

Versatile

Eccentric Plug Valve

Flow Control & Isolation Solved



VIKING JOHNSON™

PIPE CONNECTIONS, REPAIR & FLOW CONTROL PRODUCTS FOR THE UTILITIES INDUSTRY

CRANE

BUILDING SERVICES & UTILITIES



Flow control & isolation solved

Numerous applications

Eccentric Plug Valves can be used for a wide range of flow control and isolation applications including clean and dirty water, sewage, sludge and slurries, air and other services. Available with EPDM, Nitrile, Neoprene and Fluoroelastomer Rubber encapsulated plugs. The Eccentric Plug Valve can be used to isolate and regulate any of these services bi-directionally.

Quality manufacturing

Manufactured in cast iron, using high pressure moulding techniques for consistent quality and precision, the Eccentric Plug Valve also incorporates a nickel weld deposited seat for corrosion and erosion resistance, specially profiled for low torque and extended seat life. At DN65 epoxy seat only.

The Eccentric Plug Valve is trunnion supported and fully encapsulated in an elastomeric polymer. The valve body is fully internally and externally Epoxy coated as standard.

A rubber lined option is also available. Offering a high flow capacity with a round port design in sizes up to DN300 (larger sizes have rectangular ports), the Eccentric Plug Valve design ensures that the ductile iron plug rotates away from the seat as soon as movement begins, avoiding scuffing and thereby enhancing life expectancy.



Eccentric Plug Valve - Series 601

Specifications

Installation

The Millcentric® plug valve is suitable for flow and shut-off in either direction. Seat end downstream is the preferred orientation and any reverse flow requirement should be stated at the time of order. For use on fluids with suspended solids, installation with the seat upstream and the valve stem horizontal is recommended. Plug rotation to the top of the valve will ensure smooth operation.

In-Line Maintenance

In the unlikely event of stem leakage, the stem seals can be easily replaced without removing the bonnet. Access to the body for cleaning or inspection does not require removal from the line.

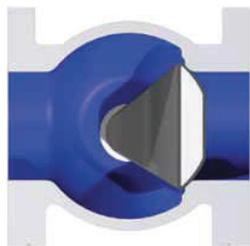
Modular Construction

Design of the bonnet and stem allows for on-site adaption of gear operators, power actuators, or extension devices on to standard valves. Conversion can be easily undertaken without removing the valve bonnet, thereby minimizing downtime.

Power Operation

Pneumatic, electric or hydraulic operation is available, complete with accessories such as limit switches, solenoid valves and positioners when required.

Flow Control



- ▶ Valve in closed position for bubble tight shut-off
- ▶ Normal flow direction gives pressure assisted sealing
- ▶ Torques are low even in reverse flow



- ▶ Plug rotates away from the seat for instant opening
- ▶ Seat wear and operating torque reduced
- ▶ No further seat contact until valve is closed again



- ▶ Design of Millcentric plug valve allows modulating control over the full 90° travel
- ▶ Ideally suited for balancing service
- ▶ Standard rotary valve provides control and tight shut-off in one valve



- ▶ Plug is out of flow path when fully open
- ▶ Straight through, uninterrupted smooth flow
- ▶ Round port reduces turbulence and erosion, lowers pumping costs and can be "pigged" to clean the pipeline

Eccentric Plug Valve - Series 601

Product Design Benefits

Body

The Eccentric Plug Valve body casting is BS1452 Grade 220 (ASTM A126 Class B) cast iron using high pressure moulding techniques for consistent quality and precision.

Flanges are available drilled to PN16, PN10 or ANSI B16.1 Class 125. Alternative grooved or mechanical joint ends are available.

Seat

On sizes DN80 and above, the Eccentric Plug Valve incorporates, as standard, an 1/8" thick, 99% welded nickel seat for corrosion and erosion resistance, specially profiled for low torque and extended seat life.

On DN65 only corrosion resistant epoxy seat is available for general duties.

Stem seal

High integrity sealing is achieved by combining the advantages of a resilient, abrasion resistant u-cup seal.

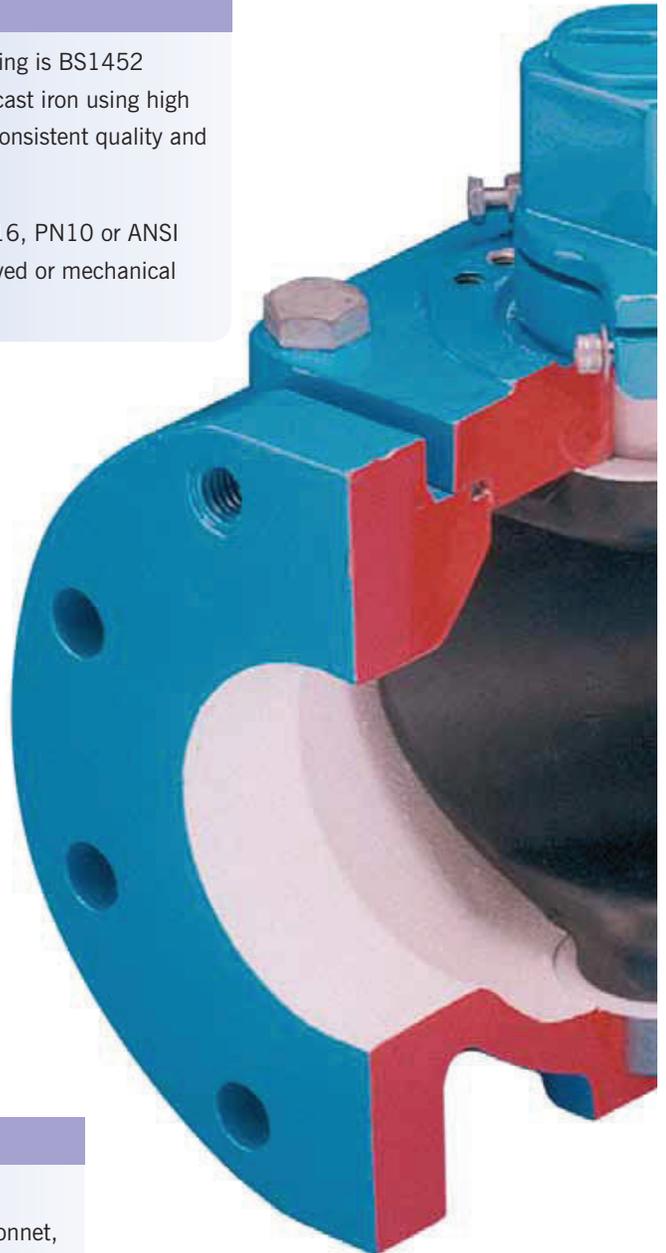
From vacuum to high pressure, the self-adjusting sealing system gives positive, trouble-free service and is retained independently of the plug stem or external torque device, eliminating periodic maintenance.

Bearings

The plug rotates in permanently lubricated 316 stainless steel bearings located in the body and bonnet, along with upper and lower PTFE thrust washers which ensure consistently low operating torque.

Position indication

Eccentric Plug Valves equipped with a torque collar have open and closed travel stops and are fitted with an intermediate position indicator.



Bonnet

Superior 'O' ring sealing on sizes up to DN800 means lower bolting stresses compared with compression gaskets. Asbestos-free gaskets are used on sizes DN900 and above.

Flow

The round port design (up to and including DN300) with streamlined internal contours gives class leading high capacity straight through flow in the fully open position, reducing turbulence, pressure drop and the effect of erosive media. Flow of sludges and slurries is therefore also enhanced.

Sizes DN350 and above have rectangular ports.

Interchangeable

The face-to-face dimensions on sizes DN300 and below are identical to BS5163 gate valves. Therefore, fitting an Eccentric Plug Valve as a replacement for a gate valve can be accomplished without pipeline modification.

Plug

The ductile iron plug is supported on integral trunnions, and is encapsulated in an elastomeric polymer, providing leaktight shut-off in either direction, even under vacuum conditions.

High integrity sealing is achieved by any of the abrasion resistant elastomers. The PTFE thrust washers prevent entry of abrasive materials into the bearings.



Customer Benefits

- ▶ Round port design for full flow - industry leading Kv valves
- ▶ Nickel welded seat - for corrosion and erosion resistance
- ▶ Epoxy seat - only on DN65 (max temp 50°C)
- ▶ Variety of flange connections available - PN10/16 ANSI 125
- ▶ Elastomer encapsulated ductile iron plug - material to suit media
- ▶ DN65 - DN200 have a 50mm square drive, suitable for a standard waterworks T-key - or dedicated operating lever (supplied separately)
- ▶ Epoxy coated inside and out - for improved corrosion resistance
- ▶ Optional power operation - for remote operation
- ▶ Interchangeable - face to face dimensions are common with gate valves DN80-DN300
- ▶ PTFE washers - preventing entry of abrasive materials into bearings (longer life expectancy)
- ▶ Stainless steel bearings - permanently lubricated, offering lower torque

Eccentric Plug Valve - Series 601

Elastomer Selection

Elastomers available for Millcentric Valve

Natural rubber is also available.

Nitrile

A general purpose material sometimes referred to as BUNA-N with a -20°C to 100°C temperature range. Used on sewage, water, hydrocarbon and mineral oils.

EPDM

An excellent polymer for use on chilled water through to LP steam applications having a temperature range of -35°C to 90°C. Resistance to many acids, alkalies, detergents, phosphate esters, alcohols and glycols is an added benefit.

Neoprene

This versatile material shows outstanding resistance to abrasion and ozone. Chemical resistance to a wide range of petroleum base products and dilute acids and alkalies. Temperature range -20°C to 100°C.

Fluoroelastomer

Retention of mechanical properties at high temperature is an important feature of this elastomer: temperature range is -5°C to 145°C. It also has excellent resistance to oils, fuels, lubricants and most mineral acids and aromatic hydrocarbons. Note: Not for water or steam applications.

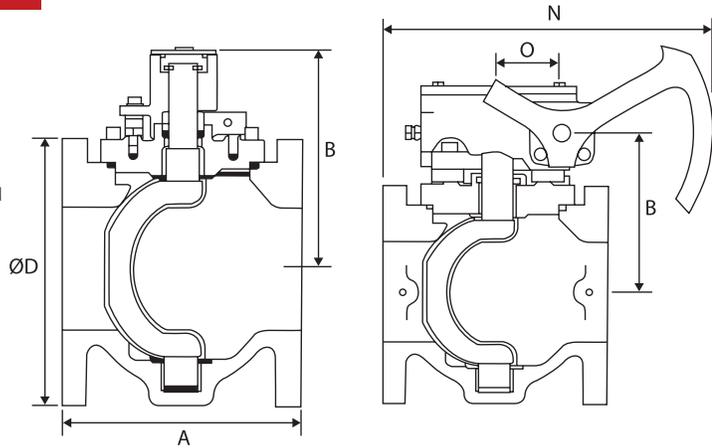
Elastomer Selection Chart

| Service | Elastomer | Average Useful Temp. Range | Service | Elastomer | Average Useful Temp. Range | Service | Elastomer | Average Useful Temp. Range |
|------------------------|-----------------|----------------------------|--------------------------|-----------------|----------------------------|------------------------|-----------------|----------------------------|
| Acetone | EPDM | -35°C to 90°C | Caustic Soda | EPDM | -35°C to 90°C | Oil, Animal | Nitrile | -20°C to 100°C |
| Air | EPDM | -35°C to 90°C | Cement Slurry | EPDM | -35°C to 90°C | Oil, Mobil Therm Light | Fluoroelastomer | -5°C to 145°C |
| Air w/Oil | Nitrile | -20°C to 100°C | Copper Sulphate | EPDM | -35°C to 90°C | Oil, Mobil Therm 600 | Fluoroelastomer | -5°C to 145°C |
| Alcohol AMYL | EPDM | -35°C to 90°C | Creosote (Coal) | Nitrile | -20°C to 100°C | Oil, Mobil Therm 603 | Nitrile | -20°C to 100°C |
| Alcohol Aromatic | Fluoroelastomer | -5°C to 145°C | Coal Slurry | Nitrile | -20°C to 100°C | Oil, Lubricating | Nitrile | -20°C to 100°C |
| Alcohol Butyl | Neoprene | -20°C to 100°C | Diesel Fuel No. 3 | Nitrile | -20°C to 100°C | Oil, Vegetable | Nitrile | -20°C to 100°C |
| Alcohol Denatured | Nitrile | -20°C to 100°C | Diethylene Glycol | EPDM | -35°C to 90°C | Paint, Latex | Nitrile | -20°C to 100°C |
| Alcohol Ethyl | EPDM | -35°C to 90°C | Ethylene Glycol | EPDM | -35°C to 90°C | Phosphate Ester | EPDM | -35°C to 90°C |
| Alcohol Grain | Nitrile | -20°C to 100°C | Fatty Acid | Nitrile | -20°C to 100°C | Propane | Nitrile | -20°C to 100°C |
| Alcohol Isopropyl | Neoprene | -20°C to 100°C | Fuel Oil No. 2 | Nitrile | -20°C to 100°C | Rape Seed Oil | EPDM | -35°C to 90°C |
| Alcohol Methyl | EPDM | -35°C to 90°C | Fertilizer Liquid H4N2O2 | EPDM | -35°C to 90°C | Sewage with Oils | Nitrile | -20°C to 100°C |
| Ammonia Anhydrous | Neoprene | -20°C to 100°C | Gasoline Keg | Nitrile | -20°C to 100°C | Sodium Hydroxide 20% | EPDM | -35°C to 90°C |
| Ammonium Nitrate | EPDM | -35°C to 90°C | Gas Natural | Nitrile | -20°C to 100°C | Starch | EPDM | -35°C to 90°C |
| Ammonia, water | EPDM | -35°C to 90°C | Glue, Animal | Nitrile | -20°C to 100°C | Steam to 250°F | EPDM | -35°C to 90°C |
| Animal Fats | Nitrile | -20°C to 100°C | Green Liquor | EPDM | -35°C to 90°C | Stoddard, Solvent | Nitrile | -20°C to 100°C |
| Black Liquor | EPDM | -35°C to 90°C | Hydraulic Oil (Petro) | Nitrile | -20°C to 100°C | Sulphuric Acid 10% 50% | Neoprene | -20°C to 100°C |
| Blast Furnace Gas | Neoprene | -20°C to 100°C | Hydrogen | Nitrile | -20°C to 100°C | Sulphuric Acid 100% | Fluoroelastomer | -5°C to 145°C |
| Butane | Nitrile | -20°C to 100°C | JF4, JP5 | Fluoroelastomer | -5°C to 145°C | Trichloroethylene Dry | Fluoroelastomer | -5°C to 145°C |
| Bunker Oil "C" | Nitrile | -20°C to 100°C | Kerosene | Nitrile | -20°C to 100°C | Triethanol Amine | EPDM | -35°C to 90°C |
| Calcium Chloride | EPDM | -35°C to 90°C | Ketone | EPDM | -35°C to 90°C | Varnish | Fluoroelastomer | -5°C to 145°C |
| Carbon Dioxide | EPDM | -35°C to 90°C | Lime Slurry | EPDM | -35°C to 90°C | Water, Fresh | EPDM | -35°C to 90°C |
| Carbon Monoxide (Cold) | Neoprene | -20°C to 100°C | Methane | Nitrile | -20°C to 100°C | Water, Salt | EPDM | -35°C to 90°C |
| Carbon Monoxide (Hot) | Fluoroelastomer | -5°C to 145°C | Methyl Ethyl Ketone | EPDM | -35°C to 90°C | Xylene | Fluoroelastomer | -5°C to 145°C |
| Carbon Tetrachloride | Fluoroelastomer | -5°C to 145°C | Naptha (Berzin) | Nitrile | -20°C to 100°C | | | |

Eccentric Plug Valve - Series 601 DN65 to DN300

Specifications

- Round port design for full flow DN65 - DN300
- Nickel welded seat
- Epoxy seat at DN65 (max temp 50°C)
- Elastomer encapsulated ductile iron plug
- DN65 - DN200 have a 50mm square drive, suitable for a standard waterworks T-key
- Epoxy coated inside and out
- Optional power operation
- Flange drillings: PN10, PN16, ANSI B16.1 Class 125 and Class 250
- Rubber lined option
- Ductile iron option for PN25
- Stainless steel option
- Glass lined option



Eccentric Plug Valve

| DN | Dimensions | | | | | | | Weight Class 125 | |
|-----|------------------------|---------------|---------------|------------------------|--------|--------|---------|------------------|-------------|
| | PN16, Class 125 A (mm) | Wrench B (mm) | Geared B (mm) | PN16, Class 125 D (mm) | N (mm) | O (mm) | T* (mm) | Wrench (kg) | Geared (kg) |
| 65 | 191 | 159 | - | 178 | - | 67 | 241 | 13 | 29 |
| 80 | 203 | 159 | - | 191 | - | 67 | 241 | 18 | 34 |
| 100 | 229 | 184 | 162 | 229 | 152 | 67 | 241 | 30 | 46 |
| 125 | 254 | 213 | 194 | 254 | 305 | 67 | 241 | 37 | 53 |
| 150 | 267 | 213 | 194 | 279 | 305 | 67 | 241 | 43 | 59 |
| 200 | 292 | 273 | 241 | 343 | 305 | 67 | 286 | 86 | 102 |
| 250 | 330 | - | 292 | 406 | 305 | 118 | 295 | | 152 |
| 300 | 356 | - | 333 | 483 | 305 | 118 | 295 | | 196 |

* Centre of body to face of handwheel

Flow Control

Materials & Relevant Standards

Torque collar (up to DN200)

Cast Iron, BS 1452 Gr,
ASTM 220 A126 CLB, DIN 1691 GG25

U-cup seal

As plug coating

Bonnet

Cast Iron, BS 1452 Gr 220,
ASTM A126 CLB, DIN 1691 GG25

'O' ring (up to DN700)

As plug coating

Gasket (DN900 and above)

Asbestos-free

Bearings (up to DN500)

Stainless Steel (permanently lubricated)

Bearings (DN600 and above)

Bronze (permanently lubricated)

Thrust water

PTFE

Plug

Ductile Iron, BS 2789 Gr 500/7,
ASTM A536, DIN 1693 GGG-40

Plug elastomer

As specified

Body

Cast Iron, BS 1452 Gr 220,
ASTM A126 CLB, DIN 1691 GG25

Pressure Rating

PN16 Maximum cwp 16 bar

Hydrostatic Test

Shell: 24 bar
Seat: 17.6 bar

Class 125

Maximum cwp 175 lbf/in²

Hydrostatic Test

Shell: 350 lbf/in²
Seat: 220 lbf/in²

Velocity Limit

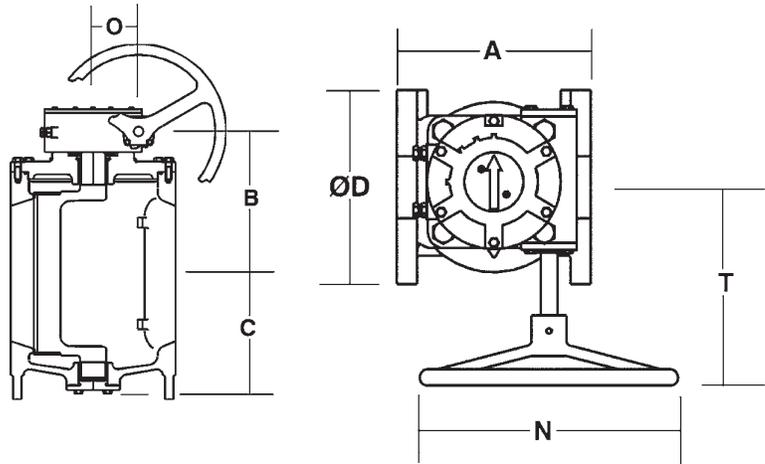
Non-abrasive: 10 m/s (30 ft/s)
Abrasive (on/off service): 5 m/s (15 ft/s)
Air: 50 m/s (150ft/s)

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Eccentric Plug Valve - Series 601 DN350 and above

Specifications

- Rectangular ports
- Nickel welded seat
- Gear operated
- Optional power actuation
- Elastomer faced ductile iron plug
- Sizes above DN1400, details available on request
- Flange drillings: PN10, PN16, ANSI B16.1 Class 125 and Class 250
- Ductile iron option for PN25
- Stainless steel option
- Rubber lined option
- Glass lined option



Eccentric Plug Valve

| DN | Dimensions | | | | | | | Weight (Geared) (kg) |
|------|-----------------------|--------|--------|-----------------------|--------|--------|--------|----------------------|
| | PN16, ANSI 125 A (mm) | B (mm) | C (mm) | PN16, ANSI 125 D (mm) | N (mm) | O (mm) | T (mm) | |
| 350 | 432 | | | 533 | 305 | 118 | 295 | 240 |
| 400 | 451 | 406 | 356 | 591 | 457 | 117 | 381 | 470 |
| 450 | 546 | 432 | 381 | 635 | 457 | 117 | 381 | 615 |
| 500 | 597 | 521 | 400 | 699 | 457 | 117 | 381 | 855 |
| 600 | 1067 | 584 | 549 | 813 | 610 | 152 | 457 | 1730 |
| 700 | 1295 | 705 | 629 | 984 | 610 | 238 | 559 | 2360 |
| 900 | 1524 | 838 | 737 | 1168 | 610 | 238 | 610 | 3160 |
| 1000 | 1829 | 960 | 737 | 1346 | 765 | - | - | 4620 |
| 1200 | 2134 | 960 | 914 | 1511 | 765 | - | - | 6070 |
| 1400 | 2438 | 960 | 914 | 1683 | 765 | - | - | 6870 |
| 1600 | TBA | TBA | TBA | TBA | TBA | TBA | TBA | TBA |
| 1800 | TBA | TBA | TBA | TBA | TBA | TBA | TBA | TBA |

Materials & Relevant Standards

Torque collar (up to DN200)

Cast Iron, BS 1452 Gr, ASTM 220 A126 CLB, DIN 1691 GG25

U-cup seal

As plug coating

Bonnet

Cast Iron, BS 1452 Gr 220, ASTM A126 CLB, DIN 1691 GG25

'O' ring (up to DN700)

As plug coating

Gasket (DN900 and above)

Asbestos-free

Bearings (up to DN500)

Stainless Steel (permanently lubricated)

Bearings (DN600 and above)

Bronze (permanently lubricated)

Thrust washer

PTFE

Plug

Ductile Iron, BS 2789 Gr 500/7, ASTM A536, DIN 1693 GGG-40

Plug elastomer

As specified

Body

Cast Iron, BS 1452 Gr 220, ASTM A126 CLB, DIN 1691 GG25

Pressure Rating

PN16 Maximum cwp 16 bar

Hydrostatic Test

Shell: 24 bar
Seat: 17.6 bar

Class 125

Maximum cwp 150 lbf/in²

Hydrostatic Test

Shell: 265 lbf/in²
Seat: 165 lbf/in²

Velocity Limit

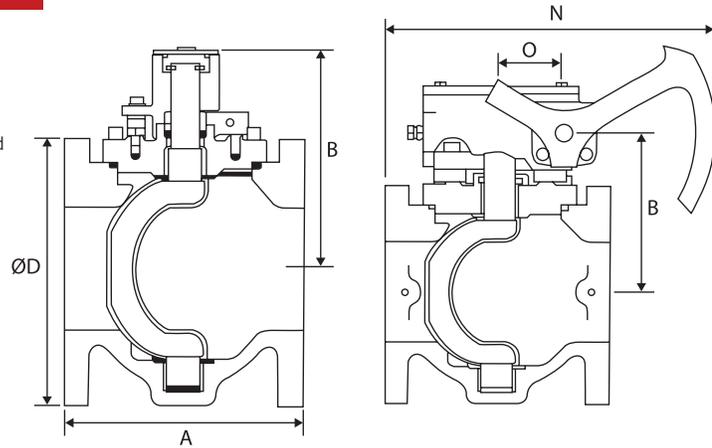
Non-abrasive: 10 m/s (30 ft/s)
Abrasive (on/off service): 5 m/s (15 ft/s)
Air: 50m/s (150ft/s)

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Eccentric Plug Valve - Series 601 Rubber lined DN80 to DN350

Specifications

- Natural rubber body lining
- Natural rubber encapsulated ductile iron plug
- DN80 - DN200 have a 50mm square drive, suitable for a standard waterworks T-key
- Gear operation optionally available
- Optional power operation
- Flange drillings: PN10, PN16, ANSI B16.1 Class 125
- DN400 – DN1000 details on request



Eccentric Plug Valve

| DN | Dimensions | | | | | | | Weight | |
|-----|-------------------------|---------------|---------------|------------------------|--------|--------|----------|-------------|-------------|
| | PN16, Class 125 A* (mm) | Wrench B (mm) | Geared B (mm) | PN16, Class 125 D (mm) | N (mm) | O (mm) | T** (mm) | Wrench (kg) | Geared (kg) |
| 80 | 203 | 159 | - | 191 | - | 67 | 241 | 18 | 34 |
| 100 | 229 | 184 | 162 | 229 | 152 | 67 | 241 | 30 | 46 |
| 125 | 254 | 213 | 194 | 254 | 305 | 67 | 241 | 37 | 53 |
| 150 | 267 | 213 | 194 | 279 | 305 | 67 | 241 | 43 | 59 |
| 200 | 292 | 273 | 241 | 343 | 305 | 67 | 286 | 86 | 102 |
| 250 | 330 | 289 | - | 406 | 305 | 118 | 295 | | 152 |
| 300 | 356 | 330 | - | 483 | 305 | 118 | 295 | | 196 |
| 350 | 432 | 330 | - | 533 | 305 | 118 | 295 | | 240 |

* Excludes thickness of rubber on face of flanges
 ** Centre of body to face of handwheel

Flow Control

Materials & Relevant Standards

Torque collar (up to DN200)

Cast Iron, BS 1452 Gr,
 ASTM 220 A126 CLB, DIN 1691 GG25

U-cup seal

As plug coating

Bonnet

Cast Iron, BS 1452 Gr 220,
 ASTM A126 CLB, DIN 1691 GG25

'O' ring (up to DN700)

As plug coating

Gasket (DN900 and above)

Asbestos-free

Bearings (up to DN500)

Stainless Steel (permanently lubricated)

Bearings (DN600 and above)

Bronze (permanently lubricated)

Thrust water

PTFE

Plug

Ductile Iron, BS 2789 Gr 500/7,
 ASTM A536, DIN 1693 GGG-40

Plug elastomer

As specified

Body

Cast Iron, BS 1452 Gr 220,
 ASTM A126 CLB, DIN 1691 GG25

Pressure Rating PN16

Maximum cwp 16 bar

Hydrostatic Test

Shell: 24 bar
 Seat: 17.6 bar

Velocity Limit

Abrasive (on/off service): 5m/s (15ft/s)

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