

## PILOT OPERATED PRESSURE SUSTAINING VALVES PS47

### DESCRIPTION

The ADCA PS47 pilot operated pressure sustaining valves are designed for use with steam, compressed air, nitrogen and other gases compatible with the construction materials. The PS47 accurately senses upstream pressure and acts to precisely control it to a minimum or disperse excess pressure.

### MAIN FEATURES

Precise control of upstream pressure from 0,07 bar to 17 bar.  
Robust steel or stainless steel construction.  
Guided piston and valve stem.  
Hardened plug.

**OPTIONS:**

- Soft sealing.
- Low pressure top.
- Dome loaded version.
- Bottom cover drain connection.
- Stellite plug and seat.
- External sensing connection.

**USE:** Saturated steam, compressed air and other gases (Group 2) compatible with the construction (except oxygen).

**AVAILABLE MODELS:**

- PS47 – steel versions for steam.
- PS47i – stainless steel versions for steam (only available from DN 15 to DN 50).
- PS47G – steel versions for compressed air and gases.
- PS47Gi – stainless steel versions for compressed air and gases.

**SIZES:** 1/2" to 2"; DN 15 to DN 50.

**CONNECTIONS:**

- Flanged EN 1092-1 PN 40.
- Flanged ASME B16.5 Class 150 or 300.
- Female threaded ISO 7 Rp or NPT.
- Socket weld (SW) ASME B16.11.

**INSTALLATION:** Horizontal installation.  
See IMI – Installation and maintenance instructions.  
In steam applications, a “Y” strainer, humidity separator and steam trap should be installed upstream of the valve.



#### CE MARKING – GROUP 2 (PED – European Directive)

| CLASS 150  | PN 40                         | Category      |
|------------|-------------------------------|---------------|
| 1/2" to 2" | DN 15 to 32<br>1/2" to 1 1/4" | SEP           |
| –          | DN 40 to 50<br>1 1/2" to 2"   | 1 (CE marked) |

| LIMITING CONDITIONS                       |               |
|---|---------------|
| Valve model                               | PS47<br>PS47i |
| Body design conditions                    | PN 40         |
| Maximum upstream pressure                 | 17 bar        |
| Minimum upstream pressure *               | 0,35          |
| Maximum downstream pressure               | 17 bar        |
| Maximum operating temperature             | 250 °C        |
| Maximum hydraulic factory valve body test | 60 bar        |

\* 0,07 bar with low pressure top (limited to 7 bar maximum inlet pressure).

Remark: Pressure and temperature limiting conditions may change if "G" version for compressed air and gases is chosen or soft sealing/piston rings are used.

**Warning: A pressure sustaining valve is not a safety relief valve and must not be used for that purpose!**

| REGULATING RANGES |                         |                        |                        |                          |
|-------------------|-------------------------|------------------------|------------------------|--------------------------|
| SPRING COLOUR     | GREEN<br>w/ 1 diaphragm | BLUE<br>w/ 1 diaphragm | RED<br>w/ 2 diaphragms | BLACK<br>w/ 2 diaphragms |
| Regulating range  | 0,07 to 0,5 bar *       | 1,5 to 5,5 bar         | 3,5 to 8,5 bar         | 7 to 17 bar              |

\* With low pressure top.

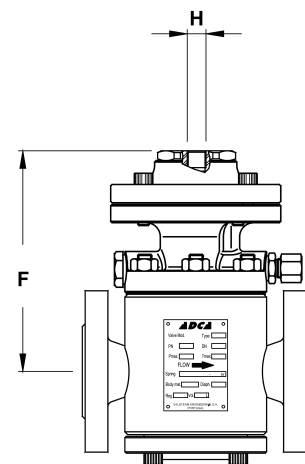
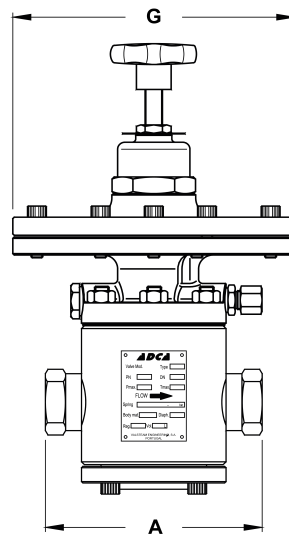
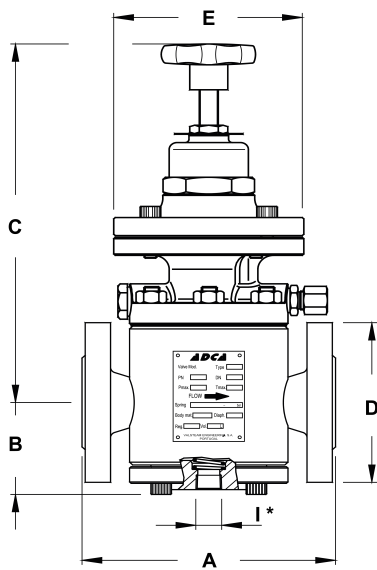


Fig. 1 - Valve with standard diaphragm Fig. 2 - Valve with low pressure top

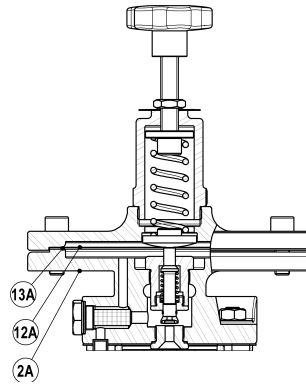
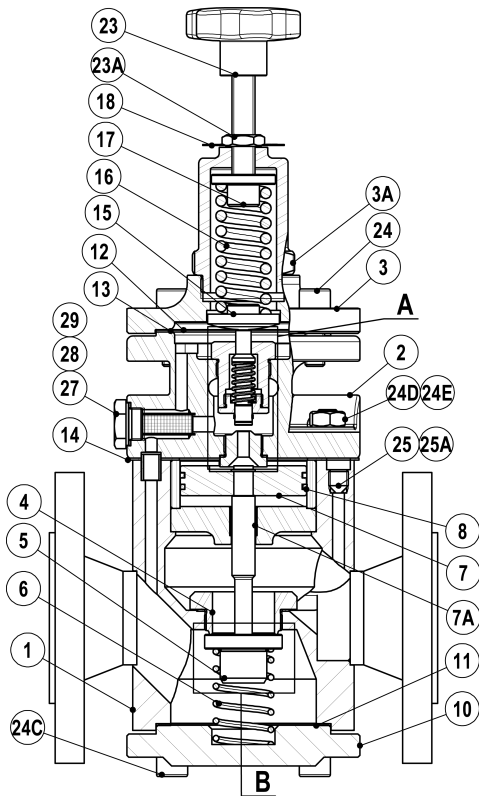
Fig. 3 - Dome loaded valve

| DIMENSIONS (mm) |       |           |           |          |    |     |     |     |     |     |      |      |           |
|-----------------|-------|-----------|-----------|----------|----|-----|-----|-----|-----|-----|------|------|-----------|
| SIZE            | A     |           |           |          | B  | C   | D   | ØE  | F   | ØG  | H    | I *  | WGT. (kg) |
|                 | PN 40 | CLASS 150 | CLASS 300 | THREADED |    |     |     |     |     |     |      |      |           |
| 1/2" – DN 15    | 150   | 184       | 190       | 140      | 56 | 275 | 95  | 120 | 162 | 195 | 1/4" | 3/8" | 13        |
| 3/4" – DN 20    | 150   | 184       | 194       | 140      | 56 | 287 | 105 | 120 | 174 | 195 | 1/4" | 3/8" | 13,5      |
| 1" – DN 25      | 160   | 184       | 197       | 150      | 56 | 287 | 115 | 120 | 174 | 195 | 1/4" | 3/8" | 14        |
| 1 1/4" – DN 32  | 180   | -         | -         | 170      | 68 | 299 | 140 | 120 | 186 | 195 | 1/4" | 3/8" | 18        |
| 1 1/2" – DN 40  | 200   | 222       | 235       | 190      | 75 | 307 | 150 | 130 | 194 | 195 | 1/4" | 3/8" | 22        |
| 2" – DN 50      | 230   | 254       | 267       | 230      | 84 | 323 | 165 | 160 | 210 | 195 | 1/4" | 3/8" | 31        |

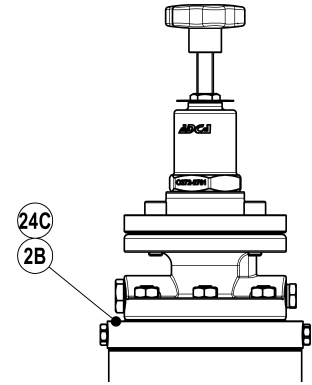
\* Optional drain connection for steam trapping. This drain connection does not replace the humidity separator, but can be useful if, e.g., the valve stops operating for long periods of time (see Fig. 6).

Remarks: As standard, connections H and I, in valves manufactured with ASME B16.5 flanges, SW or NPT threads, are female threaded NPT. In valves manufactured with EN 1092-1 flanges or ISO 7 Rp threads, these connections are also female threaded ISO 7 Rp.

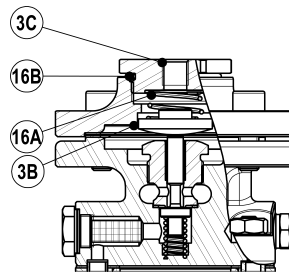
MATERIALS



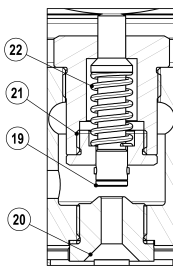
Low pressure top



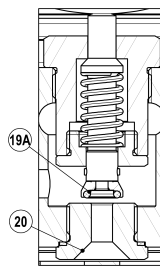
Adapting flange  
(DN50)



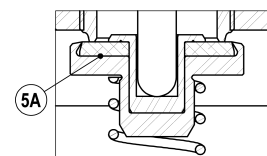
Dome loaded top



Detail A  
Pilot valve



Detail A  
Pilot valve (soft)



Detail B  
Main valve (soft)

**MATERIALS**

| POS. N° | DESIGNATION                   | PS47                                | PS47i                      |
|---------|-------------------------------|-------------------------------------|----------------------------|
| 1       | Valve body                    | S355JR / 1.0045;<br>P250GH / 1.0460 | AISI 316 / 1.4401          |
| 2       | Pilot valve body              | A351 CF8 / 1.4308                   | A351 CF8 / 1.4308          |
| 2A      | Low pressure pilot valve body | A351 CF8 / 1.4308                   | A351 CF8 / 1.4308          |
| 2B      | Adapting flange               | C45E / 1.1191                       | AISI 316 / 1.4401          |
| 3       | Top cover                     | A351 CF8 / 1.4308                   | A351 CF8 / 1.4308          |
| 3A      | Spring cover                  | A351 CF8 / 1.4308                   | A351 CF8 / 1.4308          |
| 3B      | Top cover                     | C45E / 1.1191                       | AISI 316 / 1.4401          |
| 3C      | Cover nut                     | C45E / 1.1191                       | AISI 316 / 1.4401          |
| 4       | * Main valve seat             | AISI 316 / 1.4401                   | AISI 316 / 1.4401          |
| 5       | * Main valve plug             | Hardened st. steel                  | Hardened st. steel         |
| 5A      | * Main valve plug (soft)      | AISI 316 w/ PTFE/GR; Rulon          | AISI 316 w/ PTFE/GR; Rulon |
| 6       | * Main valve spring           | AISI 302 / 1.4300                   | AISI 302 / 1.4300          |
| 7       | * Piston                      | Brass / Bronze                      | Brass / Bronze             |
| 7A      | Piston guide                  | AISI 316 / 1.4401                   | AISI 316 / 1.4401          |
| 8       | * Piston Rings                | Bronze / FKM / EPDM / NBR           | Bronze / FKM / EPDM / NBR  |
| 9       | Piston liner                  | AISI 304 / 1.4301                   | AISI 304 / 1.4301          |
| 10      | Bottom cover                  | S355JR / 1.0045                     | AISI 316 / 1.4401          |
| 11      | * Bottom cover gasket         | Stainless steel / Graphite          | Stainless steel / Graphite |
| 12      | * Diaphragm                   | AISI 301 / 1.4310                   | AISI 301 / 1.4310          |
| 12A     | * Low pressure diaphragm      | AISI 301 / 1.4310                   | AISI 301 / 1.4310          |
| 13      | * Diaphragm gasket            | Stainless steel / Graphite          | Stainless steel / Graphite |
| 13A     | * Low press. diaphragm gasket | Stainless steel / Graphite          | Stainless steel / Graphite |
| 14      | * Pilot valve gasket          | Stainless steel / Graphite          | Stainless steel / Graphite |
| 15      | Lower spring carrier          | Brass                               | Brass                      |
| 16      | * Adjustment spring           | Steel                               | Steel                      |
| 16A     | Diaphragm spring              | Stainless steel                     | Stainless steel            |
| 16B     | O-ring                        | Viton                               | Viton                      |
| 17      | Top spring carrier            | Brass                               | Brass                      |
| 18      | Spring ID plate               | Aluminium                           | Aluminium                  |
| 19      | * Pilot valve plug            | AISI 316 / 1.4401                   | AISI 316 / 1.4401          |
| 19A     | * Pilot valve plug (soft)     | PTFE/GR; Rulon, etc.                | PTFE/GR; Rulon, etc.       |
| 20      | * Pilot valve seat            | AISI 316 / 1.4401                   | AISI 316 / 1.4401          |
| 21      | * Pilot valve body            | A351 CF8 / 1.4308                   | Copper / PTFE              |
| 22      | * Pilot valve spring          | AISI 302 / 1.4300                   | AISI 302 / 1.4300          |
| 23      | Handwheel                     | Plastic / Stainless steel           | Plastic / Stainless steel  |
| 23A     | Locknut                       | AISI 304 / 1.4301                   | AISI 304 / 1.4301          |
| 24      | Bolts                         | ISO 898 or EN 10269 steel           | ISO 3506 stainless steel   |
| 24C     | Bolts                         | ISO 898 or EN 10269 steel           | ISO 3506 stainless steel   |
| 24D     | Studs                         | ISO 898 or EN 10269 steel           | ISO 3506 stainless steel   |
| 24E     | Nuts                          | ISO 898 or EN 10269 steel           | ISO 3506 stainless steel   |
| 25      | Socket set screw              | Stainless steel                     | Stainless steel            |
| 25A     | O-ring                        | Viton                               | Viton                      |
| 26      | Sensing pipe                  | Copper                              | Stainless steel            |
| 27      | * Pilot valve strainer        | AISI 304 / 1.4301                   | AISI 304 / 1.4301          |
| 28      | Strainer nut                  | AISI 304 / 1.4301                   | AISI 304 / 1.4301          |
| 29      | Gasket                        | Copper                              | Copper / PTFE              |

\* Available spare parts.

CAPACITY TABLE

| INLET (barg) | OUTLET (barg) | SATURATED STEAM (kg/h) |       |       |       |       |       | COMPRESSED AIR (Nm <sup>3</sup> /h – 0 °C – 1,013 bar) |       |       |       |       |       |
|--------------|---------------|------------------------|-------|-------|-------|-------|-------|--|-------|-------|-------|-------|-------|
|              |               | DN 15                  | DN 20 | DN 25 | DN 32 | DN 40 | DN 50 | DN 15  | DN 20 | DN 25 | DN 32 | DN 40 | DN 50 |
| 0,7          | 0,35          | 40                     | 75    | 125   | 190   | 280   | 480   | 15   | 31    | 50    | 70    | 111   | 191   |
| 1            | 0,4           | 45                     | 95    | 160   | 240   | 355   | 620   | 16   | 33    | 51    | 79    | 113   | 194   |
|              | 0,6           | 40                     | 83    | 140   | 210   | 308   | 535   | 27   | 55    | 90    | 138   | 199   | 343   |
| 2            | 0,4 - 1       | 75                     | 150   | 250   | 380   | 545   | 960   | 60   | 122   | 201   | 307   | 444   | 763   |
|              | 1,2           | 65                     | 138   | 230   | 345   | 515   | 900   | 54   | 109   | 180   | 276   | 399   | 686   |
|              | 1,6           | 50                     | 105   | 175   | 265   | 393   | 685   | 45   | 91    | 150   | 230   | 333   | 572   |
| 3            | 0,4 - 1,5     | 100                    | 200   | 335   | 510   | 750   | 1310  | 120  | 240   | 300   | 460   | 666   | 1150  |
|              | 2             | 85                     | 170   | 290   | 450   | 660   | 1155  | 105  | 210   | 251   | 384   | 555   | 1050  |
|              | 2,2           | 80                     | 165   | 277   | 416   | 613   | 1050  | 48   | 93    | 152   | 232   | 334   | 570   |
|              | 2,6           | 60                     | 127   | 203   | 315   | 467   | 818   | 45   | 61    | 101   | 154   | 223   | 384   |
| 4            | 0,4 - 2       | 125                    | 250   | 420   | 630   | 920   | 1580  | 150  | 238   | 499   | 739   | 1089  | 1825  |
|              | 2,5           | 114                    | 225   | 385   | 580   | 850   | 1465  | 135  | 208   | 449   | 568   | 978   | 1635  |
|              | 3,2           | 92                     | 183   | 309   | 482   | 708   | 1205  | 119  | 177   | 398   | 492   | 867   | 1444  |
|              | 3,6           | 68                     | 137   | 237   | 353   | 536   | 932   | 60   | 124   | 202   | 154   | 444   | 763   |
| 5            | 0,4 - 2       | 150                    | 310   | 512   | 755   | 1114  | 1895  | 180  | 360   | 505   | 768   | 1110  | 1908  |
|              | 3             | 144                    | 295   | 488   | 743   | 1095  | 1835  | 165  | 330   | 556   | 691   | 997   | 1716  |
|              | 4             | 115                    | 225   | 373   | 578   | 846   | 1430  | 151  | 298   | 404   | 613   | 885   | 1526  |
|              | 4,2           | 105                    | 213   | 343   | 525   | 770   | 1342  | 136  | 285   | 383   | 582   | 840   | 1449  |
| 6            | 0,4 - 3       | 175                    | 355   | 602   | 919   | 1358  | 2298  | 210  | 468   | 696   | 1046  | 1523  | 2580  |
|              | 4             | 159                    | 314   | 538   | 827   | 1217  | 2142  | 195  | 437   | 646   | 969   | 1412  | 2389  |
|              | 5             | 119                    | 250   | 411   | 637   | 941   | 1644  | 150  | 345   | 494   | 738   | 1079  | 1817  |
|              | 5,2           | 109                    | 217   | 360   | 568   | 839   | 1465  | 135  | 315   | 443   | 664   | 968   | 1627  |
| 7            | 0,4 - 3,5     | 197                    | 410   | 670   | 1005  | 1540  | 2644  | 240  | 480   | 804   | 1200  | 1740  | 2989  |
|              | 5             | 178                    | 358   | 587   | 908   | 1345  | 2306  | 210  | 421   | 701   | 1046  | 1524  | 2640  |
|              | 6             | 132                    | 271   | 452   | 688   | 1027  | 1773  | 150  | 301   | 499   | 756   | 1104  | 1829  |
|              | 6,2           | 122                    | 251   | 416   | 635   | 934   | 1618  | 105  | 211   | 349   | 529   | 773   | 1280  |
| 8            | 0,4 - 4       | 225                    | 471   | 778   | 1169  | 1759  | 3043  | 270  | 546   | 798   | 1353  | 1746  | 3411  |
|              | 5             | 221                    | 339   | 730   | 1118  | 1659  | 2884  | 265  | 516   | 747   | 1276  | 1635  | 3220  |
|              | 6             | 192                    | 385   | 639   | 976   | 1451  | 2513  | 225  | 449   | 710   | 1125  | 1635  | 2762  |
|              | 7             | 146                    | 293   | 481   | 732   | 1085  | 1887  | 180  | 361   | 600   | 892   | 1296  | 2184  |
|              | 7,2           | 137                    | 274   | 453   | 692   | 1011  | 1782  | 156  | 312   | 540   | 768   | 1128  | 1978  |
| 9            | 0,4 - 5       | 251                    | 518   | 856   | 1325  | 1923  | 3358  | 301  | 612   | 1011  | 1507  | 2244  | 3789  |
|              | 6             | 241                    | 500   | 788   | 1222  | 1766  | 3095  | 270  | 553   | 910   | 1359  | 1980  | 3474  |
|              | 7             | 206                    | 398   | 679   | 1068  | 1559  | 2676  | 240  | 492   | 816   | 1230  | 1798  | 2970  |
|              | 8             | 156                    | 314   | 514   | 794   | 1142  | 2053  | 180  | 360   | 598   | 903   | 1288  | 2247  |
|              | 8,2           | 145                    | 292   | 483   | 741   | 1090  | 1888  | 165  | 329   | 547   | 826   | 1176  | 2056  |
| 10           | 0,4 - 5       | 275                    | 561   | 944   | 1468  | 2127  | 3718  | 330  | 659   | 1116  | 1692  | 2412  | 4173  |
|              | 6             | 272                    | 551   | 917   | 1419  | 2074  | 3619  | 314  | 628   | 1065  | 1615  | 2301  | 3983  |
|              | 7             | 252                    | 508   | 838   | 1268  | 1871  | 3249  | 288  | 599   | 1004  | 1503  | 2202  | 3810  |
|              | 8             | 213                    | 431   | 722   | 1118  | 1659  | 2831  | 240  | 492   | 806   | 1212  | 1770  | 3022  |
|              | 9             | 163                    | 333   | 548   | 843   | 1244  | 2152  | 192  | 360   | 658   | 898   | 1350  | 2280  |
|              | 9,2           | 150                    | 298   | 493   | 756   | 1143  | 1929  | 181  | 342   | 628   | 852   | 1283  | 2165  |
| 12           | 1 - 6         | 330                    | 680   | 1124  | 1732  | 2541  | 4407  | 390  | 792   | 1300  | 1978  | 2844  | 4917  |
|              | 8             | 311                    | 629   | 1023  | 1575  | 2332  | 4034  | 360  | 732   | 1219  | 1827  | 2622  | 4497  |
|              | 10            | 265                    | 533   | 812   | 1271  | 1867  | 3202  | 270  | 553   | 910   | 1359  | 1980  | 3474  |
|              | 11            | 175                    | 364   | 568   | 924   | 1350  | 2359  | 210  | 468   | 696   | 1046  | 1523  | 2580  |
| 15           | 1 - 8         | 408                    | 839   | 1373  | 2138  | 3118  | 5403  | 480  | 972   | 1602  | 2427  | 3564  | 6072  |
|              | 12            | 339                    | 656   | 1068  | 1629  | 2441  | 4250  | 375  | 762   | 1272  | 1923  | 2784  | 4692  |
|              | 14            | 199                    | 401   | 662   | 1017  | 1503  | 2619  | 255  | 528   | 889   | 1332  | 1896  | 3398  |
| 17           | 1 - 9         | 425                    | 863   | 1460  | 2178  | 3165  | 5343  | 540  | 912   | 1819  | 2737  | 3984  | 6618  |
|              | 15            | 347                    | 709   | 1190  | 1816  | 2694  | 4712  | 315  | 708   | 1179  | 1764  | 2520  | 4418  |
|              | 16            | 207                    | 416   | 717   | 1217  | 1608  | 2824  | 255  | 528   | 889   | 1332  | 1896  | 3398  |

Remarks: A pressure sustaining valve is usually sized to the minimum allowable pressure drop across the valve.

| ORDERING CODES PS47  |        |  |  |    |     |  |     |    |   |    |
|--|--------|--|--|----|-----|--|-----|----|---|----|
| <b>Valve model</b>   | PS.47  |  |  | S. | 1   |  |     | 1. | A | 15 |
| PS47 – steam (standard)  | PS.47  |  |  |    |     |  |     |    |   |    |
| PS47G – compressed air and gases   | PS.47G |  |  |    |     |  |     |    |   |    |
| <b>Body material</b>   |        |  |  |    |     |  |     |    |   |    |
| S355JR / 1.0045 or P250GH / 1.0460 carbon steel  | (1)    |  |  |    |     |  |     |    |   |    |
| AISI 316 / 1.4401 stainless steel  | I      |  |  |    |     |  |     |    |   |    |
| <b>Options</b>   |        |  |  |    |     |  |     |    |   |    |
| Standard valve with internal sensing line  | (1)    |  |  |    |     |  |     |    |   |    |
| Valve for external sensing connection  | B      |  |  |    |     |  |     |    |   |    |
| <b>Diaphragm</b>   |        |  |  |    |     |  |     |    |   |    |
| Standard diaphragm   | S.     |  |  |    |     |  |     |    |   |    |
| Low pressure diaphragm   | L.     |  |  |    |     |  |     |    |   |    |
| <b>Regulating range</b>  |        |  |  |    |     |  |     |    |   |    |
| Green spring – 0,35 to 2 bar – single diaphragm  |        |  |  |    | 1   |  |     |    |   |    |
| Blue spring – 1,5 to 5,5 bar – single diaphragm  |        |  |  |    | 2   |  |     |    |   |    |
| Red spring – 3,5 to 8,5 bar – double diaphragm   |        |  |  |    | 3   |  |     |    |   |    |
| Black spring – 7 to 17 bar – double diaphragm  |        |  |  |    | 4   |  |     |    |   |    |
| Dome loaded – 0,35 to 4 bar – single diaphragm a)  |        |  |  |    | 6   |  |     |    |   |    |
| Dome loaded – 2 to 17 bar – double diaphragm a)  |        |  |  |    | 7   |  |     |    |   |    |
| <b>Piston rings b)</b>   |        |  |  |    |     |  |     |    |   |    |
| Bronze   |        |  |  |    | (1) |  |     |    |   |    |
| FKM  |        |  |  |    | V   |  |     |    |   |    |
| EPDM   |        |  |  |    | E   |  |     |    |   |    |
| NBR  |        |  |  |    | N   |  |     |    |   |    |
| <b>Drain connection</b>  |        |  |  |    |     |  |     |    |   |    |
| Standard valve   |        |  |  |    |     |  | (1) |    |   |    |
| Drain connection ISO 7 Rp 3/8"   |        |  |  |    |     |  | D   |    |   |    |
| <b>Valve sealing</b>   |        |  |  |    |     |  |     |    |   |    |
| Standard metal to metal with hardened plug   |        |  |  |    |     |  |     | 1. |   |    |
| Stellited plug and seat  |        |  |  |    |     |  |     | 2. |   |    |
| Soft sealed with virgin PTFE b)  |        |  |  |    |     |  |     | 3. |   |    |
| Soft sealed with PTFE/GR b)  |        |  |  |    |     |  |     | 4. |   |    |
| Soft sealed with Rulon b)  |        |  |  |    |     |  |     | 5. |   |    |
| Soft sealed with FPM/Viton b)  |        |  |  |    |     |  |     | 6. |   |    |
| <b>Pipe connection</b>   |        |  |  |    |     |  |     |    |   |    |
| Threaded ISO 7 Rp  |        |  |  |    |     |  |     |    | A |    |
| Threaded NPT ASME B1.20.1  |        |  |  |    |     |  |     |    | C |    |
| Socket weld (SW) ASME B16.11   |        |  |  |    |     |  |     |    | H |    |
| Flanged EN 1092-1 PN 40  |        |  |  |    |     |  |     |    | N |    |
| Flanged ASME B16.5 Class 150   |        |  |  |    |     |  |     |    | U |    |
| Flanged ASME B16.5 Class 300   |        |  |  |    |     |  |     |    | V |    |
| <b>Size</b>  |        |  |  |    |     |  |     |    |   |    |
| DN 15 or 1/2"  |        |  |  |    |     |  |     |    |   | 15 |
| DN 20 or 3/4"  |        |  |  |    |     |  |     |    |   | 20 |
| ...  |        |  |  |    |     |  |     |    |   |    |
| <b>Special valves / Extras</b>   |        |  |  |    |     |  |     |    |   |    |
| Full description or additional codes have to be added in case of non-standard combination. |        |  |  |    |     |  |     |    |   | E  |

a) The loading control pressure is approximately the same as the required upstream set-point pressure ( $\pm 0,2$  bar).  
b) Valve limited to the materials maximum operating temperature. Consult manufacturer for more details.