 (152) | 417 | 483 | - | - | - | - |
| | | 10 (254) | 317 | 385 | - | - | - | - |
| | | 12 (305) | 336 | 417 | - | - | - | - |
| 24 | Standard | 6 (152) | 324 | 440 | - | - | - | - |
| | | 10 (254) | 359 | 503 | - | - | - | - |
| | | 12 (305) | 380 | 534 | - | - | - | - |
| 28 | Standard | 6 (152) | 540 | 618 | - | - | - | - |
| | | 10 (254) | 592 | 683 | - | - | - | - |
| | | 12 (305) | 621 | 716 | - | - | - | - |
| 32 | Standard | 6 (152) | 960 | 1043 | - | - | - | - |
| | | 10 (254) | 1014 | 1111 | - | - | - | - |
| | | 12 (305) | 1045 | 1144 | - | - | - | - |

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