

DUPCON DUNCON

THE RIGHT PRODUCT FOR YOUR APPLICATION



35 years

TRI ECCENTRIC BUTTERFLY VALVES

- Metal x Metal Seating
- Throttling and Control
- Zero Leakage (API 6D)
- Bi-directional
- Fire Safe (certified)
- Construction:
 - Flanged:
 - ISO 5752 (short)
 - ANSI B16.10 (gate)
 - Lug:
 - API 609B
 - Wafer:
 - API 609B
- ASME Class
150 # to 1500 #
- Size 4" to 104"
(100mm to 2600mm)



A history of growth and excellence

DURCON-VICE is a premium manufacturer of industrial valves in Brazil. It combines high standards in technology, quality and productivity, with tradition, experience and reliability.

Founded in 1974, DURCON-VICE employs 250 workers in 4 (four) manufacturing plants Units in Brazil and the USA. The total plant area is 20 thousand square meters.

The company produces a wide range of high technology valves, with over 2 hundred thousand valves sold, with sizes ranging from 1/4" to 104" and pressure class up to 4500#. We are present in LatinAmerica, NorthAmerica, Europe and Asia.

Our QMS is ISO 9001:2000 certified for design, development, manufacture and service. We are also PED 97/23/EC (Pressure Equipment Directive) certified.

Manufacturing Plants



Factory 1 -
Cajamar - São Paulo - Brazil



Factory 4 -
Caeiras - São Paulo - Brazil



Factory 2 -
Cajamar - São Paulo - Brazil

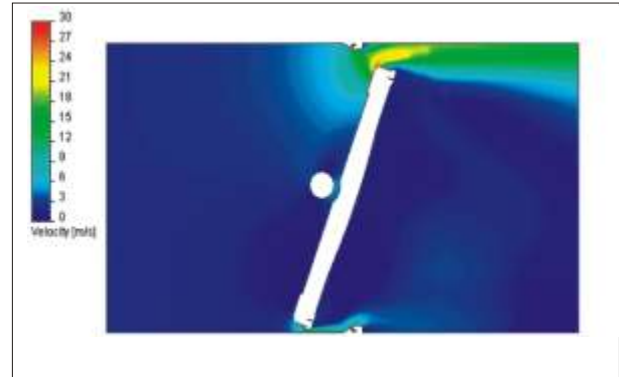


Factory 5 -
Jundiaí - São Paulo - Brazil
(Under Construction)

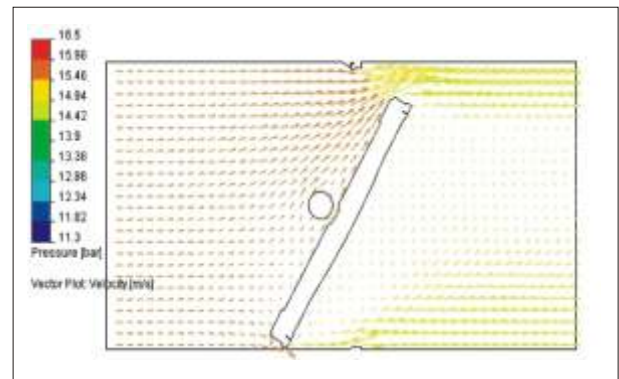


Factory 3 -
Three River - Michigan - EUA

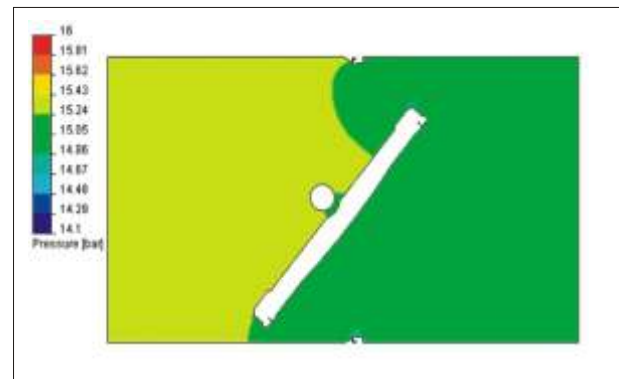
CFD Analysis (Computer Fluid Dynamic Analysis) 42" Tri-eccentric Butterfly Valve



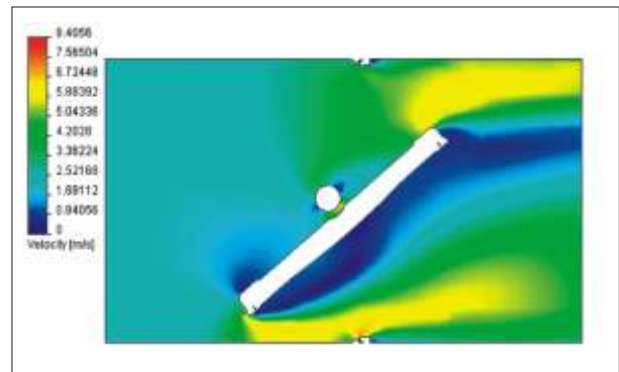
Opening 20° - Velocity



Opening 30° - Vectorial Velocity



Opening 40° - Pressure



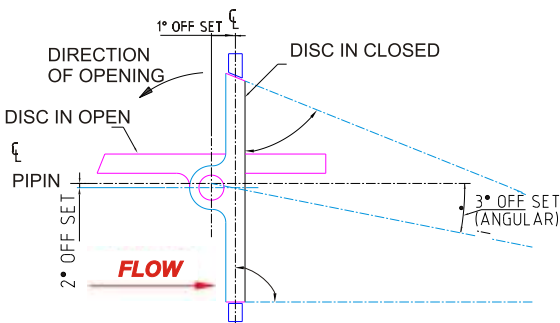
Opening 50° - Velocity

The triple offset design principle

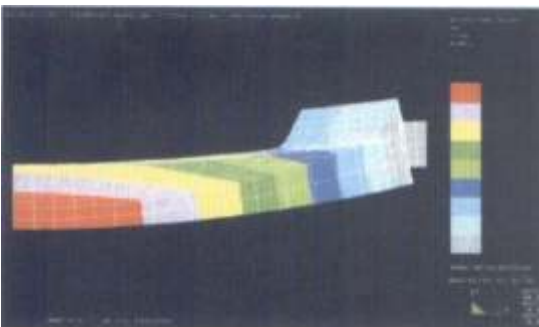
Durcon Vice Metal- to- Metal Seating
High Pressure butterfly valves provide a bi-directional bubble tight shut off. This is achieved by introducing state- of- the- art triple eccentric disc geometry.

The valve shaft is off-set against the seal (1st off- set), and against the center line of the valve (2nd off-set). The seating edges are machined with a continuously changing slope from an angle α on top of the oval seat ring to an angle β at the opposite side (3rd off-set angular).

This geometry ensures that the seat ring stays clear of the seat except at the final shut-off position, resulting in long seat life and operating cycles in excess of 250.000.



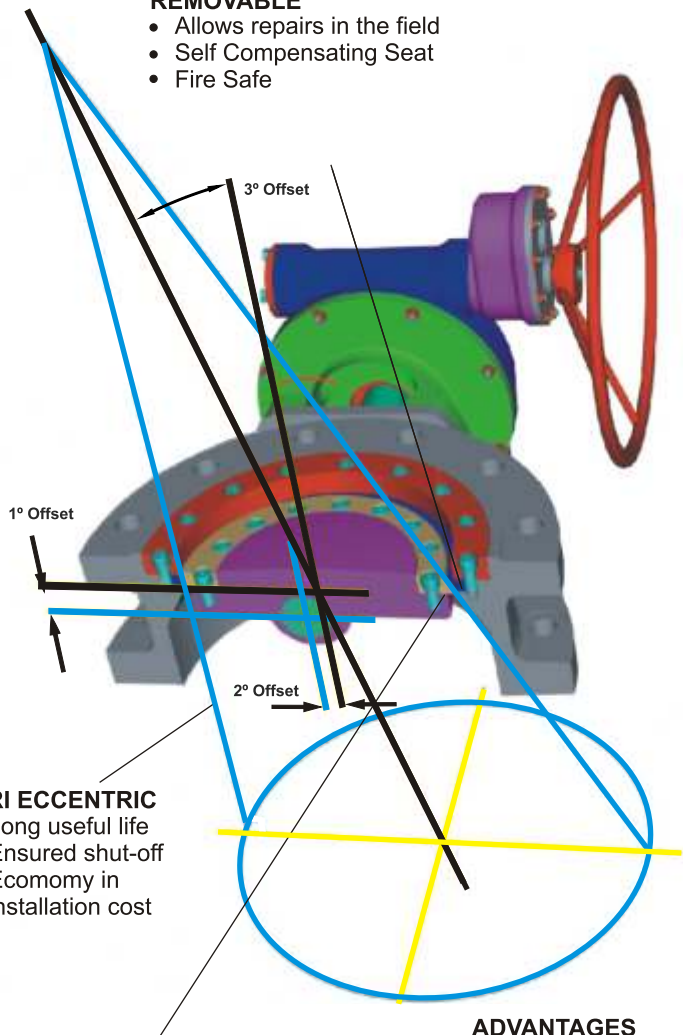
DN 2000 PN 10 Disc Deflection



Tri-Eccentric Butterfly Valve

SEAT AND SEAL RINGS SET REMOVABLE

- Allows repairs in the field
- Self Compensating Seat
- Fire Safe



- ### TRI ECCENTRIC
- Long useful life
 - Ensured shut-off
 - Economy in installation cost

METAL X METAL SEALING BI-DIRECTIONAL

- Working pressure up to 260 bar
- Working temperature from -249°C to 900°C
- 250.000 operation cycles

ADVANTAGES

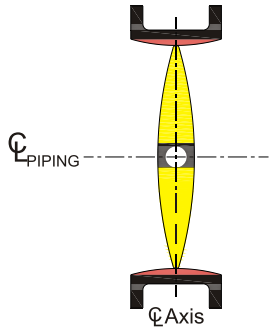
- Zero Leakage
- Zero maintenance
- Optimized costs
- Project intrinsically smaller; compact; light
- Substitutes with advantages valves type gate, globe and ball.

DN 2000 Pn10 Disc Stress



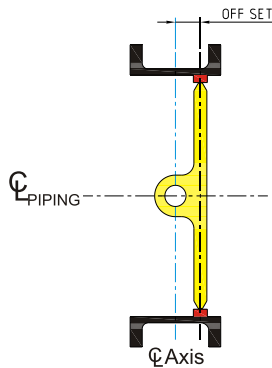
The butterfly valves evolution

Conventional (Zero Offset)



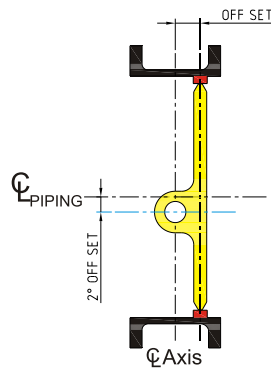
In 100% of cycle there is friction between the disc and near the shaft region resilient seal.

Mono Eccentric (One Offset)



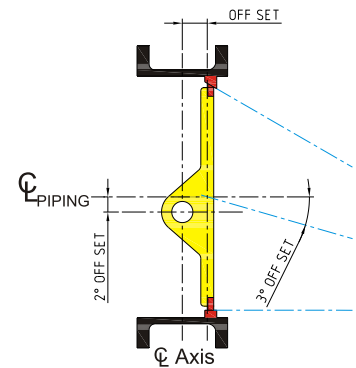
In 30% of cycle there is friction between seat and disc.

Bi Eccentric (Double Offset)



In 10% of cycle there is friction between seat and disc.

Tri Eccentric (Triple Offset)



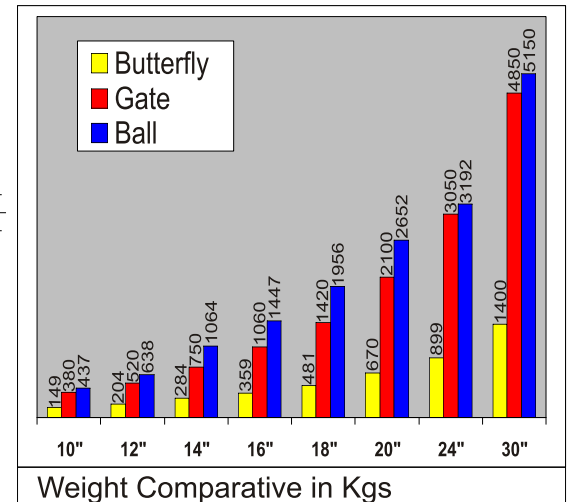
No friction between disc and seat during disc movement.

Comparative of butterfly valves

| | Conventional (Zero Offset) | Mono Eccentric (One Offset) | Bi Eccentric (Double Offset) | Tri Eccentric (Triple Offset) |
|--------------------------|-------------------------------|--------------------------------|---------------------------------|----------------------------------|
| Wear Resistance | Very Low | Low | Low | High |
| Sealing after 200 Cycles | Bad | Medium | Medium | Good |
| Reliability | Poor | Poor | Medium | High |
| Low temperatures | Not Applicable | Not Applicable | Medium | Good |
| High temperatures | Not Applicable | Not Applicable | Bad | Good |
| Low pressures | Bad | Bad | Medium | Good |
| High pressures | Bad | Bad | Medium | Good |

Tri eccentric comparative with ball, gate and globe valves

| Ex: Valve Size 18" - 300# | Butterfly Valve | Ball Valve | Gate Valve | Globe Valve |
|------------------------------|--------------------|---------------|---------------|----------------|
| Weight | 481 kg | 1956 kg | 1420 kg | 2740 kg |
| Face-to-face | 222 mm | 914 mm | 914mm | 978 mm |
| Height | 1005 mm | 960mm | 2115 mm | 1905 mm |



| Item | Tri Eccentric | Ball | Gate | Globe |
|------------------------|---------------|----------|-------------|-------------|
| Weight | Light | Heavy | Heavy | Heavy |
| Face to face | Short | Long | Long | Long |
| Height | Small | Small | Big | Big |
| Torque | Small | Medium | High | High |
| Automation | 1/4 turn | 1/4 turn | Multi-turns | Multi-turns |
| Maintenance | Simple | Medium | Difficult | Difficult |
| Seat Performance | Good | Medium | Medium | Medium |
| Packing Performance | Good | Good | Medium | Medium |
| Kv (Coef. of flow) | Good | Good | Good | Medium |
| Cost product / freight | Small | High | High | High |

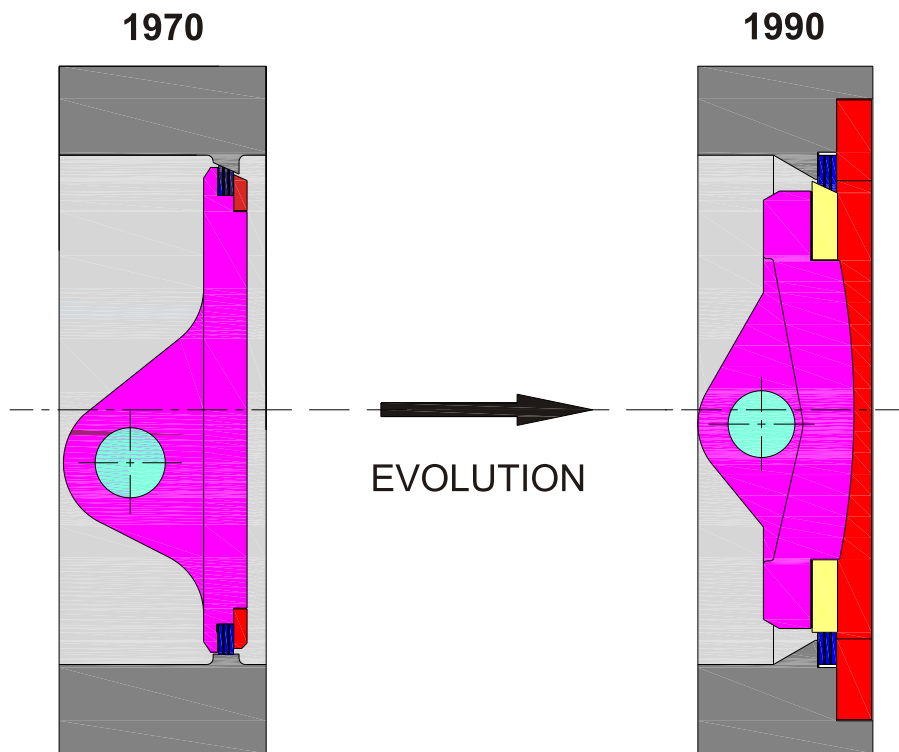
Leaks comparison table for different standards

| Standard | Maximun Leak Allowed | | | | Maximum leak Allowed (ml / min.) Example: Pressure 20,7 bar (300 Psi) | | | |
|-------------------|-------------------------|------------------------|-------------------|--------------------------|--|--------|---------|----------|
| | Water | | Air | | Tri 8" | | Tri 24" | |
| | Water | Air | Water | Air | Water | Air | Water | Air |
| API 600 | 0.4 drops/s | 0.5 drops/s | 0.7 bubbles/s | 0.9 bubbles/s | 1.50 | 2.63 | 1.88 | 3.38 |
| MSS - SP 61 | 0.4 ml/hr/mmDN | | 120 ml/hr/mmDN | | 1.33 | 400.00 | 4.00 | 1.20 |
| API 598 | 20.00 drops/min | 48.00 drops/min/ inNPS | 40.00 bubbles/min | 96.00 bubbles/min/ inNPS | ----- | 5.97 | 3.00 | 14.33 |
| FCI 70-2 CLASS VI | ----- | | 45.00 bubbles/min | 450.00 min | ----- | 7.50 | ----- | 60.45 |
| FCI 70-2 CLASS V | 0.0005 ml/minxinNPSxpsi | | 4.7ml/minxinNPS | | 1.20 | 37.60 | 3.60 | 112.80 |
| ISO 5208 Rate A | 0 mm3/seqxDN | | 0 mm3/seqxDN | | 0.00 | 0.00 | 0.00 | 0.00 |
| ISO 5208 Rate B | 0.01 mm3/seqxDN | | 0.3 mm3/seqxDN | | 0.12 | 3.60 | 0.36 | 10.80 |
| ISO 5208 Rate C | 0.03 mm3/seqxDN | | 3 mm3/seqxDN | | 0.36 | 36.00 | 1.08 | 108.00 |
| ISO 5208 Rate D | 0.1 mm3/seqxDN | | 30 mm3/seqxDN | | 1.20 | 360.00 | 3.60 | 1,080.00 |

Notes:

- 1) Tri eccentrics valves of DURCON-VICE meet all standards requirement.
- 2) API 598 defines 1ml of water it is equivalent to 16 drops.

Technology evolution of tri-eccentrics valves



The new project fastens the laminated seat firmly to the body, eliminating flexing movements, without friction, assuring no leak for many cycles.

The torque applied by the actuator to the shaft is transferred to the seating surface (there are no deformations of the seat).

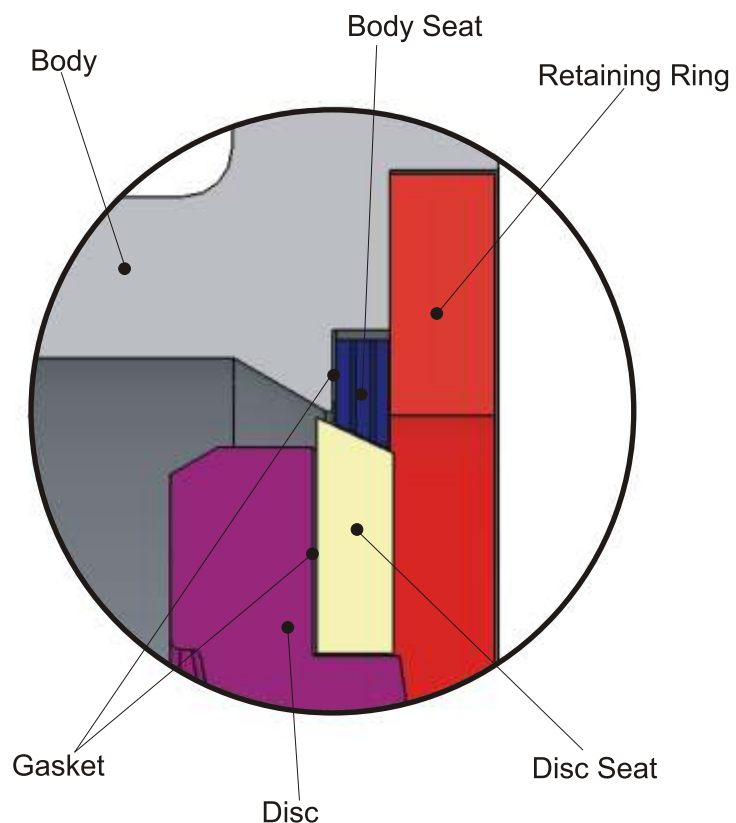
The laminated seat fastened to the body avoids the wear and tear due to erosion and abrasion (the fluid speed in the center of the piping is maximum while close to the body it is practically zero).

The seat of the valve

The valve seal is manufactured from laminated stainless steel with grafpoil filling. The body seal is held in position by a bolted retaining ring and together with the stainless disc seat ring is easily replaceable.

A gasket prevents leakage around the seal ring. The metal to metal seating valve can operate within a temperature of -249° to $+600^{\circ}\text{C}$. Valve designs for cryogenic applications are available on request.

For low temperature applications, the metal seat can be substituted by a PTFE seat. Durcon Vice High Pressure butterfly valves are manufactured in a wide range of materials to suit the most varied applications.



Tri-Eccentric configurations and optional

Basic configuration

Nominal Diameters:

4" to 104" (100 to 2600 mm)

Pressure Class:

ASME 150# to 1500# (DIN PN10 to 250)

Connections:

Flanged, Butt - weld ends, Lug and Wafer

Temperature Limits:

-249°C to +950°C (-416°F to 1742°F), for stainless steel

Body Materials:

WCB, CF8M, LCB, WC6, CF3M, Duplex, Super Duplex, Inconel, Alloy 20[®], Monel[®], Incoloy[®], Hastelloy[®], C5, Titanium, and other according to request

Actuator Options:

Manual gear, pneumatic, electric hydraulic and other or request.

Optional

- Cryogenic service
- High temperature service (above 450°)
- Steam jacket
- Integral body retention ring
- Special face to face
- Outboard bearings
- Lubricated bearings
- Live loaded packing
- Packing purge
- Lantern ring
- Metal seat with teflon
- Solid seat
- Disc protection for 90° open
- Stellite[®] seat deposit
- Flanged RTJ Connections

Flow coefficients Kv

| Nominal Diameters | in | 4 | 6 | 8 | 10 | 12 | 14 |
|-------------------|----|-----|-----|------|------|------|------|
| | mm | 100 | 150 | 200 | 250 | 300 | 350 |
| Class 150 | | 275 | 795 | 1510 | 2720 | 4040 | 5720 |
| Class 300 | | 226 | 540 | 1020 | 1690 | 2360 | 3380 |

| Nominal Diameters | in | 16 | 18 | 20 | 24 | 30 | 36 |
|-------------------|----|------|------|-------|-------|-------|-------|
| | mm | 400 | 450 | 500 | 600 | 750 | 900 |
| Class 150 | | 7410 | 9620 | 12300 | 17900 | 25200 | 44700 |
| Class 300 | | 4620 | 6010 | 7620 | 10800 | 15900 | 30900 |

Flow equation for liquids

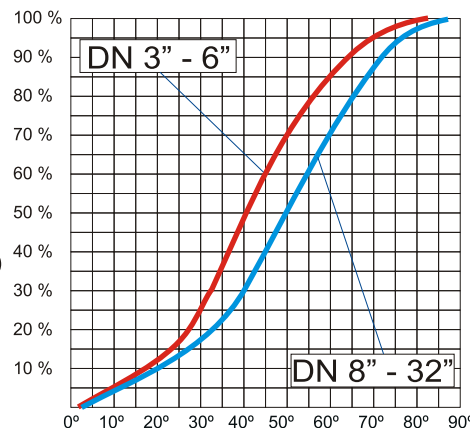
$$Q = C_v \sqrt{\frac{\Delta P}{G_L}}$$

Q = Flows in gpm
(U.S. Gallons per minute)

ΔP = Differential of pressure (PSI)

G = Specific gravity

$C_v = 1,156 K_v$



The valves with metal to metal sealing are certified "Fire Safes" according to Bs6755, API 607 and API 6FA.

Design Standards

Quality Assurance: ISO 9001:2000

Compliance with: Pressure

Equipment Directive PED 97/23/EC, category III. Cat. Mod. H1 (available on request)

Design: ASME B16.34, API 609, DIN 3840, EN 593

Face to face: ISO 5752, EN 558, ASME B16.10, API 609

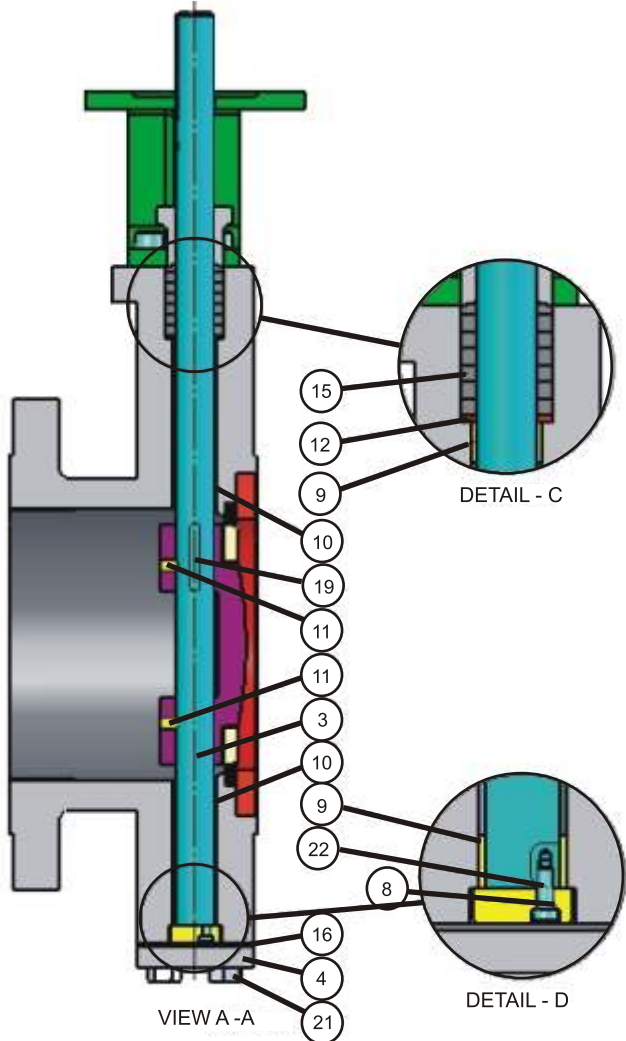
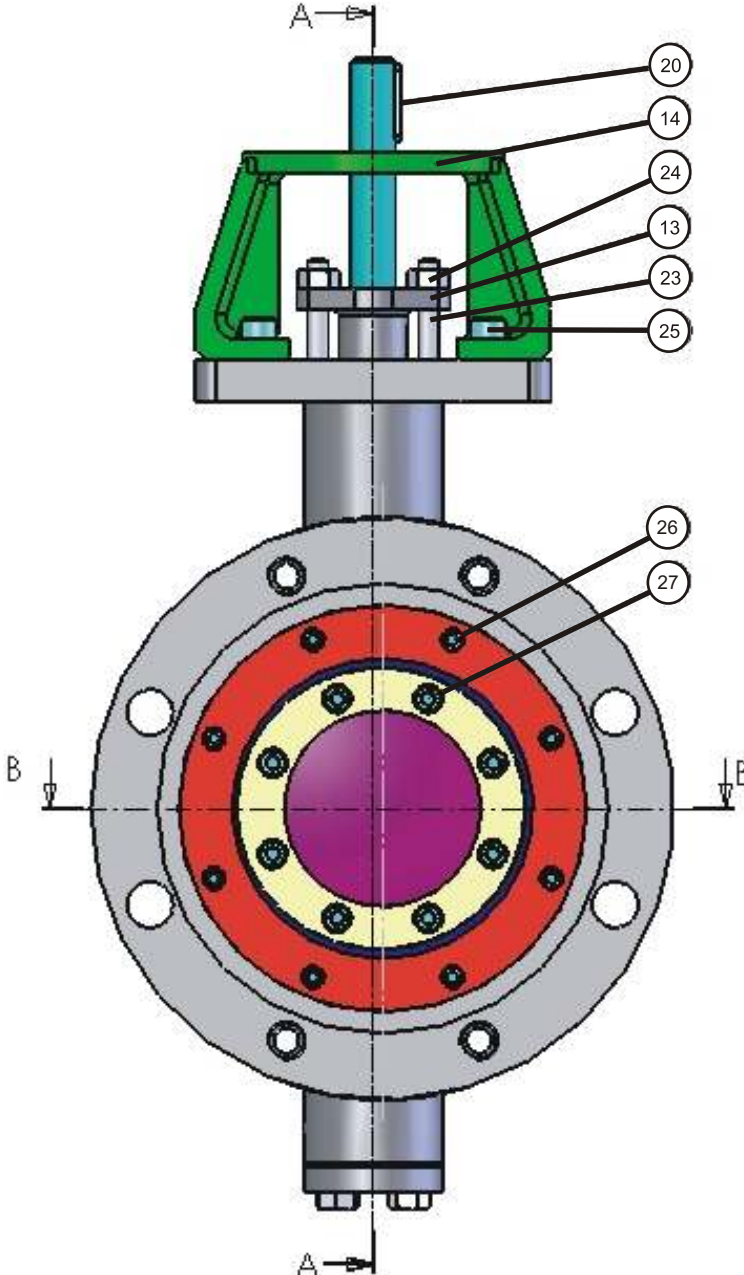
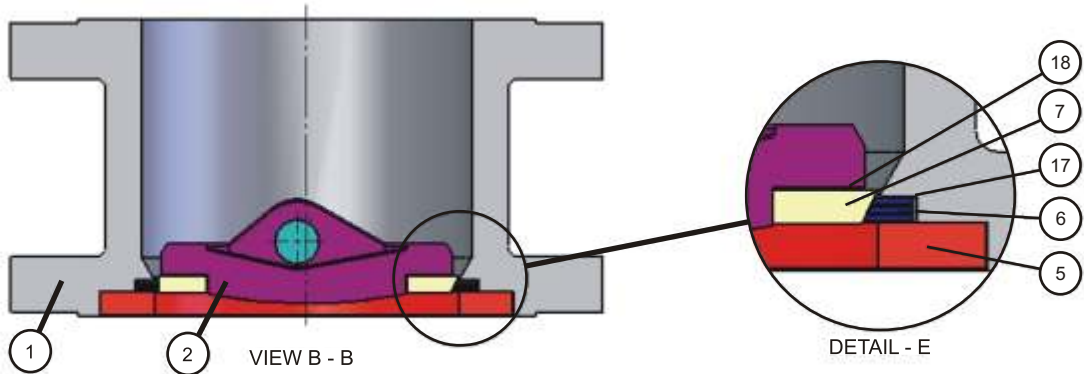
Flange Drilling: ASME B16.5, ASME B16.47, ISO 7005, DIN 2501, EN 1092,

Test: API 598, API 6D, ISO 5208, FCI 70-02

Fire safe test: API 607, edição 4th

Marking: MSS SP 25, EN 19

Valves Parts and Materials



Valves Parts and Materials

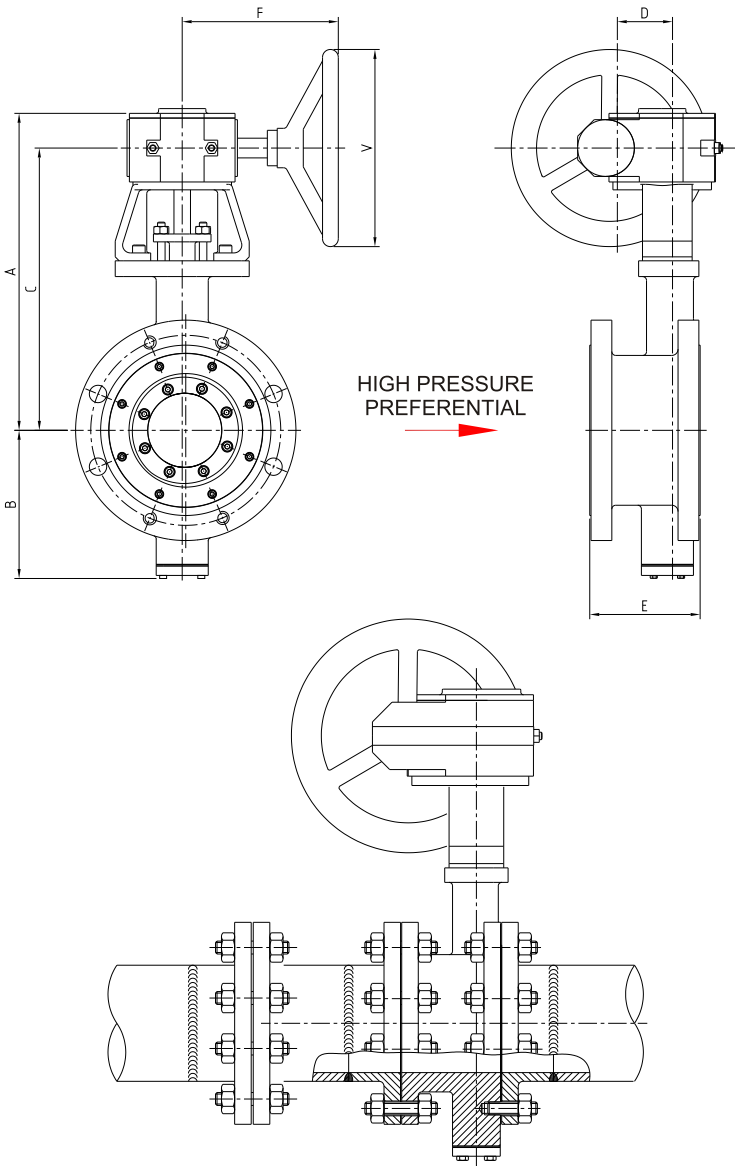
| ITEM | QTY | DESCRIPTION | UP TO 800°F (427°C) | | UP TO 1100°F (600°C) | |
|------|------|----------------------|----------------------|--|----------------------|--|
| | | | CARBON STEEL | | STAINLESS STEEL | |
| 1 | 1 | Body | ASTM A 216 GR WCB | | ASTM A 351 GR CF8M | |
| 2 | 1 | Disc | ASTM A 216 GR WCB | | ASTM A 351 GR CF8M | |
| 3 | 1 | Shaft | AISI 410 H.T. | | ASTM A 564 Type 630 | |
| 4 | 1 | Bottom cover | ASTM A 105 | | ASTM A 240 GR 316 | |
| 5 | 1 | Retaining ring | AISI 304 | | AISI 316 | |
| 6 | 1 | Body seat | AISI 316 w/ Graphite | | AISI 316 w/ Graphite | |
| 7 | 1 | Disc seat | AISI 316 | | AISI 316 | |
| 8 | 1 | Anti- expulsion disc | AISI 410 | | AISI 316 | |
| 9 | 1 | Outer bearing | AISI 304 Nitreted | | AISI 316 Nitreted | |
| 10 | 1 | Inner bearing | AISI 304 Nitreted | | AISI 316 Nitreted | |
| 11 | 2 | Locked pin | AISI 410 | | ASTM A 564 Tipo 630 | |
| 12 | 1 | Gasket ring | AISI 410 | | AISI 316 | |
| 13 | 1 | Packing Gland | ASTM A 216 GR WCB | | ASTM A 351 GR CF8M | |
| 14 | 1 | Bracket | Carbon Steel | | Carbon Steel | |
| 15 | 6 | Packing | Braided Graphite | | Braided Graphite | |
| 16 | 1 | Cover seal | Braided Graphite | | Braided Graphite | |
| 17 | 1 | Body seat seal | Braided Graphite | | Braided Graphite | |
| 18 | 1 | Disc seat seal | Braided Graphite | | Braided Graphite | |
| 19 | 1 | Disc Key | SAE 1045 | | ASTM A 564 Tipo 630 | |
| 20 | 1 | Shaft Key | SAE 1045 | | SAE 1045 | |
| 21 | 4 | Cover Bolt | ASTM A 193 GR B7 | | ASTM A 193 GR B8M | |
| 22 | 3 | Anti- expulsion bolt | Alloy Steel | | AISI 316 | |
| 23 | 2 | Studbolt | ASTM A 193 GR B7 | | ASTM A 193 GR B8M | |
| 24 | 2 | Nut | ASTM A 194 GR 2H | | ASTM A 193 GR 8M | |
| 25 | 4 | Adapter Bolt | Alloy Steel | | Alloy Steel | |
| 26 | Var. | Retaining ring bolt | Alloy Steel | | AISI 316 | |
| 27 | Var. | Disc seat bolt | Alloy Steel | | AISI 316 | |

Others materials under consult

Pressure and Temperature (According to ASME B16.34 - Year 2003)

| TEMP. °C | CLASS 150 | | | | CLASS 300 | | | | CLASS 600 | | | | CLASS 900 | | | | TEMP. °F |
|----------|---------------|----------------|-----------------|----------------|---------------|----------------|-----------------|----------------|---------------|----------------|-----------------|----------------|---------------|----------------|-----------------|-------|-----------|
| | Carbon Steel | | Stainless Steel | | Carbon Steel | | Stainless Steel | | Carbon Steel | | Stainless Steel | | Carbon Steel | | Stainless Steel | | |
| | A 216 Gr. WCB | A 351 Gr. CF8M | A 216 Gr. WCB | A 351 Gr. CF8M | A 216 Gr. WCB | A 351 Gr. CF8M | A 216 Gr. WCB | A 351 Gr. CF8M | A 216 Gr. WCB | A 351 Gr. CF8M | A 216 Gr. WCB | A 351 Gr. CF8M | A 216 Gr. WCB | A 351 Gr. CF8M | | | |
| | PSIG | BAR | PSIG | BAR | PSIG | BAR | PSIG | BAR | PSIG | BAR | PSIG | BAR | PSIG | BAR | PSIG | BAR | |
| -29 à 38 | 285 | 19.6 | 275 | 19.0 | 740 | 51.1 | 720 | 49.6 | 1,480 | 102.1 | 1,440 | 99.3 | 2,220 | 153.2 | 2,160 | 148.9 | -20 à 100 |
| 50 | 260 | 19.2 | 235 | 18.4 | 680 | 50.1 | 620 | 48.1 | 1,360 | 100.2 | 1,240 | 96.2 | 2,035 | 150.4 | 1,860 | 144.3 | 200 |
| 100 | 230 | 17.7 | 215 | 16.2 | 655 | 46.6 | 560 | 42.2 | 1,310 | 93.2 | 1,120 | 84.4 | 1,965 | 139.8 | 1,680 | 126.6 | 300 |
| 150 | 200 | 15.8 | 195 | 14.8 | 635 | 45.1 | 515 | 38.5 | 1,265 | 90.2 | 1,025 | 77.0 | 1,900 | 135.2 | 1,540 | 115.5 | 400 |
| 200 | 170 | 13.8 | 170 | 13.7 | 605 | 43.8 | 480 | 35.7 | 1,205 | 87.6 | 955 | 71.3 | 1,810 | 131.4 | 1,435 | 107.0 | 500 |
| 250 | 140 | 12.1 | 140 | 12.1 | 570 | 41.9 | 450 | 33.4 | 1,135 | 83.9 | 900 | 66.8 | 1,705 | 125.8 | 1,355 | 100.1 | 600 |
| 300 | 125 | 10.2 | 125 | 10.2 | 550 | 39.8 | 440 | 31.6 | 1,100 | 79.6 | 885 | 63.2 | 1,650 | 119.5 | 1,325 | 94.9 | 650 |
| 325 | 110 | 9.3 | 110 | 9.3 | 530 | 38.7 | 435 | 30.9 | 1,060 | 77.4 | 870 | 61.8 | 1,590 | 116.1 | 1,305 | 92.7 | 700 |
| 350 | 95 | 8.4 | 95 | 8.4 | 505 | 37.6 | 425 | 30.3 | 1,015 | 75.1 | 855 | 60.7 | 1,520 | 112.7 | 1,280 | 91.0 | 750 |
| 375 | 80 | 7.4 | 80 | 7.4 | 410 | 36.4 | 420 | 29.9 | 825 | 72.7 | 845 | 59.8 | 1,235 | 109.1 | 1,265 | 89.6 | 800 |

Drawings and dimensions for double flanges ISO 5752 - 150 # to 900



| Size 4" to 24" - Class 150 Lb. | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 100 (4") | 325 | 146 | 286 | 45 | 127 | 145 | 150 | 31 |
| 150 (6") | 395 | 190 | 351 | 60 | 140 | 160 | 150 | 42 |
| 200 (8") | 455 | 220 | 404 | 75 | 152 | 210 | 350 | 53 |
| 250 (10") | 485 | 252 | 433 | 90 | 165 | 320 | 350 | 99 |
| 300 (12") | 575 | 287 | 473 | 90 | 178 | 320 | 350 | 114 |
| 350 (14") | 600 | 325 | 498 | 90 | 190 | 320 | 350 | 165 |
| 400 (16") | 635 | 350 | 535 | 90 | 216 | 325 | 450 | 198 |
| 450 (18") | 655 | 375 | 620 | 110 | 222 | 330 | 350 | 249 |
| 500 (20") | 785 | 415 | 735 | 130 | 229 | 385 | 450 | 311 |
| 600 (24") | 880 | 450 | 820 | 160 | 267 | 410 | 450 | 469 |

Dimensions in mm

| Size 4" to 24" - Class 300 Lb. | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 100 (4") | 340 | 161 | 301 | 45 | 127 | 145 | 150 | 34 |
| 150 (6") | 415 | 210 | 371 | 75 | 140 | 185 | 250 | 62 |
| 200 (8") | 480 | 245 | 434 | 90 | 152 | 215 | 450 | 105 |
| 250 (10") | 572 | 282 | 450 | 90 | 165 | 320 | 350 | 149 |
| 300 (12") | 607 | 322 | 515 | 110 | 178 | 342 | 450 | 204 |
| 350 (14") | 641 | 365 | 550 | 130 | 190 | 397 | 450 | 284 |
| 400 (16") | 698 | 395 | 597 | 130 | 216 | 392 | 350 | 359 |
| 450 (18") | 815 | 420 | 755 | 160 | 222 | 430 | 500 | 481 |
| 500 (20") | 875 | 455 | 815 | 160 | 229 | 430 | 600 | 670 |
| 600 (24") | 985 | 500 | 925 | 220 | 267 | 520 | 600 | 899 |

Dimensions in mm

| Size 4" to 24" - Class 600 Lb. | | | | | | | | |
|--------------------------------|------|-----|------|-----|-----|-----|------|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 100 (4") | 387 | 184 | 337 | 67 | 190 | 219 | 298 | 63 |
| 150 (6") | 457 | 238 | 403 | 86 | 210 | 340 | 350 | 110 |
| 200 (8") | 530 | 263 | 460 | 117 | 230 | 370 | 350 | 187 |
| 250 (10") | 641 | 327 | 546 | 130 | 250 | 420 | 350 | 283 |
| 300 (12") | 749 | 365 | 635 | 98 | 270 | 350 | 4510 | 368 |
| 350 (14") | 819 | 390 | 708 | 98 | 290 | 350 | 4510 | 424 |
| 400 (16") | 933 | 441 | 860 | 200 | 310 | 500 | 4510 | 679 |
| 450 (18") | 936 | 460 | 864 | 200 | 330 | 500 | 4510 | 745 |
| 500 (20") | 1095 | 527 | 1022 | 263 | 350 | 670 | 700 | 1041 |
| 600 (24") | 1184 | 622 | 1111 | 263 | 390 | 670 | 700 | 1411 |

Dimensions in mm

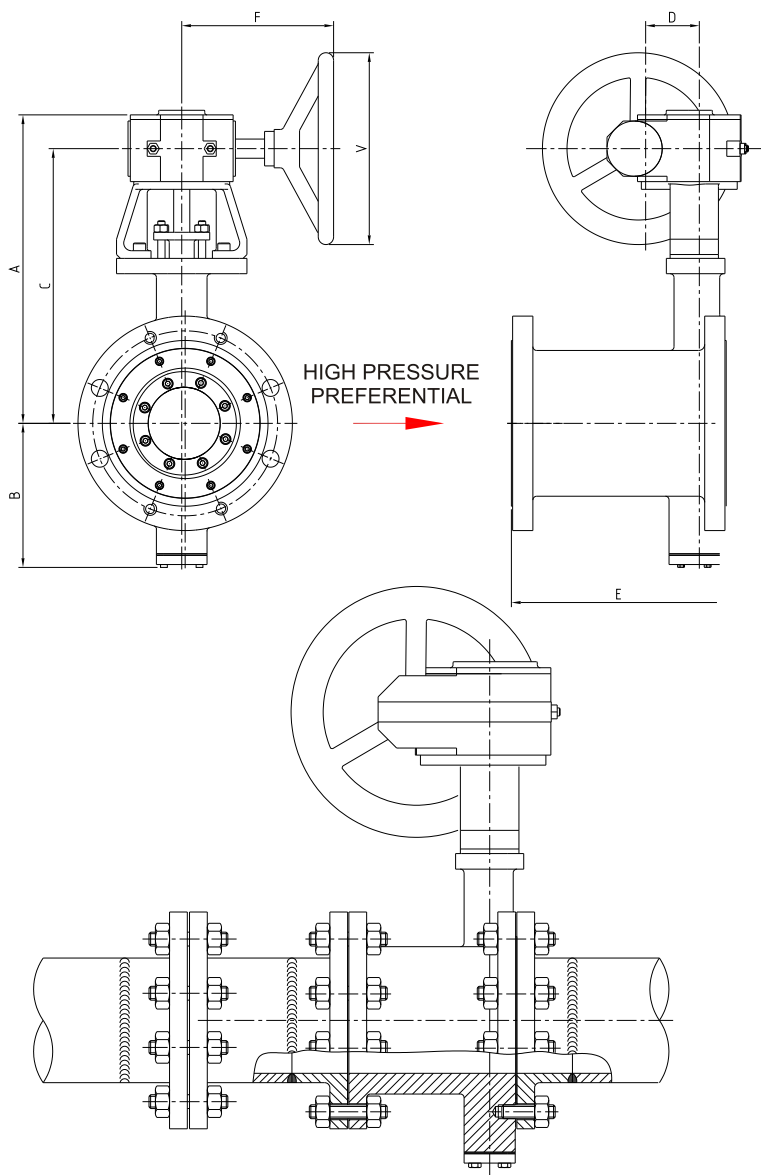
| Size 6" to 24" - Class 900 Lb. | | | | | | | | |
|--------------------------------|------|-----|------|-----|-----|-----|------|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 150 (6") | 457 | 238 | 403 | 86 | 225 | 340 | 298 | 148 |
| 200 (8") | 622 | 292 | 527 | 130 | 275 | 419 | 502 | 282 |
| 250 (10") | 730 | 346 | 616 | 100 | 325 | 349 | 4510 | 374 |
| 300 (12") | 986 | 479 | 914 | 200 | 375 | 500 | 4510 | 611 |
| 350 (14") | 924 | 457 | 864 | 200 | 425 | 500 | 4510 | 782 |
| 400 (16") | 984 | 492 | 911 | 200 | 475 | 500 | 4510 | 1138 |
| 450 (18") | 1070 | 511 | 997 | 263 | 500 | 670 | 700 | 1405 |
| 500 (20") | 1171 | 591 | 1095 | 263 | 575 | 670 | 700 | 1804 |
| 600 (24") | 1416 | 673 | 1222 | 200 | 675 | 965 | 800 | 2870 |

Dimensions in mm

Notes:

- 1) Durcon Vice suggests the installation of the valves with the shaft in the horizontal position;
- 2) The arrow indicates the preferential side of high pressure;
- 3) Dimensions are in mm and weights in Kg;
- 4) Consult Durcon Vice for other sizes, pressure classes and materials;
- 5) Durcon Vice has already manufactured tri eccentrics valves size 80" (2000mm);
- 6) Consult us for additional information.

Drawings and dimensions for double flanges B16.10 - 150 # to 900



| Size 4" to 24" - Class 150 Lb. | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 100 (4") | 325 | 146 | 286 | 45 | 229 | 145 | 150 | 33 |
| 150 (6") | 395 | 190 | 351 | 60 | 267 | 160 | 150 | 46 |
| 200 (8") | 455 | 220 | 404 | 75 | 292 | 210 | 350 | 59 |
| 250 (10") | 485 | 252 | 433 | 90 | 330 | 320 | 350 | 109 |
| 300 (12") | 575 | 287 | 473 | 90 | 356 | 320 | 350 | 128 |
| 350 (14") | 600 | 325 | 498 | 90 | 381 | 320 | 350 | 183 |
| 400 (16") | 635 | 350 | 535 | 90 | 406 | 325 | 450 | 221 |
| 450 (18") | 655 | 375 | 620 | 110 | 432 | 330 | 350 | 282 |
| 500 (20") | 785 | 415 | 735 | 130 | 457 | 385 | 450 | 353 |
| 600 (24") | 880 | 450 | 820 | 160 | 508 | 410 | 450 | 530 |

Dimensions in mm

| Size 4" to 24" - Class 300 Lb. | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 100 (4") | 340 | 161 | 301 | 45 | 305 | 145 | 150 | 38 |
| 150 (6") | 415 | 210 | 371 | 75 | 403 | 185 | 250 | 73 |
| 200 (8") | 480 | 245 | 434 | 90 | 419 | 215 | 450 | 122 |
| 250 (10") | 572 | 282 | 450 | 90 | 457 | 320 | 350 | 177 |
| 300 (12") | 607 | 322 | 515 | 110 | 502 | 342 | 450 | 230 |
| 350 (14") | 641 | 365 | 550 | 130 | 572 | 397 | 450 | 344 |
| 400 (16") | 698 | 395 | 597 | 130 | 610 | 392 | 350 | 439 |
| 450 (18") | 815 | 420 | 755 | 160 | 660 | 430 | 500 | 592 |
| 500 (20") | 875 | 455 | 815 | 160 | 711 | 430 | 600 | 819 |
| 600 (24") | 985 | 500 | 925 | 220 | 813 | 520 | 600 | 1140 |

Dimensions in mm

| Size 4" to 24" - Class 600 Lb. | | | | | | | | |
|--------------------------------|------|-----|------|-----|------|-----|------|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 100 (4") | 387 | 184 | 337 | 67 | 432 | 219 | 298 | 69 |
| 150 (6") | 457 | 238 | 403 | 86 | 559 | 340 | 350 | 127 |
| 200 (8") | 530 | 263 | 460 | 117 | 660 | 370 | 350 | 177 |
| 250 (10") | 641 | 327 | 546 | 130 | 787 | 420 | 350 | 325 |
| 300 (12") | 749 | 365 | 635 | 98 | 838 | 350 | 4510 | 407 |
| 350 (14") | 819 | 390 | 708 | 98 | 889 | 350 | 4510 | 514 |
| 400 (16") | 933 | 441 | 860 | 200 | 991 | 500 | 4510 | 799 |
| 450 (18") | 936 | 460 | 864 | 200 | 1092 | 500 | 4510 | 912 |
| 500 (20") | 1095 | 527 | 1022 | 263 | 1194 | 670 | 700 | 1265 |
| 600 (24") | 1184 | 622 | 1111 | 263 | 1397 | 670 | 700 | 1772 |

Dimensions in mm

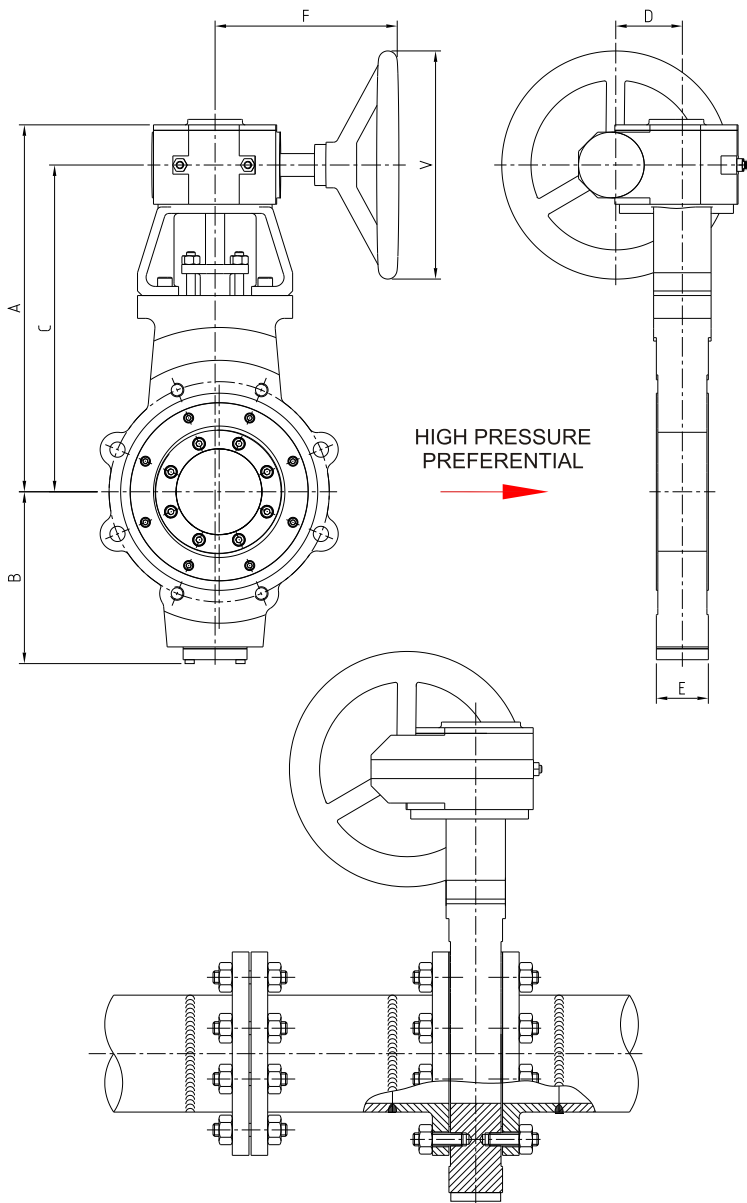
| Size 6" to 24" - Class 900 Lb. | | | | | | | | |
|--------------------------------|------|-----|------|-----|------|-----|------|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 150 (6") | 457 | 238 | 403 | 86 | 610 | 340 | 298 | 173 |
| 200 (8") | 622 | 292 | 527 | 130 | 737 | 419 | 502 | 320 |
| 250 (10") | 730 | 346 | 616 | 100 | 838 | 349 | 4510 | 437 |
| 300 (12") | 986 | 479 | 914 | 200 | 965 | 500 | 4510 | 696 |
| 350 (14") | 924 | 457 | 864 | 200 | 1029 | 500 | 4510 | 917 |
| 400 (16") | 984 | 492 | 911 | 200 | 1130 | 500 | 4510 | 1318 |
| 450 (18") | 1070 | 511 | 997 | 263 | 1219 | 670 | 700 | 1655 |
| 500 (20") | 1171 | 591 | 1095 | 263 | 1321 | 670 | 700 | 2140 |
| 600 (24") | 1416 | 673 | 1222 | 200 | 1549 | 965 | 800 | 3412 |

Dimensions in mm

Notes:

- 1) Durcon Vice suggests the installation of the valves with the shaft in the horizontal position;
- 2) The arrow indicates the preferential side of high pressure;
- 3) Dimensions are in mm and weights in Kg;
- 4) Consult Durcon Vice for other sizes, pressure classes and materials;
- 5) Durcon Vice has already manufactured tri eccentrics valves size 80" (2000mm);
- 6) Consult us for additional information.

Drawings and dimensions for lug type - API 609 B - 150 # to 600



| Size 4" to 24" - Class 150 Lb. | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 100 (4") | 325 | 146 | 286 | 45 | 54 | 145 | 150 | 29 |
| 150 (6") | 395 | 190 | 351 | 60 | 57 | 160 | 150 | 39 |
| 200 (8") | 455 | 220 | 404 | 75 | 64 | 210 | 350 | 49 |
| 250 (10") | 485 | 252 | 433 | 90 | 71 | 320 | 350 | 81 |
| 300 (12") | 575 | 287 | 473 | 90 | 81 | 320 | 350 | 111 |
| 350 (14") | 600 | 325 | 498 | 90 | 92 | 320 | 350 | 154 |
| 400 (16") | 635 | 350 | 535 | 90 | 102 | 325 | 450 | 187 |
| 450 (18") | 655 | 375 | 620 | 110 | 114 | 330 | 350 | 247 |
| 500 (20") | 785 | 415 | 735 | 130 | 127 | 385 | 450 | 317 |
| 600 (24") | 880 | 450 | 820 | 160 | 154 | 410 | 450 | 470 |

Dimensions in mm

| Size 4" to 24" - Class 300 Lb. | | | | | | | | |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 100 (4") | 340 | 161 | 301 | 45 | 54 | 145 | 150 | 32 |
| 150 (6") | 415 | 210 | 371 | 75 | 59 | 185 | 250 | 53 |
| 200 (8") | 480 | 245 | 434 | 90 | 73 | 215 | 450 | 83 |
| 250 (10") | 572 | 282 | 450 | 90 | 83 | 320 | 350 | 134 |
| 300 (12") | 607 | 322 | 515 | 110 | 92 | 342 | 450 | 179 |
| 350 (14") | 641 | 365 | 550 | 130 | 117 | 397 | 450 | 273 |
| 400 (16") | 698 | 395 | 597 | 130 | 133 | 392 | 350 | 332 |
| 450 (18") | 815 | 420 | 755 | 160 | 149 | 430 | 500 | 461 |
| 500 (20") | 875 | 455 | 815 | 160 | 159 | 430 | 600 | 577 |
| 600 (24") | 985 | 500 | 925 | 220 | 200 | 520 | 600 | 623 |

Dimensions in mm

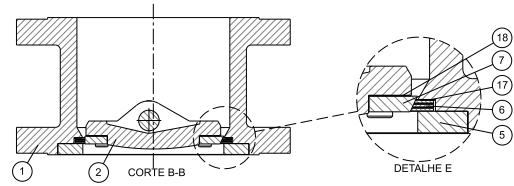
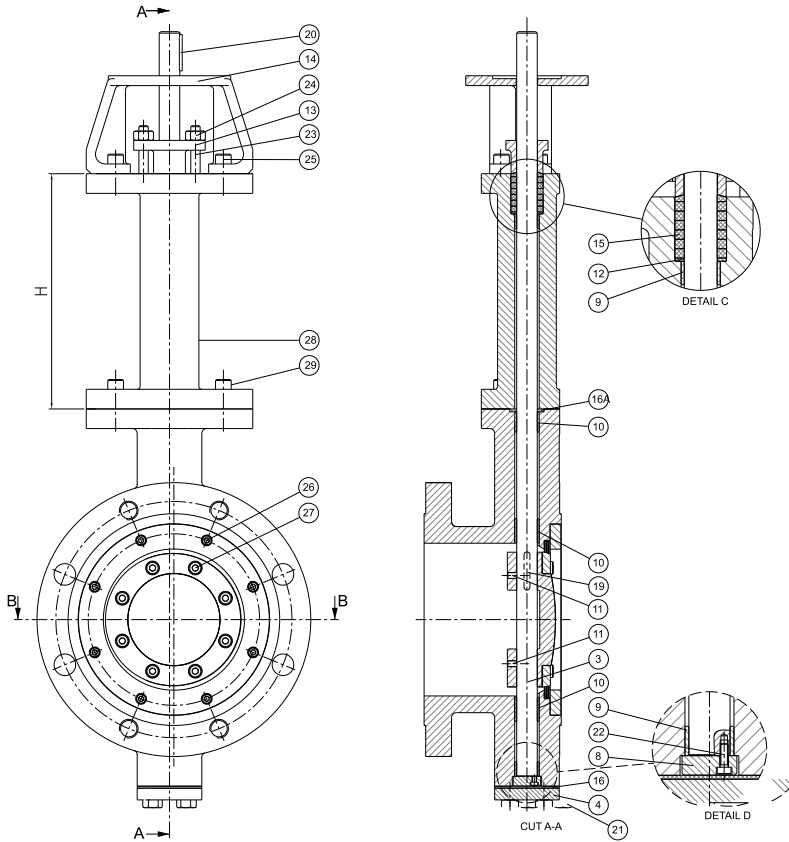
| Size 4" to 24" - Class 600 Lb. | | | | | | | | |
|--------------------------------|------|-----|------|-----|-----|-----|------|-------------|
| Size mm (Inch) | A | B | C | D | E | F | V | Weight (kg) |
| 100 (4") | 387 | 184 | 337 | 67 | 64 | 219 | 298 | 35 |
| 150 (6") | 457 | 238 | 403 | 86 | 78 | 340 | 350 | 72 |
| 200 (8") | 530 | 263 | 460 | 117 | 102 | 370 | 350 | 102 |
| 250 (10") | 641 | 327 | 546 | 130 | 117 | 420 | 350 | 187 |
| 300 (12") | 749 | 365 | 635 | 98 | 140 | 350 | 4510 | 259 |
| 350 (14") | 819 | 390 | 708 | 98 | 155 | 350 | 4510 | 329 |
| 400 (16") | 933 | 441 | 860 | 200 | 178 | 500 | 4510 | 520 |
| 450 (18") | 936 | 460 | 864 | 200 | 200 | 500 | 4510 | 635 |
| 500 (20") | 1095 | 527 | 1022 | 263 | 216 | 670 | 700 | 804 |
| 600 (24") | 1184 | 622 | 1111 | 263 | 232 | 670 | 700 | 1243 |

Dimensions in mm

Notes:

- 1) Durcon Vice suggests the installation of the valves with the shaft in the horizontal position;
- 2) The arrow indicates the preferential side of high pressure;
- 3) Dimensions are in mm and weights in Kg;
- 4) Consult Durcon Vice for other sizes, pressure classes and materials;
- 5) Durcon Vice has already manufactured tri eccentrics valves size 80" (2000mm);
- 6) Consult us for additional information.

Criogenic Configuration



What means cryogenics?

Criogenic is the science that works with materials and processes with temperatures below -102°C (-150°F)

Characteristic:

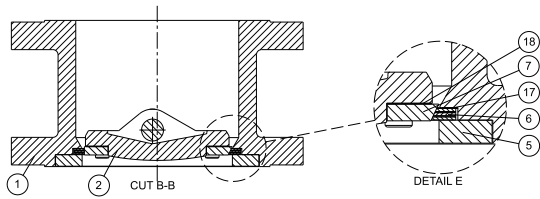
- The metallic seat is not affected for the low temperatures.
- Laminated with teflon filling is standard
- Extended bonnet to avoid the low temperatures in the packing and actuator.

| ITEM | QTY | DESCRIPTION | MATERIAL |
|------|------|----------------------------|--|
| 1 | 1 | Body | ASTM A 351 GR CF8M |
| 2 | 1 | Disc | ASTM A 351 GR CF8M |
| 3 | 1 | Shaft | AISI 316 |
| 4 | 1 | Bottom Cover | ASTM A 240 GR 316 |
| 5 | 1 | Retaining Ring | AISI 316 |
| 6 | 1 | Body Seat | AISI 316 w/ Graphite |
| 7 | 1 | Disc Seat | AISI 304 |
| 8 | 1 | Thrust Bearing | AISI 316 |
| 9 | 1 | Bearing | AISI 316 Nitrited |
| 10 | 1 | Bearing | AISI 316 Nitrited |
| 11 | 2 | Pin | ASTM A 564 Type 630 |
| 12 | 1 | Gasket Ring | AISI 316 |
| 13 | 1 | Packing Gland | ASTM A 351 GR CF8M |
| 14 | 1 | Bracket | Carbon Steel |
| 15 | 6 | Packing | Graphite |
| 16 | 1 | Botton Spiral Wound Gasket | Graphite |
| 16A | 1 | Bonnet Spiral Wound Gasket | Graphite |
| 17 | 1 | Gasket | Graphite |
| 18 | 1 | Gasket | Graphite |
| 19 | 1 | Disc Key | AISI 316 |
| 20 | 1 | Key | SAE 1045 |
| 21 | 4 | Screw | ASTM A 193 GR B16 |
| 22 | 3 | Screw | AISI 316 |
| 23 | 2 | Stud Bolts | ASTM A 193 GR B16 |
| 24 | 2 | Stud Nut | ASTM A 193 GR 4 |
| 25 | 4 | Screw | Alloy Steel |
| 26 | Var. | Screw | ASTM A 193 GR B16 |
| 27 | Var. | Screw | ASTM A 193 GR B16 |
| 28 | 1 | Bonnet | ASTM A 240 GR 316 ou ASTM A 351 GR CF8M |
| 29 | 4 | Screw | AISI 316 |

Notes

- 1) The height H depends on the working pressure and temperatures (consult for details factory), or on customer's specification;
- 2) Consult Durcon Vice for other: sizes, pressure classes and materials;
- 3) Consult Durcon-Vice for additional information.

High Temperature Configuration

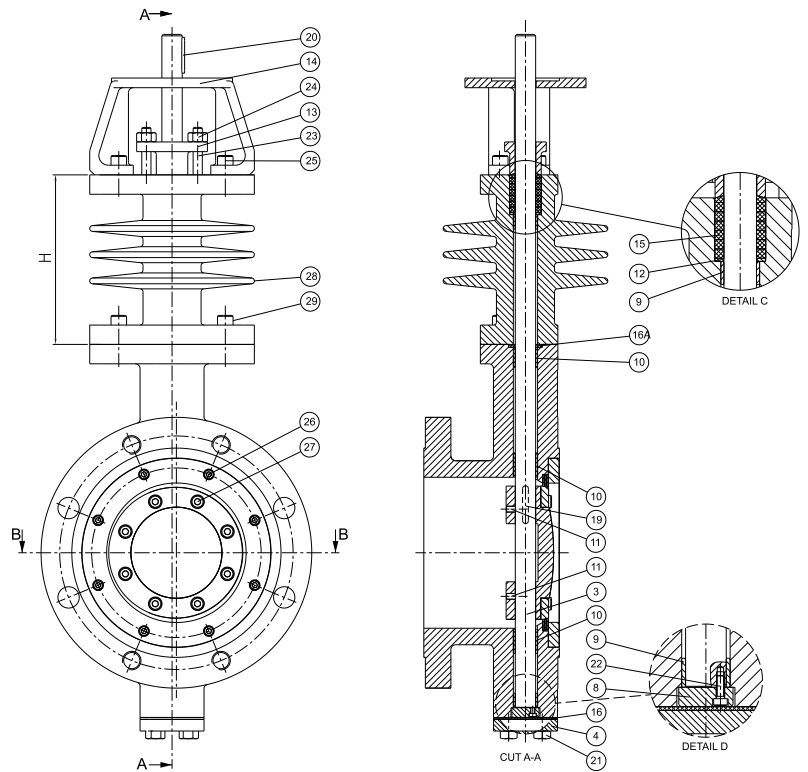


What is high temperature?

High temperature deals with materials and processes at temperatures above 600° C (1112°F).

Characteristic:

- The valve is customized to compensate the thermal dilatations of their components.
- Solid seat standard.
- Extended bonnet to avoid the high temperatures in the packing and actuator.



Notes

- 1) The height H depends on the working pressure and temperature or on customer's specification (consult factory);
- 2) Consult Durcon Vice for others sizes, pressure classes and materials;
- 3) Consult us for additional information.

| ITEM | QTY | DESCRIPTION | MATERIAL |
|------|------|----------------------------|--|
| 1 | 1 | Body | ASTM A 351 GR CF8M |
| 2 | 1 | Disc | ASTM A 351 GR CF8M |
| 3 | 1 | Shaft | AISI 316 |
| 4 | 1 | Bottom Cover | ASTM A 240 GR 316 |
| 5 | 1 | Retaining Ring | AISI 316 |
| 6 | 1 | Body Seat | AISI 316 w/ Graphite |
| 7 | 1 | Disc Seat | AISI 304 |
| 8 | 1 | Thrust Bearing | AISI 316 |
| 9 | 1 | Bearing | AISI 316 Nitrited |
| 10 | 1 | Bearing | AISI 316 Nitrited |
| 11 | 2 | Pin | ASTM A 564 Type 630 |
| 12 | 1 | Gasket Ring | AISI 316 |
| 13 | 1 | Packing Gland | ASTM A 351 GR CF8M |
| 14 | 1 | Bracket | Carbon Steel |
| 15 | 6 | Packing | Graphite |
| 16 | 1 | Bottom Spiral Wound Gasket | Graphite |
| 16A | 1 | Bonnet Spiral Wound Gasket | Graphite |
| 17 | 1 | Gasket | Graphite |
| 18 | 1 | Gasket | Graphite |
| 19 | 1 | Disc Key | AISI 316 |
| 20 | 1 | Key | SAE 1045 |
| 21 | 4 | Screw | ASTM A 193 GR B16 |
| 22 | 3 | Screw | AISI 316 |
| 23 | 2 | Stud Bolts | ASTM A 193 GR B16 |
| 24 | 2 | Stud Nut | ASTM A 193 GR 4 |
| 25 | 4 | Screw | Alloy Steel |
| 26 | Var. | Screw | ASTM A 193 GR B16 |
| 27 | Var. | Screw | ASTM A 193 GR B16 |
| 28 | 1 | Bonnet | ASTM A 240 GR 316 ou ASTM A 351 GR CF8M |
| 29 | 4 | Screw | AISI 316 |

Main Applications in Industry

Power Generation



Main Applications

- Equipments isolation (pumps, valves, heat exchanges, etc)
- Cooling, condensate, feeding water and steam
- Gas to turbine
- Gas Exhaustion and air injection

Main Customers

Petrobras
Sierra Pacific Power Co.
Atlantic Thermal Systems
Tampa Electric
Eletronuclear
AES
Itaipu

| Customer | Application | Size | Pressure/Temp. |
|------------------------------|-----------------------------------|------------|----------------|
| • Nuclebras/Eletróbrás | • Gas Steam Turbine | • 6" - 18" | • 600# |
| • Termo Bahia/Promon | • Gas to Turbine | • 18" | • 600# |
| • Piratininga/Camargo Corrêa | • Isolation / Bypass of Condenser | • 36" | • PN 10 |

Oil and Gas



Main Applications

- Isolation of reservoirs and storage
- Steam piping and condensate
- Cooling water systems
- Desalinization
- Transport of hydrocarbons
- Dessulfurization system
- Services with hydrogen, oxygen, cryogenic, vacuum
- Services with hot gases
- Services with solvents
- LPG and LNG lines

Main Customers

Petrobras
Shell
Mobil
Repsol
Chevron-Texaco
Agip
Comgas

| Customer | Application | Size | Pressure/Temp. |
|-------------------------|--|-----------|----------------|
| • Petrobras/ Ultratec | • Offshore Platforms (Desalinization) | • 18" | • 150# |
| • Petrobras/ Termobahia | • Gas to the Turbine in Power Generation | • 18" | • 600# |
| • Petrobras/ Ipiranga | • Hydrocarbon Transportation | • 6 - 16" | • 150# |
| • Petrobras/ Reduc | • Hydrocarbon Transportation | • 4 - 24" | • 150# |
| • Petrobras | • LNG Transportation | • 12" | • 300# |

Chemical and Petrochemical



Main Applications

- Ethylene plants
- Propylene plants
- Service with hydrogen
- Service with CO₂ and Steam
- Service with oxygen
- Cryogenic services
- Thermal Fluids
- Tail gas
- Services with hydrocarbon

Main Customers

Lyondell Petrochemical
E.I. Dupont
Hyundai Petrochemical
Dow Chemical
Brasken
Bunge
Bayer

| Customer | Application | Size | Pressure/Temp. |
|----------------------------|---------------------|------------|----------------|
| • Cabot do Brasil | • Tail Gas | • 36" | • 150# |
| • Columbian Petroquímica | • Tail Gas | • 36" | • 250°C |
| • Rio Polímero/ ABB Lummus | • Cryogenic Service | • 18" | • 150# |
| • Carbocloro | • Tail Gas | • 12 - 42" | • 150# |
| • Elekeiroz | • Steam | • 4 - 8" | • 600# |
| • White Martins | • Cryogenic Service | • 4 - 40" | • 150# |

Sugar and Alcohol



Main Applications

- Steam
- Cooling water
- Vegetable steam
- Bolier feed water piping
- Equipaments isolation (pumps, valves, heat exchanges, etc)
- Pre-evaporators isolation
- Condensate lines
- Pressure Relief of
- Process Steam lines

Main Customers

Equipav
Usina da Barra
Usina Sta. Elisa
Copersucar
Cosan
Usina Caete
Usina São Martinho

| Customer | Application | Size | Pressure/Temp. |
|----------------------|----------------------------|----------------------|----------------|
| • Usina São Martinho | • Vegetables Steam | • 18", 24", 36", 42" | • 250°C |
| • Usina Pioneiros | • Turbine Steam Exhaustion | • 36" | • 300°C |
| • Usina Santa Isabel | • Turbine Steam Exhaustion | • 30" | • 300°C |
| • Usina Alta Mogiana | • Turbine Extraction | • 48" | • 300°C |

Main Applications in Industry



Mining and Metallurgy

Main Applications

- Water pumping stations
- Cooling water service
- Vacuum service

Main Customers

Cia. Panamericana
Getchell Gold
Samarco
Vale do Rio Doce
Alunorte
Alcoa
Alcan

Customer

- Cia Vale do Rio Doce
- Ory x Gold Mins
- Níquel Tocantins

Applications

- Water Tanks
- Water Piping Stations
- Sulfate of Nickel Slution

Size

- 6" - 18"
- 500 mm
- 10"

Pressure/Temp.

- 600#
- 250 bar
- 150#



Steel Mill

Main Applications

- Cooling water pumping stations
- Hot gas (tail gas)
- Hot air
- Blast furnance, tail gas and coke oven gas

Main Customers

CSN - Nipon Steel
Usiminas
Arcelor - CST
Gerdau
Usinor
Sidenor

Customer

- CST - Cia Siderurgica de Tubarão
- COSIPA - Cia Siderurgica Paulista
- Usiminas
- Voest
- Iscor Limited
- Gerdau Açominas

Applications

- Gas
- Sea Water
- Cooling Water
- Tail Gas
- Blast Furnace Isolation Gas
- Cooling Water

Size

- 40"
- 30"
- 8"
- 1200mm
- 700mm
- 32-40"

Pressure/Temp.

- 150#
- 150#
- 150#
- 600C°
- 700C°
- 150#



Pulp & Paper

Main Applications

- Boiler isolation equipament (pumps, control valves, etc)
- Liqueurs green, white and black
- Oxygen
- Whitewash

- Cooling water, boiler feeding, steam and co-generation systems

Main Customers

Wausau Paperl
Federal Paper
Eurocan Pulp &
PaperTemple-Iniland Paper
Celulosa Arauco
Aracruz
Klabin

Customer

- Cenibra
- Klabin/ Riocel
- Aracruz Guaiba

Applications

- Wash water
- Steam
- Black liqueur

Size

- 4 -30"
- 6"
- 12 -14"

Pressure/Temp.

- 150#
- 150#
- 150#



Water and Sewage

Main Applications

- Water distribution pumping
- Sewage pumping
- Water and waste treatment
- Water pumping stations

Main Customers

Sabesp
Cedae
Sanepar
Sanasa
Cosan
Copasa
Embasa
Cosanpa
SAAE Guarulhos

Customer

- Peterson Candy
- Rand Water
- Metropolitan Water
- Veolia
- Sanepar/ ACMA
- Embasa
- Cosanpa
- SAAE Guarulhos

Applications

- Water Treatment
- Pump Station
- Water Pumping
- Water Pumping
- Sewage
- Filter Discharge
- Filter Washing
- Filter Washing

Size

- 1600 mm
- 1800 mm
- 1200 mm
- 36"
- 24"
- 42"
- 20"
- 16"

Pressure/Temp.

- PN 10
- 100 bar
- 150#
- 16 bar
- PN 10
- 250#
- PN 10
- 150#



CNC Machine Centers



CN Vertical Lathe



Surface Roughness Control



Three Dimensional Control



Butterfly Tri Eccentric Valve Test

Machines, Personnel and Instruments

- Calibrated Instruments and certified non-destruction examination personnel levels 1 and 2 ,
- Qualified welding processes and welders,
- Pressure and leak tightness test equipment to 15.000 psi,
- Modern CNC machine centers
- Automatic welding machine
- Three dimensional control

Focus on Quality

Durcon Vice has an efficient instruments to meet targets defined in our strategic plan. The company and its products meet all the legislation requirements, as well as international codes and standards.

- SA 8000 - Social Responsibility
- ISO 9001:2000 - Quality Management System
- PED 97/23/EC - CE Mark Pressure Equipment Directive



CE



SA 8000



ISO 9001:2000

Our Achievements



Extreme Pressure

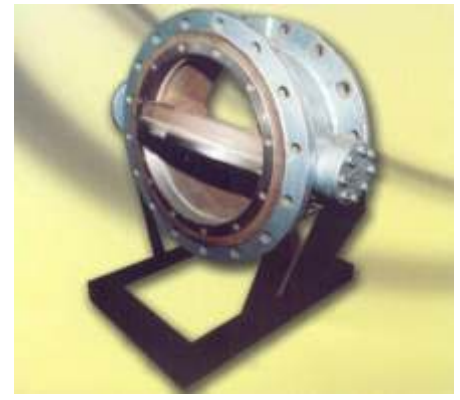
20" - 1500# Tri Eccentric butterfly valve, metal seated, operating on a water column over 2,5 Km, underground.

The pressure over 200 Bar (2900 psi).



Extreme Temperature

1350mm Tri Eccentric butterfly valve metal seated, installed on a platinum smelter, operating on furnace off gas. **Temperature of 950° C (1740°F).**



Extreme Operating Cycles

600mm Tri Eccentric butterfly valve. Twin seal butterfly valve, for oxygen service, installed on a petrochemical plant.

250.000 cycles under full differential pressure successfully.

Additional tests



Fire Safe Certified



Fire Safe Test



Cryogenic Test



100.000 Cycles Certified

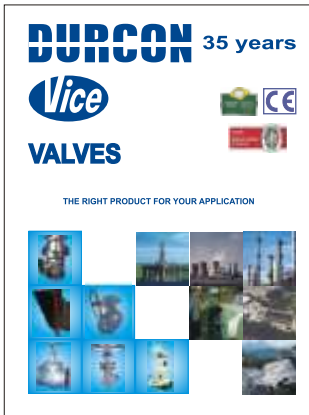
How to Specify and to Order

Valve Butterfly model BTE (tri eccentric) of DURCON-VICE. The seat and seal rings, in the disk and in the body of the valve must be removable to facilitate the maintenance. The size, connections, pressure class, material of the body, material of the disc, seating and actuators, should be in agreement with the following selections:

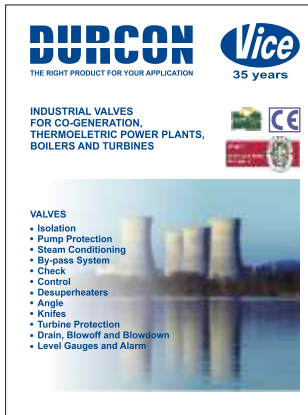
| Product | Size | Class | Material of the Body / Disk | Seating | Connections | Actuation | Other Details | |
|-------------------------------|-------------------------|--|---|--|--|--|--|-------------------------|
| BTE - Butterfly Tri Eccentric | Specify when Requesting | 25# 75# 150# 300# 600# 900# | PN 10 PN 16 PN 25 PN 40 PN 64 PN 100 Others | WCB - ASTM A216 WCB WC6 - ASTM A217 WC6 CF8 - ASTM A351 CF8 CF8M - ASTM A351 CF8M Others | PTFE-PTFE 304-316 - Stainless Steel U-Stellite Others | LUG - Lug WF - Wafer FRI - ISO Flanges FRA - ANSI Others | RE - Handwheel with Gear Reduce AE - Electric Actuators AP - Pneumatic Actuators D.A. AH - Hydraulic Actuator Others | Specify when Requesting |

Additionally, inform the following details of the application: fluid, temperature at normal and maximum operation, pressure at normal and maximum operation, flow and maximum differential pressure.

Durcon Vice Products Line



Institutional Durcon Vice



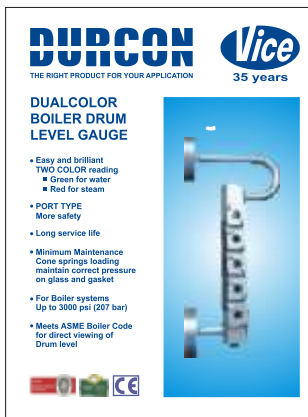
Industrial Valves for Co-generation, Thermolectric Power Plants, Boilers and Turbines



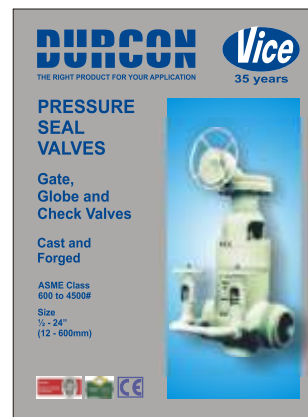
Automatic Recirculation Valves - Model NVM, VRM-HPM and NVL



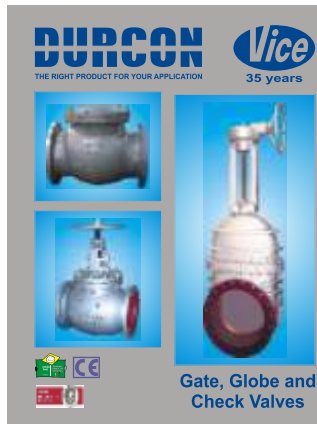
Globe Stop Valve - Model DURBLOCK "T" and "Y"



Dualcolor Boiler Drum Level Gauge



Globe, Gate and Check Valves Pressure Seal



Globe, Gate and Check Valves Bolted Bonnet



Knife Gate and Slide Gate Valves



Special Valves

The right products for your applications.

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 E-mail: sales@durcon-vice.com.br
 Web-page: www.durcon-vice.com.br

