

Uniwat®



Concentric Butterfly Valves

www.comeval.es



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General Design Considerations



A butterfly valve is a type of flow control device, typically used to regulate a fluid flowing through a section of pipe. A flat circular plate (disc) is positioned in the centre of the pipe. The plate has a rod (shaft) through it connected to an actuator on the outside of the valve. Rotating the actuator turns the plate either parallel or perpendicular to the flow. Unlike a ball valve, the plate is always present within the flow, therefore a pressure drop is always induced in the flow regardless of valve position.

A butterfly valve is from a family of valves called quarter turn valves. The “butterfly” is a metal disc mounted on a rod. When the valve is closed, the disc is turned so that it completely blocks off the passageway. When the valve is fully open, the disc is rotated a quarter turn so that it allows unrestricted passage. The valve may also be opened incrementally to regulate flow thanks to the gradual interlocking notch.

Butterfly valves are of simple design, of light weight and volume and very effective on isolating lines for its quick and safe operation. Most of butterfly valves design are flangeless for installation between counter flanges what saves space, costs and maintenance.

There are two kind of flangeless butterfly valves:

Wafer Style Concentric Butterfly Valves: Wafer style is the more common one and is the least expensive one. The Wafer Style Concentric Butterfly valve is just about the standard. It is so common that no one even bothers to use the word “wafer” when ordering a butterfly valve. They take it for granted that if they order a butterfly valve, they will get a wafer style one. Wafer butterfly valves are installed between two flanges using bolts or studs and nuts. This type of installation, of course, makes it impossible to disconnect just one side of the piping system from the valve. That is where the lug style valve comes in.

Lug Style Butterfly Valves: Lug style valves are provided with tapered holes to fix threaded bolts in. This allows them to be installed into a system using two sets of bolts and no nuts. The valve is installed between two flanges using a separate set of bolts for each flange. This set-up permits either side of the piping system to be disconnected without distributing the other side.

Lug Style Butterfly Valves are used in dead end service and generally have a reduced pressure rating.

Valves can also be of dual flanged design; provided with integral flanges that are ready to be installed between flanges of the same standard. These are more bulky valves and usually required for large sizes and other styles of performance by the position of the shaft. (see next paragraph).

Other kind of valves by its nature of shaft design are as follows:

Concentric Design: This is the most common and simple design. The valve shaft is concentric to the disc. It is normally a resilient seated valve. Rotating the handle turns the plate either parallel or perpendicular to the flow of water, shutting off the flow

Double Eccentric Design: This design features a slight offset in the way the disc is positioned, which increases the valve's sealing ability and decreases its tendency to wear. It is normally used for throttling functions, larger sizes and / or metal seated valves.

Triple Offset Design: This design is the one offering the highest degree of performance. The shaft is totally off set from the central axis thus increasing the ability of the valve disc to close tightly at even high pressure. These valves are usually metal seated thus being used for high temperature too. These valves are usually operated by worm gear to achieve a slow closing.

Codification

Butterfly valve

V F 7 0 0 P G G N 0 0 0 5 0

VF : UNIWAT® butterfly valve identification

BUTTERFLY TYPE

750 Lug type with back seat

ACTUATION DEVICE

P With lever
R With worm gear
B Bare shaft
E Electric actuator

BODY

G Ductile iron JS1030 (GGG40)

DISC

I St. Steel CF8M (AISI 316)

SEAT

T PTFE

SPECIAL CONNECTION AND DESIGN

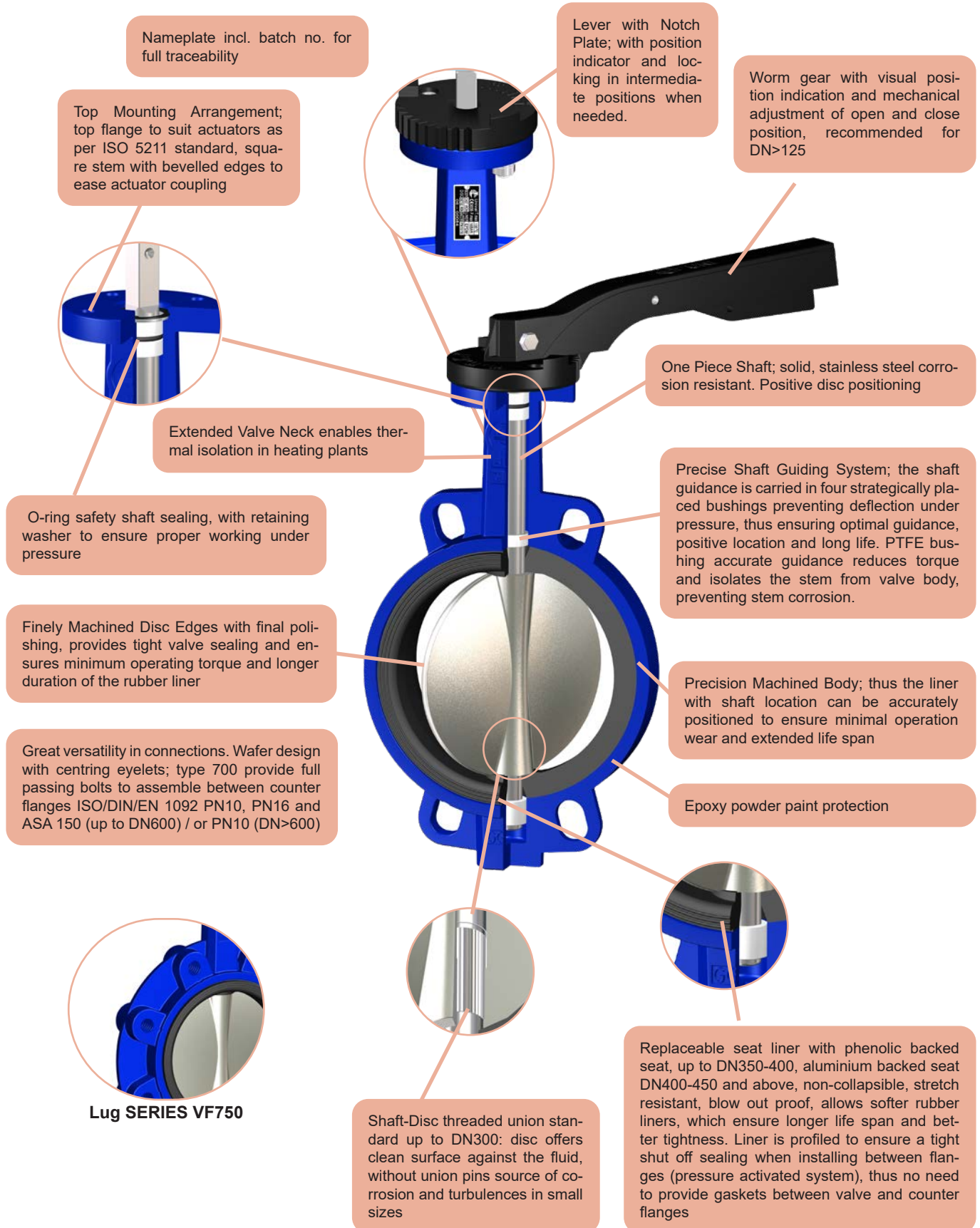
00 No special connection

VALVE SIZE

050 DN50
300 DN300

Design Attributes

Concentric Butterfly Valves are quarter turn rotary valves, bidirectional, with rubber or fluoropolymer seat, for stopping or regulating the flow of the service fluid when necessary. A metal disc is positioned in the centre of the valve. The plate has a rod (stem) through it connected to an actuator device (handwheel, gear, etc.) on the outside of the valve. The valve closes by turning the disc clockwise and is open when the lever is parallel to the pipe. Valves are provided with epoxy paint against environmental aggression. They are of simple design, light weight and volume and offer a quick operation with full seat tightness, being widely used in many applications with significant savings in space and investment costs for installation.



SERIES VF750

Main Features

Valve design: EN 593, EN 12516 & DIN 3840.

Nominal Pressure: PN16 (DN25-DN300)/ PN10* (DN350-1200). For PTFE seat PN10 (DN40-600)

* Option PN16 (DN350-1200)

Face to face length: EN 558 S20 (DIN 3202 K1) SERIES VF700/750/7U0

Valve end connections:

-VF750 Lug type to be installed between welding neck flanges EN 1092-1/2 type 11/B

PN16 (DN25-300); PN10 (DN350-600), option PN16 (DN350-600)

Top flange: ISO 5211

Marking: EN 19

Pressure Tests: EN 12266-1

Seat leakage rate: Rate A (full seat tightness in both directions)

Outside epoxy coating protection blue color similar to RAL5002. Min. average thickness 150 microns

Product compliant with Directive 2014/68/EU on Pressure Equipment (PED) and Machinery Directive 2006/42/EC

WRAS Approval for VF750 DN25-DN300

Main Duties / Limits of use

Liquids compatible with materials of construction, acc. to Directive 2014/68/EU, Annex II table 8 (liquids of group 1*) & table 9 (liquids of group 2*) up to category I

Low pressure steam & neutral gases of group 2*, acc. to Directive 2014/68/EU, Annex II table 7 up to category I

Table 7: PS 16 bar DN25-200 (Art.4-Parr.3 DN25-50)

PS 13 bar DN250

PS 10 bar DN300-350

PS 6 bar DN400-500

PS 2,5 bar DN600-1200

Table 8: PS 16 bar DN25-125 (Art.4-Parr.3)

PS 13 bar DN150

PS 10 bar DN200-1200 (Art.4-Parr.3 DN200)

Table 9: PS 16 bar DN25-300 (Art.4-Parr.3)

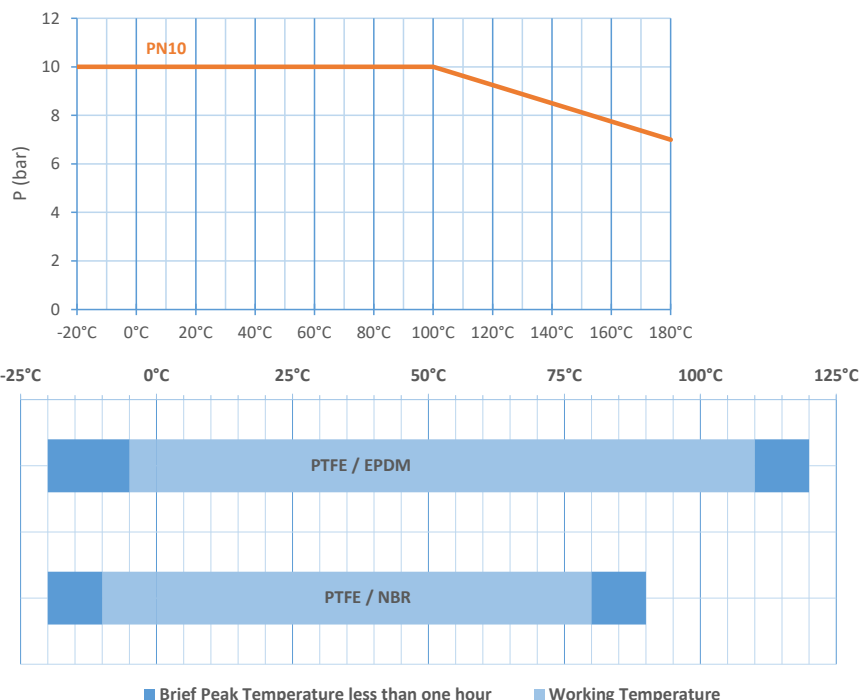
- Option DN350-1200

PS 10 bar DN350-1200 (Art.4-Parr.3)

Questions referring to chemical resistance, please consult us

Observe also pressure/temperature limits on diagrams under

*Classification of fluids (group 1 or 2) acc. to Directive 2014/68/EU, Article 13



We recommend not to exceed maximum velocity as follows:
PN10: 3 m/s

TSmax: 80°C for drinking water

Temperature ranges given just for reference.

Pressure-temperature rating, material compatibility and other parameters also to be considered for rubber selection.

Please consult our Technical Department for a particular application.

Options

Compliance with EN 1074-1/2, higher service pressure ratings and temperatures, other connections, other designs and approvals, limit switches, different actuation. Please consult us

Flow Coefficients Kv Values (m³/h)

SERIES VF750

| DN | Opening Angle of the Valve | | | | | | | | |
|------|----------------------------|------|------|-------|-------|-------|-------|-------|--------|
| | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° |
| 25 | - | - | 1,5 | 5 | 8,3 | 14 | 22 | 33 | 36 |
| 32 | - | 0,8 | 1,7 | 5,3 | 9,5 | 16 | 25 | 37 | 41 |
| 40 | - | 1,5 | 3,5 | 8 | 14 | 23 | 37 | 55 | 61 |
| 50 | - | 2,5 | 7 | 14 | 24 | 40 | 64 | 95 | 105 |
| 65 | - | 5 | 11 | 23 | 40 | 67 | 107 | 159 | 176 |
| 80 | - | 9 | 20 | 35 | 61 | 101 | 161 | 240 | 265 |
| 100 | - | 16 | 38 | 78 | 137 | 226 | 360 | 538 | 594 |
| 125 | 0,5 | 26 | 69 | 129 | 219 | 361 | 576 | 860 | 950 |
| 150 | 0,8 | 44 | 105 | 205 | 373 | 617 | 983 | 1468 | 1622 |
| 200 | 1,3 | 82 | 205 | 387 | 680 | 1124 | 1792 | 2676 | 2957 |
| 250 | 2,1 | 138 | 345 | 669 | 1084 | 1791 | 2855 | 4262 | 4711 |
| 300 | 3,7 | 210 | 534 | 1028 | 1639 | 2707 | 4318 | 6449 | 7126 |
| 350 | 5,5 | 305 | 750 | 1326 | 2347 | 3878 | 6184 | 9236 | 10205 |
| 400 | 7,4 | 388 | 935 | 1813 | 3208 | 5301 | 8454 | 12625 | 13950 |
| 450 | 9,7 | 550 | 1212 | 2370 | 4193 | 6929 | 11049 | 16500 | 18232 |
| 500 | 13 | 658 | 1595 | 2981 | 5275 | 8716 | 13900 | 20758 | 22937 |
| 600 | 20 | 962 | 2246 | 4431 | 7919 | 13083 | 20864 | 31158 | 34429 |
| 700 | 55 | 1233 | 2725 | 5105 | 9022 | 14906 | 23770 | 35499 | 39225 |
| 800 | 135 | 1719 | 3394 | 6367 | 10338 | 17081 | 27239 | 40905 | 44950 |
| 900 | 180 | 2475 | 4731 | 8631 | 13691 | 22620 | 36072 | 54165 | 59525 |
| 1000 | 250 | 3342 | 6443 | 11752 | 18642 | 30800 | 49116 | 73755 | 81050 |
| 1200 | 320 | 4715 | 8643 | 15155 | 24198 | 39980 | 63757 | 95741 | 105210 |

A valve flow coefficient represents the standard flow rate which flows through the valve at a given opening, referred to pre-established conditions:

* Kv value is the volume of water at 20°C, in cubic meters per hour (m³/h), that will flow through the valve at a static pressure drop of 1 bar across the valve.

* Cv value is the volume of water at 60°F, in gallons per minute (gpm), that will flow through the valve at a static pressure drop of 1 psi across the valve.

Conversion from Kv to Cv can be roughly calculated by means of the following expression:

$$Cv = Kv \times 1,17$$

Flow rate through the valve with other liquids can be calculated with the following expressions (for gases please consult us):

$$Kv = q (SG / dp)^{1/2} \quad \text{where}$$

q = water flow (m³/h)

SG = specific gravity (1 for water)

dp = pressure drop (bar)

$$Cv = q (SG / dp)^{1/2} \quad \text{where}$$

q = water flow (US gallons per minute)

SG = specific gravity (1 for water)

dp = pressure drop (psi)

It is common practice to size the valves on the basis of pipe DN for on off application. Nevertheless, Butterfly Valves used for control purpose should be calculated on the basis of operating conditions.

First step is to calculate the Kv values for the different working conditions and then choose the DN with such Kv values in the region of 20° to 70° valve opening angle.

COMEVAL Technical Department is at your disposal to help you sizing your system.

Valve Torques (Nm)

| DN | PTFE seat | |
|------|-----------|------|
| | PN6 | PN10 |
| 25 | | |
| 32 | | |
| 40 | 13 | 17 |
| 50 | 16 | 19 |
| 65 | 26 | 30 |
| 80 | 38 | 43 |
| 100 | 67 | 73 |
| 125 | 102 | 114 |
| 150 | 159 | 186 |
| 200 | 180 | 340 |
| 250 | 428 | 524 |
| 300 | 596 | 800 |
| 350 | - | 1031 |
| 400 | - | 1505 |
| 450 | - | 2096 |
| 500 | - | 2823 |
| 600 | - | 4327 |
| 700 | - | - |
| 800 | - | - |
| 900 | - | - |
| 1000 | - | - |
| 1200 | - | - |

*Special construction

Remarks for Actuator Sizing:

The torque values given are for water or other non-viscous lubricating liquids at ambient temperature.

Recommended safety factor to be applied:

30-40% for double acting pneumatic actuators

30-50% for single acting pneumatic actuators and electric actuators

There are several factors that can increase above given values and should be taken into account for actuators sizing:

-For gases and dry medium (non lubricating), multiply above values by about 1,25-2 depending on application

-For viscous liquids increase above values depending on the liquid properties

-For service conditions such as likelihood of seat swelling, or low and high temperature seat hardening, an additional safety factor should be considered.

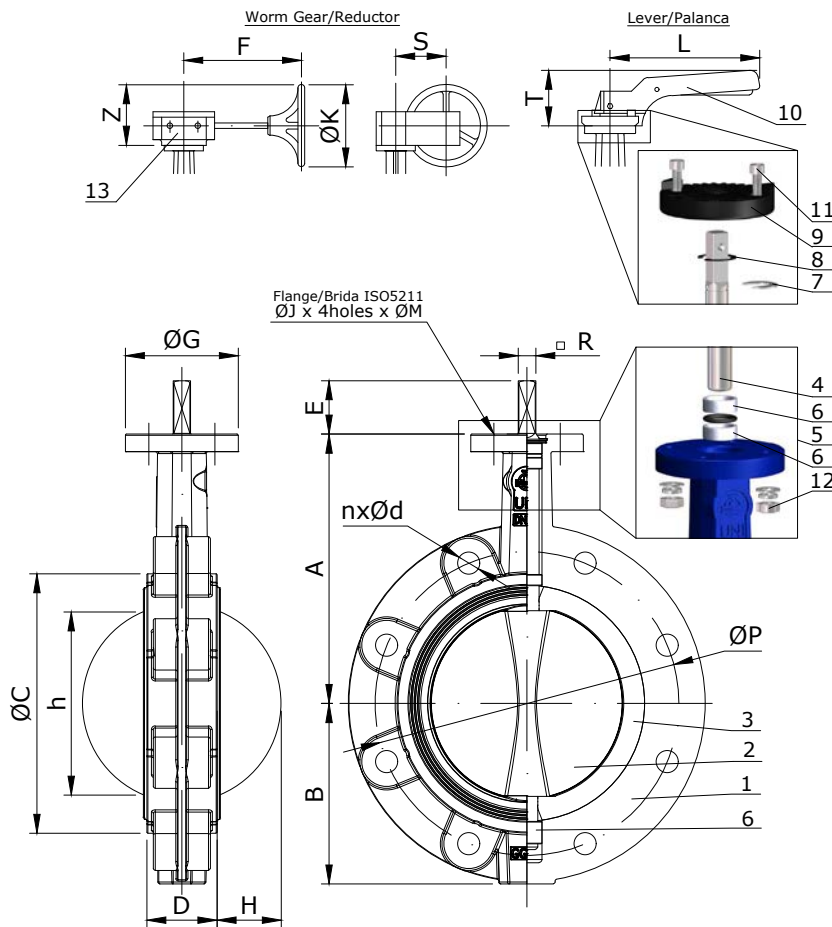
There are three torques to be considered when selecting the proper actuator for a butterfly valve:

- 1) Seating Torque: The torque to displace a resilient seat and effect shutoff
- 2) Bearing Torque: The torque required to overcome friction forces on the valve shaft bearing surfaces during valve travel angle (about 30% of seating torque)
- 3) Dynamic Torque: Due to fluid forces which tend to close the valve when the valve is partially open. This torque is due to the velocity of the fluid created by a differential pressure across the valve. Systems should be projected to avoid high velocities across the valve

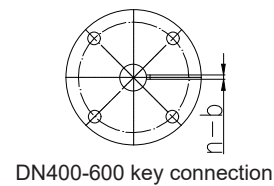
Above given values are inclusive of the 3 torques if max. recommended velocities are not exceeded, the actuator selected must provide the calculated torque over its total opening and closing travel angle.

SERIES VF750

Main Parts and Materials



| NO. | PART | MATERIAL |
|-----|-------------|-----------------------------------------------------------------|
| 1 | BODY | Ductile iron EN-JS1030 (GGG40) |
| 2 | DISC | St. steel CF8M |
| 3 | LINER | PTFE (VF750_T_) |
| 4 | STEM | St. steel AISI 420 (DN25-300) St. steel AISI 431 (DN350-600) |
| 5 | O-RING | NBR / EPDM |
| 6 | BUSHING | PTFE |
| 7 | WASHER | Steel |
| 8 | CIRCLIP | Steel |
| 9 | NOTCH PLATE | Aluminium |
| 10 | HAND LEVER | Aluminium / Ductile iron |
| 11 | BOLTS | Steel |
| 12 | NUTS | Steel |
| 13 | WORM GEAR | Ductile iron |



Main Valve Parameters

| DN | 40 | 50 | 65 | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 |
|-----------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| MAIN DIMENSIONS | A | 129 | 129 | 137 | 145 | 164 | 189 | 204 | 243 | 289 | 319 | 368 | 400 | 422 | 562 |
| | B | 70 | 76 | 85 | 95 | 110 | 125 | 139 | 175 | 203 | 238 | 267 | 298 | 318 | 410 |
| | D | 33 | 43 | 46 | 46 | 52 | 56 | 56 | 60 | 68 | 78 | 78 | 86 | 105 | 152 |
| | ØP | 110 | 125 | 145 | 160 | 180 | 210 | 240 | 295 | 350 | 400 | 460 | 515 | 565 | 725 |
| | n-Ød | 4-Ø18 | 4-Ø18 | 4-Ø18 | 8-Ø18 | 8-Ø18 | 8-Ø18 | 8-Ø22 | 8-Ø22 | 12-Ø22 | 12-Ø22 | 16-Ø22 | 12-Ø26 | 20-Ø26 | 20-Ø30 |
| COUPLING DETAIL | ISO 5211 | F05 | F05 | F05 | F05 | F05 | F07 | F07 | F07 | F10 | F10 | F10 | F10 | F14 | F14 |
| | E | 32 | 32 | 32 | 32 | 32 | 32 | 45 | 45 | 45 | 45 | 51 | 51 | 57 | 70 |
| | □R | 9 | 9 | 9 | 9 | 11 | 14 | 14 | 17 | 22 | 22 | Ø33 | Ø38 | Ø41 | Ø50 |
| | ØG | 65 | 65 | 65 | 65 | 90 | 90 | 90 | 125 | 125 | 125 | 125 | 175 | 175 | 210 |
| | ØJ | 50 | 50 | 50 | 50 | 70 | 70 | 70 | 102 | 102 | 102 | 102 | 140 | 140 | 165 |
| | ØM | 4-Ø8 | 4-Ø8 | 4-Ø8 | 4-Ø8 | 4-Ø10 | 4-Ø10 | 4-Ø10 | 4-Ø12 | 4-Ø12 | 4-Ø12 | 4-Ø12 | 4-Ø18 | 4-Ø18 | 4-Ø22 |
| | n-b | | | | | | | | | | | | 1x10 | 1x10 | 1x12 |
| LEVER | T | 29 | 29 | 29 | 29 | 29 | 29 | 34 | 34 | 47 | | | | | |
| | L | 260 | 260 | 260 | 260 | 280 | 280 | 280 | 390 | 390 | 540 | | | | |
| WORM GEAR | F | 132,5 | 132,5 | 132,5 | 132,5 | 132,5 | 132,5 | 197 | 197 | 212 | 212 | 257 | 257 | 257 | 321 |
| | S | 44 | 44 | 44 | 44 | 44 | 44 | 53 | 53 | 79 | 79 | 220 | 220 | 220 | 265 |
| | Z | 97,5 | 97,5 | 97,5 | 97,5 | 97,5 | 97,5 | 177 | 177 | 178,5 | 178,5 | 285 | 285 | 285 | 375 |
| | ØK | 136 | 136 | 136 | 136 | 136 | 136 | 277 | 277 | 277 | 277 | 285 | 285 | 285 | 375 |
| | | | | | | | | | | | | | | | |

We do not recommend the use of valves with PTFE liner and lever for DN200-DN300

Dimensions in mm subject to manufacturing tolerance

Information / restriction of technical rules need to be observed!

Installation, Operating and Maintenance Manual can be downloaded at www.comeval.es

The engineer, designing a system or a plant, is responsible for the selection of the correct valve

Product suitability must be verified, contact manufacturer for information

Solutions on Control Accesories and Actuation

UNIWAT butterfly valves can be provided with a wide range of solutions on control accessories and actuation which is all packaged at our works according to customer specifications. The modular system permits to distributors and plant users to assemble or replace the diverse options in site. Virtually most applications that may be encountered on the industry today are covered with the standard range of actuation and accessories, nevertheless, other customer tailored solutions can be provided by our R&D Section.

Position Indication Arrangements on Manual Valves

Special designs of proven reliability have been engineered by our R&D section to provide UNIVAL users with more service options.



Valve with hand lever with electromechanical limit switches



Valve with hand lever with inductive proximity limit switches



Valve with worm gear with electromechanical limit switches



Valve with worm gear with inductive proximity limit switches



Valve with hand lever with limit switches box (metal or plastic)



Valve with worm gear with limit switches box (metal or plastic)



Other options



Stem extensions



Pad Locked lever

Stem Extensions; either for manual operated valves or actuated ones. The length of extension is made to the customer specification, and provides bolting arrangement on both sides: valve stem and actuator stem side with upper part according to ISO 5211 standard.

Pad Locked lever; this simple system prevents unauthorized operation at the plant. It is arranged on request.

Pneumatic Actuators CMVL T Series - Options and Accesories

Valve position indication can be provided by some arrangements such as Limit Switches that can be mounted either onto the actuator shell or cased into plastic or metal boxes.



Inductive proximity limit switches

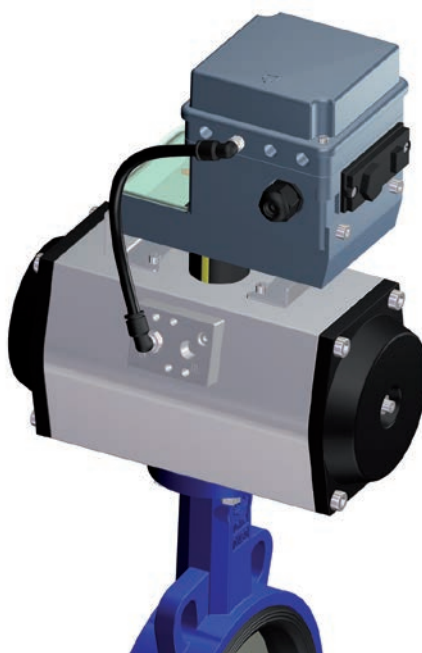


Metal or plastic limit switches boxes

Solenoid Valves in diverse materials and configurations can be provided as the most common accessories on pneumatic actuators. For throttling services a range of standard or smart Positionners can be adapted onto the actuators. Intermediate Gear Boxes can be fitted in all cases for emergency manual actuation.



Solenoid Valves for On/Off control



Pneumatic or Electropneumatic,
Standard or Intelligent Positionners



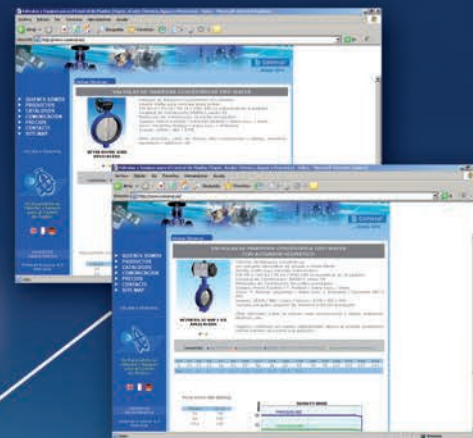
Intermediate Gear Box for
emergency manual actuation

Marketing Tools Available to Distributors

A rich assortment of Uniwat® marketing tools are available to our distributors worldwide, visit our corporate Web site www.comeval.es for more details.



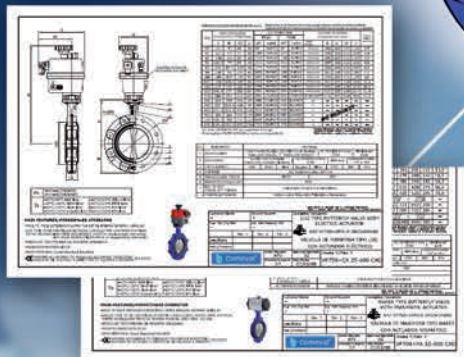
Data Sheets Manual
Comprehensive of all technical and engineering information on the comprehensive portfolio.



Web Site Product Sheet
Valve description, main dimensions, operating parameters and other links accessible at your finger tips.

Arrangement Drawings

Standardized sectional parts and dimensional drawings for use on engineering projects or enquiries.



Cut way / Demo Samples



Price Lists

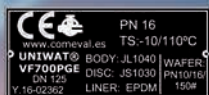
Up dated price book comprehensive of all models including actuated valves.

Join us on the net to start your Uniwat® experience
www.comeval.es



Operating and Maintenance Manuals

Provided along every valve into the sealed plastic bag. Also accessible via Internet at all times



Traceability

Valves are provided with a riveted name plate ensuring traceability, year of manufacture and main parameters. Valves are individually preserved into a sealed air bubble plastic bag and then on sets of some number of valves per cardboard box to assist with handling and storing. Please ask your Uniwat® distributor for packaging details. (no minimum order requirement is imposed).

Excelling the best.

Uniwat®



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