



ORION STEEL VALVES

# Axial Check Valves

API 6D



**AXIAL CHECK VALVES API 6D - p. 73**

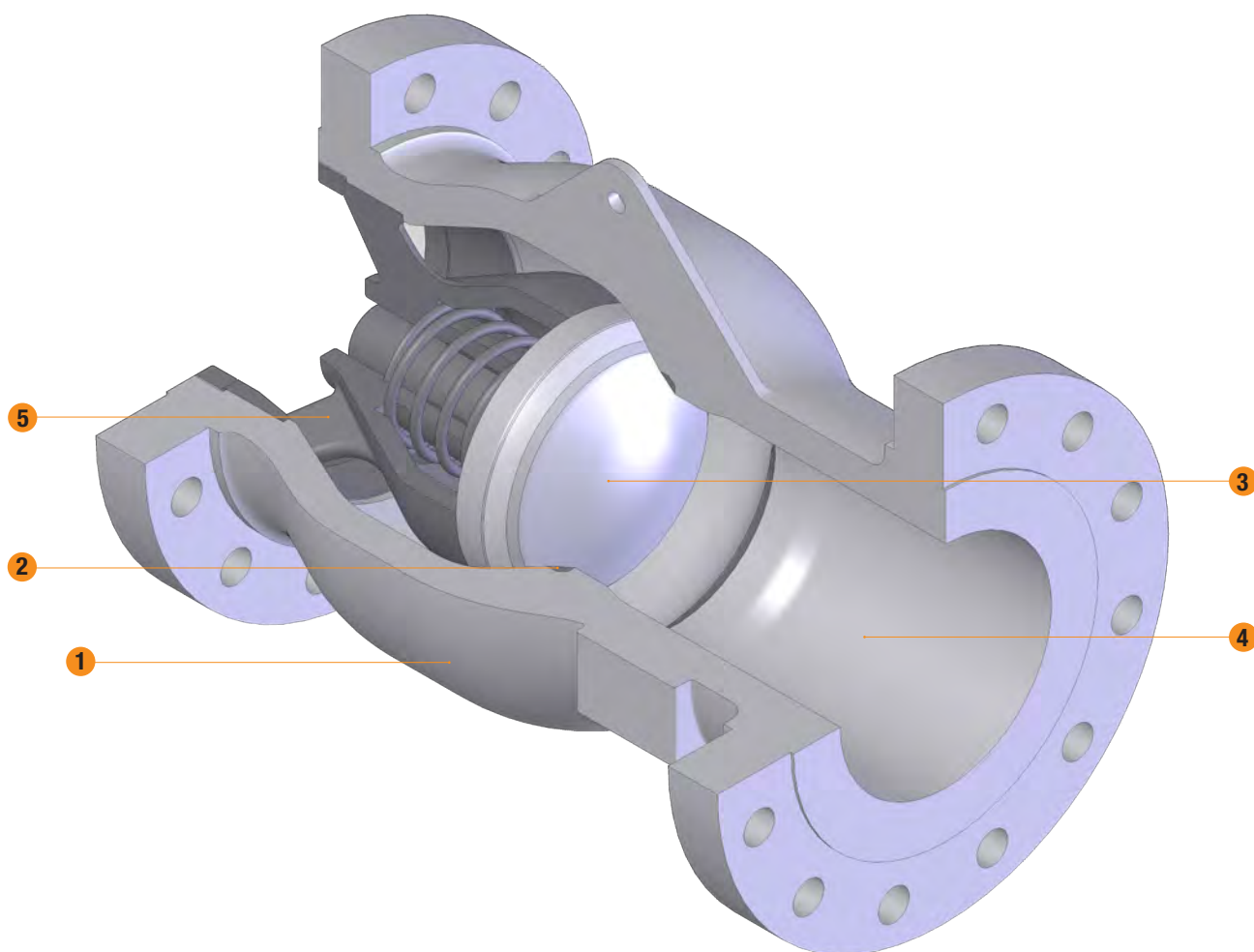
Class ASME 150 (PN 20) • 300 (PN 50) • 600 (PN 100) • 900 (PN 150) • 1500 (PN 250) • 2500 (PN 420)

**AXIAL CHECK VALVES OPERATING CONDITIONS - p. 79**

ORION STEEL VALVES

# Axial Check Valves

API 6D



Note: Please fill in the attached questionnaire in order to give your valves installation details.

**1 VALVE BODY**

The body is cast or forged in carbon or stainless steel and is also available in many other CRA. For severe services and large valve sizes it can be internally lined or fully clad instead of having solid CRA. The internal profile is designed in order to minimize pressure losses, and basic dimensions (face to face and wall thickness) comply with API 6D and ASME B16.34 standards. Body connections can be provided as per ASME B 16.5 RF or RTJ, as well as BW end or hub connection are available.

**2 SEAT**

The seat ring is part of the trim. It can be integral with the body or renewable. A ground lapped surface allows the tightness.

**3 VALVE DISC**

The disc is the main part of the trim and allows fluid control. It comes in forged steel and in cast steel. Its shape is carefully designed in order to avoid turbulences and is assisted by a spring in closed position.

**4 SPRING**

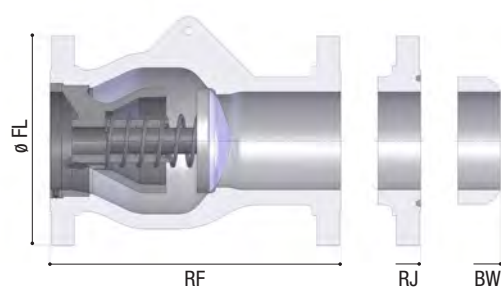
The valve will be closed quickly at fluid stop and reversal, giving its peculiar NON SLAM EFFECT, avoiding any reverse acceleration of fluid and consequent water-hammer. Selection of spring characteristics can be made upon engineering evaluation of specific applications.

**5 DIFFUSER**

The diffuser supports the disc and spring assembly and lets the fluid exiting from the valve with minor impact on pressure drop.

**INSTALLATION REMARKS**

As per ORION standard, the spring is sized for horizontal and vertical (downward-upward flow) installation, but it shall be properly sized to match specific installation, especially on larger valves where heavy discs are involved. An arrow is cast embossed on the body of the valve, indicating the fluid direction. Check anyway with ORION if the valve is suitable for the desired installed position.



### Class ASME 150 (PN 20)

FIGURE NUMBERS - CLASS ASME 150 - ALL SIZES

RA 150: RF - RAISED FACE • BW - WELDING ENDS

| SIZE                    | 1"  | 2"  | 2½" | 3"  | 4"  | 6"  | 8"  | 10" | 12" |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RF-BW                   | 127 | 203 | 216 | 241 | 292 | 356 | 495 | 622 | 698 |
| Ø FL                    | 110 | 150 | 180 | 190 | 230 | 280 | 345 | 405 | 485 |
| Approximate WEIGHT (Kg) |     |     |     |     |     |     |     |     |     |
| FLANGED                 | 3   | 9   | 13  | 18  | 33  | 56  | 122 | 188 | 284 |
| BW                      | /   | 7   | 10  | 14  | 26  | 45  | 98  | 150 | 227 |

| SIZE                    | 14" | 16" | 18" | 20" | 24"   | 26"   | 28"   | 30"   | 32"   |
|-------------------------|-----|-----|-----|-----|-------|-------|-------|-------|-------|
| RF-BW                   | 787 | 864 | 978 | 978 | 1.067 | 1.295 | 1.295 | 1.448 | 1.524 |
| Ø FL                    | 535 | 595 | 635 | 700 | 758   | 815   | 873   | 927   | 984   |
| Approximate WEIGHT (Kg) |     |     |     |     |       |       |       |       |       |
| FLANGED                 | 399 | 543 | 510 | 979 | 1.270 | 1.560 | 1.851 | 2.141 | 2.432 |
| BW                      | 319 | 434 | 408 | 783 | 1.016 | 1.248 | 1.481 | 1.713 | 1.946 |

| SIZE                    | 34"   | 36"   | 42"   | 48"   | 50"   | 54"   | 60"   |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|
| RF-BW                   | 1.651 | 1.956 | 2.083 | 1.956 | 2.360 | 2.537 | 2.802 |
| Ø FL                    | 1.111 | 1.168 | 1.346 | 1.511 | 1.568 | 1.683 | 1.854 |
| Approximate WEIGHT (Kg) |       |       |       |       |       |       |       |
| FLANGED                 | 3.013 | 3.303 | 4.175 | /     | /     | /     | /     |
| BW                      | 2.410 | 2.642 | 3.340 | 4.037 | 4.270 | 4.734 | 5.431 |

### Class ASME 300 (PN 50)

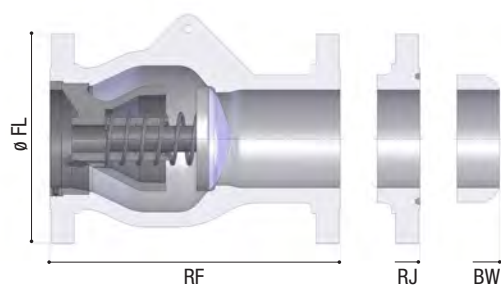
FIGURE NUMBERS - CLASS ASME 300 - ALL SIZES

RA 300: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

| SIZE                    | 2"  | 2½" | 3"  | 4"  | 6"  | 8"  | 10" | 12" | 14" |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RF-BW                   | 267 | 292 | 318 | 356 | 444 | 533 | 622 | 711 | 838 |
| RJ                      | 283 | 308 | 334 | 372 | 460 | 549 | 638 | 727 | 854 |
| Ø FL                    | 165 | 190 | 210 | 255 | 320 | 380 | 445 | 520 | 585 |
| Approximate WEIGHT (Kg) |     |     |     |     |     |     |     |     |     |
| FLANGED                 | 12  | 20  | 27  | 41  | 100 | 158 | 258 | 379 | 524 |
| BW                      | 10  | 16  | 22  | 33  | 80  | 126 | 206 | 303 | 419 |

| SIZE                    | 16" | 18" | 20"   | 22"   | 24"   | 26"   | 30"   | 36"   | 42"   |
|-------------------------|-----|-----|-------|-------|-------|-------|-------|-------|-------|
| RF-BW                   | 864 | 977 | 1.016 | 1.118 | 1.346 | 1.346 | 1.594 | 2.083 | 2.198 |
| RJ                      | 880 | 993 | 1.035 | 1.140 | 1.368 | /     | /     | /     | /     |
| Ø FL                    | 650 | 710 | 775   | 838   | 915   | 972   | 1.092 | 1.270 | 1.289 |
| Approximate WEIGHT (Kg) |     |     |       |       |       |       |       |       |       |
| FLANGED                 | 654 | 853 | 1.162 | 1.601 | 2.039 | 2.548 | 3.566 | 5.093 | /     |
| BW                      | 523 | 682 | 930   | 1.281 | 1.631 | 2.038 | 2.853 | 4.074 | 5.296 |

| SIZE                    | 48"   | 50"   | 54"   | 60"   |
|-------------------------|-------|-------|-------|-------|
| RF-BW                   | 2.493 | 2.591 | 2.788 | 3.083 |
| RJ                      | /     | /     | /     | /     |
| Ø FL                    | 1.467 | 1.530 | 1.657 | 1.810 |
| Approximate WEIGHT (Kg) |       |       |       |       |
| FLANGED                 | /     | /     | /     | /     |
| BW                      | 6.518 | 6.925 | 7.739 | 8.961 |



### Class ASME 600 (PN 100)

FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

RA 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

| SIZE                    | 2"  | 2½" | 3"  | 4"  | 5"  | 6"  | 8"  | 10" | 12" |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RF-BW                   | 292 | 330 | 356 | 432 | 508 | 559 | 660 | 787 | 838 |
| RJ                      | 295 | 333 | 359 | 435 | 511 | 562 | 663 | 790 | 841 |
| Ø FL                    | 165 | 190 | 210 | 275 | 330 | 355 | 420 | 510 | 560 |
| Approximate WEIGHT (Kg) |     |     |     |     |     |     |     |     |     |
| FLANGED                 | 14  | 23  | 31  | 59  | 95  | 131 | 237 | 370 | 502 |
| BW                      | 11  | 18  | 25  | 47  | 76  | 105 | 190 | 296 | 402 |

| SIZE                    | 14" | 16" | 18"   | 20"   | 24"   | 36"   | 40"    | 46"    | 50"    |
|-------------------------|-----|-----|-------|-------|-------|-------|--------|--------|--------|
| RF-BW                   | 889 | 991 | 1.092 | 1.194 | 1.397 | 2.083 | 2.286  | 2.540  | 2.756  |
| RJ                      | 892 | 994 | 1.095 | 1.200 | 1.407 | 2.098 | /      | /      | /      |
| Ø FL                    | 605 | 685 | 745   | 815   | 940   | 1.314 | 1.321  | 1.511  | 1.670  |
| Approximate WEIGHT (Kg) |     |     |       |       |       |       |        |        |        |
| FLANGED                 | 736 | 969 | 1.203 | 1.607 | 2.575 | 8.872 | 10.971 | /      | /      |
| BW                      | 589 | 775 | 962   | 1.286 | 2.060 | 7.098 | 8.777  | 11.295 | 12.974 |

| SIZE                    | 54"    | 60"    |
|-------------------------|--------|--------|
| RF-BW                   | 2.959  | 3.263  |
| RJ                      | /      | /      |
| Ø FL                    | 1.778  | 1.994  |
| Approximate WEIGHT (Kg) |        |        |
| FLANGED                 | /      | /      |
| BW                      | 14.654 | 17.172 |

### Class ASME 900 (PN 150)

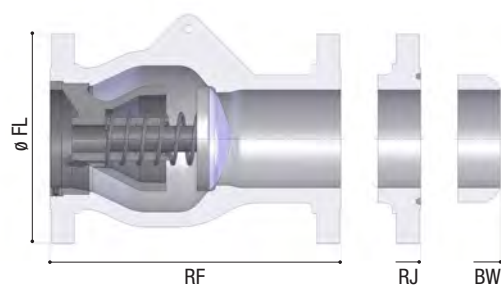
FIGURE NUMBERS - CLASS ASME 600 - ALL SIZES

RA 600: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

| SIZE                    | 2"  | 2½" | 3"  | 4"  | 5"  | 6"  | 8"  | 10" | 12" |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RF-BW                   | 368 | 419 | 381 | 457 | 559 | 610 | 737 | 838 | 965 |
| RJ                      | 371 | 422 | 384 | 460 | 562 | 613 | 740 | 841 | 968 |
| Ø FL                    | 215 | 245 | 240 | 290 | 350 | 380 | 470 | 545 | 610 |
| Approximate WEIGHT (Kg) |     |     |     |     |     |     |     |     |     |
| FLANGED                 | 18  | 30  | 41  | 68  | 112 | 155 | 286 | 482 | 751 |
| BW                      | 14  | 24  | 33  | 54  | 90  | 124 | 229 | 386 | 601 |

| SIZE                    | 14"   | 16"   | 18"   | 20"   | 24"   |
|-------------------------|-------|-------|-------|-------|-------|
| RF-BW                   | 1.029 | 1.130 | 1.537 | 1.321 | 1.549 |
| RJ                      | 1.039 | 1.140 | 1.550 | 1.334 | 1.568 |
| Ø FL                    | 640   | 705   | 785   | 855   | 1.040 |
| Approximate WEIGHT (Kg) |       |       |       |       |       |
| FLANGED                 | 1.020 | 1.289 | 1.516 | 2.840 | 5.488 |
| BW                      | 816   | 1.031 | 1.213 | 2.272 | 4.390 |



### Class ASME 1500 (PN 250)

FIGURE NUMBERS - CLASS ASME 1500 - ALL SIZES

RA 1500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

| SIZE                    | 2"  | 2½" | 3"  | 4"  | 5"  | 6"  | 8"  | 10"   | 12"   |
|-------------------------|-----|-----|-----|-----|-----|-----|-----|-------|-------|
| RF-BW                   | 368 | 419 | 470 | 546 | 673 | 705 | 832 | 991   | 1.130 |
| RJ                      | 371 | 422 | 473 | 549 | 676 | 711 | 842 | 1.001 | 1.146 |
| Ø FL                    | 215 | 245 | 265 | 310 | 375 | 395 | 485 | 585   | 675   |
| Approximate WEIGHT (Kg) |     |     |     |     |     |     |     |       |       |
| FLANGED                 | 37  | 51  | 64  | 100 | 167 | 233 | 495 | 777   | 1.208 |
| BW                      | 30  | 41  | 51  | 80  | 134 | 186 | 396 | 622   | 966   |

| SIZE                    | 14"   | 16"   | 18"   | 20"   | 24"   |
|-------------------------|-------|-------|-------|-------|-------|
| RF-BW                   | 1.257 | 1.384 | 1.537 | 1.664 | 1.943 |
| RJ                      | 1.276 | 1.406 | 1.559 | 1.686 | 1.971 |
| Ø FL                    | 750   | 825   | 915   | 985   | 1.170 |
| Approximate WEIGHT (Kg) |       |       |       |       |       |
| FLANGED                 | 1.638 | 2.069 | 2.840 | 3.545 | 4.955 |
| BW                      | 1.310 | 1.655 | 2.272 | 2.836 | 3.964 |

### Class ASME 2500 (PN 420)

FIGURE NUMBERS - CLASS ASME 2500 - ALL SIZES

RA 2500: RF - RAISED FACE • BW - WELDING ENDS • RJ - RING JOINT

| SIZE                    | 2"  | 2½" | 3"  | 4"  | 6"  | 8"    | 10"   | 12"   |
|-------------------------|-----|-----|-----|-----|-----|-------|-------|-------|
| RF-BW                   | 451 | 508 | 578 | 673 | 914 | 1.022 | 1.270 | 1.422 |
| RJ                      | 454 | 514 | 584 | 683 | 927 | 1.038 | 1.292 | 1.444 |
| Ø FL                    | 235 | 265 | 305 | 355 | 485 | 550   | 675   | 760   |
| Approximate WEIGHT (Kg) |     |     |     |     |     |       |       |       |
| FLANGED                 | 60  | 82  | 103 | 162 | 377 | 804   | 1.231 | 1.658 |
| BW                      | 48  | 66  | 82  | 130 | 302 | 643   | 985   | 1.326 |

For size and pressure classes non mentioned in the above tables please contact ORION.

N.B. All dimension are given in millimeters, weight are expressed in Kg. and are not including the operator.

Dimensions and weight may change from above values without notice.



## ORION CAST STEEL VALVES SpA

### AXIAL CHECK VALVES OPERATING CONDITIONS

Please fill in all the below required informations, in order to let ORION to evaluate the best valve design for your application

#### VALVE / PIPE

Line Size:

Pressure Class:

Item / Tag No :

#### OPERATING POSITION:

Horizontal pipeline

Vertical Pipeline

Upward stream

Downward stream

#### PLANT LOCATION

Meters of straight pipe before/after the valve:  /  m

Suction

High Cycling Yes

Distance of the valve from a bend in Pip:  m

Pump Discharge

No

#### DESIGN CONDITIONS

Operating Temperature Range (Min / Max):  /  °C

Pressure:  bar g

#### OPERATING CONDITIONS AT VALVE INLET

Temperature:  °C

Pressure:  bar g

#### FLUID DETAILS AT VALVE INLET

Liquid:

2 Phase Liquid & Gas:

Gas / Vapour:

Fluid Type:

Operating Density:  kg/m<sup>3</sup>

Molecular Wt. (for gas):  kg/kmol

Compressibility Factor:

#### ACTUAL FLOW RATES

Liquid:

Gas / Vapour:

Maximum:  m<sup>3</sup>/hr

Maximum:  kg/hr

Normal:  m<sup>3</sup>/hr

Normal:  kg/hr

Minimum:  m<sup>3</sup>/hr

Minimum:  kg/hr

#### PUMP / COMPRESSOR DETAILS:

| Type of Equipment | Flow                 |                      |
|-------------------|----------------------|----------------------|
|                   | Non Pulsating        | Pulsating*           |
| Pump**            | <input type="text"/> | <input type="text"/> |
| Compressor        | <input type="text"/> | <input type="text"/> |

\*If Pulsating, please indicate

Hz

#### SYSTEM DECELERATION AT CHECK VALVE

(if known):

m/s<sup>2</sup>

