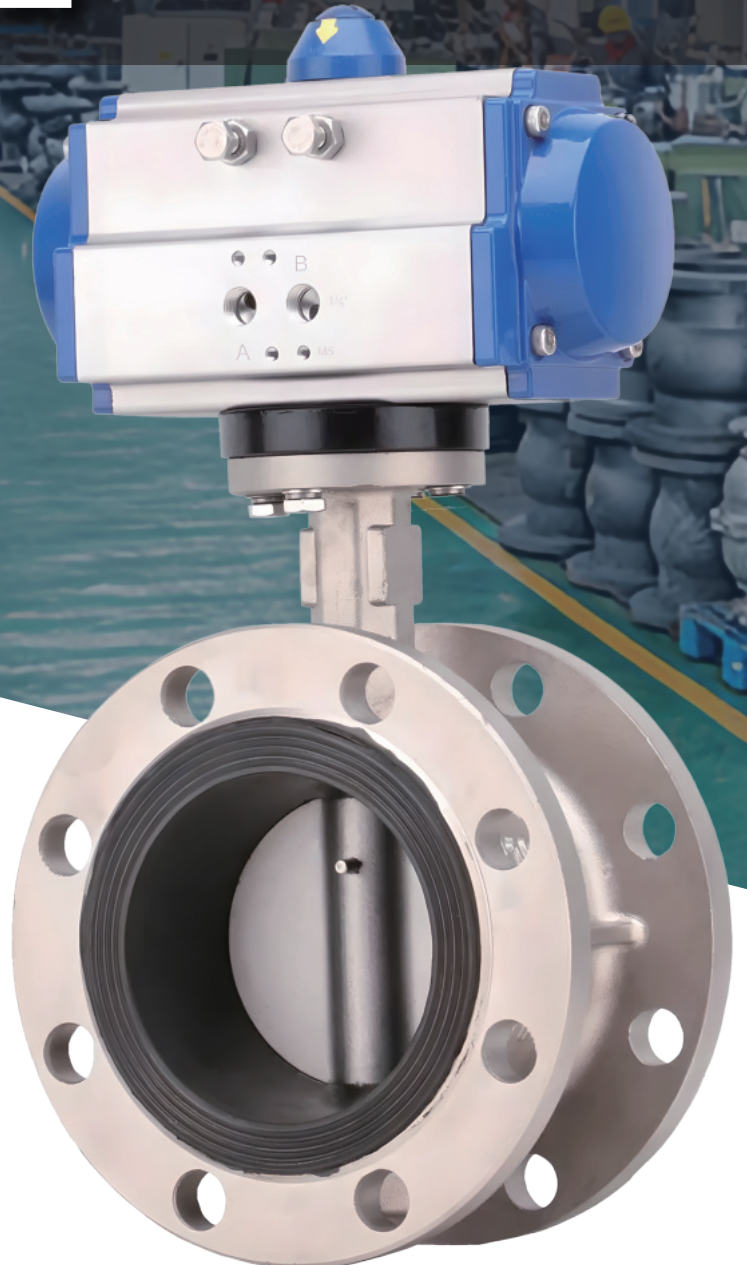


Pneumatic Flange Butterfly Valve **INSTRUCTION MANUAL**



dc DELCO

Specialized Control Valve Manufacturer

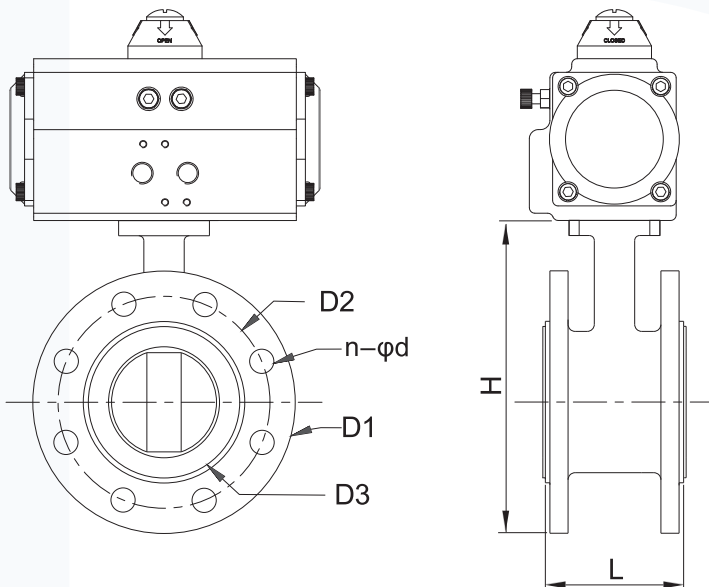


Introduction

Pneumatic flange butterfly valve is a universal flange connected butterfly valve with a sturdy structure, suitable for medium and low pressure industrial pipelines. Flange standard: ANSI 150#/DIN PN16, The valve body material can be selected from carbon steel or stainless steel; Soft seal (EPDM/NBR) or metal hard seal are optional; Pneumatic actuator with manual emergency operation device. Application scenarios: Power plant circulating water system, petrochemical plant cooling water pipeline, urban gas distribution.

Main Parts Materials

UNIT:mm



| NO. | Component | Material | | |
|-----|--------------------|--|------------------------------------|---------------------------------|
| | | Z | C | P |
| 1 | Seat | Rubber , PTFE | | |
| 2 | Ball | 45 Steel | 45 Steel | Stainless Steel |
| 3 | Seat | Ductile Iron-iron Hard Chrome Plating | Simple Steel or Stainless Steel | Stainless Steel |
| 4 | O-Ring | Grey Cast Iron | Carbon Steel | Stainless Steel |
| 5 | Stem | 35 Steel | Carbon Steel | Stainless Steel |
| 6 | Connecting Set | 45 Steel | Stainless Steel | Stainless Steel |
| 7 | Screw | 45 Steel | 45 Steel | Stainless Steel |
| 8 | Pneumatic Actuator | Copper Base PowderMetallurgy | Copper Base PowderMetallurgy | Copper Base PowderMetallurgy |
| 9 | Location Indicator | Rubber , Viton | | |
| 10 | Pneumatic Actuator | AT Series , AW Series | | |
| 11 | Location Indicator | Plastic | | |

Main Outline and Connecting Size-PN10,PN16

| MODEL | DN50 | DN65 | DN80 | DN100 | DN125 | DN150 | DN200 | DN250 | DN300 | DN350 | DN400 | DN500 |
|-------|-------|--------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| Inch | 2" | 2-1/2" | 3" | 4" | 5" | 6" | 8" | 10" | 12" | 14" | 16" | 20" |
| D | 52.7 | 64.4 | 78.8 | 104.2 | 123.3 | 157 | 202.5 | 250.5 | 301.6 | 333.3 | 389.6 | 491.6 |
| D1 | 165 | 185 | 200 | 220 | 250 | 285 | 340 | 395 | 445 | 505 | 565 | 670 |
| D2 | 125 | 145 | 160 | 180 | 210 | 240 | 295 | 355 | 410 | 470 | 525 | 620 |
| D3 | 99 | 118 | 132 | 156 | 184 | 211 | 266 | 319 | 370 | 429 | 480 | 582 |
| L | 108 | 112 | 114 | 127 | 140 | 140 | 150 | 165 | 185 | 195 | 216 | 229 |
| H | 192 | 207 | 224 | 255 | 290 | 325 | 386 | 460 | 510 | 565 | 632 | 759 |
| n-Φd | 4-Φ18 | 4-Φ18 | 8-Φ18 | 8-Φ18 | 8-Φ18 | 8-Φ22 | 12-Φ22 | 12-Φ22 | 12-Φ22 | 16-Φ22 | 16-Φ26 | 20-Φ26 |

Uses and Structural Features of Product

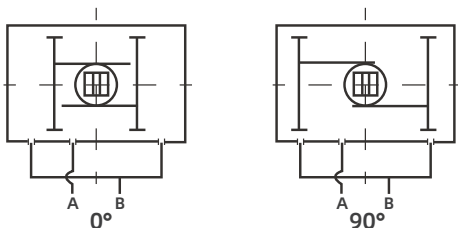
Pneumatic butterfly valves are widely used in natural gas, oil chemical industry, metallurgy, papermaking, power, mining, printing and dyeing, biological pharmacy, daily chemicals, foodstuff and beverage, water treatment and air treatment etc. For automatic control and adjustment control of fluid, together with automatic pneumatic meters.

- The Structural Features of Pneumatic Butterfly valves: Pneumatic Actuator uses new-style AT pneumatic actuator, with double-acting and single-acting types (spring reposition), driven by gear and rack with high dependability; big diameter valves are driven by AW pneumatic actuator on pull-extraction manner, with reasonable structure and large output torque as well as double-acting and single-acting types (spring reposition). Refer to our stylebook of pneumatic actuator.
- Center-line Resilient seal: uses rubber and fluoroplastic of full-lining rubber and fluoroplastic as sealing material. Elastic Seat is furnished with high-precision butterfly plate to insure zero leakage. Bushings are mounted on the bottom, middle and upper parts of valve stem for supporting and rotary slippage, thus to retain minimum friction. The products are light-weighted, small-sized and quick to start and close.
- Three-eccentricity Structure Seal: using metal and fluoroplastic for seat sealing. Metal sealed butterfly valves incorporate seat with elastic sealing ring and multilayer composite butterfly plate. 3-D eccentric sealing structure functions small friction upon starting and closing dependable sealing, anti-friction, high-temperature resistance, self-centering effect, little leakage and long life-span. Provided with the advantages of reasonable structure, lightweight, small size, dapper installation dimension, easy operation and quick on-and-off the fluid control valves have been rapidly developed and most widely used.

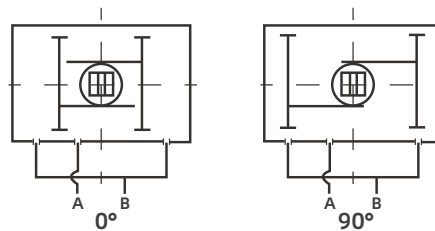
Products Performance Specification

| Pressure grade | | Nominal Pressure PN(MPa) | | | | | Pound(Class) | | | |
|---------------------|------------------|--|------|-----|---|------|--------------|---|------|------|
| | | 1.6 | 2.5 | 4.0 | 6.4 | 10.0 | 150 | 300 | 400 | 600 |
| Test Pressure (MPa) | Shell test | 2.4 | 3.75 | 6.0 | 9.6 | 15.0 | 3.03 | 7.5 | 10.2 | 15.0 |
| | Sealing test | 1.76 | 2.75 | 4.4 | 7.04 | 11.0 | 2.2 | 5.5 | 7.48 | 11.0 |
| | Air Sealing Test | 0.6 (MPa) | | | | | | | | |
| Applicable medium | | Material of Valve Body | | | | | | | | |
| | | C | | | P | | | R | | |
| | | Water, Steam, oil and liquefied gas etc. | | | Corrosive mediums such as nitric acid etc | | | Corrosive mediums such as nitric acid etc | | |

Double Acting Actuators

CCW PN (MPa)


Air to Port A forces the pistons outwards, causing the pinion to turn counterclockwise while the air is being exhausted from Port B.
 Air to Port B forces the pistons inwards, causing the pinion to turn clockwise while the air is being exhausted from Port A.

CW (Class)


Air to Port A forces the pistons outwards, causing the pinion to turn clockwise while the air is being exhausted from Port B.
 Air to Port B forces the pistons inwards, causing the pinion to turn counterclockwise while the air is being exhausted from Port A.

Output Torque of Double Acting Actuators

| MODEL | Air supply pressure (Unit: Bar) | | | | | | | | | |
|---------|---------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 2 | 2.5 | 3 | 4 | 4.5 | 5 | 5.5 | 6 | 7 | 8 |
| AT52DA | 8.0 | 10.0 | 12.0 | 16.0 | 18.0 | 20.0 | 21.9 | 23.9 | 27.9 | 31.9 |
| AT65DA | 14.6 | 18.2 | 21.9 | 29.2 | 32.8 | 36.5 | 40.1 | 43.8 | 51.1 | 58.4 |
| AT75DA | 20.1 | 25.1 | 30.1 | 40.1 | 45.1 | 50.2 | 55.2 | 60.2 | 70.2 | 80.3 |
| AT85DA | 31.4 | 39.2 | 47.0 | 62.7 | 70.5 | 78.4 | 86.2 | 94.1 | 109.7 | 125.4 |
| AT92DA | 45.1 | 56.4 | 67.7 | 90.3 | 101.6 | 122.9 | 124.1 | 135.4 | 158.0 | 180.6 |
| AT105DA | 66.1 | 82.7 | 99.2 | 132.2 | 148.8 | 165.3 | 181.8 | 198.4 | 231.4 | 264.5 |
| AT125DA | 100.3 | 125.4 | 150.5 | 200.6 | 225.7 | 250.8 | 275.9 | 301.0 | 351.1 | 401.3 |
| AT140DA | 171.0 | 213.8 | 256.5 | 342.0 | 384.8 | 427.5 | 470.3 | 513.0 | 598.5 | 684.0 |
| AT160DA | 266.0 | 332.5 | 399.0 | 532.0 | 598.5 | 665.0 | 731.5 | 798.0 | 931.0 | 1064.0 |
| AT190DA | 425.6 | 532.0 | 638.4 | 851.2 | 957.6 | 1064.0 | 1170.4 | 1276.8 | 1489.6 | 1702.4 |
| AT210DA | 532.0 | 665.0 | 798.0 | 1064.0 | 1197.0 | 1330.0 | 1463.0 | 1596.0 | 1862.0 | 2128.0 |
| AT240DA | 769.5 | 961.9 | 1154.3 | 1539.0 | 1731.4 | 1923.8 | 2116.1 | 2308.5 | 2693.3 | 3078.0 |
| AT270DA | 1169.6 | 1462.1 | 1754.5 | 2339.3 | 2631.7 | 2924.1 | 3216.5 | 3508.9 | 4093.7 | 4678.6 |

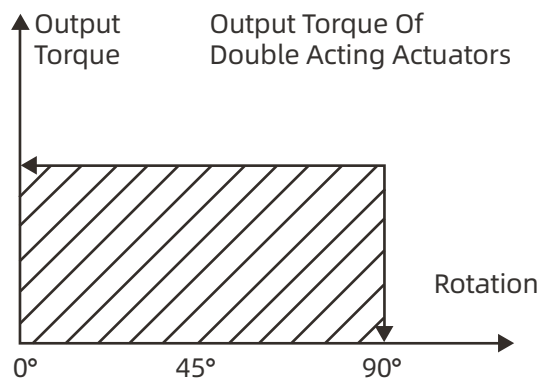
Selection of Double Acting Actuator:

The suggested safety factor for double acting actuators under normal working conditions is 20%-30%.

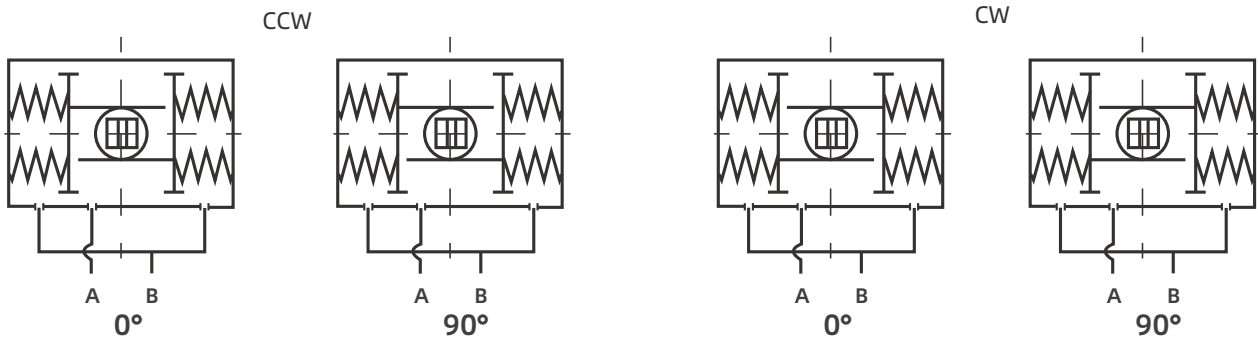
Example:

- The torque needed by valve=100N.m
- The torque considered safety factor(1+30%)=130N.m
- Air Supply=5Bar

According to the above table, we can choose the minimum model is AT160DA.



Spring Acting Actuators



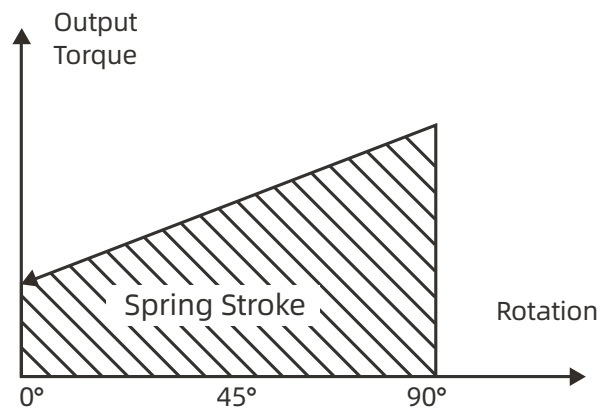
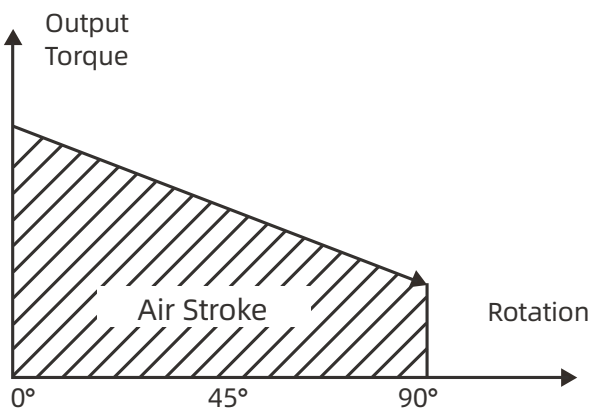
Air to port A forces the pistons outwards, causing the springs to compress. The pinion turns counter clockwise while air is being exhausted from port B.

Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The pinion turns clockwise while air is being exhausted from port A.

Air to port B forces the pistons outwards, causing the springs to compress. The pinion turns counter clockwise while air is being exhausted from port B.

Loss of air pressure on port B, the stored energy in the springs forces the pistons inwards. The pinion turns clockwise while air is being exhausted from port A.

Output Torque of Spring Return Actuators



NOTE:

Make sure that the torque necessary to operate the valve is compatible with the actuator torque (It depends on both actuator type and air supply).

Please note that the requested torque depends not only on the valve, but on the working conditions and the safety margins of the plant in question, too.

Output Torque of Spring Return Actuators (UnitLN.m)

| Output Torque of Air to Springs | | | | | | | | | | | | | | | | | Springs'output | |
|---------------------------------|-------------|-------|------|-------|------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|------|
| Air Pressure | 2.5Bar | | 3Bar | | 4Bar | | 5Bar | | 6Bar | | 7Bar | | 8Bar | | | | | |
| Model | Spring Q.ty | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | |
| | | Start | End | Start | End | Start | End | Start | End | Start | End | Start | End | Start | End | Start | End | |
| AT52SR | 5 | 5.7 | 3.8 | 7.6 | 5.7 | | | | | | | | | | | | 6.2 | 4.3 |
| | 6 | 4.9 | 2.5 | 6.9 | 4.5 | 10.9 | 8.5 | | | | | | | | | | 7.4 | 5.0 |
| | 7 | 4.0 | 1.3 | 6.0 | 3.3 | 9.8 | 7.3 | 14.0 | 10.4 | | | | | | | | 8.6 | 5.9 |
| | 8 | | | 5.2 | 2.0 | 9.2 | 6.0 | 13.2 | 9.1 | 17.2 | 14.1 | | | | | | 9.9 | 6.7 |
| | 9 | | | 4.3 | 0.8 | 8.3 | 4.8 | 12.3 | 7.9 | 16.3 | 12.8 | 20.3 | 16.8 | | | | 11.1 | 7.6 |
| | 10 | | | | | 7.4 | 3.6 | 11.5 | 6.7 | 15.5 | 11.6 | 19.5 | 15.6 | | | | 12.4 | 8.5 |
| | 11 | | | | | 6.6 | 2.3 | 10.6 | 5.4 | 14.6 | 10.4 | 18.6 | 14.3 | 22.6 | 18.3 | | 13.6 | 9.3 |
| | 12 | | | | | | | 9.7 | 4.2 | 13.8 | 9.1 | 17.8 | 12.2 | 21.8 | 17.1 | | 14.8 | 10.2 |
| AT65SR | 5 | 11.4 | 7.7 | 15.0 | 11.4 | 22.3 | 14.9 | | | | | | | | | | 10.4 | 6.8 |
| | 6 | 10.1 | 5.7 | 13.6 | 9.3 | 20.9 | 16.6 | 28.3 | 23.9 | | | | | | | | 12.5 | 8.2 |
| | 7 | 8.6 | 3.6 | 12.5 | 7.2 | 19.5 | 14.5 | 26.8 | 21.9 | | | | | | | | 14.6 | 9.6 |
| | 8 | | | 10.9 | 5.1 | 18.2 | 12.4 | 25.5 | 19.8 | 32.8 | 27.0 | 40.1 | 34.3 | | | | 16.7 | 10.9 |
| | 9 | | | | | 16.8 | 10.4 | 24.1 | 17.7 | 31.4 | 24.9 | 38.7 | 32.2 | | | | 18.8 | 12.3 |
| | 10 | | | | | 1.4 | 8.2 | 22.8 | 15.6 | 30.0 | 22.8 | 37.3 | 30.1 | 44.7 | 37.4 | | 20.9 | 13.7 |
| | 11 | | | | | | | 21.5 | 13.5 | 28.7 | 20.7 | 34.6 | 28.0 | 43.3 | 35.3 | | 22.9 | 15.0 |
| | 12 | | | | | | | 20.0 | 11.4 | 27.3 | 18.6 | 34.6 | 25.9 | 41.9 | 33.3 | | 25.0 | 16.4 |
| AT75SR | 5 | 14.5 | 10.6 | 19.4 | 15.5 | 29.5 | 25.7 | | | | | | | | | | 14.5 | 10.5 |
| | 6 | 12.4 | 7.6 | 17.3 | 12.6 | 27.4 | 22.7 | 37.5 | 32.8 | | | | | | | | 17.4 | 12.7 |
| | 7 | 10.4 | 4.8 | 15.2 | 9.7 | 25.3 | 19.9 | 35.4 | 29.9 | | | | | | | | 20.3 | 14.8 |
| | 8 | | | 13.1 | 6.8 | 23.1 | 16.9 | 33.3 | 27.0 | 43.2 | 37.0 | 53.3 | 47.0 | | | | 23.2 | 16.9 |
| | 9 | | | | | 21.0 | 14.1 | 31.2 | 24.1 | 41.1 | 34.1 | 51.2 | 44.2 | | | | 26.1 | 19.0 |
| | 10 | | | | | 19.0 | 11.1 | 28.8 | 21.2 | 39.0 | 31.2 | 49.1 | 41.2 | 59.1 | 51.2 | | 29.0 | 21.1 |
| | 11 | | | | | | | 27.0 | 18.3 | 37.0 | 28.3 | 47.0 | 38.4 | 57.0 | 48.4 | | 31.9 | 23.2 |
| | 12 | | | | | | | 24.9 | 15.4 | 34.9 | 25.4 | 44.9 | 35.4 | 54.9 | 45.4 | | 34.7 | 25.3 |
| AT85SR | 5 | 23.3 | 16.1 | 31.1 | 24.0 | 46.8 | 39.7 | | | | | | | | | | 23.0 | 15.8 |
| | 6 | 20.1 | 11.5 | 28.0 | 19.3 | 43.7 | 35.1 | 59.4 | 50.7 | | | | | | | | 27.6 | 19.0 |
| | 7 | 17.0 | 6.9 | 24.8 | 14.8 | 40.5 | 30.5 | 56.2 | 46.2 | | | | | | | | 32.2 | 22.1 |
| | 8 | | | 21.7 | 10.1 | 37.4 | 25.8 | 53.1 | 41.5 | 68.8 | 57.2 | 84.5 | 72.9 | | | | 36.8 | 25.3 |
| | 9 | | | | | 34.2 | 21.3 | 49.9 | 37.0 | 65.6 | 52.6 | 81.2 | 68.3 | | | | 41.4 | 28.5 |
| | 10 | | | | | 31.0 | 16.6 | 46.7 | 32.3 | 62.4 | 48.0 | 79.1 | 63.7 | 93.8 | 79.3 | | 46.0 | 31.6 |
| | 11 | | | | | | | 43.6 | 27.7 | 59.3 | 43.4 | 75.0 | 59.1 | 90.6 | 74.8 | | 50.6 | 34.8 |
| | 12 | | | | | | | 40.4 | 23.2 | 56.1 | 38.9 | 71.7 | 54.5 | 87.4 | 70.2 | | 55.2 | 38.0 |
| AT92SR | 5 | 33.1 | 22.0 | 44.2 | 33.2 | 66.8 | 55.9 | | | | | | | | | | 34.4 | 23.3 |
| | 6 | 28.4 | 15.2 | 39.6 | 26.4 | 62.2 | 49.0 | 84.8 | 71.6 | | | | | | | | 41.2 | 28.0 |
| | 7 | 23.8 | 8.2 | 34.9 | 19.4 | 57.5 | 42.1 | 80.2 | 64.7 | | | | | | | | 48.1 | 32.7 |
| | 8 | | | 31.3 | 12.6 | 52.9 | 35.2 | 75.5 | 57.9 | 98.1 | 80.5 | 120.7 | 103.0 | | | | 55.0 | 37.3 |
| | 9 | | | | | 48.2 | 28.4 | 70.9 | 51.0 | 93.5 | 73.6 | 116.0 | 96.1 | | | | 61.9 | 42.0 |
| | 10 | | | | | 43.6 | 21.5 | 66.2 | 44.1 | 88.8 | 66.7 | 111.3 | 89.2 | 134.0 | 111.8 | | 68.7 | 46.7 |
| | 11 | | | | | | | 61.5 | 37.2 | 84.1 | 59.9 | 106.6 | 82.4 | 129.2 | 105.0 | | 75.6 | 51.4 |
| | 12 | | | | | | | 56.8 | 30.4 | 79.4 | 53.0 | 101.9 | 75.5 | 124.5 | 98.1 | | 82.5 | 56.0 |
| AT105SR | 5 | 51.0 | 33.4 | 67.5 | 49.9 | 100.6 | 83.0 | | | | | | | | | | 49.2 | 31.6 |
| | 6 | 44.7 | 23.5 | 61.1 | 40.0 | 94.2 | 73.2 | 127.3 | 106.2 | | | | | | | | 59.1 | 38.0 |
| | 7 | 38.4 | 13.7 | 54.9 | 30.3 | 87.9 | 63.4 | 121.0 | 96.4 | | | | | | | | 68.9 | 44.3 |
| | 8 | | | 48.5 | 20.4 | 81.6 | 53.5 | 114.7 | 86.5 | 147.7 | 119.6 | 180.8 | 152.7 | | | | 78.7 | 50.6 |
| | 9 | | | | | 75.3 | 43.7 | 108.4 | 76.8 | 141.5 | 109.8 | 174.5 | 142.9 | | | | 88.6 | 56.9 |
| | 10 | | | | | 68.9 | 33.4 | 102.0 | 66.5 | 135.1 | 99.6 | 168.2 | 132.6 | 201.2 | 165.7 | | 98.4 | 63.3 |
| | 11 | | | | | | | 95.7 | 57.0 | 128.7 | 90.1 | 161.8 | 123.1 | 194.8 | 156.2 | | 108.3 | 69.6 |
| | 12 | | | | | | | 89.4 | 47.5 | 122.5 | 80.6 | 155.5 | 113.6 | 188.6 | 146.7 | | 118.1 | 75.9 |

Output Torque of Spring Return Actuators (UnitLN.m)

| Output Torque of Air to Springs | | | | | | | | | | | | | | | | | Springs'output | |
|---------------------------------|-------------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|----------------|------|
| Air Pressure | 2.5Bar | | 3Bar | | 4Bar | | 5Bar | | 6Bar | | 7Bar | | 8Bar | | | | 0° | 90° |
| Model | Spring Q.ty | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | 0° | 90° | |
| | | Start | End | Start | End | Start | End | Start | End | Start | End | Start | End | Start | End | Start | End | |
| AT125SR | 5 | 73 | 47 | 98 | 72 | 148 | 122 | | | | | | | | | | 79 | 52 |
| | 6 | 63 | 31 | 88 | 56 | 138 | 107 | 188 | 157 | | | | | | | | 94 | 63 |
| | 7 | 52 | 15 | 77 | 40 | 127 | 90 | 178 | 141 | | | | | | | | 110 | 73 |
| | 8 | | | 67 | 25 | 117 | 75 | 167 | 125 | 217 | 176 | 268 | 226 | | | | 125 | 84 |
| | 9 | | | | | 107 | 59 | 157 | 109 | 207 | 159 | 257 | 210 | | | | 141 | 94 |
| | 10 | | | | | 96 | 44 | 146 | 94 | 196 | 144 | 247 | 194 | 297 | 245 | | 157 | 105 |
| | 11 | | | | | | | 136 | 78 | 186 | 128 | 236 | 178 | 286 | 228 | | 173 | 115 |
| AT140SR | 5 | 128 | 85 | 171 | 127 | 256 | 213 | | | | | | | | | | 129 | 86 |
| | 6 | 111 | 59 | 154 | 102 | 239 | 187 | 325 | 273 | | | | | | | | 155 | 103 |
| | 7 | 94 | 33 | 137 | 76 | 222 | 162 | 308 | 247 | | | | | | | | 181 | 120 |
| | 8 | | | 120 | 50 | 205 | 136 | 291 | 221 | 376 | 307 | 462 | 392 | | | | 206 | 137 |
| | 9 | | | | | 187 | 110 | 273 | 196 | 358 | 281 | 444 | 367 | | | | 232 | 155 |
| | 10 | | | | | 170 | 84 | 256 | 169 | 341 | 255 | 427 | 340 | 512 | 426 | | 258 | 172 |
| | 11 | | | | | | | 238 | 143 | 324 | 229 | 409 | 314 | 495 | 400 | | 284 | 189 |
| AT160SR | 5 | 193 | 124 | 259 | 191 | 392 | 324 | | | | | | | | | | 310 | 206 |
| | 6 | 165 | 83 | 232 | 149 | 365 | 282 | 498 | 415 | | | | | | | | 250 | 168 |
| | 7 | 137 | 41 | 203 | 107 | 336 | 240 | 469 | 373 | | | | | | | | 292 | 196 |
| | 8 | | | 176 | 66 | 309 | 199 | 442 | 237 | 575 | 465 | 709 | 598 | | | | 333 | 223 |
| | 9 | | | | | 280 | 157 | 413 | 290 | 546 | 423 | 679 | 556 | | | | 375 | 251 |
| | 10 | | | | | 253 | 115 | 386 | 248 | 519 | 381 | 652 | 514 | 785 | 647 | | 417 | 279 |
| | 11 | | | | | | | 358 | 207 | 491 | 340 | 624 | 473 | 757 | 606 | | 458 | 307 |
| AT190SR | 5 | 332 | 222 | 438 | 329 | 651 | 542 | | | | | | | | | | 500 | 335 |
| | 6 | 292 | 161 | 398 | 267 | 611 | 480 | 824 | 693 | | | | | | | | 309 | 200 |
| | 7 | 252 | 99 | 358 | 205 | 571 | 418 | 784 | 631 | | | | | | | | 371 | 240 |
| | 8 | | | 318 | 143 | 531 | 356 | 744 | 569 | 957 | 782 | 1169 | 995 | | | | 433 | 280 |
| | 9 | | | | | 491 | 295 | 704 | 507 | 917 | 720 | 1130 | 933 | | | | 495 | 320 |
| | 10 | | | | | 451 | 233 | 664 | 446 | 877 | 658 | 1090 | 871 | 1302 | 1084 | | 557 | 360 |
| | 11 | | | | | | | 624 | 384 | 837 | 597 | 1050 | 809 | 1263 | 1022 | | 618 | 400 |
| AT210SR | 5 | 390 | 285 | 523 | 418 | 789 | 684 | | | | | | | | | | 680 | 440 |
| | 6 | 335 | 209 | 468 | 342 | 734 | 608 | 1000 | 874 | | | | | | | | 742 | 480 |
| | 7 | 280 | 133 | 413 | 266 | 679 | 532 | 945 | 798 | | | | | | | | 836 | 605 |
| | 8 | | | 358 | 190 | 624 | 456 | 890 | 722 | 1156 | 988 | 1422 | 1254 | | | | 912 | 660 |
| | 9 | | | | | 569 | 380 | 835 | 646 | 1101 | 912 | 1367 | 1178 | | | | 936 | 684 |
| | 10 | | | | | 514 | 304 | 780 | 570 | 1046 | 836 | 1312 | 1102 | 1578 | 1368 | | 1026 | 760 |
| | 11 | | | | | | | 725 | 494 | 991 | 760 | 1257 | 1026 | 1523 | 1292 | | 1216 | 836 |
| AT240SR | 5 | 552 | 409 | 744 | 600 | 1129 | 985 | | | | | | | | | | 1216 | 836 |
| | 6 | 470 | 297 | 662 | 489 | 1047 | 874 | 1432 | 1259 | | | | | | | | 1468 | 960 |
| | 7 | 388 | 187 | 580 | 379 | 964 | 764 | 1349 | 1149 | | | | | | | | 1660 | 1084 |
| | 8 | | | 498 | 268 | 883 | 653 | 1267 | 1037 | 1652 | 1422 | 2037 | 1807 | | | | 1872 | 1586 |
| | 9 | | | | | 800 | 542 | 1185 | 926 | 1569 | 1311 | 1954 | 1696 | | | | 2176 | 1859 |
| | 10 | | | | | 718 | 431 | 1103 | 816 | 1488 | 1201 | 1872 | 1586 | 2257 | 1970 | | 2257 | 1970 |
| | 11 | | | | | | | 1021 | 705 | 1406 | 1090 | 1791 | 1474 | 2176 | 1859 | | 2521 | 2093 |
| AT270SR | 5 | 903 | 675 | 1195 | 968 | 1779 | 1552 | | | | | | | | | | 2521 | 2093 |
| | 6 | 790 | 519 | 1083 | 811 | 1667 | 1396 | 2252 | 1981 | | | | | | | | 3448 | 2949 |
| | 7 | 679 | 361 | 972 | 654 | 1556 | 1238 | 2141 | 1823 | | | | | | | | 4488 | 3949 |
| | 8 | | | 860 | 497 | 1444 | 1081 | 2029 | 1666 | 2614 | 2252 | 3199 | 2836 | | | | 4488 | 3949 |
| | 9 | | | | | 1332 | 923 | 1917 | 1509 | 2502 | 2094 | 3087 | 2678 | | | | 4488 | 3949 |
| | 10 | | | | | 1220 | 767 | 1805 | 1352 | 2390 | 1937 | 2974 | 2521 | 3560 | 3107 | | 4488 | 3949 |
| | 11 | | | | | | | 1693 | 1194 | 2278 | 1779 | 2862 | 2364 | 3448 | 2949 | | 4488 | 3949 |

Selection of Single Acting Actuator

The suggested safety factor for spring return actuator under normal working conditions is 30%-50%.

Example:

The torque needed by valve=80N.m

The torque consider safety factor=80(1+30%)=104N.m

Air Supply=5Bar

According to the table of spring return actuators' output, we find output torque of AT140SR K7 is: Air stroke 0° =308N.m

Air stroke 90° =247N.m

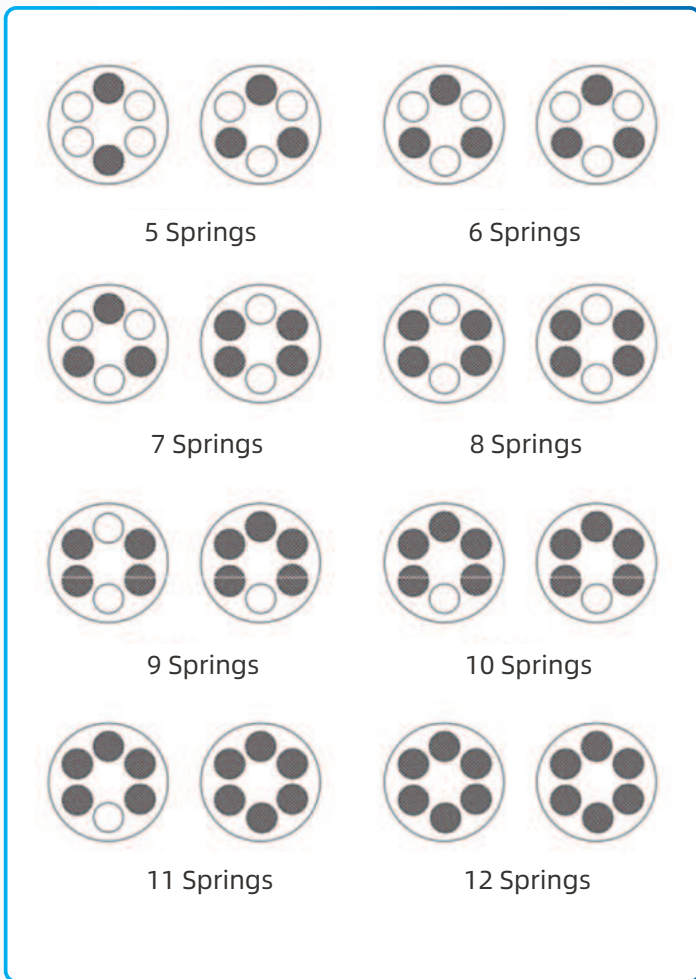
Spring stroke 90° =181N.m

Spring stroke 0° =120N.m

All the output torque is larger than we needed.

Attention:

During the spring reset of the single acting actuator, the actuator B port ventilation does not affect the actuator output torque, instead, it helps the spring reset.



During selecting the spring return actuators, we can choose the more reasonable and more economical actuators, if we know the different torque needed by the valve working at opening, operating and closing.

Example:

The max torque needed by the butterfly valve=104N.m

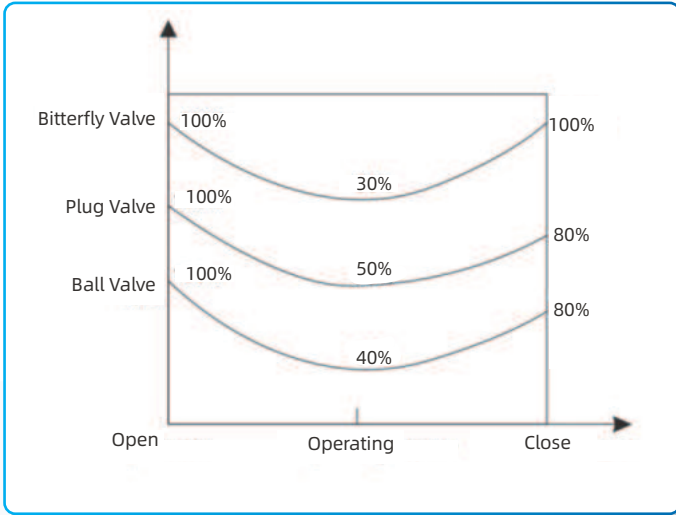
The torque after opened (operating) 104x30%=32N.m

Air Supply=5Bar

We can select the AT125SR K11 output torque is:

- Air stroke 0° =136N.m >104N.m
- Air stroke 90° =78N.m >32N.m
- Spring stroke 90° =173N.m >32N.m
- Spring stroke 0° =115N.m >104N.m

The above datas show the actuator's torque can satisfy the requirement of the butterfly valve.



Example.

Butterfly valve original maximum torque = 104N.m

Opened torque $104 \times 30\% = 32\text{N.m}$

Air pressure = 5Bar

We can choose AT125SRK11

Air stroke $0^\circ = 136\text{N.m} > 104\text{N.m}$

Air stroke $90^\circ = 78\text{N.m} > 32\text{N.m}$

Spring stroke $90^\circ = 173\text{N.m} > 32\text{N.m}$

Spring stroke $0^\circ = 115\text{N.m} > 104\text{N.m}$

The above data shows that it can meet the normal opening and closing of this butterfly valve.

Operating Conditions

1. Operating media

Dry or lubricated air, or the non-corrosive gases the maximum particle diameter must be less than $30 \mu\text{m}$.

2. Air supply pressure the minimum supply pressure is 2.5 Bar, the maximum supply pressure is 8 Bar.

3. Operating temperature

Standard: $-20^\circ\text{C} \sim +80^\circ\text{C}$

Low temperature: $-35^\circ\text{C} \sim +80^\circ\text{C}$

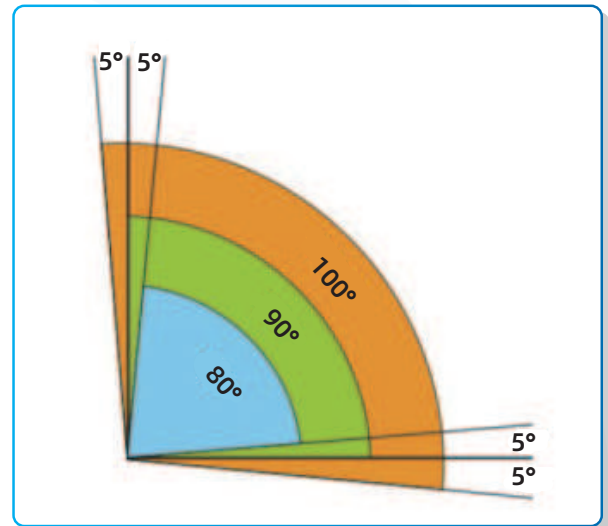
High temperature: $-15^\circ\text{C} \sim +150^\circ\text{C}$

4. Travel adjustment

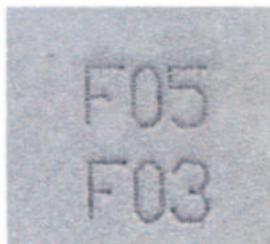
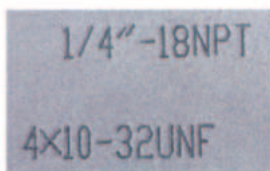
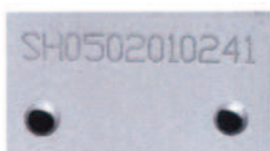
Have adjustment range of $\pm 5^\circ$ for the rotation at 0° and 90°

5. Application

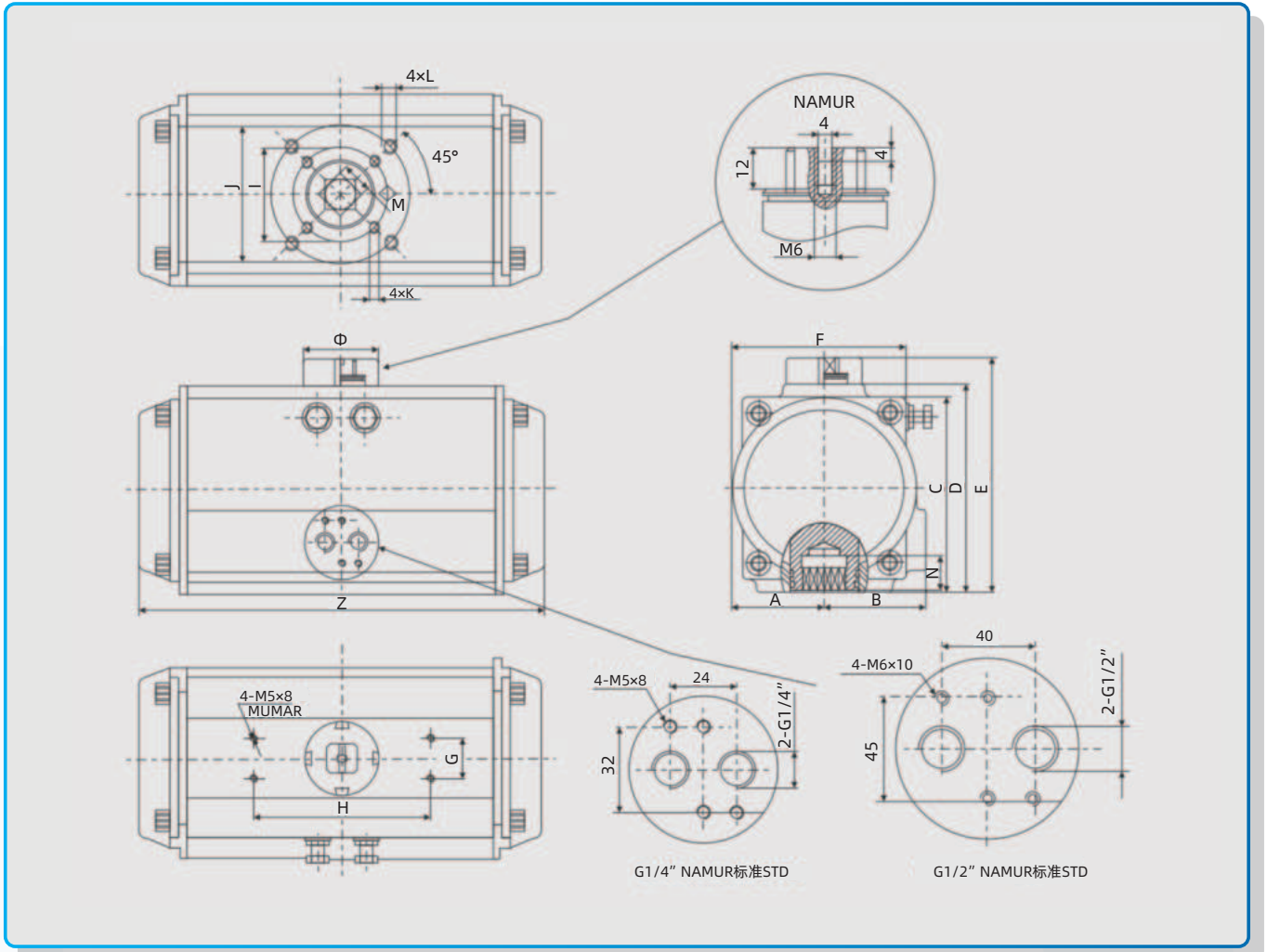
Either indoor or outdoor.



Operating Type (Single Action And Double Action)



- Air supply connection is designed in accordance with NAMUR Standard to install solenoid valves.
- The Namur drive pinion and the Namur top mounting connection permit direct installation of accessories such as limit switch box and positioner.
- Bottom mounting connection is designed in accordance with ISO5211 and DIN3337 standards for direct mounting with valve gear boxes or mounting brackets
- Each actuator is marked with a serial number, air connection and bottom mounting holes are marked for easy track and distinction.



Dimension Table

| MODEL | A | B | C | D | E | F | G | H | I | J | K | L | M | N | Z | Φ | Air Connection |
|-------|------|------|-------|-------|-------|-------|----|-----|------|------|----------|----------|----|----|-----|-----|----------------|
| AT52 | 30 | 41.5 | 65.5 | 72 | 92 | 65 | 30 | 80 | Φ36 | Φ50 | 4-M5x8 | 4-M6x10 | 11 | 14 | 147 | Φ40 | NAMUR G1/4" |
| AT65 | 37.5 | 46 | 81 | 89 | 109 | 73.5 | 30 | 80 | Φ50 | Φ70 | 4-M6x10 | 4-M8x13 | 14 | 18 | 170 | Φ40 | NAMUR G1/4" |
| AT75 | 42 | 53 | 94 | 100 | 120 | 81 | 30 | 80 | Φ50 | Φ70 | 4-M6x10 | 4-M8x13 | 14 | 18 | 184 | Φ40 | NAMUR G1/4" |
| AT85 | 46 | 57 | 98.5 | 108.5 | 128.5 | 92 | 30 | 80 | Φ50 | Φ70 | 4-M6x10 | 4-M8x13 | 17 | 21 | 206 | Φ40 | NAMUR G1/4" |
| AT92 | 50 | 58.5 | 111 | 116.5 | 136.5 | 98 | 30 | 80 | Φ50 | Φ70 | 4-M6x10 | 4-M8x13 | 17 | 21 | 262 | Φ40 | NAMUR G1/4" |
| AT105 | 57.5 | 64 | 122.5 | 134 | 154 | 109.5 | 30 | 80 | Φ70 | Φ102 | 4-M8x13 | 4-M10x16 | 22 | 26 | 282 | Φ40 | NAMUR G1/4" |
| AT125 | 71 | 74.5 | 150 | 160 | 180 | 133.5 | 30 | 80 | Φ70 | Φ102 | 4-M8x13 | 4-M10x16 | 22 | 26 | 304 | Φ55 | NAMUR G1/4" |
| AT140 | 75 | 77 | 162 | 174 | 194 | 137.5 | 30 | 80 | Φ102 | Φ125 | 4-M10x16 | 4-M12x20 | 27 | 31 | 396 | Φ55 | NAMUR G1/4" |
| AT160 | 87 | 87 | 185 | 198.5 | 218.5 | 158.5 | 30 | 80 | Φ102 | Φ125 | 4-M10x16 | 4-M12x20 | 27 | 31 | 445 | Φ55 | NAMUR G1/4" |
| AT190 | 103 | 103 | 216 | 232 | 262 | 189 | 30 | 130 | | Φ140 | | 4-M16x25 | 36 | 50 | 532 | Φ80 | NAMUR G1/4" |
| AT210 | 113 | 113 | 235.5 | 257 | 287 | 210 | 30 | 130 | | Φ140 | | 4-M16x25 | 36 | 50 | 536 | Φ80 | NAMUR G1/4" |
| AT240 | 130 | 130 | 264.5 | 292 | 322 | 245 | 30 | 130 | | Φ165 | | 4-M20x25 | 46 | 60 | 602 | Φ80 | NAMUR G1/4" |
| AT270 | 147 | 147 | 299 | 332 | 362 | 273 | 30 | 130 | | Φ165 | | 4-M20x25 | 46 | 60 | 722 | Φ80 | NAMUR G1/2" |

Air Consumption

Air Volme Opening&Closing

Unit: L

| MODEL | Aur Volumr Opening | Aur Volumr Closing | MODEL | Aur Volumr Opening | Aur Volumr Closing |
|-------|--------------------|--------------------|-------|--------------------|--------------------|
| AT52 | 0.12 | 0.16 | AT140 | 2.5 | 2.2 |
| AT65 | 0.21 | 0.23 | AT160 | 3.7 | 3.2 |
| AT75 | 0.3 | 0.34 | AT190 | 5.9 | 5.4 |
| AT85 | 0.43 | 0.47 | AT210 | 7.5 | 7.5 |
| AT92 | 0.64 | 0.73 | AT240 | 11 | 9 |
| AT105 | 0.95 | 0.88 | AT270 | 17 | 14 |
| AT125 | 1.6 | 1.4 | | | |

Air consumption rest with Air Supply. Air volume and Action cycle times,expressions:

L/Min=Air volume(Air volume Opening+Air volume closing)

$$\times \left[\frac{\text{Air Supply (Kpa)}+101.3}{101.3} \right] \times \text{Action cycle times(/min)}$$

| Series | MODEL | Spring Q.ty | Options |
|-----------|-------|-------------|---|
| AT □ DA | 52 | K5 | 120°,140°,180° for special degree operation |
| | 65 | K6 | |
| | 75 | K7 | |
| AT □ SR □ | 85 | K8 | SS Stainless Steel Pinion |
| AT □ □ Ni | 92 | K9 | |
| | 105 | K10 | |
| | 125 | K11 | |
| | | K12 | |

| Series | MODEL | Spring Q.ty | Options |
|-----------|-------|-------------|---|
| AT □ DA | 140 | K5 | 120°,140°,180° for special degree operation |
| | 160 | K6 | |
| | 190 | K7 | |
| AT □ SR □ | 210 | K8 | SS Stainless Steel Pinion |
| AT □ □ Ni | 240 | K9 | |
| | 270 | K10 | |
| | | K11 | |
| | | K12 | |

Weight Table

| Model | AT52Φ(52) | AT65Φ(65) | AT75Φ(75) | AT85Φ(85) | AT92Φ(92) | AT105Φ(105) | AT125Φ(125) |
|-------|-----------|-----------|-----------|-----------|-----------|-------------|-------------|
| DA | 1.38kg | 2.03kg | 2.7kg | 3.13kg | 4.6kg | 6.77kg | 8.9kg |
| SR | 1.45kg | 2.05kg | 2.9kg | 3.6kg | 5.22kg | 6.85kg | 10.11kg |

| Model | AT140Φ(140) | AT160Φ(160) | AT190Φ(190) | AT210Φ(210) | AT240Φ(240) | AT270Φ(270) |
|-------|-------------|-------------|-------------|-------------|-------------|-------------|
| DA | 13.25kg | 20.14kg | 31.3kg | 46.8kg | 67.28kg | 96.9kg |
| SR | 15.55kg | 24kg | 35.25kg | 54.8kg | 80.2kg | 118kg |

Note: 1.SR is 12 springs; 2. Weight is net weight.

Temperature Rating of Seat Sealing Material

| Code | Material | (°C) Applicable Temperature |
|------|--|-----------------------------|
| F | Reinforced Polytetrafluoroethylene(PTFE) | -40~180 |
| P | Para-potition polyphenylene | -40~285 |
| Y | Hard Alloy | -40~425 |

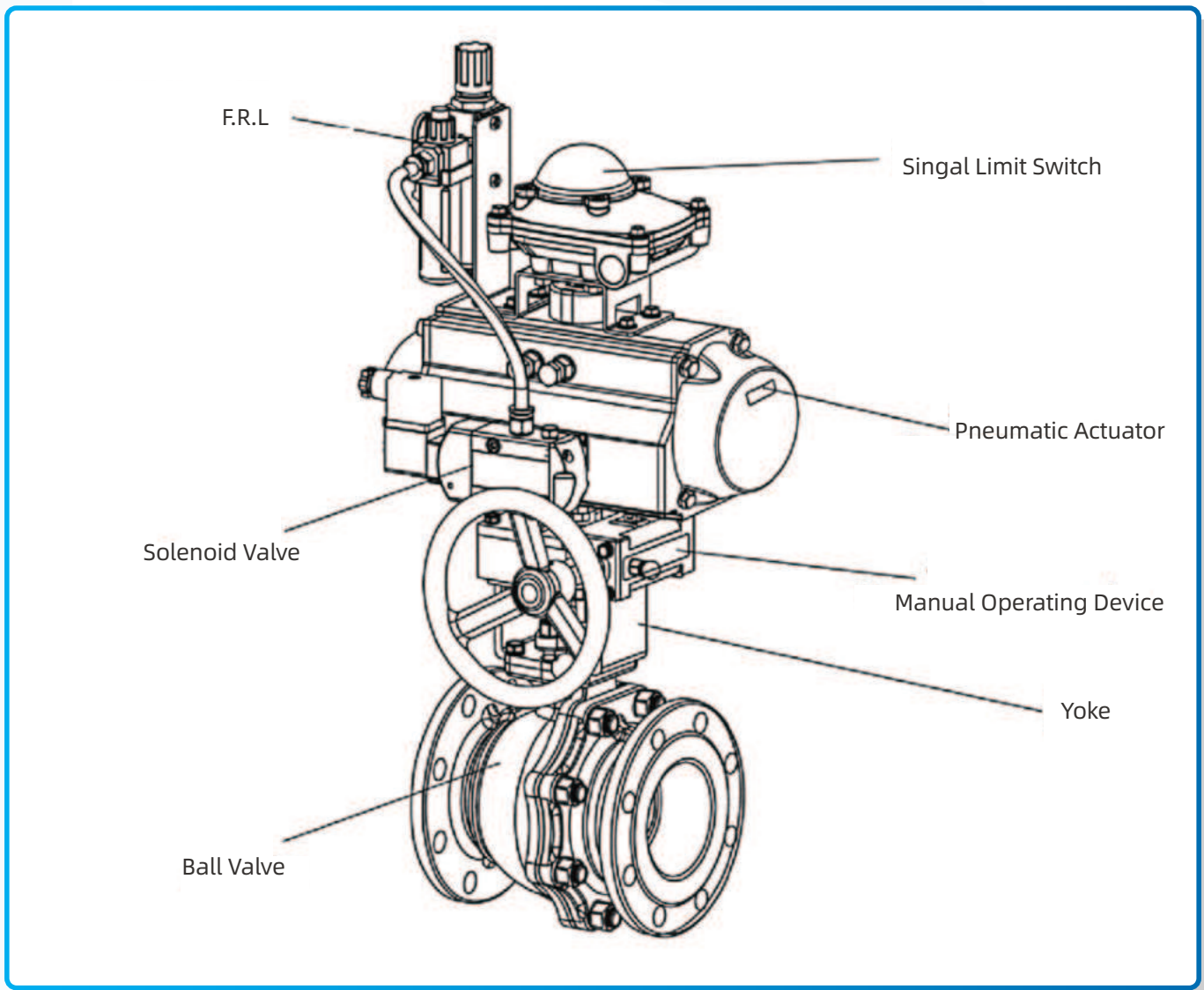
According to the diferent control and the request can choose the following accessories:

Cut-off Accessories: Single coil solenoid valve, Double electrically-controlled Solenoid valve, Limit Switch

Adjusting Accessories: Electropneumatic positioner, Pneumatic positioner, Electric-pneumatic Converter.

Air-supply Treatment Accessories: Air-filtering reducing valve, F.R.L.

Manual Device: HKCT Series



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